

Invacare® Storm³
Invacare® Storm³ Euro
Invacare® Storm³ Vertic
SERVICE INSTRUCTIONS



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Yes, you can.®

These instructions contain information about:

Testing work

Repair Instructions

This manual is part of the instructions for use.

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1 Introduction

1.1 General information

- Service and maintenance work must be carried out taking this service manual into account.
- It is imperative that you observe safety information.
- Information about operation or about general maintenance and care work on the mobility aid should be taken from the operating manual.
- You can find information about ordering spare parts in the spare parts catalogue.
- Only use original Invacare® spare parts. The guarantee will become invalid if other spare parts are used!
- We reserve the right to make any alterations on the grounds of technical improvements.
- The mobility aid may only be maintained and overhauled by qualified personnel.
- The minimum requirement for service technicians is suitable training, such as in the cycle or orthopaedic mechanics fields, or sufficiently long-term job experience.
 - Experience in the use of electrical measuring equipment (multimeters) is also a requirement.
 - Special Invacare® training is recommended.
- Alterations to the mobility aid which occur as a result of incorrectly or improperly executed maintenance or overhaul work lead to the exclusion of all liability on the side of INVACARE.
- If you have any problems or questions please contact Invacare® Service.

1.2 Notes on transport

- If the mobility aid has to be shipped back to the manufacturer for major repairs, you should always use the original packaging for transport.
- Please attach a precise description of the fault.

1.3 Definition and representation of information and safety information in this manual

Different types of information and signal words are used throughout this manual.



HAZARD!

The signal word "HAZARD!" refers to immediate hazards.

- *The following lines in italics refer to actions which serve to avoid such hazards.*
-



WARNING!

The signal word "WARNING!" refers to possibly-occurring hazards which can lead to death or serious injuries if they are not avoided.

- *The following lines in italics refer to actions which serve to avoid such hazards.*
-



ATTENTION!

The signal word "ATTENTION!" refers to possibly-occurring hazards which can lead to minor injuries and/or material damage if they are not avoided.

- *The following lines in italics refer to actions which serve to avoid such hazards.*
-



CAUTION!

The signal word "CAUTION!" refers to hazards which could lead to material damage if they are not avoided.

- *The following lines in italics refer to actions which serve to avoid such hazards.*
-



Note

The signal word "Note" is used to denote general information which simplifies the handling of your product and refers to special functions.

1.4 Hazard symbols and symbols used

Different types of hazard symbols and symbols are used throughout this manual.



General hazards

This symbol warns you of general hazards!

- *Always follow the instructions to avoid injury to the user or damage to the product!*



BURN HAZARD!

This symbol warns you of the danger of chemical burns, for example due to the discharge of battery acids!

- *Always follow the instructions to avoid injury to the user or damage to the product!*



DANGER OF CRUSHING!

This symbol warns you of crushing hazards due to inattentive working with heavy components.

- *Always follow the instructions to avoid injury to the user or damage to the product!*



EXPLOSION HAZARD!

This symbol warns you of an explosion hazard, which can be caused by excessive tyre pressure in a pneumatic tyre.

- *Always follow the instructions to avoid injury to the user or damage to the product!*



Wear safety shoes

The symbol refers to the requirement for wearing safety shoes.

- *Wear standardised safety shoes during all work.*



Wear eye protection

This symbol refers to the requirement for wearing eye protection, for example when working with batteries.

- *Wear eye protection when this symbol is shown.*



Wear safety gloves

This symbol refers to the requirement for wearing safety gloves, for example when working with batteries.

- *Wear safety gloves when this symbol is shown.*



Note

This symbol identifies general information which is intended to simplify working with your product and which refers to special functions.



Requirements:

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



Always dispose used or damaged batteries correctly

The symbol refers to information for the correct disposal of used or damaged batteries.

1.5 Images in this manual

The detailed images in this manual are given digits to identify various components. Component numbers in text and operational instructions always relate to the image directly above.

2 Safety and fitting instructions

These safety instructions are intended to prevent accidents at work, and it is imperative that they are observed.

2.1 Before any inspection or repair work

Read and observe this repair manual and the associated operating manual!

Observe the minimum requirements for carrying out the work (see chapter entitled „General information“)

2.2 Personal safety equipment



Safety shoes

The mobility device, and some of its components, are very heavy. These parts can result in injuries to the feet if they are allowed to drop.

- *Wear standardised safety shoes during all work.*



Eye protection

It is possible that battery acid can be discharged when working on defective batteries or when handling batteries improperly.

- *Always wear eye protection when working on any defective or possibly defective batteries.*



Safety gloves

It is possible that battery acid can be discharged when working on defective batteries or when handling batteries improperly.

- *Always wear acid-proof safety gloves when working on any defective or possibly defective batteries.*

2.3 General safety information and information about fitting / removal



WARNING: Danger of crushing!

Various components such as the drive unit, batteries, seat etc are very heavy. This results in injury hazards to your hands!

- *Please note the high weight of some components! This applies especially to the removal of drive units, batteries and the seat.*



WARNING!

Injury hazard if the vehicle starts moving unintentionally during repair work!

- *Switch the power supply off (ON/OFF key)!*
- *Engage the drive!*
- *Before raising the vehicle, secure the wheels by blocking them with wedges!*

**ATTENTION!****Fire and burn hazard due to electrical short-circuit!**

- *The mobility device must be completely switched off before removal of voltage-carrying components! To do this, remove the batteries.*
- *Avoid short-circuiting the contacts when carrying out measurements on voltage-carrying components!*

**CAUTION!****Danger of burns from hot surfaces on the motor!**

- *Allow the motors to cool down before commencing work on them.*

**ATTENTION!****Injury hazard and danger of damage to vehicle due to improper or incomplete maintenance work!**

- *Use only undamaged tools in good condition.*
- *Some moving parts are mounted in sockets with PTFE coating (Teflon™). Never grease these sockets!*
- *Never use "normal" nuts instead of self-locking nuts.*
- *Always use correctly-dimensioned washers and spacers*
- *When reassembling, always replace any cable ties which were cut during dismantling.*
- *After completing your work / before renewed start-up of the mobility device, check all connections for tight fitting.*
- *After completing your work / before renewed start-up of the mobility device, check all parts for correct locking.*
- *Only operate the vehicle with the approved tyre pressures (see technical data).*
- *Check all electrical components for correct function. Please note that incorrect polarity can result in damage to the electronics.*
- *Always carry out a trial run at the end of your work.*

**CAUTION!****Danger of injury and damage to property, if the maximum speed reduction on a wheelchair with a lifter does not function correctly!****The wheelchair's control unit must reduce the maximum possible speed as soon as the lifter is raised.**

- *Test the maximum speed reduction for correct function after any maintenance work or modifications to the wheelchair.*

**Note**

Mark all current settings for the mobility aid (seat, armrests, backrest etc.), and the associated cable connecting plugs, before dismantling. This makes reassembly easier.

All plugs are fitted with mechanical safety devices which prevent release of the connecting plugs during operation. To release the connecting plugs the safety devices must be pressed in. When reassembling ensure that these safety devices are correctly engaged.

**WARNING!**

Any changes to the drive program can affect the driving characteristics and the tipping stability of the vehicle!

- *Changes to the drive program may only be carried out by trained Invacare® specialist dealers!*
 - *Invacare® supplies all mobility aids with a standard drive program ex-works. Invacare® can only give a warranty for safe vehicle driving behaviour - especially tipping stability - for this standard drive program!*
-

3 Tightening torques

The tightening torques stated in the following list are based on the thread diameter for the nuts and bolts for which no specific values have been determined. All values assume dry and de-greased threads.

Thread	M4	M5	M6	M8	M10	M12	M14	M16
Tightening torque in Nm $\pm 10\%$	3 Nm	6 Nm	10 Nm	25 Nm	49 Nm	80 Nm	120 Nm	180 Nm

**CAUTION!**

Damage can be caused to the mobility device due to improperly tightened screws, nuts or plastic connections.

- *Always tighten screws, nuts etc to the stated tightening torque.*
- *Only tighten screws or nuts which are not listed here fingertight.*

4 Tool list

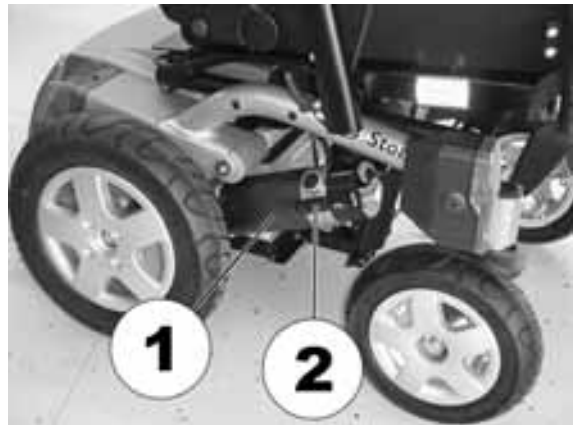
You will need a standard tool set with at least the following:

- set of open and ring spanners (6 – 24 mm)
- set of Allen keys (1.5 - 10 mm)
- torque wrench (commercial)
- socket spanner set
- set of screwdrivers (0.5 - 1.6 mm)
- oblique pliers
- flat-nosed pliers
- circlip pliers
- pointed pliers
- cable lug pliers
- wooden or plastic hammer
- tyre repair kit (commercial)
- tyre pressure indicator
- valve removal tool
- wheel bearing puller
- Multimeter with probes and various cable clips
- soldering iron 30 W
- front wheel hub puller (available from INVACARE Service)
- circlip pliers for star lock caps (commercially available, make Tigtemeyer)
- pop riveting tool
- stepped mandrel

5 Layout of modules and components

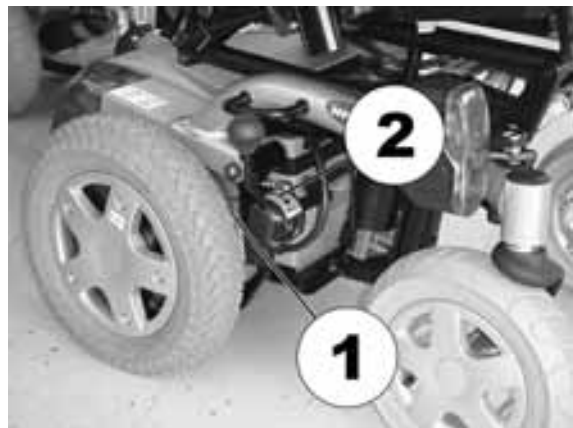
Under the seat (standard motors)

- 1) Drive motor
- 2) Disengaging mechanism



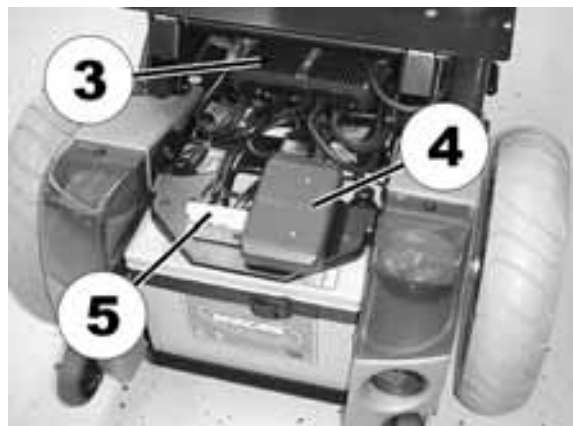
Under the seat (GB motors)

- 1) Drive motor (behind the drive wheel)
- 2) Disengaging mechanism



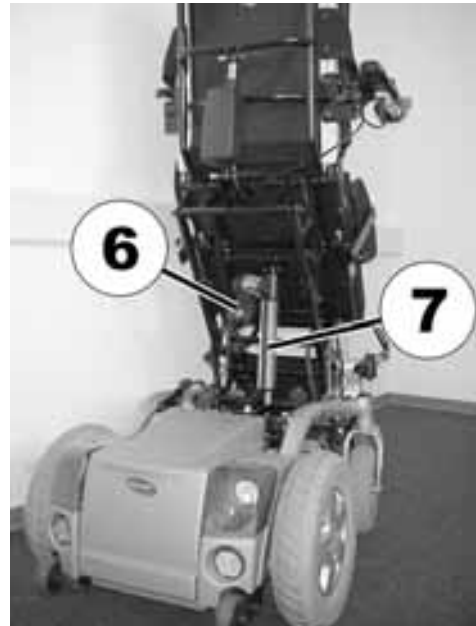
Under the rear cowling

- 3) Power module
- 4) CLAM (Combined Light and Actuator Module) (only available if the wheelchair is equipped with electric adjustment options)
- 5) Distributor circuit board for lighting



**Under the raised verticalizer mechanism
(only available on the Storm3 Vertic)**

- 6) Control box of the verticalizer limit stop
- 7) Actuator of the verticalizer



6 Service plan (1x annually)



CAUTION!

Danger of injury and damage to property, if the maximum speed reduction on a wheelchair with a lifter does not function correctly!

The wheelchair's control unit must reduce the maximum possible speed as soon as the lifter is raised.

- Test the maximum speed reduction for correct function after any maintenance work or modifications to the wheelchair.

Component	Check	Remedy	Chapter :	✓
Chest belt	<ul style="list-style-type: none"> • Chest belt must be fit snugly. Check Velcro strip for correct function. Velcro strip may not open by itself. 	<ul style="list-style-type: none"> • Replace if damaged or if velcro function is affected 		
Armrests and side panels	<ul style="list-style-type: none"> • Armrest damage and fastening • Side panel damage and fixing 	<ul style="list-style-type: none"> • Tighten screws, replace padding • Tighten screws, replace side panels 	15.4 15.4	
Seat unit / seat angle adjustment	<ul style="list-style-type: none"> • Cushion • Check seat angle adjustment 	<ul style="list-style-type: none"> • Replace covers / upholstery • Replace parts 	15	
Backrest unit mechanical	<ul style="list-style-type: none"> • Damage and seams • Fixings 	<ul style="list-style-type: none"> • Replace parts • Tighten screws 	16	
Backrest unit electrical	<ul style="list-style-type: none"> • check cabling • Check function 	<ul style="list-style-type: none"> • Replace cable or motor if necessary 	16.3	
Frame (chassis) / battery strap	<ul style="list-style-type: none"> • Check fixings, welded seams and battery strap 	<ul style="list-style-type: none"> • Tighten screws, replace components 	10.1	
Wheel suspension and wheels	<ul style="list-style-type: none"> • Check drive wheels for tight fit and side play • Check steering wheels for tight fit, float, side play and correct torque (15 Nm +/- 1.5 Nm) • Check steering wheel forks • Check tyres 	<ul style="list-style-type: none"> • Adjust, replace wheel hubs • Replace wheels, wheel fork or wheel bearings • Replace • Fit new 	11 11.1 11.1.4 11.1.5 11.1.3 11.2.3	

Component	Check	Remedy	Chapter:	✓
Drive units, disengager	<ul style="list-style-type: none"> • Check functions in drive and push modes • Check disengager 	<ul style="list-style-type: none"> • Replace motor if necessary • Tighten screws / nuts, adjust or replace if necessary 	10.4	
			10.4.1	
Footrests	<ul style="list-style-type: none"> • Check welded seams, interlocking, screws, footplates 	<ul style="list-style-type: none"> • Tighten, replace 	17	
Electrical footrests	<ul style="list-style-type: none"> • Check cabling • Check contacts • Check functions 	<ul style="list-style-type: none"> • Replace cable if necessary 	17.1.1	
Lighting	<ul style="list-style-type: none"> • Check cabling • Check function 	<ul style="list-style-type: none"> • Replace bulbs or cables if necessary 	13	
Batteries	<ul style="list-style-type: none"> • Damage to batteries / strip fuse, contact corrosion • Check contacts, terminals • Check battery voltage 	<ul style="list-style-type: none"> • Replace batteries / strip fuse Clean contacts • Tighten, replace • Charge batteries / replace 	12.1.1	
			12.1.2	
			-	
Remote / electronics	<ul style="list-style-type: none"> • Remote, status display blinking • Fixing • Cable, connecting plug • Joystick function • Power supply 	<ul style="list-style-type: none"> • Evaluate blinking code • Tighten, replace • Replace • Replace joystick • Replace cable, connector plug or console 	8	
			14.1.4	
			-	
			14.1.1	
			14.1.4	
Wheelchair	<ul style="list-style-type: none"> • Check all parts for soiling 	<ul style="list-style-type: none"> • Clean seat 	-	
Verticalizer mechanism (only available on the Storm³ Vertic)	<ul style="list-style-type: none"> • Check welding seams for damage • Check tight fit of the screwed fixings • Check correct function of the actuator 	<ul style="list-style-type: none"> • Replace verticalizer mechanism if necessary • Tighten screwed fixings • Replace actuator if necessary 	21	

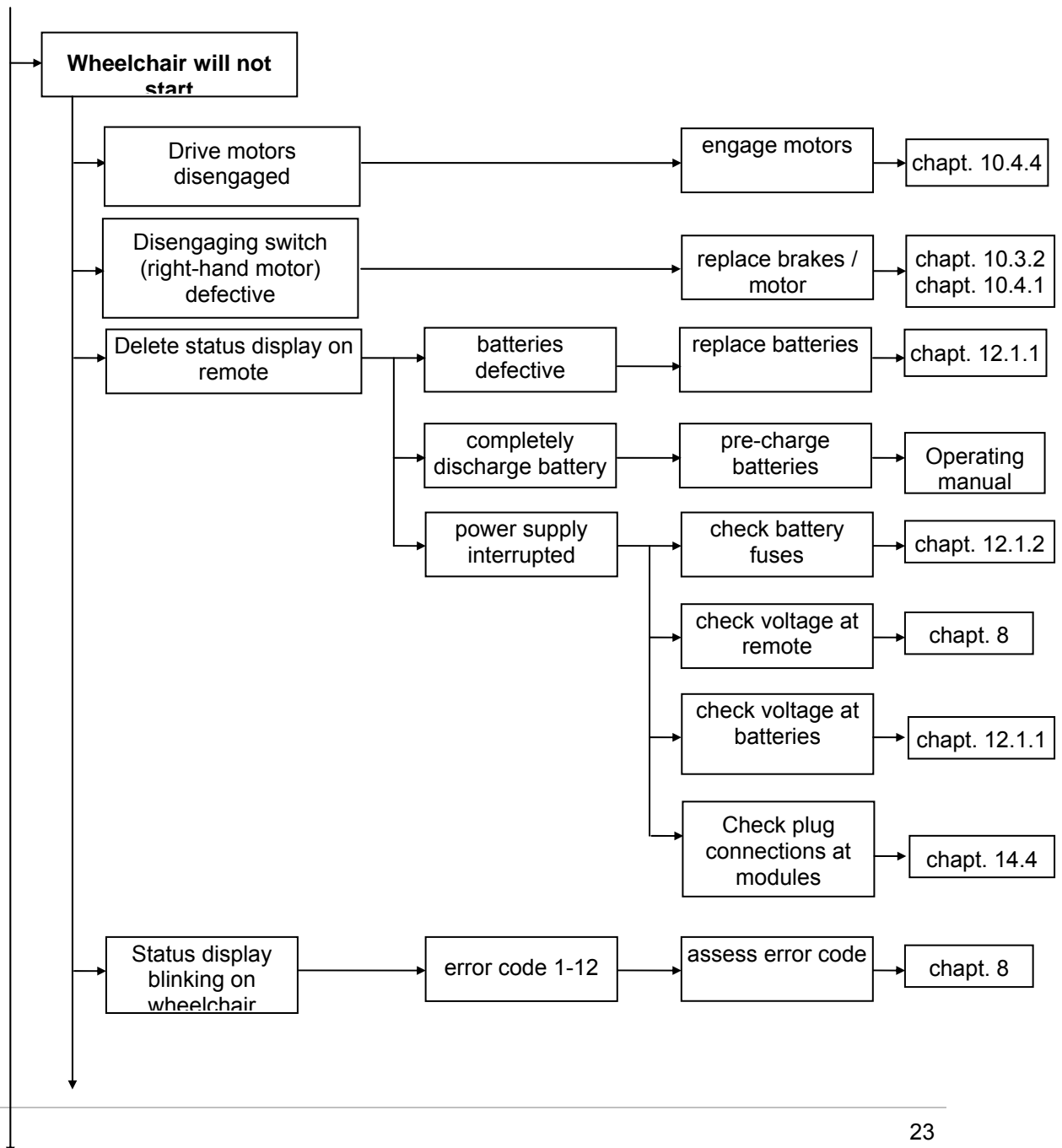
7 Operational faults

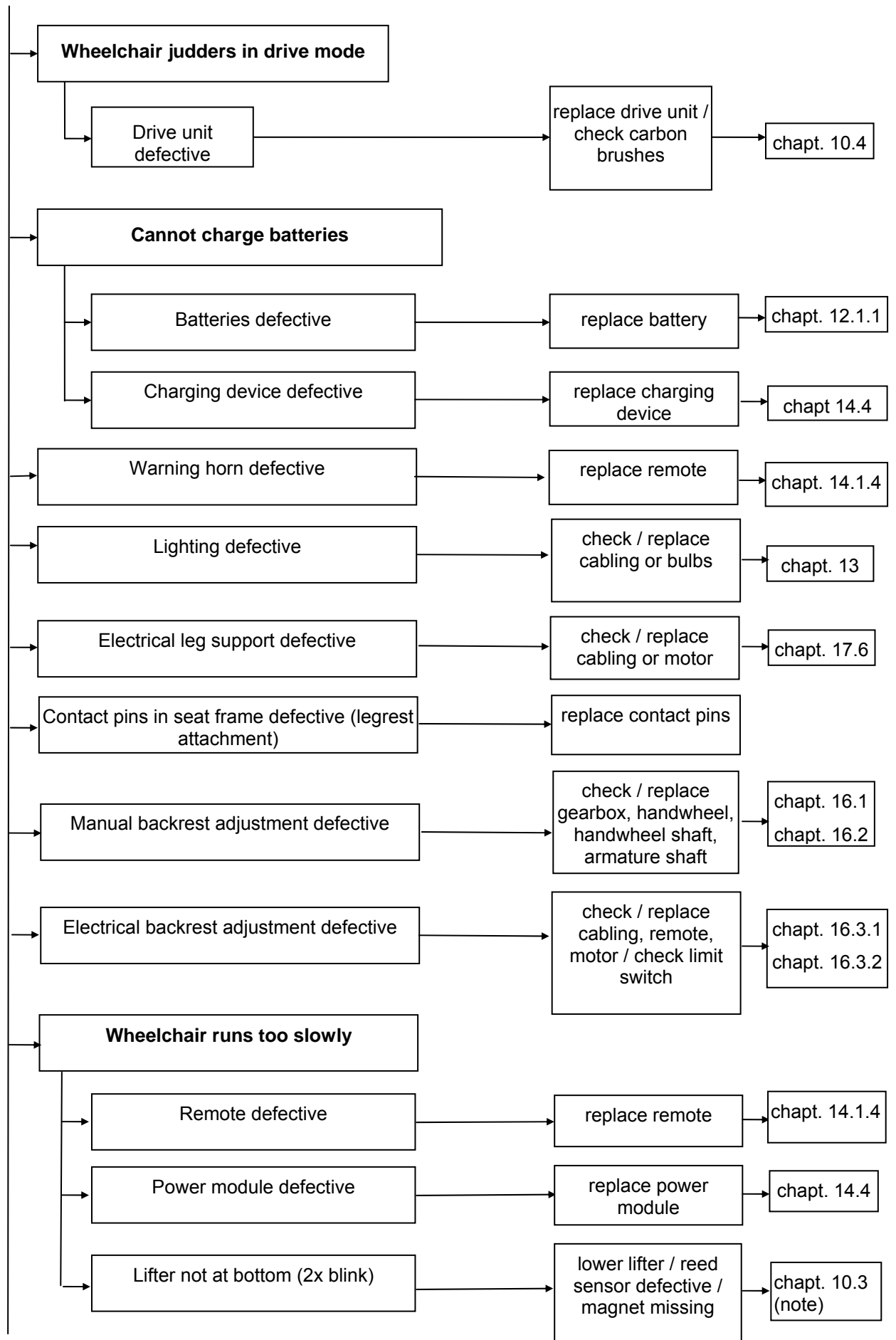
7.1 General

If faults occur in drive mode or power supply proceed as follows:

- First assess the fault causes described in Chapter 7.2.
- Check the status display on the remote and assess the error codes in accordance with Chapter 8.
- Carry out the necessary testing / repairs. While doing this please note the references to the appropriate chapter in the manual or to the appropriate documentation.

7.2 Fault causes





8 Remote control error codes

Before assessing the error codes, carry out the following test:

- Turn the remote on and off several times. Wait approx. 5 seconds before switching on.

The test checks whether the error can be automatically rectified by the electronics, and if necessary deactivates the blinking status display at the remote. If this is not the case, you can locate the fault using the blink codes as follows:

- turn the remote on and off
- check which blink code is showing by counting
- wait for the blink code pause (approx. 2-3 seconds)
- re-count the code.

FLASHCODE	MEANING	SOLUTION	Documentation
1	Module defective	<ul style="list-style-type: none"> • Replace module 	See chapter "Electronics" on page 89.
2	Accessory error (for example, short circuit in a light bulb) Lifter raised Backrest not in driving position	<ul style="list-style-type: none"> • Check accessory connections, check accessories • Lower the lifter completely • Put backrest in driving position 	See chapter "Lighting" on page 73.
3	Fault in right-hand motor. Connection loose/defective or motor defective.	<ul style="list-style-type: none"> • Check plug-in connections. 	See chapter "Drive unit, disengage lever, support wheels" on page 35 chapter "Replacing and calibrating a GB drive motor" on page 45.
4	Fault in left-hand motor. Connection loose/defective or motor defective.	<ul style="list-style-type: none"> • Check plug-in connections. 	See chapter "Drive unit, disengage lever, support wheels" on page 35 chapter "Replacing and calibrating a GB drive motor" on page 45.

FLASHCODE	MEANING	SOLUTION	Documentation
5	Fault/brake fault on right-hand motor. Connection loose/defective or motor defective.	<ul style="list-style-type: none"> Check plug-in connections. 	See chapter " Drive unit, disengage lever, support wheels " on page 35 and chapter " Replacing and calibrating a GB drive motor " on page 45.
	Right motor disengaged (GB-motors)	<ul style="list-style-type: none"> Engage motor. Shut electronics down and then switch on again. 	
	Both motors disengaged (standard motors)	<ul style="list-style-type: none"> Engage motors. Shut electronics down and then switch on again. 	
6	Fault/brake fault on left-hand motor. Connection loose/defective or motor defective.	<ul style="list-style-type: none"> Check plug-in connections. 	See chapter " Drive unit, disengage lever, support wheels " on page 35 chapter " Replacing and calibrating a GB drive motor " on page 45.
	Left motor disengaged (GB-motors)	<ul style="list-style-type: none"> Engage motor. Shut electronics down and then switch on again. 	
7	Battery dead	<ul style="list-style-type: none"> Pre-charge battery 	See chapter " Batteries, battery case " on page 70.
8	Battery voltage too high	<ul style="list-style-type: none"> Possibly turn on lighting Check battery charger 	See chapter " Batteries, battery case " on page 70.
9 or 10	Faulty data transmission between modules	<ul style="list-style-type: none"> Check modules 	See chapter " Electronics " on page 89.
11	Motors overloaded / overheated	<ul style="list-style-type: none"> Switch the remote off and back on again, wait a short time if necessary 	
12	Module used has compatibility problems	<ul style="list-style-type: none"> Remove incorrect module 	See chapter " Electronics " on page 89.

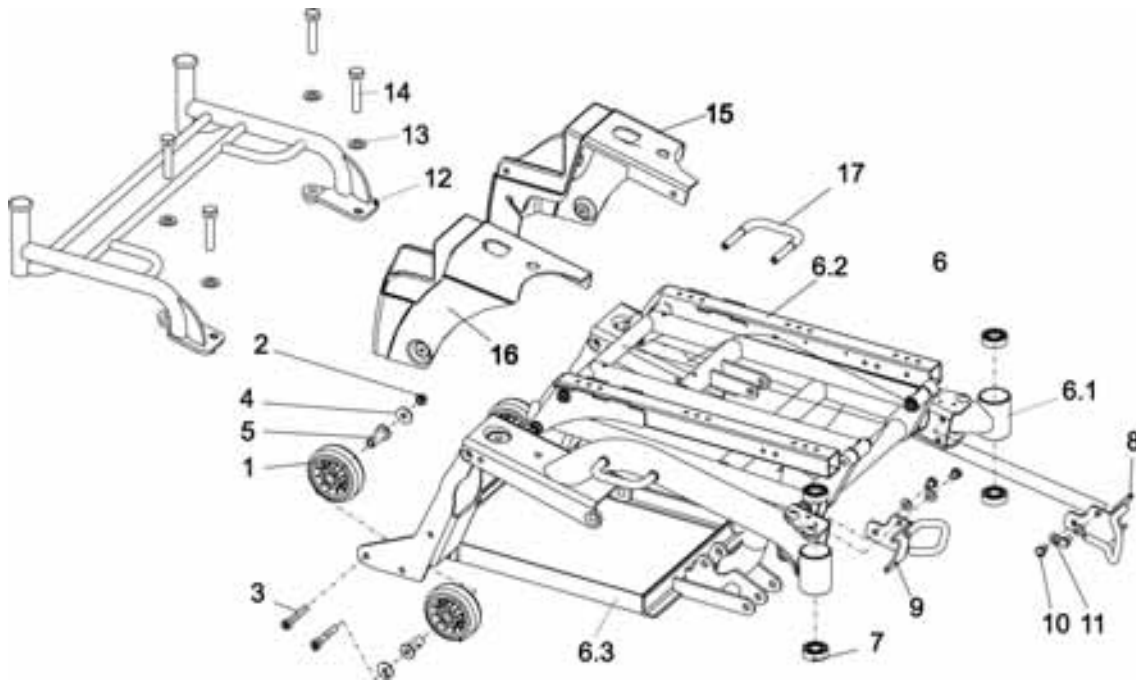
9 Module composition / variations

The Storm³ can be supplied the following options from start of production:

- **Batteries (chapt. 12)**
 - 70 Ah
- **Brake (chapt. 10.6)**
- **Drive wheels / steering wheels (chapt. 11.1, 11.2)**
 - 3.00 - 8 drive wheels (pneumatic, puncture-proof)
 - 3.00 - 6 castor wheels (pneumatic, puncture-proof)
- **Lighting (chapt. 13)**
- **Remote and accessories (chapt. 14)**
 - ACS REM24 SC
 - ACS operation for attendant (switchable)
 - ACS tray control
 - centre joystick swingaway
 - chin control
 - G80 I
 - remote holder height-adjustable / swingaway
- **Backrest elements (chapt. 16)**
 - backrest adjustment manual
 - backrest adjustment electrical
- **Headrest (chapt. 16.5)**
- **Legrests/footrests (chapt. 17, 18)**
 - vari 90° - 65° (VARI F)
 - footrest hanger manually height-adjustable (VARI A)
 - footrest hanger with manual height adjustment (ADM)
 - footrest hanger with electrical height adjustment (ADE)
 - fixed footplates
 - angle-adjustable footplates
 - angle and depth-adjustable footplates
 - footplate
- **Kerb climber (chapt. 19.1)**
- **Cane holder (chapt. 19.2)**

10 Frame / Chassis

10.1 Frame / chassis (not Storm³ Euro)



POS	QTY.	ITEM NO./PCS.	ITEM DESCRIPTION
1	4	1418533	ANTI-TIP WHEEL KAMA 80 X 30
2	4	F00002	HEXAGON NUT M8 SELF-LOCKING
3	4	D50170	MACHINE SCREW WITH ALLEN KEY HEAD M8 X 50
4	4	G10103	WASHER 8.4 X 25 X 2
5	4	1419233-0003	HEADED BUSH
6	1	1419341	CHASSIS WITH LIFTER & BATTERY CASE ASSY. GREEN
6	1	1421681	CHASSIS WITH LIFTER & BATTERY CASE ASSY. SILVER
6.1	1	1417949-1101060	CHASSIS GREEN PREASSEMBLED
6.1	1	1417949-9006	CHASSIS SILVER PREASSEMBLED
6.2	1	1418527	LIFTING UNIT PREASSEMBLED
6.3	1	1417955-9005	BATTERY FRAMES PREASSEMBLED
7	4	1419254	ANGULAR BALL BEARING 7202B 2RS
8	1	1422049-9005	FRONT FIXING LH
9	1	1422050-9005	FRONT FIXING RH
10	4	D60178	HEXAGON BOLT M8 X 12
11	4	G00107	WASHER 8.4 X 17 X 1.6
12	1	1421022-9005	TAXI STRAP

13	2	G00117	WASHER 10.5 X 21 X 2
14	2	D00094	HEX BOLT M10 X 50
15	1	1419333	BACK LIGHT SUPPORT LH
15	1	1421815	LIGHT SUPPORT LH WITH LUGGAGE CARRIER CUTOUT
16	1	1419334	BACK LIGHT SUPPORT RH
16	1	1421814	LIGHT SUPPORT RH WITH LUGGAGE CARRIER CUTOUT
17	2	1421650-9005	SIDE FIXING
-	4	D90187	CHEESE HEAD SCREW WITH ALLEN KEY HEAD M6 X 20
-	4	G00115	WASHER 6.4 X 12.5 X 1.6

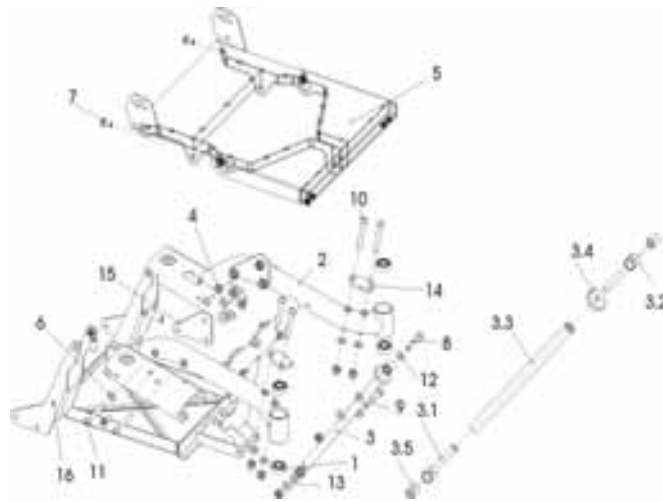
10.1.1 Service work to frame (chassis)



Note

Repair work to the frame (chassis) is easier to carry out if the complete seat unit has been dismantled beforehand (see page 97, chapt. 15.2.1).

10.2 Frame / Chassis (Storm³ Euro)



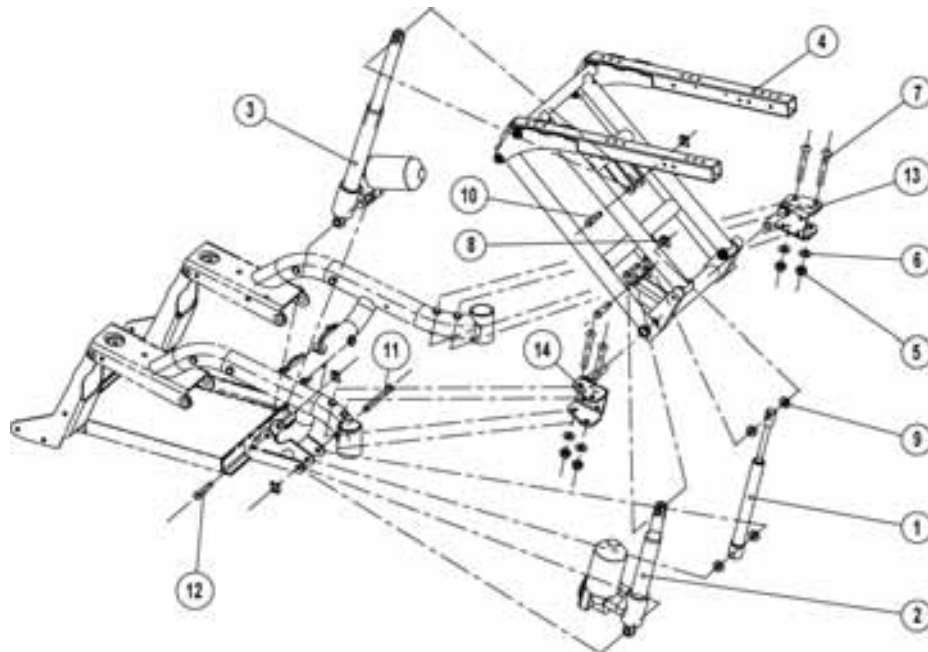
ITEM	Qty	Art. no./pcs.	Art. description
-	1	1430125	CHASSIS "EURO" ASSY.
1	4	1419254	ANGULAR BALL BEARING 7202B 2RS
2	1	1417949-9006	CHASSIS SILVER PREASSEMBLED
3	1	1430109	SPINDLE ASSY.
3.1	1	F16004A.89	SPINDLE LH
3.2	1	F16003A.89	SPINDLE RH
3.3	1	1430110-0004	SPINDLE HOUSING
3.4	1	F16006A-0004	KNURLED NUT
3.5	2	F364012	BUSH RD. 18 X 3.9 X 22
4	12	F20110	HEX NUT M10 SELF-LOCKING
5	1	1428501-9005	SEAT PLATE "EURO"
6	16	G00117	WASHER 10.5 X 21 X 2
7	4	5824273	BOLT M10 X 20
8	1	1430302	BOLT M10 X 50 DIN 912
9	1	1430303	BOLT M10 X 60 DIN 912
10	4	1430307	BOLT M10 X 70 DIN 7380
11	4	1419325	BOLT M10 X 75 DIN 7380
12	2	1430304	SPACER 10.5 X 21 X 2
13	2	1430305	SPACER 10.5 X 21 X 6
14	2	1430137-9005	BULB HOLDER "EURO"
15	2	1428920-9005	SEAT ATTACHMENT
16	1	1417955-9005	BATTERY FRAMES PREASSEMBLED

10.2.1 Service work to frame (chassis)

**Note**

Repair work to the frame (chassis) is easier to carry out if the complete seat unit has been dismantled beforehand (see page 97, chapt. 15.2.1).

10.3 Lifter



POS	QTY.	ITEM NO./PCS.	ITEM DESCRIPTION
-	1	1421764	LIFTER PREASSEMBLED
1	1	1419237	GAS-FILLED SPRING
2	1	1418526	MOTOR LA30.1L-50-24-001
3	1	1419400	MOTOR LA30.1S-150-24-002
4	1	1418527	LIFTER ASSY.
5	4	F20110	HEX NUT M10 SELF-LOCKING
6	4	G00117	WASHER 10.5 X 21 X 2
7	4	3908508	COUNTERSUNK SCREW WITH ALLEN KEY HEAD M8*16 10.9
8	5	K32395	SELF-LOCKING WASHER 10 MM
9	4	1419953	LINING
10	3	1419941-0003	BOLT
11	1	1419942-0003	BOLT
12	1	1419943-0003	BOLT
13	1	1418547-9005	BEARING PLATE LH
14	1	1418544-9005	BEARING PLATE RH



Note

Repair work to the lifter is easier to carry out if the complete seat unit has been dismantled beforehand (see page 97, **chapt. 15.2.1**).

Disassembly/reassembly of the spindles from the manual seat tilter or lifter is the same as described in the following chapters.

10.3.1 Replacing motor for electrical seat tilting



- Raise lifter (see page 72, chapt. 12.1.2).
- Remove battery cover (see page 71, chapt. 12.1.1).
- Remove the connecting plugs from the CLAM.
- Loosen cable connector (multi-use).
- Lever off locking washer (1) with screwdriver.
- Drive out the bolt.
- Unscrew hexagon cap nut (2).
- Remove the Allen screw and spacer (3).
- Remove seat tilt motor and replace.

10.3.2 Replacing the electrical lifter motor



ATTENTION: Danger of crushing!

When the lifter motor is disassembled, the gas pressure spring pushes the system upwards. This results in injury hazards to your hands!

- *Pay attention to your hands, not to be crushed!*

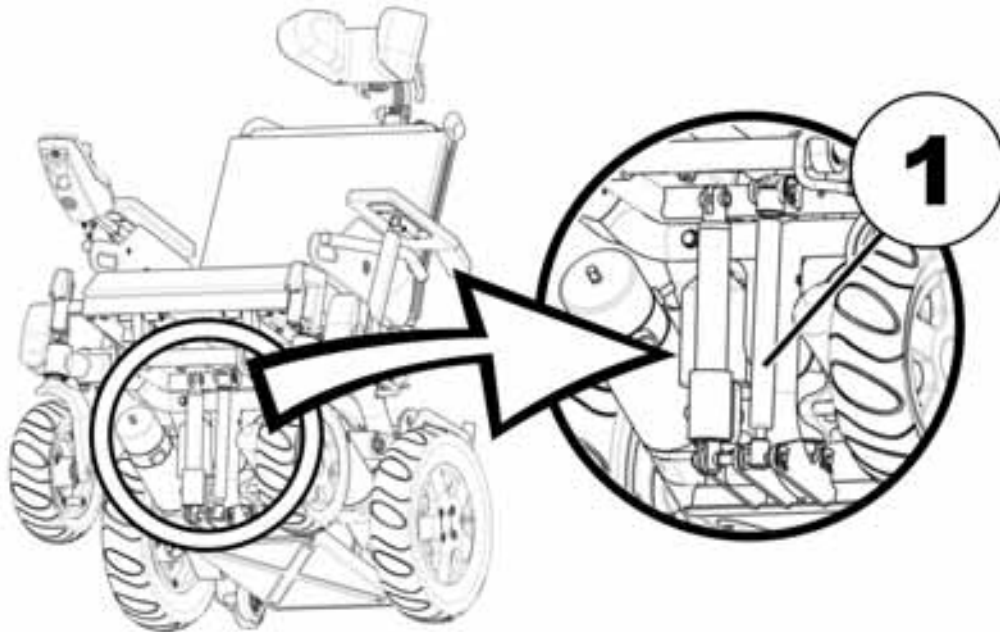


- Raise the lifter if necessary (see page 72, chapt. 12.1.2).
- Loosen the cable holder and withdraw the connecting plugs from the CLAM.
- Lever off locking washer (1) with screwdriver.
- Drive out the bolt.
- Lever off locking washer (2) with screwdriver.
- Drive out the bolt.
- Remove the lifter motor downwards to the left and replace.

Reassembling is done in reverse order.

10.3.3 Replacing the gas pressure spring for lifter support

The image below shows the position of the gas pressure spring (1).

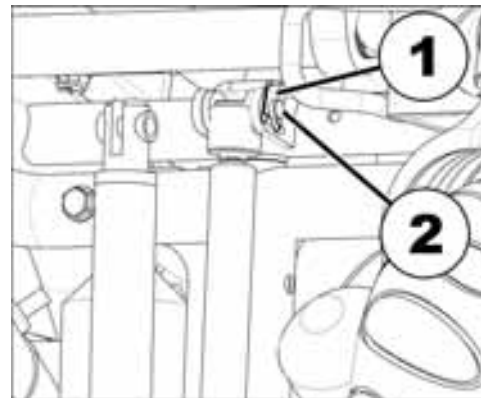


The gas pressure spring is fitted to the bottom piston rod.

Run the Lifter up if necessary.

Lever the top SL fuse (1) off using a screwdriver.

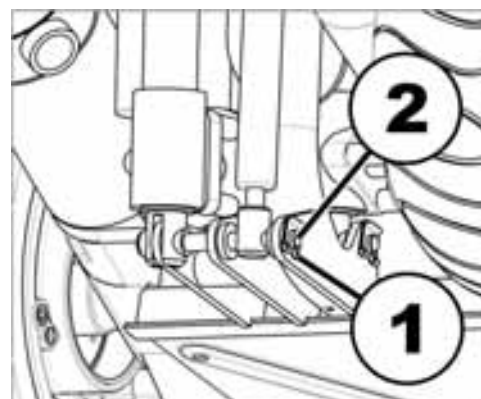
Remove the bolts (2).



Lever the bottom SL fuse (1) off using a screwdriver.

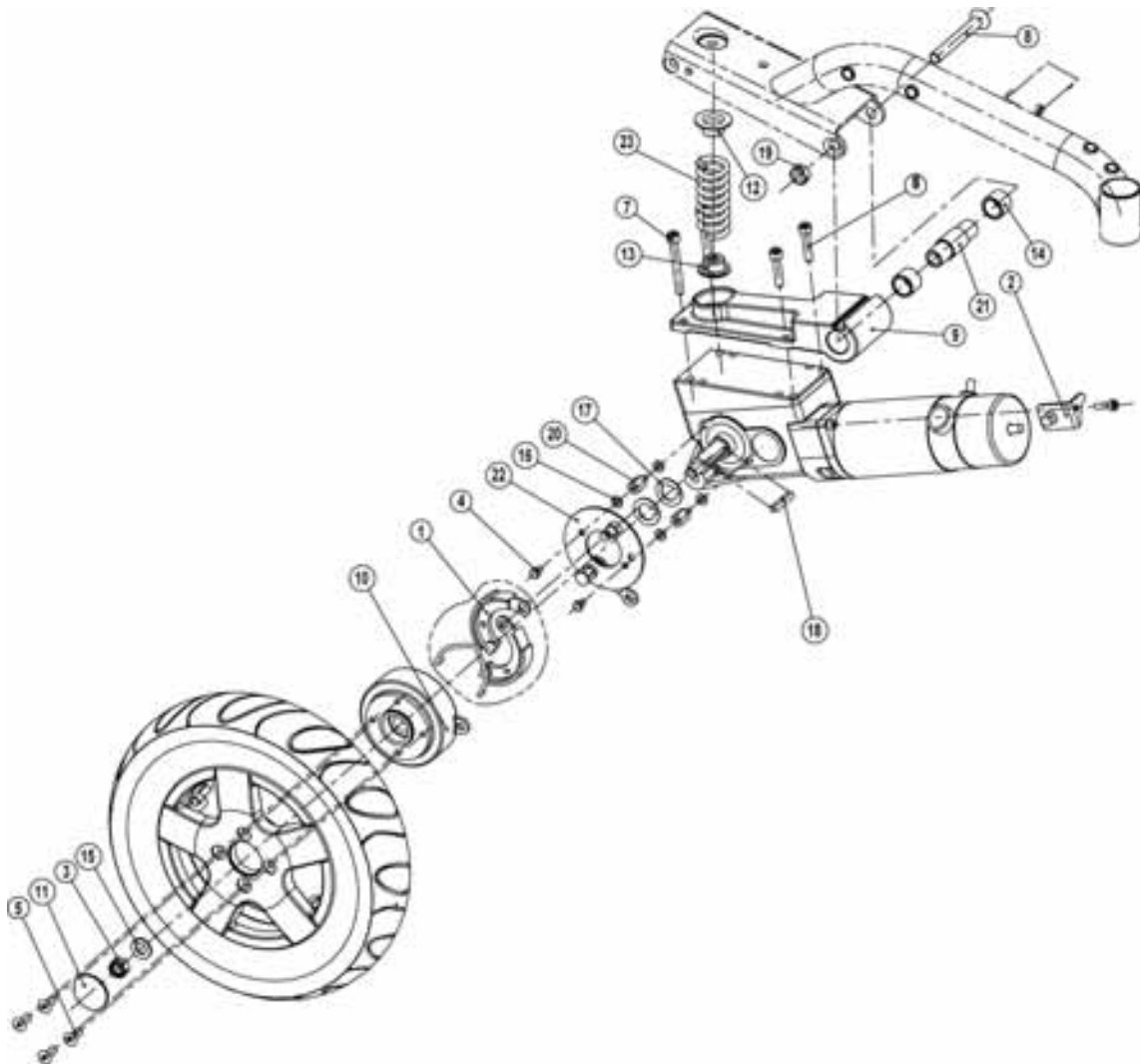
Remove the bolts (2).

Remove gas pressure spring and replace.



10.4 Drive unit, disengage lever, support wheels

10.4.1 Drive unit (conventional motors)



Pos	Qty.	Item No./Pcs.	Item Description
-	1	SP1421805	DRIVE UNIT 6 KM/H RH ASSY. (WITHOUT BRAKE)
-	1	SP1421804	DRIVE UNIT 6 KM/H LH ASSY. (WITHOUT BRAKE)
-	1	SP1421803	DRIVE UNIT 6 KM/H RH ASSY. (WITH BRAKE)
-	1	SP1421802	DRIVE UNIT 6 KM/H LH ASSY. (WITH BRAKE)
-	1	SP1421809	DRIVE UNIT 10 KM/H RH ASSY. (WITHOUT BRAKE)
-	1	SP1421808	DRIVE UNIT 10 KM/H LH ASSY. (WITHOUT BRAKE)
-	1	SP1421807	DRIVE UNIT 10 KM/H RH ASSY. (WITH BRAKE)
-	1	SP1421806	DRIVE UNIT 10 KM/H LH ASSY. (WITH BRAKE)
-	1	SP1421813	DRIVE UNIT 12 KM/H RH ASSY. (WITHOUT BRAKE)
-	1	SP1421812	DRIVE UNIT 12 KM/H LH ASSY. (WITHOUT BRAKE)
-	1	SP1421811	DRIVE UNIT 12 KM/H RH ASSY. (WITH BRAKE)

-	1	SP1421810	DRIVE UNIT 12 KM/H LH ASSY. (WITH BRAKE)
-	1	SP1423186	MOUNTING SET DRIVE UNIT ASSY.
8	1	1418519	BOLT M12 X 100 DIN 7991
19	1	1418520-0003	NUT M12
1	2	M30985	BRAKE BLOCK SET 90 X 18 (ANELLI)
2	1	1421654-0003	COUNTER-HOLDER RH
2	1	1421653-0003	COUNTER-HOLDER LH
-	1	SP1423443	MOUNTING SET WHEEL 3.00-8"
3	1	F00108	HEXAGON NUT M12 X 1.5 SELF-LOCKING
5	4	D60183	COUNTERSUNK SCREW WITH ALLEN KEY HEAD M8 X 20 PB
11	1	1415177	CAP WITH "INVACARE" LOGO
15	1	G00104	WASHER 13 X 24 X 2.5
4	2	D08109	HEX BOLT M6 X 10
6	2	1419287	BOLT M8 X 35 PB DIN 912
7	2	1419288	BOLT M8 X 65 PB DIN 912
9	1	1415192	LINK BLOCK
10	1	1415171	WHEEL HUB FOR BRAKE
-	1	1415172	WHEEL HUB STD.
14	2	1421760	SINTERED METAL BUSH
16	4	G00110	WASHER 6.4 X 12.5 X 1.6
17	2	1423164-0002	WASHER 19 MM WITH RECESS FOR FEATHER KEY
18	1	N23004	FEATHER KEY A 6 X 6 X 40
20	2	F331060	HEXAGONAL SPACER
21	1	1421761	AXLE
22	1	SP1415066	BRAKE ANCHOR PLATE PREASSEMBLED
22	1	SP1415067	BRAKE ANCHOR PLATE PREASSEMBLED
-	1	SP1423441	SPRING SET "HARD"
12	2	1418510	SPRING PLATE
12	4	1418510	SPRING PLATE
13	2	1420010	FITTING AID
13	4	1420010	FITTING AID
23	2	1422834	PRESSURE SPRING "HARD"
-	1	SP1423442	SPRING SET "SOFT"
23	2	1421841	PRESSURE SPRING SOFT
24	1	1421722	DRIVE UNIT 6 KM/H RH
24	1	1421721	DRIVE UNIT 6 KM/H LH
24	1	1421725	DRIVE UNIT 10 KM/H RH
24	1	1421724	DRIVE UNIT 10 KM/H LH
24	1	1421727	DRIVE UNIT 12 KM/H RH

24	1	1421726	DRIVE UNIT 12 KM/H LH
-	1	Z131035	SPARE PART BRAKE KIT RH FOR DRIVE P01061/3 (SCHMID)
-	1	Z131034	SPARE PART BRAKE KIT LH FOR DRIVE P01062/4 (SCHMID)
-	1	P09292	BRAKE COVER FOR DRIVE (02 SCHMID)
-	1	SP1423439	CARBON BRUSH SET SCHMID
-	2	P09293	CARBON BRUSHES FOR DRIVE (02 SCHMID)
-	1	F351007	ACS MOTOR PLUG ASSY.

10.4.2 Replacing drive unit, pressure spring



- Remove taxi strap if necessary by unscrewing all four screws.
- Remove battery cover (see page 71, chapt. 12.1.1).
- Remove the respective motor plug.
- Unscrew all plastic adjusting screws and dismantle the complete equipment rack (see page 93, chapt. 14.4.4).
- Dismantle disengage lever (see page 39, chapt. 10.4.4).
- Remove batteries (see page 71, chapt. 12.1.1).
- Dismantle the respective rear wheel (see page 63, chapt. 11.2.1).
- Dismantle the respective bulb holder (see page 77, chapt. 13.2.2).
- Pass a suitable screw through the diaphragm (1) to pretension the spring (M8 x 120).
- Unscrew the hex nut (2) and drive out the Allen key.
- Remove the drive unit with the rocker block (3) downwards and replace if necessary.
- Slacken the defective pressure spring (4) if necessary and replace.

10.4.3 Replacing carbon brushes

**Note**

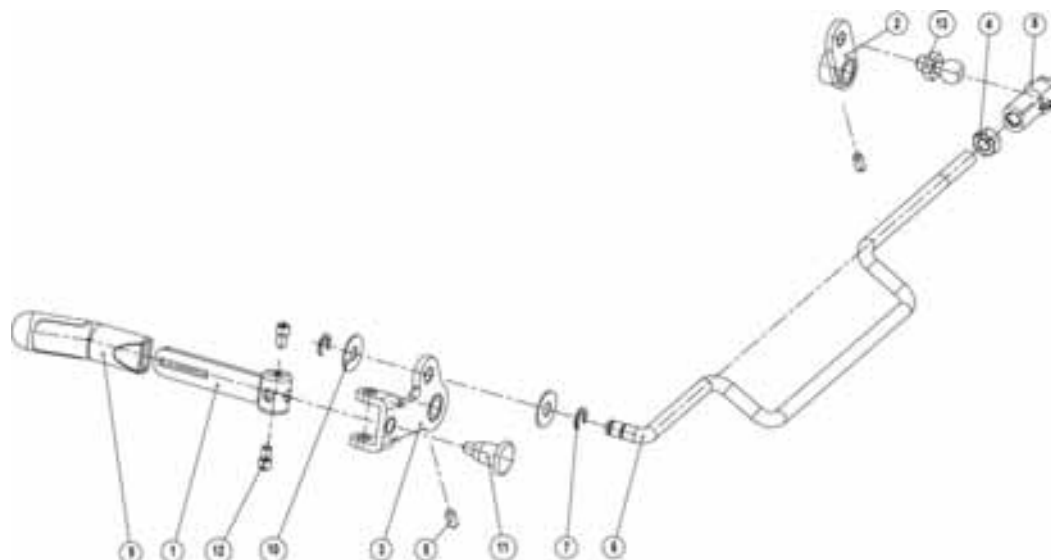
When replacing carbon brushes, ensure that the spring located behind the plastic cap does not get lost.



- Unscrew plastic cap (1).
- Lever the carbon brushes out with a screwdriver.
- Replace carbon brushes.

Reassembling is done in reverse order.

10.4.4 Disengage lever (conventional Motors)



Pos	Qty.	Item No./Pcs.	Item Description
-	1	1420009	DISENGAGING MECHANISM ASSY.
1	1	1419957-0003	BRAKE LEVER
2	1	1419958-0003	BRAKE LEVER 2
3	1	1419972-0003	BRAKE LEVER 1
4	1	F00114	HEXAGON NUT M8
5	2	D70106	GRUB BOLT M6 X 6
6	1	1419961-0003	CLUTCH ROD
7	2	G90091	LOCKING WASHER FOR NOMINAL DIAMETER 6 MM
8	1	5816488	BALL SEAT
9	1	5221280	HANDLE
10	2	G10502	WASHER 20 X 7.9 X 1
11	1	5006742	TENSION CLIP SMALL Only on chairs that were manufactured before March 1st, 2011
12	2	1420014	PILOT SCREW
13	1	1419956	BALL JOINT



NOTE:

Adjust the disengage lever after service work and check for correct functioning.

10.4.4.1 Replacing the disengage lever



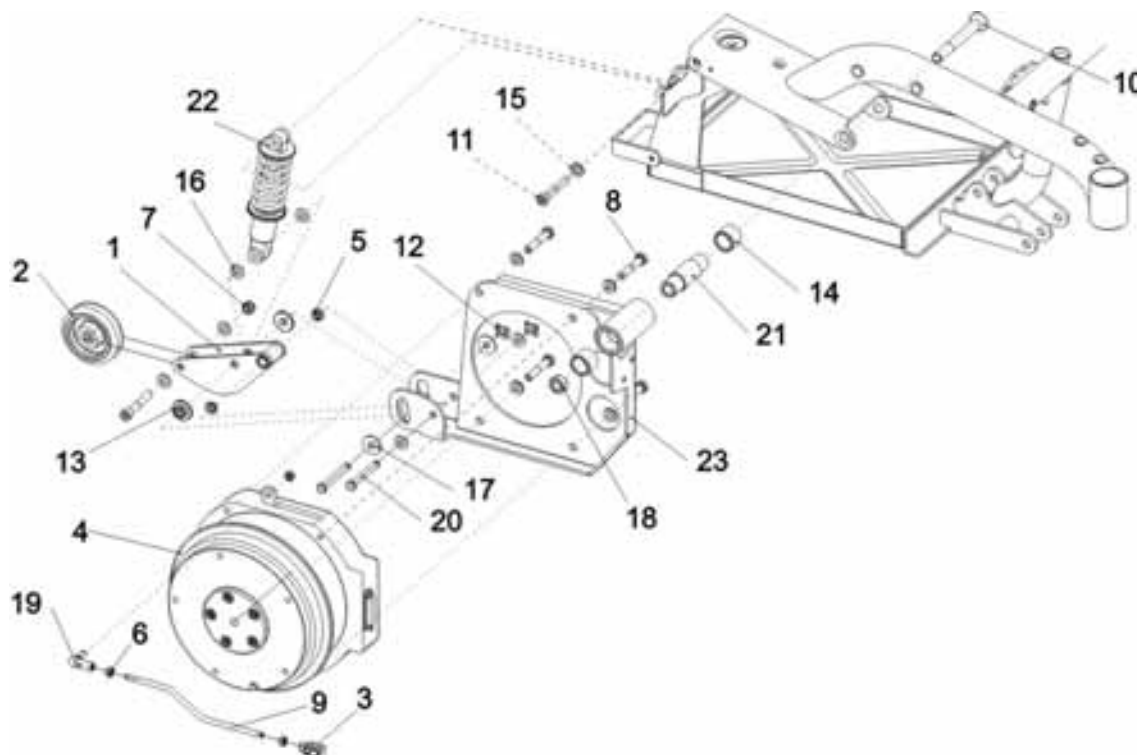
- Both motors must be engaged. The wheelchair must not be able to be pushed.
- Open the safety lock and lever off the Springfix ball seat (3).
- Loosen both fixing screws (1 and 2) of the levers on the motors.
- Lever both levers off the motors.
- Loosen the Springfix ball seat lock nut when reassembling, and lever off the ball seat safety lock.
- Push both adjustment levers onto the respective shafts. The levers must be parallel to each other, thus showing in the same direction.
- Put Loctite on both fixing screws and tight them.
- Screw on the lever with the handle (see illustration above) then screw on the left-hand lever.
- Both adjustment levers should lean to the right when viewed in the direction of travel.
- Turn the ball seat (3) until it is engaged with the ball joint.
- Press on the ball seat and close the safety lock.
- Tighten the lock nut.

10.4.4.2 Function check for disengage lever



- If present, pull the latches (2) and keep them pulled.
- Expand lever (1).
- Release snap.
- Raise the lever as far as the stop. The wheelchair is now disengaged and can be pushed.
- Press the lever downwards.
- Place the release lever below the carbon brushes.
- Check that the snap is once again fully engaged.
- The wheelchair is now in drive mode and should not be able to be pushed.
- If the disengage does not work, it must be readjusted (see page 40, chapt. 10.4.4.1).

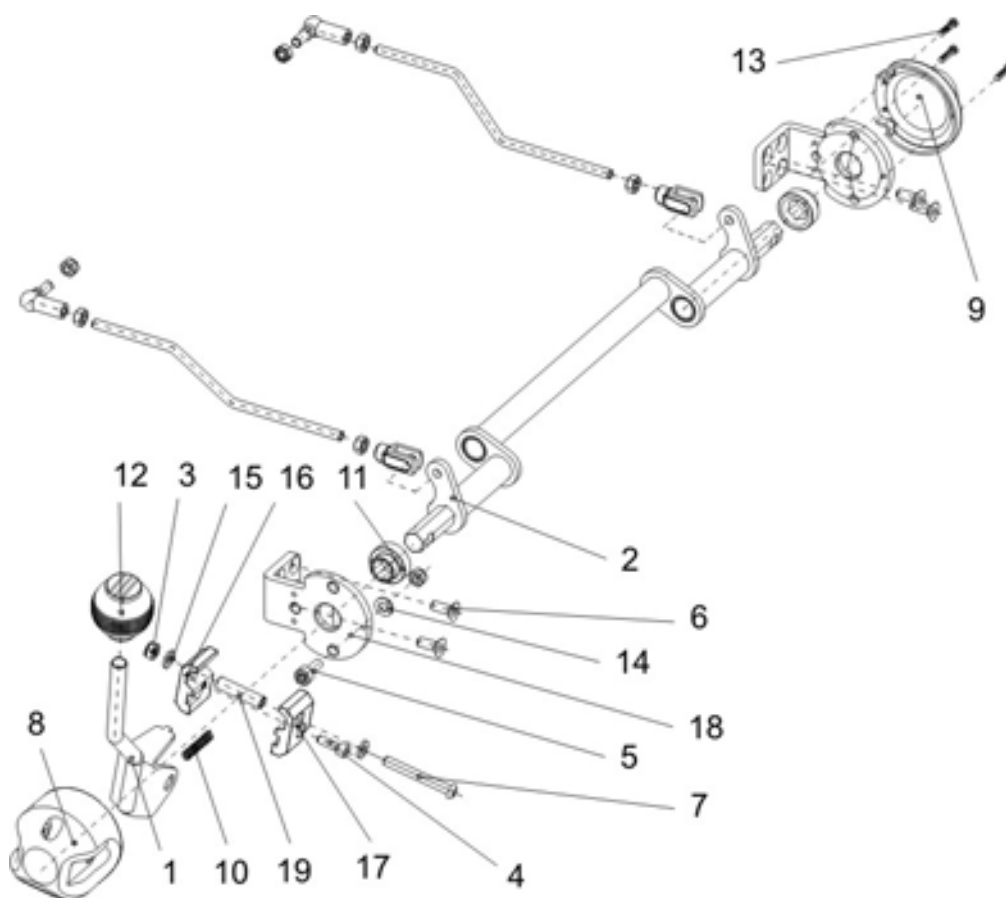
10.4.5 Drive unit (GB Motors)



Item	Qty	Part-No.	Part-Designation
-	-	INFO8	ONLY FOR STORM³ TRUE TRACK
-	1	1433534	DRIVE UNIT GEARLESS MOTORS CPL.
2	1	SP1428929	SUPPORT WHEEL
3	1	1430139	KNUCKLE JOINT
4	1	1433561	MOTOR GEARLESS LH
4	1	1433562	MOTOR GEARLESS RH
5	2	N02188	BUSH BB 0806 DU
6	3	F00103	HEX NUT M6
7	1	F00002	NYLOC NUT M8
8	4	D00102	AXLE BOLT M8 X 45
9	1	1430140-0002	PUSH BAR
10	1	1418519	SCREW M12 X 100, DIN 7991
11	2	1432970	BOLT M8x50 DIN912
12	2	1433559	SL-LOCK 8MM
13	2	1429355	BUSH
14	2	1421760	SINTERED METAL BUSH
15	5	5829220	NORTH HOLE WASHER 8 MM
16	6	G00107	WASHER 8,4 X 17 X 1,6
17	2	G10103	WASHER 8,4 X 25 X 2
18	1	1418520-0003	NUT M12
19	1	1430138	ANGLE JOINT M6 R

<i>Item</i>	<i>Qty</i>	<i>Part-No.</i>	<i>Part-Designation</i>
20	2	1429354	BOLT
21	1	1421761	SHAFT
22	1	1428928	SHOCK ABSORBER DV-22-165
23	1	1428930-9005	CRANK RH
-	-	INFO8	ONLY FOR STORM³ TRUE TRACK
-	1	1422840-9005	CRANK LH
-	1	SP1428930	CRANK RH CPL.
23	1	1428930-9005	CRANK RH
21	1	1421761	SHAFT
14	2	1421760	SINTERED METAL BUSH
-	1	SP1422840	CRANK LH CPL.
-	1	1422840-9005	CRANK LH
21	1	1421761	SHAFT
14	2	1421760	SINTERED METAL BUSH
-	1	SP1429557	ANTI-TIP HOLDER AND WHEEL CPL.
1	1	1429557-9005	TIP WHEEL HOLDER
2	1	1428929	ANTI-TIPPER
5	2	N02188	BUSH BB 0806 DU
7	1	F00002	NYLOC NUT M8
11	1	1432970	BOLT M8x50 DIN912
12	2	1433559	SL-LOCK 8MM
13	2	1429355	BUSH
15	2	5829220	NORTH HOLE WASHER 8 MM
16	2	G00107	WASHER 8,4 X 17 X 1,6
17	2	G10103	WASHER 8,4 X 25 X 2
20	2	1429354	BOLT

10.4.6 Disengage lever (GB Motors)



Item	Qty	Part-No.	Part-Designation
-	-	INFO8	ONLY FOR STORM³ TRUE TRACK
-	1	SP1431810	DISENGAGER TRUE TRACK CPL.
1	1	1430160-9005	ENGAGING LEVER
2	1	1431813-0003	ROTARY SHAFT
3	1	F20109	NYLOC NUT M6
4	1	1415042	SOCKET HEAD CAP SCREW M5 X 16
5	1	D50132	SOCKET HEAD CAP SCREW M6 X 16
6	4	D60111	COUNTERSUNK SOCKET HEAD SCREW M6 X 16
7	1	5824278	DIN 7380 M6x50 10.9 I-6Kt CHEESE HEAD SCREW
8	1	1430163	CAP 1 FOR CLUTCH MECHANISM
9	1	1430164	CAP 2 FOR CLUTCH MECHANISM
10	1	1430162-0002	COMPRESSION SPRING
11	2	1430406	BUSHING
12	1	1430147	HANDLE KNOB
13	3	H90993	CLIP 3,0 MM
14	1	G00110	WASHER 6,4 X 12,5 X 1,6
15	2	G00115	WASHER 6,4 X 12,5 X 1,6

Item	Qty	Part-No.	Part-Designation
16	1	1431805-0002	CLAMP SIDE 1
17	1	1431806-0002	CLAMP SIDE 2
18	2	1430158-0003	BEARING PLATE ROCKER
19	1	1430161-0002	BEARING TUBE

**Note**

Adjust the disengage lever after service work and check for correct functioning.

10.5 Replacing and calibrating a GB drive motor

The next two sections describe how to replace a GB motor, and then calibrate the new one. We recommend reading through the instructions once before beginning work.



Note

First check whether the vehicle is equipped with puncture-proof tyres or pneumatic tyres!

Depending on whether the vehicle is equipped with puncture-proof tyres or pneumatic tyres, the process of disassembly and re-assembly will be different! You can recognise puncture-proof tyres by the fact that they do not have a valve!

10.5.1 Replacing the motor



WARNING: Danger of crushing!

The mobility device is very heavy. Injury hazard to hands and feet!

- *You should seek help from a second person.*

Injury hazard caused by uncontrolled movement of the mobility device!

- *Switch the power supply off (ON/OFF key).*
- *Engage the drive.*
- *Before raising the vehicle, secure the wheels by blocking them with wedges.*



ATTENTION: Explosion hazard!

If the wheelchair is fitted with pneumatic tyres, the wheel can explode if the air is not released from the tyre before removing the wheel!

- *Always release the air from the wheel before you remove it. Depress the small tappet in the centre of the valve!*



WARNING: Uncontrolled movement!

The wheelchair will drive erratically if the GB Motors are not calibrated after being replaced!

- *Make sure to calibrate the GB Motors after replacing them!*



WARNING: Loss of a wheel!

If the bolts which secure the wheel are not tightened firmly enough, or if the threaded holes in the casing are damaged by being tightened too much, the wheel can come loose during travel!

- *Always position the nuts manually in their holes when fitting the drive wheels.*
- *Never use electrical or pneumatic screwdrivers !*
- *Tighten the Allen screws with a torque of 25 Nm !*
- *The Nordlock washers must be fitted exactly as they were before removal !*



Note

If motors become defective within their guarantee period, they will either be replaced or repaired on Invacare's decision. This guarantee does not cover pay for working hours. We also accept no liability for physical injuries or unauthorised repairs. Invacare's sole obligation and its exclusive remedy during this guarantee is limited to such repair and/or replacement measures.

**Requirements:**

- Wooden block to prop up the vehicle
- Allen key 6mm
- Allen key 4mm
- Small flat-bladed screwdriver
- Circlip pliers
- Loctite 243
- 2x combination wrench 13mm
- Hammer
- Chisel
- Torque wrench
- One new hexagonal dome headed bolt, M8, 20mm long, 5mm key size

Additional parts and tools for working on puncture-proof tyres

Tyre lubrication (soap-based)

3 screws M8 x 30 mm (for preliminary positioning of the rim during assembly)

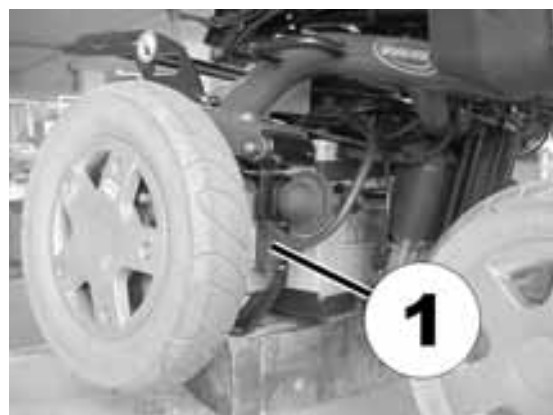
**Note**

Pay attention to small pieces, and the order in which the components are disassembled. Arrange them in an orderly fashion so they can easily be assembled again in the right order.

- Prop up the wheelchair by lifting it up on the side that you want to work on and then placing the wooden block underneath the battery box on that side.



- Use the small flat-bladed screwdriver to loosen the screws that hold the motor cable connection and disconnect the cable.



10.5.1.1 Disassembling the tyre and rim on a vehicle with pneumatic tyres



ATTENTION: Explosion hazard!

If the wheelchair is fitted with pneumatic tyres, the wheel can explode if the air is not released from the tyre before removing the wheel!

- Always release the air from the wheel before you remove it. Depress the small tappet in the centre of the valve!

- Unscrew valve cap.
- Depressurise tyre by pressing in the pin in the valve (1).
- Unscrew 5 screws (2) using the 6mm Allen key.
- Remove the wheel rim half with the inner tube.



10.5.1.2 Disassembling the rim and the tyre on a vehicle with puncture-proof tyres



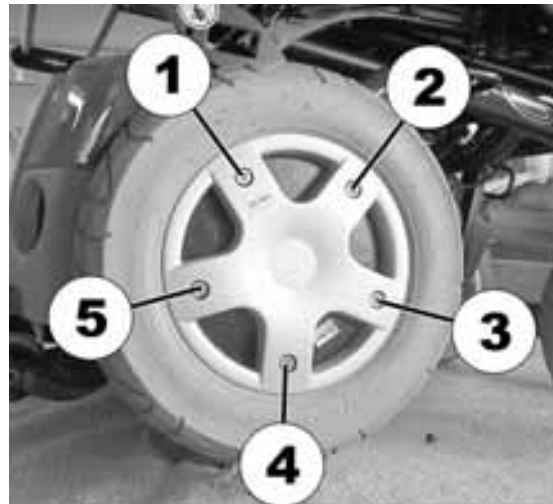
WARNING!

Danger of damage to the motor if the screws are not loosened and removed in the correct sequence!

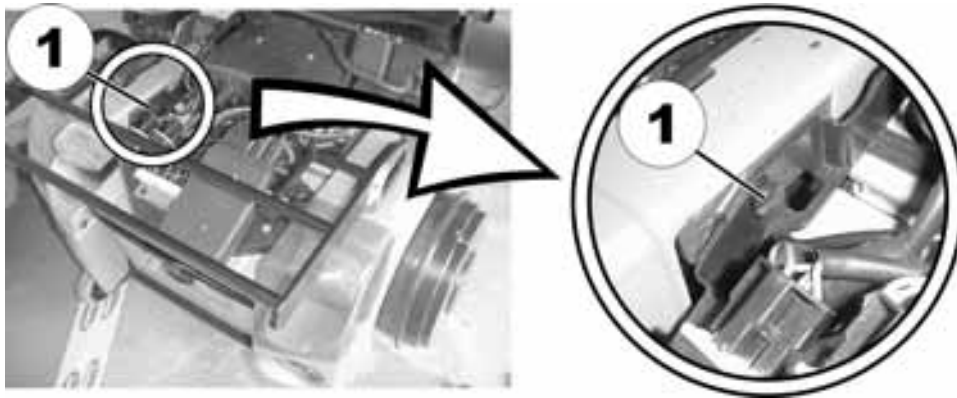
- Make sure you loosen and remove the screws in the correct sequence!

Screws 1 to 5 must be loosened and removed in a particular sequence in relation to each other. There is no pre-defined numbering for the screws. There is, for example, no screw with the pre-defined number "1". For this reason, you can start with any screw. This will then be "number 1". "Number 2" is then the screw next to it in a clockwise direction, "3" is the next and so on.

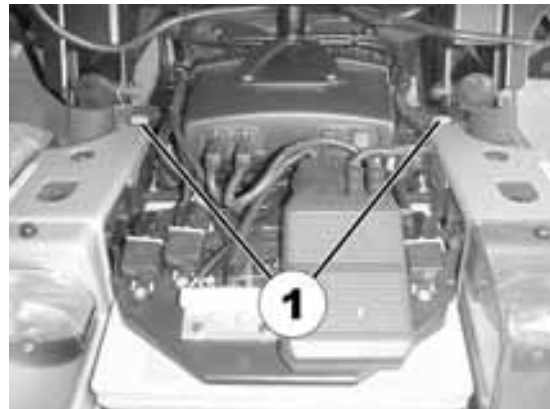
- Loosen and remove screws 1 and 3, using the 6mm Allen key.
- Loosen screws 2, 4 and 5 a single turn each, one after the other, going from screw to screw in a clockwise direction, until they have all been completely loosened and removed..
- Remove the rim-half and the puncture-proof inlay from the wheel.



10.5.1.3 Proceed with removing the motor



- Remove the battery cover.
- Loosen the screws that secure the electronics holder (1) (present on both sides; the picture shows the screw on the left side for orientation purposes) with the large flat-bladed screwdriver.
- Remove the plastic pins (1) with a flat-bladed screwdriver (the luggage rack has been removed in this picture for better visibility)



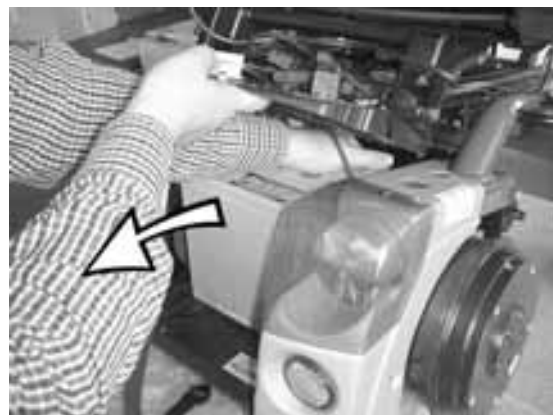
- Loosen the screws that hold the battery pole connectors and disconnect them from the battery poles.



- Loosen the battery fixation belt.



- Pull the batteries out.



- Release the fixation clip of the declutching rod.





WARNING! Danger of injury and danger of damage to the vehicle!
Keep in mind the heavy weight of the GB motors during disassembly!

- Loosen and remove the four fixation screws (1) of the motor.
- Remove the motor.



- Remove the folding spring bolt of the declutching rod.
- Attach the declutching rod to the new motor.



- The drive unit is re-assembled in the reverse order.
- Tighten the wheel screws to 25 Nm.

10.5.1.4 Reassembling the rim and the tyre on a vehicle with pneumatic tyres

- Re-position the inner-tube in the tyre.
- Re-fit the rim-half.
- Position the screws and tighten them a little.
- Fill the inner-tube with a little air.
- Tighten the screws that hold the rim.
- Check to make sure the tyre is fitted snugly to the rim.
- Pump up the tyre to 3 Bar air pressure.
- Check again to make sure the tyre fits rim correctly.
- Screw on the valve cap.

10.5.1.5 Reassembling the rim and the tyre on a vehicle with puncture-proof tyres

- To reassemble a tyre with a puncture-proof core, you will need to coat the inner and outer edges of the tyre (1 and 3) and the inner surface of the puncture-proof inlay (2) with tyre lubrication.



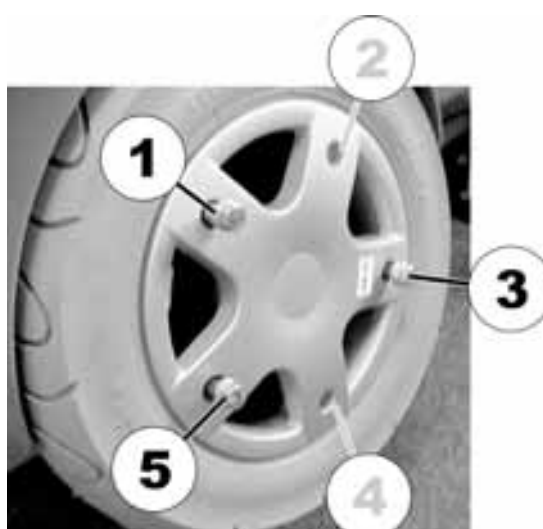
- Push the tyre with the puncture-proof inlay onto the motor (rotor casing)



- Position the rim-half in the tyre. The holes for the screws in the rim-half and the ones in the rotor casing need to be aligned with each other. It can be helpful to align the notch in the rim-half and the one in the rotor casing where the valve would usually be, using them as a positioning guide.

- Insert the three M8 x 30mm screws at positions 1, 3 and 5 and tighten them by hand.

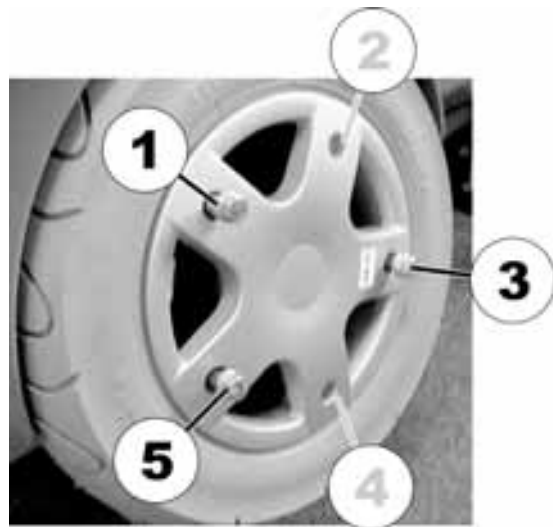
- Tighten screws 1, 3 and 5 **one turn**, one after the other, going from screw to screw in a clockwise direction, until 8 Nm are attained. (if necessary, check this value with a torque wrench). **This is necessary to pull the rim up flush with the rotor casing in a straight manner, not crooked.**



- Position two of the original M8 x 25 screws mm at positions 2 and 4 and tighten them by hand (max. 8 Nm).



- Remove the temporary M8 x 30 mm screw at **Position 5**: Re-position the original M8 x 25 mm screw and tighten by hand (max. 8 Nm).
- Remove the temporary M8 x 30 mm screw at **Position 1**: Re-position the original M8 x 25 mm screw and tighten by hand (max. 8 Nm).
- Remove the temporary M8 x 30 mm screw at **Position 3**: Re-position the original M8 x 25 mm screw and tighten by hand (max. 8 Nm).
- Tighten all screws to 25 Nm.



10.5.2 Calibrating GB motors

The following sections explain the calibration process with the handheld programming device.



Injury hazard! The wheelchair starts to move in an uncontrolled manner if one or both of the drive wheels is touching the ground during calibration!

It is absolutely imperative to get BOTH drive wheels off the ground before calibrating, not just on one side!



Requirements:

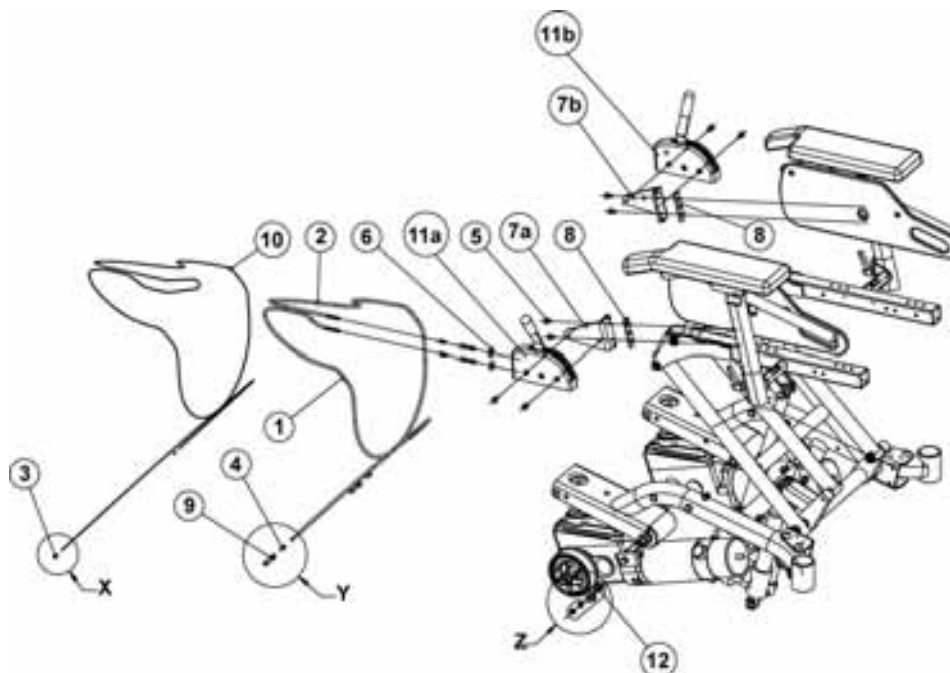
- Dynamic DX HHP" handheld programming device
- Prop up the wheelchair with wooden blocks. The drive wheels must not be touching the floor or the work surface.
- Connect the programming device. Programming device displays:

The programming device shows the following:	You should enter this:
DX HHP V1.20 Select a language... GB D NL S	"GB"
View or edit System? YES ? DIAG TECH	"TECH"
Technician mode Enter Password 000 EXIT D1 D2 D3	Enter code "592" with keys D1 to D3, then select "EXIT".
Technician mode Master JS Module JOYSTICK CALIBRATION EXIT YES NEXT	"NEXT"
** MAIN MENU ** View or edit GB Power Module ? NEXT YES	"YES"
GB Controller Torque XX % EXIT NEXT DOWN UP	"NEXT"
GB Controller Tremor Damping XX % EXIT NEXT DOWN UP	"NEXT"

The programming device shows the following:	You should enter this:
GB Controller Speed Progression XX % EXIT NEXT DOWN UP	"NEXT"
GB Controller Turn Progression XX % EXIT NEXT DOWN UP	"NEXT"
GB Controller Calibrate Motors? EXIT NEXT YES	"YES"
GB MOTOR CALIBRATION Wheels will move! Drive wheels raised? EXIT YES	"YES" (if drive wheels have been raised)
GB MOTOR CALIBRATION Chair will drive! Are wheels raised? EXIT YES	"YES" (if drive wheels have been raised)
GB MOTOR CALIBRATION -BEGIN- to start. Wheels will drive! EXIT BEGIN	"BEGIN" (if drive wheels have been raised)
GB MOTOR CALIBRATION in progress Please wait.	No entry required. Wait till end of calibration.
GB MOTOR CALIBRATION Successful! EXIT	"EXIT"

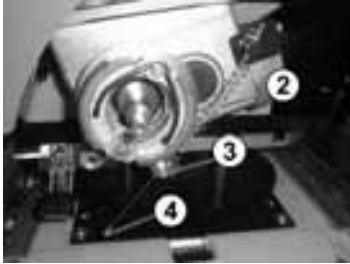
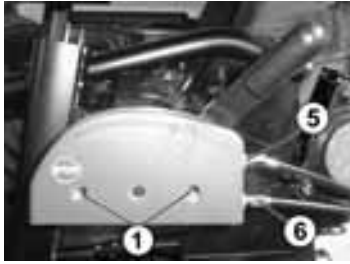
- Separate the programming device from the wheelchair. Calibration is complete.

10.6 Wheel lock



Pos	Qty.	Item No./Pcs.	Item Description
-	1	1422850	WHEEL LOCK RH ASSY.
-	1	1422851	WHEEL LOCK LH ASSY.
-	1	SP1423473	BOWDEN CABLE SET ASSY.
1	1	M30973	BOWDEN CABLE SHEATH L=1130 MM
2	1	M30974	BOWDEN CABLE SHEATH L=1470 MM
3	2	L01995	END CAP FOR BOWDEN CABLE INNER
4	4	M30047	END CAP FOR BOWDEN CABLE SHEATH
10	1	M30972	BOWDEN CABLE INNER L=3200 MM
12	2	M30055	CABLE CLAMP BOLT 6 MM
5	4	5723905	BOLT M6 X 12
6	2	G00107	WASHER 6.4 X 18 X 1.6
7 A	1	1422894-9005	BRAKE BOX HOLDER RH
7 b	1	1422895-9005	BRAKE BOX HOLDER LH
8	1	1421720-0002	GROOVED SHEET
9	4	M30050	REGULATING BOLT M6 X 24
11 A	1	SPF331038	BRAKE RH PREASSEMBLED
11 b	1	SPF331028	BRAKE LH PREASSEMBLED

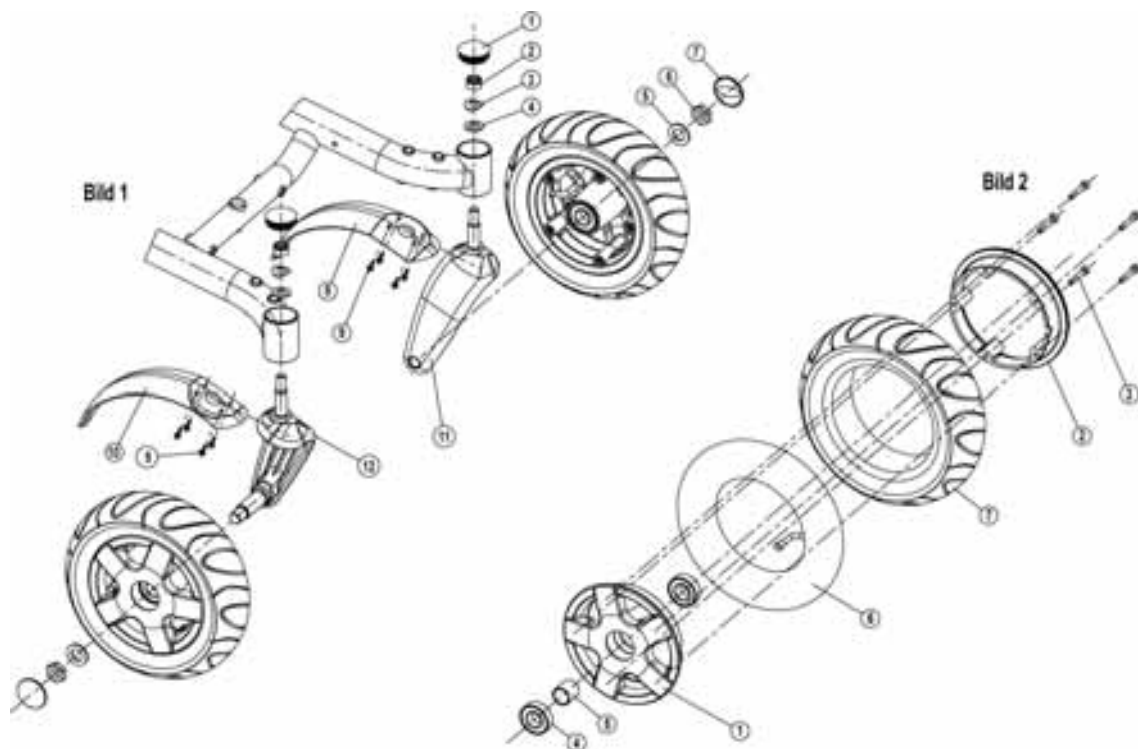
10.6.1 Replacing wheel lock / Bowden cable



- Dismantle the drive wheel on the side where the brake lever is (see page 63, chapt. 11.2.1).
- Loosen the clamping screw (3) on the brake anchor plate.
- Cut off the Bowden cable inner end cap (4) with oblique pliers.
- Dismantle the Bowden cable inner and put out of the brake housing (remove spring).
- Unscrew both Phillips screws (1) out of the brake housing.
- Remove the brake housing.
- When reassembling, thread the Bowden cable inner so that it is fed into the Bowden cable sheath centrally over the roller.
- Thread the Bowden cable inner in the clamping screw (3) through the spring (2).
- Pretension the clamping lever.
- Press on the end cap (4) and crimp in place with the oblique pliers.
- Adjust the brakes by loosening the lock nut (5) and the regulating screw (6) on the brake housing.

11 Wheels

11.1 Steering wheels / front wheels 3.00 – 6 / front wheel suspension



Pos	Qty.	Item No./Pcs.	Item Description
-	1	1422928	FRONT WHEEL SUSPENSION ASSY.
-	1	SP1423178	MOUNTING SET FRONT WHEEL FORK
1	1	1421687	SLIDER SL 42
2	1	F00108	HEXAGON NUT M12 X 1.5 SELF-LOCKING
3	1	G40102	SPRING WASHER 24 X 13 X 1.2 SHAPE A
4	1	G00104	WASHER 13 X 24 X 2.5
5	1	G00105	WASHER 17 X 30 X 3
6	1	1418054	NUT M16 X 1.5 ISO 4035
7	1	1415177	CAP WITH "INVACARE" LOGO
-	1	SP1423179	MOUNTING SET SPLASH PROTECTION LH
8	1	1419245	SPLASH PROTECTION LH
9	4	D90188	SELF-TAPPING SCREW WITH CHEESE HEAD 4.2 X 13
-	1	SP1423180	MOUNTING SET SPLASH PROTECTION RH
10	1	1419246	SPLASH PROTECTION RH
9	4	D90188	SELF-TAPPING SCREW WITH CHEESE HEAD 4.2 X 13
11	1	SP1422771	WHEEL FORK LH
12	1	SP1422772	WHEEL FORK RH

Figure 2			
-	2	SP1418531	WHEEL 3.00-6" PNEUMATIC; GREY ASSY.
-	2	SP1419256	WHEEL 3.00-6" PNEUMATIC; BLACK ASSY.
-	2	SP1422932	WHEEL 3.00-6" PUNCTURE-PROOF; GREY ASSY.
-	2	SP1422933	WHEEL 3.00-6" PUNCTURE-PROOF; BLACK ASSY.
-	1	SP1423181	MOUNTING SET WHEEL RIM 6" ASSY.
1	1	1418524-0307	RIM RING 6" EXTERNAL
2	1	1418523-0307	RIM RING 6" INTERNAL
3	5	D50117	MACHINE SCREW WITH ALLEN KEY HEAD M6 X 35
-	1	SP1423182	BEARING SET WHEEL RIM 6" ASSY.
4	2	1417943	DEEP GROOVE BALL BEARING 6004-2SRSR
5	1	1415178-0002	SPACER LINING
6	1	1415175	INNER TUBE 3.00 X 6 90° TR 87
7	1	1418532	TYRE 3.00-6", GREY
7	1	1419226	TYRE 3.00-6", BLACK
-	2	SP1418534	WHEEL 3.00-8" PNEUMATIC; GREY ASSY.
-	2	SP1419258	WHEEL 3.00-8" PNEUMATIC; BLACK ASSY.
-	2	SP1421829	WHEEL 3.00-8" PUNCTURE-PROOF; GREY ASSY.
-	2	SP1421831	WHEEL 3.00-8" PUNCTURE-PROOF; BLACK ASSY.
-	2	SP1421801	WHEEL 3.00-8" TRELLEBORG; GREY ASSY.
-	2	SP1421833	WHEEL 3.00-8" TRELLEBORG PUNCTURE-PROOF; GREY ASSY.
-	1	M12016	INNER TUBE 3.00-8" WITH VALVE TR 87-90/90°
-	1	1415173	TYRE 3.00-8", GREY
-	1	1419257	TYRE 3.00-8", BLACK
-	1	M11968	TYRE 3.00-8" STOLLE; GREY
-	5	D50120	MACHINE SCREW WITH ALLEN KEY HEAD M6 X 40
-	4	1419329-0307	RIM RING 8" INTERNAL
-	1	1418522-0307	RIM RING 8" EXTERNAL
-	1	1419340	MAGNET RUBBER
-	1	P30497	CIRCULAR MAGNET 6 X 25

Lay the vehicle down on its side on a relatively firm underlay, or place wooden blocks under the frame so that the castor wheels are not loaded.

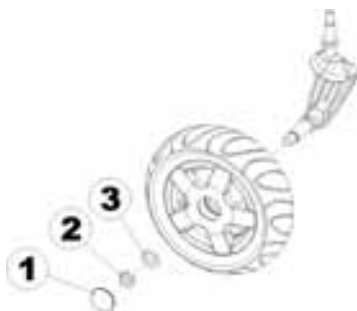
11.1.1 Replacing castor wheel / front wheel



WARNING!

Danger of accident or injury if a wheel falls off during travel due to incorrect reassembly!

- Secure the wheel bolt nuts during reassembling using products such as Vibratite VC3 or Loctite 243



- Lever off cap (1) with screwdriver.
- Unscrew nut (2).
- Remove washer.
- Remove wheel.
- When reassembling, secure the nut using Loctite (e.g. 243).

11.1.2 Replacing wheel rim halves



Note

Pneumatic tyres have black valve caps. Puncture-protected tyres have red valve caps

In case of pneumatic tyres:



ATTENTION: Explosion hazard!

If the wheelchair is fitted with pneumatic tyres, the wheel can explode if the air is not released from the tyre before removing the wheel!

- Always release the air from the wheel before you remove it. Depress the small tappet in the centre of the valve!

In case of puncture protected tyres:



CAUTION!

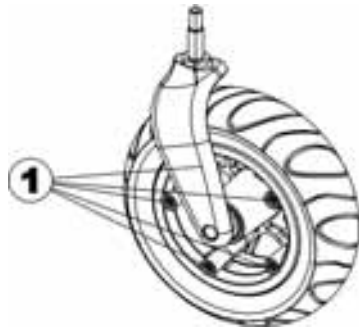
Material damage hazard. The valve can become blocked by the puncture protection gel and be unusable!

- During the following work you should always hold the valve up so that the puncture protection gel cannot enter the valve.



- Remove the front wheel (see above).
- Unscrew all Allen screws (1) and remove both wheel rim halves from the tyre.
- Remove wheel rim halves and replace.

11.1.3 Repairing / replacing tyres or inner tube



- Remove the front wheel (see page 59, chapt. 11.1.1).
- Unscrew all Allen screws (1).
- Remove the tyre with inner tube from the wheel rim halves.
- Repair inner tube and replace, or insert new.

Reassembling is done in reverse order.



Note

If the old inner tube is repaired and re-used, and has become wet during repair, you can make replacement easier by sprinkling the inner tube with a little talcum powder.

- Insert the wheel rim halves from outside into the tyre.
- Pump up the tyres a little.
- Insert the Allen screw once again, and screw the wheel rims together tightly.
- Check that the tyre is seated correctly once again.
- Pump the tyre up to the prescribed pressure.
- Check that the tyre is seated correctly once again.
- Screw the valve cap back on.
- Refit the wheel.

11.1.4 Replacing the wheel fork



CAUTION!

Incorrect reassembly can damage the bearings or cause the steering wheels to fall out!

- *The single-row angular ball bearings are not the same on either side! For this reason they may only be fitted with the correct side toward the outside (visible)!*
- *Follow the fitting manual correctly!*



- Remove the front wheel.
- Lever the plastic cap off with a screwdriver.
- Unscrew hexagon cap nut.
- Remove washer and spring washer.
- Remove the front wheel with wheel fork downwards.

**IMPORTANT ASSEMBLY INFORMATION!**

The illustrations show the wide border of the running ring outside (A) and the narrow border on the inside (B).

The bearings always need to be fitted so that the narrow edges are facing each other (inside)! The steering head bolts and nuts must always be pressing against the wide outside edges!

Otherwise, the bearings will be pressed apart by the pressure of the bolt.



The steering wheels should be able to turn freely after fitting, but the bearings should have no play.

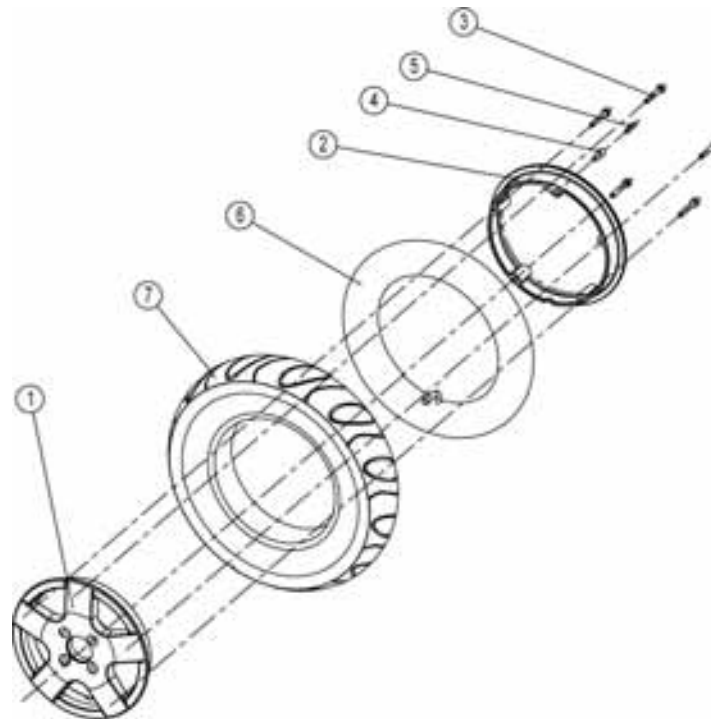
- First tighten the bolts to 20 Nm +/- 2 Nm.
- Loosen the nuts a little.
- Then retighten to 15 Nm +/- 1.5 Nm

11.1.5 Replacing deep groove ball bearings

- Remove the front wheel (see page 59, chapt. 11.1.1).
- Lever the plastic cap (1) off with a screwdriver.
- Unscrew hexagon cap nut (2). When reassembling, secure the nut using Loctite (e.g. 243).
- Remove the washer (3).
- Carefully tap the deep groove ball bearing (4) out.
- Place the spacer bushes (5) between the bearings and press in new deep groove ball bearings using a drill guide.

Reassembling is done in reverse order.

11.2 Drive wheels 3.00 – 8 (conventional motors)



Pos	Qty.	Item No./Pcs.	Item Description
-	2	SP1418534	WHEEL 3.00-8" PNEUMATIC; GREY ASSY.
-	2	SP1419258	WHEEL 3.00-8" PNEUMATIC; BLACK ASSY.
-	2	SP1421829	WHEEL 3.00-8" PUNCTURE-PROOF; GREY ASSY.
-	2	SP1421831	WHEEL 3.00-8" PUNCTURE-PROOF; BLACK ASSY.
-	2	SP1421801	WHEEL 3.00-8" TRELLEBORG; GREY ASSY.
-	2	SP1421833	WHEEL 3.00-8" TRELLEBORG PUNCTURE-PROOF; GREY ASSY.
-	1	SP1423184	MOUNTING SET WHEEL RIM 8" ASSY.
1	1	1418522-0307	RIM RING 8" EXTERNAL
2	4	1419329-0307	RIM RING 8" INTERNAL
3	5	D50120	MACHINE SCREW WITH ALLEN KEY HEAD M6 X 40
-	1	SP1423185	MOUNTING SET TACHO DRIVE ASSY.
4	1	1419340	MAGNET RUBBER
5	1	P30497	CIRCULAR MAGNET 6 X 25
6	1	M12016	INNER TUBE 3.00-8" WITH VALVE TR 87-90/90°
7	1	1415173	TYRE 3.00-8", GREY
7	1	1419257	TYRE 3.00-8", BLACK
-	1	M11968	TYRE 3.00-8" STOLLE; GREY

11.2.1 Replacing the drive wheels (conventional motors)

Lay the vehicle down on its side on a firm surface, or place wooden blocks under the frame so that there is no weight on the castor wheels.



Only use original tyres, see spare parts catalogue!

- Unscrew all Allen screws (1).
- Remove the drive wheel from the wheel hub and replace.
- When reassembling the drive wheel Allen keys, tighten them to 30 Nm and secure using Loctite 243 or a similar product.

Caution: do not loosen the central nut!



Note

Pneumatic tyres have black valve caps. Puncture-protected tyres have red valve caps

In case of pneumatic tyres:



ATTENTION: Explosion hazard!

If the wheelchair is fitted with pneumatic tyres, the wheel can explode if the air is not released from the tyre before removing the wheel!

- *Always release the air from the wheel before you remove it. Depress the small tappet in the centre of the valve!*

In case of puncture protected tyres:



CAUTION!

Material damage hazard. The valve can become blocked by the puncture protection gel and be unusable!

- *During the following work you should always hold the valve up so that the puncture protection gel cannot enter the valve.*

11.2.2 Replacing wheel rim halves



- Remove the drive wheel (see above).
- Unscrew all Allen screws (2) and remove both wheel rim halves from the tyre.
- Remove wheel rim halves and replace.

11.2.3 Repairing / replacing tyres or inner tube



- Remove the drive wheel (see above).
- Unscrew all Allen screws (2).
- Remove the tyre with inner tube from the wheel rim halves.
- Repair inner tube or tyre and replace, or insert new.

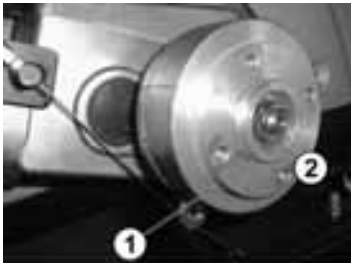


Note

If the old inner tube is repaired and re-used, and has become wet during repair, you can make replacement easier by sprinkling the inner tube with a little talcum powder.

- Insert the wheel rim halves from outside into the tyre.
- Pump up the tyres a little.
- Insert the Allen screw once again, and screw the wheel rims together tightly.
- Check that the tyre is seated correctly once again.
- Pump the tyre up to the prescribed pressure.
- Refit the wheel.

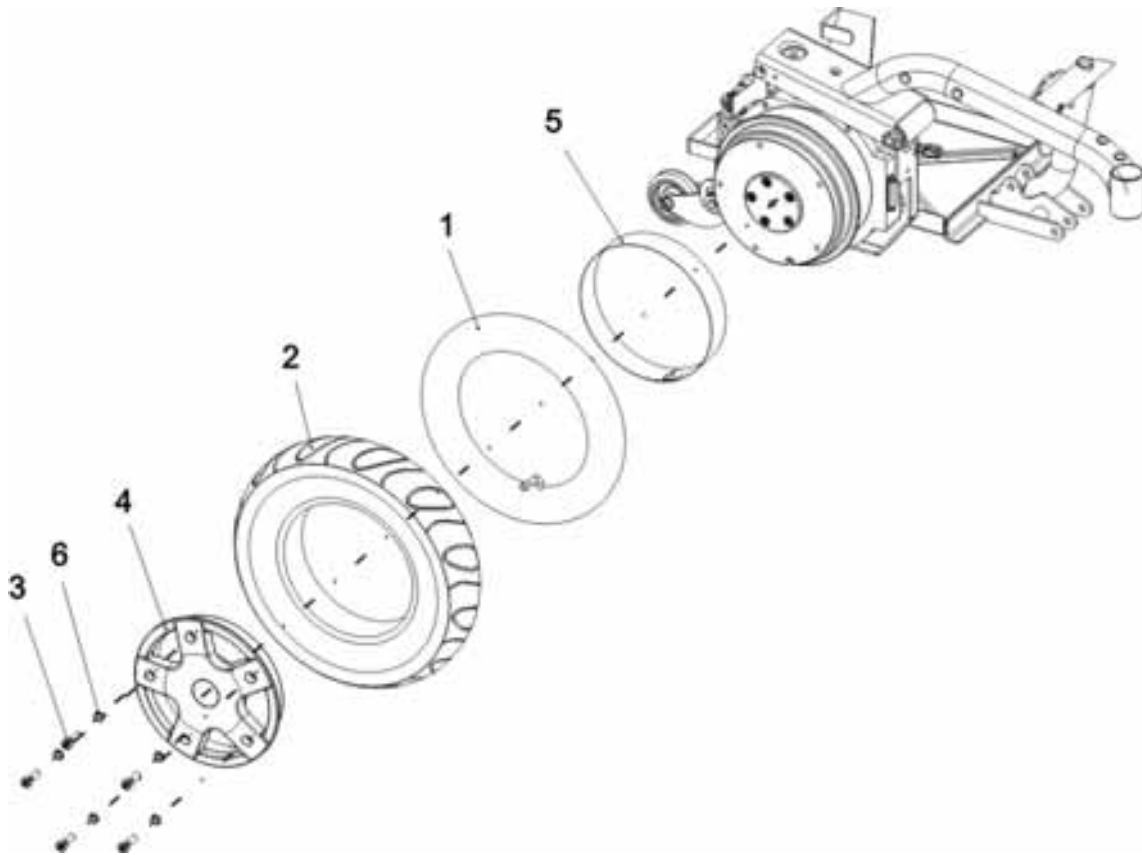
11.2.4 Replacing wheel hubs, brake linings



- Dismantle drive wheel (see page 63, chapt. 11.2.1).
- Unscrew hex nut (2) and remove washer.
- When reassembling, tighten the nut to a maximum of 60 Nm and secure it with Loctite (e.g. 243).
- Remove the wheel hub (1) and replace. Ensure that the feather key is seated correctly.
- Slacken the torsion spring (3) behind this and remove it.
- Pull off the brake linings (4) and replace.

Reassembling is done in reverse order.

11.3 Drive wheels 3.00 – 8 (GB motors)



<i>Item</i>	<i>Qty</i>	<i>Part-No.</i>	<i>Part-Designation</i>
-	-	INFO8	ONLY FOR STORM³ TRUE TRACK
-	1	1433537	REAR WHEEL FOR GEARLESS MOTORS
1	1	M12016	INNER TUBE 3.00-8 WITH VALVE TR 87-90/90
2	1	1415173	COVER 3.00-8", GREY
2	1	1419257	COVER 3.00-8", BLACK
2	1	M11968	TYRE 3.00X8", STOLLE, (TRELLEBORG), GREY
3	5	5723604	SCREW M8 X 25
4	1	1429347-0307	REAR WHEEL RIM OUTER
5	1	1433532	INNER TUBE PROTECTIVE FILM

11.3.1 Repairing / replacing tyres or inner tube (GB Motors) (procedure also applies to replacing a rim)



Note

Pneumatic tyres have black valve caps. Puncture-protected tyres have red valve caps

In case of pneumatic tyres:



ATTENTION: Explosion hazard!

If the wheelchair is fitted with pneumatic tyres, the wheel can explode if the air is not released from the tyre before removing the wheel!

- Always release the air from the wheel before you remove it. Depress the small tappet in the centre of the valve!

In case of puncture protected tyres:



CAUTION!

Material damage hazard. The valve can become blocked by the puncture protection gel and be unusable!

- During the following work you should always hold the valve up so that the puncture protection gel cannot enter the valve.



WARNING: Loss of a wheel!

If the bolts which secure the wheel are not tightened firmly enough, or if the threaded holes in the casing are damaged by being tightened too much, the wheel can come loose during travel!

- Always position the nuts manually in their holes when fitting the drive wheels.
- Never use electrical or pneumatic screwdrivers !
- Tighten the Allen screws with a torque of 25 Nm !
- The Nordlock washers must be fitted exactly as they were before removal !



WARNING: Uncontrolled movement!

The wheelchair will drive erratically if the GB Motors are not calibrated after being replaced!

- Make sure to calibrate the GB Motors after replacing them!



Note

If motors become defective within their guarantee period, they will either be replaced or repaired on Invacare's decision. This guarantee does not cover pay for working hours. We also accept no liability for physical injuries or unauthorised repairs. Invacare's sole obligation and its exclusive remedy during this guarantee is limited to such repair and/or replacement measures.

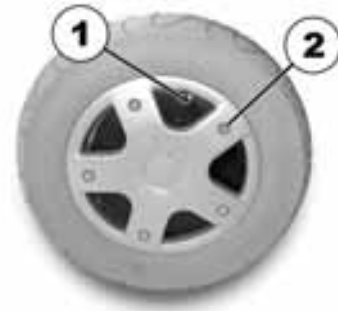


Requirements:

- Open-ended spanner 6 mm.
- Torque wrench
- Repair kit for tyre repair or a new inner tube.
- Talcum powder
- Screw blocker Loctite (e.g. Loctite 243)

Disassembly

- Jack up the vehicle (place wooden blocks under frame).
- Unscrew valve cap.
- Deflate the tyre by pressing the pin in the valve (1).
- Unscrew 5 cylinder head screws (2).
- Remove the wheel rim half.
- Remove the inner tube from the tyre.

**Note**

If the old inner tube is repaired and re-used, and has become wet during repair, you can make replacement easier by sprinkling the inner tube with a little talcum powder.

**Note**

Ensure that the tyre is replaced on the same side and in the same travel direction as it was previously mounted.

11.3.2 Calibrating GB motors

The following sections explain the calibration process with the handheld programming device.



WARNING: Risk of accidents!

Hazards to workers, surroundings and mobility device!

- Do not leave the mobility device unattended during the following procedure!
- Make sure that BOTH drive wheels are off the ground before calibrating.
- Secure the area.



Requirements:

- "Dynamic DX HHP" handheld programming device

Calibrating the motors:

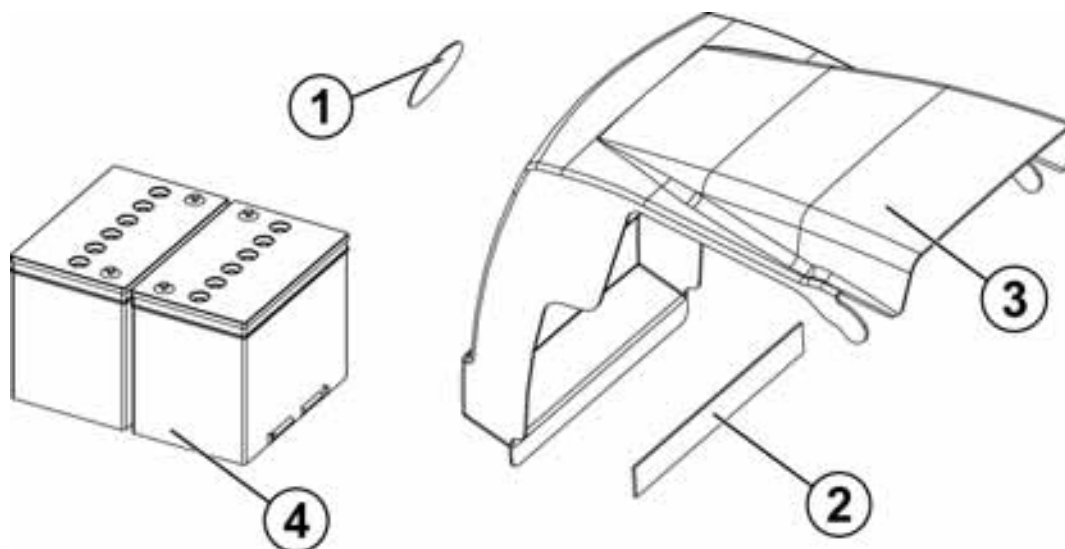
- Support the wheelchair with wooden blocks. The drive wheels must not be touching the floor or the work surface.
- Connect the programming device. Programming device displays:

The programming device shows the following:	You should enter this:
DX HHP V1.20 Select a language... GB D NL S	"GB"
View or edit System? YES ? DIAG TECH	"TECH"
Technician mode Enter Password 000 EXIT D1 D2 D3	Enter code "592" with keys D1 to D3, then select "EXIT".
Technician mode Master JS Module JOYSTICK CALIBRATION EXIT YES NEXT	"NEXT"
** MAIN MENU ** View or edit GB Power Module ? NEXT YES	"YES"
GB Controller Torque XX % EXIT NEXT DOWN UP	"NEXT"

The programming device shows the following:	You should enter this:
GB Controller Tremor Damping XX % EXIT NEXT DOWN UP	"NEXT"
GB Controller Speed Progression XX % EXIT NEXT DOWN UP	"NEXT"
GB Controller Turn Progression XX % EXIT NEXT DOWN UP	"NEXT"
GB Controller Calibrate Motors? EXIT NEXT YES	"YES"
GB MOTOR CALIBRATION Wheels will move! Drive wheels raised? EXIT YES	"YES" (if drive wheels have been raised)
GB MOTOR CALIBRATION Chair will drive! Are wheels raised? EXIT YES	"YES" (if drive wheels have been raised)
GB MOTOR CALIBRATION -BEGIN- to start. Wheels will drive! EXIT BEGIN	"BEGIN" (if drive wheels have been raised)
GB MOTOR CALIBRATION in progress Please wait.	No entry required. Wait till end of calibration.
GB MOTOR CALIBRATION Successful! EXIT	"EXIT"

- Separate the programming device from the wheelchair. Calibration is complete.

12 Batteries, battery case



Pos	Qty.	Item No./Pcs.	Item Description
-	1	1421846	BATTERY ASSY.
1	1	0572-06266	INVACARE LOGO
2	1	F384070	VELCRO BAND CUT 25 X 250 MM
3	1	1419330	BATTERY COVER "SILVER"
3	1	1421737	BATTERY COVER "GREEN"
4	2	P50016	BATTERY 12V/70 AH
-	1	SP1423696	BATTERY CHARGER 24V/8A WITH CONTINENTAL MAINS CABLE ASSY.
-	1	SP1423697	BATTERY CHARGER 24V/8A WITH MAINS CABLE UK ASSY.
-	1	P51981	BATTERY CHARGER 8A WITH XLR PLUG
-	1	P21079	MAINS CABLE GCB-0401 CONTINENTAL
-	1	P51981	BATTERY CHARGER 8A WITH XLR PLUG
-	1	P21079	MAINS CABLE GCB-0403 CONTINENTAL
-	1	1421655	BATTERY STRAP
-	4	P52996	BATTERY TERMINAL COVER
-	3	F384057	BATTERY INSERT



ATTENTION!

Injury hazard and possible material damages if batteries are handled improperly!

- *The installation of new batteries may only be carried out by authorised specialists.*
- *Observe the warning information on the batteries.*
- *Only use battery versions stated in the specifications.*

**ATTENTION!****Fire and burns hazard if battery terminal is bypassed!**

- Please take great care to ensure that the battery terminals are never short-circuited with tools or mechanical mobility device parts!
- Ensure that the battery terminal caps have been replaced if you are not working on the battery terminals.

**ATTENTION: Danger of crushing!****The batteries are extremely heavy. This results in injury hazards to your hands.**

- Bear in mind that the batteries are sometimes very heavy!
- Please handle the batteries with care.

**WARNING: BURN HAZARD!****Injury hazard due to discharged acid.**

- Always wear acid-proof protective gloves when handling batteries.
- Always wear protective goggles when handling batteries.

**What to do if acid is discharged:**

- Always take clothing which has been soiled by or dipped in acid off immediately!
- Rinse any areas of your skin which has come into contact with battery acid off immediately with plenty of water!

If contact with eyes is made:

- Rinse the affected eye under running water for several minutes! You should also consult an eye specialist immediately afterwards!

12.1.1 Replacing batteries



- Raise the lifter (see following information if electronics or lifter motor is defective).
- Remove battery cover.



- Pull all connecting plugs out of the modules.
- Unscrew the equipment rack (1) and remove.
- Push the battery terminal caps back.
- Loosen battery terminal clamps with spanner.
- Open the battery strap.
- Tilt the rear battery forwards and remove.
- Push the lighting cabling to one side and remove the insert.
- Remove the front battery.
- After fitting new batteries, stow the lighting cabling between the two batteries.

12.1.2 Replacing the fuse strip



CAUTION: Fire hazard!

A short circuit can cause extremely high currents which can result in spark formation and fire!

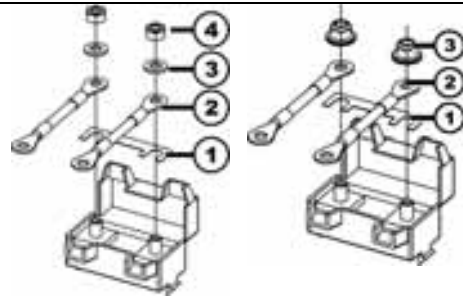
- Always use an original strip fuse with the approved amperage.
- If the main fuse has blown, first rectify the cause before fitting a new one.



CAUTION: Fire hazard!

Fitting the incorrect strip fuse causes a fire hazard!

- Only fix the strip fuses in the sequence shown in the image on the right!
- Tighten the nuts with 3.3 or 3.5 Nm!

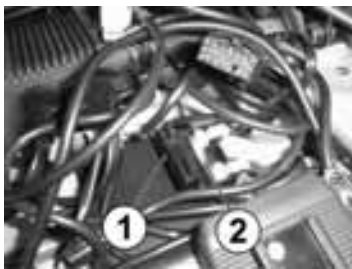


Until 03.2004

1. Fuse
2. Fuse compartment
3. Washer
4. Nut M5

After 03.2004

1. Fuse
2. Fuse compartment
3. Nut DIN 6923



- Remove battery cover.
- Raise the lifter (see following information).
- Pull all necessary connecting plugs out of the modules in order to access the fuse holder.
- Open the fuse strip holder (1).
- Loosen the hex nuts and replace the strip fuse (2).

Reassembling is done in reverse order.

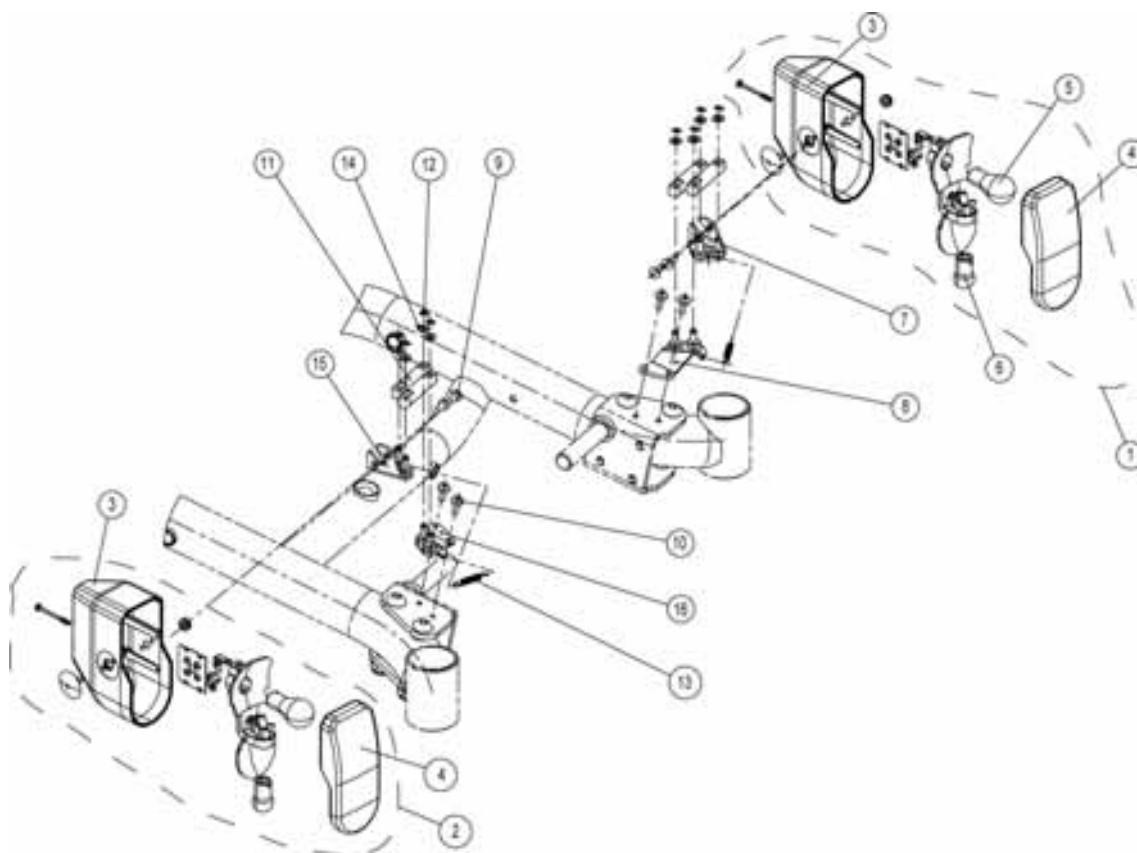


Note

If the electronics are defective, connect an external power source, or remove the locking washers and bolts from the seat tilting mechanism and then remove the lifter motor. The seat tilting mechanism and lifter can then be manually operated (see page 33, chapt. 3210.3).

13 Lighting

13.1 Front headlight



Pos	Qty.	Item No./Pcs.	Item Description
-	1		LIGHTING UNIT 24V FRONT FOLDAWAY ASSY.
-	1		LIGHTING UNIT 12V TÜV FRONT FOLDAWAY ASSY.
1	1	1420413	FRONT HEADLIGHT LH 24V ASSY.
1	1	SP 1420431	FRONT HEADLIGHT LH 12V ASSY.
2	1	1420412	FRONT HEADLIGHT RH 24V ASSY.
2	1	SP 1420412	FRONT HEADLIGHT RH 24V ASSY.
3	1	1420020	HEADLIGHT HOUSING
4	1	1420019	REFLECTOR GLASS
5	1	1419271	LIGHTBULB 24V/21W; YELLOW
5	1	1423457	LIGHTBULB 12V/21W; YELLOW
6	1	P31108	BULB 24V/10W
6	1	1423458	BULB 12V/10W
-	1	SP1423188	SWIVEL MECHANISM LH ASSY.
7	1	1421772	HEADLIGHT ATTACHMENT LH
8	1	1422837	STOP LH
9	4	D36112	CHEESE HEAD SELF-TAPPING SCREW WITH PHILLIPS

			HEAD 4.8 X 16
10	4	1421762	BOLT M5 X 12 DIN 7500C
11	4	1421782-0003	SWIVEL ROD
12	8	1421785	RETAINING RING DIN 471 FST 4
13	2	1421790	TENSION SPRING
14	8	1422890	WASHER 5.3 DIN 125

13.1.1 Replacing bulbs



- Unscrew the Phillips screw (1) on the rear of the headlight housing.
- Remove the reflector glass.
- Remove the reflector.
- Replace the bulb.

13.1.2 Replacing complete headlight



- Pull the headlight cable (1) below the seat out of the lighting distributor board.
- Unscrew the Phillips screw (2) from the frame.
- Remove headlight and replace.

Reassembling is done in reverse order.



13.1.3 Replacing headlight



- Pull the headlight cable below the seat out of the lighting distributor board.
- Unscrew the Phillips screw (1) out of the headlight attachment.
- Remove headlight and replace.

Reassembling is done in reverse order.

Check lighting for correct functioning.

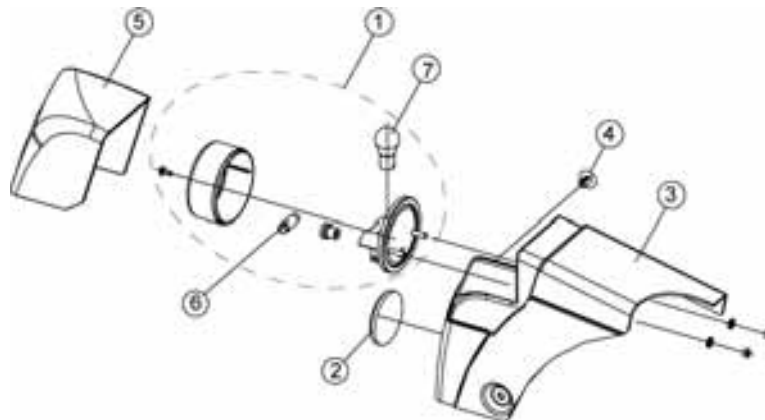


CAUTION:

After a new headlight has been fitted, it must be adjusted to suit road conditions.

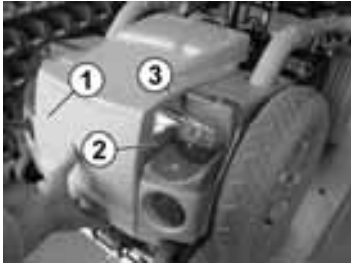
- *Adjust the headlight so that the street is lighted well without dazzling anyone.*
-

13.2 Back lights



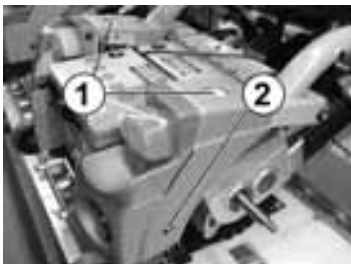
Pos	Qty.	Item No./Pcs.	Item Description
1	2	1419935	BACK LIGHT 24V ASSY.
6	1	P31191	BULB 24V/5W (SOFITTE)
7	1	1419271	LIGHTBULB 24V/21W; YELLOW
1	2	SP1419935	BACK LIGHT 12V ASSY.
6	1	1423459	BULB 12V/5W (SOFITTE)
7	1	1423457	BULB 12V/21W, YELLOW
2	2	1419274	REFLECTOR RED
3	1	1419333	BACK LIGHT SUPPORT LH
3	1	1419334	BACK LIGHT SUPPORT RH
4	3	1419337	SCREW-IN RIVET
5	1	1419331	LIGHTING HOUSING CLEAR LH
5	1	1419332	LIGHTING HOUSING CLEAR RH
5	1	1421738	LIGHTING HOUSING SILVER LH
5	1	1421739	LIGHTING HOUSING SILVER RH

13.2.1 Replacing bulbs



- Raise the lifter (if batteries or lifter are defective see page 72, chapt. 12.1.2)
- Remove battery cover (1) (see page 71, chapt. 12.1.1).
- Unscrew the lamp glass (2) from inside and remove.
- Unscrew the black light cap (3) and remove).
- Replace the bulb

13.2.2 Replacing back light supports or back lights



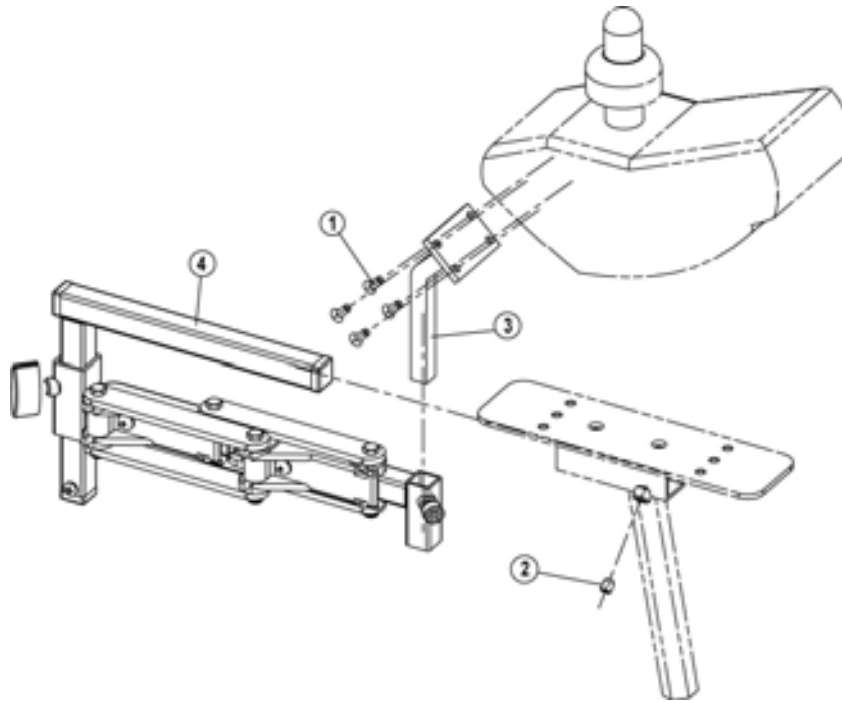
- Raise the lifter (if batteries or lifter are defective see page 72, chapt. 12.1.2).
- Remove taxi strap (1) if necessary by unscrewing all four screws.
- Remove battery cover (see page 71, chapt. 12.1.1).
- Pull the back light cable below the seat out of the lighting distributor board.
- Unscrew the equipment rack (see page 93, chapt. 14.4.4).
- Unscrew the back light support (2).
- Replace complete back light supports or back lights.

Reassembling is done in reverse order.

Check lighting for correct functioning.

14 Remote

14.1 ACS remote REM24 SC



Pos	Qty.	Item No./Pcs.	Item Description
-	1	SP1422877	REMOTE HOLDER RH FOLDING & HV ASSY. (REM 24 SC)
-	1	SP1422878	REMOTE HOLDER LH FOLDING & HV ASSY. (REM 24 SC)
-	1	SP1423434	MOUNTING SET REMOTE HOLDER HV & FOLDING
1	4	D10124	COUNTERSUNK SCREW WITH PHILLIPS HEAD M4 X 10
2	1	D70188	GRUB SCREW WITH ALLEN KEY & POINT M6 X 8
3	1	1421793-0303	ADAPTER FOR ACS REMOTE HOLDER SWINGAWAY
4	1	1421795	ACS REMOTE HOLDER SWINGAWAY RH
4	1	1421796	ACS REMOTE HOLDER SWINGAWAY LH

14.1.1 Replacing joystick knob



- Pull the joystick knob off upwards and replace.

14.1.2 Replacing the tachometer holder or hand protector



- Unscrew cheese head screws (1).
- Remove tachometer holder or hand protector and replace.

14.1.3 Replacing remote holder (height-adjustable, hinged)



- Loosen wing nut (1) on remote.
- Pull the remote out upwards.
- Loosen wing nut (2) on remote holder.
- Pull the remote holder out downwards.

14.1.4 Replacing the remote



- If possible, use the Wizard Software to save the drive programs.
- Pull out the BUS cable (1) "remote – battery – drive unit" on the remote.
- Unscrew Machine screws (2).
- Remove remote.

Reassembling is done in reverse order.

Functional check:

A functional check must be carried out after any service work on the remote.



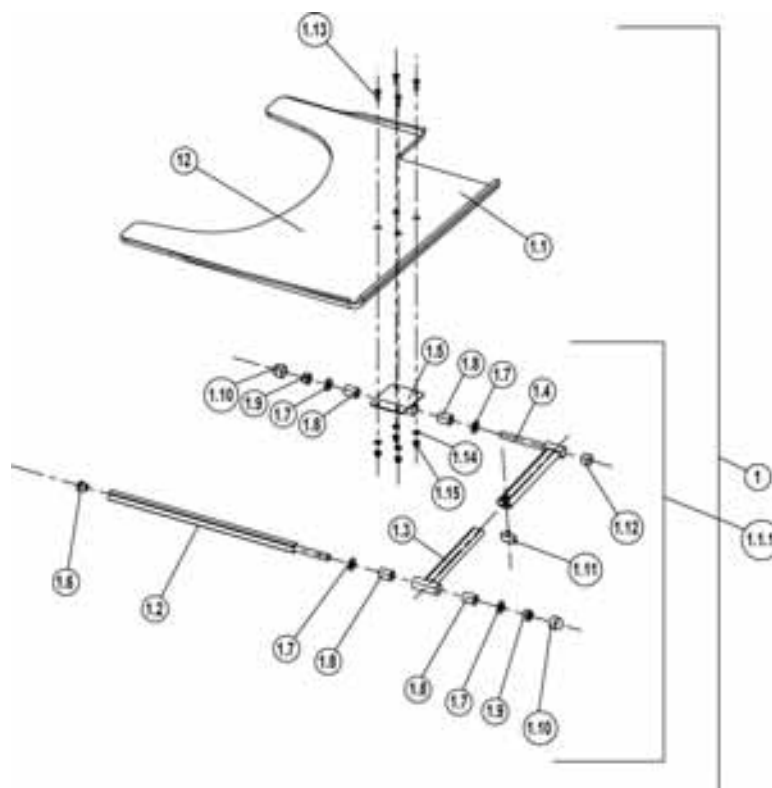
WARNING:

Danger of injury due to improperly assembling or swapped connection plugs!

- *Do not reverse the connection plug between drive units and power module.*
 - *Check correct function of the drive units.*
-

14.2 Remote holder with many different operation capabilities

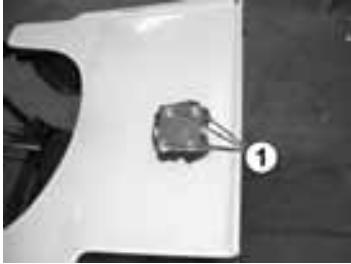
14.2.1 Tray can be swivelled for operation



Pos	Qty.	Item No./Pcs.	Item Description
1	1	SP1422952	TRAY SWINGAWAY FOR REM. LH CPL.
1	1	SP1422953	TRAY SWINGAWAY FOR REM. RH CPL.
1.1	1	Z177017	TRAY WITH CUT OUT LH; TRANSPARENT
1.1	1	Z177016	TRAY WITH CUT OUT RH; TRANSPARENT
1.1.1	1	SPZ177011	TRAY HOLDER ASSY.
1.2	1	Z177024.00	GUIDE FOR TRAY / CENTRE JOYSTICK; CHROMED
1.3	1	Z17270A.00	SWIVEL ARM; CHROMED
1.4	1	Z17150A.00	SWIVEL ARM EXTENSION; CHROMED
1.5	1	Z17160A.00	TRAY ATTACHMENT; CHROMED
1.6	1	L01055	SLIDER E 15*15
1.7	4	G00104	WASHER 13 X 24 X 2.5
1.8	4	Z17032A	LINING RD. 19 X 3.5 X 25
1.9	2	F20106	HEXAGON NUT M12 SELF-LOCKING
1.10	2	L01037	COVER CAP SKS 12 FOR NUT M12
1.11	1	L31001	WING NUT M6 X 10

1.12	1	L01008	SLIDER SL 22
1.13	4	D20127	COUNTERSUNK BOLT WITH PHILLIPS HEAD M6 X 20
1.14	4	G00110	WASHER 6.4 X 12.5 X 1.6
1.15	4	F60106	HEXAGON CAP NUT M6 SELF-LOCKING

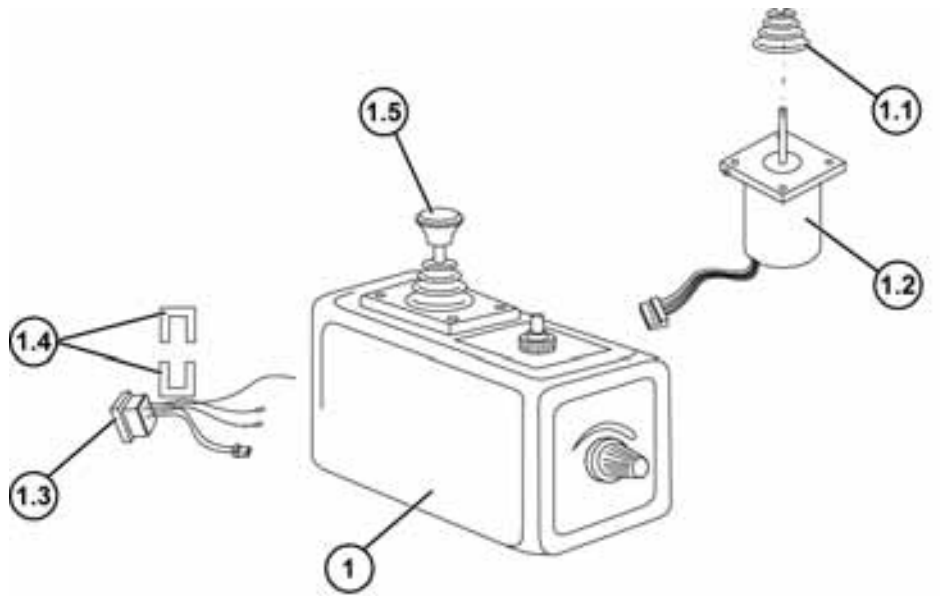
14.2.2 Replacing the tray



- Unscrew the Phillips screw (1) out of the tray attachment.
- Remove tray and replace.
- After fitting the new tray, remove the protective film.

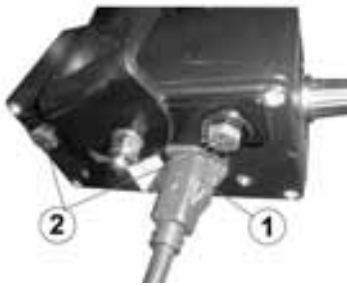
Reassembling is done in reverse order.

14.2.3 ACS operation for attendant (switchable)



Pos	Qty.	Item No./Pcs.	Item Description
1	1	6001425	ACS OPERATION FOR ATTENDANT SWITCHABLE
1.1	1	Z183001A	BELLOWS FOR ACS JOYSTICK; BLACK
1.2	1	P10304	ACS JOYSTICK FOR STD REMOTE
1.3	1	P41105	SOCKET FOR BUS CABLE
1.4	1	GME61927	FIXING CLASP FOR ACS BUS PLUG
1.5	1	P40120	DRIVE LEVER KNOB FOR ACS REM. ATT. SWITCHABLE

14.2.4 Replacing the ACS operation box for attendant (switchable)



(view from below)

- Remove the BUS connector plug (1) .
- Unscrew the hex nuts (2).
- Remove operation box and replace.

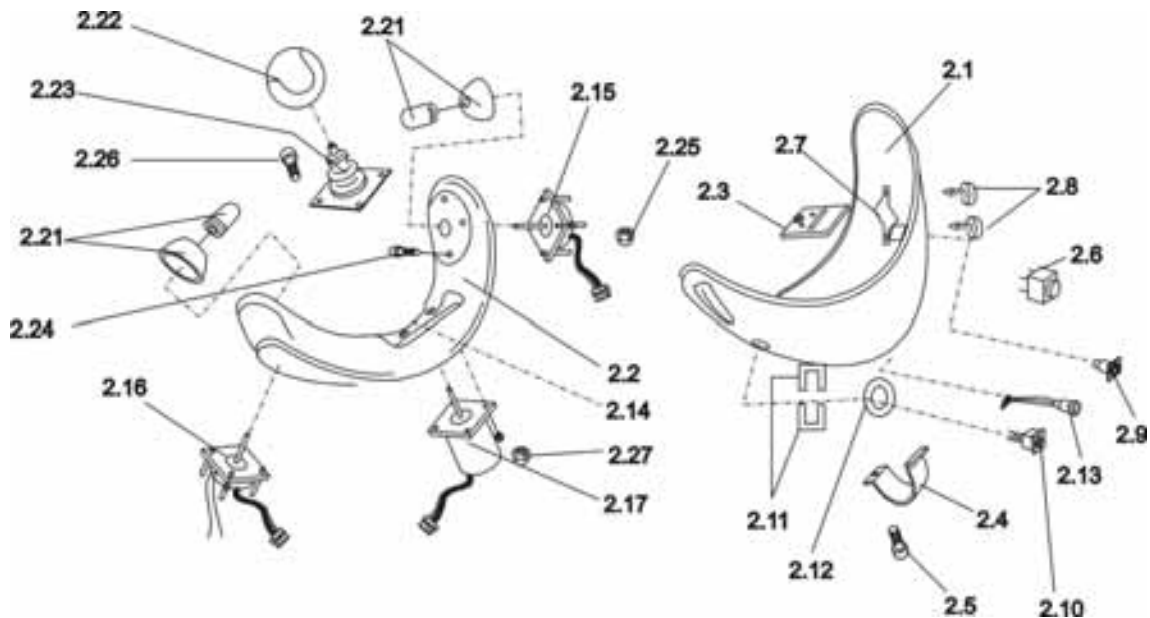
14.2.5 Replacing the ACS joystick (switchable)



- Unscrew the square socket screws (1).
- Pull the joystick out and withdraw the connector plug.
- Remove joystick and replace.

Reassembling is done in reverse order.

14.2.6 ACS chin control



Pos	Qty.	Item No./Pcs.	Item Description
2	1	SP1422801	ACS CHIN CONTR. LH CPL.
2	1	SP1422802	ACS CHIN CONTR. RH CPL.
2.1	1	Z183242	HOUSING BOTTOM SHELL LH FOR ACS CHIN CONTR. FOLDING
2.1	1	Z183241	HOUSING BOTTOM SHELL RH FOR ACS CHIN CONTR. FOLDING
2.2	1	F383019	HOUSING TOP SHELL FOR ACS CHIN CONTR. GREY
2.3	1	F383061.99	PLATE FOR ACS CHIN CONTR.
2.4	1	F383018.99	CLAMPING PLATE FOR ACS CHIN CONTR.
2.5	1	D50132	MACHINE SCREW WITH ALLEN KEY HEAD M6 X 16
2.6	1	P30499	HORN F/YMB 24 (DIGISOUND)
2.7	1	Z183048	CLAMP FOR HORN
2.8	2	D26197	SELF-TAPPING SCREW WITH PHILLIPS HEAD 2.9 X 25
2.9	1	GCN0528	SOCKET FOR ACS CHARGER
2.10	1	P41108	SOCKET FOR ACS BUS CABLE
2.11	2	GME61927	FIXING CLASP FOR ACS BUS PLUG
2.12	1	T95099	O-RING 14-3 MM
2.13	1	P41104	SOCKET FOR PROGRAMMING DEVICE
2.14	1	P10475	LABEL SET FOR ACS CHIN CONTR.
2.15	1	Z183243	SWITCH JOYSTICK FOR ACS CHIN CONTR. LH
2.16	1	Z183244	SWITCH JOYSTICK FOR ACS CHIN CONTR. RH
2.17	1	P10304	ACS JOYSTICK FOR STD REMOTE
2.18	1	F383021	PCB HOLDER FOR ACS CHIN CONTR.
2.19	1	GSM9881	DISPLAY PCB FOR ACS CHIN CONTR.
2.20	1	P10279	MICROPROCESSOR PCB UCM-S (SERVO VERSION)
2.21	2	Z183229	SPARE PART JOYSTICK KNOB
2.22	1	Z183265	FOAM RUBBER BALL WITH INSERT ASSY.
2.23	1	Z183001A	BELLOWS FOR ACS JOYSTICK; BLACK
2.24	8	D40196	MACHINE BOLT WITH PHILLIPS HEAD 5 X 22
2.25	8	F00113	HEX NUT M2.5 SELF-LOCKING
2.26	4	D40197	MACHINE BOLT WITH PHILLIPS HEAD M6 X 20
2.27	8	F00101	HEX NUT M3

14.2.7 Replacing the ACS chin control (complete)



- Pull the BUS cable (2) out of the ACS chin control.
- Unscrew the Allen screw (1) out of the clamping plate.
- Remove the complete ACS chin control and replace.

14.2.8 Replacing the foam rubber ball over the joystick knob



- Pull the rubber ball over the joystick knob off upwards and replace.

Reassembling is done in reverse order.

14.3 Troubleshooting the ACS control system

Wheelchair becomes slower or does not run.

Check	Possible cause:	Immediate measure:	Further measure(s):
Status display on remote gone out?	<ul style="list-style-type: none"> Power supply interrupted 	<ul style="list-style-type: none"> Check plug connection at remote 	<ul style="list-style-type: none"> Talk to your dealer.
	<ul style="list-style-type: none"> Battery fuse defective. 	<ul style="list-style-type: none"> Check battery fuse. 	<ul style="list-style-type: none"> Replace battery fuse.
	<ul style="list-style-type: none"> Battery fully discharged. 	<ul style="list-style-type: none"> Charge battery 	<ul style="list-style-type: none"> See battery charger instruction manual.
	<ul style="list-style-type: none"> Battery defective 	<ul style="list-style-type: none"> Replace battery. 	<ul style="list-style-type: none"> Talk to your dealer.
Remote status display blinking?	<ul style="list-style-type: none"> Various errors. 	<ul style="list-style-type: none"> Check error code. 	<ul style="list-style-type: none"> See battery charger instruction manual.

Red LEDs in battery charger display and status display are blinking, drive mode display shows horizontal bar.

Check	Possible cause:	Immediate measure:	Further measure(s):
	<ul style="list-style-type: none"> Battery discharged or defective. 	<ul style="list-style-type: none"> Charge or replace battery. 	<ul style="list-style-type: none"> See battery charger instruction manual.

14.3.1 Error codes

The ACS electronic system is capable of carrying out a self-test and of rectifying some errors automatically. In this case the status display will stop blinking. To do this switch the remote on and off several times. Wait approx. 5 seconds each time before switching the remote on again. If the error is not corrected by this process, localise the error using the blink codes listed below.

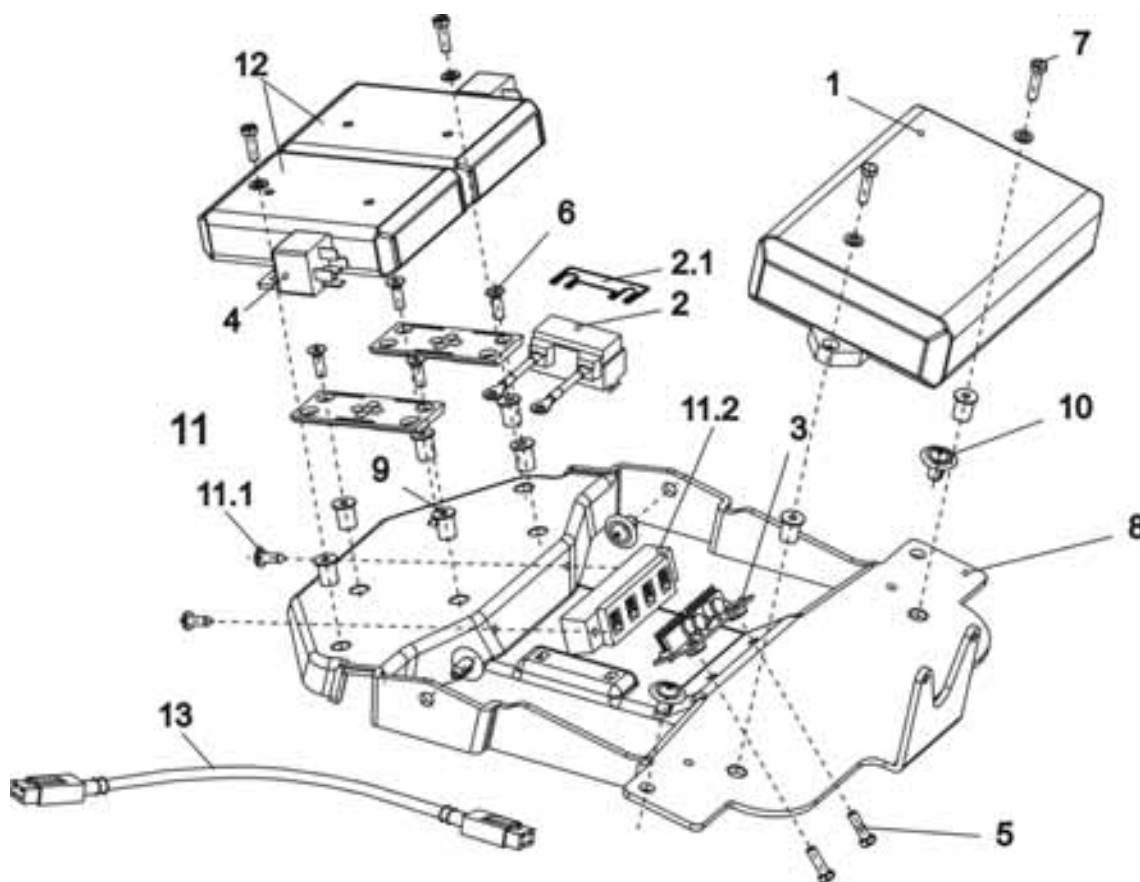
Joystick box status display blink codes

Blink code:	Meaning:	Immediate measure:	Further measure(s):
1 x blink	Module defective.	-	<ul style="list-style-type: none"> Talk to your dealer.
2 x blink	Accessory error (e.g. bulb short-circuit)	<ul style="list-style-type: none"> Check accessory part connections Check accessory parts 	<ul style="list-style-type: none"> Talk to your dealer.
	Lifter raised.	<ul style="list-style-type: none"> Lower lifter completely. 	-
3 x blink	Fault in right-hand motor. Connection loose/defective.	<ul style="list-style-type: none"> Check plug connections. 	<ul style="list-style-type: none"> Talk to your dealer.
4 x blink	Fault in left-hand motor. Connection loose/defective or motor defective.	<ul style="list-style-type: none"> Check plug connections. 	<ul style="list-style-type: none"> Talk to your dealer.
5 x blink	Fault/brake fault on right-hand motor. Connection loose/defective or motor defective. Microswitch defective.	<ul style="list-style-type: none"> Check plug connections. Check microswitch. 	<ul style="list-style-type: none"> Talk to your dealer.
	Motors disengaged	<ul style="list-style-type: none"> Engage motors turn the remote on and off 	-
6 x blink	Fault/brake fault on left-hand motor. Connection loose/defective or motor defective.	<ul style="list-style-type: none"> Check plug connections. 	<ul style="list-style-type: none"> Talk to your dealer.
7 x blink	Battery fully discharged.	<ul style="list-style-type: none"> Pre-charge battery 	<ul style="list-style-type: none"> Talk to your dealer.
8 x blink	Battery voltage too high.	<ul style="list-style-type: none"> Switch light on if necessary. 	<ul style="list-style-type: none"> Talk to your dealer.
9 or 10 x blink	Incorrect data transmission between modules.	-	<ul style="list-style-type: none"> Talk to your dealer.

11 x blink	Motors overloaded.	<ul style="list-style-type: none"> • Turn remote on and off 	-
12 x blink	Compatibility problems between modules.	<ul style="list-style-type: none"> • Remove incorrect module. 	<ul style="list-style-type: none"> • Talk to your dealer.

14.4 Electronics

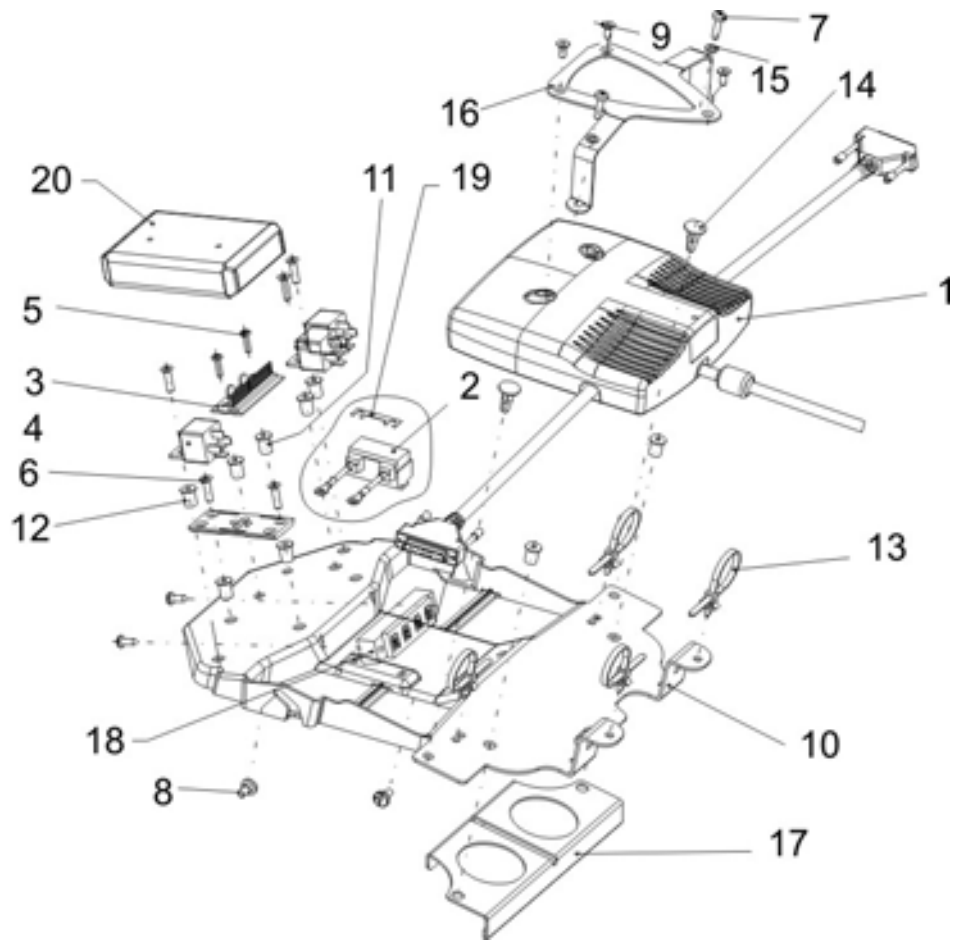
14.4.1 ACS Electronics Holder assembly (conventional motors)



Pos	Qty.	Item No./Pcs.	Item Description
-	1	1418529	ACS ELECTRONICS HOLDER ASSY.
1	1	6001423	ACS ELECTRONICS DX-PMB AS (60A - 6 KM/H)
1	1	P10064	ACS ELECTRONICS DX-PM2 (80A - 10 / 12 KM/H)
2	1	1419369	STRIP FUSE ASSY.
2.1	1	P12191	STRIP FUSE 50A
3	1	1415004	LIGHTING PCB (CENTRAL DISTRIBUTOR)
4	2	P11195	CHANGEOVER RELAY WITH BRACKET 24V/10-20A
5	4	D08102	HEX BOLT M5 X 16
6	4	D60177	COUNTERSUNK SCREW WITH ALLEN KEY HEAD M5 X

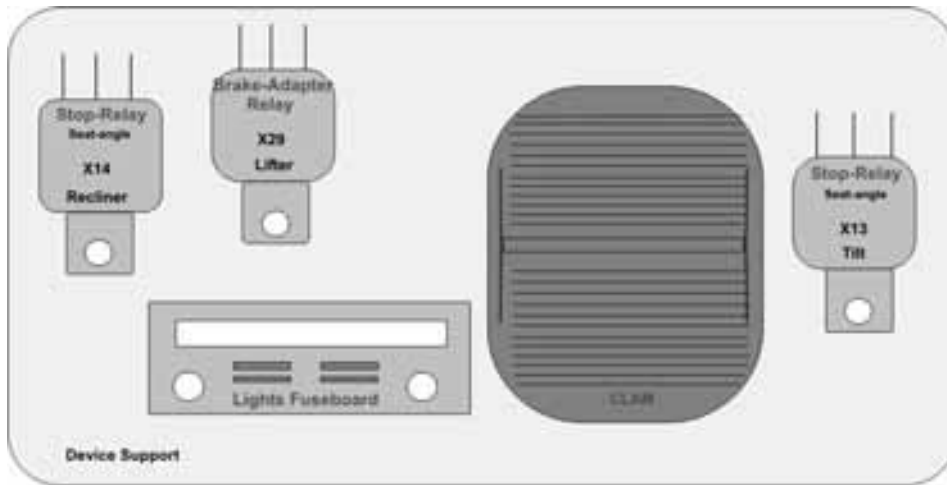
			16
7	2	D08103	HEX BOLT M5 X 20
8	1	1418528	EQUIPMENT RACK
-	1	SP1423191	MOUNTING SET ACS ELECTRONICS HOLDER
9	8	1422052	GETO WELL NUT M5
10	4	1419337	SCREW-IN RIVET
11	1	SP1422053	ACS BUS DISTRIBUTOR ASSY.
11.1	2	D36112	CHEESE HEAD SELF-TAPPING SCREW WITH PHILLIPS HEAD 4.8 X 16
11.2	1	P10072	ACS BUS T-ADAPTER (DISTRIBUTOR)
12	1	6001825	ACS LIGHTING MODULE 24V STD.
12	1	P10080	ACS LIGHTING MODULE 12V (TÜV).
12	1	P10081	ACS-CLAM (LIGHT-MOTOR MODULE COMBINED)
13	1	GSM63003	ACS BUS CABLE L=300 MM
-	1	1419370	BATTERY CABLE
-	1	1419983	BATTERY CABLE (TÜV VERSION)
-	1	1419390	CLAM WIRING HARNESS ACTUATORS; LIGHT
-	1	1421728	CLAM WIRING HARNESS LIGHT; LIFTER; LEGREST.; SEAT TILT.
-	1	1421729	CLAM WIRING HARNESS LIGHT; EL. ADJUSTMENT
-	1	1421730	CLAM WIRING HARNESS LIGHT; LEG SUPPORTS; SEAT TILT.

14.4.2 ACS Electronics Holder assembly (GB motors)



<i>Item</i>	<i>Qty</i>	<i>Part-No.</i>	<i>Part-Designation</i>
-	-	INFO8	ONLY FOR STORM³ TRUE TRACK
-	1	1434437	ELECTRONICS HOLDER F. STORM³ TRUE TRACK CPL.
1	1	1430150	ACS POWER MODUL DX-GB 100A
2	1	1432561	STRIP FUSE HOLDER M. 80 A FUSE
3	1	1415004	CENTRAL LIGHT DISTRIBUTOR MAINBOARD
4	3	P11195	RELAY SWITCH 24V/10-20A
5	2	D30110	CROSS HEAD SCREW M4 X 16
6	5	D10108	COUNTERSUNK CROSS HEAD SCREW M5 X 20
7	2	D30108	CROSS HEAD SCREW M5 X 20
8	2	1426350	BOLT M6x4 DIN923 BLACK GALVANISED
9	3	5723976	COUNTERSUNK SCREW M5 X 12
10	1	1418528	DEVICE SUPPORT
11	2	1432557	GETO WELL NUT M4
12	7	1422052	GETO WELL NUT M5
13	4	1422888	CABLE BINDER 5,0x225 SCHWARZ
14	2	1426351	NYLON MOULDED CRAMP
15	2	G00111	WASHER 5,3 X 10 X 1
16	1	1430145-0003	FIXING FOR POWER MODULE
17	1	1430146-9005	STABILISOR
18	1	1422053	ACS DISTRIBUTOR
19	1	1433734	STRIP FUSE 80A (ONLY TRUE TRACK!)
20	1	P10081	ACS-CLAM (LIGHTING/ACTUATOR MODULE COMBINED)

14.4.3 Layout of the equipment rack (rear part)



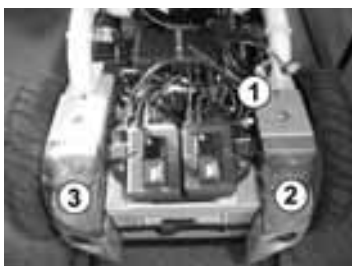
Look from behind !!

14.4.4 Replacing the equipment rack



- Raise lifter (see page 72, chapt. 12.1.2).
- Remove battery cover (see page 71, chapt. 12.1.1).
- Squeeze the connector plugs together and pull out of modules.
- Unscrew the plastic adjustment screw (1) from the equipment rack.
- Unscrew the power module (1), CLAM (2), lighting module (3), relay (4), strip fuse holder (5), lighting distributor strip (6) and ACS BUS distributor (7) from the rear side of the equipment rack (see illustration below).
- Pull out the Geto Well nuts and check (replace defective nuts if necessary).
- Remove equipment rack and replace.

14.4.5 Replacing electronic components



- Dismantle equipment rack (see above).
- Pull all connecting plugs out of the modules.
- Unscrew and replace power module (1), CLAM (2), lighting module (3), relay (4), strip fuse holder (5), lighting distributor strip (6) and ACS BUS distributor (7) from the rear side of the equipment rack.

Reassembling is done in reverse order.

14.5 Updating the driving program

The driving programs for electric wheelchairs are continually updated and improved by Invacare®. For this reason, you should check whether the version number is still up to date each time a wheelchair comes in for repairs, and also during regular inspections.

If a newer version is available, the driving program must be updated. The procedure for updating the driving program is described in the user manual of the Wizard software.



Note

The electronic system is supplied with a standard drive program. If the driving program has been customised, you have to perform this customisation again, after installing the new driving program.



WARNING: Every alteration to the drive program can influence vehicle handling and the tipping stability of the wheelchair!

- *Alterations to the drive program must only be carried out by trained Invacare®-dealers!*
 - *Invacare® can only assume a warranty for the safe vehicle handling of the wheelchair – in particular tipping stability - for unaltered standard drive programs!*
-



Pre-requisites:

- Dynamic® Wizard software
 - User manual for the Wizard software
 - For further information on other requirements - such as the minimum system configuration of the PC to be used for programming, necessary programming cables - see the user manual of the Wizard software. You find the latest version of the user manual in the download area on <http://www.dynamiccontrols.com/>.
-

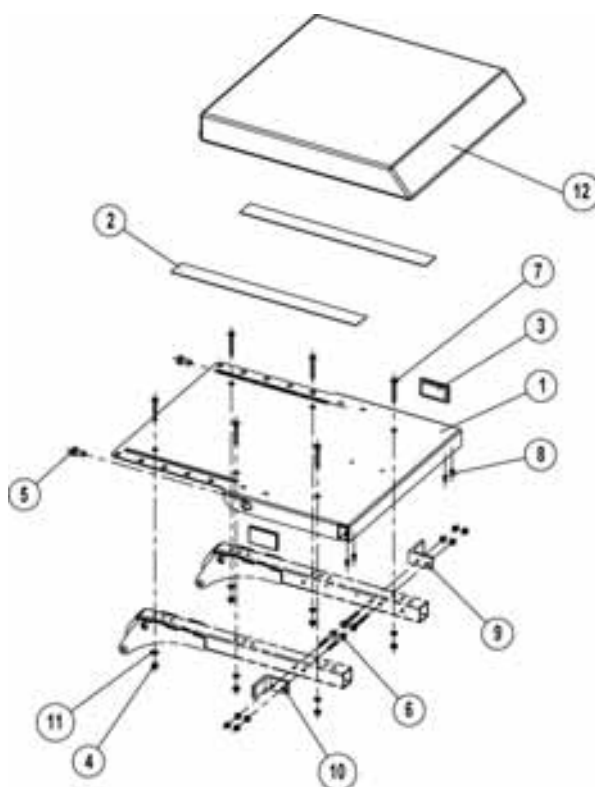
15 Seat unit

The seat unit settings can be individually matched to the user. These settings should therefore be retained when carrying out service work.

15.1 Seat unit Euro

The seat unit for the Storm³ Euro is shown on the exploded drawing for the chassis on page 30.

15.2 Standard seat complete



Pos	Qty.	Item No./Pcs.	Item Description
-	1	1422060	SEAT (SINGLE-PART) ASSY.
1	1	1419999-9005	SEAT PLATE
2	2	U21087	HOOKED BELT CUT 38 X 400 MM
3	2	P31298	REFLECTOR; YELLOW
-	1	SP1423205	FIXING KIT SEAT (SINGLE PART VERS.)
4	10	F20109	HEXAGON NUT M6 SELF-LOCKING
5	2	5824273	BOLT M10 X 20
6	4	5824263	BOLT M6 X 50
7	6	D60096	COUNTERSUNK SCREW WITH ALLEN KEY HEAD M6 X 45 10.9
8	4	D70187	GRUB SCREW WITH ALLEN KEY & CUP POINT M8 X 10

9	1	1421701-9005	SUPPORT BRACKET LH, SB 43
10	1	1421700-9005	SUPPORT BRACKET RH, SB 43
11	10	G00115	WASHER 6.4 X 12.5 X 1.6
12	1	1420460	SEAT CUSHION ST=41 CM
12	1	1420461	SEAT CUSHION ST=46 CM
12	1	1420462	SEAT CUSHION ST=51 CM

**Note**

Seat adjustments such as seat angle, seat depth, backrest angle and distance between armrests should be individually adjusted to suit the user. These settings should therefore be retained when carrying out service work.

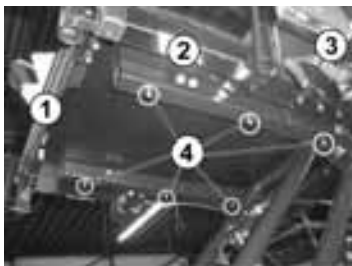
15.2.1 Replacing the seat



- Remove seat and backrest cushions (legrests if necessary).
- Raise lifter.
- Pull the BUS cable out of the remote.
- If a wheel lock is fitted, remove the side panel.
- Unscrew the hex nuts (1).
- Remove seat unit and replace.

Reassembling is done in reverse order.

15.2.2 Replacing the seat plate



- Remove the seat and backrest cushions.
- Raise lifter.
- Pull the BUS cable out of the remote.
- Unscrew the foot rest adapter (1) (see page 119, chapt. 17.1.1).
- Unscrew the side panel mounting (2) (see page 102, chapt. 15.4.4).
- Unscrew the fitting attachment (3).
- Unscrew the hex nuts (4).
- Remove seat plate and replace.

Reassembling is done in reverse order.



Note

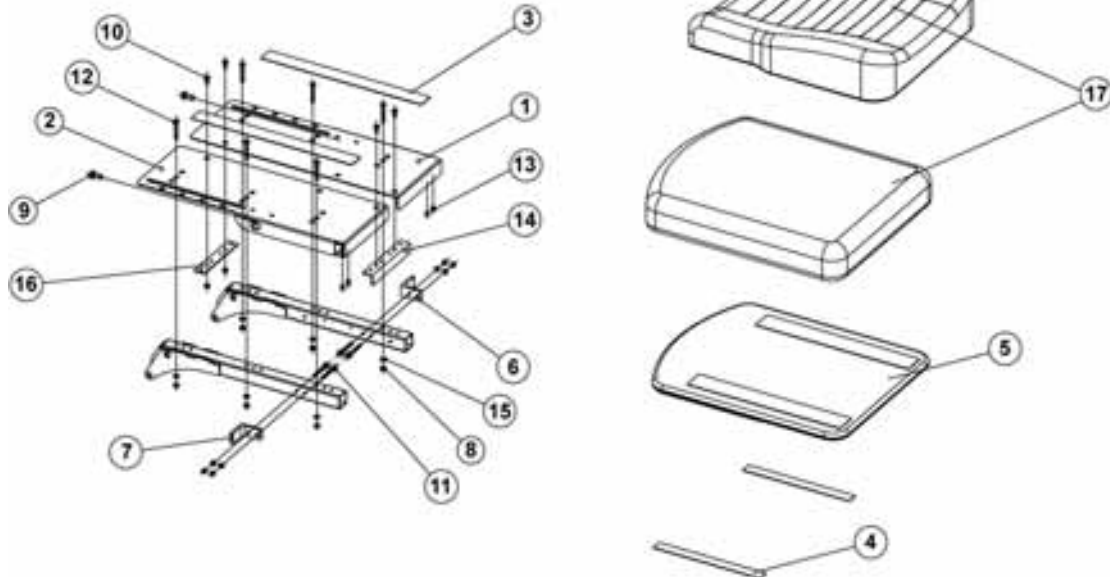
When reassembling the new seat plate, you to use the same holes. Since the seat plate can be moved by ± 2 cm, which changes the wheelchair centre of gravity, you should carry out a centre of gravity test on a sloping surface after refitting.

15.3 Split seat plate



Note

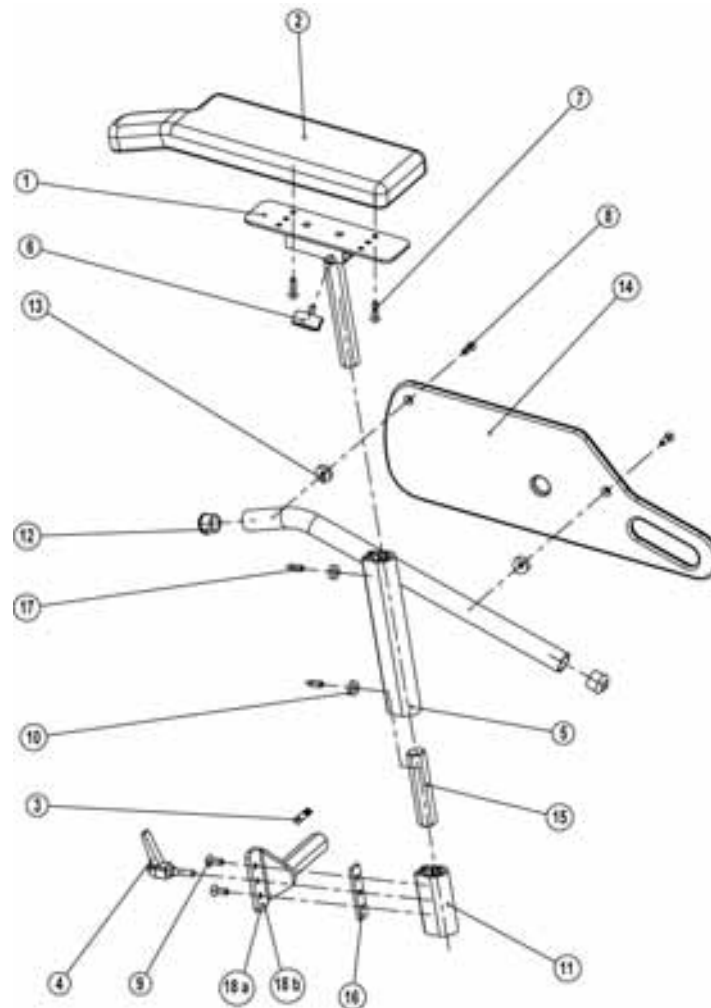
Service work for both seat units is identical except for the transverse support (Pos. 10, 14) (see page 97, chapt. 15.2.1).



Pos	Qty.	Item No./Pcs.	Item Description
-	1	1422064	SEAT SPLIT SB 43 ASSY.
-	1	1422065	SEAT SPLIT SB 48 ASSY.
1	1	1420458-9005	SEAT PLATE LH ASSY.
2	1	1420457-9005	SEAT PLATE RH ASSY.
3	2	U21087	HOOKED BELT CUT 38 X 400 MM
4	2	5816479	DURALOCK SJ 3552
5	1	5314532	SEAT PLATE 410 X 520 MM
5	1	5314533	SEAT PLATE 460 X 520 MM
6	1	1421701-9005	SUPPORT BRACKET LH, SB 43
7	1	1421700-9005	SUPPORT BRACKET RH, SB 43
6	1	1421705-9005	SUPPORT BRACKET LH, SB 48
7	1	1421706-9005	SUPPORT BRACKET LH, SB 48
-	1	SP1423206	MOUNTING SET SEAT (SPLIT)
8	12	F20109	HEXAGON NUT M6 SELF-LOCKING
9	2	5824273	BOLT M10 X 20
10	4	D60111	COUNTERSUNK SCREW WITH ALLEN KEY HEAD M6 X 16
11	4	5824263	BOLT M6 X 50
12	6	D60096	COUNTERSUNK SCREW WITH ALLEN KEY HEAD M6 X

			45 10.9
13	4	D70187	GRUB SCREW WITH ALLEN KEY & CUP POINT M8 X 10
14	1	1421699-9005	ANGLE BRACE***CHECK PIC
15	10	G00115	WASHER 6.4 X 12.5 X 1.6
16	1	1420496-9005	SUPPORT PLATE
17	1	1422071	SEAT CUSHION CONTOUR SB 43 GREY
17	1	1422072	SEAT CUSHION CONTOUR SB 43 BLACK
17	1	5314525	SEAT CUSHION FLEX GREY, 55 X 44 X 7
17	1	1422530	SEAT CUSHION FLEX SB 43 BLUE
17	1	1422531	SEAT CUSHION SB 43 VIC AIR
17	1	1422073	SEAT CUSHION CONTOUR SB 48 GREY
17	1	1422074	SEAT CUSHION CONTOUR SB 48 BLACK
17	1	5314526	SEAT CUSHION FLEX GREY, 55 X 49 X 7
17	1	1422532	SEAT CUSHION FLEX SB 48 BLUE

15.4 Armrests and side panels



Pos	Qty.	Item No./Pcs.	Item Description
-	1	SP1421692	ARMREST RH ASSY. 340 MM
-	1	SP1421694	ARMREST LH ASSY. 340 MM
-	1	SP1421693	ARMREST RH ASSY. 380 MM
-	1	SP1421695	ARMREST LH ASSY. 380 MM
1	1	1421716-9005	ARMREST RH ASSY.
1	1	1421717-9005	ARM SUPPORT LH ASSY.
2	1	D171010A	ARMREST PADDING RH; BLACK
2	1	D171009A	ARMREST PADDING LH; BLACK
3	1	1421689	"STOP" LABEL
-	1	SP1423221	SIDE PANEL PLATE 340 MM RH ASSY.
-	1	SP1423702	SIDE PANEL PLATE 340 MM LH ASSY.
-	1	SP1423703	SIDE PANEL PLATE 380 MM LH ASSY.
-	1	SP1423701	SIDE PANEL PLATE 380 MM RH ASSY.
4	1	1415027	CLAMPING LEVER M6 X 25

5	1	1422096-9005	SIDE PANEL ADJUSTER RH ASSY. 250-340 MM
5	1	1422095-9005	SIDE PANEL ADJUSTER LH ASSY. 250-340 MM
6	1	L31001	WING NUT M6 X 10
7	2	D10108	COUNTERSUNK SCREW WITH PHILLIPS HEAD M5 X 20
8	2	DG90101	COUNTERSUNK BOLT M5 X 16
9	2	D60111	COUNTERSUNK SCREW WITH ALLEN KEY HEAD M6 X 16
10	2	Z173189.99	NUT M6 SP-14
11	1	1421714-9005	SIDE PANEL MOUNTING
12	2	L01008	SLIDER SL 22
13	2	0572-02152	CIRCULAR WASHER SHAPE B; BLACK
14	1	1420471	SIDE PANEL PLATE
15	1	1422092-0002	CONNECTORS
16	1	1421720-0002	GROOVED SHEET
17	2	5824352	GRUB SCREW M6 X 6 DIN 916
18 a	1	1422089-9005	SIDE PANEL MOUNTING RH
18 a	1	1422097-9005	SIDE PANEL MOUNTING LH
18 b	1	1422115-9005	SIDE PANEL MOUNTING LH SHORT (FOR SB 380 MM)
18 b	1	1422114-9005	SIDE PANEL MOUNTING RH SHORT (FOR SB 380 MM)

15.4.1 Replacing armrest padding / changing its position



- Push the height-adjustable / swingaway remote holder back as far as possible.
- Unscrew the front screw.
- Swivel the holder plate approx. 45° outwards.
- Remove the height-adjustable / swingaway remote holder.
- Move to hold a plate inwards and to the rear, then fix first with the back screw.
- Swivel the holder plate approx. 45° outwards.
- Insert the height-adjustable / swingaway remote holder.
- Align the holder plate over the fixing hole.
- Insert the front screw.

15.4.2 Replacing the side panel



- loosen clamping lever (1).
- Pull the side panel out upwards and replace.

15.4.3 Replacing the side panel plate



- Unscrew the Phillips screw (1).
- Remove side panel plate and replace.

Reassembling is done in reverse order.

15.4.4 Replacing the side panel mounting



- Remove side panel (see page 102, chapt. 15.4.2).
- Loosen Allen screw (1).
- Withdraw side panel mounting and replace.

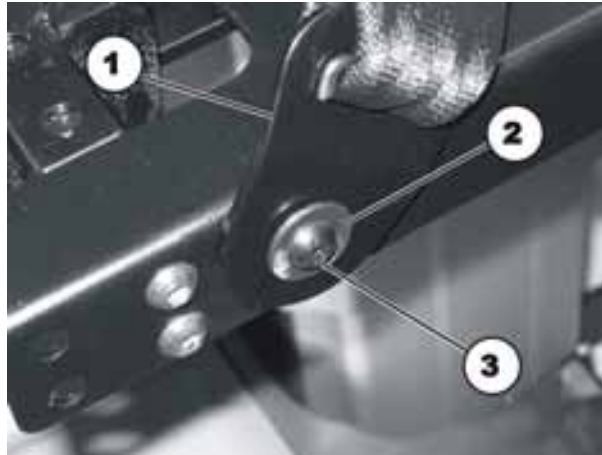
Reassembling is done in reverse order.

15.5 Replacing the safety belt



Requirements:

- 10 mm socket spanner
 - 4 mm Allen key
-

**Dismantling the safety belt:**

- Remove the plastic cap (5).
- Loosen the bolt (3) and the associated nut (in the figure this is covered) with a 4 mm Allen key and a 10 mm socket spanner.
- Remove the nut incl. the washer.
- Remove the screw incl. the safety belt, the washer (2) and the washer arranged behind.

**Note**

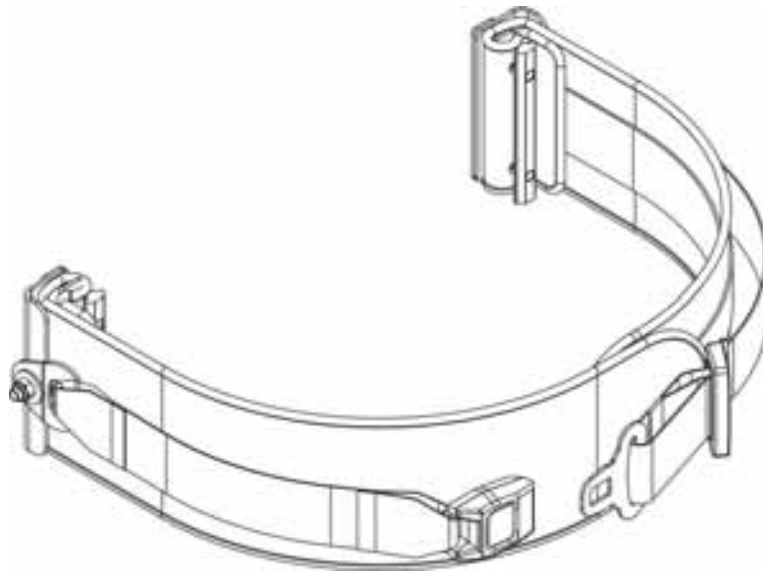
Another nut is fixed between the two washers (2) and (4) as a spacer so that the belt mounting can rotate freely.

- Replace the safety belt (1).

Refitting the safety belt:

- Refit the parts in reverse order.

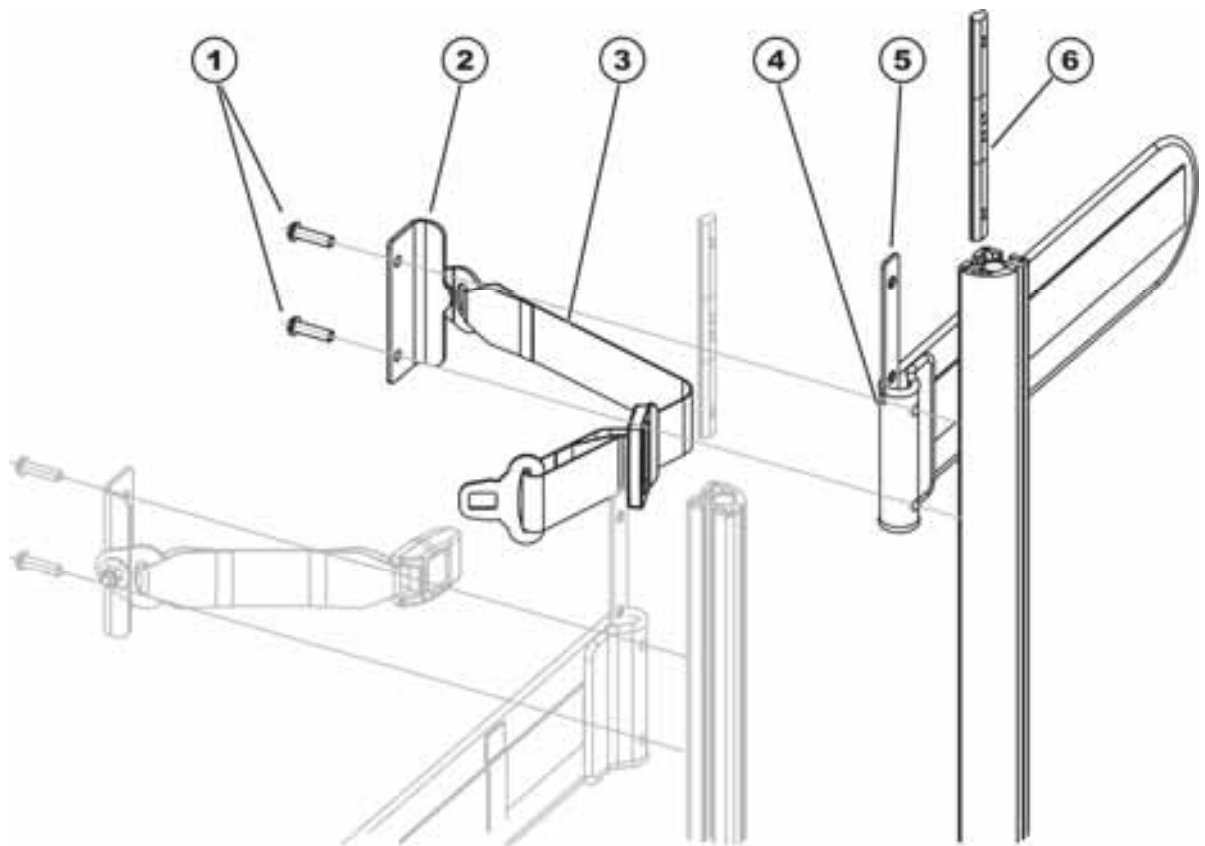
15.6 Chest strap



15.6.1 Replacing the chest strap

**Requirements:**

- 5 mm Allen wrench



Uninstalling the chest strap:

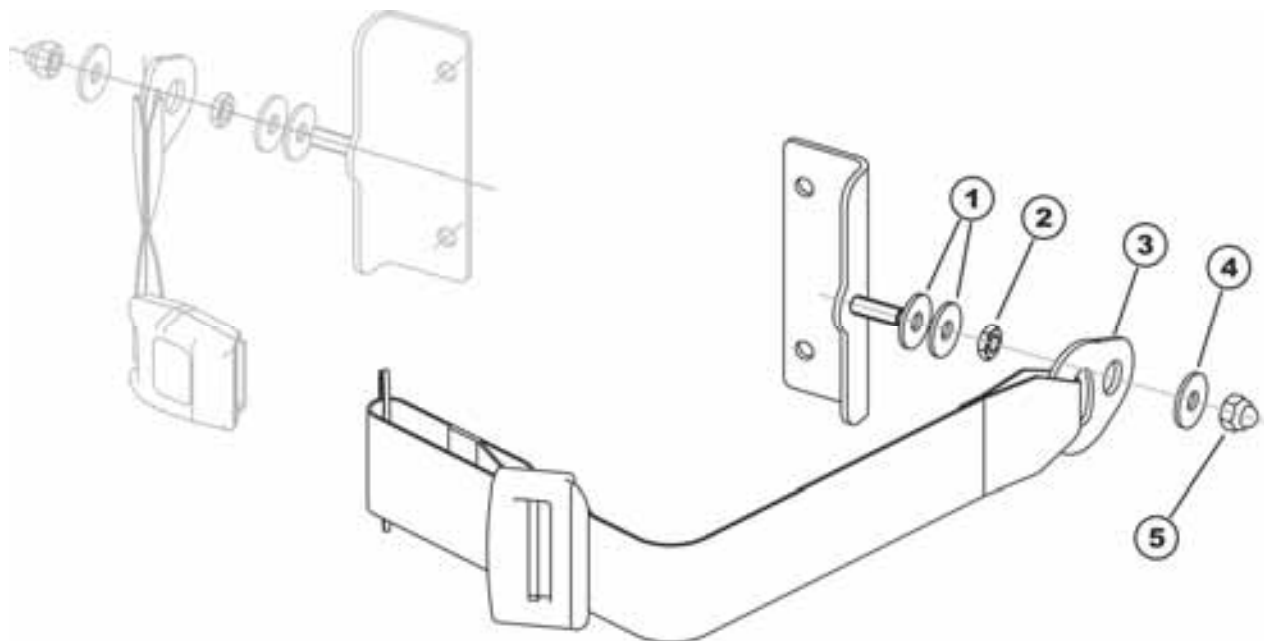
- Loosen and remove the hexagon socket head screws (1) together with the washers.
- Remove the mounting plate (2) of the additional belt (3).
- Remove the chest strap (4). Pay attention to the insert (5) while doing this.

Installing the chest strap:

- Place the insert into the chest strap.
- Position the mounting plate of the additional belt.
- Install the hexagon socket head screws with the washers. These have to go through the holes provided in the components, and are screwed into the sliding block (6).
- Set the height of the chest strap approximately to the desired height and tighten the Allen screws.
- Set the exact height of the chest strap later together with the user, see Chapter 22.7.

15.6.2 Replacing the additional belt**Requirements:**

- 13 mm socket wrench

**Uninstalling the additional belt:**

- Loosen and remove the box nut (5) together with the washer (4).
- Remove the attachment bracket (3) of the additional belt.

**Note**

It is not necessary to remove the nut (2) and the washers (1). These are mounted as spacers so that the belt attachment bracket can rotate freely.

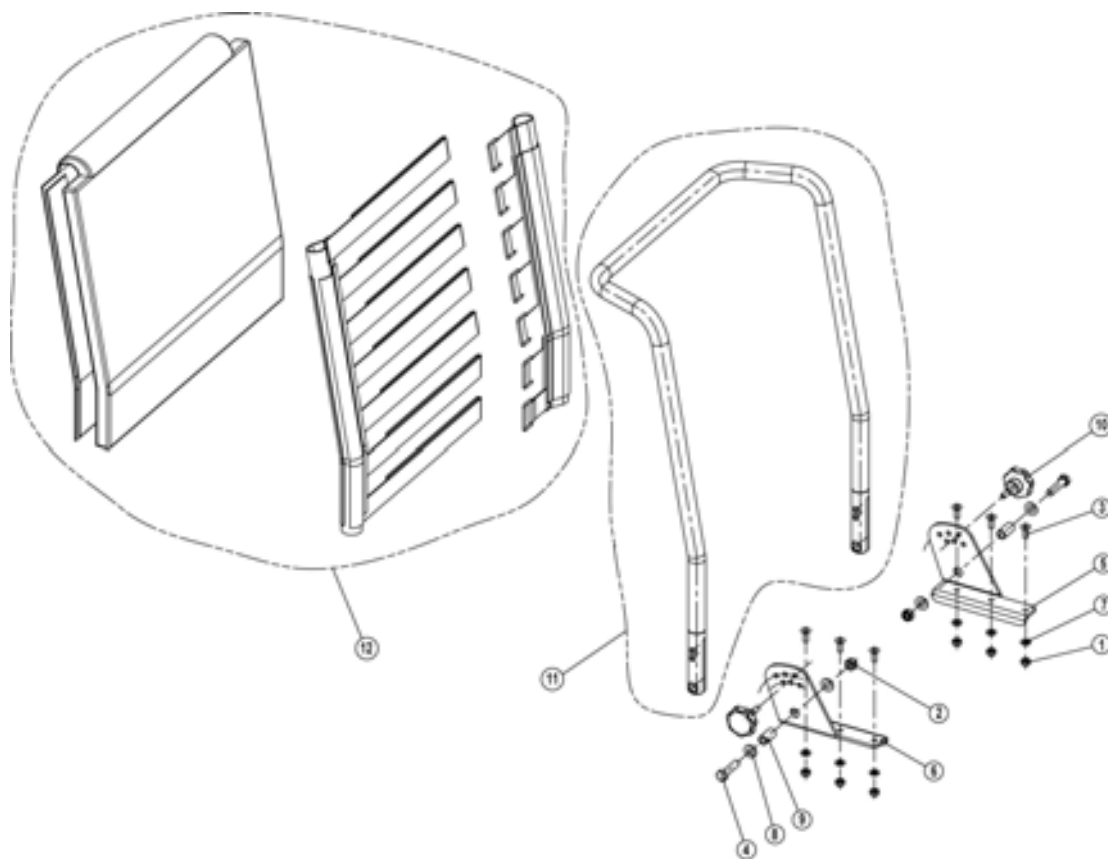
Installing the additional belt:

- Assemble the parts in reverse order.

16 Backrest adjustment

The backrest settings can be matched to the individual user requirements. These settings should therefore be retained when carrying out service work.

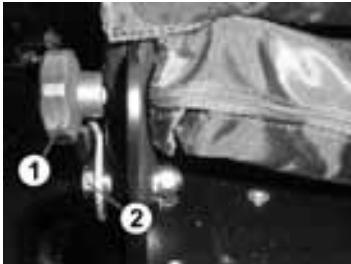
16.1 Standard / Euro (manual)



Pos	Qty.	Item No./Pcs.	Item Description
-	1	1422061	BACKREST STD.
-	1	SP 1423208	MOUNTING SET BACKREST STD. ASSY.
1	6	F20109	HEXAGON NUT M6 SELF-LOCKING
2	2	F00002	HEXAGON NUT M8 SELF-LOCKING
3	6	D60111	COUNTERSUNK SCREW WITH ALLEN KEY HEAD M6 X 16
4	2	D08111	HEXAGON BOLT M8 X 35
5	1	1419997-9005	BACKREST ADJUSTMENT LH
6	1	1419994-9005	BACKREST ADJUSTMENT RH
7	6	G00115	WASHER 6.4 X 12.5 X 1.6
8	4	G00107	WASHER 8.4 X 17 X 1.6
9	2	H11036A.99	LINING RD. 12 X 1.8 X 23
10	2	1420444	CLAMP SCREW GRIP M8 ASSY.

11	1	1419996-9005	BACKREST TUBE 480 MM STD.
11	1	1420465-9005	BACKREST TUBE 540 MM STD.
12	1	1422062	BACKREST BELT 480 MM
12	1	1422063	BACKREST BELT 540 MM
-	1	1422845	SEAT BELT WITH SNAP FASTENING ASSY.
-	1	1422869	SEAT BELT WITH VELCRO FASTENING ASSY.
-	1	1422848	H BELT
-	2		SELF-TAPPING SCREW WITH PHILLIPS HEAD 4.8 X 22
-	2		PLASTIC ROSETTE

16.1.1 Replacing the backrest tube



- Remove backrest belt.
- Unscrew the handwheel (1) and hex bolt (2) on both sides.
- Pull the backrest tube out upwards and replace.

Reassembling is done in reverse order.

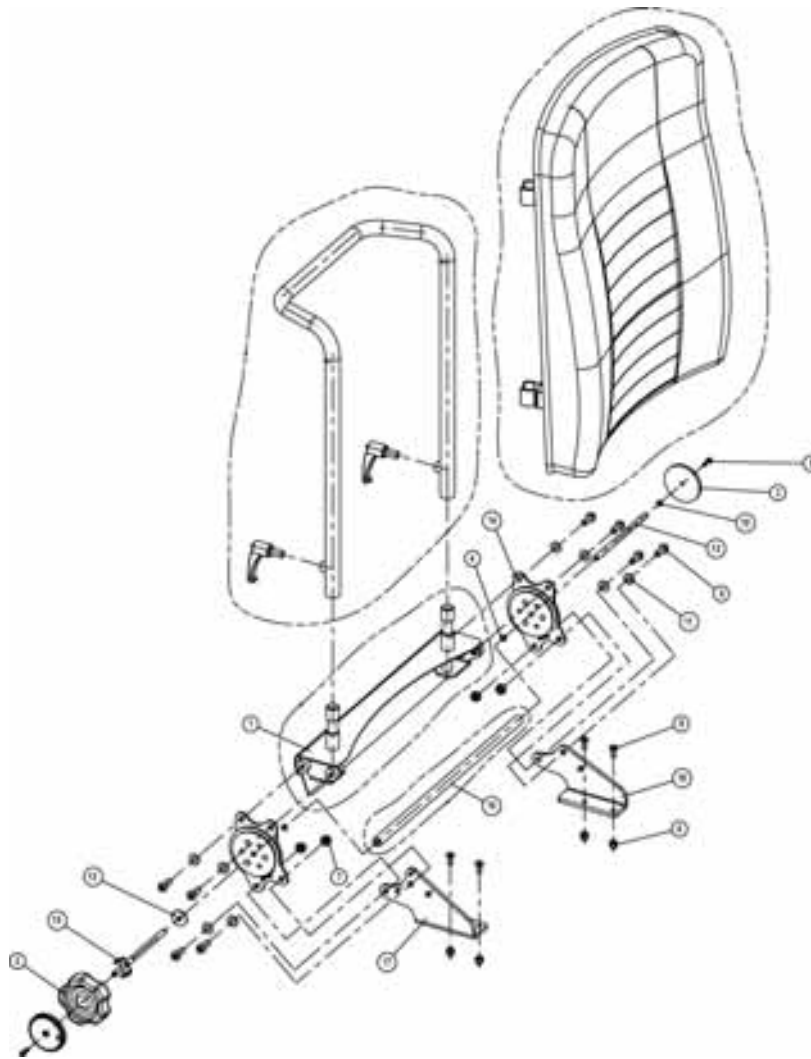
16.1.2 Replace backrest adjustment (not for Euro)



- Remove backrest tube (see page 108, chapt. 16.1.1).
- Unscrew hex nut (1).
- Remove the Allen screw from above.
- Remove backrest adjustment and replace.

Reassembling is done in reverse order.

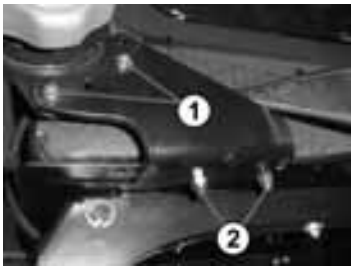
16.2 Contour backrest (manual)



Pos	Qty.	Item No./Pcs.	Item Description
-	1	1422067	BACKREST ADJUSTMENT MANUAL SB 48 ASSY.
-	1	1422066	BACKREST ADJUSTMENT MANUAL SB 43 ASSY.
1	1	1422112-9005	BACKREST ATTACHMENT 480 MM
1	1	1419992-9005	BACKREST ATTACHMENT 480 MM
2	1	1420483	HANDWHEEL
3	2	1421696	REFLECTOR PERFORATED; YELLOW
4	2	5729029	RETAINING RING
5	2	D30110	MACHINE BOLT WITH PHILLIPS HEAD M4 X 16
6	4	F60107	HEXAGON CAP NUT M6 SELF-LOCKING
7	4	F00002	HEXAGON NUT M8 SELF-LOCKING
8	4	D60111	COUNTERSUNK SCREW WITH ALLEN KEY HEAD M6 X 16
9	8	5824259	BOLT M8 X 20

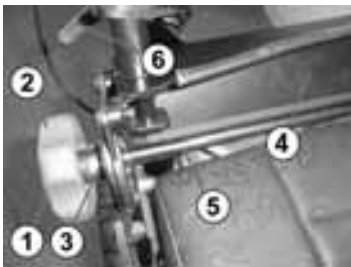
10	1	G00103	WASHER 4.3 X 9 X 0.8
11	8	G00107	WASHER 8.4 X 17 X 1.6
12	1	G10103	WASHER 8.4 X 25 X 2
13	1	1420488-0002	ARMATURE SHAFT
14	2	1419980	SEAT COVER
15	1	1421713-0003	HANDWHEEL SHAFT
16	1	1420491	CONNECTING TUBE 480 MM
16	1	142049	CONNECTING TUBE 430 MM
17	1	1420476-9005	FITTING ATTACHMENT RH
18	1	1420477-9005	FITTING ATTACHMENT LH

16.2.1 Replacing the fitting attachment



- Unscrew Allen screw (1) and nut.
- Unscrew Allen screws (2).
- Remove fitting attachment and replace.

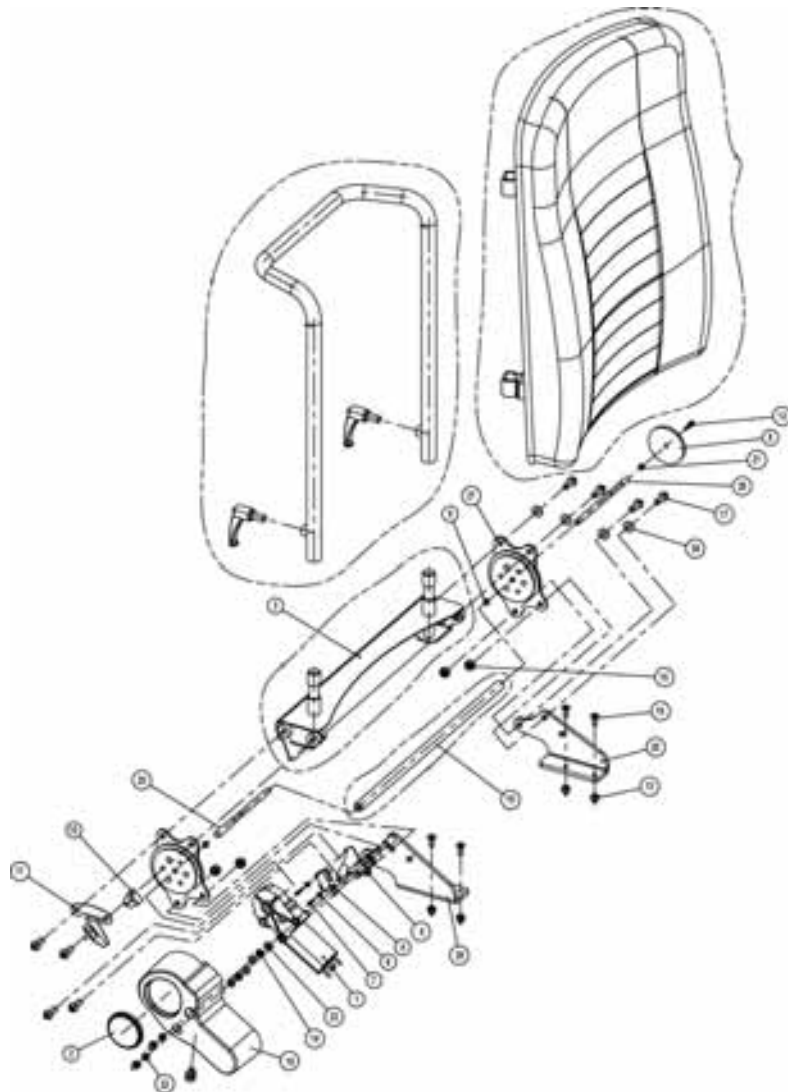
16.2.2 Replacing the backrest attachment and connecting tube



- Loosen the clamping lever (6) and remove the backrest tube.
- Unscrew the reflector (1).
- Unscrew the handwheel (2).
- Pull the handwheel shaft or armature shaft out to the side.
- Unscrew the seat fittings (3).
- Remove the backrest attachment (4) or connecting tube (5) and replace.

Reassembling is done in reverse order.

16.3 Contour backrest (electrical)



Pos	Qty.	Item No./Pcs.	Item Description
-	1	SP1422068	BACKREST ADJUSTMENT ELECTRICAL SB 43 ASSY.
-	1	SP1422069	BACKREST ADJUSTMENT ELECTRICAL SB 48 ASSY.
1	1	1420475	GEARED MOTOR GMPG
2	1	1420482	REFLECTOR
3	1	1419992-9005	BACKREST ATTACHMENT 430 MM
3	1	1422112-9005	BACKREST ATTACHMENT 480 MM
4	1	1422887	LIMIT SWITCH
5	1	1420497-0003	MICROSWITCH PLATE
6	2	5729071	FIBREGLASS WASHER
7	2	D36111	CHEESE HEAD SELF-TAPPING SCREW WITH PHILLIPS HEAD 2.9 X 16
8	1	1421696	REFLECTOR PERFORATED; YELLOW
9	2	5729029	RETAINING RING

-	1	SP1423212	ANGULAR SENSOR ASSY.
10	1		ANGULAR SENSOR
11	1	1420999-0003	ANGULAR SENSOR PLATE
12	1	D30110	MACHINE BOLT WITH PHILLIPS HEAD M4 X 16
13	6	F60107	HEXAGON CAP NUT M6 SELF-LOCKING
14	2	F20104	HEXAGON NUT M6 SELF-LOCKING
15	4	F00002	HEXAGON NUT M8 SELF-LOCKING
16	4	D60111	COUNTERSUNK SCREW WITH ALLEN KEY HEAD M6 X 16
17	8	5824259	BOLT M8 X 20
18	1	1420998	MOTOR CAP
19	1	1420490	CONNECTING TUBE 430 MM
19	1	1420491	CONNECTING TUBE 480 MM
20	1	1420477-9005	FITTING ATTACHMENT LH
20	1	G00103	WASHER 4.3 X 9 X 0.8
21	2	G00115	WASHER 6.4 X 12.5 X 1.6
22	4	G00110	WASHER 6.4 X 12.5 X 1.6
23	4	G00107	WASHER 8.4 X 17 X 1.6
25	1	1420487-0002	MOTOR SHAFT
26	1	1420488-0002	ARMATURE SHAFT
-	1	SP1423215	SEAT FITTINGS ASSY. (PAIR)
27	2	1419980	SEAT COVER
28	1	1421708-9005	FITTING ATTACHMENT RH

16.3.1 Replacing the backrest adjustment motor



- Unscrew the motor cap, open the tension relief and remove the cable.
- Unscrew the hex nuts (1).
- Pull both flat plugs (red) out of the motor.
- Remove the motor from the fitting attachment.
- Remove motor and replace.

Reassembling is done in reverse order.

16.3.2 Replacing the angle sensor



- Raise lifter (see page 72, chapt. 12.1.2).
- Unscrew the motor cap, open the tension relief and remove the cable.
- Cut off all cable binders on the angular sensor cable.
- Pull the connector plug out of the angular sensor underneath the seat.
- Bend up the metal tab.
- Pull the angular sensor out upwards.
- When reassembling the new angular sensor, ensure that the notch is located on the left (see arrow).

Reassembling is done in reverse order.

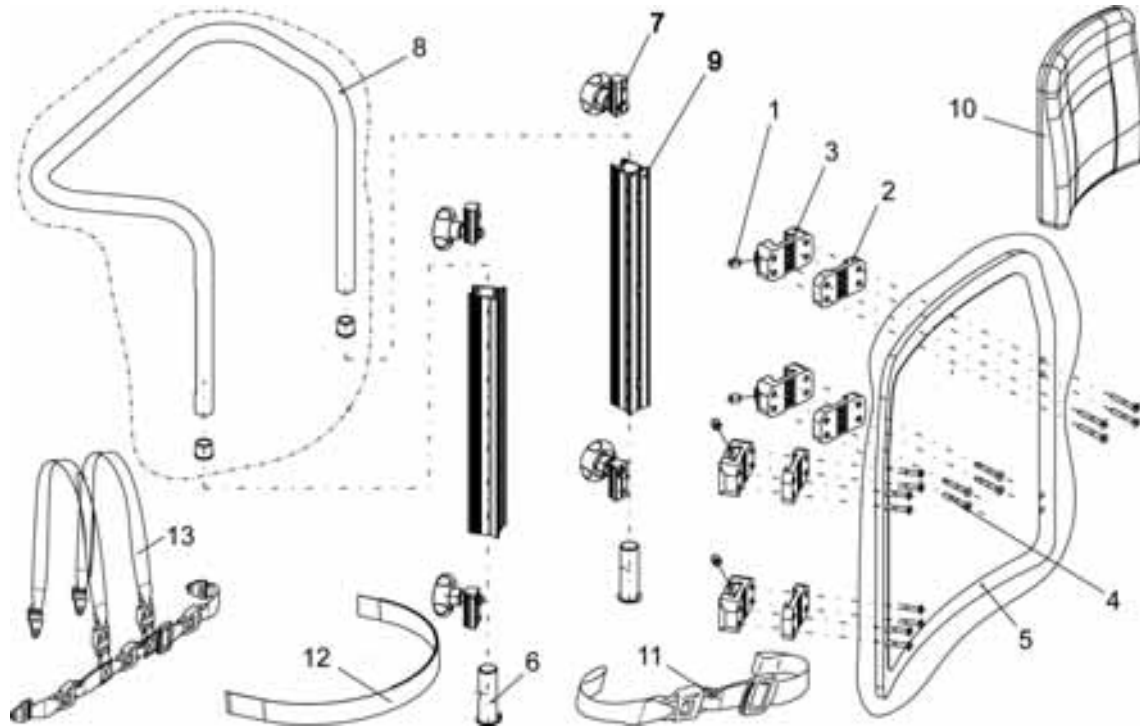
Test: Set the seat tilter to 0° using a spirit level. Lean the backrest back until the angular sensor stops automatically at 45° (please check using protractor!)

16.4 Flex backrest (manual)



Note

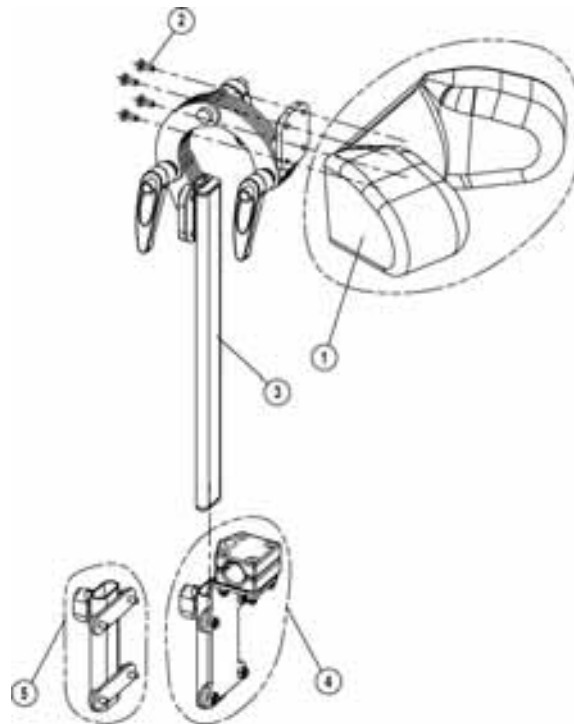
Service work is identical that required for the contour backrest apart from a few components (see page 109, chapt. 16.2).



Pos	Qty.	Item No./Pcs.	Item Description
-	1	SP1422126	BACKREST FLEX SB 39 WITHOUT UPHOLSTERY ASSY.
-	1	SP1422124	BACKREST FLEX SB 43 WITHOUT UPHOLSTERY ASSY.
-	1	SP1422125	BACKREST FLEX SB 48 WITHOUT UPHOLSTERY ASSY.
1	4	5824372	GRUB SCREW DIN 916-M10 X 12
2	4	1421702	SPACER
3	4	5253525	BACKREST RAIL SUPPORT
4	16	1421704	BOLT 5 X 45 DIN 7505
5	1	1422108	BACKREST PLATE SB 39
5	1	1422107	BACKREST PLATE SB 43
5	1	1422106	BACKREST PLATE SB 48
-	1	SP1423220	GUIDE BUSH ASSY. (PAIR)
6	2	1421698-0003	GUIDE BUSH
7	4	5253088	FIXING BLOCK
8	1	5253057	PUSH BAR SB 39
8	1	5253058	PUSH BAR SB 43/48

9	2	5252204	BACKREST BAR
10	1	1422537	BACKREST CUSHION SB 43 VIC AIR
10	1	5252507-TR04	BACKREST CUSHION VINYL GREY, SB 44
10	1	1422535	BACKREST CUSHION SB 43; BLUE
10	1	5252508-TR04	BACKREST CUSHION VINYL GREY, SB 49
10	1	1422536	BACKREST CUSHION SB 48; BLUE
11	1	1422846	SEAT BELT WITH SNAP FASTENING ASSY.
12	1	1422870	SEAT BELT WITH VELCRO FASTENING ASSY.
13	1	1422847	H BELT

16.5 Headrest



Pos	Qty.	Item No./Pcs.	Item Description
-	1	SP1422923	HEADREST CONTOUR BLUE ASSY.
1	1	1422867	HEADREST UPHOLSTERY CONTOUR BLUE
-	1	SP1422924	HEADREST CONTOUR GREY ASSY.
1	1	1422866	HEADREST UPHOLSTERY CONTOUR GREY
-	1	SP1422925	HEADREST CONTOUR BLACK ASSY.
1	1	1422865	HEADREST UPHOLSTERY CONTOUR BLACK
-	1	SP1422926	HEADREST FLEX BLUE ASSY.
1	1	1422544	HEADREST UPHOLSTERY FLEX BLUE
-	1	SP1423163	HEADREST FLEX GREY ASSY.
1	1	5253011-TR04	HEADREST GREY
2	4	D30197	MACHINE BOLT WITH PHILLIPS HEAD M5 X 12
3	1	5255497	HEADREST HOLDER
4	1	1422914	HEADREST HOLDER FOR STD. SEATING SYSTEM ASSY.
5	1	1422547	HEADREST HOLDER FOR CONTOUR/FLEX SEATING SYSTEM ASSY.

16.5.1 Replacing the headrest shell



- Lever the plastic caps (1) off with a screwdriver.
- Unscrew the Phillips screws beneath this.
- Remove the headrest shell and replace.

16.5.2 Replacing the headrest arms



- Remove headrest shell (see page 117, chapt. 16.5.1).
- Loosen the hand screw (1) on the headrest attachment.
- Pull the headrest arm out and replace.

16.5.3 Replacing the headrest attachment



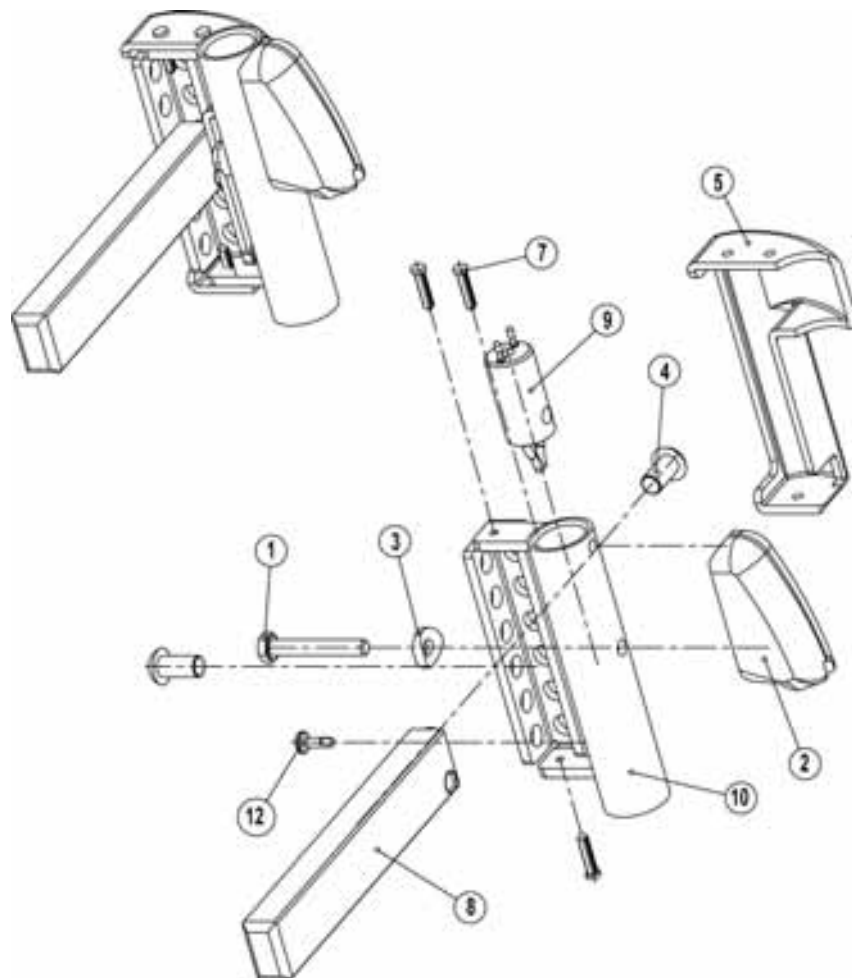
- Loosen the hand screw (1).
- Pull the headrest out.
- Lever the plastic caps (2) off with a screwdriver.
- Unscrew the Phillips screws beneath this.
- Remove the headrest attachment and replace.

Reassembling is done in reverse order.

17 Footrests

The service work described in the following chapter relates to both the right-hand and left-hand footrest hanger. The footrest hanger settings can be individually matched to the user. These settings should therefore be retained when carrying out service work.

17.1 Footrest support



Pos	Qty.	Item No./Pcs.	Item Description
-	1	SP1422825	FOOTREST SUPPORT LH FOR ELECTRICAL LEGRESTS
-	1	SP1422826	FOOTREST SUPPORT RH FOR ELECTRICAL LEGRESTS
-	1	SP1417917	FOOTREST SUPPORT LH
-	1	SP1417918	FOOTREST SUPPORT RH
1	1	1422057	BOLT M6 X 40 DIN 933
4	2	3908508	COUNTERSUNK SCREW WITH ALLEN KEY HEAD M8*16 10.9
5	1	1419716	ENCLOSURE LH
-	1	1419717	ENCLOSURE RH

2	1	Z173201.79	FOOTREST ADAPTER
7	3	H90993	PINE TREE CLIP FOR HOLE DIAMETER 3.0 MM
8	1	1417921-0003	INSERT
3	1	1417934-0003	SPACER WASHER
9	1	1415097	LEGREST CONTACT WITH CONNECTION CABLE 700 MM
10	1	1417920-0303	LEGREST ATTACHMENT LH
-	1	1422056-0303	LEGREST ATTACHMENT RH
12	1	D90188	SELF-TAPPING SCREW WITH CHEESE HEAD 4.2 X 13

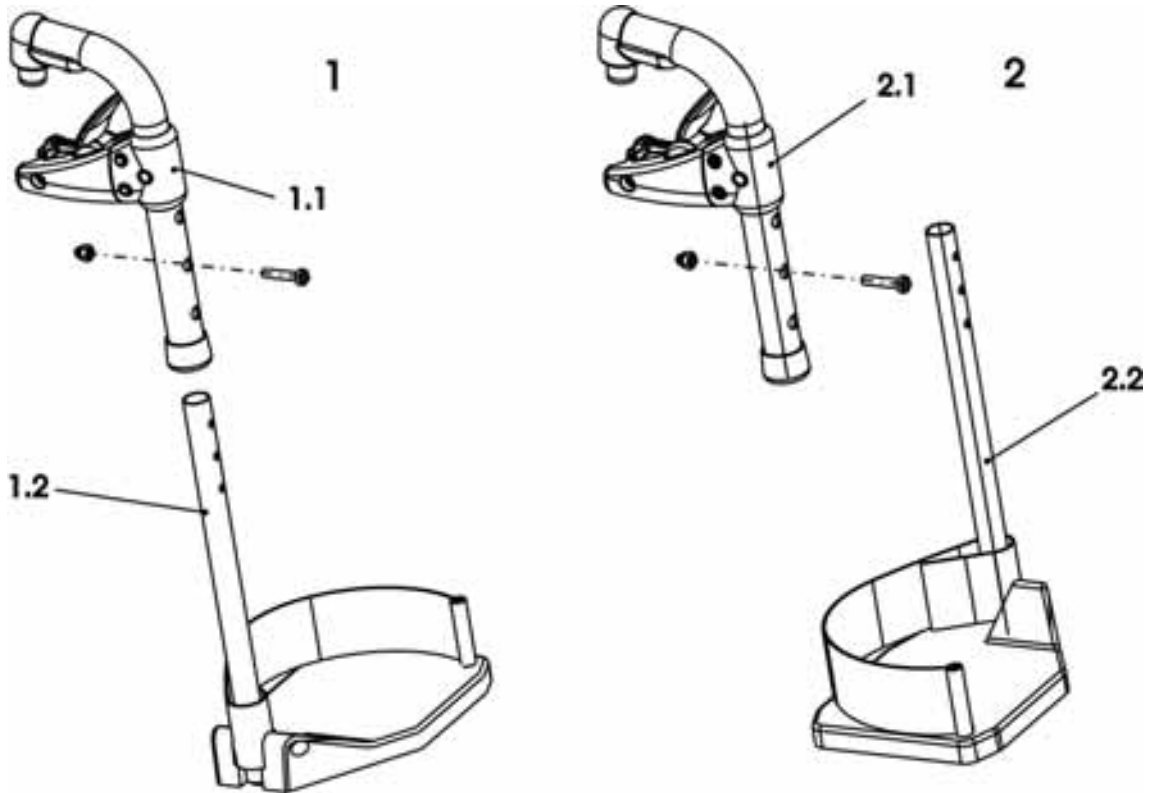
17.1.1 Replacing the footrest adapter (electrical / manual)



- Remove legrests.
- Cut all the cable binders off the footrest adapter cable (only for electrical footrest adapter).
- Pull the footrest adapter plug out beneath the seat (only for electrical footrest adapter).
- Unscrew the grub screw (1).
- Withdraw footrest adapter and replace.

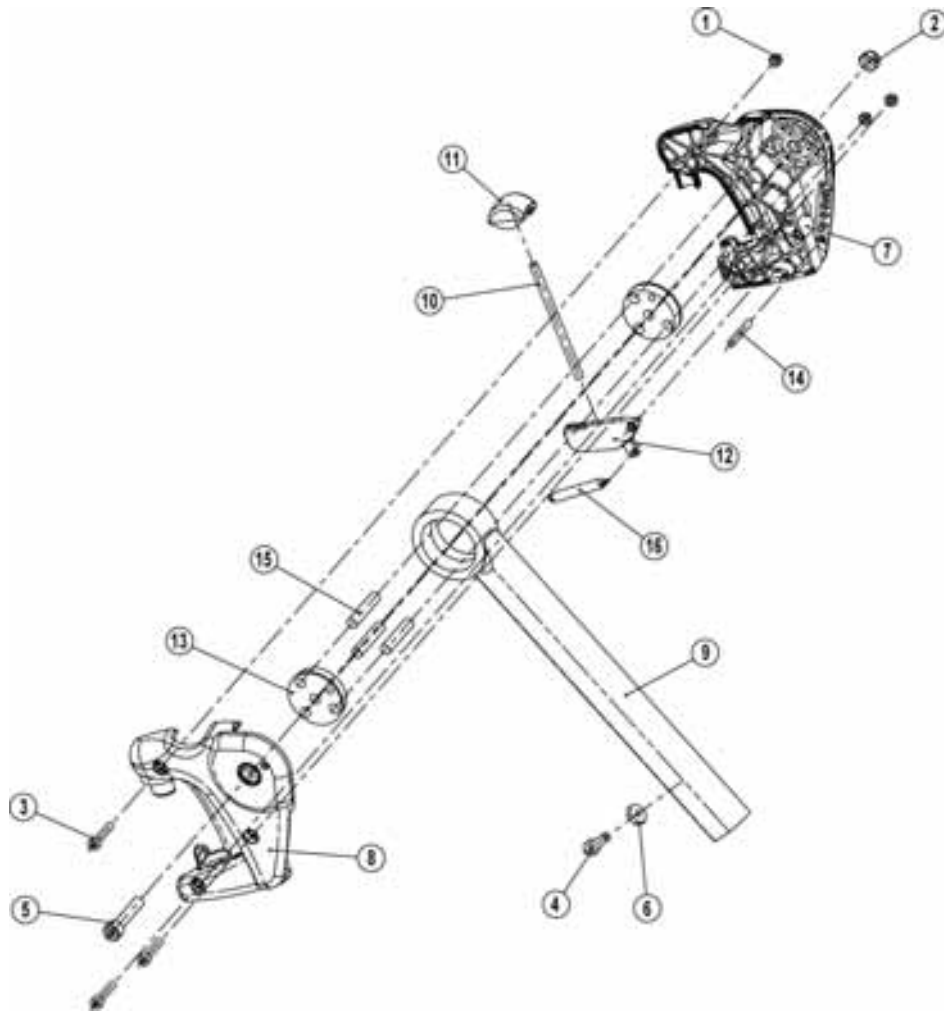
Reassembling is done in reverse order.

17.2 "Standard 80" Footrest



Item	Qty.	Art no / Pcs	Description
-	1	1430117	LEGRESTS "STORM 3 EURO" ASSY. (PAIR)
1	1	1430115	LEGRESTS "STORM 3 EURO" RH ASSY.
1.1	1	B273002	FOOTREST UPPER PART STD. 80 RE ASSY.; RAL 5025 PEARL
1.2	1	B273009	FOOTREST LOWER PART STD. 80 RE ASSY.
2	1	1430116	LEGRESTS "STORM 3 EURO" LH ASSY.
2.1	1	B273003	FOOTREST UPPER PART STD. 80 LI ASSY.; RAL 5025 PEARL
2.2	1	B273010	FOOTREST LOWER PART STD. 80° LI ASSY.

17.3 Footrest hanger (VARI F, 90°-65°)



Pos	Qty.	Item No./Pcs.	Item Description
-	1	SP1422563	FOOTREST HANGERT RH (90°-65°) ASSY.
-	1	SP1422564	FOOTREST HANGER LH (90°-65°) ASSY.
1	3	F20111	HEXAGON NUT M5 SELF-LOCKING
2	1	F00002	HEXAGON NUT M8 SELF-LOCKING
3	3	D50050	MACHINE SCREW WITH ALLEN KEY HEAD M5 X 25
4	1	D50051	MACHINE SCREW WITH ALLEN KEY HEAD M6 X 16
5	1	D50052	MACHINE SCREW WITH ALLEN KEY HEAD M8 X 40
6	1	Z173189.99	NUT M6 SP-14
7	1	Z173181	LEG SUPPORT SHELL LH
8	1	Z173182	LEG SUPPORT SHELL RH
9	1	Z173185-9005	FOOTREST UPPER PART RH (90-65°)
-	1	SP1423193	MOUNTING SET RELEASE LEVER
10	1	Z173184.99	PLUNGER ROD
11	1	Z173183	RELEASE BUTTON

12	1	Z173177	CLASP LEVER
13	2	Z173188	PRESSURE CONE
14	1	J10096	STRAIGHT PIN RD. 5 X 32; DIN-7
15	3	J10097	STRAIGHT PIN RD. 8 X 40; DIN-7
16	1	Z173178	TENSION SPRING

17.3.1 Replacing the interlock



Always compare the position numbers with the appropriate drawings!

- Unscrew cylinder head screw (5), hex nut (2).
- Unscrew cylinder-head screw (3) and hex nut (1).
- Remove footrest hanger shell (8).
- Replace the plunger rod (10), release button (11), locking lever (12) or tension spring (16).
- Replace footrest hanger shells (7, 8) if necessary.

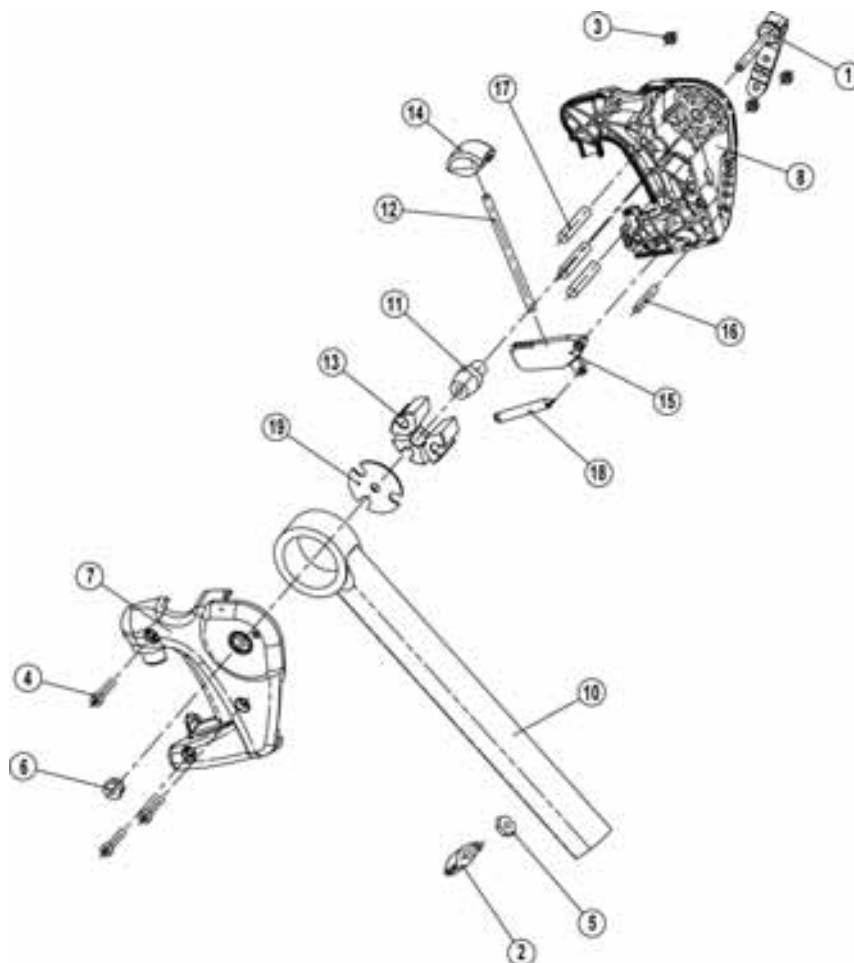
17.3.2 Replacing the footrest hanger, press cone



- Open the footrest hanger shells (see page 122, chapt. 17.3.1).
- Withdraw straight pins (15).
- Remove pressure cone (2x 13).
- Replace the footrest hanger (9) or cone (13).

Reassembling is done in reverse order.

17.4 Footrest hanger (VARI A, 80°) manually height-adjustable with angle adjustment



Pos	Qty.	Item No./Pcs.	Item Description
-	1	SP1422566	FOOTREST HANGER RH MANUAL HEIGHT-ADJUSTABLE. ASSY.
-	1	SP1422565	FOOTREST HANGER LH MANUAL HEIGHT-ADJUSTABLE. ASSY.
1	1	L32906	CLAMPING LEVER M6
2	1	L10024	WING NUT M6 X 16
3	3	F20111	HEXAGON NUT M5 SELF-LOCKING
4	3	D50050	MACHINE SCREW WITH ALLEN KEY HEAD M5 X 25
5	1	Z173189.99	NUT M6 SP-14
6	1	Z174131.89	NUT M6 SW-13
7	1	Z173194	LEG SUPPORT SHELL RH
8	1	Z173181	LEG SUPPORT SHELL LH
9	1	SPZ174163	CALF SUPPORT ASSY.
10	1	Z173203-9005	FOOTREST HANGER RH MANUAL HEIGHT-ADJUSTABLE.

-	1	SP1423194	MOUNTING SET RELEASE LEVER FOR BST MAN. HV
11	1	Z174132.99	CLAMP CONE
12	1	Z173184.99	PLUNGER ROD
13	3	Z173206.80	CLAMP BLOCK
14	1	Z173183	RELEASE BUTTON
15	1	Z173177	CLASP LEVER
16	1	J10096	STRAIGHT PIN RD. 5 X 32; DIN-7
17	3	J10097	STRAIGHT PIN RD. 8 X 40; DIN-7
18	1	Z173178	TENSION SPRING
19	1	Z174133.99	BEARING PLATE

17.4.1 Replacing the interlock, angle adjustment



Always compare the position numbers with the appropriate drawings!

- Unscrew clamping lever (1) and hex nuts (6).
- Unscrew cylinder-head screw (4) and hex nut (3).
- Remove footrest hanger shell (7).
- Replace the plunger rod (12), release button (14), locking lever (15) or tension spring (18).
- Replace footrest hanger shells (7. 8) if necessary.



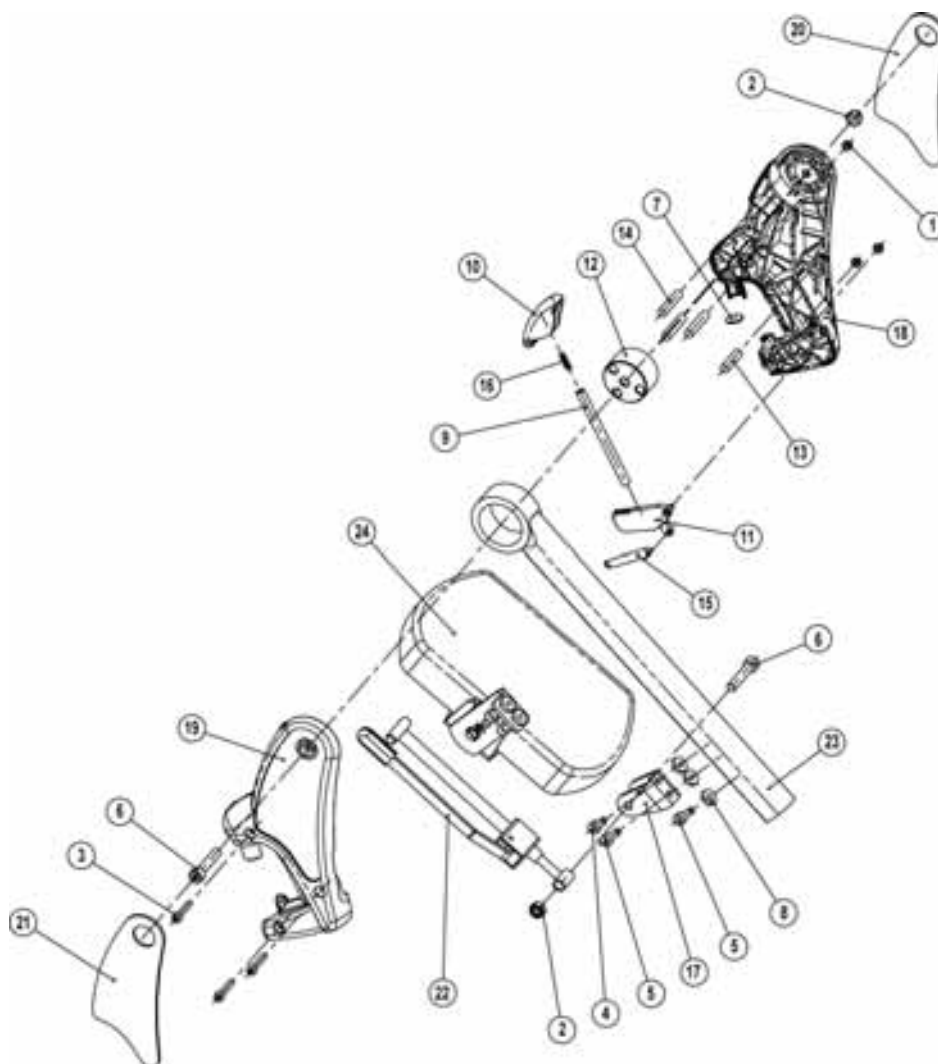
- Remove bearing plate (19).
- Withdraw straight pins (17).
- Pull out clamp cone (11), if necessary knock out carefully.
- Remove clamping blocks (3x 13).



- When reassembling, ensure that the clamp blocks (3x 13) and the clamp cone (11) are in the right position.
- Only screw the clamping lever (1) in so far that the foot support is securely locked in place when the clamping lever is activated, and so that it can be set at an angle when the clamping lever is opened.

Reassembling is done in reverse order.

17.5 Footrest hanger (ADM) with manual height adjustment



Pos	Qty.	Item No./Pcs.	Item Description
-	1	SP1422567	FOOTREST HANGER RH 80° MANUAL HEIGHT-ADJUSTABLE ASSY.
-	1	SP1422568	FOOTREST HANGER LH 80° MANUAL HEIGHT-ADJUSTABLE ASSY.
1	3	F20111	HEXAGON NUT M5 SELF-LOCKING
2	2	F00002	HEXAGON NUT M8 SELF-LOCKING
3	3	D50050	MACHINE SCREW WITH ALLEN KEY HEAD M5 X 25
4	1	D50047	MACHINE SCREW WITH ALLEN KEY HEAD M6 X 12
5	2	D50051	MACHINE SCREW WITH ALLEN KEY HEAD M6 X 16
6	2	D50052	MACHINE SCREW WITH ALLEN KEY HEAD M8 X 40
7	1	Z174139	ADP BLANK
8	3	Z173189.99	NUT M6 SP-14
-	1	SP1423195	MOUNTING SET RELEASE LEVER FOR BST 80° MAN. HV

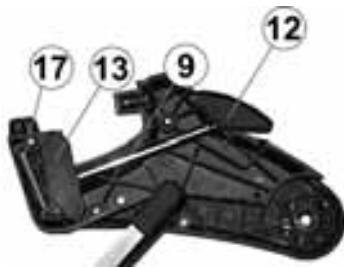
9	1	Z174113.99	LOCKING ROD
10	1	Z174112	RELEASE LEVER (AD)
11	1	Z173177	CLASP LEVER
12	1	Z174134	SLIDING CYLINDER
13	1	J10093	STRAIGHT PIN RD. 8 X 30. DIN-7
14	3	J10094	STRAIGHT PIN RD. 8 X 36. DIN-7
15	1	Z173178	TENSION SPRING
16	1	N12196	PRESSURE SPRING
17	1	Z174135.89	MOTOR RECEPTACLE
18	1	Z174111	LEG SUPPORT SHELL (AD) LH
19	1	Z174110	LEG SUPPORT SHELL (AD) RH
20	1	Z174162	KNEE CUSHION (ADM) LH
21	1	Z174172	KNEE CUSHION (ADM) RH
22	1	SPZ174130	ADM ADJUSTMENT ASSY.
23	1	Z173207-9005	FOOTREST HANGER RH 80° MANUAL HEIGHT-ADJUSTABLE
24	1	SPZ174164	CALF PLATE PREASSEMBLED

17.5.1 Replacing the ADM adjustment



Always compare the position numbers with the appropriate drawings!

- Unscrew cylinder head screw (6).
- Unscrew cylinder-head screw (6) and hex nut (2).
- Unscrew cylinder-head screw (3) and hex nut (2).
- Remove hanger shell (11).
- Remove ADM adjustment (22).



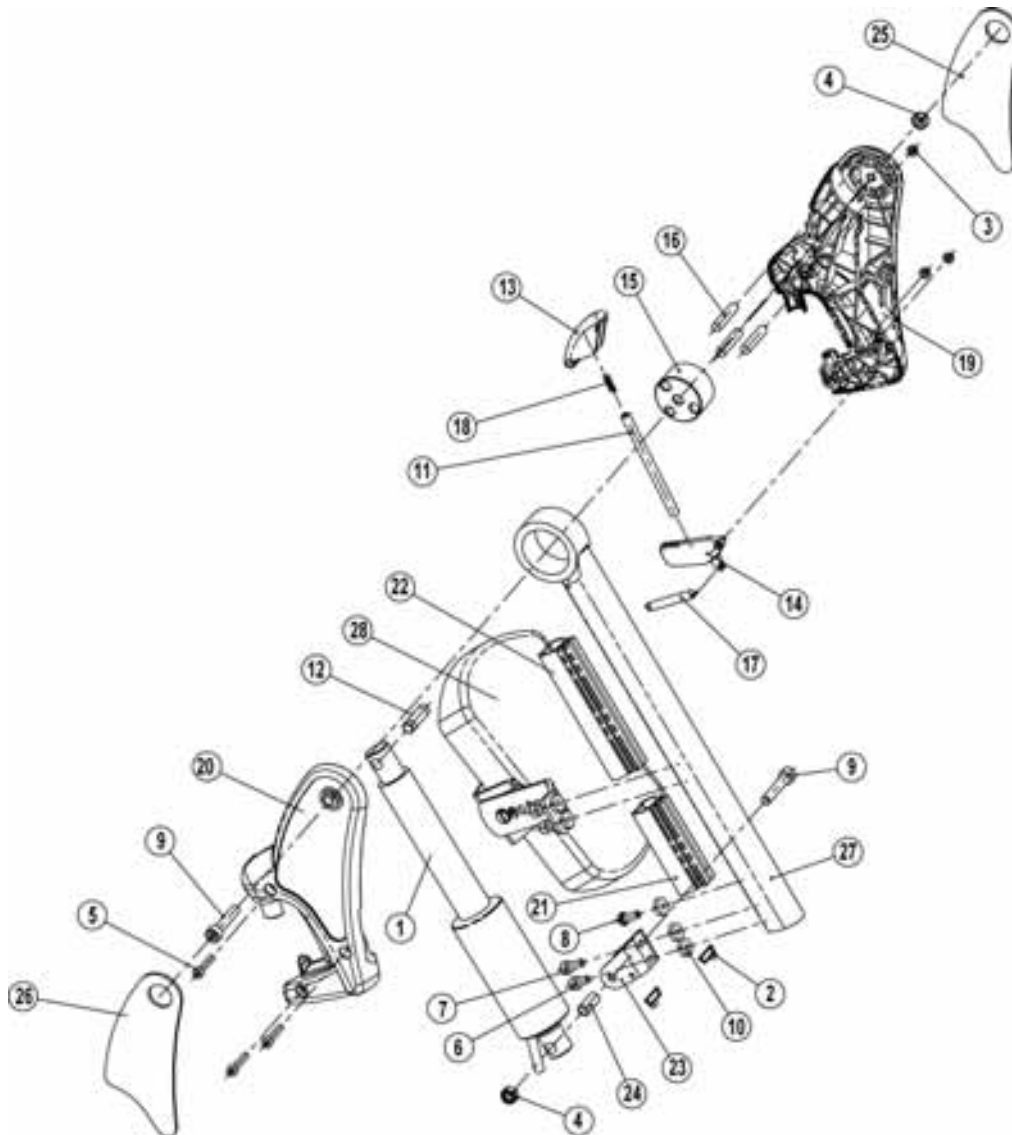
- Replace the plunger rod (9), release button (12), locking lever (13) or tension spring (17).
- Replace footrest hanger shells (10. 11) if necessary.



- Pull the plunger rod (1) out downwards.
- While doing this, ensure that the pressure spring (2) is not lost.
- The individual parts can now be replaced.

Reassembling is done in reverse order.

17.6 Footrest hanger (ADE) with electrical height adjustment



Pos	Qty.	Item No./Pcs.	Item Description
-	1	SP1422569	FOOTREST HANGER RH ELECTRICAL HEIGHT-ADJUSTABLE ASSY.
-	1	SP1422570	FOOTREST HANGER LH ELECTRICAL HEIGHT-ADJUSTABLE. ASSY.
1	1	SPZ151006	LIFT MOTOR WITH PCB PREASSEMBLED
2	2	P22414	CABLE BINDER L=142 MM
3	3	F20111	HEXAGON NUT M5 SELF-LOCKING
4	2	F00002	HEXAGON NUT M8 SELF-LOCKING
5	3	D50050	MACHINE SCREW WITH ALLEN KEY HEAD M5 X 25
6	1	D50047	MACHINE SCREW WITH ALLEN KEY HEAD M6 X 12
7	1	D50051	MACHINE SCREW WITH ALLEN KEY HEAD M6 X 16
8	1	D08120	HEXAGON BOLT M6 X 16

9	2	D50052	MACHINE SCREW WITH ALLEN KEY HEAD M8 X 40
10	3	Z173189.99	NUT M6 SP-14
-	1	SP1423201	MOUNTING SET RELEASE LEVER FOR BST ELECTRICAL HV
11	1	Z174113.99	LOCKING ROD
12	1	Z174137.99	PINTLES
13	1	Z174112	RELEASE LEVER (AD)
14	1	Z173177	CLASP LEVER
15	1	Z174134	SLIDING CYLINDER
16	3	J10094	STRAIGHT PIN RD. 8 X 36. DIN-7
17	1	Z173178	TENSION SPRING
18	1	N12196	PRESSURE SPRING
19	1	Z174111	LEG SUPPORT SHELL (AD) LH
20	1	Z174110	LEG SUPPORT SHELL (AD) RH
21	1	Z174174	PROTECTOR BOTTOM
22	1	Z174175	PROTECTOR TOP
23	1	Z174135.89	MOTOR RECEPTACLE
24	1	4000665	SPACER LINING
25	1	Z174162	KNEE CUSHION (ADM) LH
26	1	Z174172	KNEE CUSHION (ADM) RH
27	1	Z173205-9005	FOOTREST UPPER PART ADP
28	1	SPZ174164	CALF PLATE PREASSEMBLED

17.6.1 Replacing the footrest hanger, interlock, lift motor



Always compare the position numbers with the appropriate drawings!

- Unscrew cylinder head screw (9).
- Unscrew cylinder head screw (5).
- Remove right-hand footrest hanger shell (14).
- The locking lever (18), tension spring (21), release lever (17) or lock bar (11) can now be replaced.

Reassembling is done in reverse order.



- Unscrew cylinder head screws (6. 7) and hex bolt (8).
- Cut off cable binders.
- Pull nut (10) out of the tube profile.
- Pull protector (15. 16) out of the tube profile.
- Lift motor (1) can be replaced.



- Ensure that the contacts are correctly located with reassembling.
- Plug the cable into the corresponding recesses (see diagram left).
- Push protector (15. 16) into the tube profile.
- Fit leg support.
- Fix cable with cable binder.
- Check leg support for correct functioning.

A = Brown, B = Blue



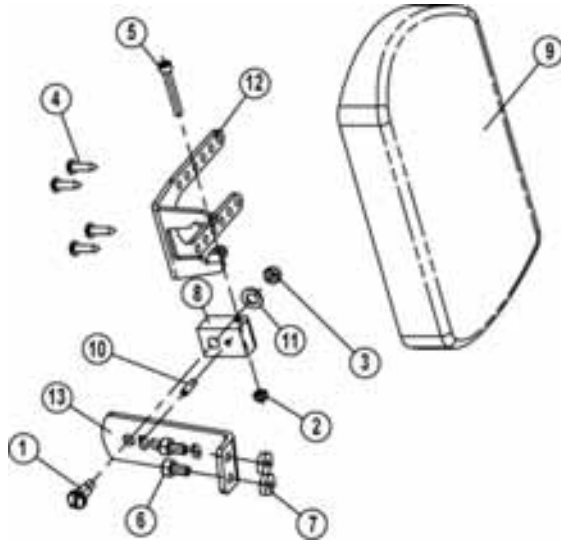
- If the travel direction is incorrect, the legrest contact (1) in the footrest adapter can be turned through 180°.

Reassembling is done in reverse order.

17.7 Replacing the calf support

**Note**

Information about calf support replacement applies to all footrest variations.



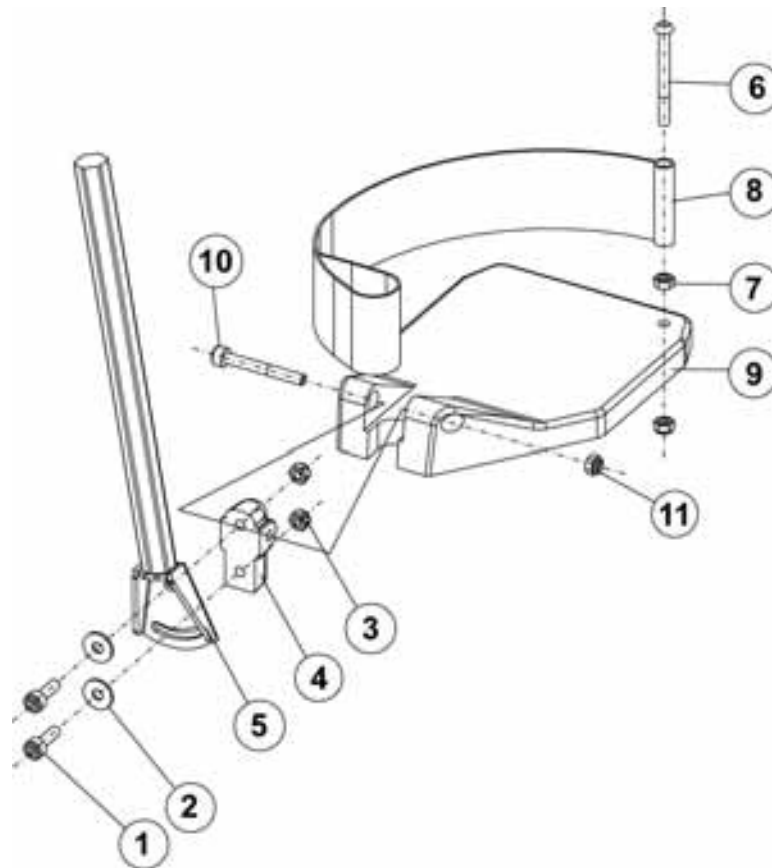
- Unscrew the Phillips screws (4).
- Remove the calf support (9) and replace.

Reassembling is done in reverse order.

18 Footrest lower part

The footrest lower part disassembly/reassembly described in the following chapter applies equally to the right hand and left-hand footrest lower parts. The footrest lower part settings can be individually matched to the user. These settings should therefore be retained when carrying out service work.

18.1 Angle-adjustable footrests



Pos	Qty.	Item No./Pcs.	Item Description
-	1	SP1421664	FOOTREST LOWER PART ANGLE-ADJ. RH CPL.
-	1	SP1421665	FOOTREST LOWER PART ANGLE-ADJ. LH CPL.
-	1	SP1423203	FOOTPLATE TUBE ANGLE-ADJUSTABLE RH ASSY.
-	1	SP1423204	FOOTPLATE TUBE ANGLE-ADJUSTABLE LH ASSY.
1	2	D50049	MACHINE SCREW WITH ALLEN KEY HEAD M6 X 20
2	2	G10105	WASHER 6.4 DIN 9021
3	2	F00103	HEXAGON NUT M6
4	1	Z174147.79	FOOTPLATE RECEPTACLE
5	1	1419715-0001	FOOTPLATE TUBE ANGLE-ADJUSTABLE RH
-	1	1419714-0001	FOOTPLATE TUBE ANGLE-ADJUSTABLE LH
-	1	SP1423202	HEEL STRAP CPL.

6	1	0029-40516	BOLT M6 X 60
7	2	F00103	HEXAGON NUT M6
8	1	B273011	HEEL BAND
9	1	0572-04449	FOOTPLATE RH; BLACK
-	1	0572-04435	FOOTPLATE LH; BLACK
10	1	D50114	MACHINE SCREW WITH ALLEN KEY HEAD M6 X 50
11	1	F20109	HEXAGON NUT M6 SELF-LOCKING

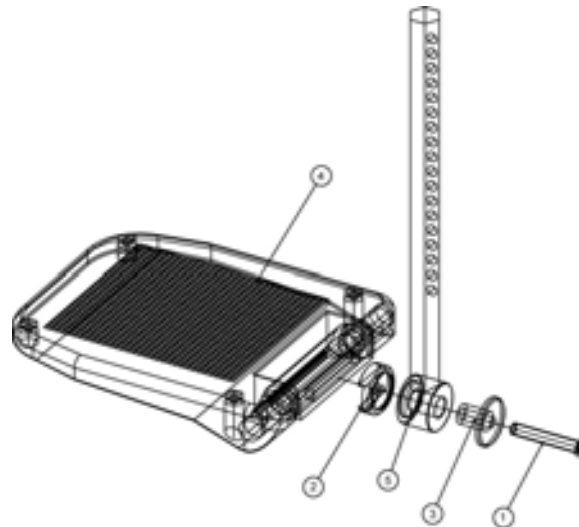
18.1.1 Replacing the footplate



- Unscrew the Allen screw (1).
- Remove the footplate and heel strap if necessary and replace.

Reassembling is done in reverse order.

18.1.2 Angle and depth-adjustable footplate



Pos	Qty.	Item No./Pcs.	Item Description
-	1	SP1419344	FOOTPLATE LH ANGLE AND DEPTH-ADJUSTABLE ASSY.
-	1	SP1419345	FOOTPLATE RH ANGLE AND DEPTH-ADJUSTABLE ASSY.
1	1	D90183	CHEESE HEAD SCREW WITH ALLEN KEY HEAD M6 X 45
2	1	1421657-0003	TOOTHED WASHER
3	1	5314672	SOCKET
4	1	5106376	FOOTPLATE ADAPT / SPIREA ANGLE ADJ.
5	1	1419320-0001	HEXAGONAL INSERT LH
5	1	1419320-0001	HEXAGONAL INSERT RH

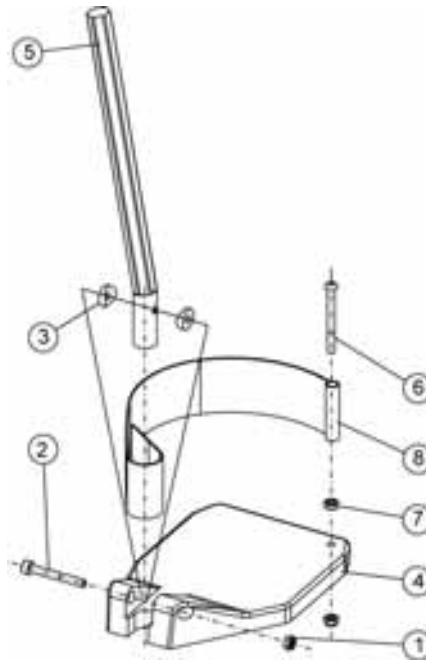
18.1.3 Replacing the footplate



- Unscrew the Allen screw (1).
- Replace footplate.

Reassembling is done in reverse order.

18.1.4 Fixed footplate



Pos	Qty.	Item No./Pcs.	Item Description
-	1	SP1421662	FOOTREST LOWER PART RH ASSY.
-	1	SP1421663	FOOTREST LOWER PART LH ASSY.
1	1	F20109	HEXAGON NUT M6 SELF-LOCKING
2	1	D50114	MACHINE SCREW WITH ALLEN KEY HEAD M6 X 50
3	2	0572-02152	CIRCULAR WASHER SHAPE B; BLACK
4	1	0572-04449	FOOTPLATE RH; BLACK
-	1	0572-04435	FOOTPLATE LH; BLACK
5	1	1419931-0001	FOOTPLATE TUBE
-	1	SP1423202	HEEL STRAP CPL.
6	1	0029-40516	BOLT M6 X 60
7	2	F00103	HEXAGON NUT M6
8	1	B273011	HEEL BAND

18.1.5 Replacing the footplate

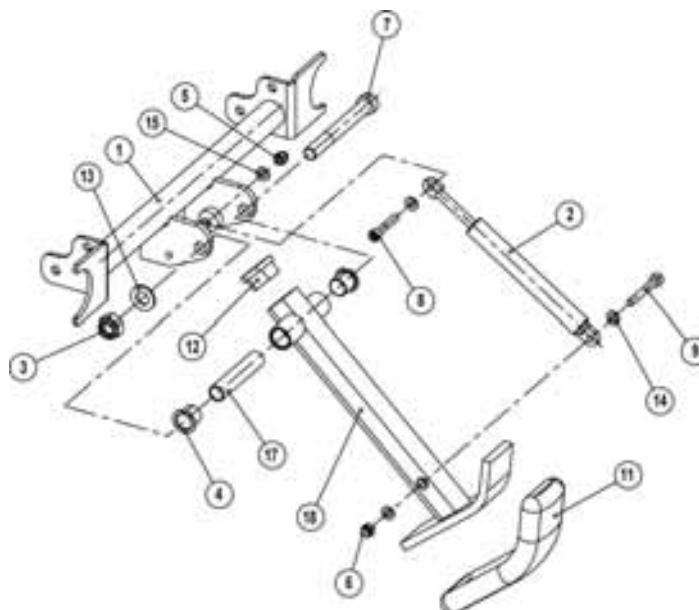


- Unscrew the Allen screw (1).
- Remove the footplate and circular washers (2).
- Replace footplate.
- When reassembling the footplate, ensure that the circular washer is in the right position (2) (radius towards inside).

Reassembling is done in reverse order.

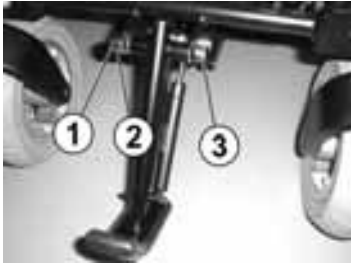
19 Accessories

19.1 Kerb climber



Pos	Qty.	Item No./Pcs.	Item Description
-	1	SP1418452	KERB CLIMBER ASSY.
1	1	1418451-7021	KERB CLIMBER ATTACHMENT
2	1	N10499	GAS-FILLED SPRING
3	1	F20106	HEXAGON NUT M12 SELF-LOCKING
4	2	N02201	BUSH BB 1517 DU
5	1	F60106	HEXAGON CAP NUT M6 SELF-LOCKING
6	1	F60107	HEXAGON CAP NUT M6 SELF-LOCKING
7	1	D50094	MACHINE SCREW WITH ALLEN KEY HEAD M6 X 100
8	1	D50117	MACHINE SCREW WITH ALLEN KEY HEAD M6 X 35
9	1	D50122	MACHINE SCREW WITH ALLEN KEY HEAD M6 X 45
10	4	D60178	HEXAGON BOLT M8 X 12
11	1	B11037B	CONTACT SHOE
12	1	L01039	CAP COVER F 38 X 20
13	1	G00104	WASHER 13 X 24 X 2.5
14	2	G00115	WASHER 6.4 X 12.5 X 1.6
15	2	G00110	WASHER 6.4 X 12.5 X 1.6
16	4	G00107	WASHER 8.4 X 17 X 1.6
17	1	F310060	SPACER LINING
18	1	F310062.P28	KERB CLIMBER; BLACK MATT (EN-200 J)

19.1.1 Replacing the kerb climber



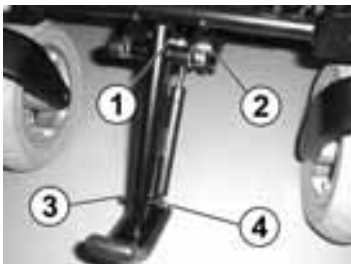
- Lever the plastic cap (1) off with a screwdriver.
- Hold the hex nut (2) below this secure.
- Unscrew the Allen screw (3).
- Remove the kerb climber and replace.

19.1.2 Replacing the kerb climber assy.



- Unscrew all four hex bolts (1).
- Remove the kerb climber attachment and replace.

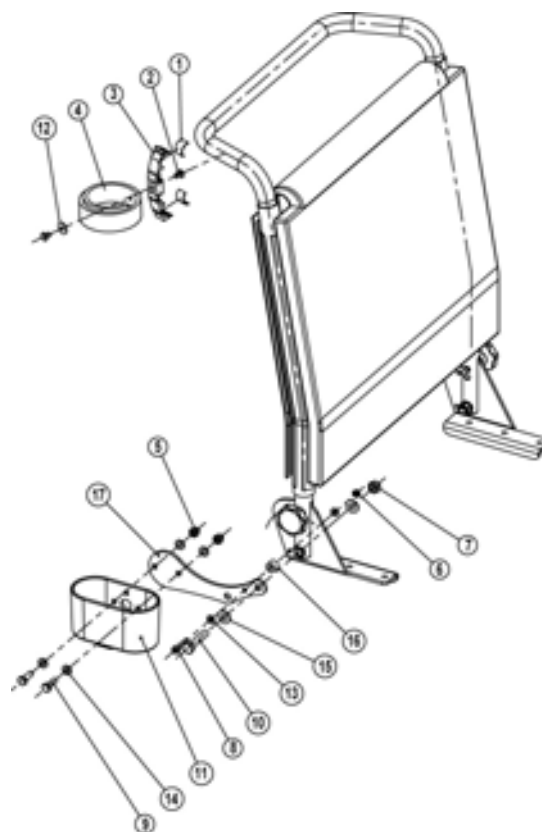
19.1.3 Replacing the gas pressure springs



- Hold the hex nut (1) secure and unscrew the Allen screw (2).
- Hold the hex nut (3) secure and unscrew the Allen screw (4).
- Remove the gas pressure spring and replace.

Reassembling is done in reverse order.

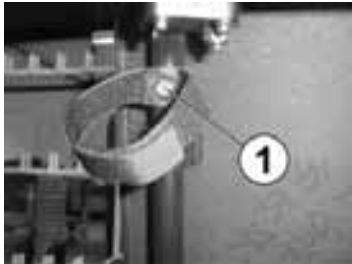
19.2 Cane holder (standard)



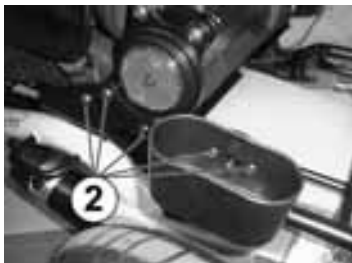
Pos	Qty.	Item No./Pcs.	Item Description
-	1	SP1422844	CANE HOLDER STD. ASSY.
1	2	1423187	ADHESIVE TAPE
2	2	1423176	SKIFFY NAIL
3	1	1423158	SPEED CLIP
4	1	1420493	BELT
5	2	F60107	HEXAGON CAP NUT M6 SELF-LOCKING
6	1	F20111	HEXAGON NUT M5 SELF-LOCKING
7	2	F00002	HEXAGON NUT M8 SELF-LOCKING
8	1	D50050	MACHINE SCREW WITH ALLEN KEY HEAD M5 X 25
9	1	D00199	HEXAGON BOLT M8 X 40
10	2	D90187	CHEESE HEAD SCREW WITH ALLEN KEY HEAD M6 X 20
11	1	5007160	CANE HOLDER SHELL 117 X 61
12	1	G10106	WASHER 5.3 X 15 X 1.6
13	2	1422890	WASHER 5.3 DIN 125
14	4	G00115	WASHER 6.4 X 12.5 X 1.6

15	4	G00107	WASHER 8.4 X 17 X 1.6
16	1	1422941-0003	LINING
17	1	1422935-9005	CANE HOLDER PLATE

19.2.1 Replacing the cane holder



- Unscrew the Phillips screw (1).
- Remove the Velcro band and replace.

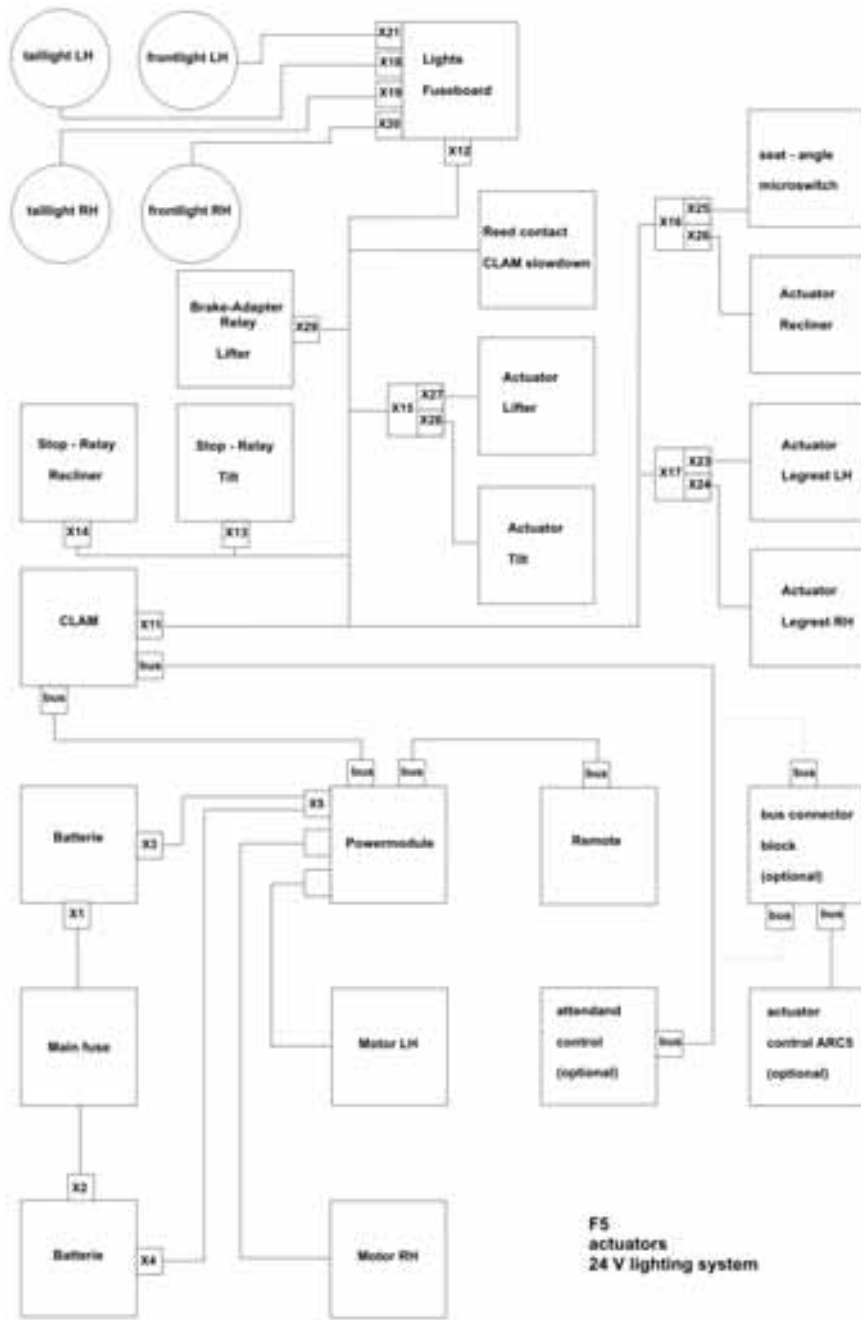


- Unscrew Allen screws (2).
- Remove the cane holder or cane holder shell and replace.

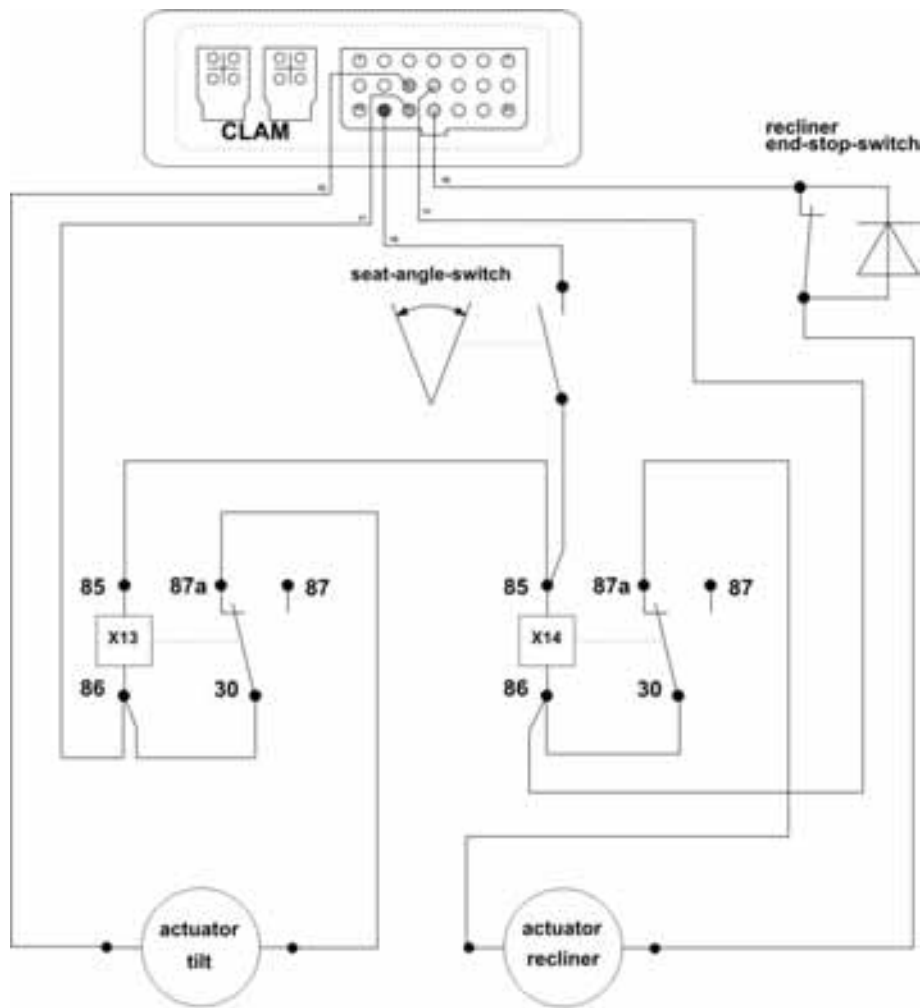
Reassembling is done in reverse order.

20 Wiring diagrams

20.1 Storm³ - maximum configuration



20.2 Detailed diagram of the Storm³ with electrical seat tilt and backrest angle adjustment (only Flex- or Kontur Seat)



wiring schematic
tilt and recliner F5

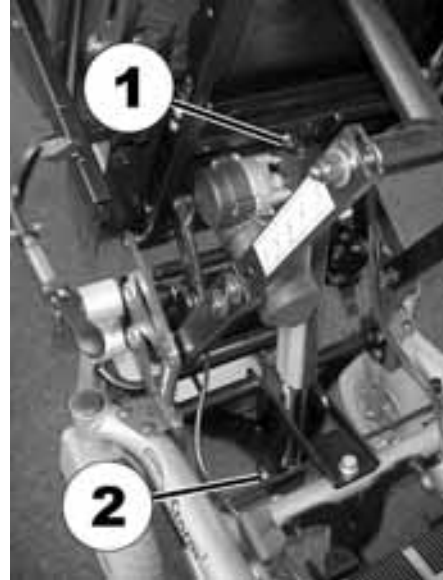
21 Replacing the verticalizer actuator



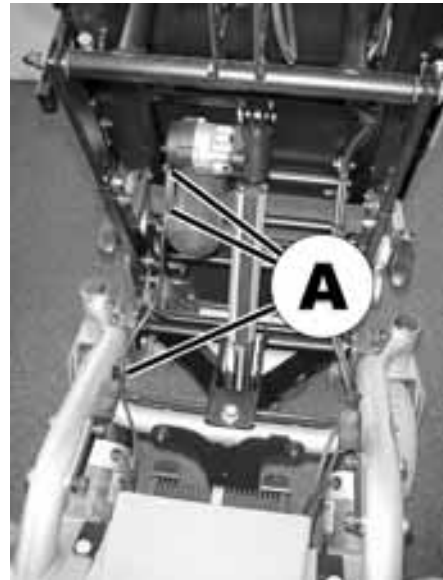
Requirements:

- Screwdriver, flat, width of edge approx. 6 mm

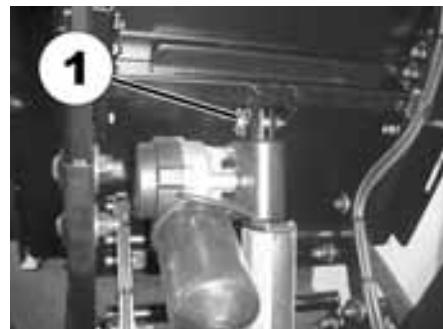
- Raise the actuator. The actuator retaining pins are to be found at (1) and (2).



- Remove the battery cover.
- Cut through the cable tie (A).
- Remove the actuator cable connector from the electronic system.



- Arrange for a second person to support the verticalizer.
- Remove the security lock locking device of the upper retaining pin (1).
- Remove the retaining pin.



- Remove the security lock locking device of the lower retaining pin (2).
- The actuator retaining pins are to be found at (1) and (2).



- Pull out the actuator.
- Insert the new actuator.
- Re-apply the retaining pins and security lock locking devices.
- Secure the actuator cable using new cable ties.
- Check all functions of the verticalizer.

22 Adjusting the wheelchair to the user's seating posture

The alignment of the verticalizer and the seat position of the user should be carried out in the following order:

Seat depth
 Lower leg length
 Back height
 Knee cushion distance to shin
 Knee cushion height
 Distance between the knee cushions
 Armrest height
 Armrest angle
 Chest belt height
 Backrest angle
 Headrest
 Stand-up angle

22.1 Torques

Please note the following torques for all adjustment and maintenance work during which it is necessary to loosen and re-tighten screws or nuts:

Thread diameter	M5	M6	M8	M10	M12	M16
Fastening torque (Nm)	3.4-4.9	5.9-7.8	14-19	25-34	44-61	115-155
Fastening torque (mkp)	0.35-0.80	0.60-0.80	1.4-1.9	2.6-3.5	4.5-6.2	11.5-16

22.2 Adjusting the seat depth

To optimally adjust the wheelchair to the user's needs, it is advisable to have the seat depth adjusted individually by an authorised Invacare® dealer.

There are perforated rails under the seat for adjusting the seat depth. This results in the following seat depths: 38, 40, 42, 44 and 46 cm. The electric wheelchair is set at the max. seat depth of 46 cm when supplied.



WARNING! Danger of crushing!

Injury hazards to your hands when working underneath the raised seat unit.

- *Ensure that the seat can not be lowered during work*
- *Switch off the electric wheelchair.*



CAUTION!

Possible material damages. If the seat depth is not adjusted properly, there is danger of the verticalizer being destroyed!

- *The lower and upper perforated rails of the parallelogram must be adjusted in an analog fashion towards each other. In the event of diversity in adjustment the verticalizer is destroyed upon operation due to the change in geometry.*



What should be observed when adjusting the seat depth?

If the seat depth adjustment is too short, the forces on the body whilst standing up are too great. If the seat depth adjustment is too long, the user can “collapse” whilst standing up.



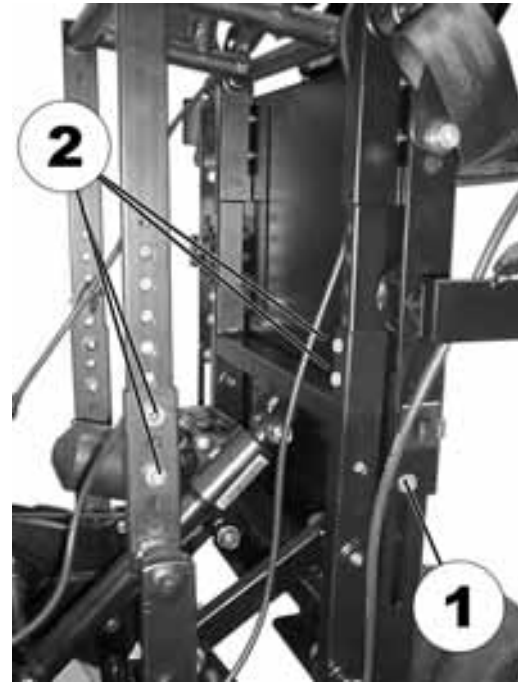
Requirements:

- 4 mm Allen key
- 6 mm Allen key
- 13 mm open-ended spanner

The picture on the right shows the position of the seat plate guide screws (1) and the fastening screws of the perforated rails (2).



- Loosen the seat plate guide screw (1).
- Loosen the fastening screws of the perforated rails (2) using an Allen key and an open-ended spanner and pull out.
- Adjust the perforated rails to the desired seat depth.
- Screw the screws back in and tighten using an Allen key and an open-ended spanner.



22.3 Legrest

22.3.1 Setting the lower leg length of the legrest

**The adjustment range of the calf length depends on the seat height!**

Depending on the model, the calf length has two possible adjustment ranges (measured including the seat cushion):

36...45 cm

41...50 cm

**What should be observed when adjusting the lower leg length?**

When adjusting the lower leg length, please make sure that the legrests are individually adjusted to correctly fit the length of the user's legs. The thighs must be resting on the seat cushion.

**Requirements:**

- 5 mm Allen key

- Loosen the screws (1) using the Allen key.
- Set the foot plate to the desired height.
- Re-tighten the screws.



22.4 Changing the height of the backrest

By cutting off a segment of the backrest sling (underneath the backrest cushion), the height of the backrest can be permanently shortened once by 5 cm.



Requirements:

- Allen key 3 mm
 - Scissors
-

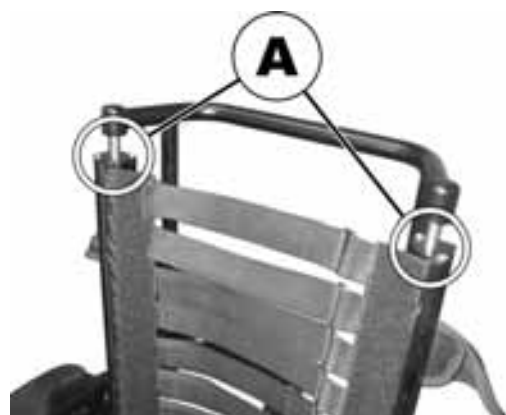
- Remove seat cushion.



- Remove backrest cushion.



- To change the height of the backrest, first the covers (A) on the ends of the backrest support tubes need to be loosened.



- Loosen and remove the screws (1) that hold the covers, using the 3 mm Allen key.



- Turn each cover so that the gap (1) is pointing towards the front, positioned directly over the end of the fixation rod of the backrest sling.



- Pull the backrest sling up through the opening.



- Using the scissors, cut the last segment of the backrest sling off, as shown in the illustration.



- Push the backrest sling and, if necessary, the fixation rod back down into the backrest frame.



- Re-position the screws (1) in the covers on the ends of the backrest frame tubes and tighten with the Allen key.



22.5 Restraining straps for the legs

22.5.1 Opening and closing the restraining strap

- Flip lever (1) over. The restraining bar is released.
- Open the restraining strap (2) to the front.
- If necessary, loosen the locking lever on the other side and remove the entire strap.

The restraining strap is re-fitted in the reverse order and closed.



22.5.2 Adjusting the position of the release lever



ATTENTION: Danger of injury!

There is danger of injury for the driver, in case one of the fixation bolts loosens or falls out, as a result of incorrect assembly!

- *The lower nut on the fixation bolt must always be tightened to 15 Nm after all assembly work!*
-

**Requirements:**

- Open-end spanner 13 mm
 - Torque spanner 13 mm
-

- Loosen the fixation nut (1) of the release lever.
- Adjust the lever to the desired position.
- Re-tighten the nut to 15 Nm.



22.5.3 Adjusting the retaining bar and knee cushions

22.5.3.1 Setting the depth of the restraining strap

**Requirements:**

- 5 mm Allen key

**What should be observed when adjusting the distance of the knee cushion to the shin?**

If the distance of the knee cushion to the shin is too small, great pressure is asserted on the legs when standing up. If the distance is too large, the user can “collapse” whilst standing up.

The holes in the inner and outer tubes are spaced differently. The many possible combinations of holes provide the ability to finely adjust the retaining bar.

- Use the screw wrench to loosen the Allen screws (1) and remove.
- Set the desired knee strap position (choose hole pattern combination inner tube/outer tube).
- Replace the screws and tighten.



22.5.3.2 Adjusting the height of the knee cushions

**Requirements:**

- Crosstip screwdriver

**ATTENTION: Danger of injury!**

There is danger of injury for the driver, in case of incorrect assembly of the knee cushions!

- *The knee pads should not press directly on the knees! The upper edge of the knee pads should be positioned just below the upper end of the shin bone!*

- Remove the knee cushion upholstery.



- Loosen the screws (1) using the crosstip screwdriver and remove.



- Move the knee cushions to the desired position.
- Re-insert the screws and tighten.



22.5.3.3 Setting the width of the knee cushions

**Requirements:**

- 4 mm Allen key

- Use the screw wrench to loosen the Allen screws (1).
- Set the desired knee cushion position.
- Re-tighten the screws.



22.6 Adjusting the armrests and the joystick box

22.6.1 Adapting the height of the armrests

**Requirements:**

- 5 mm Allen key

- Loosen the eight Allen screws (1) (only the four on the right side are to be seen in the picture).
- Adjust the height of the armrests.
- Re-tighten the screws.



22.6.2 Setting the angle of the swing-up armrest

**Requirements:**

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

**CAUTION!**

Damage to the wheelchair may result if the height of armrests is unevenly adjusted!

- *Adjust the armrests only horizontal and parallel to each other. Never adjust higher on one side and lower on the other!*

- Use the open-ended spanner to loosen the counternut (1).
- Adjust the Allen screw (2) until the desired setting angle of the armrest has been achieved.
- Re-tighten the counternut (1).



22.6.3 Setting the resistance of the swing-up armrest

The swing-up armrest is prevented from lowering under its own weight by the pre-set resistance.

**Requirements:**

- 5 mm Allen key

- Adjust the Allen screw (1) until the desired resistance of the armrest has been achieved.



22.6.4 Adapting the remote to the length of the user's arm

- Loosen the wing screw (1).
- Set the remote to the desired length by pushing forward or backward.
- Re-tighten the screw.



22.6.5 Setting the height of the remote

- Loosen the wing screw (1).
- Set the remote to the desired height.
- Re-tighten the screw.



22.6.6 Setting the width of the side sections

The distance between the side sections can be adjusted by 5.5 cm on both sides (11 cm in total).

**Requirements:**

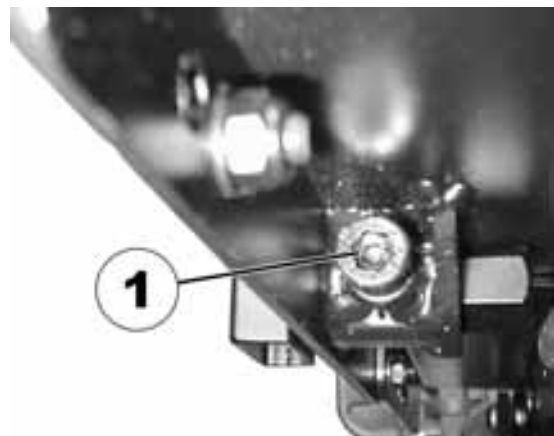
- Allen key 8 mm

Where to find the adjustment screws

The picture shows the position of the screws (1) (underneath the seat frame, hidden in the picture), that allow an adjustment to the width of the side sections.

**Doing the adjustment**

- Loosen the screw (1).
- Set the side section in the desired position.
- Re-tighten the screw.
- Check the firm fit of the side section.
- Repeat the process for the second side section.



22.7 Adapting the height of the chest belt

**Requirements:**

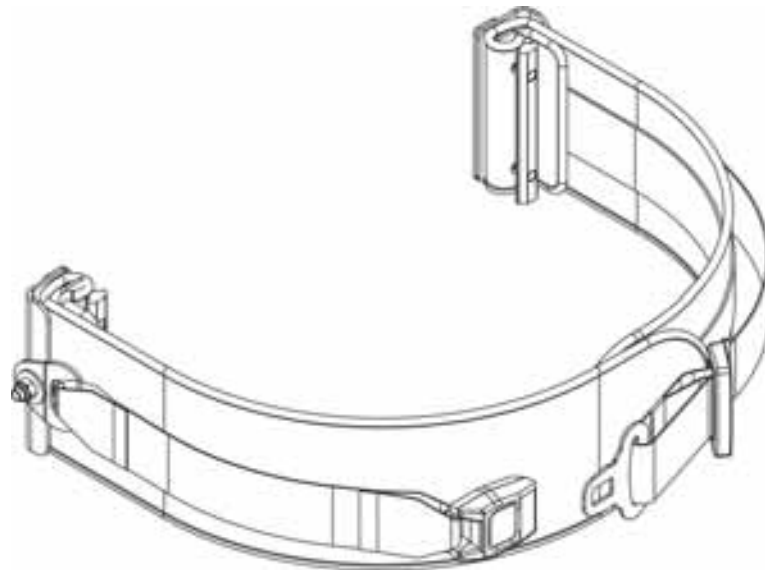
- 5 mm Allen key

**WARNING: Risk of falling if the chest strap is not closed!**

- *Make sure that the Velcro strips on the chest strap cover each other completely!*
- *Always secure the chest strap with the additional belt (with the latch), before the chair is raised up.*

**What should be observed when adjusting the height of the chest belt?**

The height of the chest belt depends on the stability of the upper part of the body. The lesser the stability, the higher the belt adjustment.



- Loosen the Allen screws (1).
- Adjust the height of the belt.
- Re-tighten the screws.



22.8 Adjusting the backrest

The inclination of the electrically adjustable backrest is continuously adjustable between +6° and +22°. The actuator is controlled via the remote.

22.9 Adjusting the headrest

22.9.1 Adjusting the height

- Loosen the hand wheel (1).
- Move the headrest to the desired height.
- Re-tighten the hand wheel.



22.9.2 Setting the position

- Loosen the release handle (1,2 or 3).
- Move the headrest to the desired position.
- Re-tighten the release handle.



22.10 Adjustment of the stand-up angle

**Requirements:**

- Screwdriver, flat, width of edge approx. 6 mm

**CAUTION:**

Danger of material damage. The Verticalizer could be destroyed if the position of the upper shut-off switches is changed!

- *Never modify the position of the upper shut-off switches!*

The control box (1) for the limit stop of the verticalizer is to be found under the seat.

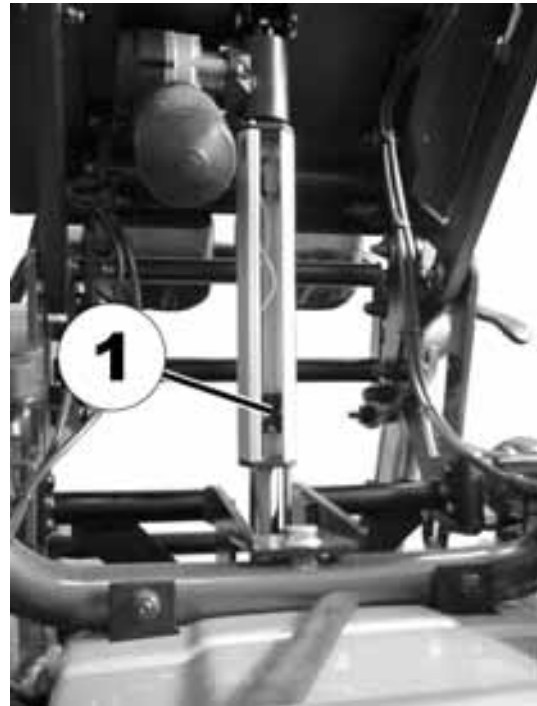
- Raise the verticalizer.



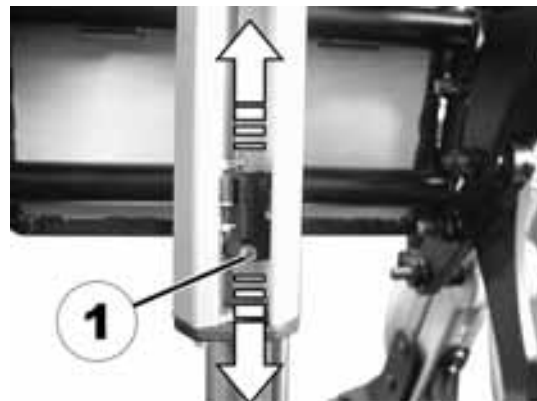
- Use the screwdriver to carefully release the rubber cover at the upper end of the control box and remove.



There are three limit switches in the control box, two at the upper end and one at the lower end. The lower limit switch (1) is the one used to adjust the stand-up angle. Never change the position of the upper shut-off switches!



- Use the screwdriver to loosen the fastening screw on the limit switch (1).
- Slide the limit switch upward or downward.
- Upward = actuator is shut down earlier when standing up, user is erected to a lesser degree.
- Downward = actuator is shut down later when standing up, user is erected to a greater degree.
- Re-tighten the fastening screw.
- Re-position the rubber cover and press carefully into the groove using the screwdriver.



22.11 Adjusting the table (option)

22.11.1 Swivelling the table upward



WARNING: Danger of crushing!

Danger of injury to the hands if accidentally folding down the table. The table does not lock and is not fixed when it is folded up.

- *Do not leave the table in the folded position. Wave off the table, only to bottom.*

- Release the quick release fastener (1).
- Open the table out to the front.



- Raise the armrest slightly.
- Swivel the table top downward and lower in a downward direction together with the armrest.



22.11.2 Adjusting the depth of the table



Requirements:

- 5 mm Allen key

- Use the Allen key to loosen the screws (1, on both sides).
- Adjust the table to the desired depth.
- Re-tighten the screws.

