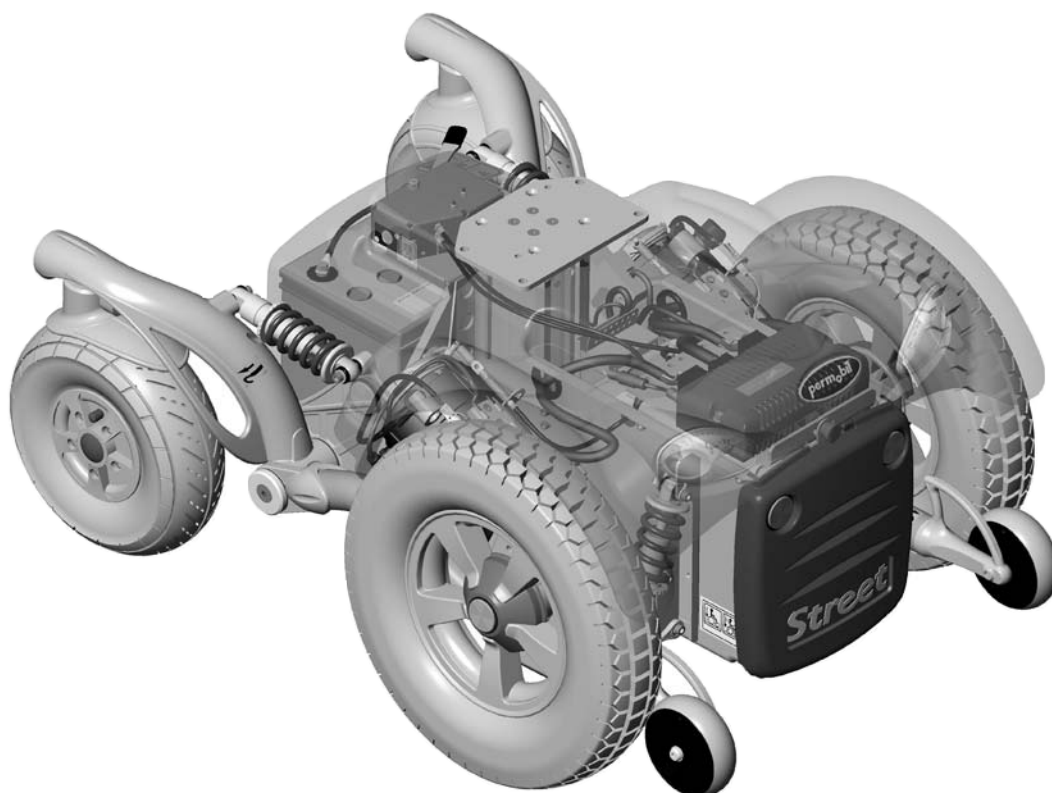


Street

Electric 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



Fig. 1. Chassis identification number.

Pilot+ controller

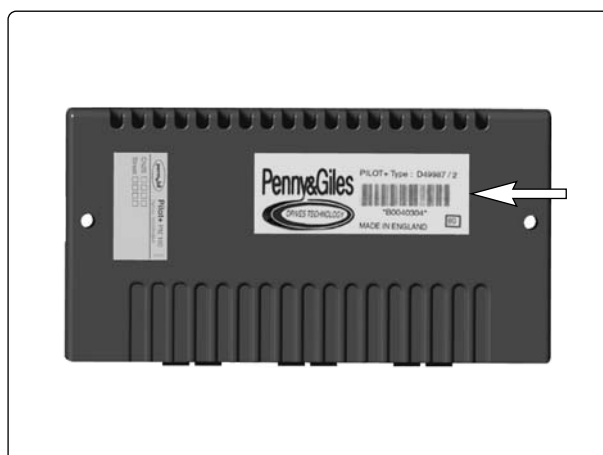


Fig. 2. Pilot+ controller identification number.

Control panel

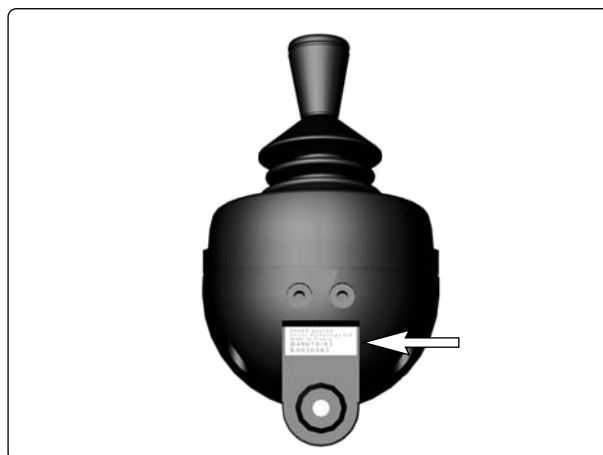


Fig. 3. Control panel identification number.

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 4.

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.

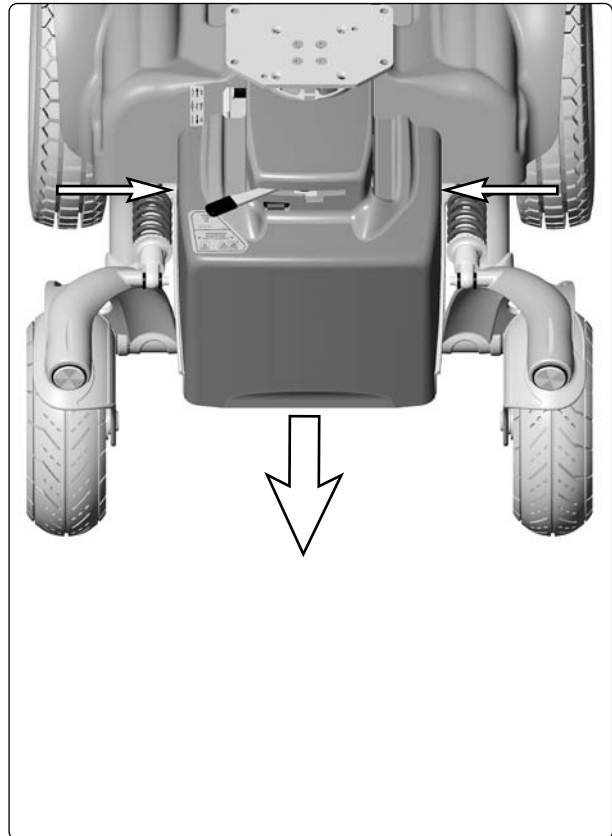


Fig. 4. Front cover attachment points.

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 5

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.

Fitting

Fitting is the reverse procedure.

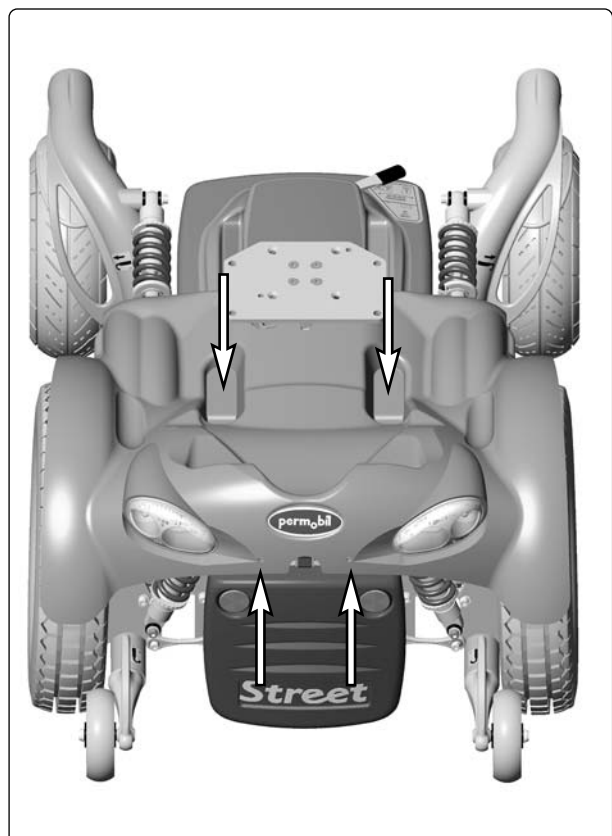


Fig. 5. Rear cover attachment points.

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 6.

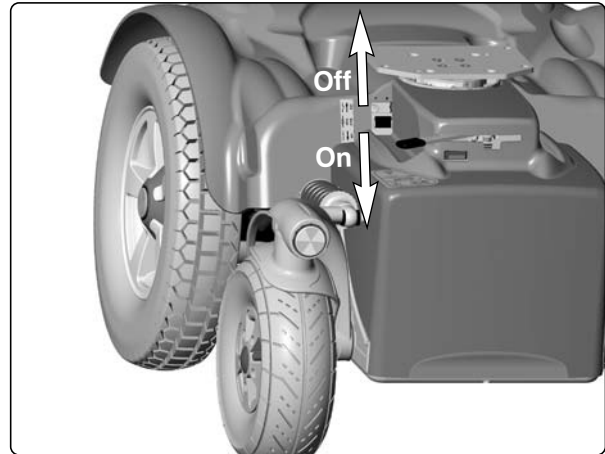


Fig. 6. Circuit breaker/Battery isolator.

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 7.

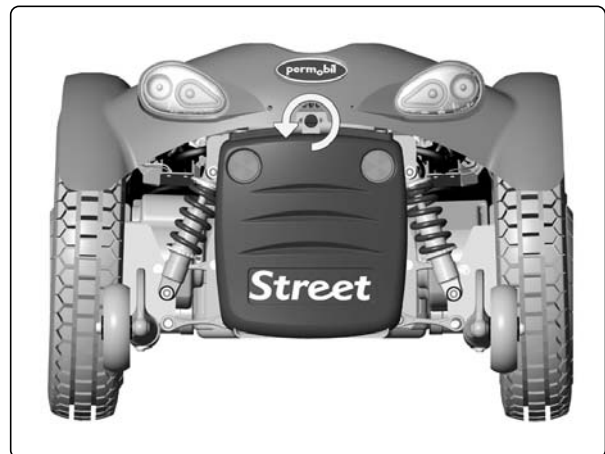


Fig. 7. Battery cover locking knob.

4. Pull the battery straight out using the battery belt; see figure 8.
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 7.
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 6.



Fig. 8. Rear battery connection.

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 6.
3. Remove the front chassis cover; see page 7.
4. Disconnect the battery connectors. See the decal on the inside of the chassis cover.

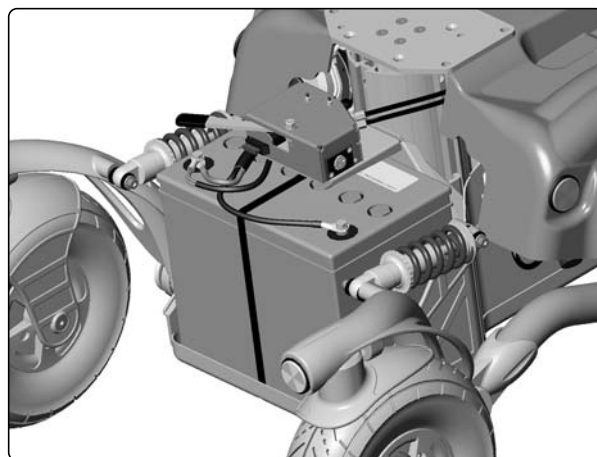


Fig. 9. Front battery connection.

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 10.

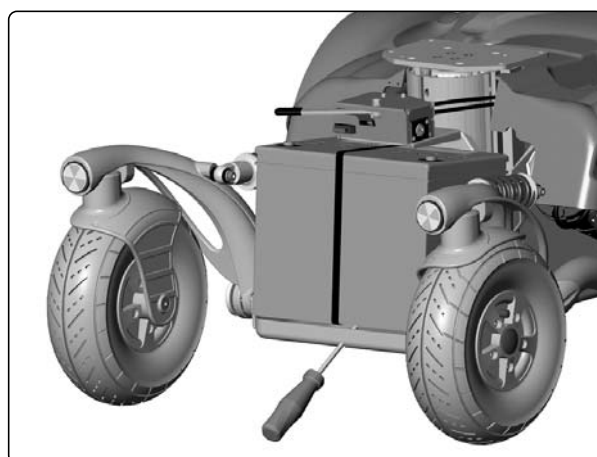


Fig. 10. With a screwdriver through the hole in the front edge of the chassis to facilitate removal, the battery can be lifted.

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 6.

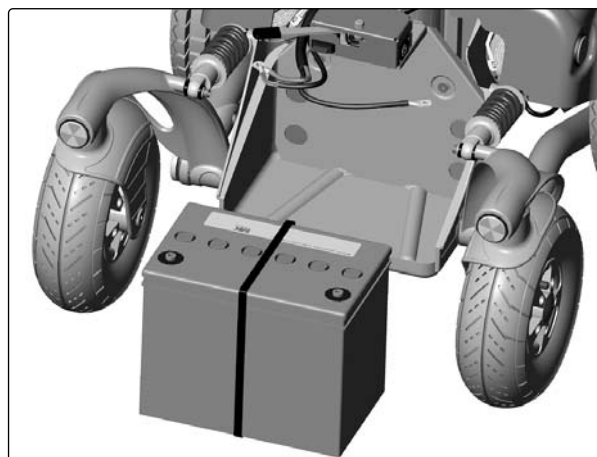


Fig. 11. Front battery removed.

Rear 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 the three washers (3 and 4); see figure 13.
4. Pull the wheel off the shaft. Use puller 304103-99-0 if the wheel is tight; see figure 12.

Fitting

1. Check that the wheel shaft and rim are undamaged. Clean as necessary to remove dirt and rust. Replace damaged parts.
2. Check that the key is firmly attached and undamaged; fit a new key if necessary.
3. Lubricate the shaft with a thin layer of copper paste (Würth 0893800x, Art. no.: 1820540).



WARNING

Do not use any type of lubrication in the threaded hole in the axle or on the bolt.

4. Fit the wheel onto the axle. The use of hand force only is preferred, but, if need be, carefully use a rubber mallet, whose head diameter is no less than 1.5 inches (38 mm), to ensure that the rim is fully seated upon the motor.



NOTE

Hitting too hard with a rubber mallet could cause damage to the gear.

5. Mount the three washers (3) and 4) onto the bolt (2) and secure the wheel. **Use a torque wrench to tighten the bolt to 24 ft-lbs (33Nm).** Install the hub cap (1). See Fig. 13.



NOTE

The washer (4) should be placed with the most flat side inwards.



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

Do not use any other type of thread lock.

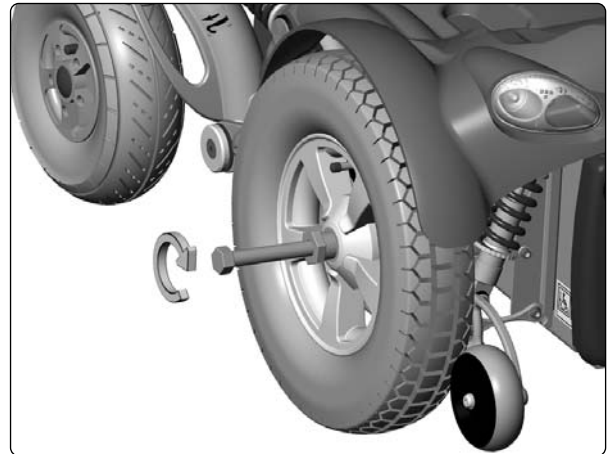


Fig. 12. Puller 304103-99-0.

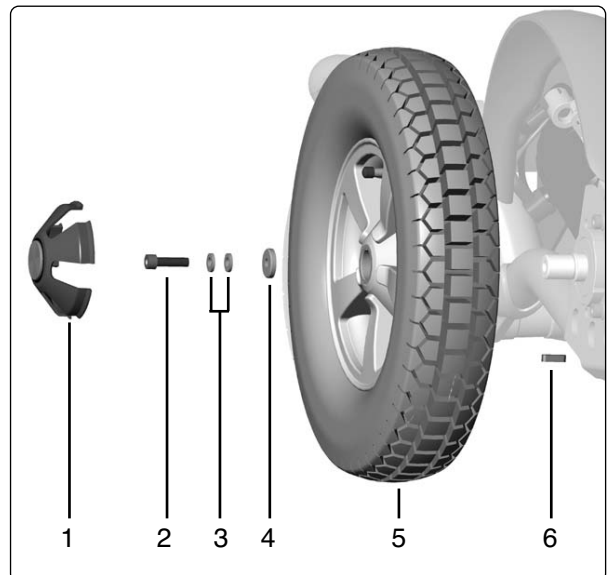


Fig. 13. Fitting of rim.

Pos.	Description
1	Hubcap
2	Bolt, ISO 4762 M8x25 10.9 Fe/Zn 5 C2 / Locking coat DIN 267-28
3	Shim washer DIN 988 8 A2 (DB 8x14x0.5 Stainless)
4	Washer, 8 HB 305 Fe/Zn 5 C2 (TBR SB 8,4x26x5)
5	Rear wheel
6	Key DIN 6885A 6x6x22

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 15.

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. 15.



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.

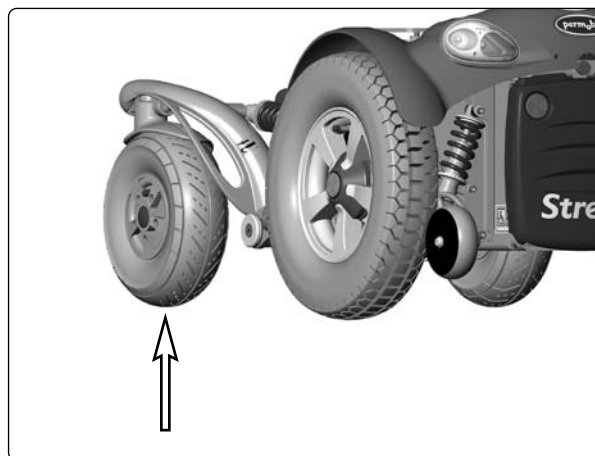


Fig. 14. Front wheel

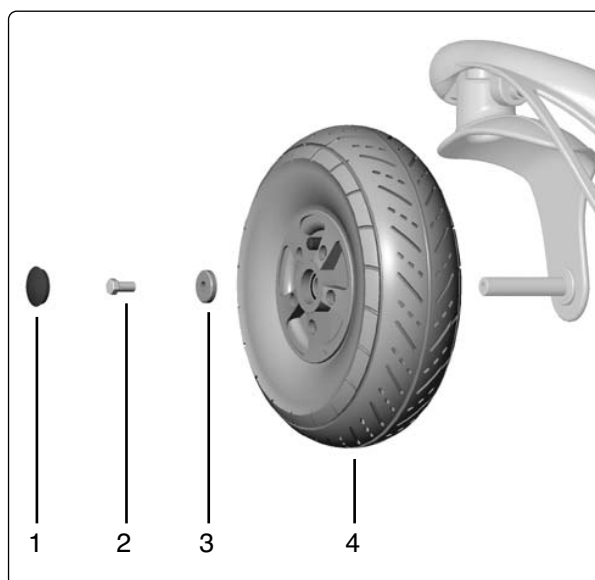


Fig. 15. Fitting of rim.

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 TBR5B 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

Support wheels

Removal

1. Turn off the main power switch on the control panel.
2. Remove the bolt; see figure 16.

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.

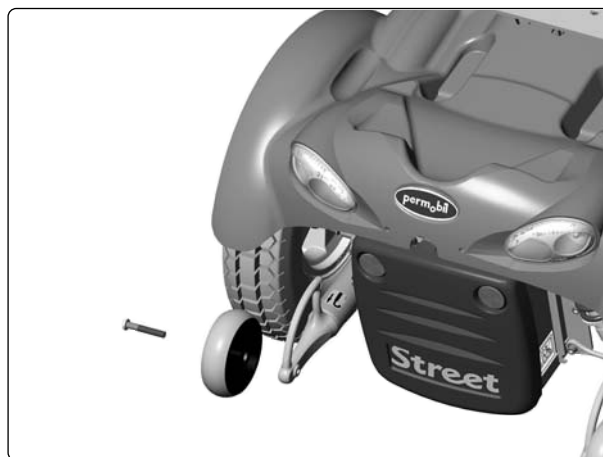


Fig. 16. The support wheels are fitted with one bolt each.

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 figures 17 and 19.

Fitting

Fitting is the reverse procedure. Adjust the shock absorber spring before fitting, see page 14-15.

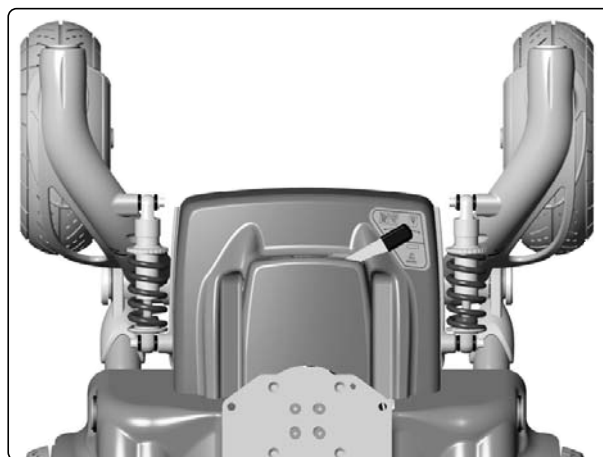


Fig. 17. Front shock absorber.

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 figures 18 and 19.

Fitting

Fitting is the reverse procedure. Adjust the shock absorber spring before fitting, see page 14-15.



Fig. 18. Rear shock absorber.

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

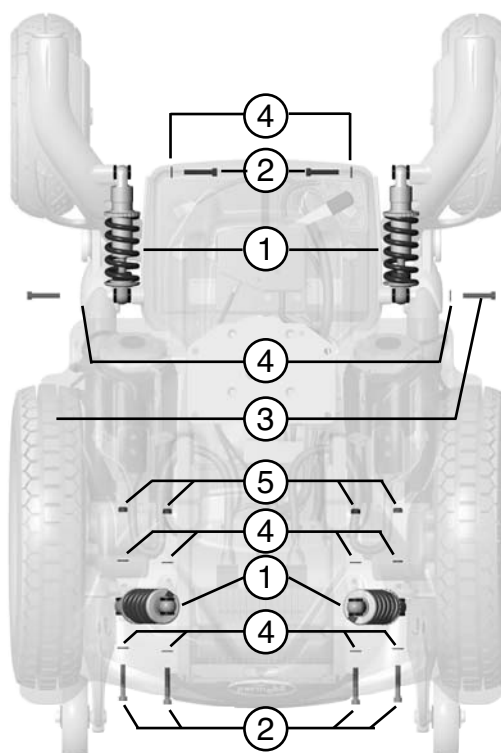
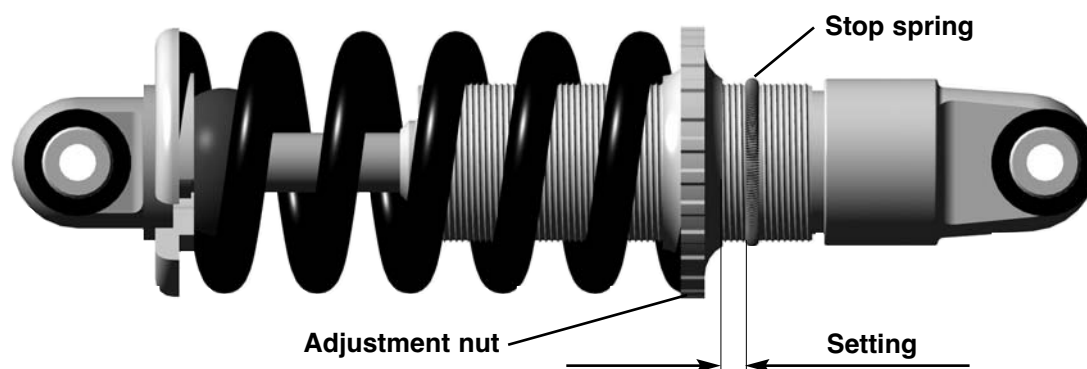


Fig. 19. Shock absorber attachment to chassis.

Adjustment of the DNM Shock absorber

Before a new shock absorber is fitted, its spring force shall be adjusted to the correct value; see figure 20.

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 stop spring is in the right position.

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

Adjustment of DNM shock absorber springs

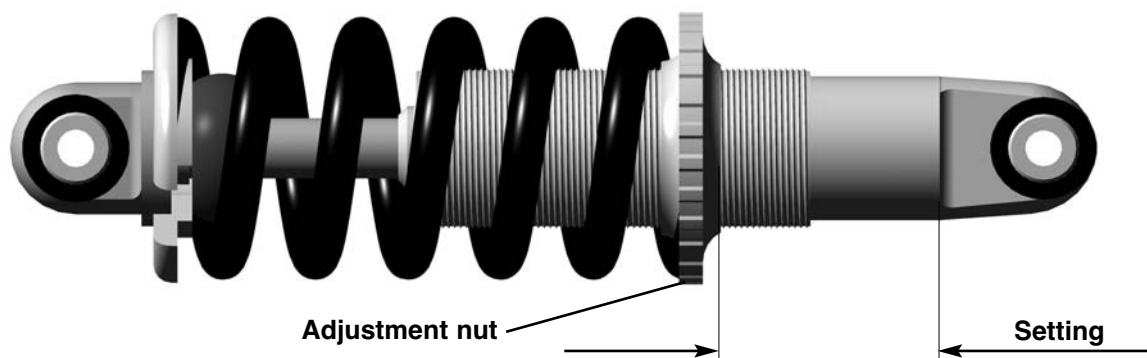
Passenger weights	Setting, Front	Setting, Rear
0 - 155 lb.	0 inch	0 inch
155 - 220 lb.	0 - 1/8 inch	0 inch
220 - 264 lb.	1/8 - 3/16 inch	0 inch

Fig. 20. Adjustment of the DNM shock absorber springs.

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 21.

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

Fig. 21. 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.

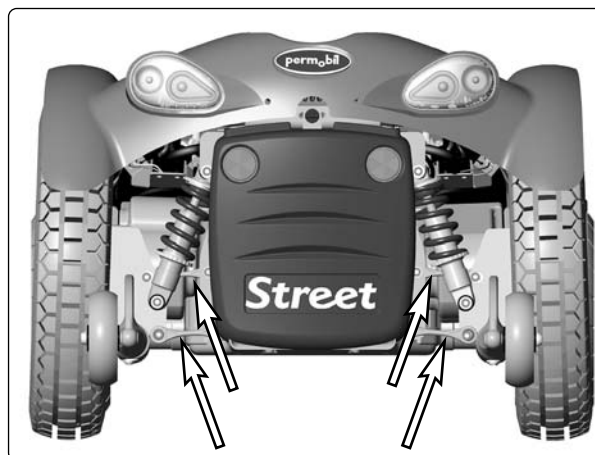


Fig. 22. Four tie rods are mounted on the wheelchair's rear suspension.

4. Remove the appropriate tie rod. The tie rods are attached with two bolts each; see figures 23 and 24.

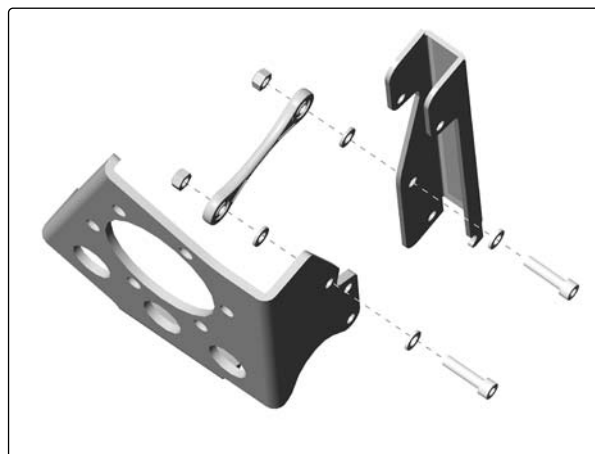


Fig. 23. Upper tie rod attachment between the chassis and slewing bracket attachment points.

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

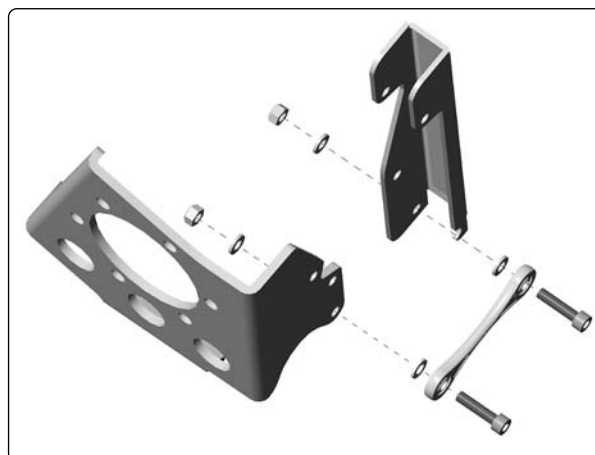


Fig. 24. Lower tie rod attachment between the chassis and slewing bracket attachment points.

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 figures 25 and 26.

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).

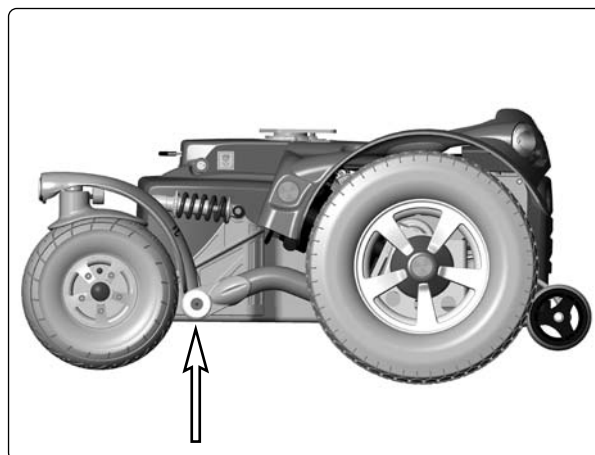


Fig. 25. Front and rear slewing bracket attachment.

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

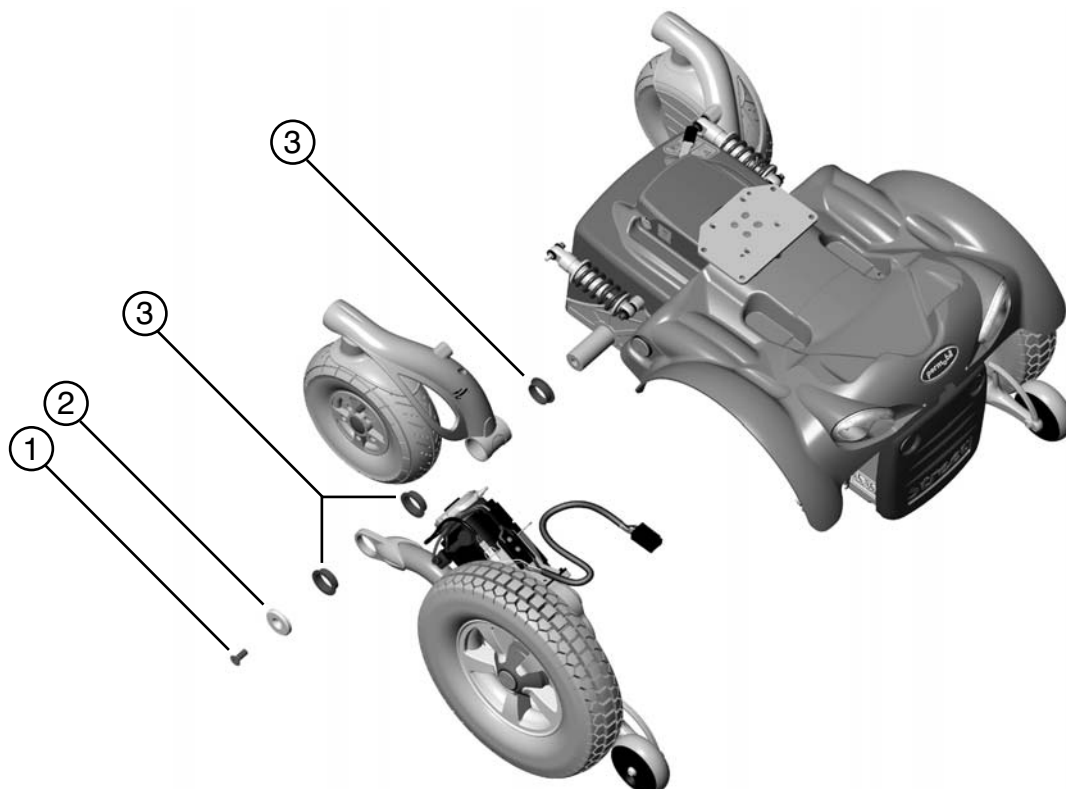


Fig. 26. Removal/fitting of slewing brackets.

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 27.

Fitting

Fitting is the reverse procedure.

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

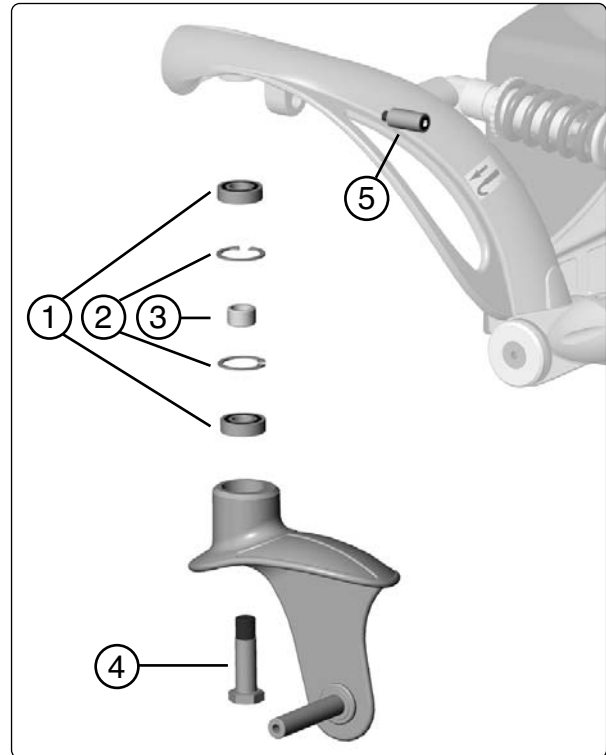


Fig. 27. Wheel fork with friction brake.

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 28.

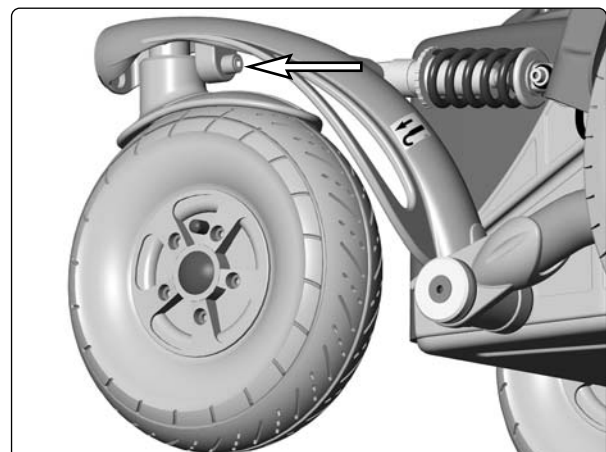


Fig. 28. Adjusting the friction brake's bearing pressure.

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 from the top of the slewing bracket; see figure 29.1.
4. Remove the wheel fork. It is attached with a bolt from above; see figure 29.2.

Fitting

Fitting is the reverse procedure.

Assemble the o-ring on the friction plate, see figure 30.



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).

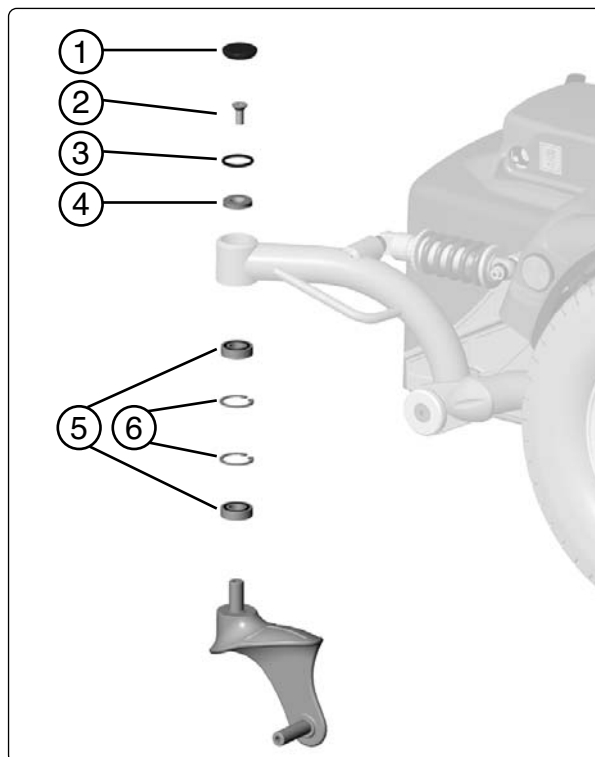


Fig. 29. Wheel fork with friction brake.

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

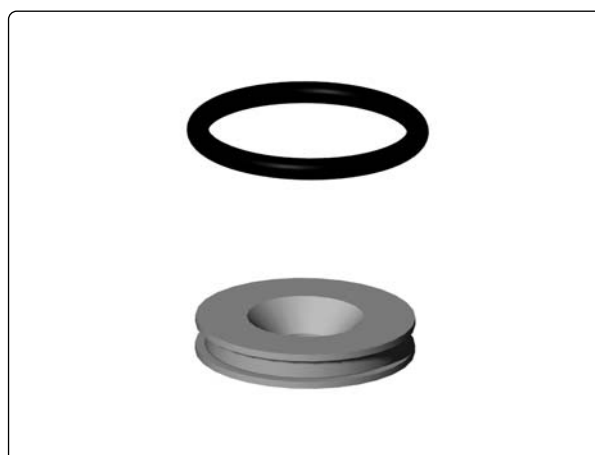


Fig. 30. Fitt the o-ring on the friction plate.

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 31.

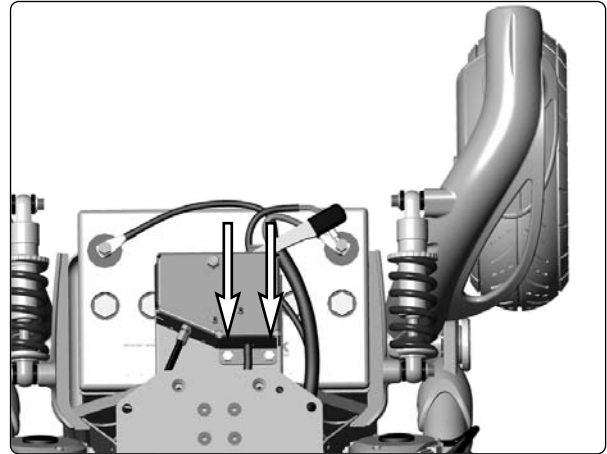


Fig. 31. The wheel lock release mechanism is attached with two screws.

5. Remove the lock nut (32.1).
6. Screw in the adjusting screw (32.2) fully.

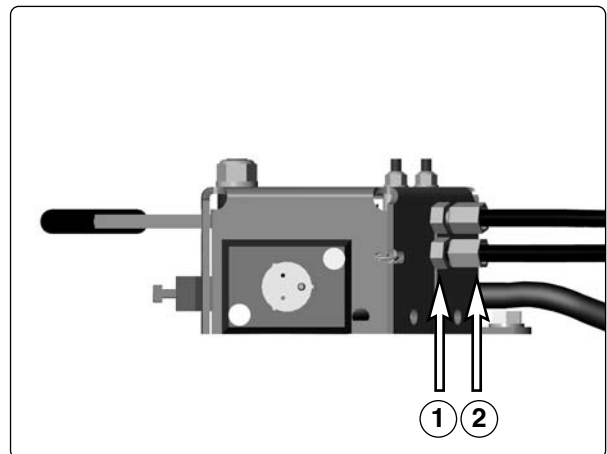


Fig. 32. Adjustment of wheel lock release cable. Lock nut (1) Adjusting screw (2).

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.

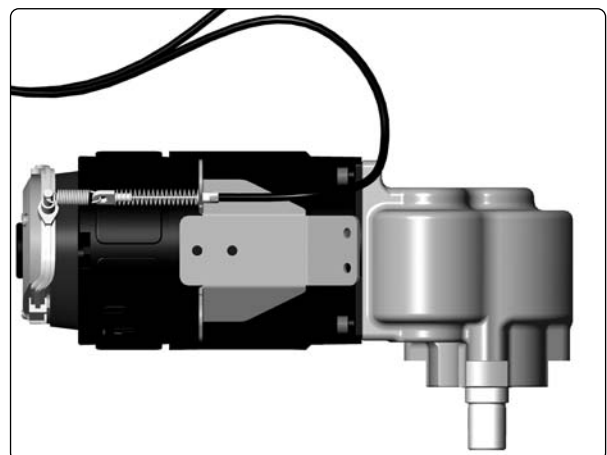


Fig. 33. Wheel lock release cable attachment at the magnetic wheel lock.

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 (32.2) so that the cable is sufficiently tensioned so that the wheel lock release sensor (figure 34) 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 (32.1).
6. Refit the wheel lock release mechanism and the chassis covers.

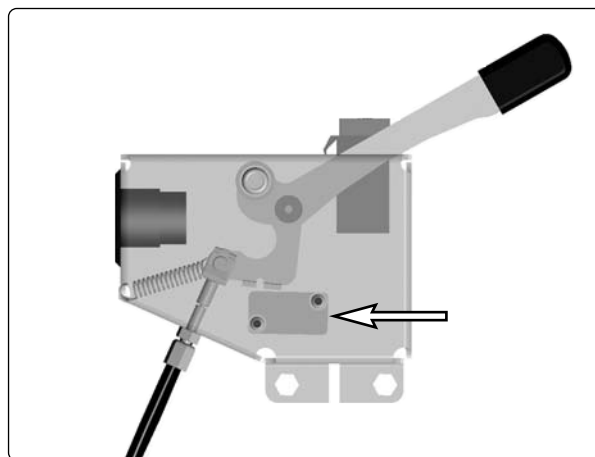


Fig. 34. Wheel lock release sensor.

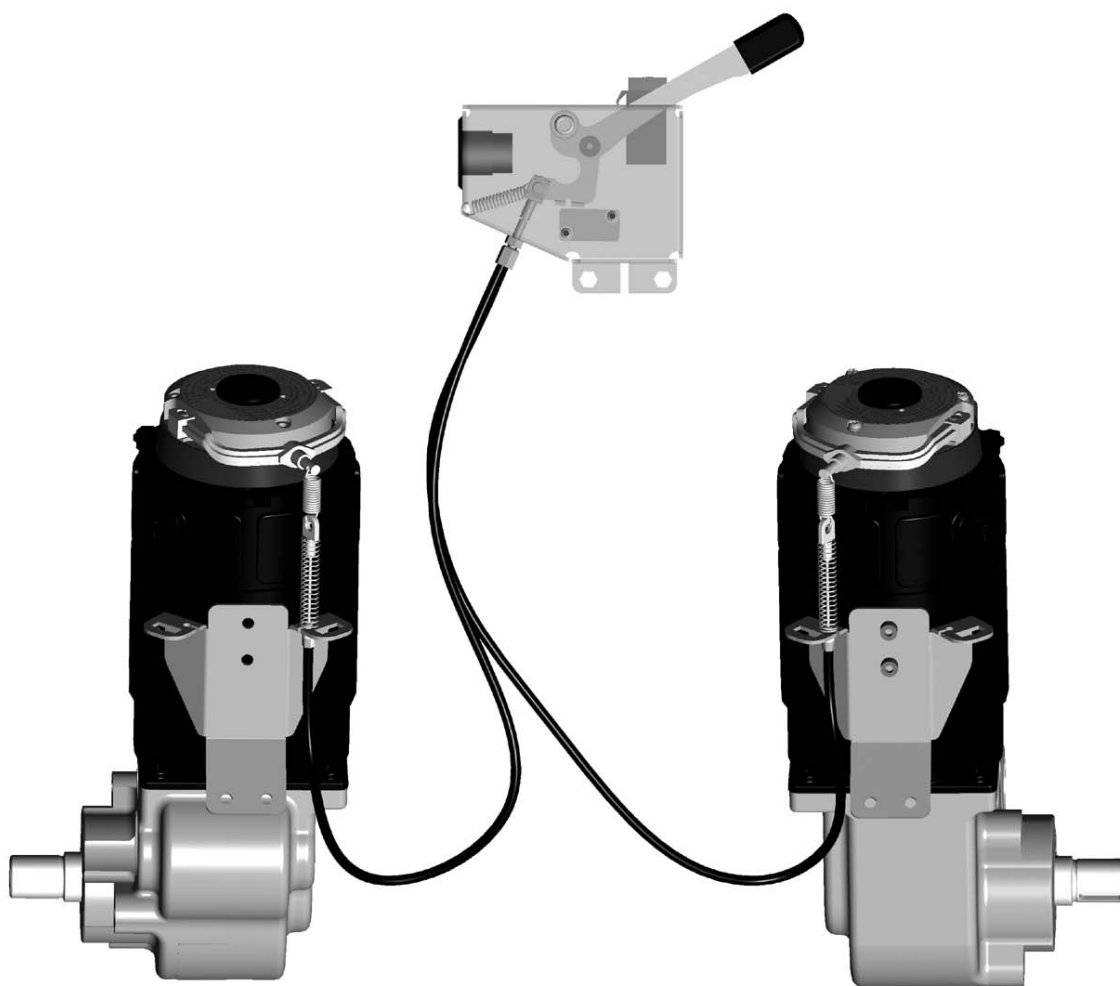


Fig. 35. Mechanism for wheel lock release.

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.

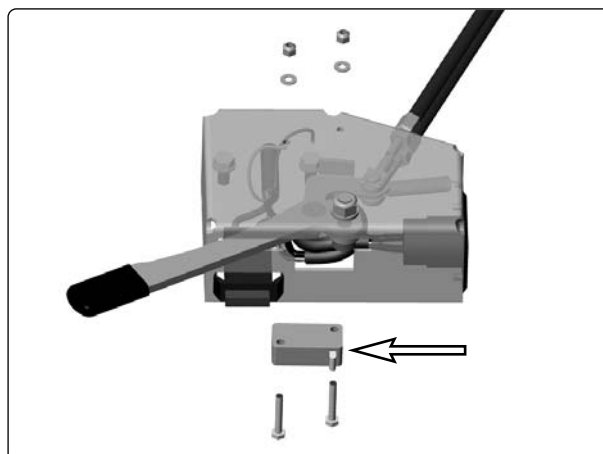


Fig. 36. Wheel lock release sensor.

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 37.

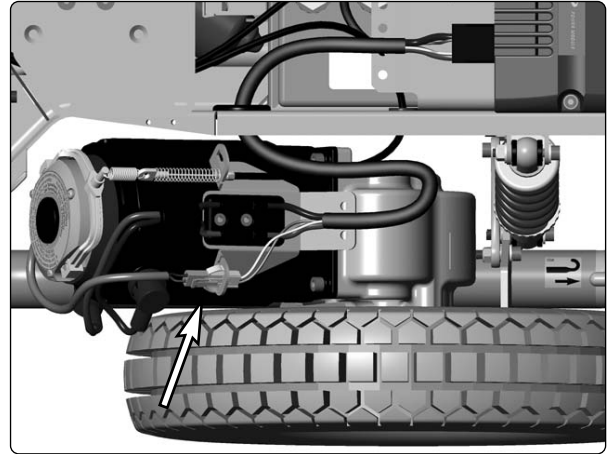


Fig. 37. Magnetic wheel lock electrical connection.

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 38.

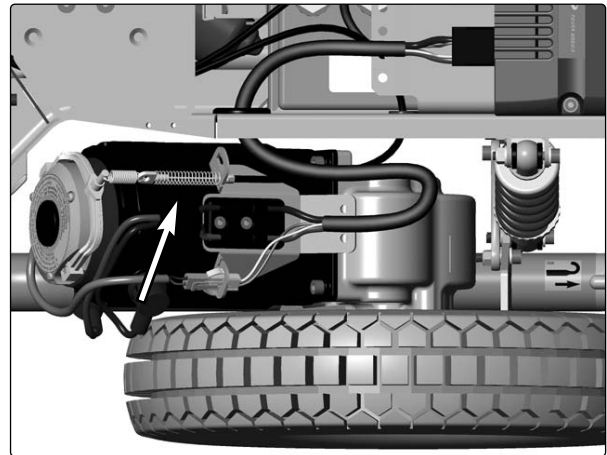


Fig. 38. Remove the wheel lock release cable.

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.

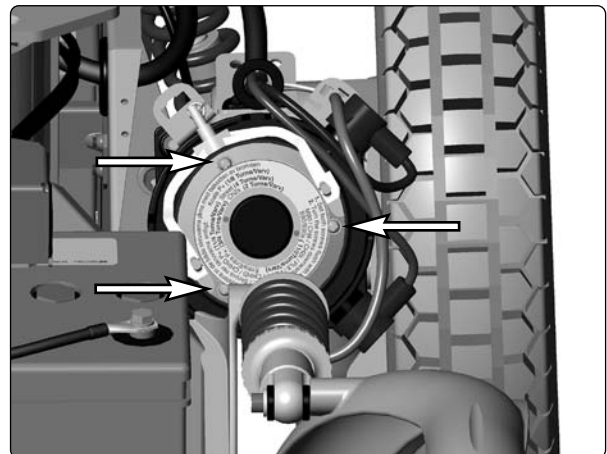


Fig. 39. Remove the magnetic wheel lock.

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 40.



Fig. 40. Wheel lock adjustment is made using the two adjusting screws.

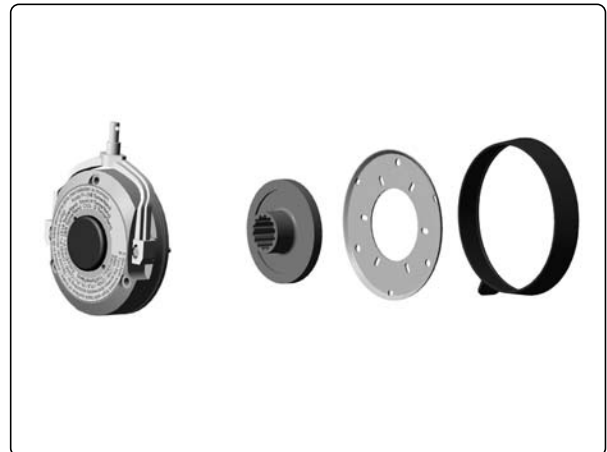


Fig. 41. Magnetic wheel lock, wheel lock disk, cover and rubber seal disassembled.

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

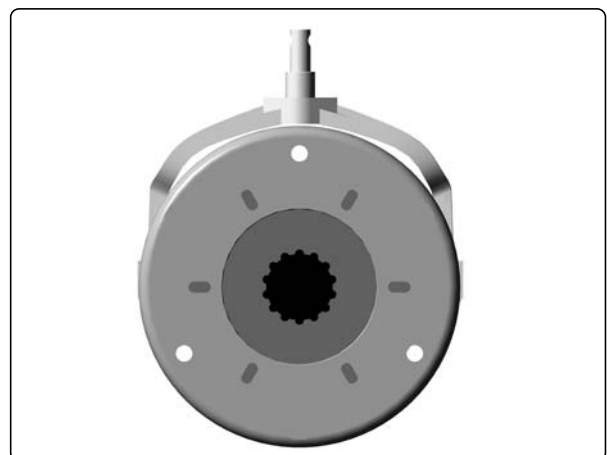
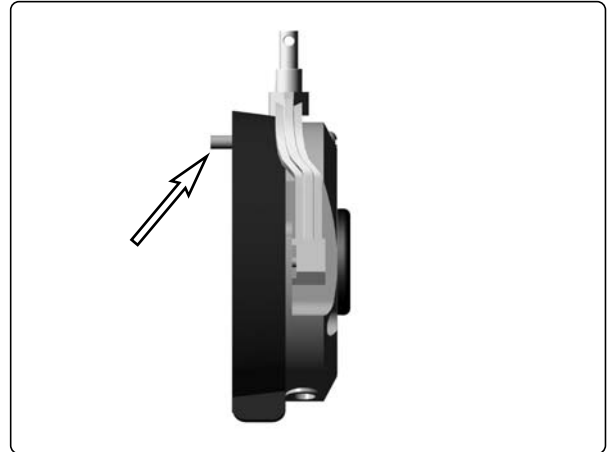


Fig. 42. Magnetic wheel lock, wheel lock disk and cover assembled.

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.



*Fig. 43. 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 44.

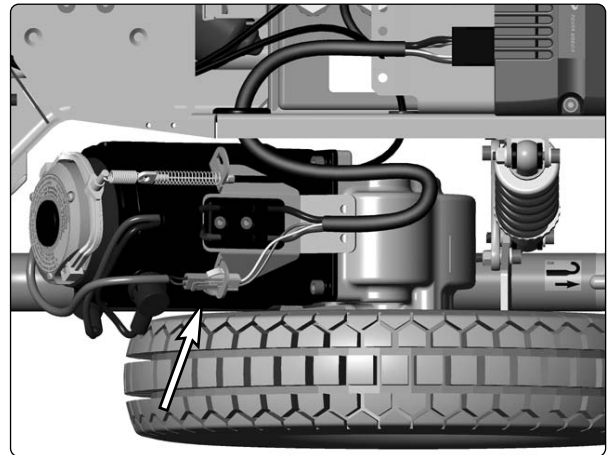


Fig. 44. Magnetic wheel lock electrical connection.

6. Fit the wheel lock release cable; see figure 45.
7. Fit the covers; see page 7.

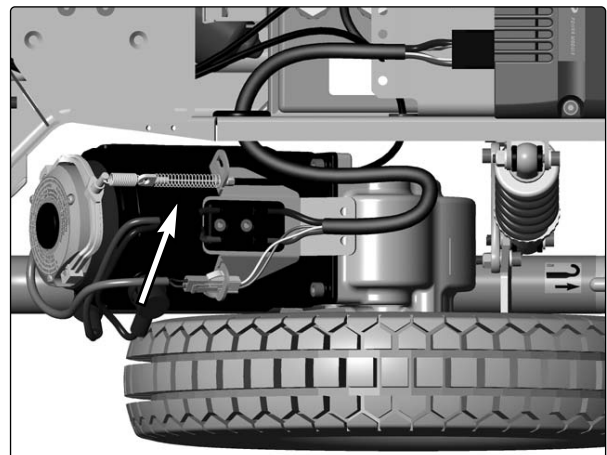


Fig. 45. Fit the wheel lock release cable.

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 46.
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.

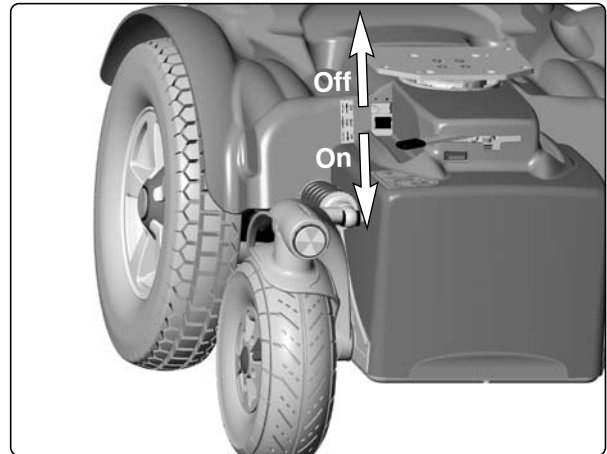


Fig. 46. Circuit breaker/Battery isolator.

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

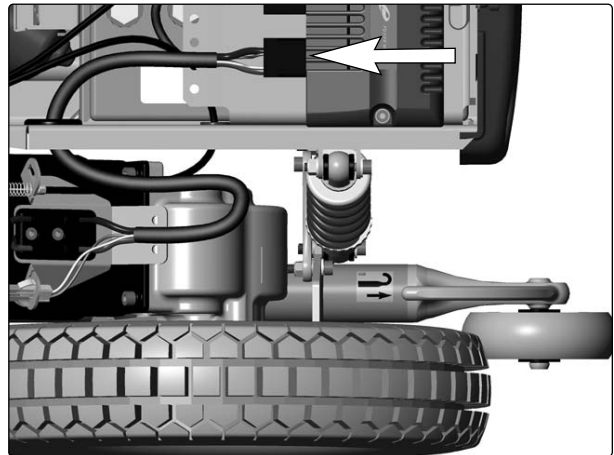


Fig. 47. Magnetic wheel lock and drive motor electrical connection.

7. Remove the rubber ring from the cable pass-through hole; see figure 48.
8. Pull the drive motor's connection cable out through the chassis cable pass-through; see figure 48.

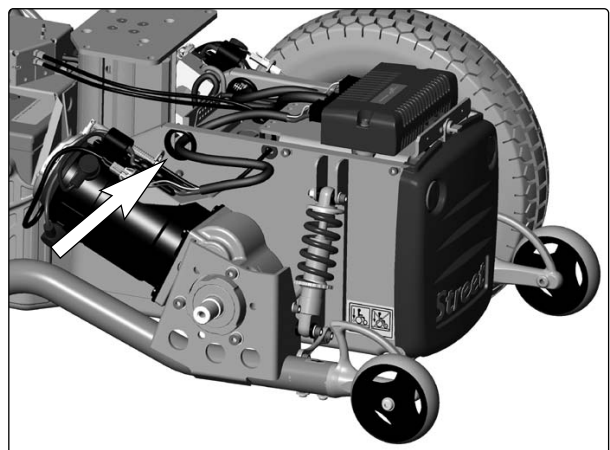


Fig. 48. Cable pass-through.

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 49.

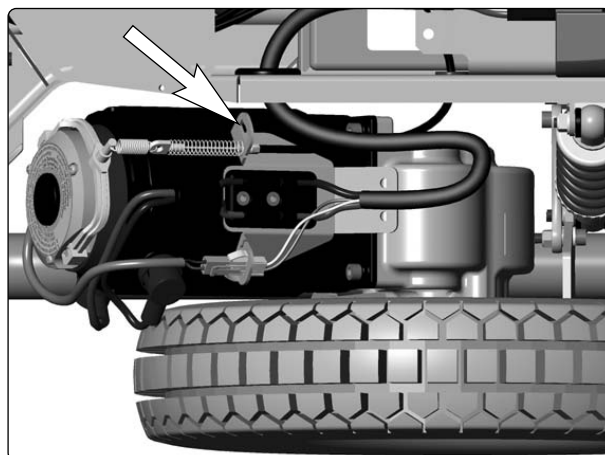


Fig. 49. Wheel lock release cable attachment.

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.

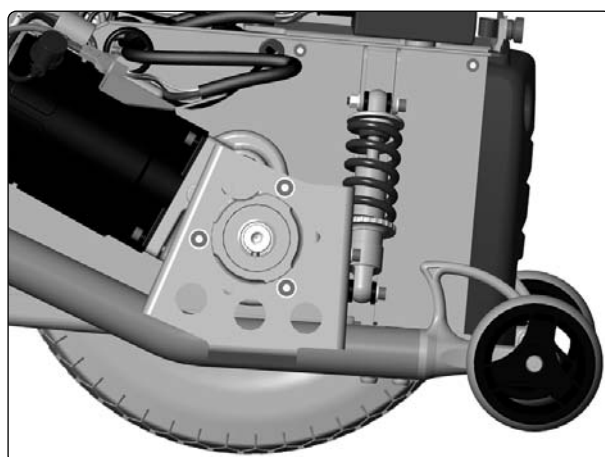


Fig. 50. Drive motor mounting screws.

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 51.
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.

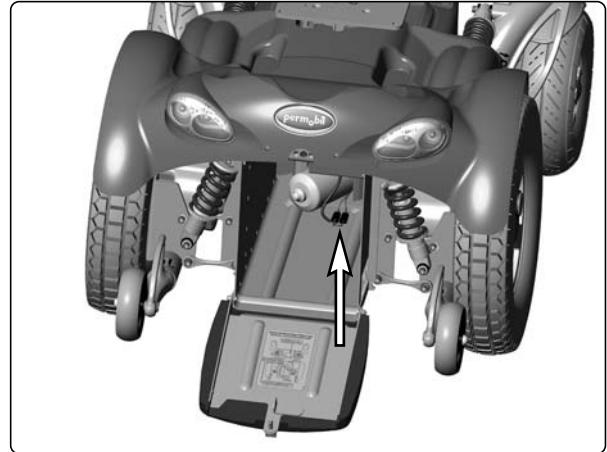


Fig. 51. Seat elevator cabling.

Removal of seat

Chair with seat tilt

1. Put the circuit breaker in the "OFF" position; see figure 53.
2. Remove the two screws that hold the tilt mechanism's upper part at the front edge; see figure 52.1.
3. Remove the two screws that hold the tilt mechanism's upper part at the rear edge; see figure 52.2.
4. Lift off the seat with the tilt mechanism's upper part 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.

5. Remove the part of the seat tilt mechanism that remains on the seat elevator/seat column. It is attached with four screws; see figure 52.3.

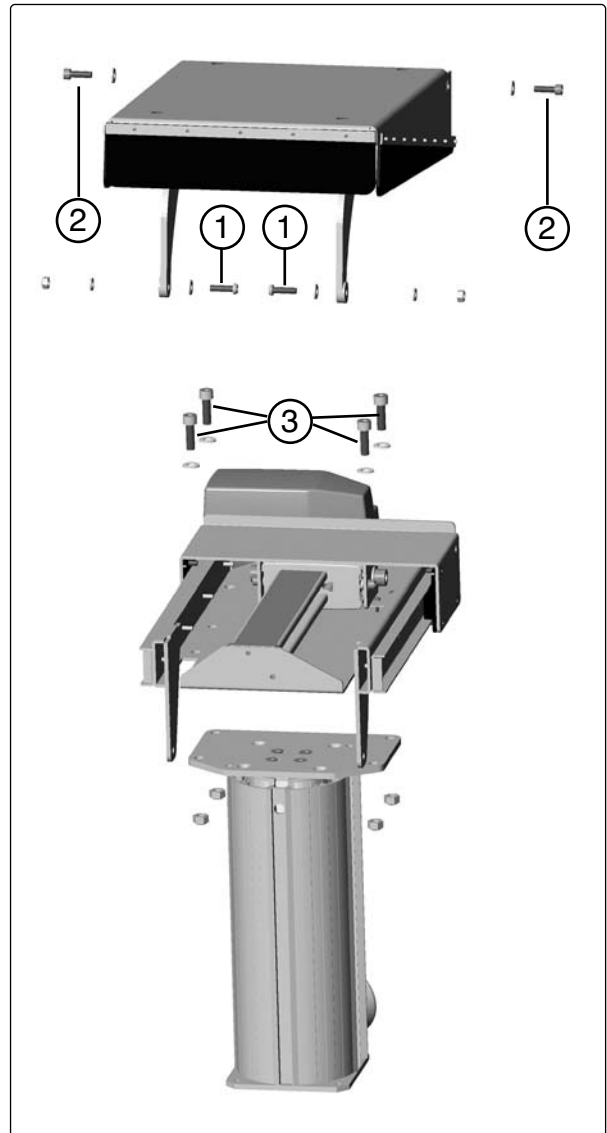


Fig. 52. Seat elevator and seat tilt mechanism.

Chair without seat tilt

1. Put the circuit breaker in the “OFF” position; see figure 53.

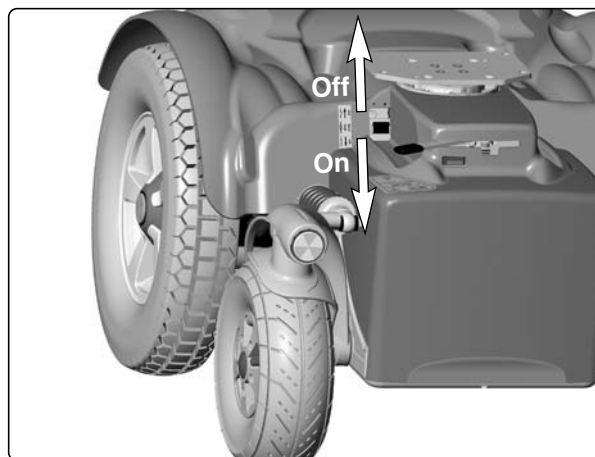


Fig. 53. Circuit breaker/Battery isolator.

2. Remove the four screws on the seat frame bottom that secure the seat frame's lower section; see figure 54.1.
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 54.2.

Fitting

Fitting is the reverse procedure.

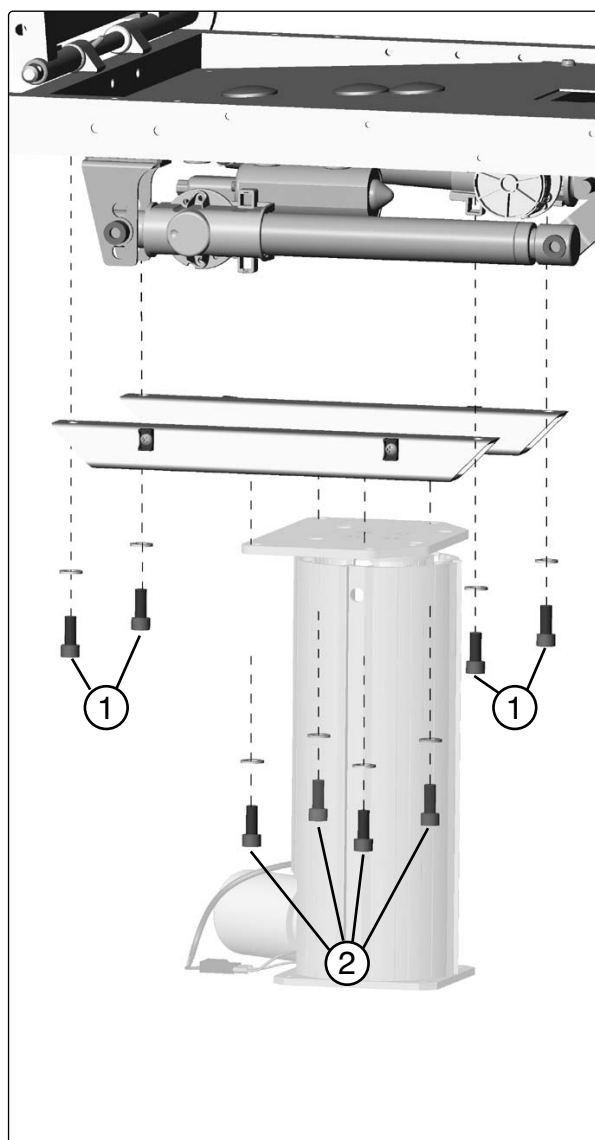


Fig. 54. Seat elevator and seat frame.

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 55.
4. Remove the cabling from the SLS circuit board. See page 34 for complete information on removing the SLS circuit board.

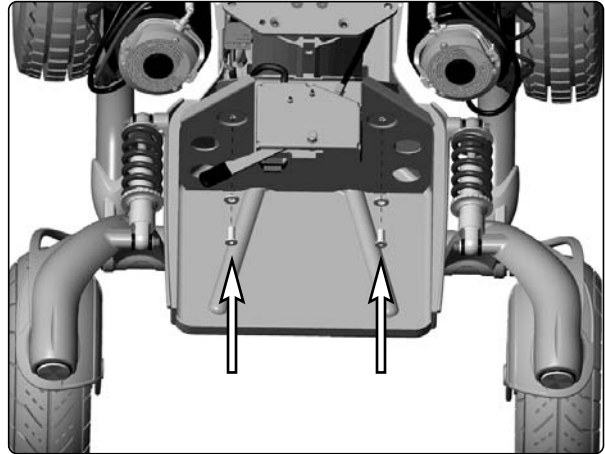


Fig. 55. Seat elevator's upper attachment screws.

5. Remove the seat elevator's four lower attachment screws on the bottom of the chassis; see figure 56.
6. By angling the seat elevator while lifting it, it can be removed without removing the bracket for the SLS drive stage

Fitting

Fitting is the reverse procedure.

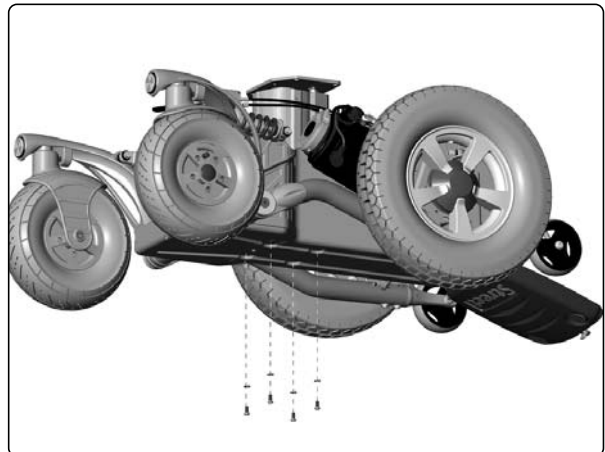


Fig. 56. Seat elevator's lower attachment screws.

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.

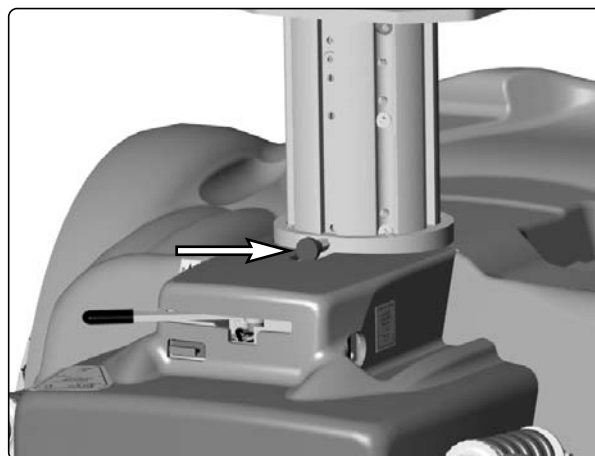


Figure 57. The catch that locks the seat post's height position.

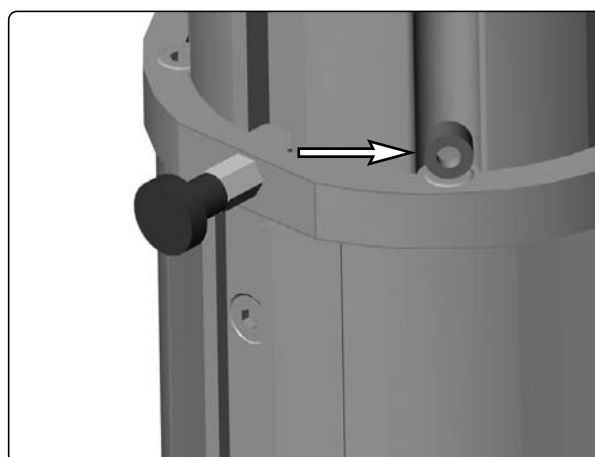


Figure 58. If the wheelchair is transported with the seat post in the service position, the position of the seat post must be secured with a screw (M5).

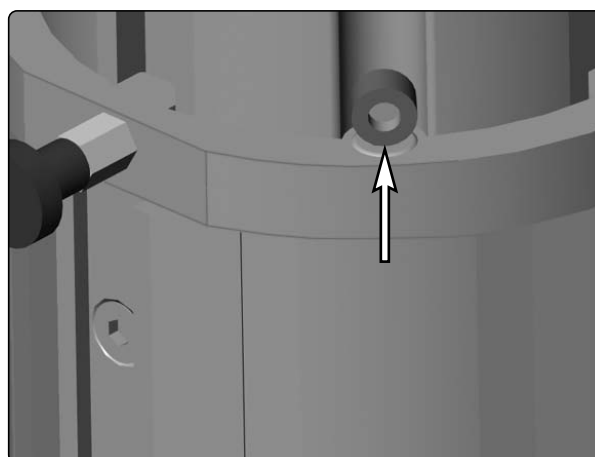


Figure 59. Lower the seat to its normal height. Ensure that the head of the securing screw is in contact with the outer tube of the seat post.

Control panel

Removal

1. Switch off the main power switch on the control panel.
2. Put the circuit breaker in the "OFF" position, see page 35.
3. Disconnect the control panel cable by pulling the connector at the rear of the control panel straight backwards.
4. To remove the control panel, remove the screws holding the common bracket for the control panel and Seat control panel, see fig. 60. Remove the control panel bracket by removing the two screws on the rear of the control panel, see fig. 61.

Fitting

Fitting is the reverse procedure.

Seat control panel

Removal

1. Switch off the main power switch on the control panel.
2. Put the circuit breaker in the "OFF" position, see page 35.
3. Remove the cover of the Seat control panel by pulling it straight upwards. If the lid is stuck, you can carefully use a screwdriver to pry between the lid and the lower part of the end of the box, see fig. 62.
4. You can now lift the circuit board and cable out of the box.
5. Disconnect the cable from the circuit board by pulling the connector straight upwards, see fig. 63.
6. To remove the control panel, remove the screws holding the common bracket for the control panel and Seat control panel, see fig. 60. Remove the Seat control panel bracket by removing the two screws on the underside of the box, see fig. 61. Note the position of the bracket for refitting.

Fitting

Fitting is the reverse procedure.



Fig. 60 The Control panel and Seat control panel bracket.



Fig. 61 The Control panel and Seat control panel fixings.



Fig. 62. Removing the Seat control panel lid.

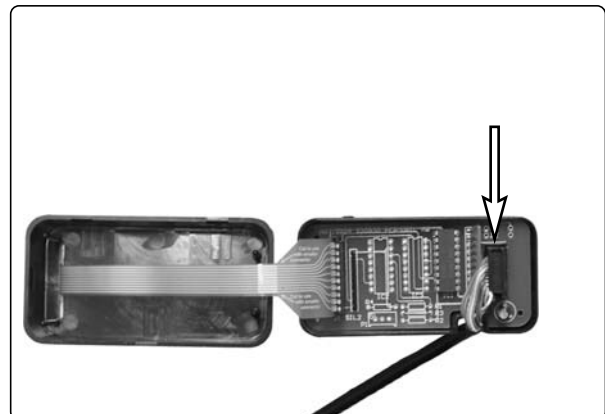


Fig. 63. The Seat control panel electrical connector.

Pilot+ controller

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. Disconnect the electrical connections to the pilot+ controller, being attentive to their placement: see figure 64.



NOTE

The Pilot+ controller connectors A and E have the same function. Cabling from SLS circuit board and control panel can therefore be switched if desired.

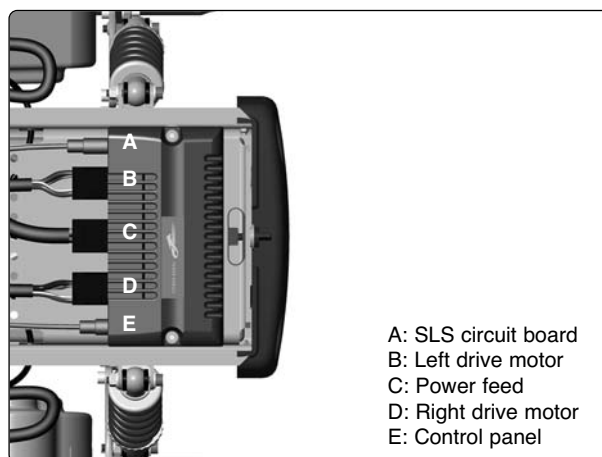


Fig. 64. Pilot+ controller cable connections.

5. Remove the Pilot+ controller by removing its two attachment screws; see figure 65.

Fitting

Fitting is the reverse procedure.

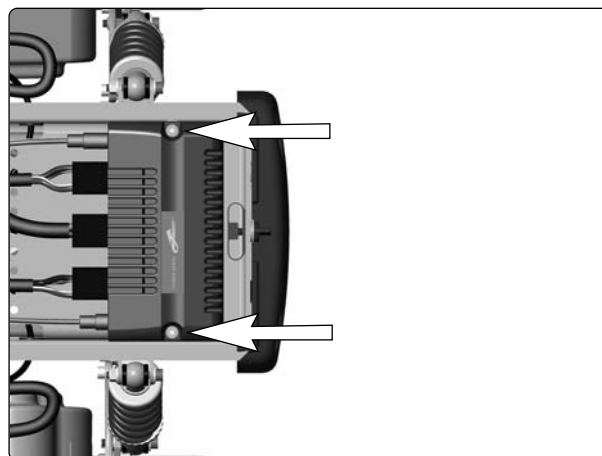


Fig. 65. The Pilot+ controller is attached with two screws.

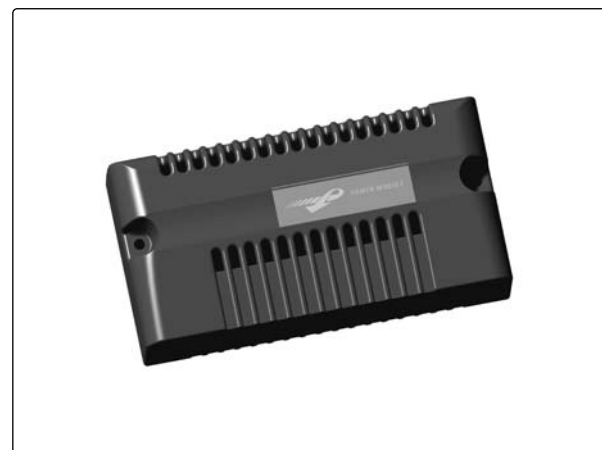


Fig. 66. Pilot+ controller

SLS Drive stage

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.

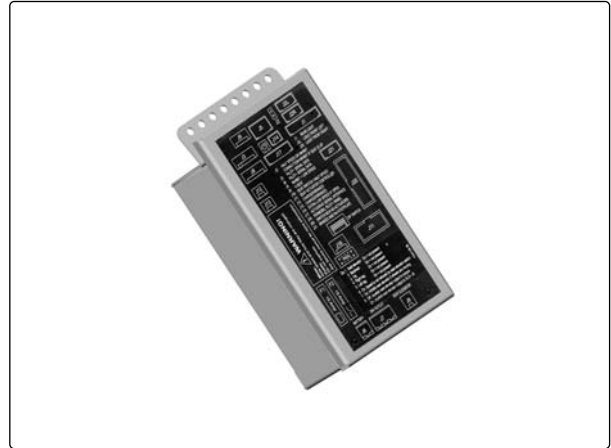


Fig. 67. SLS Drive stage.

4. Lift the SLS Drive stage straight up from its holder; see figure 68.
5. Remove the lid from the drive stage.
6. Clip the cable ties that hold the cables and its electrical connections, being attentive to their placement to facilitate subsequent refitting.

Fitting

Fitting is the reverse procedure.

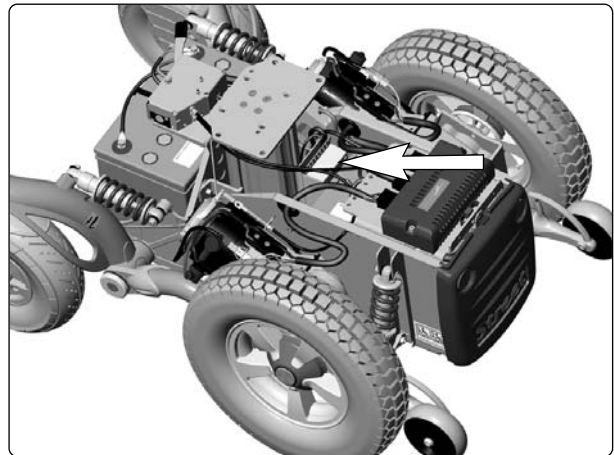


Fig. 68. SLS Drive stage unattached in its holder.

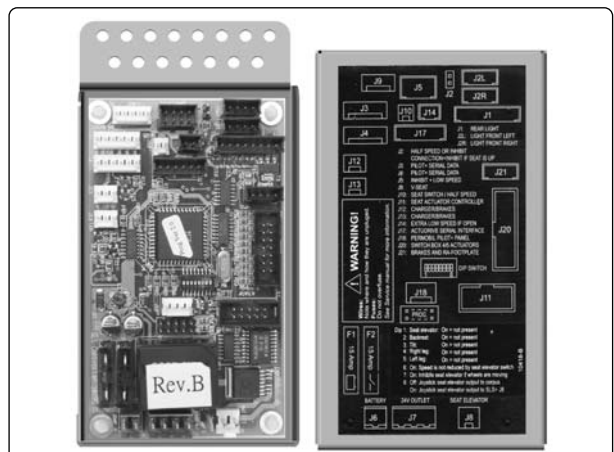


Fig. 69. SLS Drive stage.

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 70.



NOTE

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

Circuit breaker replacement

1. Remove the chassis covers; see page 7.
2. Put the circuit breaker in the "OFF" position; see figure 70.
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.

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 71.



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 72.
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.

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 70.

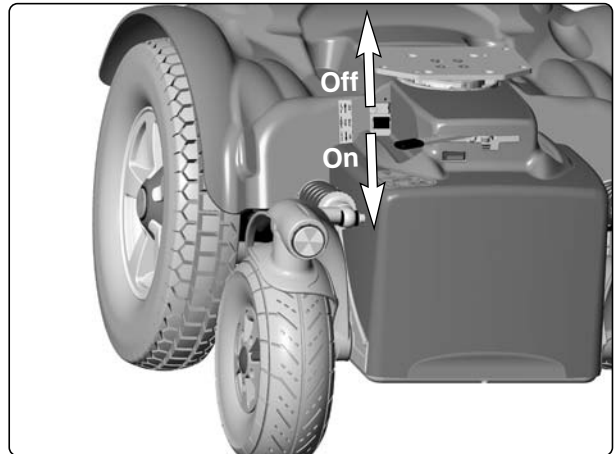


Fig. 70. Circuit breaker/Battery isolator.



Fig. 71. Circuit breaker bracket.

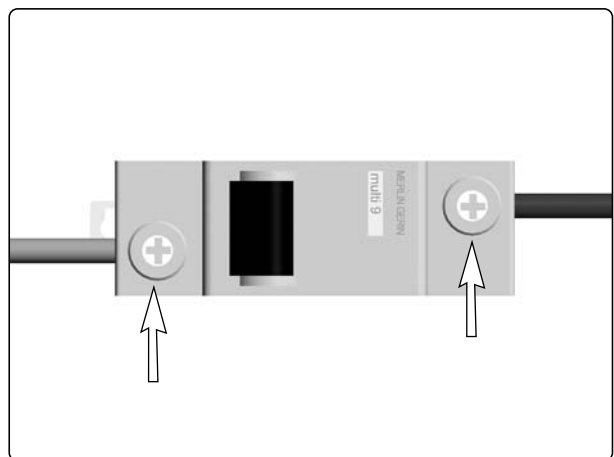


Fig. 72. Circuit breaker cable connection.

Charge fuse replacement

The charge fuse is mounted at the front of the chassis, under the wheel lock release lever; see figure 73. 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.

Fuse replacement for seat/lighting

There are two fuses on the SLS Drive stage, F1 (24V unswitched) and F2 (24V switched). These protect two outlets. One output (24V unswitched) supplies power regardless of if the chair is turned on or off. The other output (24V switched) supplies power only when the chair is turned on. The seat and lighting are normally connected to this outlet.

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 SLS Drive stage straight up from its holder; see page 34.
5. Remove the lid from the drive stage.
6. Replace the blown fuses.
7. Refit the lid to the box.
8. Place the SLS Drive stage in its holder.
9. Refit the covers; see page 7.

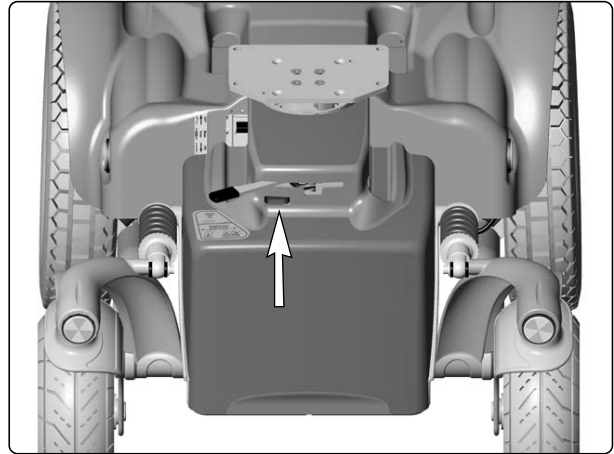


Fig. 73. Charge fuse.

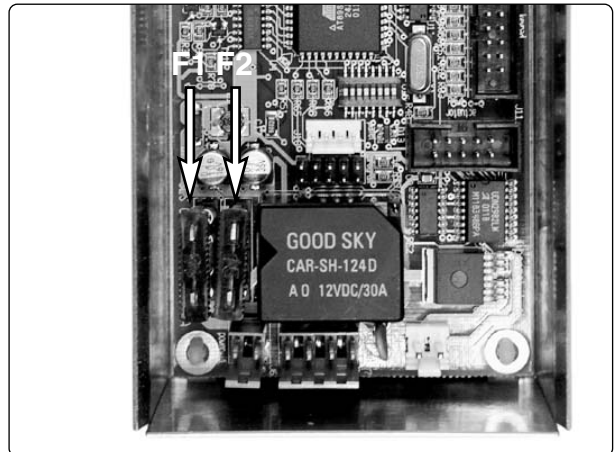


Fig. 74. F1: 24V unswitched 15A.
F2: 24V switched 15A Seat/Lighting.

Fuses

Replacing the SLS Fuse

The SLS fuse is located in its holder on the top of the front battery.

1. Switch off the main power switch on the control panel.
2. Put the circuit breaker in the "OFF" position. It is accessed through a hole in the chassis cover; see page 35.
3. Remove the chassis front cover, see page 7. The SLS-fuse is fitted by the positive battery pole on the front battery, see Fig. 75.

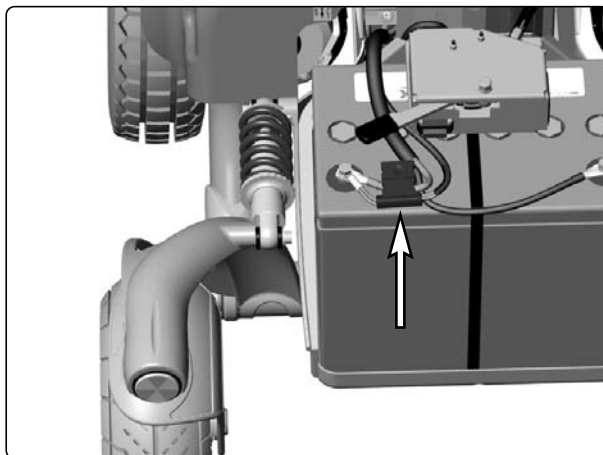


Fig. 75. The SLS-fuse is fitted by the positive battery pole on the front battery.

4. Open the cover of the fuse holder by pulling it straight out.
5. Replace the blown fuse.
6. Close the cover of the fuse holder.
7. Refit the chassis front cover, see page 7.
8. Put the circuit breaker in the "ON" position; It is accessed through a hole in the chassis cover; see page 35.

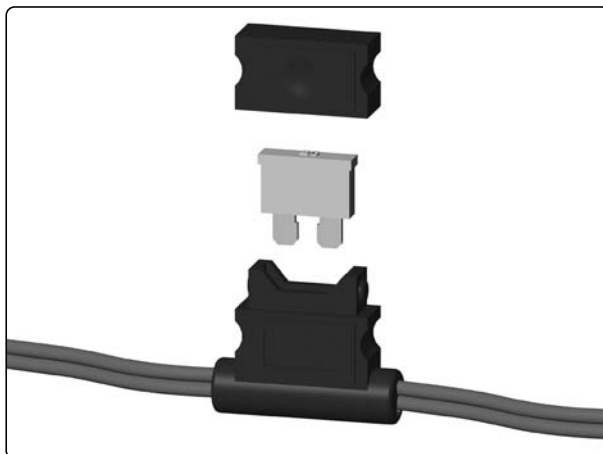


Fig. 76. Replacing the SLS-fuse.

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.

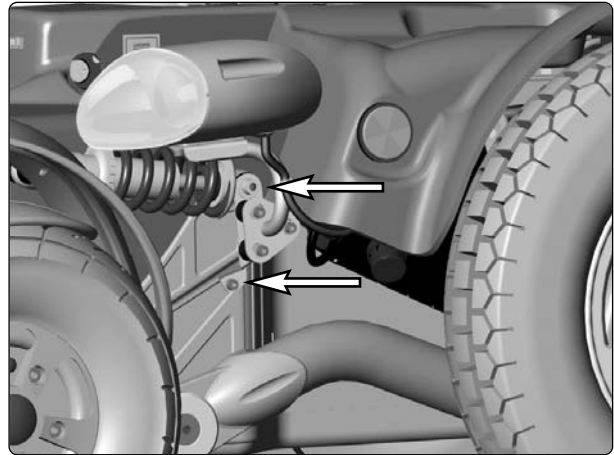


Fig. 77. The light is fitted with two screws. The upper screw also holds the shock absorber.

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.



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

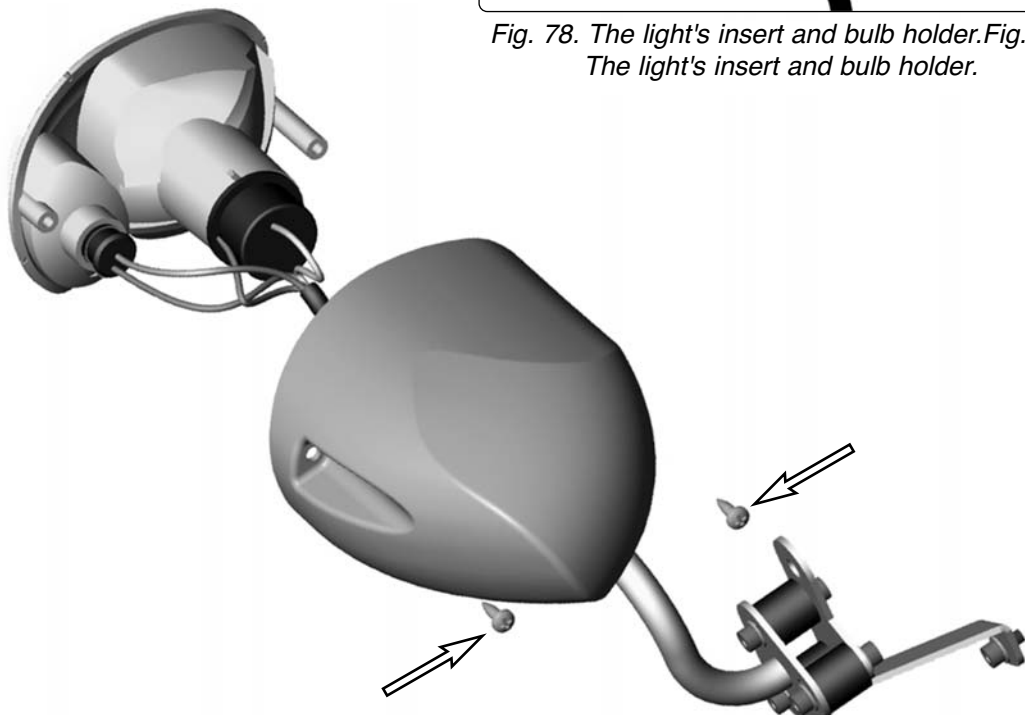


Fig. 79. The light's insert is fitted with two screws.

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.



Fig. 80. 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.

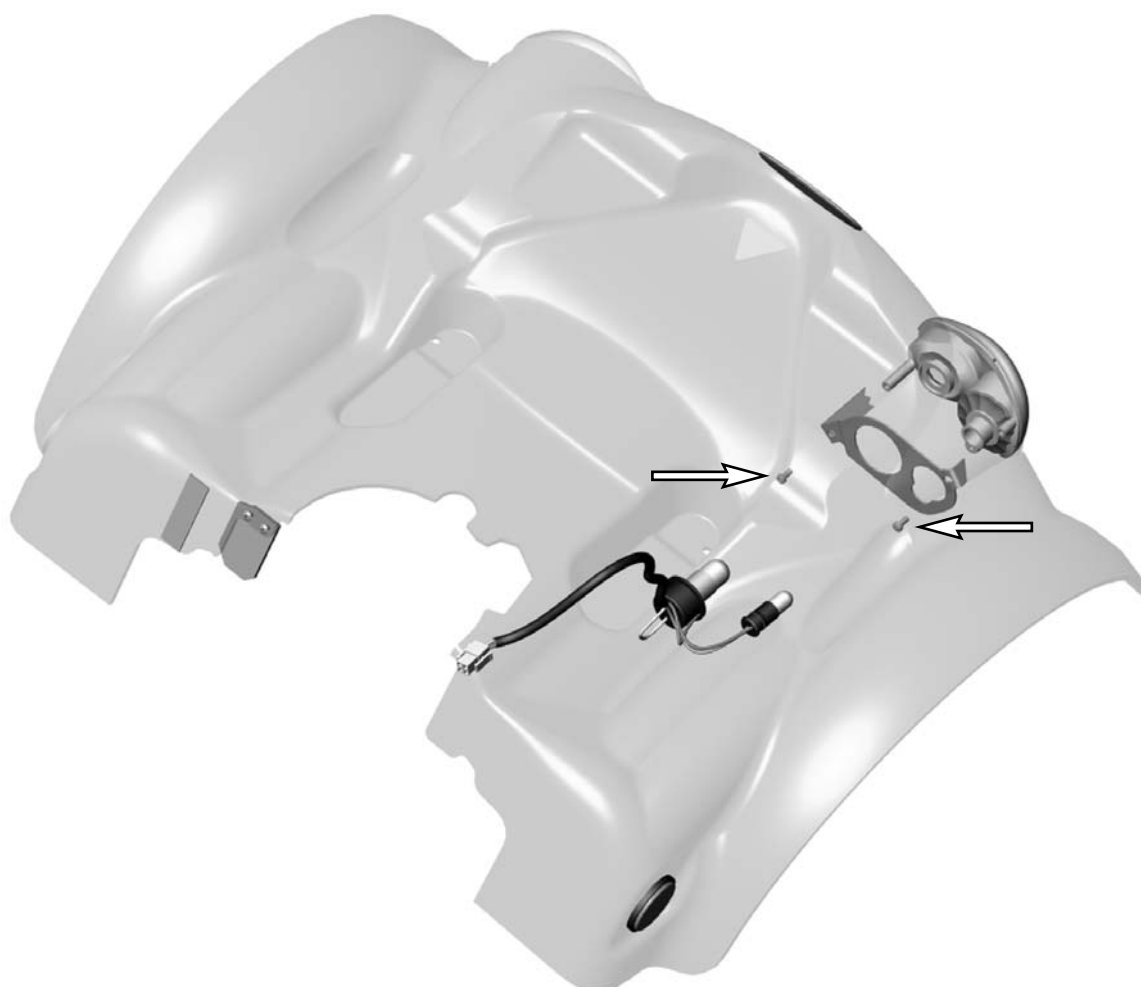


Fig. 81. The light's insert is fitted with two screws.

Trouble Shooting Guide

The troubleshooting guide below describes a number of events that can arise when you use your wheelchair, as well as providing suggestions for solutions. Note that this guide does not describe all the possible events that can arise, and you should always get in touch with your service contact or Permobil when you are unsure

EVENT	POSSIBLE CAUSE	SOLUTION
The wheelchair does not start.	Batteries discharged.	Charge the batteries.
	The cable connection to the control panel has become loose.	Attach the cable to the control panel.
	Main fuse set in "OFF" position after, for example, changing batteries.	Reset the main fuse. See page 35.
	Main fuse triggered.	See page 35.
The wheelchair can not be driven.	Battery charger connected.	Terminate the charging and remove the charging cable from the charging outlet.
	Wheel lock release activated.	Reset the wheel lock release.
	Wheelchair locked with the security key.	Unlock the wheelchair. See Owner's manual.
<i>Applies for electrical controlled seat tilt only.</i>	Seat tilt activated more than 30°.	Run the seat tilt back. See Owner's manual.
<i>Applies for electrical controlled leg support only.</i>	Foot plates run in too close to the front wheels.	Run the leg support out. See Owner's manual.
Battery voltage indicator on the control panel blinking once every 2.5 seconds and the wheelchair can not be driven.	The control system is in Sleep Mode.	Switch the start button on the control panel off and on again.
Battery voltage indicator on the control panel rapidly blinking and the wheelchair can not be driven.	Fault indicated in the drive electronics.	See page 42-43.
The wheelchair stops while being driven.	The cable connection to the control panel has become loose.	Attach the cable to the control panel.
<i>Applies for electrical seat tilt only.</i>	Seat tilt activated more than 30°.	Run the seat tilt back. See Owner's manual.
<i>Applies for electrical leg support only.</i>	Foot plates run in too close to the front wheels.	Run the leg support out. See Owner's manual.

EVENT	POSSIBLE CAUSE	SOLUTION
The wheelchair can only be driven with reduced speed. <i>Applies for electrical seat lift, seat tilt or back rest only.</i>	Seat tilt or seat lift raised to high, alt. backrest activated more than 15°.	Lower seat lift or seat tilt, alt. move the back rest forward. See Owner's manual.
The seat lift will not raise. <i>Applies for electrical seat tilt alt. back rest only.</i>	Seat tilt activated more than 10° alt. back rest is activated backwards more than 10°.	Run the seat tilt alt back rest back. See Owner's manual.
The seat tilt will not tilt upwards. <i>Applies for electrical seat lift and seat tilt only.</i>	Seat lift raised to high.	Lower the seat lift. See Owner's manual.
The back rest will not tilt backwards. <i>Applies for electrical seat lift and back rest only.</i>	Seat lift raised more than 2.5 in. from its lowest position.	Lower the seat lift. See Owner's manual.
The wheelchair will not charge.	Main fuse set in "OFF" position after, for example, changing batteries.	Reset the main fuse See page 35.
	Triggered charging fuse due to fault in, for example, batteries, charger, charging cables, charging outlet.	Carefully check possible causes before replacing. See page 36.

Error signals - Battery voltage indicator

Every time the wheelchair is started up, a check is performed on parts of the wheelchair's electronics. If any faults have arisen in these parts, this is shown on the control panel's battery voltage indicator by one or more blinking lights.

Constant light

Everything is in order. How many lights are lit, depends upon how much voltage there is in the batteries. With fully charged batteries, all lights are lit.

Slowly blinking red lights

The batteries need to be charged immediately.

Rapidly blinking, 1 - 10 lights

Error signals, an error has arisen and the wheelchair can not be driven.

Error signals

The number of blinking lights indicate what the problem could be.

- Note the number of blinking lights.
- Turn off the wheelchair.
- Turn the wheelchair back on again.
- If the error persists, count the number of blinking lights, check possible causes and solutions in the table on the adjoining page.



NOTE

Possible error signals on the battery voltage indicator are not displayed while the wheelchair is being driven, they only first appear the next time the wheelchair is restarted.



WARNING

The remedying of errors that are indicated via the battery voltage indicator must be performed by a person with sufficient expertise to be able to perform such in a professional manner. Always contact an authorized serviceman when in doubt.

CAUSE		SOLUTION
High battery voltage	10 Green	Check the battery and the connections between the battery and the control unit.
Failure in wheel lock circuit	9 Green	Check the connections to the magnetic wheel lock.
Fault in electronics	8 Green	Check the contacts to the output stage. If the fault persists, change the output stage.
Fault in the control panel	7 Orange	Make sure the joystick isn't actuated at switch-on, change the control panel.
	6 Orange	
Short circuit right drive motor	5 Orange	Check the drive motor connections and cable.
Open circuit, right drive motor	4 Orange	Check the connection to the right drive motor.
Short circuit left drive motor	3 Red	Check the drive motor connections and cable.
Open circuit, left drive motor	2 Red	Check the connection to the right drive motor.
Low battery voltage	1 Red	Check the condition of the battery. Check the connection between the battery and the control unit.

Example:

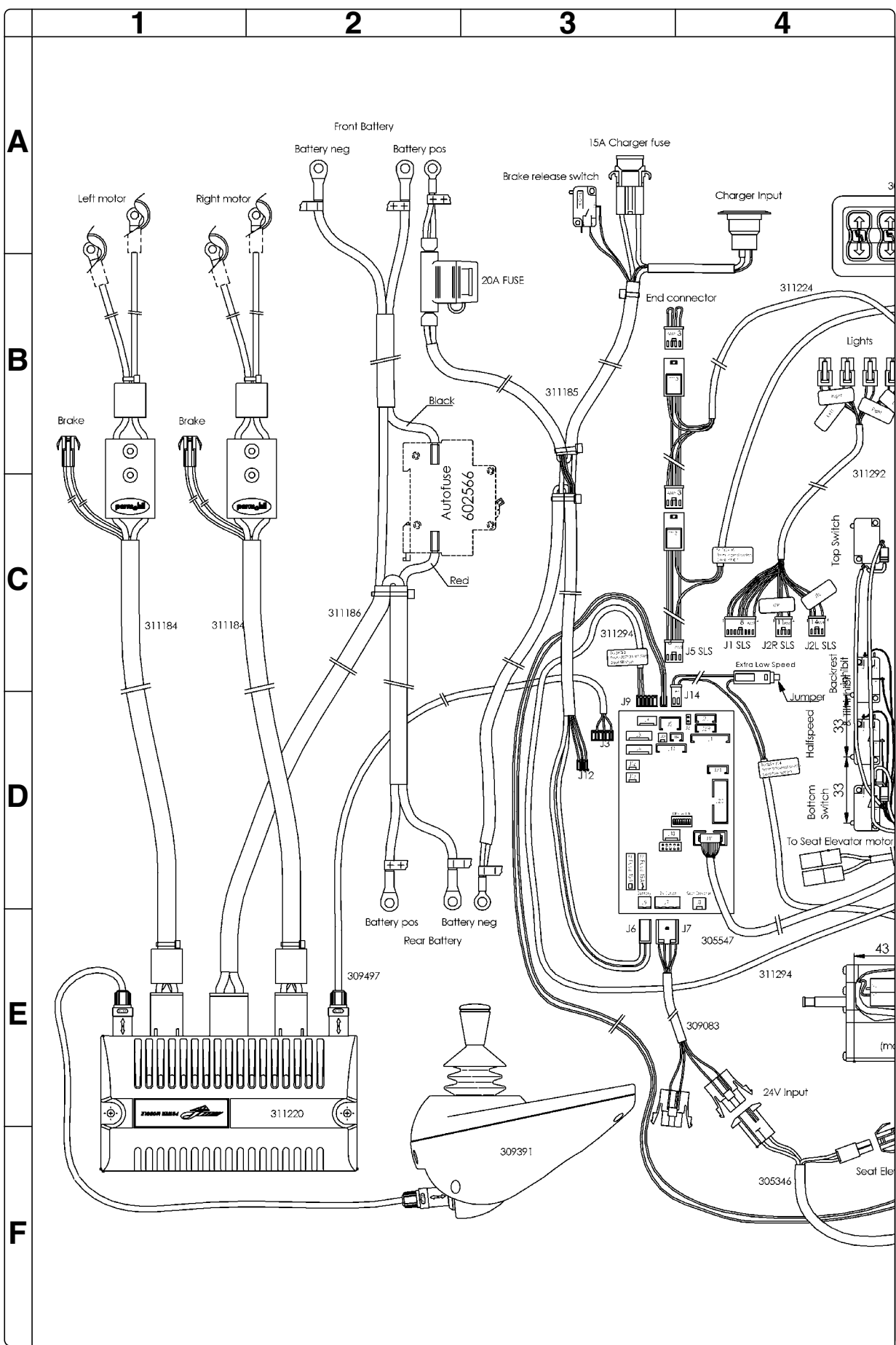
Lights 1-7, 3 red and 4 orange, blinking rapidly upon start-up and the wheelchair can not be driven.

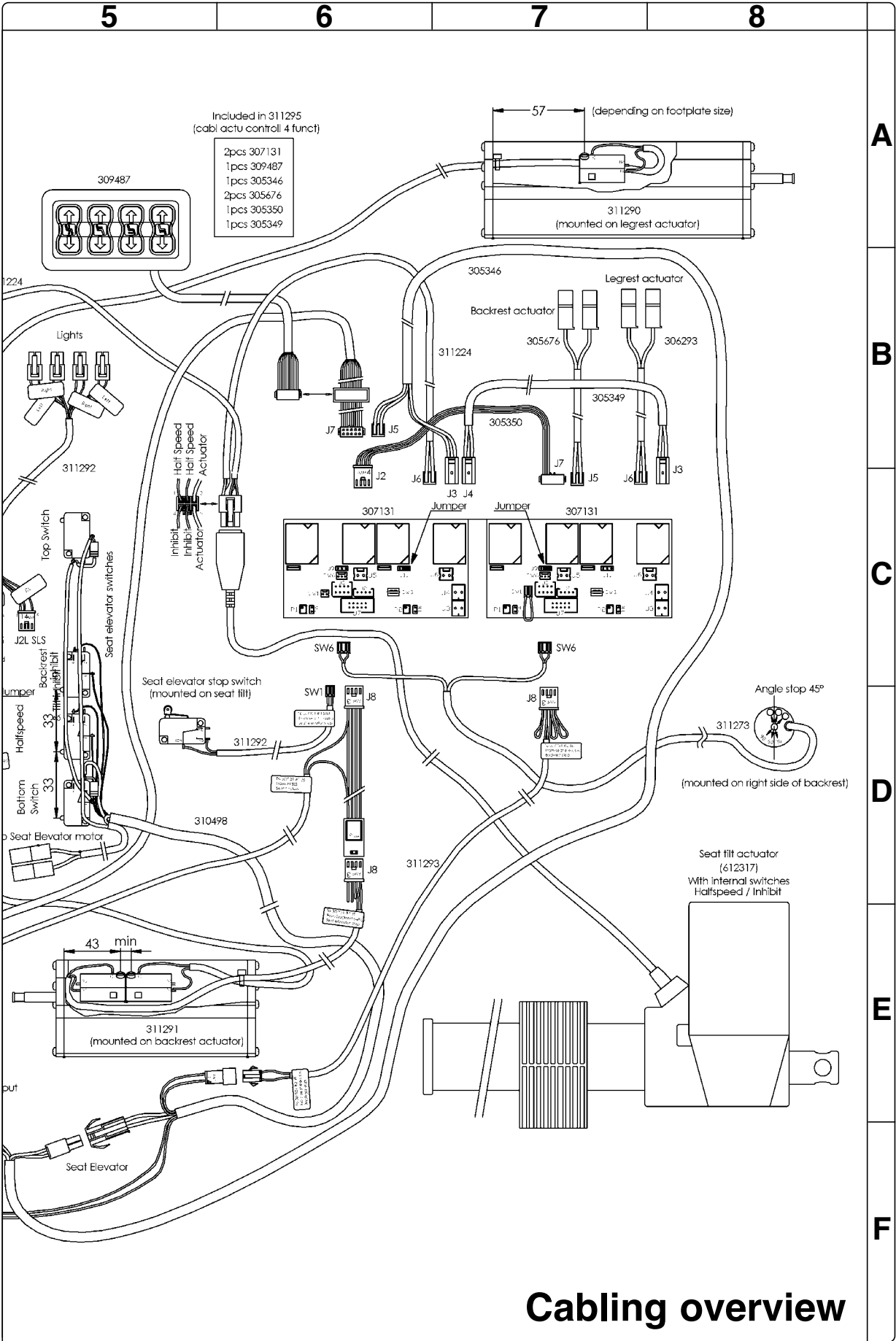
Cause:

Fault in the control panel.

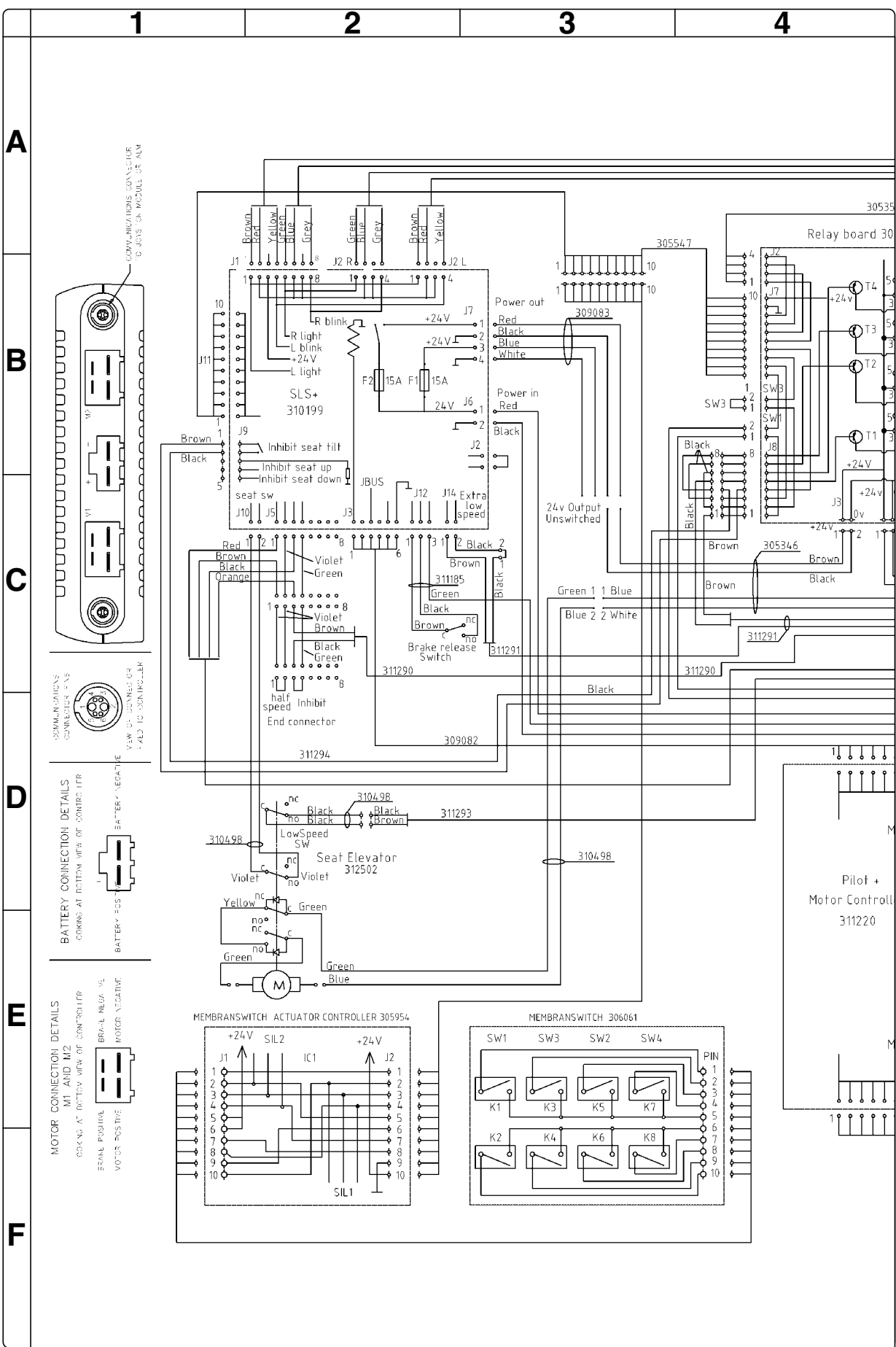
Solution:

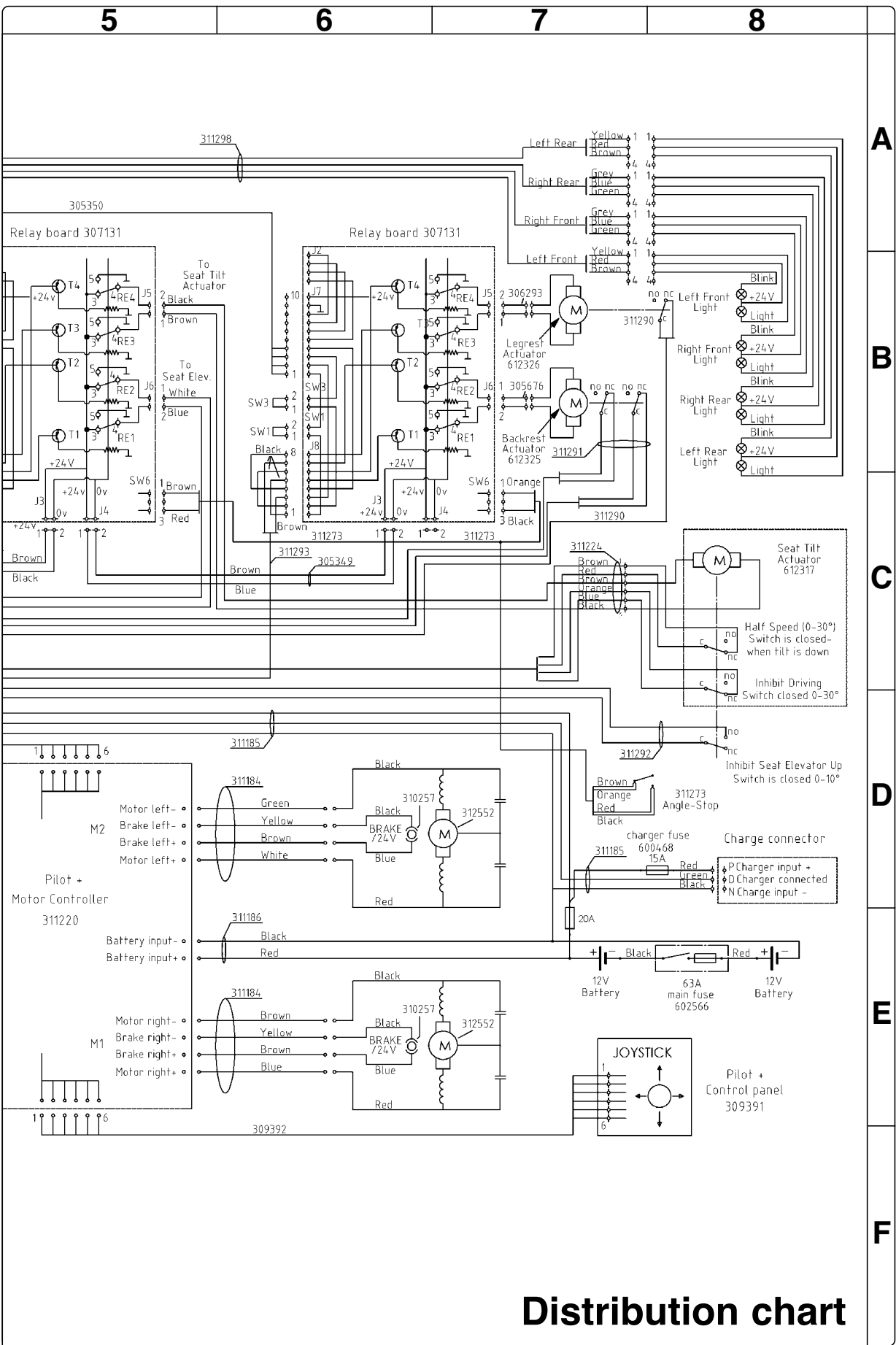
Make sure the joystick isn't actuated at switch-on, change the control panel.





Distribution chart





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