

Chairman Robo

Owner's manual



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Safety instructions

General

An electric wheelchair is a motorised vehicle and special care must, therefore, be taken when it is used.

Incorrect use may both injure the user and damage the chair. In order to reduce these risks, you should read the Owner's Manual carefully, in particular the safety instructions and their warning texts.

Any inappropriate modifications to the wheelchair and its various systems may entail an increased risk of accidents. Carefully follow the recommendations in the Handling section to prevent the risk of accidents in connection with driving.

All modifications to and interventions in the vital systems of the wheelchair must be performed by a qualified service engineer. Always contact a qualified service engineer in cases of doubt.



WARNING

Please show great caution where this warning symbol appears. There is a risk of personal injury.

Passengers

The wheelchair is not designed to transport passengers, regardless of their age.

Driving

Do not drive the wheelchair over kerbs and other obstacles higher than 2 3/4".

When driving downhill, display the utmost caution and use the lowest speed.

The wheelchair is not designed to be driven down slopes with a gradient greater than 12 degrees.

Do not drive up slopes with a gradient greater than 12 degrees. On slopes with greater gradients, there is a risk that the wheelchair cannot be manoeuvred safely

Do not drive the wheelchair along slopes greater than 10 degrees. There is a risk of tipping.

Operating the seat lift

Ensure that nothing is caught between the chassis and the seat when the seat lift is operated. Raising the seat lift raises the centre of gravity and increases the risk of tipping. Therefore, you should only use the seat lift on level ground and not on hilly ground.

Releasing the brakes

In order to avoid the wheelchair rolling away, ensure that the wheelchair is on a level base before releasing the brakes.

Charging the batteries

The batteries must be charged in a well-ventilated room, not in a wardrobe or box-room. Do not charge the batteries in a bathroom or wet room. Use only chargers with a maximum 10 A charging current (mean value). When the charger is connected, the chair must not and cannot be driven.

Transport

Ensure that the wheelchair is properly secured (see page 33).

If the chair is not properly secured and comes loose, it can cause serious injury to persons in the vehicle and serious damage to the vehicle.

Service

Carry out only the service and maintenance which are stated in the Instructions for Use. All other service and maintenance must be carried out by persons with sufficient technical skill to be able to carry it out in a professional manner.

During all work on the electrical system of the wheelchair, the connection to the negative pole of the battery must always be removed. Take care when using metal objects in connection with work on the batteries. Short-circuiting can easily cause an explosion. Always use protective gloves and goggles.

The recommended air pressure is 0.2 MPa (2 kp/cm²). Overfilling entails the risk of explosion.

General introduction

In order that you can obtain the greatest possible benefit from the chair, it is important that it is used in the intended manner. We would, therefore, like you to read the Owner's Manual carefully, in particular the safety instructions. Keep the Owner's Manual together with everything else associated with your wheelchair.

The first thing to do is to charge the batteries. Read the chapter Charging the Batteries on page 30 if you are uncertain about how to do this. Charging takes approximately 9 hours.

Specially adapted wheelchair

If your wheelchair is marked with the decal "specially adapted product", it has been adapted to your requirements and wishes. This means that its design and functions may differ from the text in the present Owner's Manual or from the design and functions of other wheelchairs of the same type..

Specifications

All the information and specifications contained in the present Owner's Manual were valid at the time of delivery of this wheelchair. As development and improvement take place continuously at Permobil, we reserve the right to make changes without prior notification.

Design and function

General

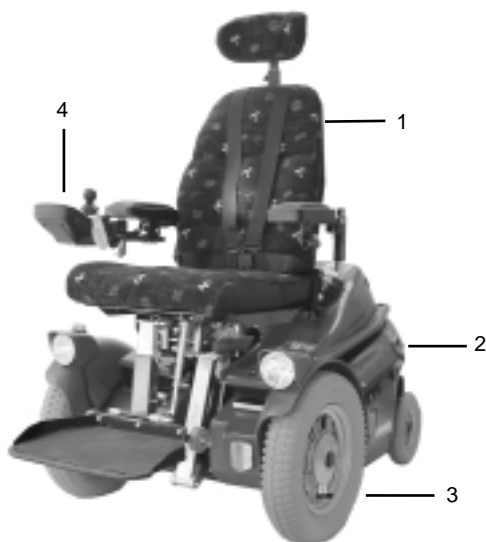


Figure 1. Chairman Robo, front view



Figure 2. Chairman Robo, rear view

- | | |
|----------------|---------------------------|
| 1. Seat | 4. Control panel |
| 2. Chassis | 5. Terra-unit (seat lift) |
| 3. Drive wheel | 6. Rear wheel |

Seat

See the supplied Owner's Manual for the seat.

Seat lift

The Chairman Robo is equipped with a unique seat lift system which makes it possible to adjust the height of the seat from 6 1/2" to 28".



Figure. 3 Highest position



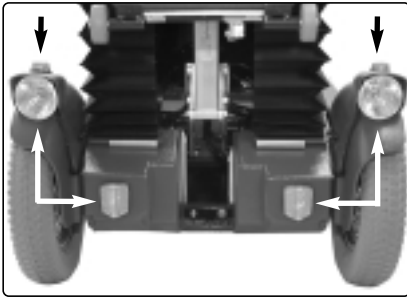
Figure. 4 Lowest position

Wheels

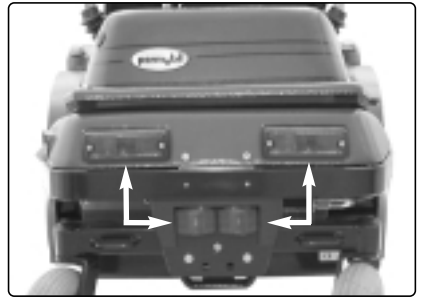
The wheelchair's front wheels, the drive wheels, have pneumatic tyres. The rear wheels, the steering wheels, have solid rubber tyres.

Lights and reflectors

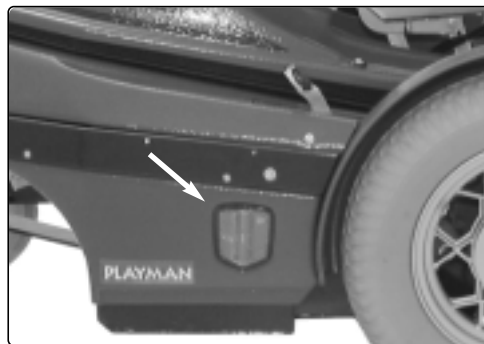
The wheelchair is equipped with reflectors at the front, rear and sides (L model) and front/rear lights and indicators (S model).



Front



Rear



Side

Figure. 5 Lights, indicators and reflectors

Electrical system

The wheelchair's batteries are located under the battery cover in the centre of the chassis.

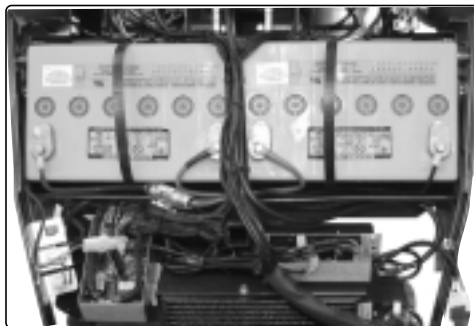


Figure 6. Batteries

Driving

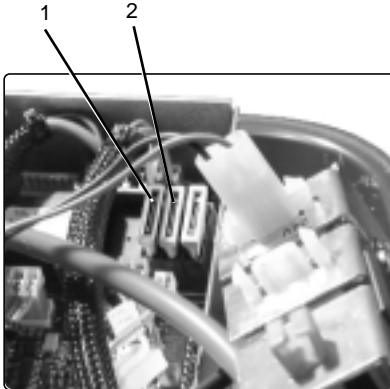
The wheelchair has a drive pack for each drive wheel. The motors regulate the speed, turning and braking. A joystick on the manoeuvring panel sends signals to the electronics unit placed under the cover on the rear part of the chassis. The electronics unit then controls the motors.



Figure 7. Electric motor with driving gear

Fuses

There are four fuses in the wheelchair: the main fuse, the charging fuse, seat lift/lights/24V switched and 24V direct. The main fuse is mounted on the electronics unit, the charging fuse is located on the thin red cable which goes to the positive pole of the battery and the two other fuses are in the electronics unit.



1. Seat lift/lights/24 V switched, 15 A
2. 24 V direct, 15 A
3. Main fuse, 80 A
4. Charging fuse, 15 A

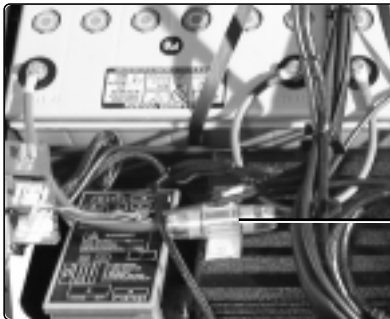


Figure 8. Fuses

Chairman Robo S Control Panel

The control panel of the wheelchair is mounted on the right arm rest and its location can be adjusted to achieve the most comfortable position in connection with maneuvering. The control panel can also be mounted on the left arm rest. The figure below shows the various functions of the control panel.



Figure 9. Chairman Robo S control panel

- | | |
|-------------------|------------------------------|
| 1. Key switch | 7. Seat lift * |
| 2. Speed selector | 8. On/off power switch |
| 3. Horn | 9. Battery voltage indicator |
| 4. Lights | 10. Joystick |
| 5. Indicators | |

**Not used if there is an additional panel*

Key switch

The key switch is a plug which is inserted in the side of the control panel. The key must be inserted before the main power switch can be activated.



Figure 10. Key switch

Main power switch

The main power switch functions as an on/off button for the power supply to the wheelchair and must be switched on for the wheelchair to work.



Figure 11. Main power switch

Seat lift

The switch for maneuvering the seat lift up and down. When the seat lift is in operation, the indicator lamp lights (figure 11). When the seat lift is activated from its lowest position, the maximum speed is reduced by half (2,2 miles/h).



Figure 12. Seat lift switch

Battery voltage indicator

The window display on the control panel (figure 12) shows the following indications (from left to right):

- Red/yellow/green = Fully charged
- Red/yellow = Semi-charged
- Red = Charge the batteries



Figure 13. Battery voltage indicator

Horn

Pressing this switch produces a sound to attract attention.



Figure 14. Horn switch

Speed selector

The speed can be set in three positions and one or more of the indicator lamps lights depending on the speed range selected.

- Low = 0 - 1 miles/h
- Medium = 0 - 2,2 miles/h
- High = 0 - 4,5 miles/h



Figure 15. Speed selector

Lights

Pressing this switch turns on the wheelchair's lights.

Indicators

Pressing on the right or left arrow activates the wheelchair's indicators.



Figure 16. Lights/indicators switches

Joystick

The joystick is used to regulate the speed of the wheelchair forwards or backwards, to turn and to brake.

The speed is regulated steplessly by moving the joystick forwards or backwards.

The speed is directly proportional to the movement of the joystick (small movement low speed - large movement high speed).

The wheelchair is turned by moving the joystick to the left or right.

The wheelchair is braked by moving the joystick back to the neutral position or letting it go.



Figure 17. Joystick

Chairman Robo L Control Panel

The control panel of the wheelchair is mounted on the right arm rest and its location can be adjusted to achieve the most comfortable position in connection with maneuvering. The control panel can also be mounted on the left arm rest. The figure below shows the various functions of the control panel.

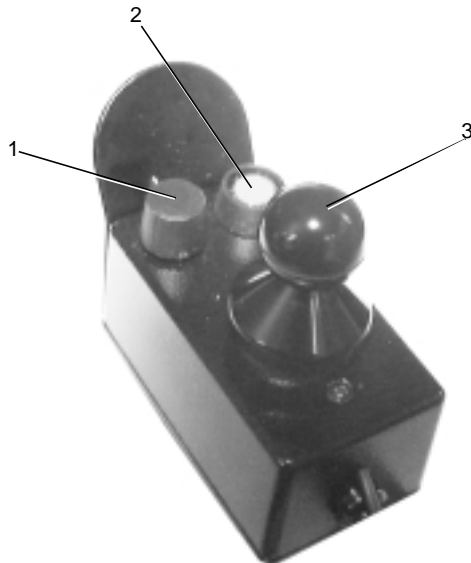


Figure 18. L control panel

1. Maximum speed control
2. Main power switch/warning lamp
3. Joystick

Maximum speed

The maximum speed can be adjusted steplessly using the maximum speed knob. Turning it anticlockwise reduces the speed.

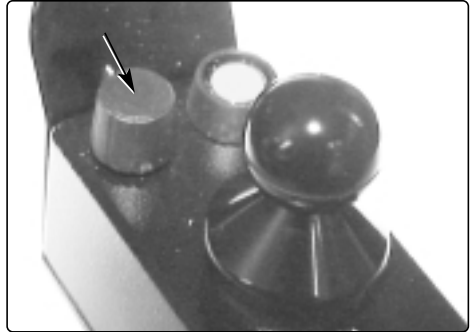


Figure 19. Maximum speed knob

Main power switch

The main power switch with integrated lamp functions not only as an on/off button but also provides warning signals. These signals are:

On constantly

The chair is ready to be driven.

Flashing slowly (once per second)

Batteries low. Charge them as soon as possible.

Flashing fast (twice per second)

Electrical, data, battery or motor fault.
Contact service.

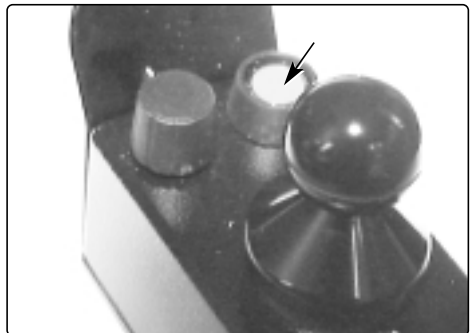


Figure 20. Main power switch

Joystick

The joystick is used to regulate the speed of the wheelchair forwards or backwards, to turn and to brake.

The speed is regulated steplessly by moving the joystick forwards or backwards. The speed is directly proportional to the movement of the joystick (small movement low speed - large movement high speed).

The wheelchair is turned by moving the joystick to the left or right.

The wheelchair is braked by moving the joystick back to the neutral position or letting it go.

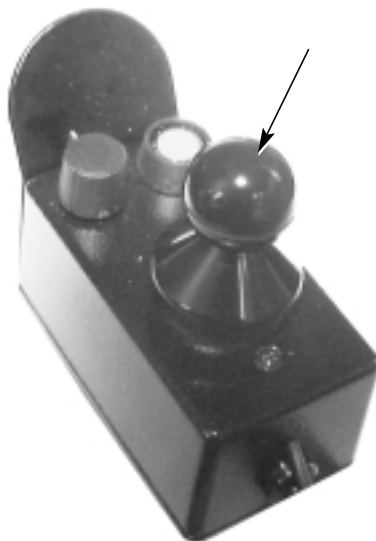


Figure 21. Joystick

Extra button box

Your wheelchair can be equipped with an extra button box, which is located behind the main control panel. The extra button box is equipped with a number of functions.

Seat lift *(figure. 22 - 1)*

Switch for maneuvering the seat lift up and down. When the seat lift is being maneuvered, the indicator lamp lights (fig. 12). When the seat lift is activated from its lowest position, the maximum speed is halved (2.2 miles/h).



Figure 22. Extra button box

Seat to floor function *(figure. 22 - 2)*

This function makes it possible to lower the seat to the floor (see page 10 fig. 4). When this function is activated, the chair cannot be operated.

Accessories

Tool bag

The wheelchair is supplied with a tool bag which contains the following tools.



Figure 23. Tool bag

<i>Tool</i>	<i>Area of use</i>
1. Pair of protective goggles	Work on the batteries
2. Set of Allen keys	General maintenance/adjustment of the seat
3. 1 x 13 mm spanner	General maintenance, changing the battery
4. Screwdriver	General maintenance/removing the covers
5. Seat lift crank	Raising the seat

Accessories

Accessories for the Chairman Robo include a rear-view mirror, joystick in the table, central control.

Contact your nearest Permobil dealer for more detailed information on the accessories available for the Chairman Robo.

Handling

General

This wheelchair is designed for use both inside and outside. When driving inside, take normal care. Outside you must remember to drive very slowly on steep downhill slopes and not to drive over kerbs and other obstacles higher than 2 3/4".

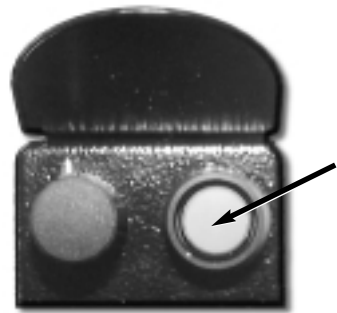
Do not make the first test run on your own. The test run is to find out how you and the wheelchair work together and you may need some assistance.

Driving

- 1 Insert the key switch in the side of the panel (only S panel).
2. Switch on the power by pressing the main power switch on the control panel.



Panel S



Panel L

Figure 24. Main power switch

3. Panel S

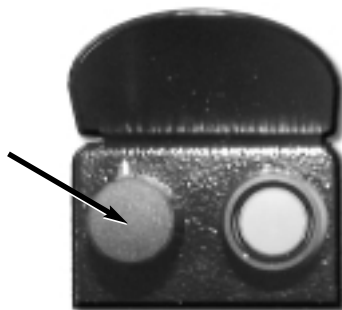
Select a suitable speed range by pressing the speed selector until the desired indicator lamp lights for your type of driving.

Panel L

Select a suitable speed range by turning the maximum speed knob. Turning it clockwise increases the speed range, turning it anticlockwise reduces the speed range.



Panel S



Panel L

Figure 25. Speed selector

4. Move the joystick carefully forwards to drive forwards or backwards to reverse. Move the joystick carefully backwards to drive forwards or backwards to reverse.



Figure 26. Joystick

5. The speed of the wheelchair is regulated steplessly by moving the joystick forwards or backwards to different extents. The wheelchair's electronics make it possible to move slowly over kerbs and other obstacles. You can drive up to the kerb or obstacle and then carefully drive over it.

When you drive down an obstacle or a steep slope, you must drive slowly and brake gently. The maximum speed should be set to low speed. You can brake gently by pulling the joystick back to a position just before the neutral position. When the speed has been reduced, you can let the joystick go.

NB: The wheelchair moves at reduced speed if the seat is raised. You can only drive at full speed if the seat is in its lowest position. Raising the seat lift raises the centre of gravity and increases the risk of tipping. Therefore, you should only use the seat lift when driving on level ground and not on hilly ground.

Steering

The wheelchair can be turned in the required direction by moving the joystick to one side or the other while driving forwards or backwards.



Figure 27. Steering

Driving rules

High kerbs and other obstacles



WARNING

Do not drive the wheelchair over kerbs and other obstacles higher than 2 3/4".



Figure 28. High kerbs and other obstacles

Downhill slopes

When driving downhill, you must drive at low speed and take great care.

**WARNING**

The wheelchair is not designed to be driven down slopes steeper than 12 degrees.



Figure 29. Driving downhill

Uphill slopes

If you drive up slopes steeper than 12°, there is a risk that the wheelchair cannot be maneuvered safely.



WARNING

Do not drive up slopes steeper than 12 degrees.



Figure 30. Driving uphill

Driving along slopes



WARNING

Do not drive the wheelchair along slopes steeper than 10 degrees. There is a risk of tipping.

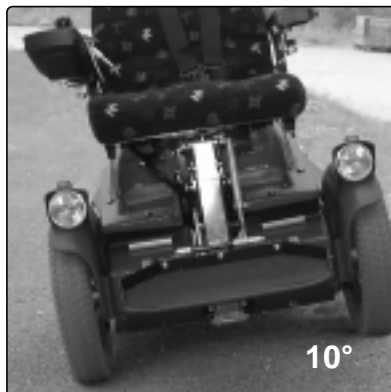


Figure 31. Driving along slopes

Releasing the brakes



WARNING

In order to avoid the wheelchair rolling away, ensure that the wheelchair is on a level base before releasing the brakes.

The brakes can be released to make it possible to move the wheelchair manually.

1. Switch off the wheelchair by switching off the main power switch.
2. Move the lever forwards (figure 32). The chair can now be moved manually.

NB: Reset the brakes after moving the chair by pulling the lever backwards. When the brake release has been activated, the wheelchair cannot be driven.



Figure 32. Releasing the brakes

Charging the batteries



WARNING

The batteries must be charged in a well-ventilated room, not in a wardrobe or box-room. Do not charge the batteries in a bathroom or wet room.



WARNING

Take care when using metal objects in connection with work on the batteries. Short-circuiting can easily cause an explosion. Always use protective gloves and goggles.



WARNING

Use only chargers with a maximum 10 A charging current (mean value).
(The effective value of the charging current must not exceed 12 A)



Figure 33. Lester Electrical's Dual mode charger

When should the batteries be charged?

As a general rule, you should recharge your batteries as frequently as possible to assure the longest possible life and to minimize the required charging time. Plan to recharge them when you do not anticipate using the chair for a long period of time.

A battery voltage indicator on the control panel indicates when the battery voltage is low (see figure on page 14). The batteries must then be charged as soon as possible.

If the batteries should become completely discharged, it is important that you recharge them as soon as possible. If you delay before recharging them, the batteries can be damaged.

Charging

1. Connect the mains cable to the mains.
2. Connect the connection cable from the charger to the charging socket on the wheelchair, which is under the plastic cover on the control panel.

NB! When the charger is connected, the chair must not and cannot be driven.

Description and Use of Battery Charger, see supplied Instruction Manual.



Figure 34. Connecting the charger

Transport

We recommend that Permobil's wheelchairs be transported on trailers. The wheelchair can be secured with straps via the fastening loops at the front and rear. If the chair has to be transported in a van, estate car or other vehicle, it is extremely important that the chair is secured properly and that the fastening points used are well anchored in the vehicle.



WARNING

If the chair is not properly secured and comes loose, it can cause serious injury to persons in the vehicle and serious damage to the vehicle and itself.

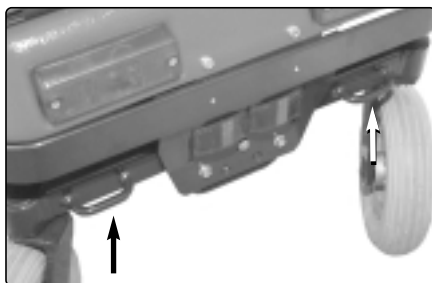


Figure 35. Rear fastening loops

Air transport

When transporting your chair by air, you should be aware of three things above all: the batteries, the dimensions and weight of the wheelchair and that the seat can be damaged when handled as it is placed together with luggage and other goods in a narrow space.

Batteries

If the wheelchair is equipped with maintenance-free gel batteries; in some airlines it is not necessary to remove the batteries from the wheelchair during the flight. However, the electrical connections to the battery must be disconnected and insulated. Check with your airline which rules apply.

If a wheelchair is equipped with acid batteries, most airlines require that the batteries shall be removed from the wheelchair and transported in special boxes provided by the airline.

Some airlines refuse to take acid batteries aboard at all, so always check with the airline in question which rules apply.

See page 39-40 for how to remove the batteries.

The dimensions and weight of the wheelchair

The weight and dimensions of the wheelchair are significant in relation to the type of airplanes in which the wheelchair is to be transported. The smaller the airplane, the smaller the wheelchair may be/the less it may weigh and vice versa. Always check with the airline in question which rules apply.

Preventing damage

Cover the control panel with soft, shock-absorbing material (foamed plastic or similar) and fold it in towards the back rest. Protect other salient objects in similar fashion. Tape any loose cables to the seat or covers.

NB!

To ensure that the chair is transported safely and that no nasty surprises pop up at the last minute, ***always contact the airline with which you are travelling beforehand.***

Maintenance and Repairs

To ensure that your wheelchair works well, it is important that it is well looked after. Every wheelchair is subject to wear, partly between the moving parts and partly on account of strains and stresses. Therefore, you must know how the wheelchair works, how you are to drive it and use it correctly and how you are to look after it.

Preventive maintenance is intended to prevent faults. If you look after your wheelchair, it will work well and the risk of faults is reduced.



WARNING

Any inappropriate modifications to the wheelchair and its various systems may entail an increased risk of accidents. Carefully follow the recommendations in the Handling section to prevent the risk of accidents in connection with driving.

All modifications to and interventions in the vital systems of the wheelchair must be performed by a qualified service engineer. Always contact a qualified service engineer in cases of doubt.

Maintenance



WARNING

During all work on the electrical system of the wheelchair, the connection to the negative pole of the battery must always be removed.



WARNING

Take care when using metal objects in connection with work on the batteries. Short-circuiting can easily cause an explosion. Always use protective gloves and goggles.

General

- Batteries discharge themselves and must be charged and maintenance-charged to prevent them from being damaged.
- The wheelchair must not be stored in rooms in which condensation occurs (mist or moisture on surfaces), i.e. wash-houses or similar rooms.
- The wheelchair may be stored in an unheated room. From the point of view of corrosion, it is best for the chair if the room is a few degrees warmer than the surroundings, which keeps the room drier.

Short-term storage

In order for the charging process to produce a battery with good capacity, the temperature in the storage room should not be less than 41°F. Storage at less than 41°F increases the risk that the battery is not fully charged when it is used and also increases the risk of corrosion.

Long-term storage

The chair may be stored in an unheated room but the battery should be maintenance-charged at least once per month. See also Short-term storage above.

Cleaning

Clean the wheelchair often. It is especially important to clean it after it has been used outside. Use a damp rag with a mild soap solution to wipe off dirt and dust.

NB: Do not use a hose to wash the wheelchair with water. The electronics can be damaged.

Wheels

Check regularly that the air pressure in the tyres is correct. Fill with air if necessary.

Batteries Storage

Please note that batteries discharge of their own accord and that a discharged battery may freeze and burst when it is cold. If the wheelchair is to be stored and not used for a long period of time, the batteries must always be charged once per month to avoid damaging them.

NB: The temperature in the storage room should not be less than 41°F.

If your wheelchair is equipped with acid batteries, the level of acid should be checked regularly.

If your wheelchair is equipped with gel batteries, there is no need to check the liquid level.

The durability of the batteries depends entirely on regular charging.



Figure 36. Batteries

Repairs

Changing fuses

In order to be able to change the fuses, you must remove the rear cover. Unscrew the five screws and lift off the cover. *Ensure that the rear light cables in the rear cover are firmly connected to the electronics (connector).*

Main fuse

The main fuse must only be changed by persons with a good knowledge of the wheelchair.

NB: If the main fuse blows, there is often a major electrical fault and a service engineer should be called.

Change the main fuse and refit the rear cover.

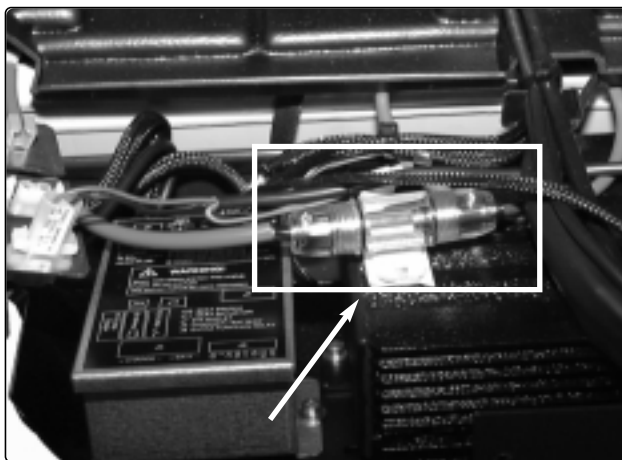


Figure 37. 80 A main fuse

Changing fuses, cont.

Pull the lid off the fuse box.

Change blown fuses. Refit the lid of the fuse box, refit the rear cover and screw it in place.

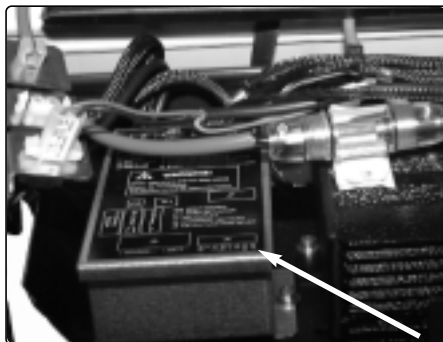


Figure 38. Fuse box

1. Seat lift/lighting/24 V switched 15 A
2. 24 V direct 15 A
3. *Jumper. Do not remove.*
4. 15 A charging fuse

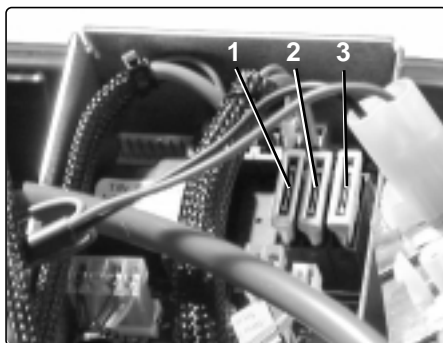


Figure 39. Fuses

Charging fuse

The fuse holder for the charging fuse is located on the thin red cable which goes to the positive pole of the battery.

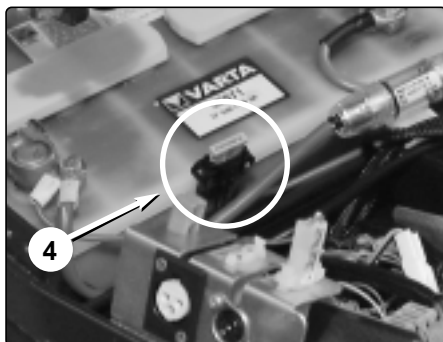


Figure 40. Charging fuse

Changing the batteries

1. Place the Permobil wheelchair on a level base.
2. Raise the seat lift to its highest position.
3. Unscrew the screws (4 screws). Remove the rear covers. Be careful when you remove the lower cover as the cables for the rear lights are fastened to it.

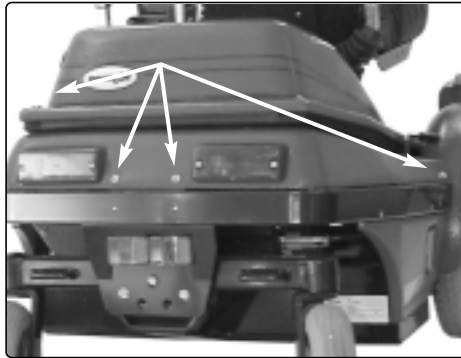


Figure 41. Rear cover screws

4. Loosen the nuts (fig. 42) two turns, pull the guide yoke upwards.

NB! This work is best performed by two people; one to loosen the nuts and pull up the guide yoke and another to hold the seat and prevent it from falling. If you are working on your own, get a good hold of the seat and check that no one is directly in front of the chair before you pull the guide yoke upwards.

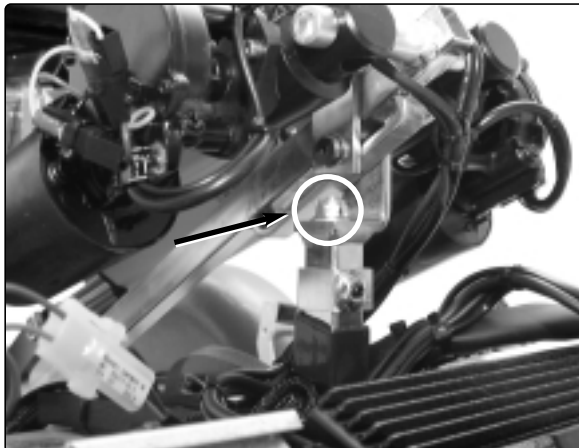


Figure 42. Guide yoke nuts

5. Disconnect the battery connections. Disconnect the positive poles first and then the negative poles.

6. Lift out the batteries.

7. Insert two new batteries.

NB! Position.

8. Connect the battery connections, first the negative poles and then the positive poles.

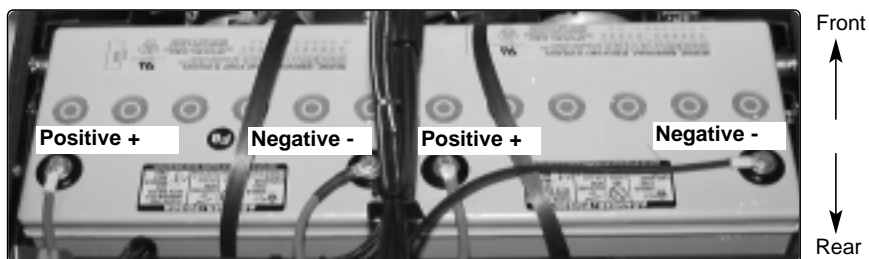


Figure 43. Fuses

NB! If the batteries are empty or an electronics fault has occurred and the seat is not raised, the adjustment device for the “terra” function must be loosened. This is done as follows:

Remove the black plastic plug (fig. 44) and unscrew and remove the Allen screw. Get a good hold on the seat and pull it forwards/upwards until the foot plate is resting on the floor. Lift off the top cover, which is fixed with Velcro. The chair is now accessible for service. For reassembly: move the seat back to the initial position and screw the adjustment device in place. Move the seat forwards and refit the cover.

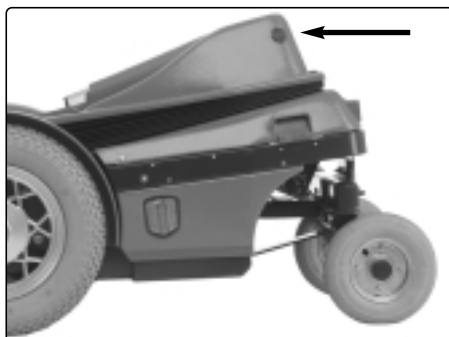


Figure 44. Plug

Changing inner tubes

1. Block up the wheelchair and let out the air.
2. Pull the tyre off the wheel rim.
3. Change the punctured inner tube.
4. Replace the tyre on the wheel rim and fill with air.



Figure 45. Filling valve

Filling with air



WARNING

The recommended air pressure is 0.2 MPa (2 kp/cm²). Overfilling entails the risk of explosion.

Low air pressure in the tyres produces abnormal wear and reduces the range. Therefore, check regularly that the front tyres have a pressure of 0.2 MPa (2 kp/cm²).

1. Unscrew and remove the plastic caps on the air valves on the drive wheels.
2. Connect the compressed air nozzle to the air valve and adjust the tyre pressure to the prescribed level.

Changing bulbs

Front lights

1. Unscrew the two Allen screws (figure 46:1) on the top of the lamp cover.
2. Pull the reflector forwards.
3. Unscrew the two Phillips screws on the rear of the lamp holder and remove the reflector.
4. Change the bulb.

Front indicators

1. Turn the indicator glass (figure 46:2) 90° anticlockwise.
2. Lift the indicator glass straight up (do not screw).
3. Change the bulb.

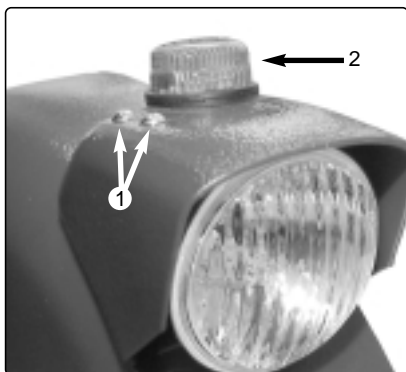


Figure 46. Front light



Figure 47. Rear light

Rear lights and indicators

1. The rear indicator bulb (upper bulb) and rear light bulb (lower bulb) can be changed after you have loosened the screws on the glass of the rear light (figure 47).

Bulbs	Socket type	Power
Headlamps	R10/E10	24V/3W
Front indicators	13256	24V/3W
Rear lights	SP36	24V/3W
Rear indicators	SP36	24V/3W

Technical specifications

Data

General

Name Chairman Robo

Dimensions and weight - including Miniflex-seat

Transport dimensions l/w/h..... 36"/25"/27,5" (92/64/70 cm)

Length 40,5" (103 cm)

Width..... 25" (64 cm)

Height 33,5"/35,4"/39,3"¹⁾ (85/90/100 cm¹⁾)

Weight including batteries 238 lbs (108 kg)

Maximum battery size..... 9 3/4" x 7" x 8 1/2" (25 x 18 x 21,5 cm)

Wheels

Wheel dimensions, front..... 300 x 8

Air pressure in front wheel..... 0,2 MPa.(2 kp/cm²)

Wheel dimensions, rear..... 200 x 50

Performance

Range 19-24,5 Miles²⁾ (30 - 40 km²⁾)

Maximum speed, forwards 4,5 miles/h (7,5 km/h)

Maximum speed, backwards approximately 3 miles/h (5 km/h)

Turning circle, 180 degrees 40,5" (103 cm)

Maximum height of obstacles..... 2 3/4" (7 cm)

Maximum slope 12 degrees

Maximum user weight..... 33 - 77 lbs³⁾ (15-35 kg)

¹⁾ Depending on backrest

²⁾ Depending on battery type/condition

³⁾ Depending on the size of the seat

Electrical system

Batteries

Recommended battery type	Gel
Battery capacity	2 x 73 Ah
Charging time	9 hours

Fuses

Charging fuse	15 A
Seatlift.....	15 A
Lighting	15 A
Main fuse	80 A

CAUTION! It is very important that you read this information regarding the possible effects of electromagnetic interference on your powered wheelchair.

Electromagnetic Interference (EMI) From Radio Wave Sources

Powered wheelchairs and motorized scooters (in this text, both will be referred to as powered wheelchairs) may be susceptible to electromagnetic interference (EMI), which is interfering electromagnetic energy (EM) emitted from sources such as radio stations, TV stations, amateur radio (HAM) transmitters, two-way radios, and cellular phones.

The interference (from radio wave sources) can cause the powered wheelchair to release its brakes, move by itself, or move in unintended directions. It can also permanently damage the powered wheelchair's control system. The intensity of the interfering EM energy can be measured in volts per meter (V/m). Each powered wheelchair can resist EMI up to a certain intensity. This is called its "immunity level". The higher the immunity level, the greater the protection.

At this time, requested immunity level as per EN 60601-1-2 is 3 V/m. The immunity level of this powered wheelchair model as shipped, with no further modification, is >20V/m in the range of 26 MHz to 950 MHz.

There are a number of sources of relatively intense electromagnetic fields in the everyday environment. Some of these sources are obvious and easy to avoid. Others are not apparent and exposure is unavoidable. However, we believe that by following the warnings listed below, your risk to EMI will be minimized.

The sources of radiated EMI can be broadly classified into three types:

1.

Hand-held portable transceivers (transmitters-receivers) with the antenna mounted directly on the transmitting unit. Examples include: citizens band (CB) radios, "walkie talkie", security, fire, and police transceivers, cellular telephones, and other personal communication devices.

NOTE! Some cellular telephones and similar devices transmit signals while they are ON, even when not being used.

2.

Medium-range mobile transceivers, such as those used in police cars, fire trucks, ambulances, and taxis. These usually have the antenna mounted on the outside of the vehicle.

3.

Long-range transmitters and transceivers, such as commercial broadcast transmitter (radio and TV broadcast antenna tower) and amateur (HAM) radios.

NOTE! Other types of hand-held devices, such as cordless phones, laptop computers, AM/FM radios, TV sets, CD players, and cassette players, and small appliances, such as electric shavers and hair dryers, so far we know, are not likely to cause EMI problems to your powered wheelchair.

Because EM energy rapidly becomes more intense as one moves closer to the transmitting antenna (source), the EM fields from hand-held radio wave sources (transceivers) are of special concern. It is possible to unintentionally bring high levels of EM energy very close to the powered wheelchair's control system while using these devices. This can affect powered wheelchair movement and braking. Therefore, the warnings listed below are recommended to prevent possible interference with the control system of the powered wheelchair.

WARNINGS

Electromagnetic interference (EMI) from sources such as radio and TV stations, amateur radio (HAM) transmitters, two-way radios, and cellular phones can affect powered wheelchairs and motorised scooters. Following the warnings listed below should reduce the chance of unintended brake release or powered wheelchair movement which could result in serious injury.

1.

Do not operate hand-held transceivers (transmitters/receivers), such as citizens band (CB) radios, or turn ON personal communications devices, such as cellular phones, while the powered wheelchair is turned ON.

2.

Be aware of nearby transmitters, such as radio or TV stations, and try to avoid coming close to them.

3.

If unintended movement or brake release occurs, turn the powered wheelchair OFF as soon as it is safe.

4.

Be aware that adding accessories or components, or modifying the powered wheelchair, may make it more susceptible to EMI.

(Note: There is no easy way to evaluate their effect on the overall immunity of the powered wheelchair).

5.

Report all incidents of unintended movement or brake release to the powered wheelchair manufacturer, and note whether there is a radio wave source nearby.

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