

Invacare® Leo
SERVICE MANUAL



CE

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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.*

**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 Service plan (1x annually)

Component	Check	Remedy	Notes	Ü
Seat:	<ul style="list-style-type: none"> Welded seams, fixings and upholstery 	<ul style="list-style-type: none"> Tighten screws, replace parts if damaged 		
	<ul style="list-style-type: none"> Seat suspension 	<ul style="list-style-type: none"> Grease the spring generously, replace parts if damaged 	See "Replacing the seat suspension / spring" on page 34	
Frames (chassis) / battery mounting	<ul style="list-style-type: none"> Check fixings, welded seams and battery mounting Check battery fixing straps 	<ul style="list-style-type: none"> Tighten screws, replace parts if damaged 		
Wheel suspension and wheels	<ul style="list-style-type: none"> Check drive wheels for tight fit 	<ul style="list-style-type: none"> Tighten hub nuts, replace if necessary 		
	<ul style="list-style-type: none"> Check steering wheels for tight fit, float and side play 	<ul style="list-style-type: none"> Adjust / replace 	See "Assembling and disassembling the wheels (4-wheel version and rear wheels on the 3-wheel version)" on page 21	
	<ul style="list-style-type: none"> Pneumatic tyre 	<ul style="list-style-type: none"> Repair or replace if damaged 	See operating manual	
	<ul style="list-style-type: none"> Check tracking and steering linkage. 	<ul style="list-style-type: none"> Tighten screws Check tracking and steering 		
Drive units, coupling mechanism	<ul style="list-style-type: none"> Check functions in drive and push modes Check clutch mechanism 	<ul style="list-style-type: none"> Replace motor if necessary Tighten screws / nuts, adjust or replace 	See "Replacing the drive motor" on page 21	
Batteries	<ul style="list-style-type: none"> Check batteries for damage 	<ul style="list-style-type: none"> Replace batteries 	See operating manual	
	<ul style="list-style-type: none"> Check battery voltage 	<ul style="list-style-type: none"> charge batteries 	See operating manual	
	<ul style="list-style-type: none"> Check contacts and terminals 	<ul style="list-style-type: none"> Clean contacts and terminals 		
Drive electronics	<ul style="list-style-type: none"> Status display flashing Fixing Cable, connecting plug Drive lever function Power supply 	<ul style="list-style-type: none"> Evaluate blinking code Tighten or replace fixing. Replace cable, connecting plug. Replace drive lever Replace cable, connecting plug or console 		

Component	Check	Remedy	Notes	Ü
Drive program	<ul style="list-style-type: none"> · Check drive electronics program version Newer version available? 	<ul style="list-style-type: none"> · Update software 		

5 Operational Faults

5.1 Operational faults

Please proceed as follows if you have any problems:

- First assess the possible cause of the problem using the following table.
- Check the drive console status display. Evaluate the blink error code.
- Carry out the necessary checks and repairs as recommended in the following table.

5.1.1 Drive fault diagnosis

PROBLEM	OTHER SYMPTOMS	POSSIBLE CAUSE	SOLUTION	Documentation
Scooter will not start	Status display on operating console does not illuminate	batteries defective	· Replace batteries	See operating manual
		completely discharge battery	· Pre-charge batteries	
		Power supply to operating console possibly interrupted	· Check master fuse	See operating instructions for main fuse position
			· Check cable between modules for loose connections or damage	See " Replacing the electronics " on page 40
	Operating console defective	· Replace operating console	See " Replacing operating console " on page 36	
Operating unit status display blinking	Various causes	· Assess error code	See " Error Codes and Diagnostic Codes " on page 17	

Scooter judders in drive mode	None	Drive motor defective	• Replace motor(s)	See " Replacing the drive motor " on page 19
		Drive lever potentiometer defective	• Replacing the potentiometer	See " Replacing the potentiometer " on page 38
Batteries not being charged	None	batteries defective	• Replace batteries	See operating manual
	LEDs blinking on charging unit	Charging unit defective	• Replace charging unit	See charging unit operating manual
Scooter runs too slowly	None	Operating console defective	• Replace operating console	See " Replacing operating console " on page 36
		batteries defective	• Replace batteries	See operating manual
Scooter does not reduce speed on bends.	None	Speed reducer for bend travel not adjusted.	• Adjust speed reducer	
		Speed reducer defective	• Replace speed reducer	See chapter "Replacing speed reducer".

5.2 Error Codes and Diagnostic Codes

Blink code	Fault	Consequence for the Scooter	Comments
1	Battery must be charged	Continues to drive	• The batteries are discharged. Charge the battery as soon as possible.
2	Battery voltage too low	Stops driving	• The batteries are depleted. Charge batteries. • If you switch the Scooter off for a few minutes, the battery can often recuperate to such a stage that a short journey is still possible.
3	Battery voltage too high	Stops driving	• The battery voltage is too high. If the battery charger is connected, disconnect it from the Scooter. • The electronic system charges the batteries when running downhill and when braking. This fault is caused when the battery voltage becomes too high during this process. Switch the Scooter off and on again.

Blink code	Fault	Consequence for the Scooter	Comments
4	Power time exceeded	Stops driving	<ul style="list-style-type: none"> The maximum current was exceeded over too long a period, probably because the motor was overloaded or has been working against an immovable resistance. Switch the scooter off, wait a few minutes and then switch on again. The electronic system has determined a motor short-circuit. Check the wiring harness for short-circuit and check the motor. Contact your Invacare® dealer.
5	Brake failure	Stops driving	<ul style="list-style-type: none"> Ensure that the disconnection lever is pressed in. There is a defect in the braking coil or in the cabling. Check the magnetic brake and cabling for open or short-circuited circuitry. Contact your Invacare® dealer.
6	No neutral position when switching Scooter on.	Stops driving	<ul style="list-style-type: none"> Drive lever is not in neutral when the keyswitch was turned. Put the drive lever in neutral, turn the power off and then turn on again. It may be necessary to recalibrate the drive lever. Contact your Invacare® dealer.
7	Fault in speed potentiometer	Stops driving	<ul style="list-style-type: none"> The drive lever electronics could be faulty or incorrectly connected. Check the cabling for open or short-circuited circuitry. Potentiometer is not correctly adjusted. Put the potentiometer into the centre position.
8	Motor voltage error	Stops driving	<ul style="list-style-type: none"> The motor or its cabling is defective. Check the cabling for open or short-circuited circuitry.
9	Miscellaneous internal fault	Stops driving	<ul style="list-style-type: none"> Contact your Invacare® dealer.
10	Push/freewheel mode error	Stops driving	<ul style="list-style-type: none"> The Scooter has exceeded the permissible maximum speed during pushing or freewheeling. Switch the electronics system off and on again.

6 Repair Work

6.1 General warning information on installation work

**CAUTION!**

Risk of damage to the vehicle! Collisions can be caused if shim rings are removed from the drive wheels during installation work!

Shim rings are frequently placed between the drive shaft and the wheel hub to compensate tolerances. Collisions can be caused if these shim rings are removed and not re-installed!

- *Install all shim rings in exactly the same positions they were in before dismantling.*
-

6.2 Assembling and disassembling the front wheel/axle (3-wheel version)

**CAUTION: Danger of accidents!**

Accidents may result from standing the chassis upright on its end!

- *Secure the chassis against falling over!*
-

**WARNING!**

Danger of damage to the scooter! The plastic cover can be damaged if you attempt to lift the vehicle by its cover!

- *Only lift the vehicle by the chassis.*
-

**Note**

Pay attention to the positions of small parts such as screws and washers during disassembly. Put small parts aside in such a way that they can be re-fitted in the correct order.

**Requirements:**

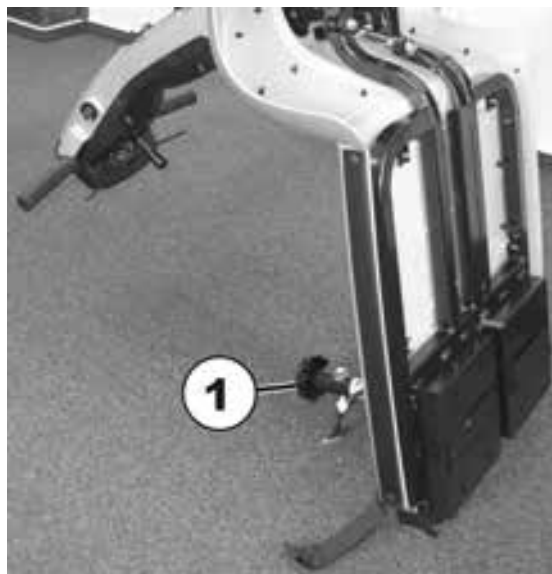
- 12 mm spanner
 - 13 mm spanner
 - Self-locking nut 13 mm
-

From the User Guide

- Remove the seat.
- Remove the batteries.
- Remove the drive unit.

Further tasks:

- Place the chassis upright on its seat adapter (1).
- Secure the chassis against falling over.

**Removing the wheel**

- Use the 13 mm spanner to loosen the nut (1). Use the 12 mm spanner to counter the axle bolt (2) and prevent it from turning.
- Slowly remove the axle.
- Remove the wheel along with the distance bushings and washer.

**Assembling the wheel:**

- Assembly of the wheel is carried out in the reverse order.
- Pay attention to the correct position of the distance bushings and washer.
- Use a new self-locking nut.
- Test all functions (test drive).

6.3 Assembling and disassembling the wheels (4-wheel version and rear wheels on the 3-wheel version)



ATTENTION! Risk of accident.

When parking the scooter on the scooters support wheels it is no longer slowed by the engine brake. The scooter can roll away out of control.

- Place the scooter rear frame on a supporting wooden block before you remove the wheels.



ATTENTION! Risk of accident.

Accidental rolling can lead to accidents.

- Secure the scooter against rolling away.



NOTE:

When disassembling, note the position of small parts such as screws and washers. Put small parts down so that they can be reassembled in the right sequence.



Requirements:

- 17 mm spanner
 - Rubber hammer
 - Flat screwdriver
 - Self-locking nut 17 mm
 - Block of wood
- Secure the scooter against rolling away.
 - Position the block of wood under the frame in the vicinity the battery box.

Removing the wheel

- Use the 17 mm spanner to loosen the nut (1).
- Remove the wheel.
- If necessary, loosen the wheel by tapping it lightly with a rubber hammer.



Assembling the wheel:

- Assembly of the wheel is carried out in the reverse order.
- Use a new self-locking nut.
- Test all functions (test drive).

6.4 Replacing the drive motor



ATTENTION! Risk of accident.

When parking the scooter on the scooters support wheels it is no longer slowed by the engine brake. The scooter can roll away out of control.

- Place the scooter rear frame on a supporting wooden block before you remove the wheels.



ATTENTION! Risk of accident.

Accidental rolling can lead to accidents.

- Secure the scooter against rolling away.



NOTE:

When disassembling, note the position of small parts such as screws and washers. Put small parts down so that they can be reassembled in the right sequence.



NOTE:

The plugs on the electronic module cannot be wrongly connected because all plugs have a different size and only fit in one socket.



Requirements:

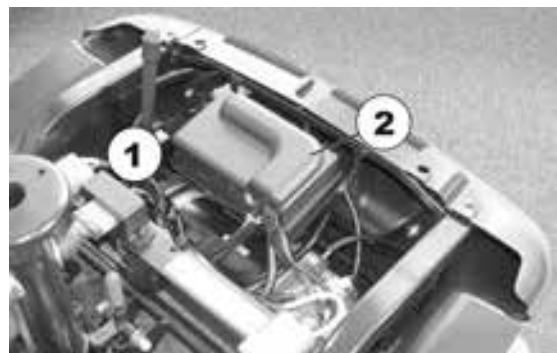
- Open spanner, 10 mm.
 - Open spanner, 17 mm.
 - Oblique pliers
 - Rubber hammer
 - Phillips screwdriver
 - Supporting wooden block
 - Self-locking nut 17 mm
-
- Secure the scooter against rolling away.
 - Place supporting wooden block under the frames at battery holder height.

From the operating manual:

- Remove the seat.
- Remove batteries.
- Remove the drive unit.

Further work:

- Cut through cable ties (1) and remove.
- Fold up electronics cover (2).



- Remove motor cable plug (1) from electronic system.
- Remove motor cable.



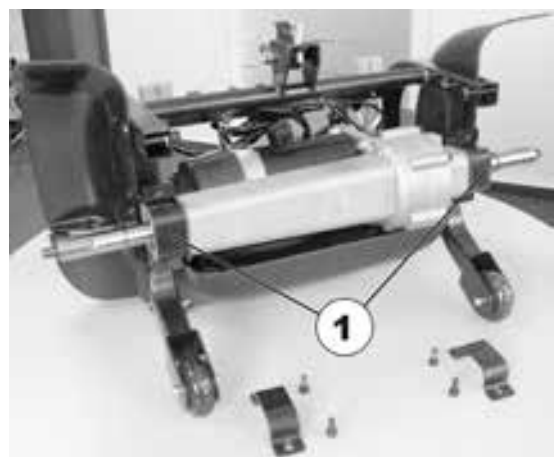
- Fold the drive to the rear onto the enclosure and the antitipper.
- Remove wheels (1). (see chapter 6.3)



- Loosen motor fixing bolts (1) on both sides and remove.
- Remove motor downwards out of the vehicle frame.



- Check rubber bearing (1) on motor suspension. Replace damaged rubber bearings.
- Reassembly of the motor takes place in reverse order
- Secure motor cable with cable tie.
- Complete reassembly of vehicle.
- Check all functions (trial run).



6.5 Replacing wheel suspension



CAUTION: Danger of accidents!

Accidents may result from standing the chassis upright on its end!

- *Secure the chassis against falling over!*



WARNING!

Danger of damage to the scooter! The plastic cover can be damaged if you attempt to lift the vehicle by its cover!

- *Only lift the vehicle by the chassis.*



Note

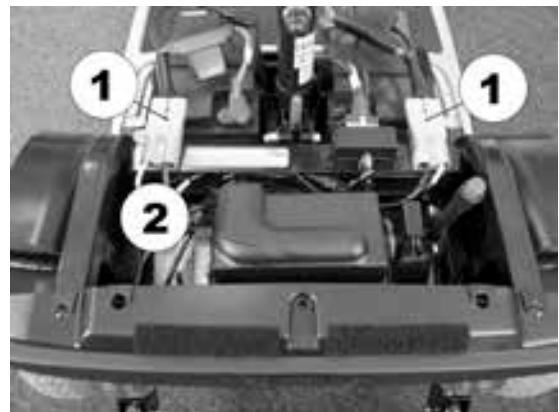
Pay attention to the positions of small parts such as screws and washers during disassembly. Put small parts aside in such a way that they can be re-fitted in the correct order.



Requirements:

- 12 mm spanner
- 13 mm spanner
- 32 mm spanner
- Phillips screwdriver

- Remove the seat.
- Remove the motor cover.
- Disconnect the battery cable (1).



- Remove the plastic plugs (1) or the rear view mirrors, if fitted, from the threaded holes.



- Remove the screws (1) beneath the control console.
- Remove screws (2).
- Remove the control lever



- Pull the control console up out of the front fixation (1).

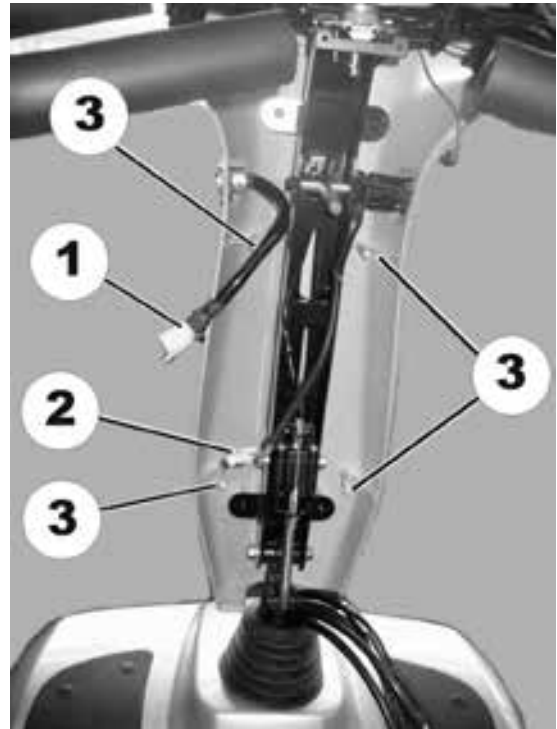


- Loosen and remove the screws (1) of the rear steering column cover.
- Remove the steering column cover.

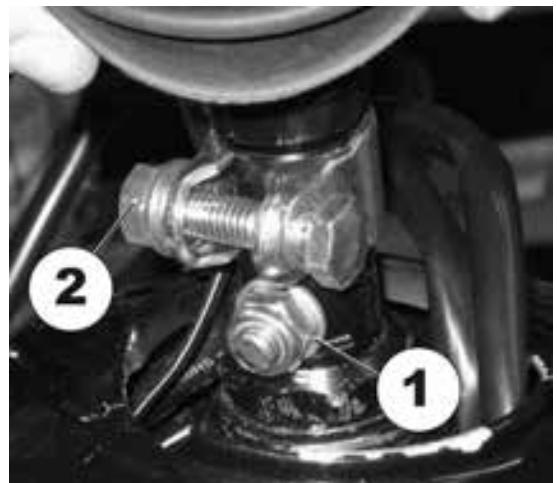


- Remove the fixation screws of the front basket holder.
- Remove the basket holder.
- Remove the distance bushings.

- Disconnect cables (1, 2) from the cable loom.
- Loosen and remove the screws (3) of the front steering column cover.
- Remove the front steering column cover.

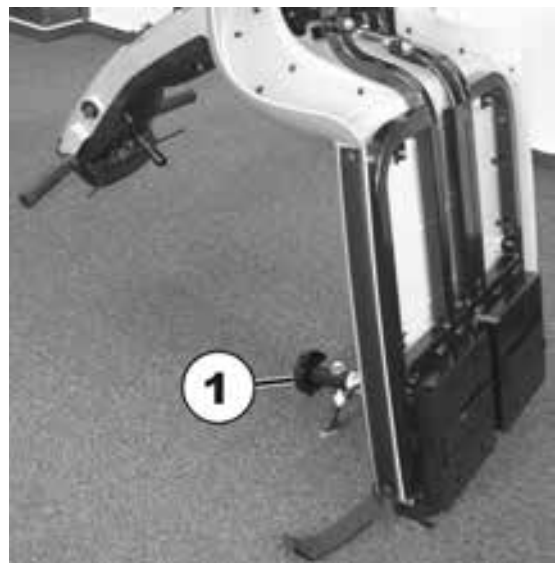


- Slide the rubber sleeve upwards.
- Loosen and remove the fixation screw of the steering column (1) using the 12 mm spanner.
- Loosen screw (2) using the 13 mm spanner.



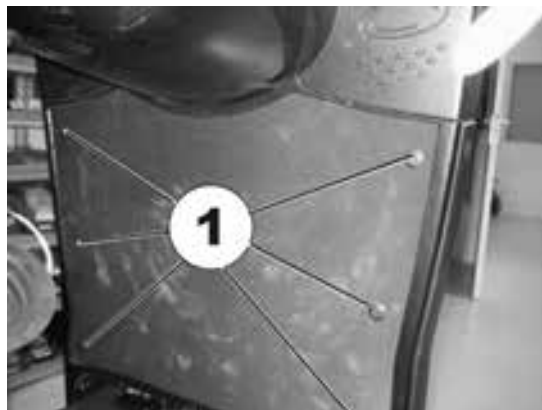
Further tasks:

- Place the chassis upright on its seat adapter (1).
- Secure the chassis against falling over.

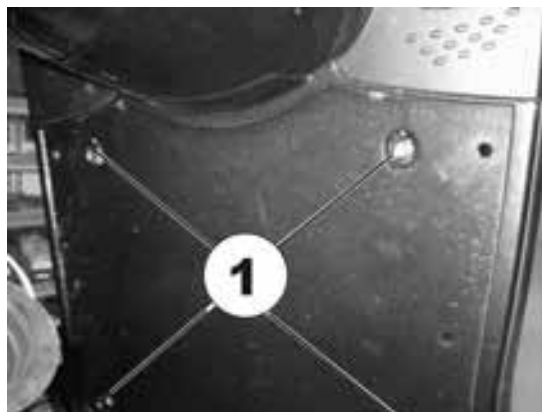


Removing the rubber mat from the foot space:

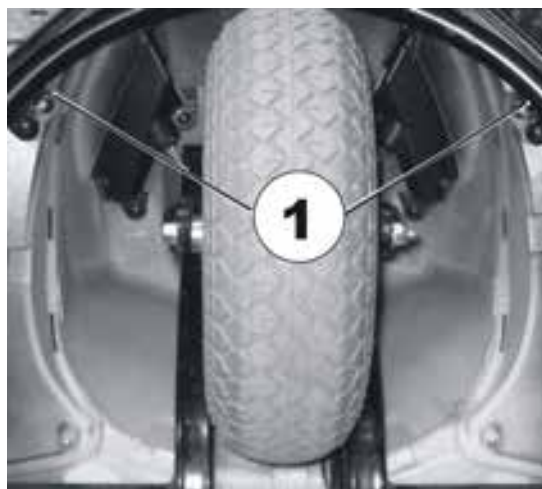
- Press the 6 fixation clips in (in the middle of the clips) using a screwdriver
- Remove the fixation clips
- Remove the foot mat



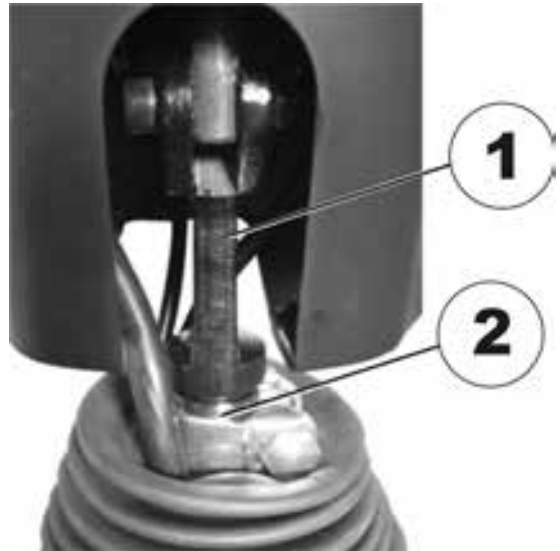
- Remove the 4 upper screws of the chassis.



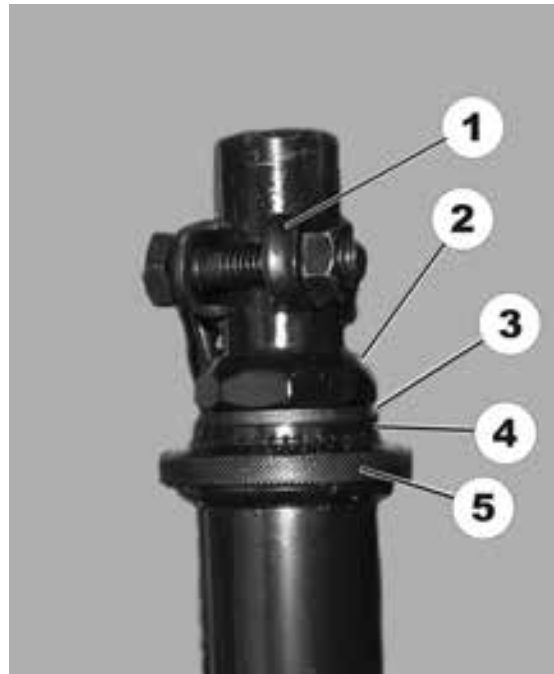
- Remove the 2 lower screws of the chassis.
- Remove the chassis by pulling it upwards.
- Remove the front wheel (see chapter 6.2).



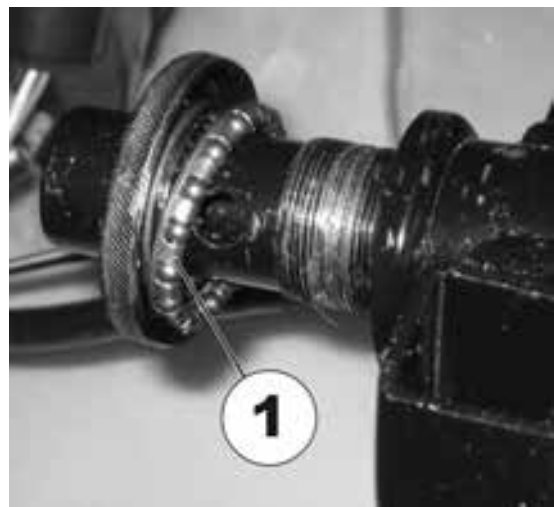
- Pull the fork out.
This can require a lot of strength, as the fork (2) can be difficult to detach from the steering head holder (1).



- Remove clamp (1).
- Use the 32 mm spanner to loosen the fork bolt (2).
- Remove the retaining ring.
- Remove the serrated washer.
- Remove the knurled screw (3).
- Pull the steering column up and out.



- Remove the ball bearing (1).



- Re-assembly is done in reverse order.
- Check all functions (test drive)

6.6 Replacing the front axle (4-wheel version)



CAUTION: Danger of accidents!

Accidents may result from standing the chassis upright on its end!

- *Secure the chassis against falling over!*



WARNING!

Danger of damage to the scooter! The plastic cover can be damaged if you attempt to lift the vehicle by its cover!

- *Only lift the vehicle by the chassis.*



Note

Pay attention to the positions of small parts such as screws and washers during disassembly. Put small parts aside in such a way that they can be re-fitted in the correct order.



Requirements:

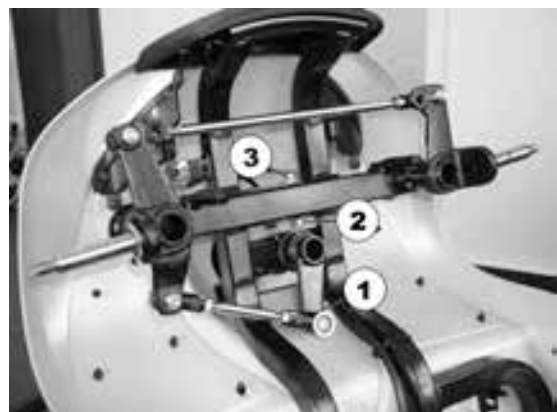
- 17 mm spanner
- 19 mm spanner

From the User Guide

- Remove the seat.
- Remove the batteries.
- Remove the drive unit.

Further tasks:

- Place the chassis upright on its seat adapter (1).
- Secure the chassis against falling over.
- Remove the wheel (1).
(see chapter 6.3)
- Loosen and remove the nut on the track rod (1) (see note below).
- Remove the track rod from the steering knuckle.
- Loosen and remove the nut of the axle suspension (2).
Counter the axle suspension bolt (3) with a spanner so it cannot rotate while performing this task.
- Pull the bolt (3) out and remove the axle assembly.



- Counter the tie rod end with a spanner while removing the nut (1) so it cannot rotate.



- Re-assembly of the axle is carried out in the reverse order.
- Test all functions (test drive).

6.7 Replacing the crash protection bar



CAUTION: Danger of accidents!

Accidents may result from standing the chassis upright on its end!

- *Secure the chassis against falling over!*



WARNING!

Danger of damage to the scooter! The plastic cover can be damaged if you attempt to lift the vehicle by its cover!

- *Only lift the vehicle by the chassis.*



Note

Pay attention to the positions of small parts such as screws and washers during disassembly. Put small parts aside in such a way that they can be re-fitted in the correct order.



Requirements:

- Phillips screwdriver

The crash protection bar (1) serves to protect the scooter from damage.



From the User Guide

- Remove the seat.
- Remove the batteries.
- Remove the drive unit.

Further tasks:

- Place the chassis upright on its seat adapter (1).
- Secure the chassis against falling over.



- Loosen and remove the 6 fixation screws of the crash protection bar using a Phillips screwdriver
- Pull the crash protection bar up and out.



- Assembly of the crash protection bar is carried out in the reverse order.
- Test all functions (test drive).

6.8 Replacing the seat suspension / spring



ATTENTION! Risk of accident.

Accidental rolling can lead to accidents.

- Secure the scooter against rolling away.



Note:

When disassembling, note the position of small parts such as screws and washers. Put small parts down so that they can be reassembled in the right sequence.



Note

The following seat support tubes are available for the seat suspension:

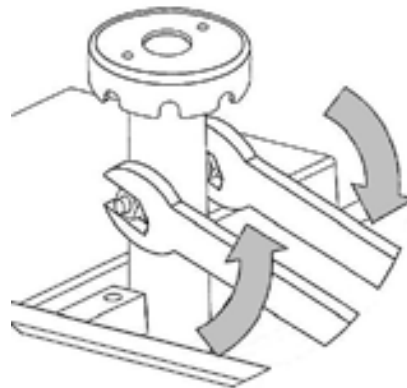
User weight	Length of the seat support tube	Part number
0 – 136 kg	508,5 mm	SP1528986
	533,5 mm	SP1528987
	558,5 mm	SP1528988
136 – 160 kg	508,5 mm	SP1522459
	533,5 mm	SP1522460
	558,5 mm	SP1522461



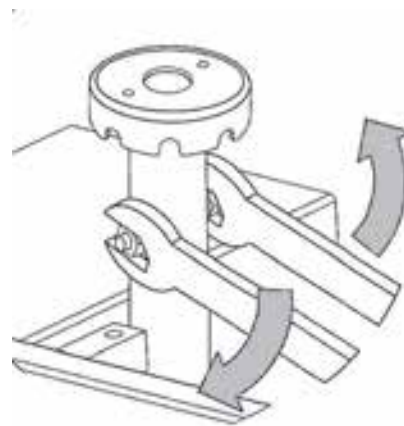
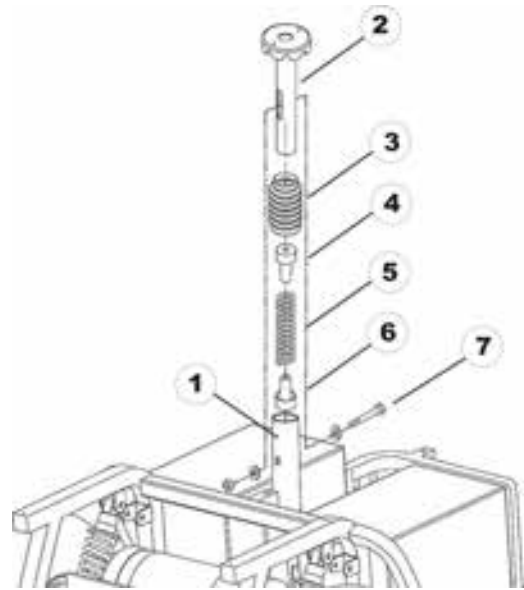
Requirements:

- 2 open spanners, 17 mm

- Secure the scooter against rolling away.
- Remove the seat.
- Loosen the securing bolt of the seat support tube.



- Remove the bolt (7), nut and washers.
- Remove the seat support tube (2) from the receptacle tube (1).
- Remove the concertina type cover (3) including the spring (5) and the plastic end pieces (4 and 6).
- Fit the plastic end pieces (4 and 6) to the new spring.
- Grease the spring generously. The spring should be covered completely.
- Assemble the concertina type cover (3).
- Install the concertina type cover (3) including the spring (5) and the plastic end pieces (4 and 6).
- Insert the seat support tube (2) into the receptacle tube (1) and press down gently.
- Reposition the bolt (7), nut and washers.
- Firmly tighten the seat support bolt.
- Reposition the seat.



6.9 Replacing operating console



ATTENTION!

Burn and scald hazard if power cable is short-circuited!

- Turn off the power completely before removing any power supply components of the electric vehicle! Therefore take out the batteries.
- Avoid a bridging of the contacts during measurements on live electrical components!



Note:

When disassembling, note the position of small parts such as screws and washers. Put small parts down so that they can be reassembled in the right sequence.



Requirements:

- Phillips screwdriver

From the operating manual:

- Remove the seat
- Remove the battery and motor compartment cover.
- Disconnect battery cable (1).



- Remove plugs from rear mirror fixing (1) or rear mirror depending on fittings.



- Remove screws (2) below operating console.



- Pull the operating console upwards out of the front fixing.



- Remove all plugs (3) from operating console.
- Replace operating console.
- Reassembly takes place in the reverse order.
- Complete reassembly of vehicle.
- Check all operating console displays.



6.10 Replacing the potentiometer



ATTENTION!

Burn and scald hazard if power cable is short-circuited!

- Turn off the power completely before removing any power supply components of the electric vehicle! Therefore take out the batteries.
- Avoid a bridging of the contacts during measurements on live electrical components!



CAUTION! Risk of accidents!

- The new potentiometer must be set to the middle position before inserting. Potentiometers which are not in the middle position can result in dangerous driving situations!



Requirements:

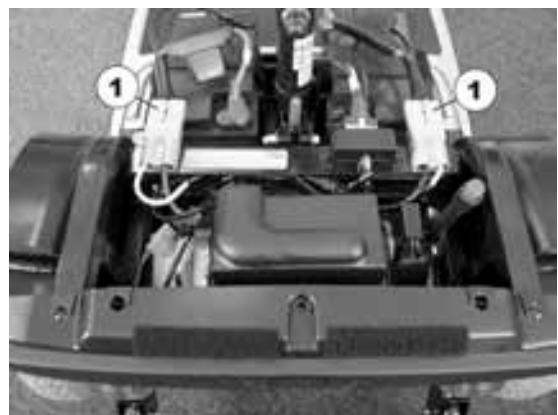
- Phillips screwdriver
- Allen key – open-ended spanner 2 mm
- Digital multimeter

From the operating manual:

- Remove the seat
- Remove the battery and motor compartment cover.
- Disconnect battery plug.

Further work:

- Remove battery plug (1).



- Remove plugs from rear mirror fixing (1) or rear mirror, depending on fittings.



- Remove screws (1) below operating console.



- Pull the operating console upwards out of the front fixing (1).

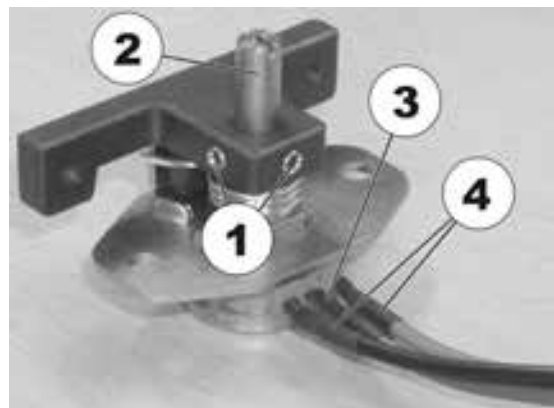


- Remove drive lever (1).
- Remove potentiometer plug (2) from the operating console.
- Remove potentiometer (3).
- Set the potentiometer to the middle position (see below).
- Reassembly takes place in the reverse order.
- Complete reassembly of vehicle.
- Check all operating console displays.



Setting the potentiometer to the middle position:

- Loosen the bolts (1) on the drive lever mounting.
- Twist the potentiometer shaft (2) until the same resistance (approx. 5kOhm) is measured between the central connection cable (3) and both outputs (4).
- Retighten the bolts on the drive lever mounting.
- Check settings and repeat the adjustment if necessary.



6.11 Replacing the electronics



ATTENTION! Risk of accident.

When parking the scooter on the scooters support wheels it is no longer slowed by the engine brake. The scooter can roll away out of control.

- Place the scooter rear frame on a supporting wooden block before you remove the wheels.



ATTENTION!

Burn and scald hazard if power cable is short-circuited!

- Turn off the power completely before removing any power supply components of the electric vehicle! Therefore take out the batteries.
- Avoid a bridging of the contacts during measurements on live electrical components!



WARNING!

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

- Changes to the drive program may only be carried out by trained Invacare® specialist dealers!
- Invacare® can only give a warranty for safe mobility aid driving behaviour - especially tipping stability - for unaltered standard drive programs!



ATTENTION! Risk of accident.

Accidental rolling can lead to accidents.

- Secure the scooter against rolling away.



Note:

The electronic system is supplied with a standard drive program. If you have carried out customer-specific modifications to the drive program, you will have to make these changes again after installing the new electronics module.



Note:

When disassembling, note the position of small parts such as screws and washers. Put small parts down so that they can be reassembled in the right sequence.



Note:

The plugs on the electronic module cannot be wrongly connected because all plugs have a different size and only fit in one socket.



Requirements:

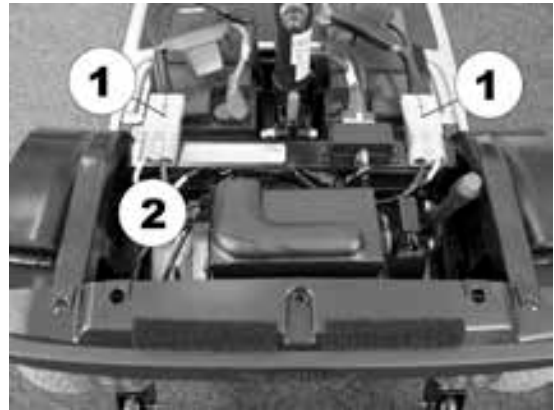
- Phillips screwdriver
- Supporting wooden block
- To adapt the drive program: programming software or hand programming device and electronics system installation manual, available from Invacare®.

From the operating manual:

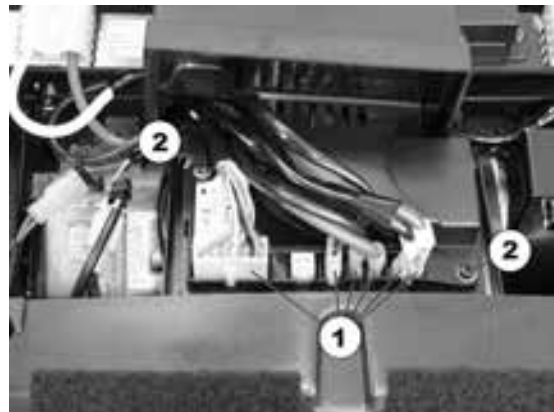
- Remove the seat
- Remove the battery and motor compartment cover.

Further work:

- Remove battery plug (1).
- Remove cover (2) from electronics system.



- Remove all plugs (1) from electronic system.
- Remove screws (2) on both sides of the electronics system.
- Replace the electronics system.
- Reassembly takes place in the reverse order.
- Modify the drive program.
- Complete reassembly of vehicle.
- Check all vehicle functions (trial run).



6.12 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/>.
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7 Accessories

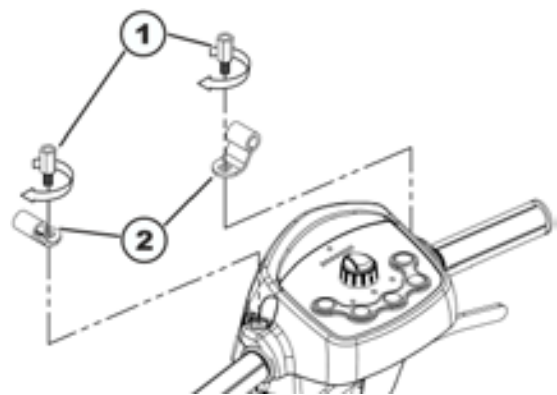
7.1 Installing the windshield



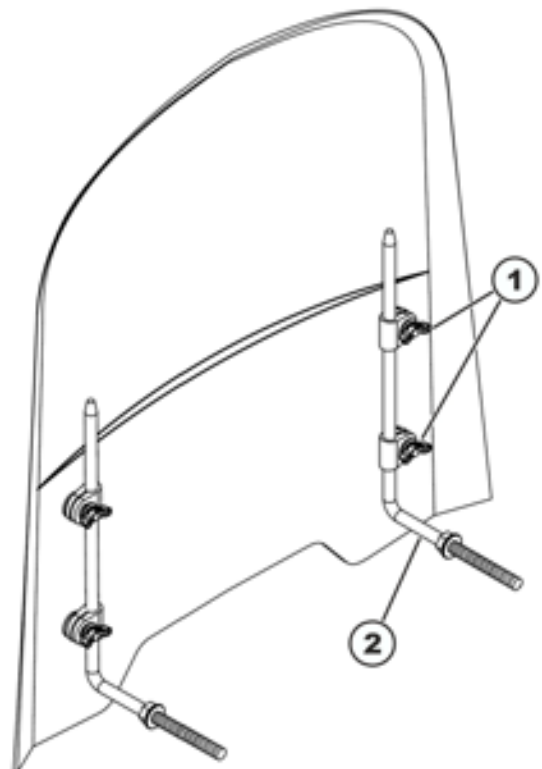
Requirements:

- 13 mm open-ended wrench
- 14 mm open-ended wrench

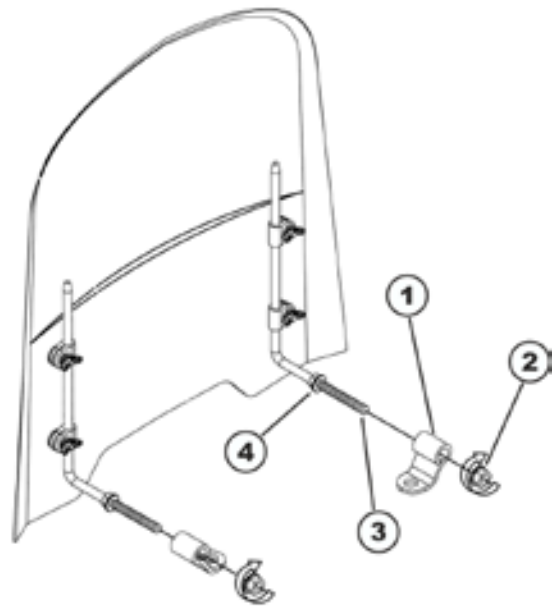
- Remove the rear view mirror and the stoppers of the plastic cover on the handlebars.
- Remove the threaded bolts of the rear view mirror holder.
- Insert the threaded bolts (1) into the holes in the brackets (2).
- Screw the threaded bolts instead of the mirror brackets into the holes provided for this purpose, but don't tighten the bolts completely yet. Make sure the brackets are turned so they point upwards and outwards towards the ends of the handlebars.



- Loosen the wing nuts (1).
- Insert the non-threaded ends of the windshield brackets (2) into the fixtures from below.



- Insert the threads of the windshield mounting brackets (3) through the bracket holders (1).
- Secure the windshield mounting brackets with the self-locking nuts (2).
- Adjust the windshield using the nuts (2) and (4) on both sides so that it is perpendicular to the direction of travel .



- Adjust the windshield so that it is horizontal.
- Tighten the wing nuts.
- Now tighten the threaded bolts.
- Install the rear view mirrors again.

