

# *Street*

Power Wheelchair





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## Introduction

The Service Manual is intended for technical personnel who maintain and repair electric wheelchairs. It is important that anyone who performs maintenance and repairs described in this manual reads and understands the content of this manual so that the work is performed professionally. Always state the chassis number when contacting Permobil to ensure that the correct information is provided.

### Technical Support

In the event of technical problems, you should contact your dealer, or Permobil Inc. USA at 800-736-0925.

### Spare parts

Spare parts must be ordered through your dealer.

### Warranties

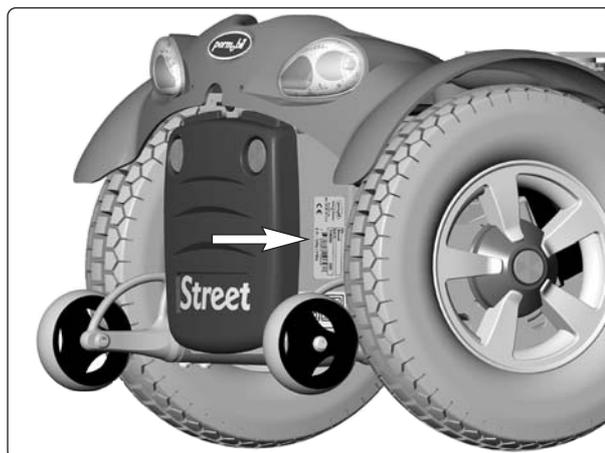
Contact your dealer or Permobil Inc. USA for information about the warranties for this chair.

### Maintenance

See the information in the Owner's Manual.

## Identification plates

### Chassis



*Chassis identification number.*

### Slutsteg R-net



*Identitetsnummer slutsteg R-net.*

### Manöverpanel R-net



*Identitetsnummer manöverpanel R-net.*

## Covers

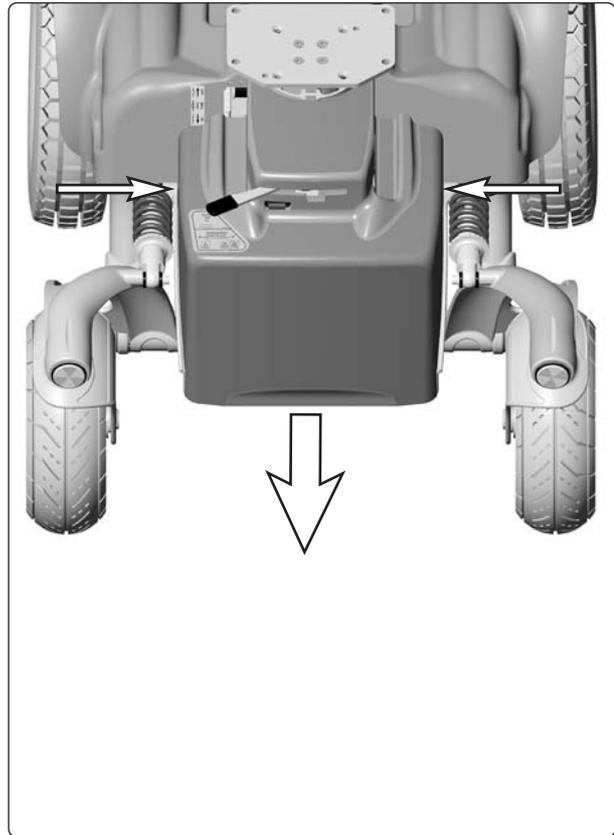
### Removal of front cover

The cover is attached with a guide pin at each side and hook and loop fastener at the front edge; see figure.

1. Run/fold out the leg rests, and if possible, raise the seat elevator.
2. Turn off the main power switch on the control panel.
3. Press the cover's sides inwards at the shock absorbers' rear brackets while pulling the cover forward.
4. With the wheel lock release lever at a middle position, detach the cover at the lower edge by pulling it straight forward.

### Fitting

Fitting is the reverse procedure.



*Front cover attachment points.*

### Removal of rear cover

The rear cover is attached with two guide pins at the back edge and with hook and loop fastener on the inside; see figure.

#### 1. Chair with seat elevator:

Raise the seat to its highest position; turn off the main power switch on the control panel. If the seat elevator cannot be raised because of a fault other than to the seat elevator, it can be raised manually; see page 28.

#### Chair with fixed seat post:

Raise the seat to its highest position, see page 31.

#### Chair without seat elevator / fixed seat post:

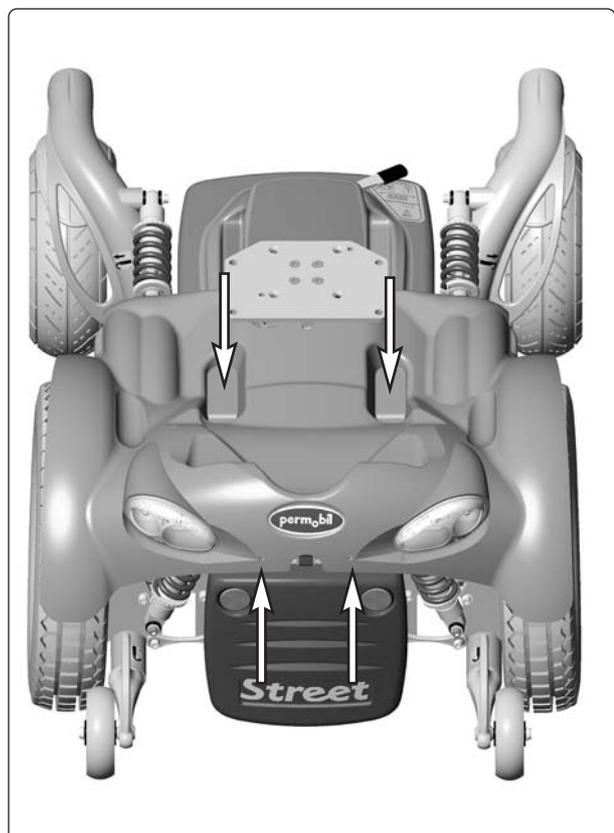
If the chair is not equipped with a seat elevator, remove the seat; see page 28.

2. Pull the cover's rear edge straight back so that the guide pins disengage; then lift up so that the hook and loop fastener on the inside of the cover releases.



#### NOTE

If the chair is equipped with lighting, disconnect the rear-light cabling at the connector fitted on the cabling.



*Rear cover attachment points.*

### Fitting

Fitting is the reverse procedure.

## Batteries

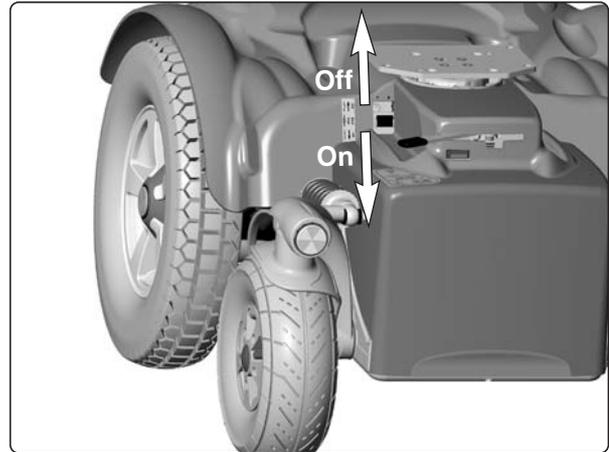


**NOTE**

Use protective goggles when working with batteries.

### Removal of rear battery

1. Place the wheelchair on a level surface.
2. Put the circuit breaker in the “OFF” position. It is accessed through a hole in the chassis cover; see figure.



*Circuit breaker/Battery isolator.*

3. Loosen the rear chassis cover by pulling the cover’s rear edge straight back so that the guide pins disengage. Open the battery cover by turning the knob 1/4 turn counterclockwise and folding down the cover; see figure.



*Battery cover locking knob.*

4. Pull the battery straight out using the battery belt; see figure.
5. Disconnect the battery connectors. See the decal on the inside of the battery cover.
6. Lift out the battery.

### Fitting

1. Lift the battery into place. Leave the belt on the battery to facilitate removal.
2. Connect the battery connectors. See the decal on the inside of the battery cover.
3. Slide the battery into the chassis, checking that the cabling runs free.
4. Close the battery cover and lock with the knob; see figure.
5. Fit the rear chassis cover by pushing the cover’s rear edge straight forward so that the cover engages the guide pins.
6. Put the circuit breaker in the “ON” position. It is accessed through a hole in the chassis cover; see figure.

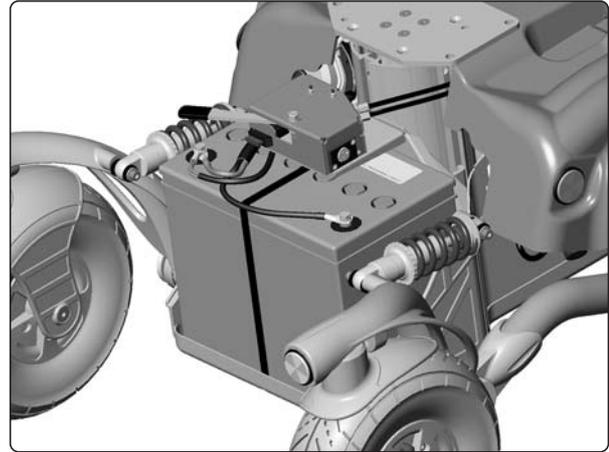


*Rear battery connection.*

## Batteries

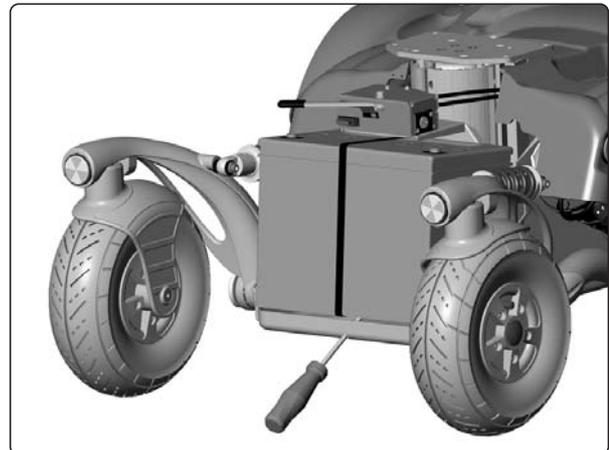
### Removal of front battery

1. Place the wheelchair on a level surface.
2. Put the circuit breaker in the "OFF" position. It is accessed through a hole in the chassis cover; see figure.
3. Remove the front chassis cover; see page 7.
4. Disconnect the battery connectors. See the decal on the inside of the chassis cover.



*Front battery connection.*

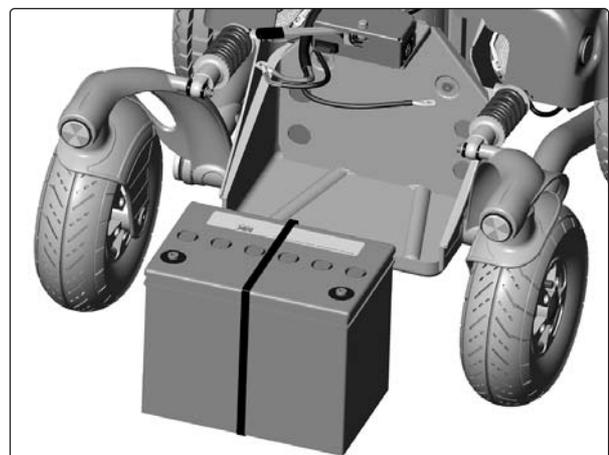
5. Lift out the battery. With a screwdriver through the hole in the front edge of the chassis to facilitate removal, the battery can be lifted; see figure.



*With a screwdriver through the hole in the front edge of the chassis to facilitate removal, the battery can be lifted.*

### Fitting

1. Lift the battery into place. Put the battery belt on the battery to facilitate removal.
2. Connect the battery connectors. See the decal on the inside of the chassis cover.
3. Fit the front chassis cover; see page 7.
4. Put the circuit breaker in the "ON" position. It is accessed through a hole in the chassis cover; see figure.



*Front battery removed.*

## Rear wheels

### Removal

1. Switch off the main power switch on the control panel.
2. Lift up and chock up the wheelchair chassis so that the wheel in question is free of the ground.
3. Remove the hub cap by pulling it straight out. If necessary, carefully lever it out using a screwdriver in the slot on the cap.
4. Remove the four screws that hold the wheel in place.



### WARNING

The central screw must not be removed.

5. Remove the wheel by pulling it straight out.

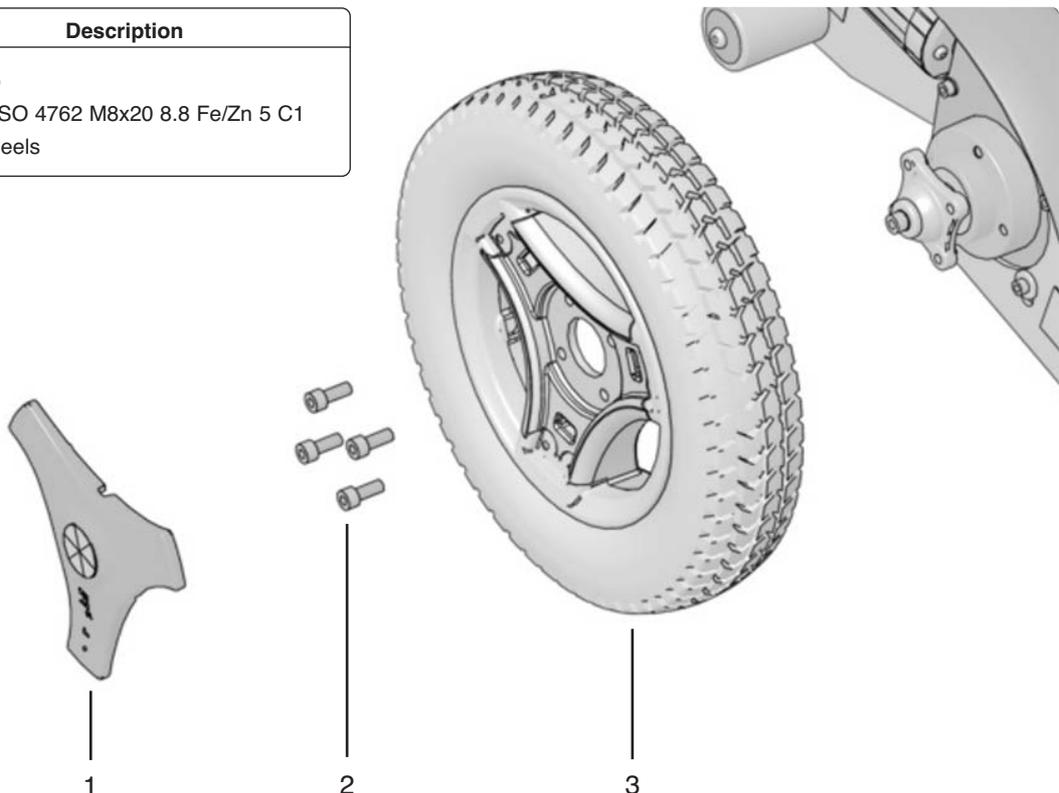
### Assembly

Assemble in the reverse order.

Tighten the four screws using a dynamometric wrench.

**Tightening torque 24 Nm.**

Item	Description
1	Hub cap
2	Screw, ISO 4762 M8x20 8.8 Fe/Zn 5 C1
3	Rear wheels



*Fitting/removing rear wheels.*

## Rear wheels

### Taking the rim apart

The rim can be taken apart to make it possible to fit/remove solid or pneumatic tires.

1. Remove the wheel in question from the wheelchair. See the previous page.
2. If the tire is pneumatic, release the air.

#### WARNING

Ensure that pneumatic tires are not pressurized before the rim is taken apart, otherwise there is a risk of personal injury.

3. Remove the six screws holding the two halves of the rim together (see illustration).
4. Take the rim apart.

### Assembly

Assemble in the reverse order.

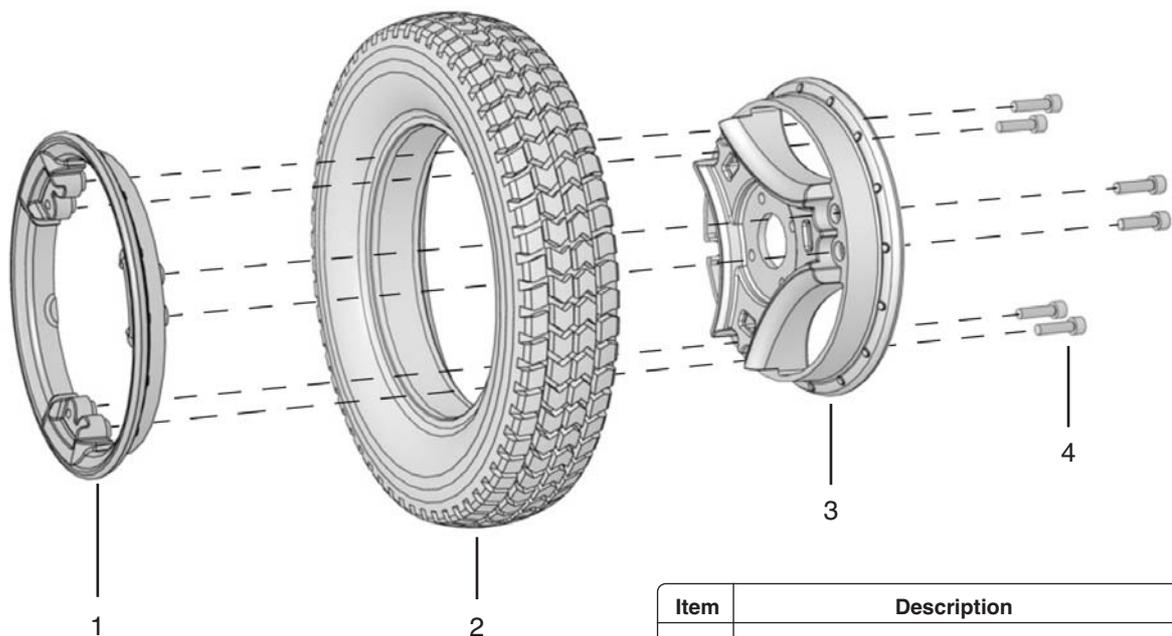
Tighten the six screws using a dynamometric wrench.

**Tightening torque: 22 Nm.**

#### WARNING

The recommended tire pressure for pneumatic tires is 200 kPa (2 bar). Overfilling entails a risk of explosion.

Incorrect tire pressure may result in lower stability and maneuverability. Check regularly that the tires have the correct pressure.



Item	Description
1	Rim, outer section
2	Tire
3	Rim, outer section
4	Screw, ISO 4762 M8x30 8.8 Fe/Zn 5 C1

*Fitting a solid tire to a split rim.*

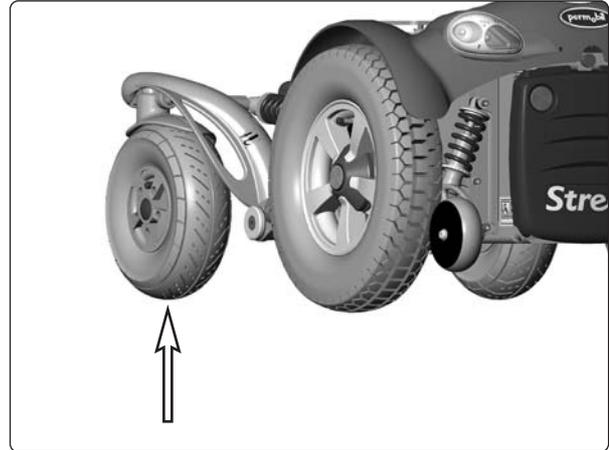
## Front wheels

### Removal

1. Turn off the main power switch on the control panel.
2. Lift the wheelchair chassis and support it on blocks so that the wheel is off the ground.
3. Remove the hubcap (1), bolt (2) and washer (3); see figure.

### Fitting

1. Check that the wheel shaft and rim are undamaged. Clean as necessary to remove dirt and rust. Replace damaged parts.
2. Slide the wheel onto the shaft using hand force only. Ensure that the wheel bottoms on the shaft.
3. Mount the washer (3) onto the bolt (2) and secure the wheel. **Use a torque wrench to tighten the bolt to 17.7 ft-lbs (24Nm).** Install the hub cap (1). See Fig.



Front wheel

#### NOTE

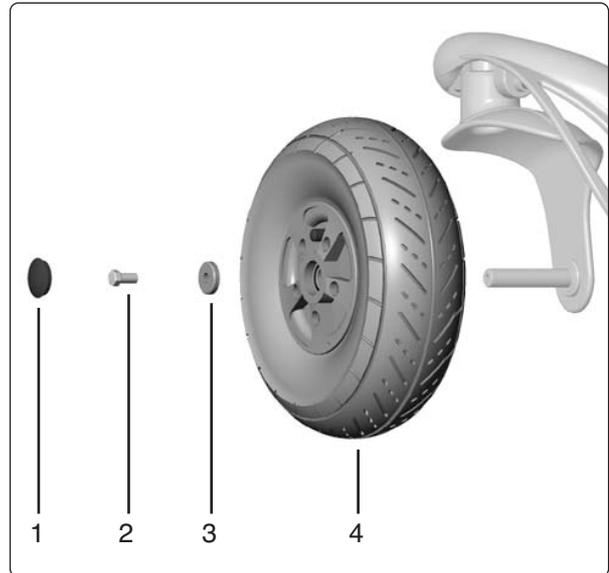
The bolt must be used once only. Removed bolt is not allowed to be refitted.

#### WARNING

Other types of bolts or washers are not to be used.

#### WARNING

Other types of locking coatings or fluids may not be used.



Fitting of rim.

Front wheel: 3.00"-4"	
Pos.	Description
1	Hubcap
2	Bolt, ISO 4017 M8x25 8.8 Fe/Zn 5 C1 / LOCKING COAT DIN 267-28
3	Washer, SS 1466 TBRSB 8.4x26x5 HB305 Fe/Zn 5 C1
4	Front wheel(Right) 3.00"-4" Air Front wheel(Left) 3.00"-4" Air

Front wheel: 210x65	
Pos.	Description
1	Hubcap
2	Bolt, ISO 4017 M8x16 8.8 Fe/Zn 5 C1/ LOCKING COAT DIN 267-28
3	Washer, 8.5x23x3
4	Front wheel, 210x65 Air Front wheel, 210x65 Solid

## Front wheel with air

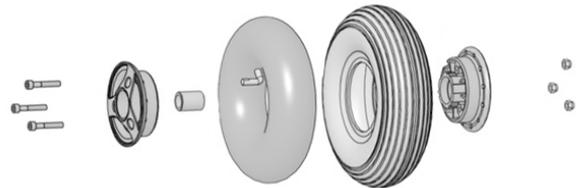
### Byte av innerslang

1. Turn off the main power switch on the control panel.
2. Lift the wheelchair chassis and support it on blocks so that the wheel is off the ground.
3. Remove the wheel, see page 12.
4. Let the air out of the tire.

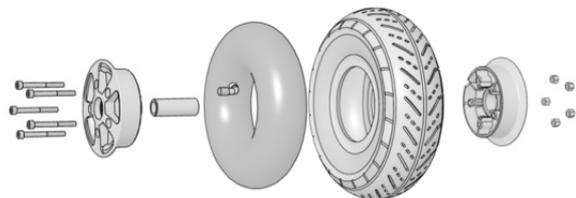


*Filling Valve, front wheel.*

5. Remove the bolts with nuts that holds the inner and outer parts of the rim together, see figure below.
6. Remove the broken inner tube.
7. Fit a new inner tube in the tire.
8. Refit the rim parts, fit the outer part with the innertubes valve thru the hole, see fig. Assemble the rim with the tire, making sure the tube doesn't get trapped between the two halves of the rim
9. Refit the bolts with nuts.
10. Fill the tire with air, see below.



*Front wheel, 210x65, Air*



*Front wheel, 3.00\"-4\", Air*

## Filling with air

Check at regular intervals that the wheelchair's tires have the prescribed tire pressure. An incorrect tire pressure can cause deterioration in stability and maneuverability, plus extremely low air pressure can give rise to abnormal wear as well as shorter driving distances. So check regularly to see that the tires are maintained at a pressure of 36 psi (250 kPa).

1. Unscrew the plastic cap on the air valve of the tire.
2. Connect the compressed air nozzle to the air valve and adjust the tire pressure to the prescribed level.

### **WARNING**

The recommended air pressure for front/rear tires is 36 psi (250 kPa). Overfilling causes a risk of explosion. Incorrect tire pressure can involve a deterioration of stability and maneuverability, so check regularly that the tire contains the prescribed air pressure. If the wheel bolt is removed for tire service, replace it with a new, unused part from Permobil and tighten the bolt to the recommended torque. Also, inspect the drive axle and wheel rim for any damage. Damage to either part can cause the wheel bolt to loosen or fracture. Permobil recommends that wheel bolts be used only one time.

## Support wheels

### Removal

1. Turn off the main power switch on the control panel.
2. Remove the bolt; see figure.

### Fitting

Fitting is the reverse procedure.



#### WARNING

Removal of the support wheels entails increased risk for tipping. The wheelchair may not be operated if the support wheels are not attached.



*The support wheels are fitted with one bolt each.*

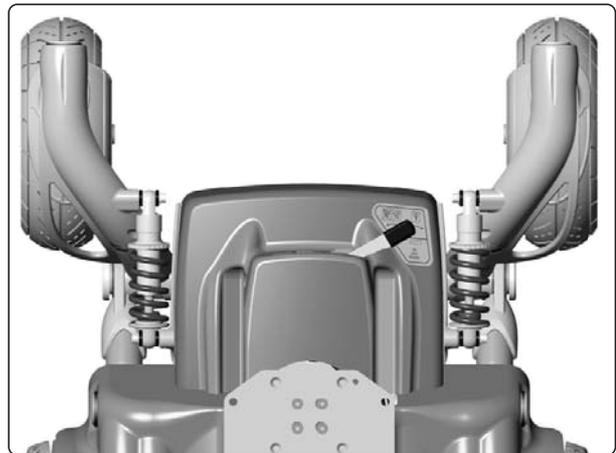
## Shock absorbers

### Removal, front

1. Turn off the main power switch on the control panel.
2. Support the chair on blocks so that the appropriate wheel is off the ground.
3. Unscrew the two bolts that secure the shock absorber; see figure.

### Fitting

Fitting is the reverse procedure. Adjust the shock absorber spring before fitting, see page 15.



*Front shock absorber.*

### Removal, back

1. Raise the seat to its highest position. To raise it manually, see page 28, 31.
2. Turn off the main power switch on the control panel.
3. Remove the chassis covers; see page 7.
4. Lift the wheelchair chassis and support it on blocks so that the wheel is off the ground.
5. Unscrew the two bolts that secure the shock absorber; see figure.

### Fitting

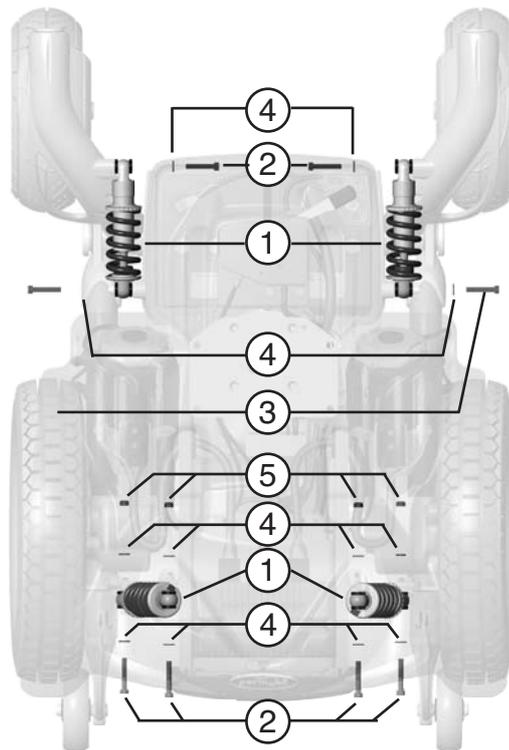
Fitting is the reverse procedure. Adjust the shock absorber spring before fitting, see page 15.



*Rear shock absorber.*

## Shock absorbers

Pos.	Description
1	Shock absorber, DNM DV-6 / 350 LBS / IN
2	Bolt, ISO 4762 M6x40 8.8 Fe/Zn 5 C1
3	Bolt, ISO 4762 M6x50 8.8 Fe/Zn 5 C1
4	Washer, 6 Fe/Zn 5 C1 (SRB 6.4x14x1.5)
5	Nut, DIN 985 M6 fzb

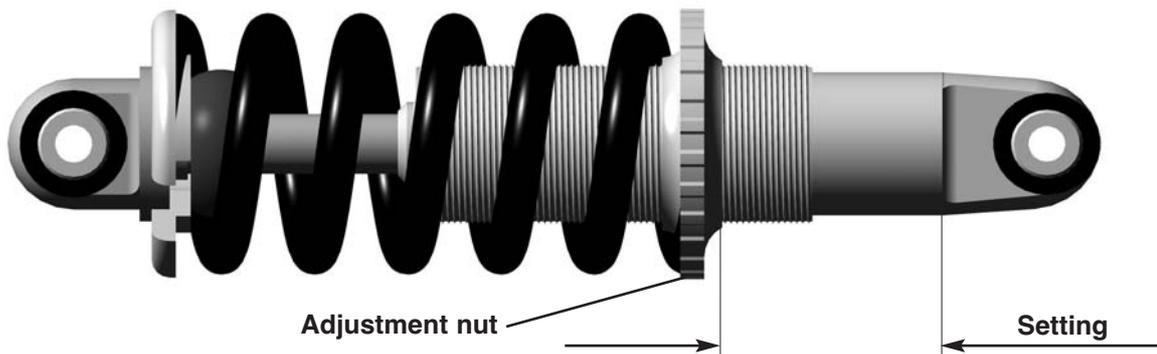


Shock absorber attachment to chassis.

### Adjustment of the KS230 Shock absorber

Before a new shock absorber is fitted, its spring force shall be adjusted to the correct value; see figure.

The spring force can be adjusted for various passenger weights with the adjusting nut. Increase the adjustment distance for harder suspension; reduce the adjustment distance for softer suspension.



#### NOTE

Make sure the same model of shock absorber is fitted on both sides of the chassis.

Adjustment of KS230 shock absorber springs		
Passenger weights	Setting, Front	Setting, Rear
0 - 155 lb	1 3/16 inch	1 3/16 inch
155 - 220 lb.	1 3/16 - 1 19/64 inch	1 3/16 inch
220 - 264 lb.	1 19/64 - 1 3/8 inch	1 3/16 inch

Adjustment of the KS230 shock absorber springs.

## Tie rods

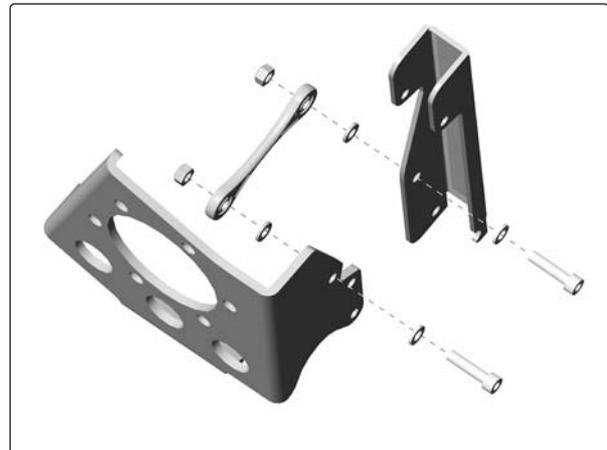
### Removal

1. Raise the seat to its highest position. To raise it manually, see page 28, 31.
2. Turn off the main power switch on the control panel.
3. Remove the rear chassis cover; see page 7.



Four tie rods are mounted on the wheelchair's rear suspension.

4. Remove the appropriate tie rod. The tie rods are attached with two bolts each; see figure.

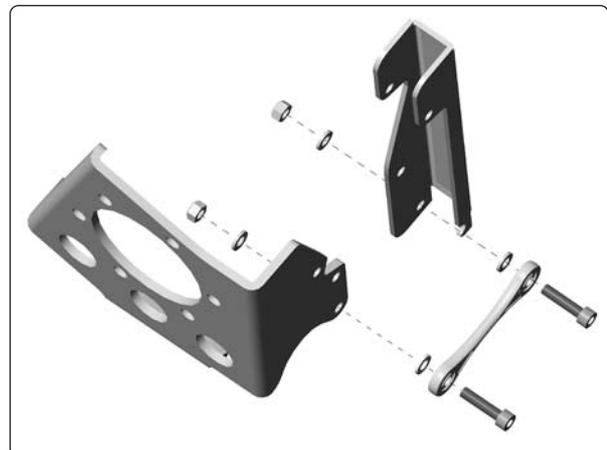


Upper tie rod attachment between the chassis and slewing bracket attachment points.

### Fitting

Fitting is the reverse procedure.

Pos.	Description
1	Tie rod
2	Washer, ISO 7089 6 200 HV Fe/Zn 5 C1 (6,4x12x1,6)
3	Bolt, ISO 4762 M6x22 8.8 Fe/Zn 5 C1
4	Nut, DIN 985 M6 fzb



Lower tie rod attachment between the chassis and slewing bracket attachment points.

## Slewing brackets

### Removal

1. Raise the seat to its highest position. To raise it manually, see page 28, 31.
2. Turn off the main power switch on the control panel.
3. Put the circuit breaker in the "OFF" position; see page 35.
4. Remove the bolt that secures the slewing bracket; see figure.

### Front slewing bracket

5. Remove the front shock absorber bracket; see page 13.

For removal of wheel fork, front wheels and friction brake, see the respective chapters.

### Rear slewing bracket

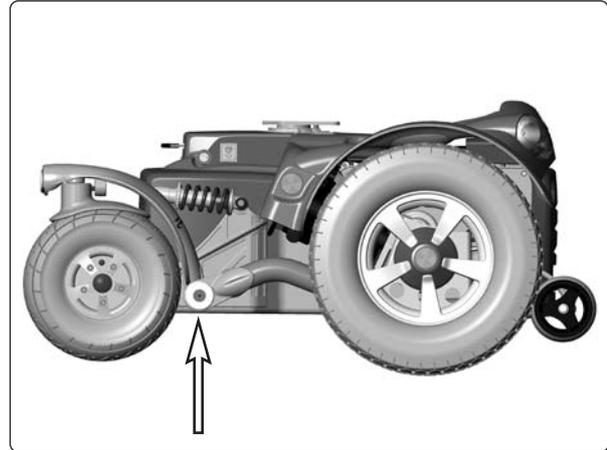
6. Remove the lower shock absorber bracket; see page 13.
7. Remove the tie rods; see page 16.

For removal of drive wheels, drive motor and support wheels, see the respective chapters.

### Fitting

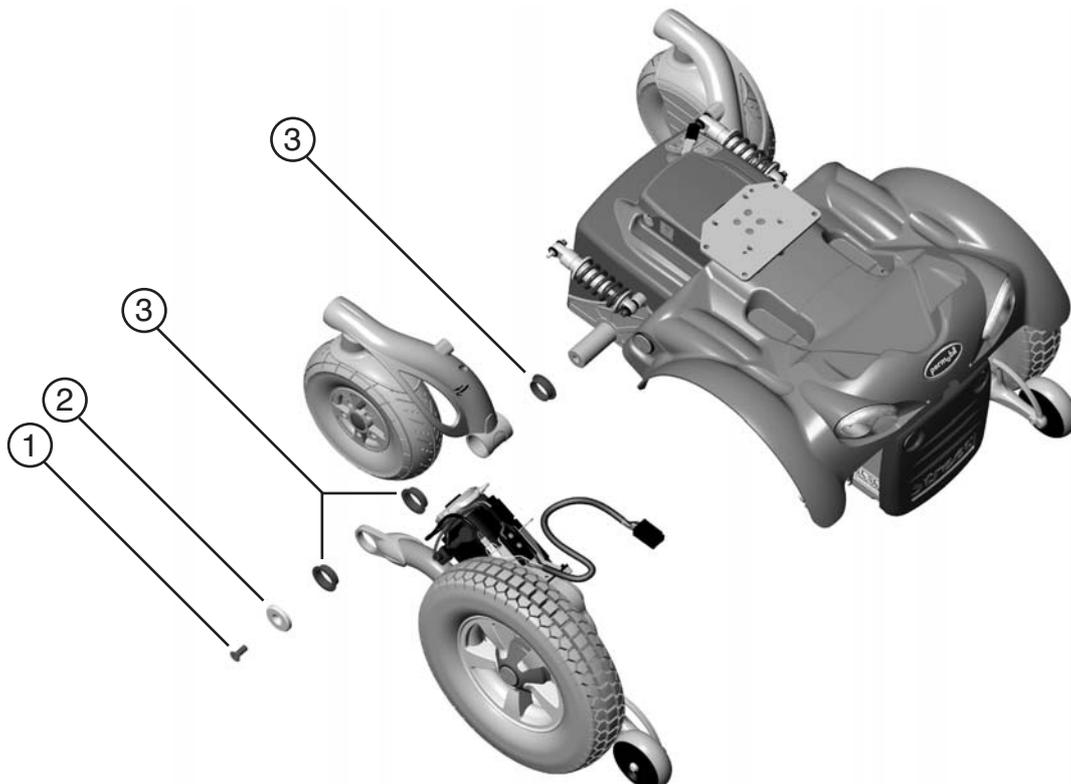
Fitting is the reverse procedure.

**Use a torque wrench to tighten the bolt to 48 ft-lbs (65Nm).**



*Front and rear slewing bracket attachment.*

Pos.	Description
1	Bolt, ISO 10642 M10x25 10.9 Fe/Zn 8 C1 / LOCKING COAT DIN 267-28
2	Washer,
3	Bushing, 35/39/48X13 PDE-F



*Removal/fitting of slewing brackets.*

## Wheel forks (Item: 1820316, 1820315)

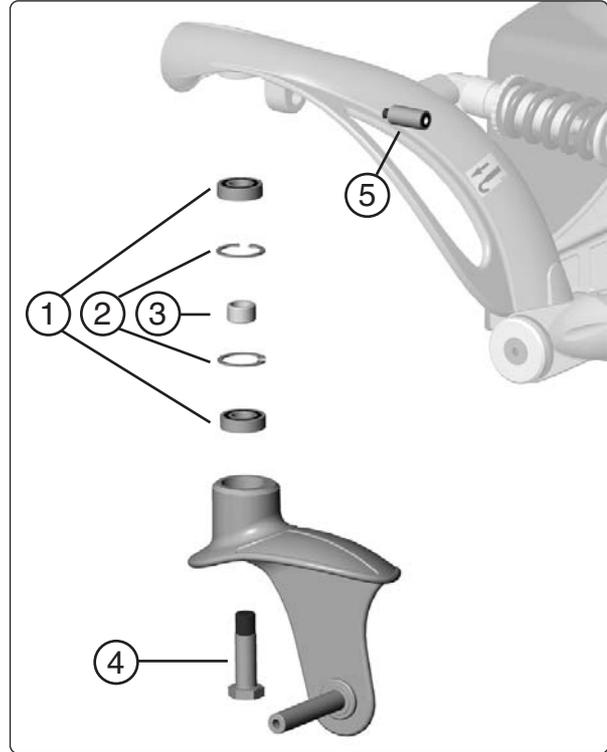
### Removal

1. Turn off the main power switch on the control panel.
2. Lift the wheelchair chassis and support it on blocks so that the appropriate wheel is off the ground.
3. Remove the front wheel; see page 11.
4. Remove the wheel fork. It is attached with a bolt from beneath; see figure.

### Fitting

Fitting is the reverse procedure.

**Use a torque wrench to tighten the bolt to 55 ft-lbs (75 Nm).**

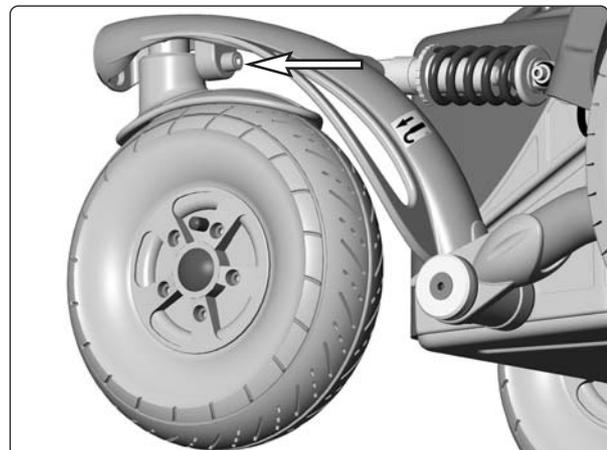


*Wheel fork with friction brake.*

Pos.	Description
1	Bearing, 6002-2RS1 (15x32x9)
2	Circlip, DIN 472 Ø32
3	Spacer
4	Bolt
5	Friction brake

### Friction brake

A friction brake unit is mounted on the slewing bracket. The brake's bearing pressure can be adjusted using the adjusting screw; see figure.



*Adjusting the friction brake's bearing pressure.*

## Wheel forks (Item: 1820302, 1820281)

### Removal

1. Turn off the main power switch on the control panel.
2. Lift the wheelchair chassis and support it on blocks so that the appropriate wheel is off the ground.
3. Remove the plastic plug (1) from the top of the slewing bracket; see figure.
4. Remove the wheel fork. It is attached with a bolt (2) from above; see figure.

### Fitting

Fitting is the reverse procedure.

Assemble the o-ring on the friction plate, see figure below..



#### NOTE

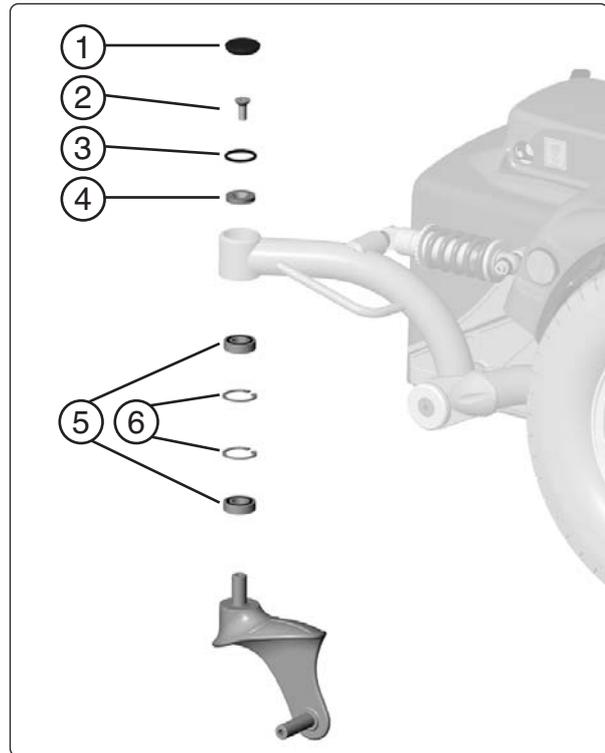
The friction brake is lubricated with O-ring grease, Item: 1820405.



#### WARNING

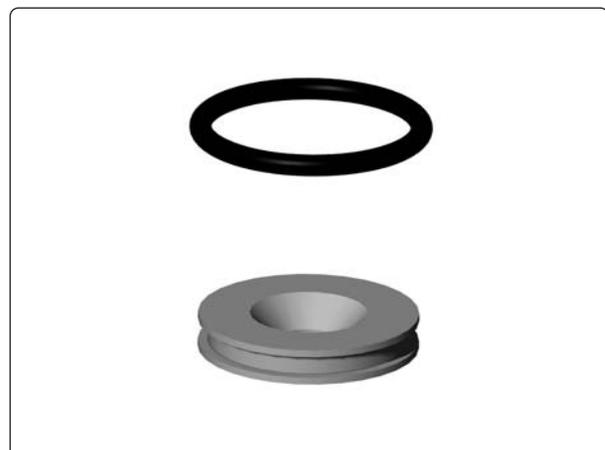
Lubricant other than that specified may not be used.

**Use a torque wrench to tighten the bolt to 24 ft-lbs (33Nm).**



*Wheel fork with friction brake.*

Pos.	Description
1	Plastic plug, SFL 35
2	Bolt, ISO 10642 M8x16 10.9 Fe/Zn 5 C1
3	O-ring Ø24,2x3 EPDM
4	Friction plate
5	Bearing, 6002-2RS1 (15x32x9)
6	Circlip, DIN 472 Ø32
	Grease, Momentum, PRO AA 2/0,025

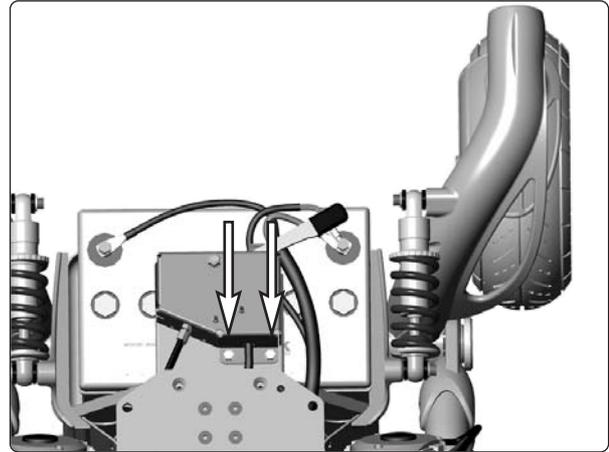


*Fitt the o-ring on the friction plate.*

## Wheel lock release cable

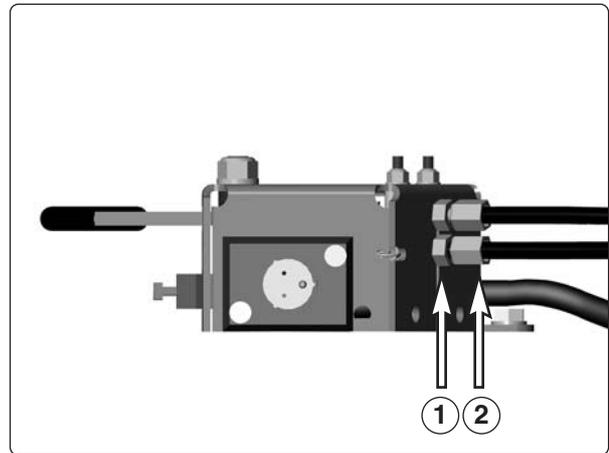
### Removal

1. Raise the seat to its highest position. To raise it manually, see page 28, 31.
2. Turn off the main power switch on the control panel.
3. Remove the chassis covers; see page 7.
4. Remove the wheel lock release mechanism. It is attached with two screws; see figure.



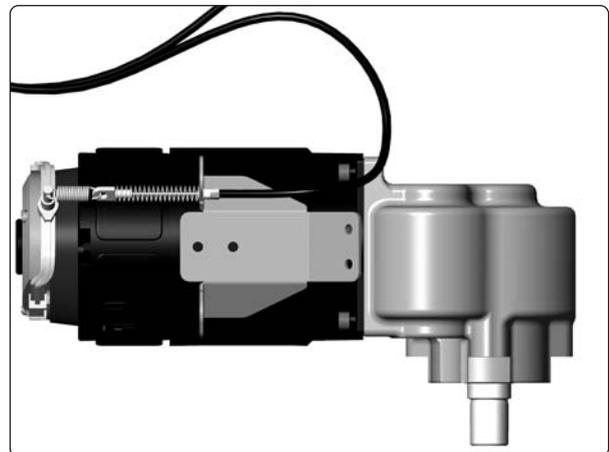
*The wheel lock release mechanism is attached with two screws.*

5. Remove the lock nut (1).
6. Screw in the adjusting screw (2) fully.



*Adjustment of wheel lock release cable.  
Lock nut (1) Adjusting screw (2).*

7. Remove the cable at the magnetic wheel lock by pulling the cable casing forward and passing the cable through the slot in the cable holder. Detach the wheel lock release cable from the magnetic wheel lock.
8. Remove the cable from the release lever.

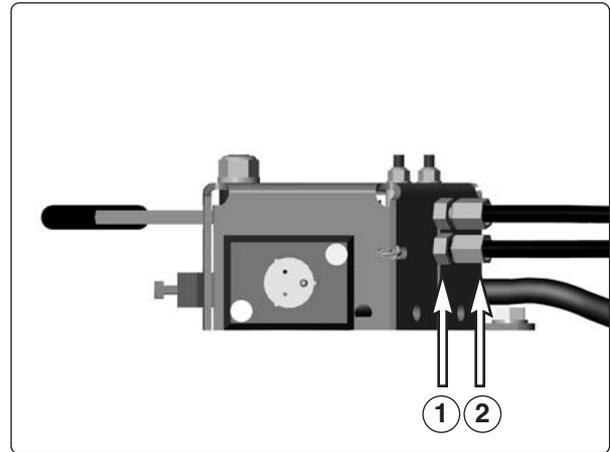


*Wheel lock release cable attachment at the magnetic wheel lock.*

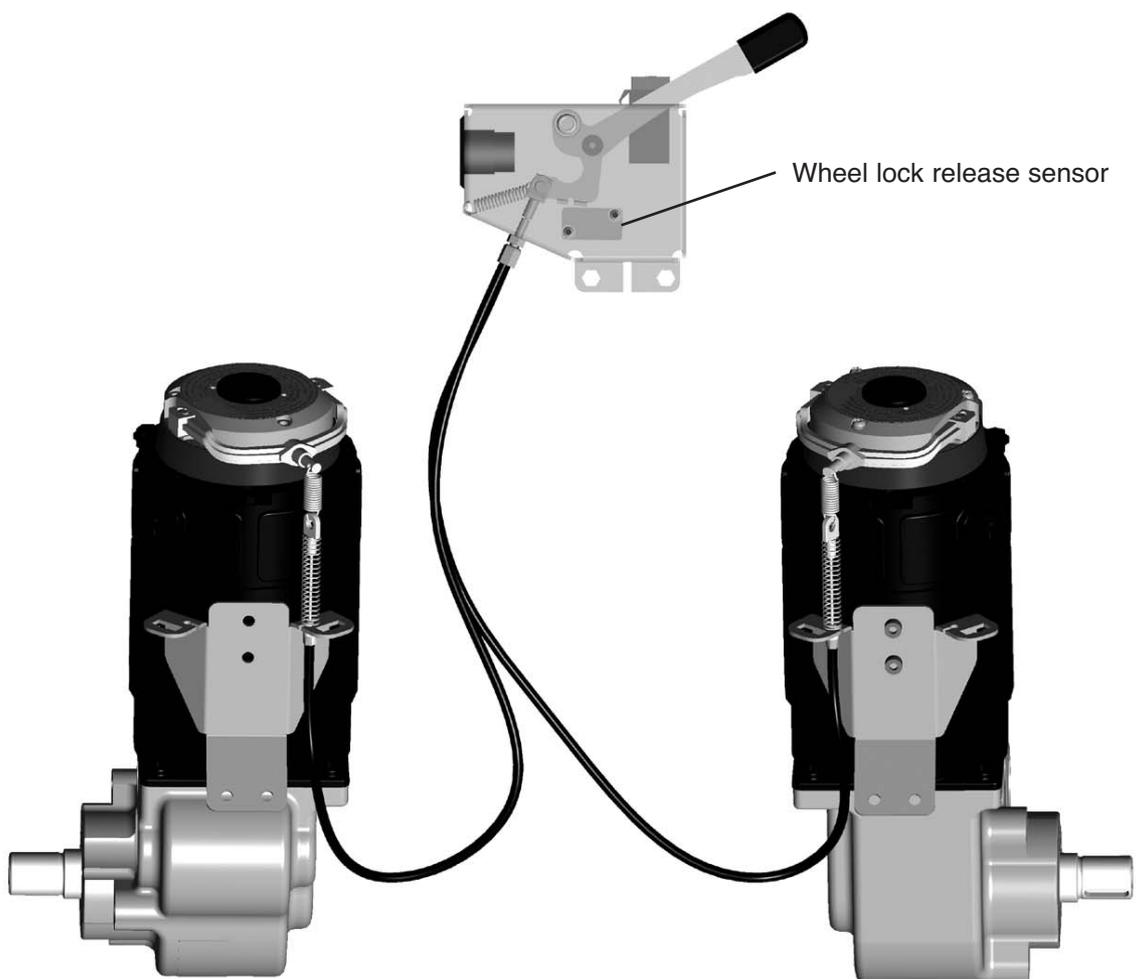
## Wheel lock release cable

### Fitting

1. Fit the cable at the magnetic wheel lock first, then at the release lever.
2. Adjust the cable sleeve length with the adjusting screw (2) so that the cable is sufficiently tensioned so that the wheel lock release sensor is actuated just before the cable pulls the release.
3. Ensure that the wheel cannot be turned before the wheel lock release sensor has been actuated.
4. Ensure that the wheel can be turned when the wheel lock release coupling is released with the release lever.
5. Tighten the lock nut (1).
6. Refit the wheel lock release mechanism and the chassis covers.



*Justering av bromsfrigöringsvagnar.  
Låsmutter (1) Justerskruv (2).*



*Mechanism for wheel lock release.*

## Wheel lock release sensor

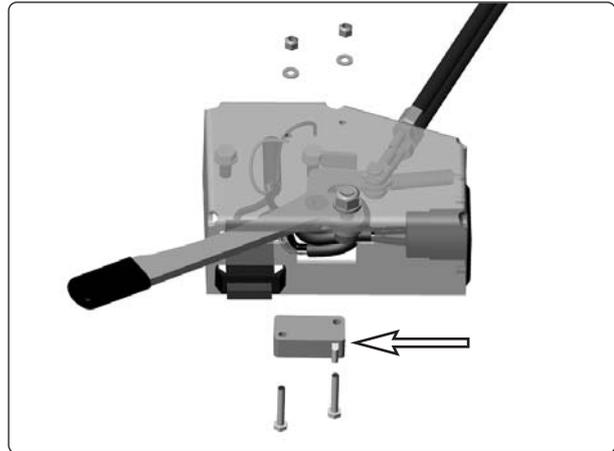
### Removal

1. Remove the chassis cover; see page 7.
2. Put the circuit breaker in the "OFF" position; see page 35.
3. Remove the wheel lock release mechanism; see page 20.
4. Remove the wheel lock release sensor, which is attached with two screws.



#### NOTE

If the release sensor is replaced, its connection cables must be re-soldered.



*Wheel lock release sensor.*

### Fitting

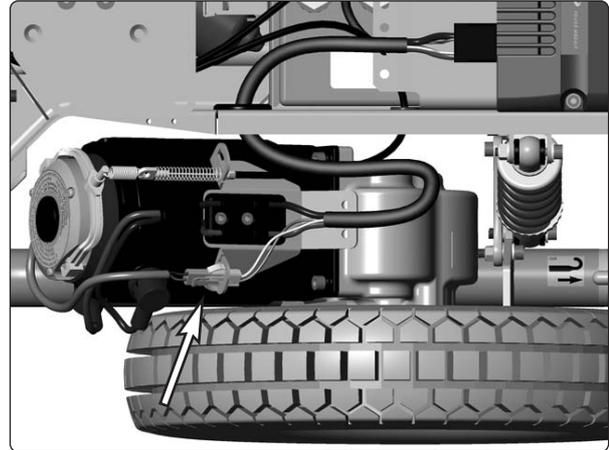
Fitting is the reverse procedure.

Pos.	Description
1	Wheel lock release sensor, VK08N001A
2	Bolt, ISO 4017 M3x20 8.8 Fe/Zn 5 C1
3	Washer, ISO 7089 3 200 HV Fe/Zn 5 C1 (3,2x7x0,5)
4	Nut, DIN 985 M3 6 Fe/Zn 5 C1

## Magnetic wheel lock

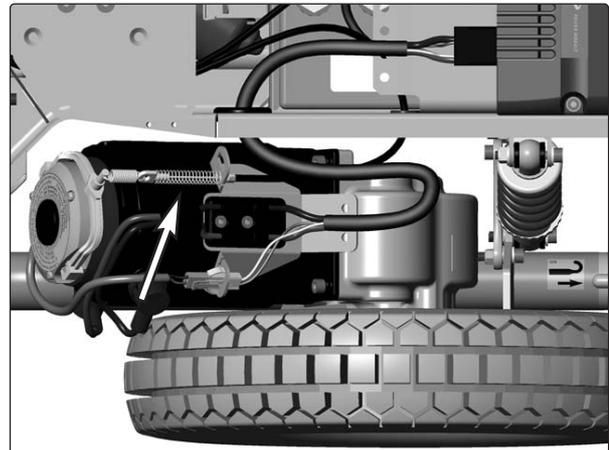
### Removal

1. Raise the seat to its highest position. To raise it manually, see page 28, 31.
2. Turn off the main power switch on the control panel.
3. Put the circuit breaker in the "OFF" position; see page 35.
4. Remove the chassis covers; see page 7.
5. Remove the magnetic wheel lock's electrical connection; see figure.



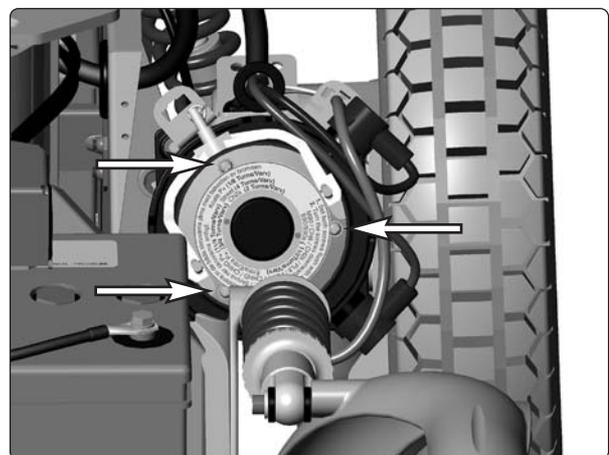
*Magnetic wheel lock electrical connection.*

6. Pull the cable casing forward, out through the slot in the cable holder and detach the wheel lock release cable from the magnetic wheel lock; see figure.



*Remove the wheel lock release cable.*

7. Remove the three screws that secure the wheel lock; see figure 39. Note the position of the wheel lock release lever and rubber seal's placement to facilitate subsequent reassembly. Remove the wheel lock with wheel lock disk and cover.



*Remove the magnetic wheel lock.*

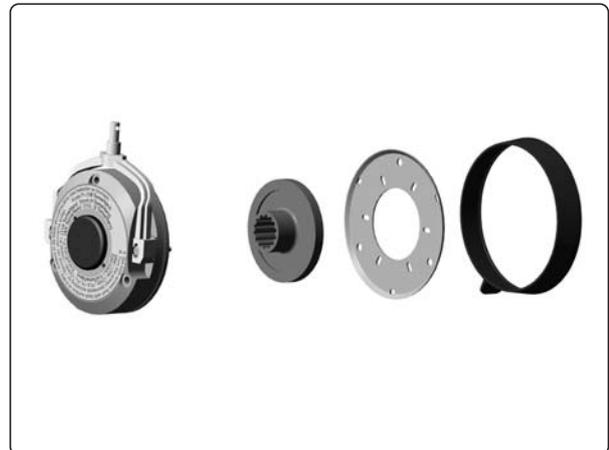
## Magnetic wheel lock

### Fitting

1. Using the adjusting screws, adjust the magnet wheel lock in accordance with the instructions on the back of the magnetic wheel lock; see figure.

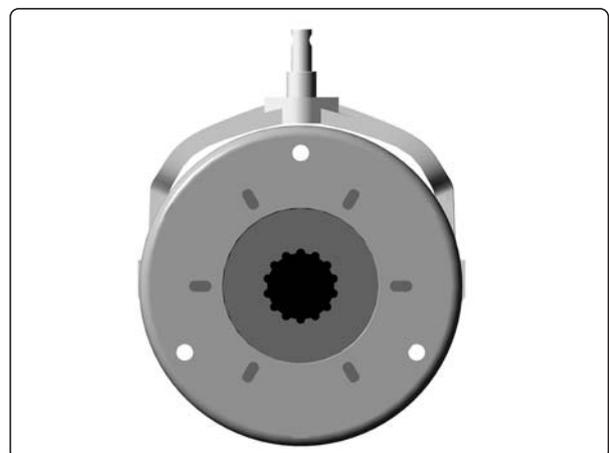


*Wheel lock adjustment is made using the two adjusting screws.*



*Magnetic wheel lock, wheel lock disk, cover and rubber seal disassembled.*

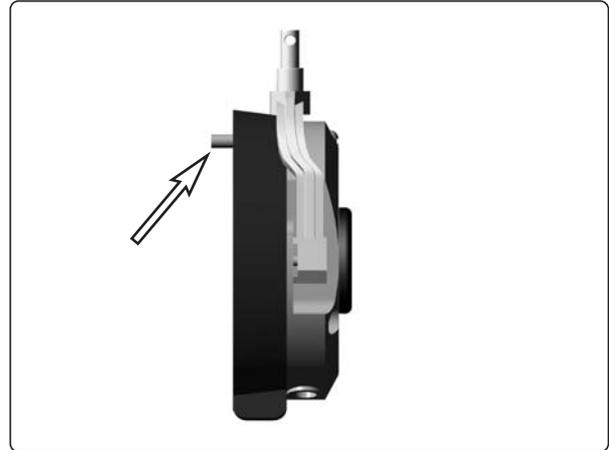
2. Fit the wheel lock disk in the magnetic wheel lock.
3. Fit the cover.



*Magnetic wheel lock, wheel lock disk and cover assembled.*

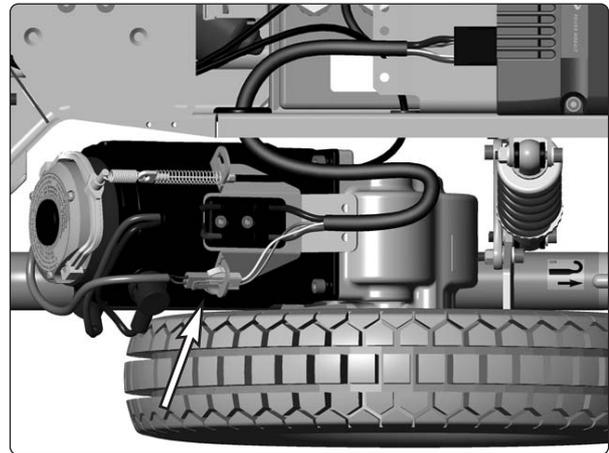
## Magnetic wheel lock

4. Insert a screw to align the parts. Attach the rubber seal with the drainage hole down. Be attentive to the position of the wheel lock release lever; fit the wheel lock so that the wheel lock release lever is aligned with the motor's cable bracket. Now fit the magnetic wheel lock using the three screws.



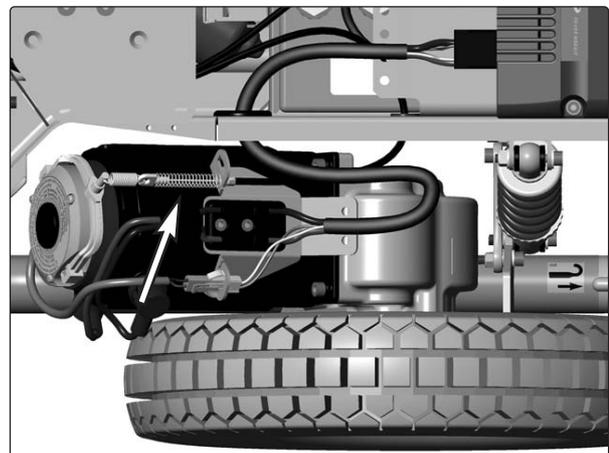
*Align the parts with one another using one of the attachment screws.  
Fit the rubber seal.*

5. Connect the magnetic wheel lock's electrical connection; see figure.



*Magnetic wheel lock electrical connection.*

6. Fit the wheel lock release cable; see figure.
7. Fit the covers; see page 7.

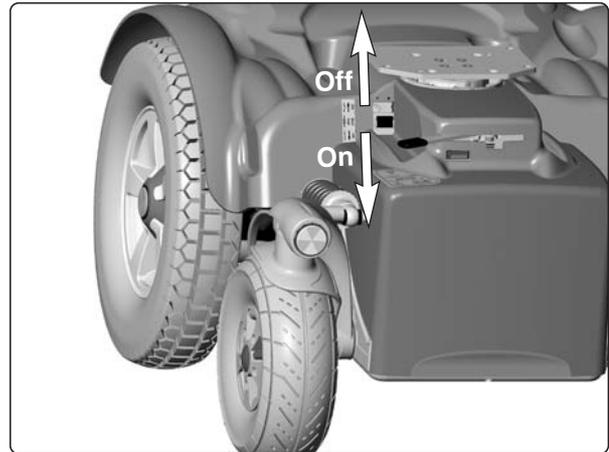


*Fit the wheel lock release cable.*

## Drive motor

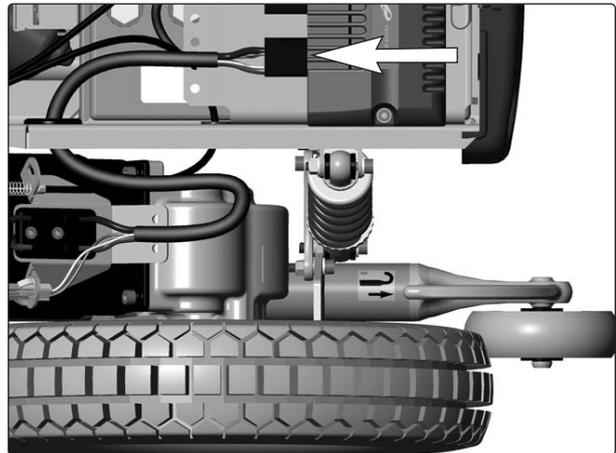
### Removal

1. Raise the seat to its highest position. To raise it manually, see page 28, 31.
2. Put the circuit breaker in the “OFF” position; see figure.
3. Remove the chassis covers; see page 7.
4. Support the appropriate side of the wheelchair on blocks.
5. Remove the rear wheel on the appropriate side; see page 10.



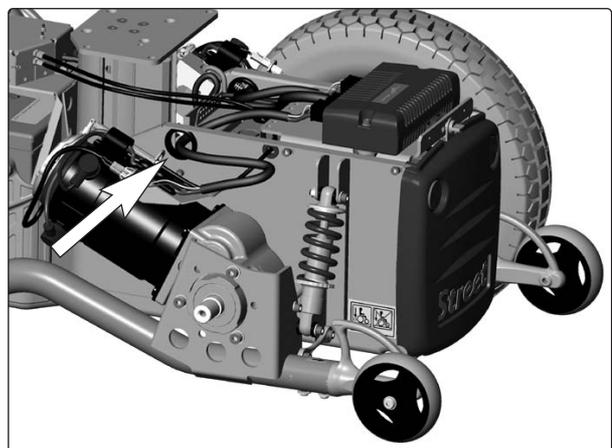
*Circuit breaker/Battery isolator.*

6. Remove the electrical connection for the motor and the magnetic wheel lock.



*Magnetic wheel lock and drive motor electrical connection.*

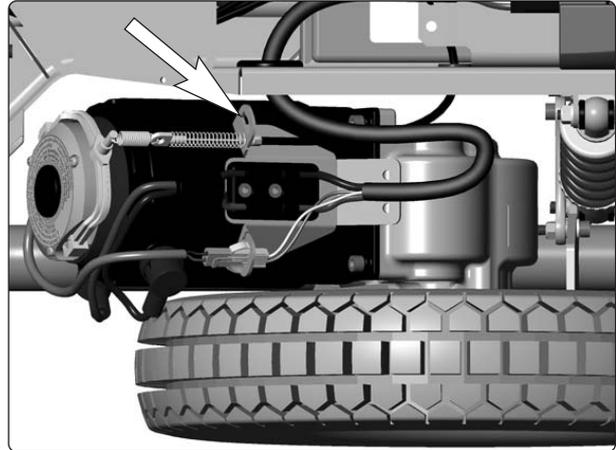
7. Remove the rubber ring from the cable pass-through hole; see figure.
8. Pull the drive motor's connection cable out through the chassis cable pass-through; see figure.



*Cable pass-through.*

## Drive motor

9. Pull the cable casing forward, out through the slot in the cable holder and detach the wheel lock release cable from the magnetic wheel lock; see figure.

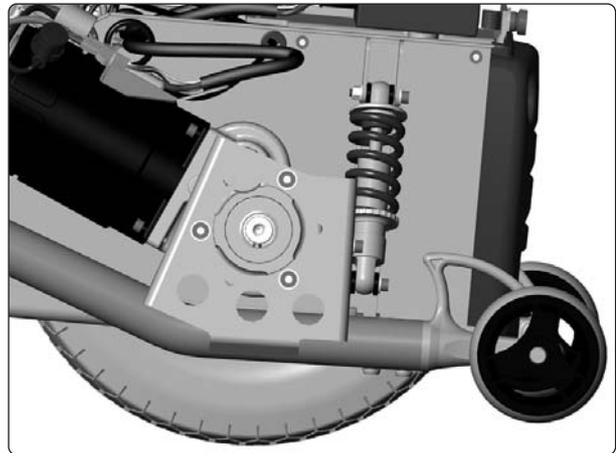


*Wheel lock release cable attachment.*

10. Remove the three screws that secure the motor.
11. Turn the motor laterally so that the wheel shaft turns freely. Lift out the motor.

### Fitting

Fitting is the reverse procedure.



*Drive motor mounting screws.*

## Seat elevator

### Manual raising of electrical seat elevator

If the seat elevator cannot be raised in the normal manner because of discharged batteries or a fault other than to the control unit, the seat elevator can be raised using cabling with article number 311312-00-0.

1. Turn off the main power switch on the control panel.
2. Remove the rear battery; see page 8.
3. Disconnect the seat elevator cabling at the connector fitted on the cabling. It is accessible from the rear through the rear battery box; see figure.
4. Connect the cabling to the seat elevator and connect the cabling to a battery or other power source at a maximum of 24 VDC. To temporarily raise the seat elevator, it is sufficient with a standard 12V car battery.

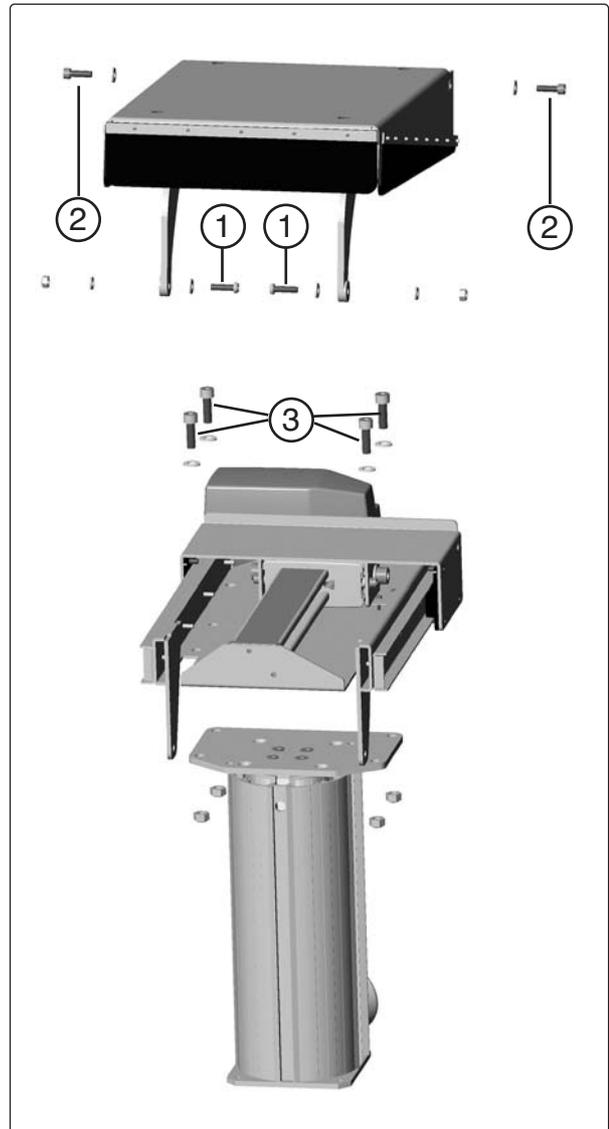


Seat elevator cabling.

### Removal of seat

#### Chair with seat tilt

1. Put the circuit breaker in the "OFF" position; see figure.
2. Remove the two screws (1) that hold the tilt mechanism's upper part at the front edge; see figure.
3. Remove the two screws (2) that hold the tilt mechanism's upper part at the rear edge, see figure.
4. Lift off the seat with the tilt mechanism's upper part and place it on its side beside the chassis.



Seat elevator and seat tilt mechanism.



#### NOTE

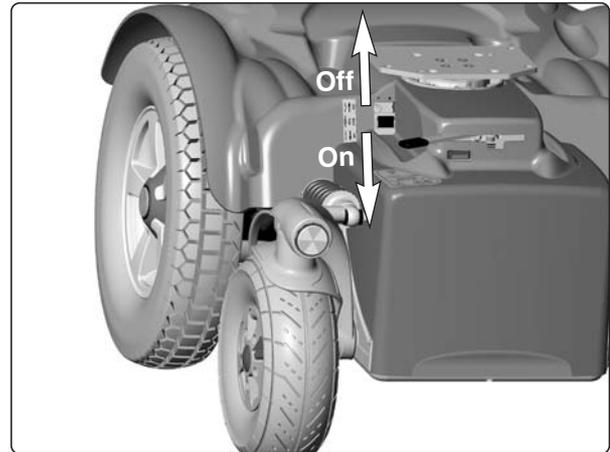
Because the seat is heavy, it should be lifted by two persons. Be careful with the cabling.

5. Remove the part of the seat tilt mechanism that remains on the seat elevator/seat column. It is attached with four screws (3), see figure.

## Seat elevator

### Chair without seat tilt

1. Put the circuit breaker in the “OFF” position; see figure.



*Circuit breaker/Battery isolator.*

2. Remove the four screws on the seat frame bottom that secure the seat frame's lower section; see figure.
3. Lift off the seat and place it on its side beside the chassis.



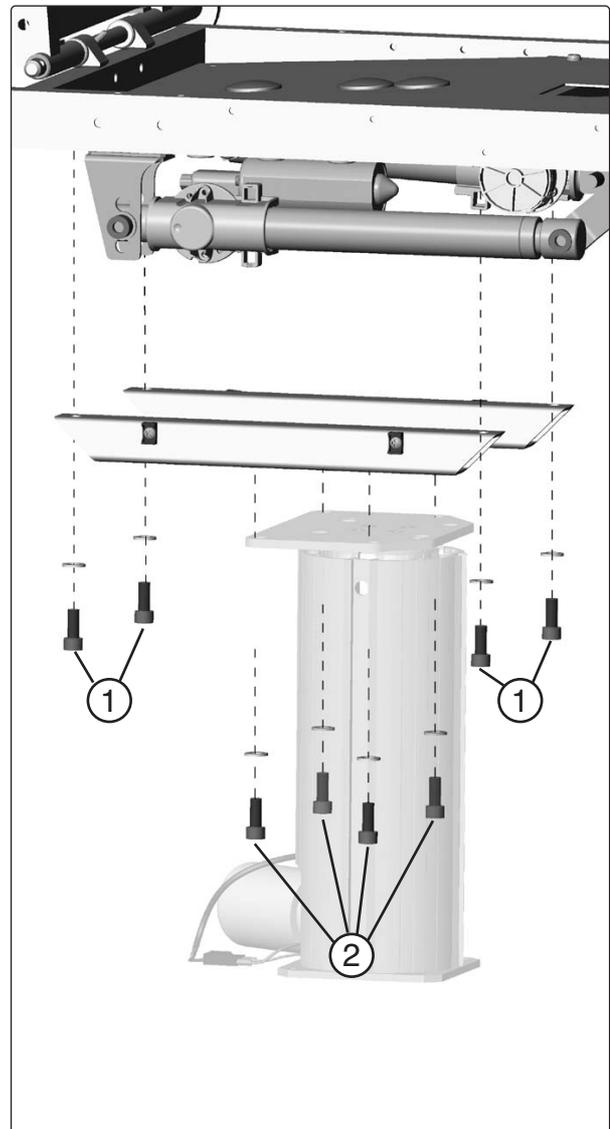
#### NOTE

Because the seat is heavy, it should be lifted by two persons. Be careful with the cabling.

4. Remove the part of the seat frame that remains on the seat elevator/seat column. It is attached with four screws; see figure.

### Fitting

Fitting is the reverse procedure.

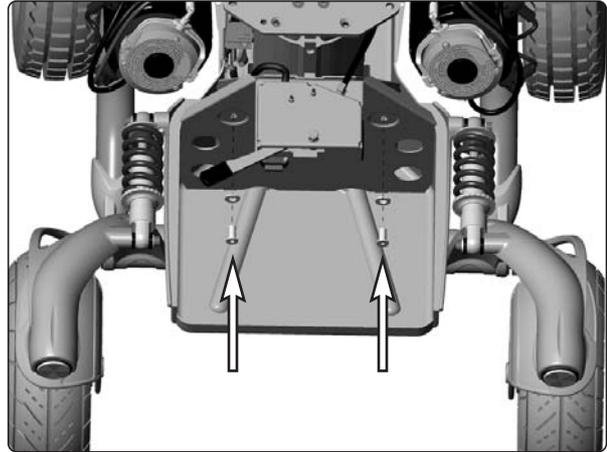


*Seat elevator and seat frame.*

## Seat elevator

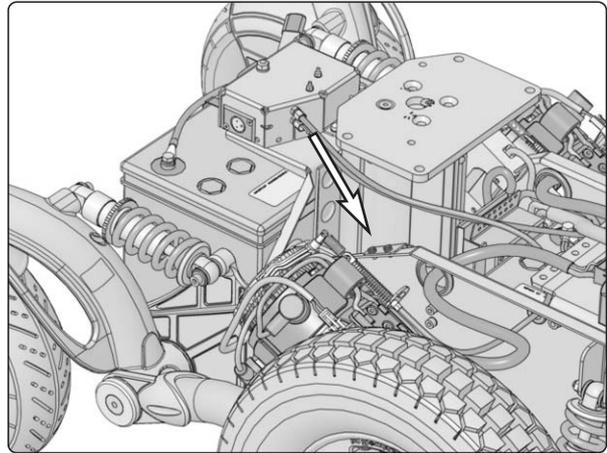
### Removal of seat elevator/Seat column/ Fixed seat post

1. Remove the chassis covers; see page 7.
2. Remove the batteries; see page 8.
3. Remove the seat elevator's upper bracket. It is attached with two screws; see figure.



*Seat elevator's upper attachment screws.*

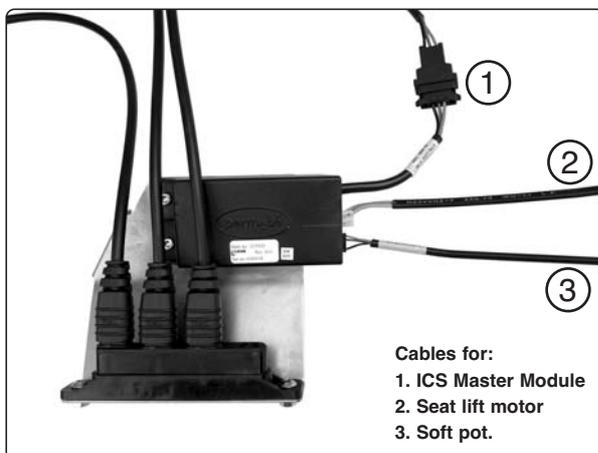
4. When removing the seat lift, undo the bracket which holds the General Module in position. The bracket is attached with two screws on the chassis, see illustration.
5. Lift the General Module and bracket out of the chassis. Detach the cables to the seat lift motor and soft pot from the General Module by pulling the two connectors straight out, see illustration below.
6. Undo the seat lift's four lower fixing screws on the underside of the chassis, see illustration.
7. By angling the seat lift as you lift it, it can be removed without having to undo the bracket for the ICS Master Module.



*The bracket on the General Module is attached with two screws.*

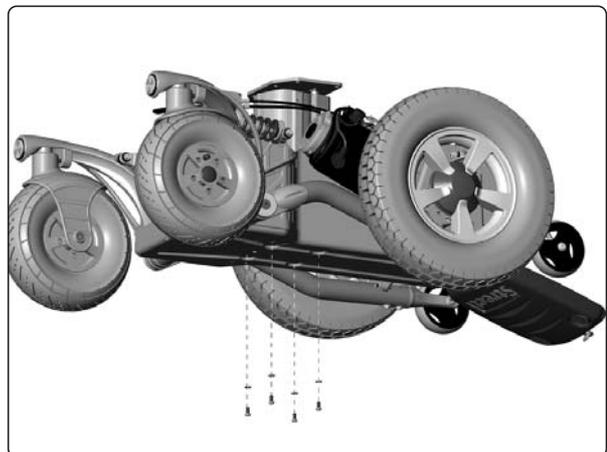
### Fitting

Fitting is the reverse procedure..



Cables for:  
1. ICS Master Module  
2. Seat lift motor  
3. Soft pot.

*General Module and its cables.*



*Seat lift's lower fixing screws.*

## Fixed seat post

### Service position

The seat post has a service position that makes it easier to service and repair the wheelchair.

1. Pull out the catch that locks the seat post's fixed height position. With the catch pulled out, turn it through 90°.
2. Raise the seat to the service position. Turn the catch back through 90° so that it can move in and lock the seat in the service position.

Ensure that the catch is fully pressed in and locking the seat in the service position. The seat must not be subjected to load and the wheelchair must not be driven with the seat post in the service position.

If the wheelchair is transported with the seat post in the service position, the position of the seat post must be secured with a screw (M5). See the figure.

#### WARNING

Raise and hold the seat firmly when the service position catch is pulled out. Otherwise the seat may fall fast to the normal position, causing personal injury.

Ensure that the catch is fully pressed in and locking the seat in the service position.

The seat must not be subjected to load and the wheelchair must not be driven with the seat post in the service position.

If the wheelchair is transported with the seat post in the service position, the position of the seat post must be secured with a screw (M5).

#### NOTE

The seat is heavy. Two people should therefore lift it. Be careful with the cabling.

### Normal position

When the service has been completed, lower the seat to its normal position.

1. Raise the seat carefully and hold it firmly while pulling out the catch. With the catch pulled out, turn it through 90°.
2. Lower the seat to its normal height. Ensure that the head of the securing screw is in contact with the outer tube of the seat post. See the figure.
3. Turn the catch back through 90° so that it can move in and lock the seat in the normal position.

#### WARNING

The seat must not be subjected to load and the wheelchair must not be driven with the seat post in the service position.

Raise and hold the seat firmly when the service position catch is pulled out. Otherwise the seat may fall fast to the normal position, causing personal injury.

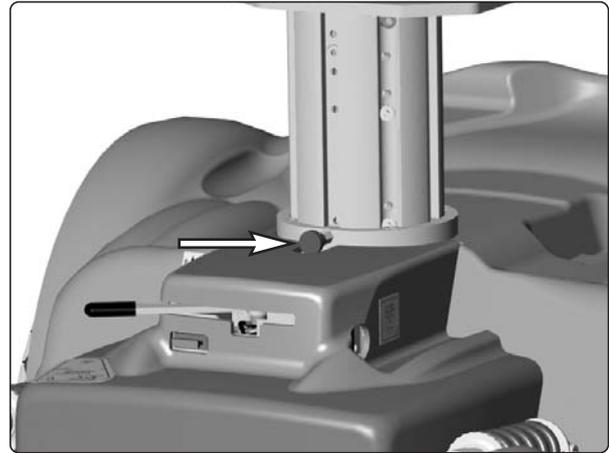


Figure 57. The catch that locks the seat post's height position.

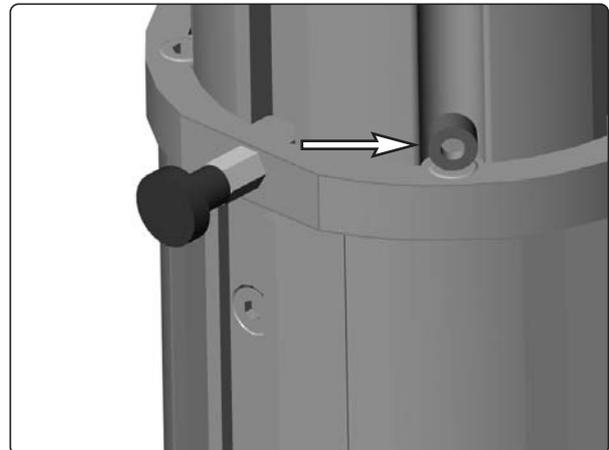


Figure 58. If the wheelchair is transported with the seat post in the service position, the position of the seat post must be secured with a screw (M5).

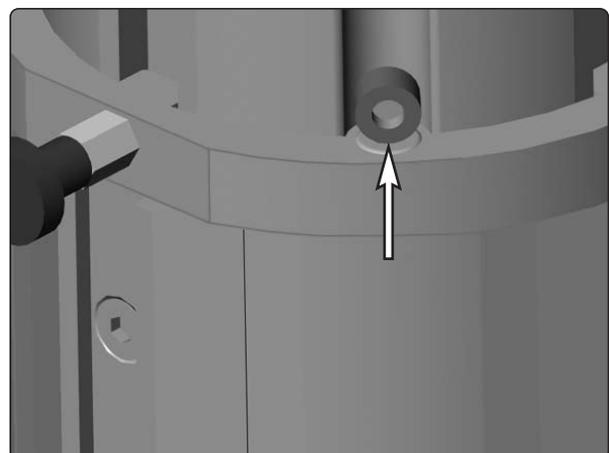
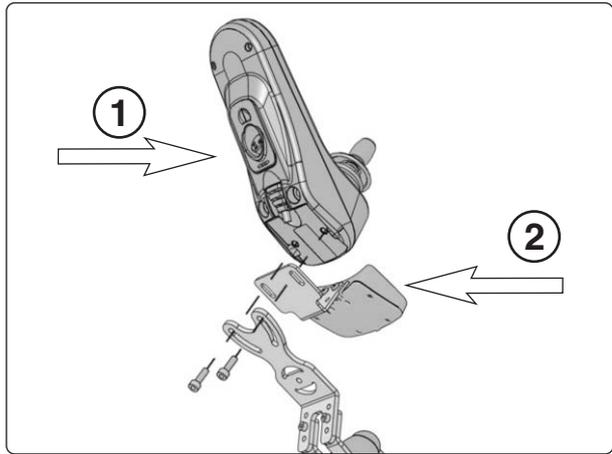


Figure 59. Lower the seat to its normal height. Ensure that the head of the securing screw is in contact with the outer tube of the seat post.

## Control panel R-net

### Removal

1. Switch off the main power switch on the control panel.
2. Remove the cable ties holding the control panel cabling in place under the arm rest. Note the positions of the cable ties for subsequent fitting.
3. Divide the control panel cabling at the contact on the cabling.
4. Remove the control panel (1). It is held in place with two screws (see illustration). These two screws also hold the bracket for the ICS control panel (2), if there is one fitted (see illustration).



*The control panel is held in place with two screws.*

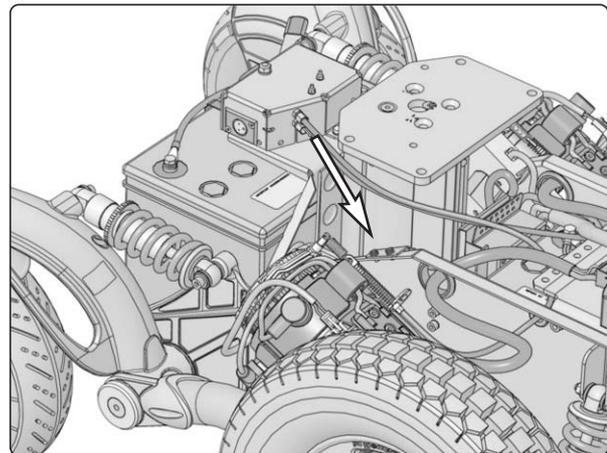
### Assembly

Assemble in the reverse order.

## General Module

### Removal

1. Remove the chassis covers; see page 7.
2. Undo the bracket which holds the General Module in place. The bracket is attached with two screws on the chassis, see illustration.
3. Lift the General Module and fixing from the chassis. If necessary cut the bundling strip holding the cables, but note its position for use in refixing the cables.

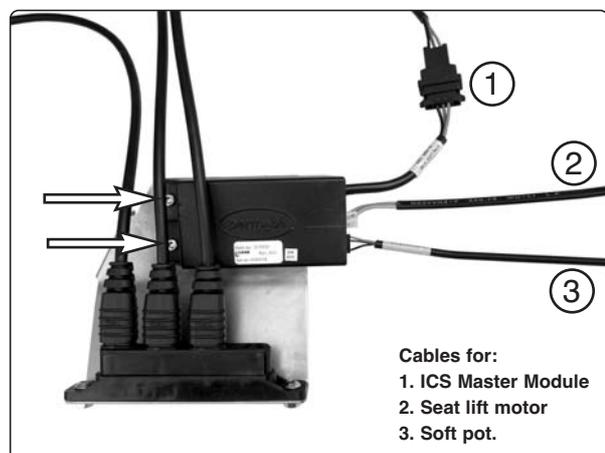


*The General Module's bracket is attached with two screws.*

4. Remove the cables from the General module, see illustration.
5. Remove the General Module, which is attached with two screws, see illustration.

### Assembly

Assemble in the reverse order.

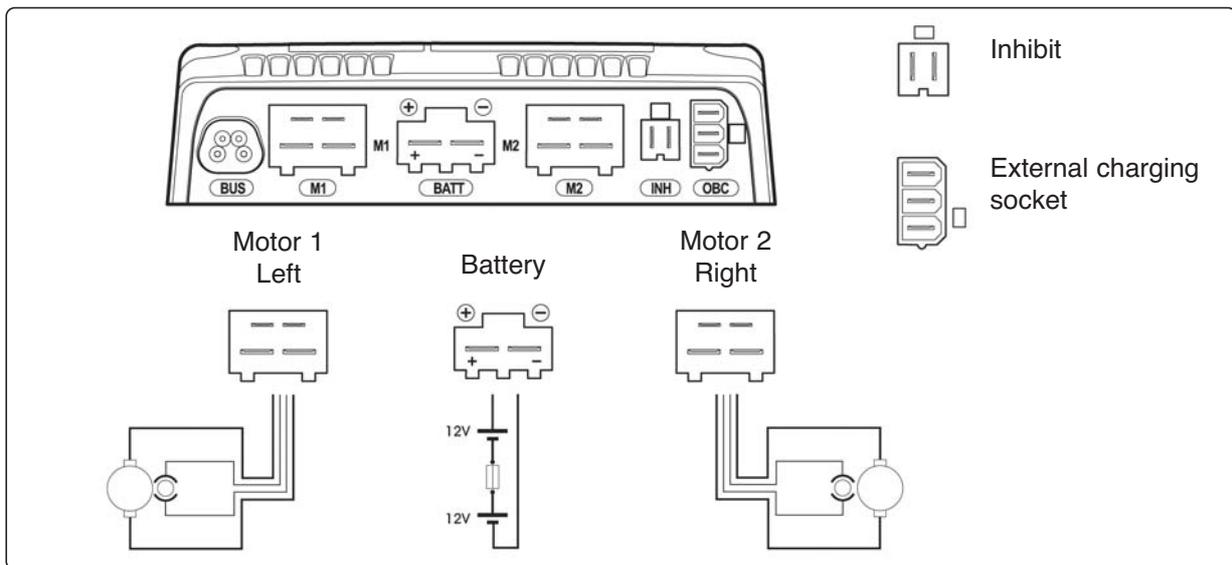


*The General Module is attached to its bracket with two screws.*

## R-net controller

### Removal

1. Raise the seat to its highest position. To raise it manually, see page 28, 31.
2. Switch off the main power switch on the control panel.
3. Put the circuit breaker in the "OFF" position. It is accessed through a hole in the chassis cover; see page 35.
4. Remove the rear chassis cover; see page 7.

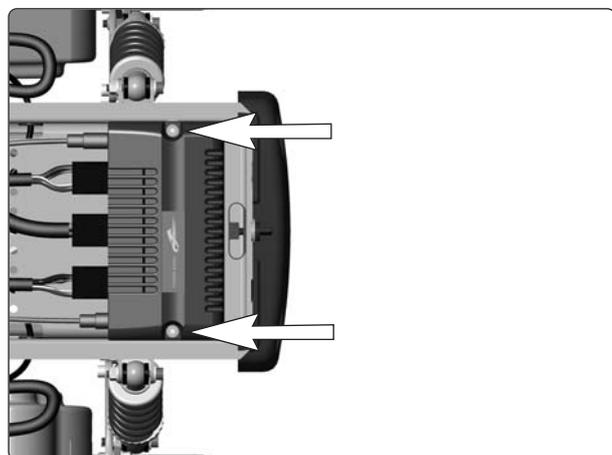


*Output stage cable connections*

5. Disconnect the electrical connections to the R-net controller, being attentive to their placement: see figure
6. Remove the R-net controller by removing its two attachment screws; see figure.

### Fitting

Fit the R-net controller in the reverse order.

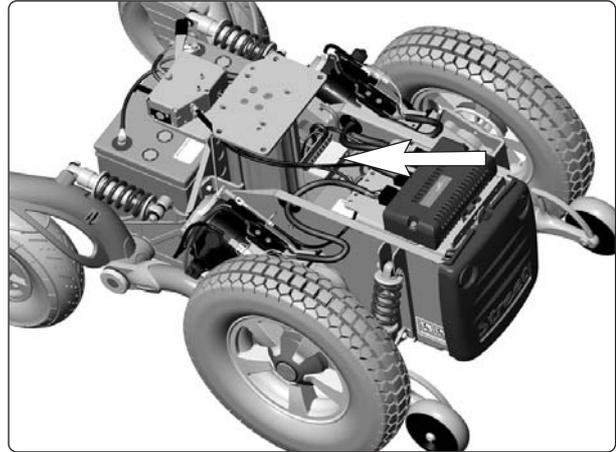


*The R-net controller is attached with two screws.*

## ICS Master Module

### Removal

1. Raise the seat to its highest position. To raise it manually, see page 28,31.
2. Put the circuit breaker in the "OFF" position; see page 35.
3. Remove the rear chassis cover; see page 7.
4. Lift the ICS Master Module straight up from its holder; see figure.
5. Remove the lid from the ICS Master Module.
6. Clip the cable ties that hold the cables and its electrical connections, being attentive to their placement to facilitate subsequent refitting.



*ICS Master Module unattached in its holder.*

### Fitting

Fitting is the reverse procedure.



*ICS Master Module.*

## Circuit breaker and fuses

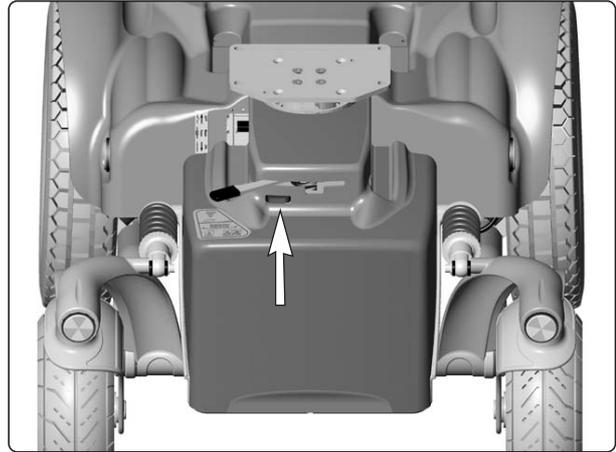
### Charge fuse replacement

The charge fuse is mounted at the front of the chassis, under the wheel lock release lever; see figure. Turn off the main power switch and the charger, if in use, before replacing the charge fuse.



#### NOTE

The circuit breaker must be in the "ON" position during charging.



*Charge fuse.*

## Circuit breaker and fuses

### Resetting the circuit breaker

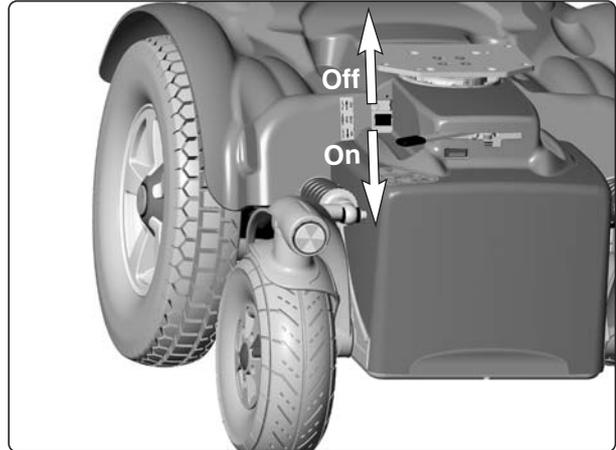
The circuit breaker also serves as a battery isolator but is normally referred to as a circuit breaker.

Circuit breaker replacement is normally not required; it is of the automatic type that can be reset when tripped. It is mounted on the chassis to the right of the seat elevator; see figure.



#### NOTE

A tripped circuit breaker often entails a major electrical fault. The cause should be carefully investigated before resetting.



*Circuit breaker/Battery isolator.*

## Circuit breaker and fuses

### Circuit breaker replacement

1. Remove the chassis covers; see page 7.
2. Put the circuit breaker in the “OFF” position; see figure.
3. Disconnect the minus cable from the front battery.
4. Disconnect the plus cable from the rear battery.



#### NOTE

Bend the battery connection cables off to the side to prevent them from coming in contact with the battery terminals.



*Circuit breaker bracket.*

5. Remove the circuit breaker from its bracket. The circuit breaker is removed by pressing the plastic clip on one side of the circuit breaker outwards using a screwdriver; see figure.



#### NOTE

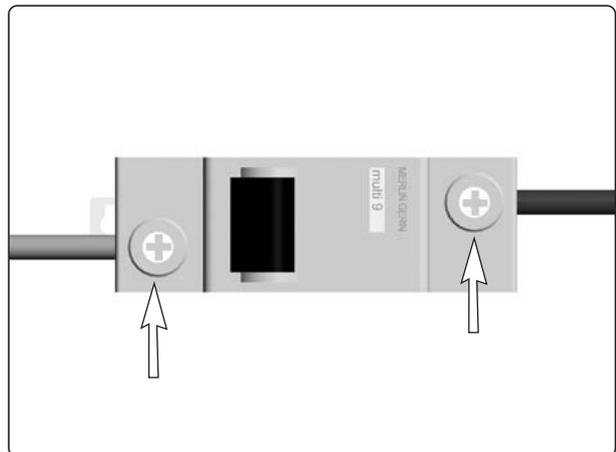
Note the orientation of the circuit breaker with consideration to subsequent mounting. The ON/OFF positions must agree with the decal.

6. Disconnect the cables from the circuit breaker by removing the screws; see figure.
7. Put the new circuit breaker in the “OFF” position.
8. Connect the cables to the new circuit breaker.



#### NOTE

Check that the cables are firmly attached.



*Circuit breaker cable connection.*

9. Fit the new circuit breaker to the bracket.



#### NOTE

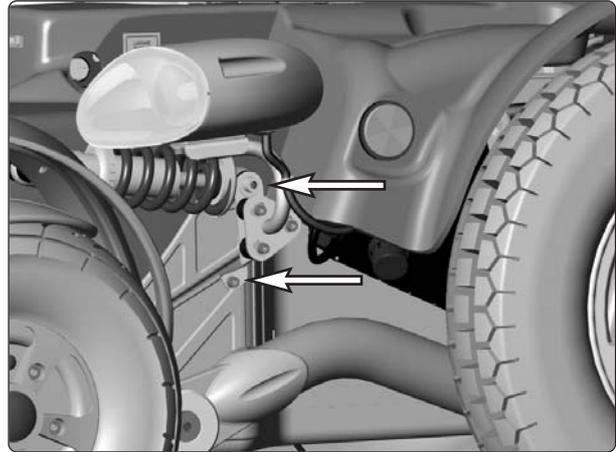
Note the orientation of the circuit breaker. The ON/OFF positions must agree with the decal.

10. Reconnect the battery connection cables to the batteries.
11. Refit the chassis covers; see page 7.
12. Put the circuit breaker in the “ON” position; see figure.

## Lights (accessory)

### Removing the front lights

1. Switch off the main power switch on the control panel.
2. Remove the front chassis cover. See page 7.
3. Chock up the chair so that the front wheel on the relevant side is freely suspended.
4. Unscrew and remove the screw with which the shock absorber and the light are fitted to the chassis. See the picture.
5. Unscrew and remove the other screw with which the light is fitted. See the picture.
6. Cut off the cable ties that hold the cables.
7. Divide the light's cables at the contact on the cables. This is loose inside the chassis.



*The light is fitted with two screws. The upper screw also holds the shock absorber.*

### Installation

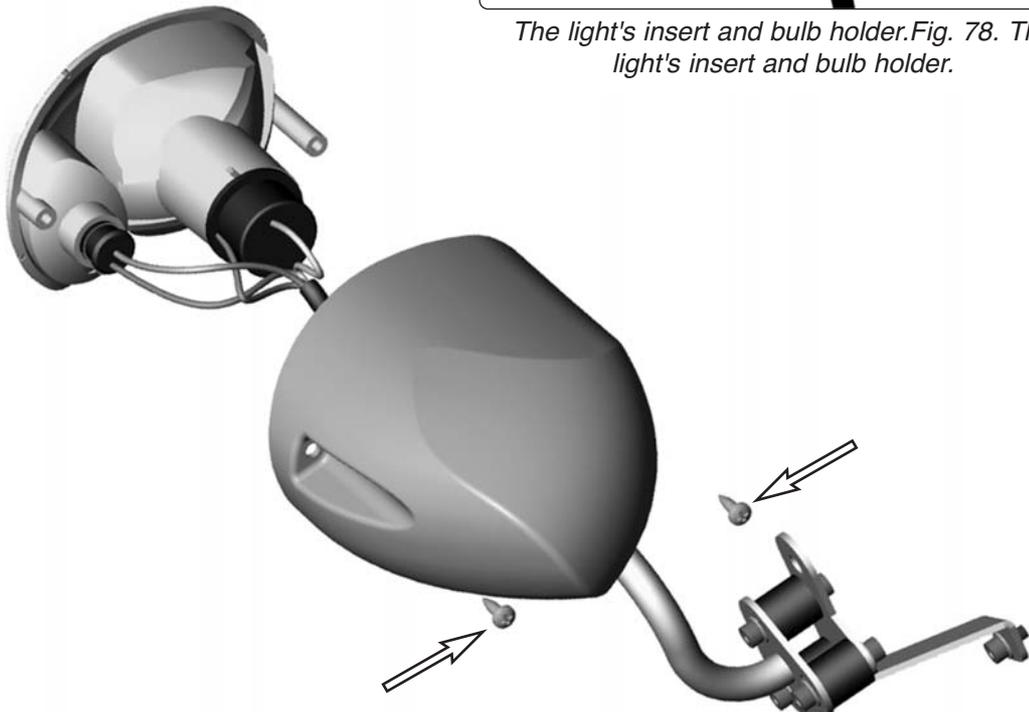
Install the lights in the reverse order.

### Replacing a bulb

1. Switch off the main power switch on the control panel.
2. Unscrew and remove the two screws that hold the light's insert. Remove the insert. See the picture.
3. Remove the bulb holder by pulling it straight out. Replace the bulb.
4. Reinstall in the reverse order.



*The light's insert and bulb holder. Fig. 78. The light's insert and bulb holder.*



*The light's insert is fitted with two screws.*

## Lights (accessory)

### Removing the rear lights

1. Switch off the main power switch on the control panel.
2. Remove the rear chassis cover. See page 7.
3. Divide the light's cables at the contact on the cables.
4. Remove the two screws that hold the light. They are located inside the cover. See the picture.

### Installation

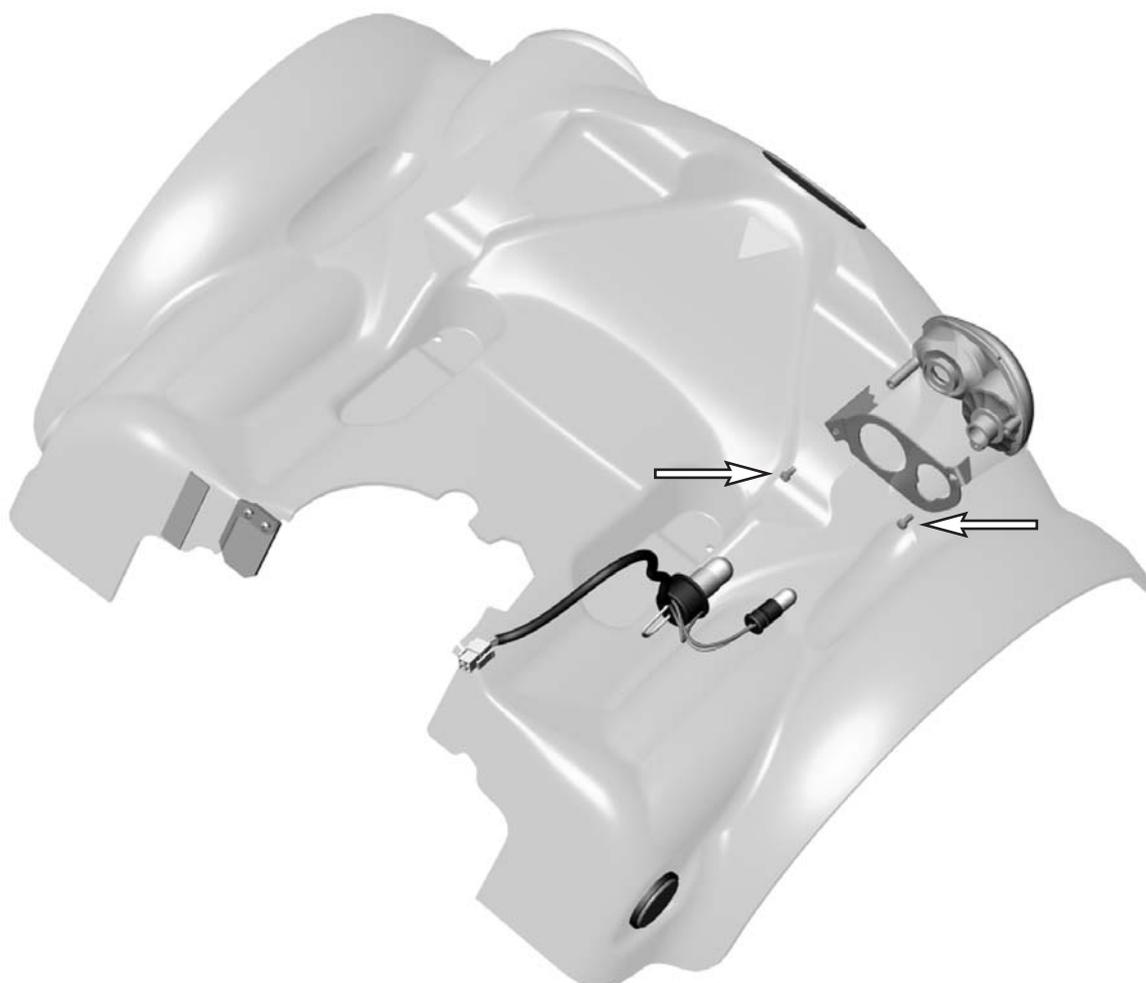
Install the lights in the reverse order.



Rear lights. Fig. 80. Rear lights.

### Replacing a bulb

1. Switch off the main power switch on the control panel.
2. Remove the rear chassis cover. See page 7.
3. From the inside of the cover, remove the bulb holder by pulling it straight out. Replace the bulb.
4. Reinstall in the reverse order.



The light's insert is fitted with two screws.

## Control system

The wheelchair's control system can be programmed in order to optimize the performance of the wheelchair while also maintaining a high level of safety regardless of the wheelchair's other settings and equipment. The control system can also be programmed in order to make adjustments needed for a specific user. Standard parameter files can be downloaded from Permobil's website, [www.permobil.se](http://www.permobil.se).

For more information on programming/adjustment of the **Rnet** control system and obtaining parameter files, see the technical user manual for programming R-net. (Art.no. 205222-SE-0).

## Troubleshooting R-net

The following troubleshooting guide describes a number of faults and events which may occur when you use your wheelchair, together with suggested remedies. Note that this guide cannot describe all the problems and events which may occur and you should always contact your service contact or Permobil in case of doubt.

EVENT	POSSIBLE CAUSE	REMEDY
The wheelchair will not start.	Batteries discharged.	Charge the batteries.
	The cable connection to the control panel has come loose.	Insert the cable in the control panel.
	<b>Main fuse blown.</b>	Check possible causes carefully before resetting/replacing the main fuse. See page 36.
The wheelchair cannot be driven.	Battery charger connected.	Stop charging and disconnect the charging cable from the wheelchair's charging socket.
	Brake release activated.	Reset the brake release.
	The wheelchair is locked.	Unlock the wheelchair. See user manual
An exclamation mark on the control panel display is flashing rapidly and the wheelchair will not run.	Electronics fault.	See pages 42–55.
The wheelchair can only be driven at reduced speed.	Seat lift raised too high.	Lower seat lift.
The wheelchair cannot be charged.	<b>Main fuse blown.</b>	Check possible causes carefully before resetting/replacing the main fuse. See page 36.
The wheelchair “switches itself off” after a certain period of inactivity.	The electronics' energy-saving mode has been activated.	Switch the wheelchair on again using the start key on the control panel.

## Troubleshooting R-net

### Rnet diagnostics

When an error or a fault occurs in the wheelchair's electronics, information on it is displayed in the control panel's display. This information can then be used to diagnose where the error/fault occurred and its cause.

Troubleshooting and repairs must always be performed by competent personnel with good knowledge of the wheelchair's electronics. More information on troubleshooting and remedies can be found in the service manual for this wheelchair model.

### Diagnostic screens

#### Current diagnostic screen

When the control system's integrated protection circuits have been triggered so that the control system can no longer operate the wheelchair, a diagnostic screen is displayed in the control panel's display.

This indicates a system fault, i.e. Rnet has detected a problem somewhere in the wheelchair's electrical system.

**NB!** *If the fault is in a module that is not currently being used, it will still be possible to drive the wheelchair, but the diagnostic screen is displayed occasionally.*

Switch off the wheelchair and leave it off for a few minutes. Then restart the wheelchair. If the fault persists, you must switch off the wheelchair and get in touch with your service contact. Write down the information displayed in plain text in the control panel's display and pass it on to your service contact.

Do not use the wheelchair until the problem has been remedied or you have received other instructions from your service contact.

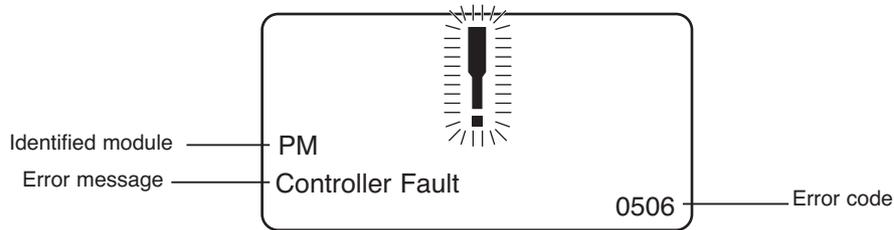


#### WARNING

Diagnostics should only be performed by persons with sound knowledge of the wheelchair's electronic control system. Incorrect or poorly performed repair works may make it dangerous to use the wheelchair. Permobil accepts no liability for any personal injury or damage to the wheelchair and its surroundings that occurs on account of incorrect or poorly performed repair work.

## Troubleshooting R-net

### Example of a screen showing a system fault



#### Identified module

This indicates the control system module that detected the problem.

**PM=** Power module

**JSM=** Joystick module

#### Error message

The error message provides a brief description of the error type.

#### Error code

The four-digit code indicates which protection circuit has been triggered.

#### 2.1.4 Example

The screen example shown below displays the following information:

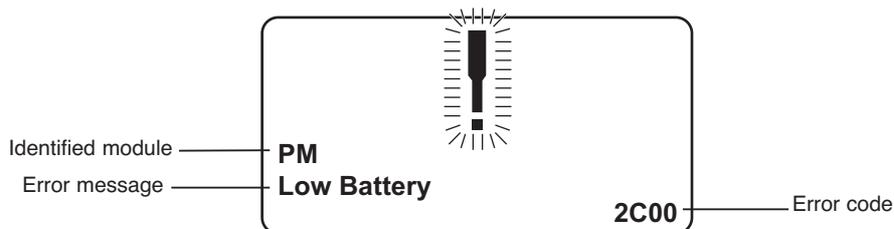
**Identified module:** Power module error

**Error message:** Low Battery

**Error code:** 2C00

This means that the battery needs charging or that the battery has not been connected properly.

- *Check the battery connections. Attempt to charge the battery if it is properly connected.*



## Troubleshooting R-net

### 2.2 System log

All errors are saved in the system log regardless of whether they have been remedied or are still active. The system log saves the error messages and the number of times they arise. The errors are saved in their respective modules within the system.

The system log is accessed by means of programming directly in the system (On Board Programming, OBP).

*Contact Permobil or your repair engineer for more information on OBP.*

#### Go to OBP mode

- *Select System from the menu.*
- *Select Diagnostics from the menu.*
- *The diagnostics screen will now appear, showing the connected modules and version history. See the illustration below.*
- *If a module has experienced no errors, the message No Entries will be displayed, otherwise something similar to the screenshot below will be displayed.*

Diagnostics	
JSM	1.9
PM	1.9
ISM	1.9

PM 1.9	
M1 Brake Error	6
System Error	1

## Troubleshooting R-net

### 3. Definitions of diagnostics messages

When an error message has been displayed and the defective module has been identified, you can use the following definitions to determine the possible cause of the error and what remedial action is required to correct it.

Error message	Description
Joystick Error	Go to section 3.1.
Low Battery	Go to section 3.2.
High Battery	Go to section 3.3.
M1 Brake Error	Go to section 3.4.
M2 Brake Error	Go to section 3.4.
M1 Motor Error	Go to section 3.5.
M2 Motor Error	Go to section 3.5.
Inhibit Active	Go to section 3.6.
Jstick Cal Error	Go to section 3.7.
Latched Timeout	Go to section 3.8.
Brake Lamp Short	Go to section 3.9.
Left Lamp Short	Go to section 3.10.
Right Lamp Short	Go to section 3.10.
L Ind Lamp Short	Go to section 3.11.
R Ind Lamp Short	Go to section 3.11.
L Ind Lamp Failed	Go to section 3.12.
R Ind Lamp Failed	Go to section 3.12.
DIME Error	Go to section 3.16.
Memory Error	Go to section 3.17.
PM Memory Error	Go to section 3.18.
Bad Cable	Go to section 3.19.
Bad Settings	Go to section 3.20.
Module Error	Go to section 3.21.
System Error	Go to section 3.22.
Gone to Sleep	Go to section 3.23.
Charging	Go to section 3.24.

## Troubleshooting R-net

### 3.1 Joystick Error

The commonest cause for this error is that the joystick was moved away from its central position before and during the time at which the control system was switched on. The screen for a shifted joystick is displayed for 5 seconds. If the joystick is not released during this time, a joystick error is registered. Even if an error screen is not displayed, the error and the number times it arises is registered in the system log.

- *Ensure that the joystick is in the central position and start up the control system.*

If the error persists, the joystick or joystick module may be defective. Read more in section 5.

### 3.2 Low Battery

This occurs when the control system detects that the battery voltage is lower than 16 V.

- *Check the batteries and their connection to the control system.*

If the error persists after the batteries and connections have been checked, the power module may be defective. Read more in section 5.

### 3.3 High Battery

This occurs when the control system detects that the battery voltage is higher than 35 V. The commonest causes for this error are that the battery has been overcharged or a poor connection between the control system and the batteries.

- *Check the batteries and their connection to the control system.*

If the error persists after the batteries and connections have been checked, the power module may be defective. Read more in section 5.

### 3.4 Brake Error

This occurs when the control system detects a problem in the solenoid brakes or the connections to them.

1505 - M1 Brake Error  
1506 - M2 Brake Error

- *Check the solenoid brakes, their cables and the connections to the control system.*

If the error persists after the checks listed above, the power module may be defective. Read more in section 5.

### 3.5 Motor Error

This occurs when the control system detects that a motor has been disconnected.

3B00 - M1 Motor Error  
3C00 - M2 Motor Error

- *Check the motors, their cables and the connections to the control system.*

If the error persists after the checks listed above, the power module may be defective. Read more in section 5.

### 3.6 Inhibit Active

This occurs when one of the inhibit signals is active and is in blocked mode.

The last two digits of the error code indicate the active inhibit signal. The code is hexadecimal.

1E01 - For inhibit signal 1.  
1E09 - For inhibit signal 9.  
1E0A - For inhibit signal 10.

- *Cycle the voltage. This will deactivate the block mode, which may remedy the error.*
- *Check all connections and switches for the indicated inhibit signals.*

## Troubleshooting R-net

### 3.7 Joystick Calibration Error

This occurs when joystick calibration has been unsuccessful.

- *Go to OBP mode and recalibrate.*

If the error persists, the joystick module may be defective. Read more in section 5.

### 3.8 Latched Timeout

This occurs when the control system detects that the programmed block time has been exceeded. This can, for example, be due to the signal units (joystick, main steering device, suction and blowing device, etc.) not having been used frequently enough.

The error reference provides information on why the control system has left block mode.

- *Cycle the voltage.*
- *Activate block mode.*

If the error persists after the checks listed above, the signal unit may be defective. Read more in section 5.

### 3.9 Brake Lamp Short

This occurs when the control system detects a short circuit in the brake lamp electrical circuit. Read more about connectors in section 2.3.

- *Check the brake lamps, their cables and the connections to the control system.*

### 3.10 Lamp Short

This occurs when the control system detects a short circuit in the electrical circuit of one of the lamps.

7205 - Short circuit left-hand lamp.  
7209 - Short circuit right-hand lamp

- *Check the lamps, their cables and the connections to the control system.*

### 3.11 Indicator Lamp Short

This occurs when the control system detects a short circuit in the electrical circuit of one of the indicators.

7206 - Short circuit left indicator.  
720A - Short circuit right indicator.

- *Check the indicators, their cables and the connections to the control system.*

### 3.12 Indicator Lamp Failed

This occurs when the control system detects an error in the electrical circuit of one of the indicators. This usually means the indicator needs replacing.

7207 - Error in left indicator.  
7208 - Error in right indicator.

- *Check the indicators, their cables and the connections to the control system.*

## Troubleshooting R-net

### 3.16 DIME Error

This occurs when the control system detects an ID conflict between two modules in the system.

If a new module has been added:

- *Disconnect the new module and cycle the voltage.*
- *If no error occurs, connect the new module to the system and cycle the voltage.*
- *If the error recurs, the new module must be the cause of the problem.*

If no new modules have been added:

- *Disconnect one module at a time and cycle the voltage.*

If the error persists after the checks listed above have been performed, consult your service contact or Permobil.

### 3.17 Memory Error

This is a non-specific memory error that may be caused by any of the system modules.

- *Check all cables and connections.*
- *Cycle the voltage.*

If the error persists and the system includes third-party modules:

- *Disconnect all modules that do not come from PGDT and cycle the voltage.*

If this has dealt with the error:

- *Connect one third-party module at a time and cycle the voltage each time.*
- *If the error recurs after one of the voltage cycles, the last module to be connected must be defective.*

If the error persists after the checks listed above, the power module may be defective. Read more in section 5.

### 3.18 PM Memory Error

This is a specific error in the power module.

- *Check all cables and connections.*
- *Reprogram the control system with the help of R-net's PC programmers.*

This should be done with either the latest specific program file for the wheelchair or Permobil's original program file.

If the error persists after the checks listed above, the power unit may be defective. Read more in section 5.



Programming should only be performed by persons with sound knowledge of control systems from PGDT. Incorrect programming can mean that the wheelchair is not safe to use. Permobil cannot be held responsible for losses of any kind if the control system factory settings are altered by programming.

## Troubleshooting R-net

### 3.19 Bad Cable

This occurs when the control system detects a connection error in the communication cables between the modules.

- *Check all cables and connections to ensure there is no stoppage.*
- *Replace any cables with visible damage. Then cycle the voltage.*
- *Disconnect one cable at a time from the system and cycle the voltage after each disconnection.*

If the error persists after the checks listed above, the power unit may be defective. Read more in section 5.

### 3.20 Bad Settings

This occurs when the control system detects incorrect or invalid program settings.

- *Check all parameter settings and then reprogram the control system with the help of R-net's PC programmers.*
- *Make a note of the current parameter settings and then reset the control system to the standard settings.*
- *Reprogram the required settings in small groups and cycle the voltage after each group to see if the error recurs.*

If the error persists after the checks listed above, the power unit may be defective. Read more in section 5.

### 3.21 Module Error

This occurs when the control system detects an error in a specific module. The module is displayed on the diagnostics screen according to the description in section 2.

- *Check all cables and connections.*
- *Cycle the voltage.*

If the error persists after the checks listed above, the module specified may be defective. Read more in section 5.

## Troubleshooting R-net

### 3.22 System Error

This occurs when the control system detects an error that cannot be ascribed to a specific module.

- *Check all cables and connections.*
- *Cycle the voltage.*

If the error persists and the system includes third-party modules:

- *Disconnect all modules that do not come from PGDT and cycle the voltage.*

If this has dealt with the error:

- *Connect one third-party module at a time and cycle the voltage each time.*
- *If the error recurs after one of the voltage cycles, the last module to be connected must be defective.*

If the error persists after the checks listed above, the system from PGDT may be defective. Read more in section 5.

### 3.23 Gone to Sleep (energy saving mode)

This occurs when the system has not been used for a period that exceeds the Sleep Timer parameter used for setting the energy saving mode. Each time this occurs it is registered in the system log.

### 3.24 Charging

This occurs when the control system detects that a charger has been connected to either inhibit contact 1 or inhibit contact 3. Read more about connectors in section 2.3.

The screen for battery charging is displayed when a charger is connected.

Each time this occurs it is registered in the system log.

When using an integral charger:

- *Disconnect the charger from the mains.*

When using an external charger:

- *Disconnect the charger from the power wheelchair.*

If the error persists after the charger has been disconnected, the joystick module may be defective. Read more in section 5.

## Troubleshooting R-net

### 4. Basic test

After a repair has been completed, the following test should be performed. These are minimum recommendations. Depending on what the original error source was, further tests may be necessary.



#### WARNING

The tests described are minimum recommendations. It is the responsibility of the repair engineer(s) to perform other tests on the basis of the original error source and the wheelchair model. The necessary information on other tests is available in the wheelchair service manual. Permobil cannot be held responsible for losses of any kind that may arise when these tests are conducted, or that arise as a consequence of further relevant tests not being conducted.



#### WARNING

These tests should be conducted in an open space, and some kind of clamping device, such as a safety belt, should always be used. Permobil cannot be held responsible for losses for any kind arising due to these recommendations not being observed.

#### 4.1 Basic inspection

Check that all contacts are properly connected.

- *Check all cables and contacts to ensure there is no visible damage.*
- *Check that the rubber gaiter around the base of the joystick is not damaged. Inspect the gaiter visually. It should not be subjected to manual handling.*
- *Ensure that all components of the control system are securely installed.*
- *Do not over-tighten the mounting screws.*

## Troubleshooting R-net

### 4.2 Brake test

These tests should be carried out on an even surface with at least one meter of free space around the wheelchair.

- *Switch on the control system.*
- *Check that the screen remains on after start-up.*
- *Bring the joystick slowly forwards until you hear the parking brakes functioning. In some cases the wheelchair may begin to move.*
- *Release the joystick immediately. You must hear both parking brakes functioning within 2 seconds.*
- *Repeat the test three times, bringing the joystick slowly backwards, to the left and to the right.*

### 4.3 Test run

Set the highest permitted speed to the lowest value and run the wheelchair in all directions while checking that it runs smoothly and is easy to maneuver.

Repeat the test with the speed control set to the highest possible value.

### 4.4 Gradient test



#### WARNING

When this test is conducted, an additional person must be present in order to prevent the wheelchair tipping over backwards.

Run the wheelchair forwards up its steepest permitted gradient. Release the joystick when the wheelchair is on the upward slope and check that the wheelchair stops and that the brakes function as they should without the front wheels lifting from the ground.

Bring the joystick forwards and continue to run up the slope. Check that the wheelchair moves gently forwards.

Stop the wheelchair and reverse down the slope. Release the joystick when the wheelchair is on the upward slope and check that the wheelchair stops and that the brakes function as they should without the front wheels lifting from the ground.

## Troubleshooting R-net

### 4.5 Test of lights, indicators and warning lights

If the wheelchair is equipped with lights:

- *Check that all bulbs light up as they should.*
- *Check that all bulbs light up as they should and that the flashing frequency is  $1.5 \text{ Hz} \pm 0.5 \text{ Hz}$ .*
- *Remove the bulbs in turn and check that the remaining bulb on the same side flashes at a frequency of  $3 \text{ Hz} \pm 0.5 \text{ Hz}$ .*

If the wheelchair is equipped with warning lights:

- *Check that all bulbs light up as they should and that the flashing frequency is  $1.5 \text{ Hz} \pm 0.5 \text{ Hz}$ .*

### 4.6 Test of adjustment device

If the wheelchair is equipped with an adjustment device:

- *Check that all motors move in the right direction.*
- *Make sure that the mechanical end stops are secured and that they stop the adjustment device motors, and thus use the automatic end stop tracking that is in the seat and light module (ISM).*

### 4.7 Test of inhibit signal

Connect a suitable battery charger or equivalent inhibit connecting device in the charging contact on the joystick module and check that the wheelchair is prevented from running.

If inhibit contacts 2, 3, 4 and 5 are used for inhibiting or speed restriction, an appropriate test should be performed in order to check that they are functioning as they should.

## 5. Repairing defective units

Apart from specific OEM-approved spare parts (contact Permobil for further information on these), there are no replaceable parts in the Rnet control system. Consequently, defective units must be sent to Permobil or a Permobil-approved repairer for repair.



If any part is replaced without Permobil's approval, the control system's warranty lapses.



Permobil cannot be held responsible for losses of any kind arising as a result of a component of the Rnet control system being opened, adjusted or modified without permission.

## Troubleshooting R-net

### Rnet diagnostics

When an error or a fault occurs in the wheelchair's electronics, information on it is displayed in the control panel's display. This information can then be used to diagnose where the error/fault occurred and its cause.

Troubleshooting and repairs must always be performed by competent personnel with good knowledge of the wheelchair's electronics. More information on troubleshooting and remedies can be found in the service manual for this wheelchair model.

### Diagnostic screens

#### Current diagnostic screen

When the control system's integrated protection circuits have been triggered so that the control system can no longer operate the wheelchair, a diagnostic screen is displayed in the control panel's display.

This indicates a system fault, i.e. Rnet has detected a problem somewhere in the wheelchair's electrical system.

**NB!** *If the fault is in a module that is not currently being used, it may still be possible to drive the wheelchair, but the diagnostic screen is displayed occasionally.*

Switch off the wheelchair and leave it off for a few minutes. Then restart the wheelchair. If the fault persists, you must switch off the wheelchair and get in touch with your service contact. Write down the information displayed in plain text in the control panel's display and pass it on to your service contact.

Do not use the wheelchair until the problem has been remedied or you have received other instructions from your service contact.

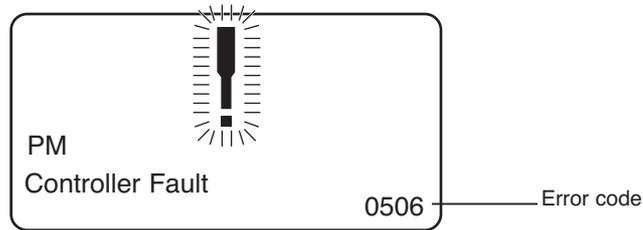


#### WARNING

Diagnostics should only be performed by persons with sound knowledge of the wheelchair's electronic control system. Incorrect or poorly performed repair works may make it dangerous to use the wheelchair. Permobil cannot be held responsible for any personal injury or damage to the wheelchair and its surroundings that occurs on account of incorrect or poorly performed repair work.

## Troubleshooting R-net

### Example of a screen showing a system fault



#### Identified module

This indicates the control system module that detected the problem.

**PM=** Power module

**JSM=** Joystick module

#### Error message

The error message provides a brief description of the error type.

#### Error code

The four-digit code indicates which protection circuit has been triggered.

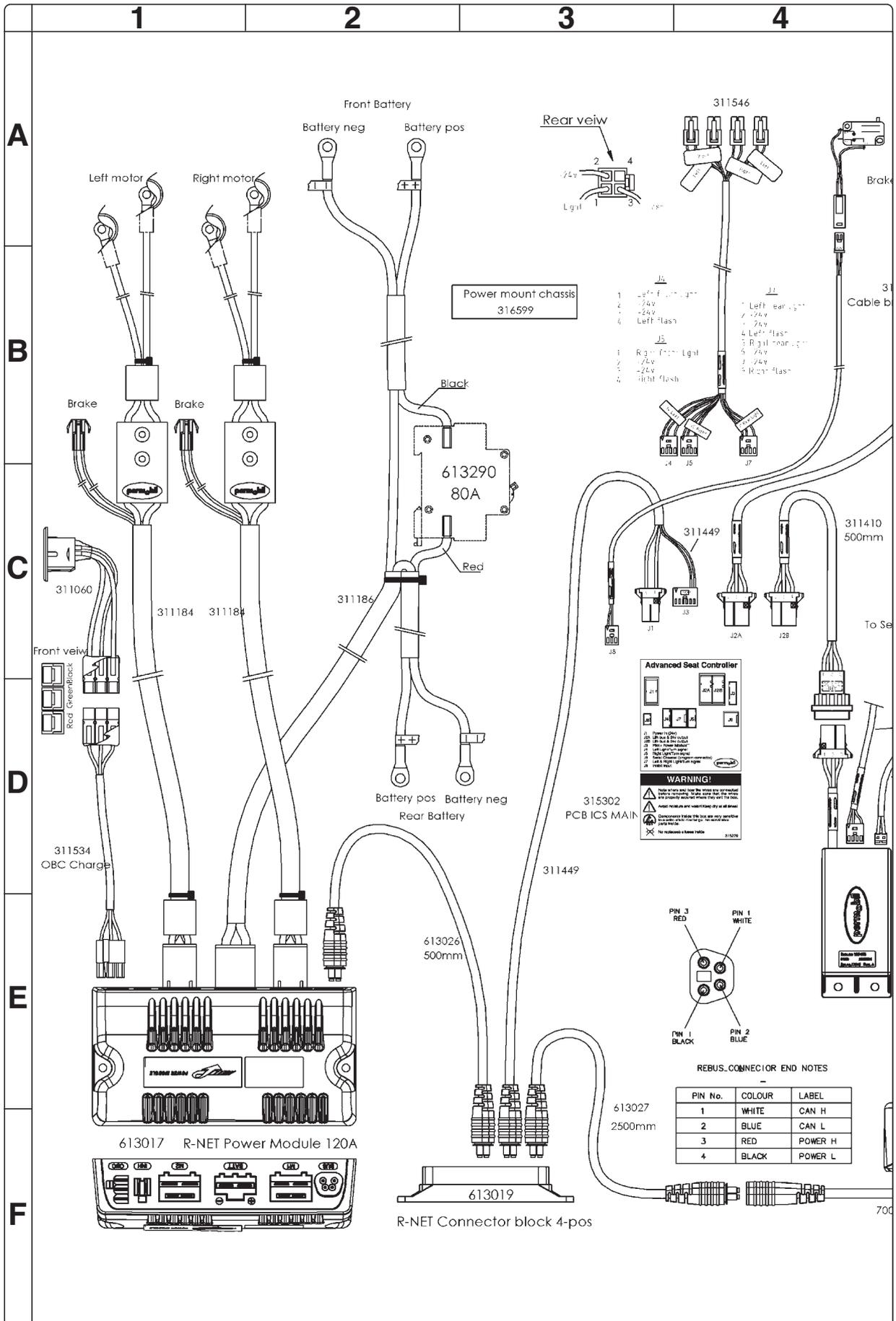
### Repair of defective units

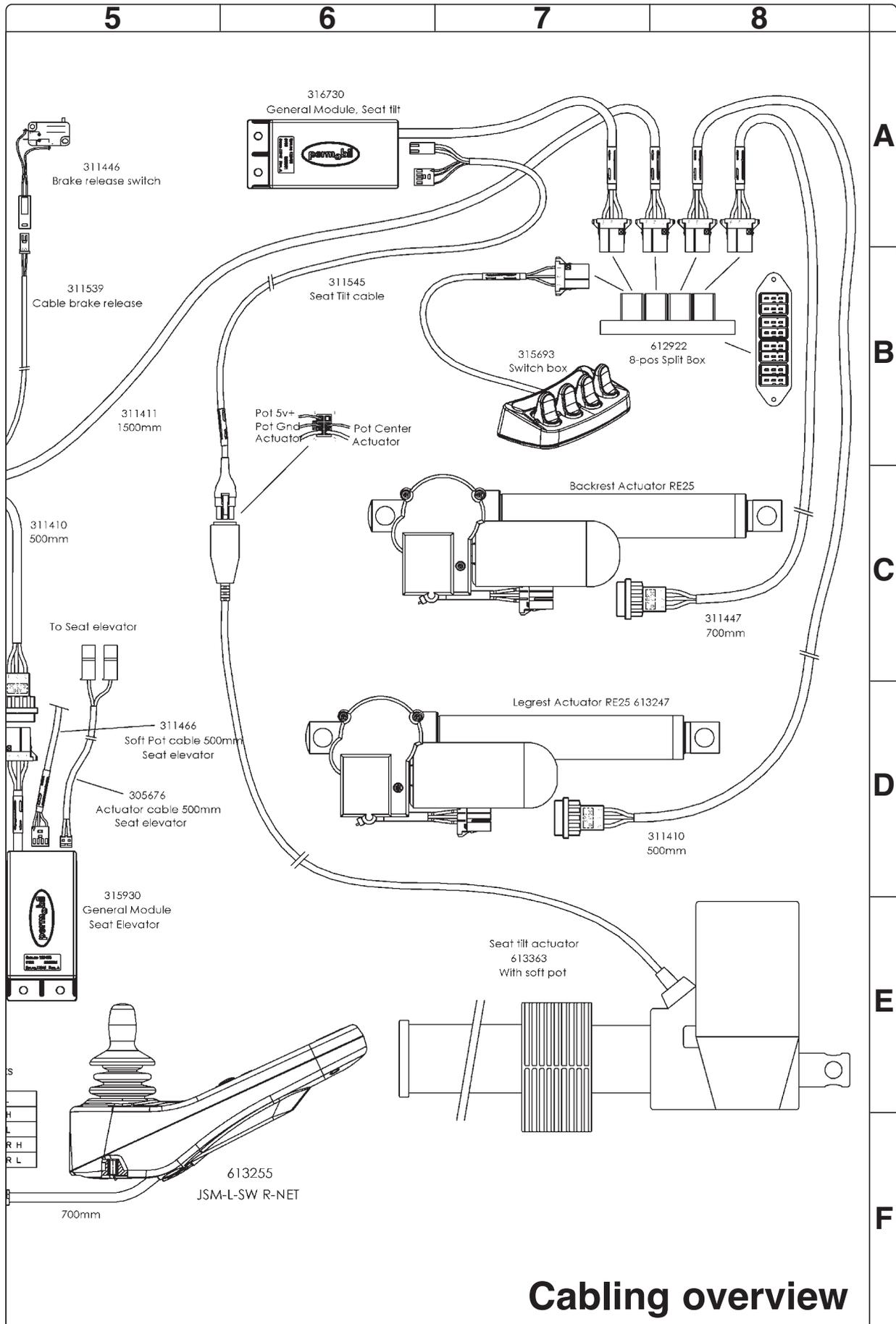
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# Cabling overview





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