INVACARE®

Yes, You Can.®

Invacare® **Typhoon II**

Electric wheelchair
Operating manual

CE

How can you get in touch with Invacare®?

If you have any questions or need support, please contact your authorised Invacare® Dealer, who has the necessary know-how and equipment plus the special knowledge concerning your Invacare® product, and can offer you all-round satisfactory service. Should you wish to contact Invacare® directly, you can reach us in Europe at the following addresses and phone numbers.

A	**Mobitec Mobilitätshilfen GmbH** Herzog Odilostrasse 101 A-5310 Mondsee **Austria**	☎ Fax: @: @: WWW:	+43 - 6232 - 55 35 0 +43 - 6232 - 55 35 4 office@mobitec-austria.com austria@invacare.com www.mobitec-austria.com
B L	**Invacare® n.v.** Autobaan 22 B-8210 Loppem (Brugge) **Belgium**	☎ Fax: @: WWW:	+32 - (0)50 - 83 10 10 +32 - (0)50 - 83 10 11 belgium@invacare.com www.invacare.be
CH	**Mobitec Rehab AG** Benkenstraße 260 CH-4108 Witterswil **Switzerland**	☎ Fax: @: @: WWW:	+41 - (0)61 - 48 77 08 0 +41 - (0)61 - 48 77 08 1 office@mobitec-rehab.ch switzerland@invacare.com www.mobitec-rehab.ch
D	**Invacare Aquatec** Alemannenstraße 10 88316 Isny **Deutschland**	☎ Fax @: WWW:	0 75 62 / 7 00 - 251 08 00 / 6 73 81 72 info@invacare-aquatec.de www.invacare-aquatec.de
DK	**Invacare® A/S** Sdr. Ringvej 39 DK-2605 Brøndby **Danmark**	☎ (Kundeservice): Fax (Kundeservice): @: WWW:	+45 - (0)36 - 90 00 00 +45 - (0)36 - 90 00 01 denmark@invacare.com www.invacare.dk

Invacare® SA
c/ Areny, s/n
Poligon Industrial de Celrà
17460 Celrà (Girona)
ESPAÑA

☎ : +34 - (0)972 - 49 32 00
Fax: +34 - (0)972 - 49 32 20
@: contactsp@invacare.com
WWW: www.invacare.es

Invacare® Poirier SAS
Route de St Roch
F-37230 Fondettes
France

☎ : +33 - (0)247 - 62 64 66
Fax : +33 - (0)247 - 42 12 24
@: contactfr@invacare.com
WWW: www.invacare.fr

Invacare® Ltd
South Road
Bridgend Industrial Estate
Mid Glamorgan - CF31-3PY
United Kingdom

☎ (Customer Service): +44 - (0)1656 - 664 321
Fax (Customer Service): +44 - (0)1656 - 667 532
@: uk@invacare.com
@: eire@invacare.com
WWW: www.invacare.co.uk

Invacare Mecc San s.r.l.
Via Dei Pini, 62
I - 36016 Thiene (VI)
ITALIA

☎ +39 - 0445 - 38 00 59
Fax: +39 - 0445 - 38 00 34
@: italia@invacare.com
WWW: www.invacare.it

Invacare Ireland Ltd.
Unit 5 Seatown Business Campus
Seatown Rd, Swords
County Dublin
Ireland

☎ +353 - 18 10 70 84
Fax: +353 - 18 10 70 85
@: eire@invacare.com

Invacare® AS
Grensesvingen 9
Postboks 6230
N-0603 Oslo
Norge

☎ (Kundeservice): +47 - (0)22 57 95 10
Fax (Kundeservice): +47 - (0)22 57 95 01
@: norway@invacare.com
WWW: www.invacare.no

Invacare® B.V. Celsiusstraat 46 NL-6716 BZ Ede **The Netherlands**	☎ : Fax: @: WWW:	+31 - (0)318 - 69 57 57 +31 - (0)318 - 69 57 58 csede@invacare.com www.invacare.nl
Invacare® PORTUGAL Lda Rua Senhora de Campanhã 105 P-4369-001 Porto **PORTUGAL**	☎ : Fax: @: WWW:	+351-225105946 +351-225105739 portugal@invacare.com www.invacare.pt
Återförsäljare: **Invacare® AB** Fagerstagatan 9 S-163 91 Spånga **Sverige** **Tillverkare:** **Invacare® Deutschland GmbH** Kleiststraße 49 D-32457 Porta Westfalica **Deutschland**	☎ (Kundtjänst): Fax (Kundtjänst): @: @: WWW: MÖLNDAL ☎ Fax: @: LANDSKRONA ☎ Fax: @: OSKARSHAMN ☎ Fax: @:	+46 - (0) 8 761 70 90 +46 - (0) 8 761 81 08 sweden@invacare.com finland@invacare.com www.invacare.se +46 - (0) 31 – 86 36 00 +46 - (0) 31 – 86 36 06 ginvacare@invacare.com +46 - (0) 418 – 285 40 +46 - (0) 418 – 180 89 linvacare@invacare.com +46 - (0) 491 – 101 40 +46 - (0) 491 – 101 80 oinvacare@invacare.com

Table of Contents

1 Introduction

Dear user,

First we would like to thank you for purchasing our product! We hope that you will have a great deal of pleasure with your new power chair

This operating manual contains important information and notes about:

- **Safety**
- **Operation**
- **Care and maintenance.**

Please take care to read the operating manual thoroughly before starting out on your first journey.

This wheelchair has been constructed for a large circle of users with different requirements.

The decision whether the model is suitable for the user may only be taken by medical specialists with appropriate expertise.

Invacare® or their statutory representatives can accept no liability in cases in which the wheelchair has not been adapted to suit the users' handicaps.

Some maintenance and settings can be carried out by the user or his attendants. Certain adjustments do however require technical training and may only be carried out by your Invacare® specialist dealer. Damages and errors caused by nonobservance of the operating manual or as a result of incorrect maintenance are excluded from all guarantees.

1.1 Important symbols in this manual

WARNING!

This symbol warns you of danger!

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

EXPLOSION HAZARD!

This symbol warns you of an explosion hazard, an example of 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!*

BURN HAZARD!

This symbol warns you of burns due, for example, to leaking battery acid!

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

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.

1.2 Important symbols found on the vehicle

This product has been supplied from an environmentally aware manufacturer that complies with the Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/CE. This product may contain substances that could be harmful to the environment if disposed of in places (landfills) that are not appropriate according to legislation.

- *The 'crossed out wheelie bin' symbol is placed on this product to encourage you to recycle wherever possible.*
- *Please be environmentally responsible and recycle this product through your recycling facility at its end of life.*

1.2.1 Explanation of symbols on lifter warning sticker.

Do not lean out when the lifter is raised!

Do not drive up or down slopes when the lifter is raised!

Do not allow any body parts to get under a raised seat!

Never drive with two people!

Never drive over uneven surfaces when the lifter is raised!

1.3 Type classification and permissible use

This vehicle was designed for persons whose ability to walk is impaired, but who are still physically and mentally able to operate an electric vehicle. It has been classified according to EN 12184 as a **class B mobility product** (for indoor and outdoor areas). It is therefore compact and agile enough for indoor areas, but also able to overcome many obstacles in outdoor areas.

You can find exact information on speed, turning radius, range, safe climbing ability, maximum obstacle height and permissible operating conditions in chapter **"Technical Specifications"** on page **144**.

Please also pay attention to all safety information in chapter **"Safety Notes"** starting from page **16**.

The vehicle was successfully tested according to German and international standards as to its safety. It was also tested successfully according to EN60529 IPX4 as to its resistance to spray water, and is therefore well suited for typical middle European weather conditions. When equipped with an appropriate lighting system, the vehicle is suitable for use on public roads.

1.4 Guarantee

The terms and conditions of the guarantee are part of the general terms and conditions particular to the individual countries in which this product is sold.

1.5 Indications

The use of this mobility product is recommended for the following indications:

The inability or a greatly restricted ability to walk within the scope of the basic requirement to be able to move within one's own four walls. The need to leave the dwelling place in order to get some fresh air during a short walk or to reach those places generally to be found at close distance to the dwelling and where everyday business is carried out.

Provision of electric wheelchairs for interior and exterior areas is advisable if the use of hand-operated wheelchairs is no longer possible on account of the disability, yet proper operation of an electromotive drive unit is still practicable.

1.6 Life expectancy

We estimate a life expectancy of five years for this product, provided it is used in strict accordance with the intended use as set out in this document and all maintenance and service requirements are met. The estimated life expectancy can be exceeded if the product is carefully used and properly maintained, and provided technical and scientific advances do not result in technical limitations. The life expectancy can also be considerably reduced by extreme or incorrect usage. The fact that we estimate a life expectancy for this product does not constitute an additional warranty.

2 Safety Notes

- READ WELL BEFORE OPERATION!

2.1 General Safety Notes

Danger of injury if wheelchair is used in any other way than the purpose described in this manual!

- *Only ever use the wheelchair in accordance with the instructions in this User's Manual!*
- *Pay strict attention to the safety information!*

Danger of injury if the wheelchair is driven when ability to operate a vehicle is impaired by medication or alcohol!

- *Never drive the wheelchair under the influence of medication or alcohol! If necessary, the wheelchair must be operated by an attendant, who is physically and mentally able!*

Danger of damage or injury if wheelchair is accidentally set into motion!

- *Switch the wheelchair off before you get in, get out or handle unwieldy objects!*
- *When the drive is disengaged, the brake inside the drive is deactivated. For this reason, pushing the wheelchair by an attendant is only recommended on flat surfaces, never on gradients. Never leave your wheelchair on a gradient with its motors disengaged. Always re-engage the motors immediately after pushing the wheelchair.*

Danger of injury if the wheelchair is switched off while driving, for example by pressing the On/Off Button or disconnecting a cable, due to it coming to an abrupt, sharp stop!

- *If you have to brake in an emergency, simply release the joystick which will bring you to a halt!*

Danger of injury when transferring wheelchair to a vehicle for transport with the occupant seated in it!

- *It is always better to transfer the wheelchair to a vehicle without the occupant seated in it!*
- *In case the wheelchair does need to be transferred to a vehicle using a ramp with the occupant seated in it, always have an attendant stand behind the wheelchair during transfer to ensure it does not tip over backwards!*

Danger of injury if maximum permissible load is exceeded!

- *Do not exceed the maximum permissible load (see technical specifications)!*

Danger of injury due to wrong lifting or dropping of heavy components!

- *When maintaining, servicing or lifting any part of your wheelchair, take into account the weight of the individual components especially the batteries! Be sure at all times to adopt the correct lifting posture and ask for assistance if necessary!*

Danger of falling out of the wheelchair.

- *Do not slide forward on the seat, do not lean forward between your knees, do not lean backwards out over the top of the backrest, for example to reach an object.*
- *If a posture belt is installed, it should be correctly adjusted and used them each time you drive the wheelchair.*
- *When changing over to a new seat, position the wheelchair as close as possible to the new seat.*

Danger of injury by moving parts!

- *Make sure that no injury is incurred by moving parts of the wheelchair, like wheels or one of the Lifter Modules (if fitted), especially when children are around!*

Danger of fire or breaking down due to electric devices being connected!

- *Do not connect any electric devices to your wheelchair that are not expressly certified by Invacare® for this purpose! Have all electrical installations done by your authorised Invacare® Dealer!*

2.2 Safety information with regard to care and maintenance

Danger of accident and loss of guarantee if maintenance is insufficient!

- *For reasons of safety and in order to avoid accidents which result from unnoticed wear, it is important that this electric vehicle undergoes an inspection once every year under normal operating conditions (see inspection plan contained in service instructions)!*
- *Under difficult operating conditions such as daily travel on steep slopes, or in the case of use in medical care cases with frequently changing wheelchair users, it would be expedient to carry out intermediate checks on the brakes, accessories and running gear!*
- *If the vehicle is to be operated on public roads, the vehicle driver is responsible for ensuring that the vehicle is in an operationally reliable condition! Inadequate or neglected care and maintenance of the vehicle will result in a limitation of the manufacturer's liability!*

2.3 Safety Information on Electromagnetic Interference

This electric vehicle was successfully tested in accordance with International standards as to its compliance with Electromagnetic Interference (EMI) Regulations. However, electromagnetic fields, such as those generated by radio and television transmitters, and cellular phones, can influence the functions of electric vehicles. Also, the electronics used in our vehicles can generate a low level of electromagnetic interference, which however will remain within the tolerance permitted by law. For these reasons we ask you to please observe the following precautions:

WARNING: Danger of malfunction due to electromagnetic interference!

- *Do not switch on or operate portable transceivers or communication devices (such as radio transceivers or cellular phones) when the vehicle is switched on!*
- *Avoid getting near strong radio and television transmitters!*
- *In case the vehicle should be set in motion unintentionally or the brakes are released, switch it off immediately!*
- *Adding electrical accessories and other components or modifying the vehicle in any way can make it susceptible to electromagnetic interference. Keep in mind that there is no sure way to determine the effect such modifications will have on the overall immunity of the electronic system!*
- *Report all occurrences of unintentional movement of the vehicle, or release of the electric brakes to the manufacturer!*

2.4 Safety Information on Driving and Freewheel Mode

Danger of injury if the wheelchair tips over!

- *Only ever negotiate gradients up to the maximum tilt-resistant gradient (see Technical Specifications) and only with the backrest and seat tilt (if fitted) in an upright position!*
- *Only ever drive downhill at a maximum of 2/3 of the top speed! Avoid abrupt braking or accelerating on gradients!*
- *If at all possible, avoid driving on slippery surfaces (such as snow, gravel, ice etc.) where there is a danger of you losing control over the vehicle, especially on a gradient! If driving on such a surface is inevitable, then always drive slowly and with the utmost caution!*
- *Never attempt to overcome an obstacle when on an uphill or downhill gradient!*
- *Never attempt to drive up or down a flight of steps with your wheelchair!*
- *Always approach obstacles straight on! Ensure that the front wheels and rear wheels move over the obstacle in one stroke, do not stop halfway! Do not exceed the maximum obstacle height (see Technical Specifications)!*
- *Avoid shifting your centre of gravity as well as abrupt joystick movements and changes of direction when the wheelchair is in motion!*
- *Never use the wheelchair to transport more than one person!*
- *Do not exceed the overall maximum permissible load or the maximum load per axle (please see chapter **"Technical Specifications"** on page **144**.).*
- *Note that the wheelchair will brake or accelerate if you change the Driving Mode whilst the wheelchair is in motion!*

Danger of breaking down in adverse weather conditions, i.e. extreme cold, in an isolated area!

- *If you are a user with severely limited mobility, we advise that in the case of adverse weather conditions DO NOT attempt a journey without an accompanying attendant!*

Danger of injury if your foot slides off the footrest and gets caught underneath the wheelchair when it is in motion!

- *Make sure each time before you drive the wheelchair that your feet are squarely and securely in place on the footplates, and that both legrests are properly locked into place!*

Danger of injury if you collide with an obstacle when driving through narrow passages such as doorways and entrances!

- *Drive through narrow passages in the lowest Driving Mode and with due caution!*

If your electric wheelchair has been fitted with angle-adjustable legrests, there is a danger of personal injury and damage to the wheelchair if you drive the wheelchair with the legrests raised!

- *To avoid unwanted displacement of the wheelchair centre of gravity to the front (especially when travelling downhill) and in order to avoid damage to the wheelchair, angle-adjustable legrests should always be lowered during normal travelling.*

2.5 Safety Information on Wheelchairs with a Lifter

IMPORTANT - IF YOUR WHEELCHAIR IS EQUIPPED WITH A LIFTER:

Danger of injury if the wheelchair tips over!

- *Never exceed the maximum permissible load (see Technical Specifications)!*
- *Avoid dangerous driving situations when the lifter is in a raised position, such as trying to overcome obstacles like kerbs or driving up or down steep gradients!*
- *Never lean out of the seat when the lifter is raised!*
- *Inspect the lifter module at least once a month to make sure the automatic speed reduction function, which reduces the speed of the wheelchair when the lifter is raised, is working properly (see chapter on lifter)! Notify your authorised dealership immediately if it is not working properly!*

Danger of injury by moving parts!

- *Never let objects get caught in the space underneath a raised lifter!*
- *Make sure that neither you nor anyone else is injured by placing hands, feet other body extremities under the raised seat!*

Danger of malfunction of the Lifter Module!

- *Inspect the lifter module at regular intervals to make sure there are no foreign objects or visible damage, and to make sure the electric plugs are firmly inserted into their sockets!*

WARNING: Danger of injuries and damage to the wheelchair can result if the wheelchair is lifted up or carried by the seat! The lifter motor can slip out of its fixation under the seat!!

- *Never attempt to lift the wheelchair by the seat, only by its frame!*

2.6 Safety information on maintenance work and alterations to the wheelchair

WARNING: Danger of injuries and damage to the wheelchair, in case the suspension is adjusted without the immobilisation mechanism of the front anti-tippers being re-adjusted!

- *When the hardness of the suspension is adjusted, the immobilisation mechanism of the front anti-tippers must without fail be checked and, if necessary, also re-adjusted!*

3 Key features

1) Button for disengaging drive (on push handle)

2) Armrest

3) Lever for disengaging a motor (only visible on right-hand side of picture)

4) Drive wheel

5) Remote

6) Legrests

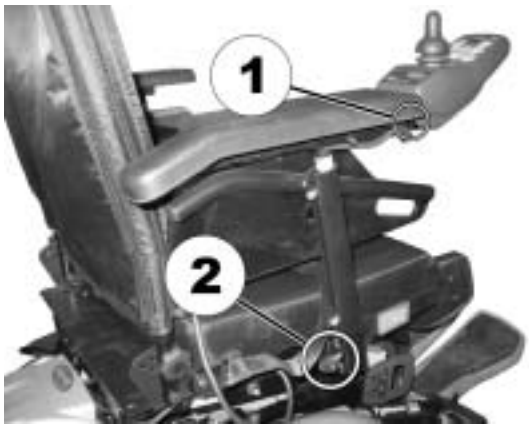
4 Getting in and out of the wheelchair

Important information when side transferring in and out of the wheelchair
In order to side transfer it is necessary for the armrest to either be raised or removed completely depending on the model. A skirtguard can be installed as an option in connection with the parallel sliding armrest. This is attached in the same way as the standard armrest and must also be removed when transferring.

4.1 Remove the standard armrest in order to side transfer

Removing the armrest:

- Loosen remote cable (1) from remote.
- Loosen clamping lever (2)
- Remove the side panel from the receptacle



4.2 Raise the parallel sliding armrest / remove the skirtguard (optional)

Swivelling the armrest up

- Swivel the armrest up to access from the side.

Remove the clothes guard (option) for access

- Disengage the release handle (1).
- Pull the skirt guard out of the holder.

Getting into the wheelchair:

- Position your wheelchair as close as possible to your seat. This might have to be done by an attendant.
- Switch your wheelchair off.
- Apply the hand brake of your wheelchair (if existing).
- Detach the side part of your wheelchair or swivel it up.
- Now slide into the wheelchair.

Getting out of the wheelchair:

- Drive your wheelchair as close as possible to your seat.
- Switch your wheelchair off.
- Apply the hand brake of your wheelchair (if existing).
- Detach the side part of your wheelchair or swivel it up.
- Now slide onto your new seat.

NOTE:
If you do not have sufficient muscle strength, you should ask other persons for help. Use a sliding board, if possible.

5 Driving

5.1 Before driving for the first time...

Before you take your first trip, you should familiarise yourself well with the operation of the vehicle and with all operating elements. Take your time to test all functions and driving modes.

NOTE:
If installed, make sure to properly adjust and use the posture belt each time you use the wheelchair.

Sitting Comfortably = Driving Safely

Before each trip, make sure that:

You are within easy reach of all operating controls.

- **The battery charge is sufficient for the distance intended to be covered.**
- **The posture belt (if installed) is in perfect order.**

The gearless wheelchair has very dynamic performance!
Please observe that gearless motors have very high performance! For this reason a wheelchair with a gearless drive has greater dynamic performance than wheelchairs fitted with conventional motors. The top speed is also higher. Please therefore drive carefully until you have become accustomed to the driving features of the wheelchair.

5.2 Parking and stationary

When parking your vehicle or if your vehicle is stationary for a prolonged period:

- Switch the vehicle's power system off (ON-/OFF key).
- Activate your anti-theft lock, if existing.

5.3 Taking Obstacles

5.3.1 The ”SureStep“ System

This electric wheelchair is fitted with "SureStep" technology. When climbing over obstacles, the front steering wheels are raised using the torque generated by the drive wheels.

5.3.2 Maximum obstacle height

Your wheelchair can overcome obstacles and kerbs with the following heights. (only applies to driving forward).

- 7,5 cm

5.3.3 Safety information when ascending obstacles

CAUTION: Danger of Tipping Over!

- *Never approach obstacles at an angle!*
- *Put your backrest into an upright position before climbing an obstacle!*

CAUTION: The wheelchair can be damaged if an obstacle is approached at excessive speed.

- *Always approach obstacles at low speed! As soon as the front wheels come into contact with the obstacle, stop for a short period before driving over the obstacle! Wheelchairs fitted with centre drive have a special mechanism (Walking Beam) for overcoming obstacles. Approaching at speed can actually lead to mechanical damage.*

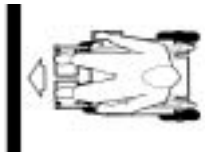
5.3.4 The correct way to overcome obstacles

Ascending and descending

The same approach applies to both ascending and descending obstacles:

- Approach the obstacle or the kerb slowly and at a right angle.
- Stop shortly before the front wheels come into contact with the obstacle.
- Check the position of the front wheels. They must be in driving direction and vertical to the obstacle!
- Approach slowly and keep at a consistent speed until the rear wheels have also passed over the obstacle.

Right



Wrong

5.4 Driving up and down gradients

For information concerning the maximum safe slope, please see chapter **"Technical Specifications"** starting on page **144**.

WARNING: Danger of tipping over!

- *Only ever drive downhill at a maximum of 2/3 of the top speed! Avoid sudden changes of direction or abrupt braking when driving on slopes!*
- *Always return the backrest of your seat or the seat tilt (if adjustable seat tilt is available) to an upright position before ascending slopes! We recommend that you position the seat backrest or the seat tilt slightly to the rear before descending slopes!*
- *If the lifter (if installed) is raised drive mode is only used for positioning and not for regular drive operation! Lower the lifter before ascending a slope!*
- *Never attempt to ascend or descend a slope on slippery surfaces or where there is a danger of skidding (such as wet pavement, ice etc)!*
- *Avoid trying to get out of the vehicle on an incline or a gradient!*
- *Always drive straight in the direction the road or path you are on goes, rather than attempting to zigzag!*
- *Never attempt to turn around on an incline or a slope!*

Braking distance is much longer on a downhill slope than on even terrain!

- *Never drive down a slope that exceeds the maximum tilt-resistant climbing ability!*

6 Pushing the wheelchair by hand

The motors of the wheelchair are equipped with automatic brakes, preventing that the wheelchair starts rolling out of control when the joystick box is switched off. When pushing the wheelchair, the magnetic brakes must be disengaged.

6.1 Electrically disengaging gearless motors

CAUTION! Danger of the wheelchair rolling away!

- *The motor brakes do not function in disengaged condition (push mode)! The pushbutton for disengaging the motors must never be fixed in its pushed-in position using adhesive tape etc!*

Disengaging motors:

- Press key (1). A peep tone will sound for about one second. The motors remain disengaged until a key is pressed (if you cannot hear the peep tone, or the peep tone stops after around one second, there is an error. In this case please contact your dealer.).

Re-engaging motors

- Release key (1) again. The motors are now re-engaged.

6.2 Manually disengaging gearless motors (emergency disengaging)

Danger of the vehicle running away!

- *When the motors are disengaged (for push operation), the electromagnetic motor brakes are deactivated! When the vehicle is parked, the levers for engaging and disengaging the motors must without fail be locked firmly into the "DRIVE" position (electromagnetic motor brakes activated)!*

The levers for disengaging the motors are located behind the drive wheels.

Disengaging motors:

- Switch off remote.
- Pull the (1) locking pin out and the engaging lever (2) to the rear. The motor is disengaged.

Re-engaging motors

- Push the engaging lever (1) forwards. The motor is engaged.

7 The REM 24 SD Remote

7.1 Layout of the remote

Upper side

Controls

1) Immobilizer
2) "Activate / scroll through drive mode" button
3) Horn
4) Left-hand indicator
5) Joystick
6) "Activate adjustment mode" button
7) ON/OFF button
8) Light
9) Right-hand indicator
10) Hazard warning signal flasher

Upper side

Displays

11) Battery charger display
12) Status display (in key symbol)
13) Drive mode display
14) Left-hand indicator display
15) Hazard warning signal flasher display
16) Light display
17) Right-hand indicator display

Underside

1) Charger socket
2) Programming socket

Rear panel

1) Socket for Buddy button 1 (corresponds to "Activate / scroll through drive mode" button).
2) Socket for Buddy button 2 (corresponds to "ON/OFF" button)
3) Socket for Buddy button 3 (corresponds to "Activate / scroll through adjustment mode" button).
4) Socket for bus cable

7.2 ON/OFF diode (status display)

INFORMATION
The ON/OFF diode (in key symbol) also serves as status or error message display. For error codes please see chapter **"Error codes and diagnostic codes"** on page **49.**

7.3 Battery charger display

- All diodes illuminated: **Full range**
- Only red diodes illuminated:
  Reduced range
- Both red diodes flashing:
  Very low range
- Only one red diode flashing:
  Battery on reserve = Charge batteries straight away

Battery charger display

INFORMATION
Protection against total discharge: The electronic system automatically shuts actuation down after a certain travel time on reserve battery and the wheelchair comes to a standstill.

7.4 Activating / deactivating the immobilizer

Activating the immobilizer

- Switch on the remote.
- Use the end of the magnetic key (Invacare® Logo) to move over the sensor area (1) on the remote (key symbol). The horn will sound briefly once. The remote shuts down automatically. The immobilizer is activated.

Deactivating the immobilizer

- Switch on the remote. The status display will flash red slowly.
- Use the end of the magnetic key (Invacare® Logo) to move over the sensor area (1) on the remote (key symbol).

Immobilizer

Magnetic key

7.5 Using the Buddy buttons with the remote

What is a Buddy button?
A Buddy button is an additional sensing device that can be used to activate a remote function. The sockets for Buddy buttons are to be found at the rear of the remote.

1) Socket 1 (corresponds to the ""Activate / scroll through drive mode"" button).
2) Socket 2 (corresponds to the "ON/OFF" button)
3) Socket 3 (corresponds to the " Activate / scroll through adjustment mode" button).

7.6 Controlling the wheelchair using the remote

- Switch on the remote (ON/OFF button). The displays on the remote will illuminate. The wheelchair is ready to drive.
- Set the drive level (“drive level“ button see **"Layout of the remote"** on page **37).**
- Speed stage 1 (slow) to 5 (fast) is shown on the drive level display.

Can the electronic system programming be adapted?
The electronic controller is programmed with standard values during manufacture. Your Invacare® dealer can carry out programming tailored to fit your requirements.

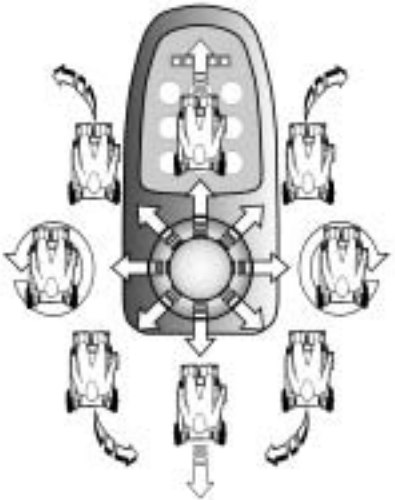
WARNING: Any alteration to the drive programme can influence vehicle handling and the tipping stability of the electric vehicle!

- *Alterations to the drive programme may only be carried out by trained Invacare® dealers!*
- *Invacare® supplies all electric vehicles from the factory with a standard drive programme. Invacare® can only assume a warranty for the safe vehicle handling of the electric vehicle – in particular tipping stability - for this standard drive programme!*

Will the wheelchair not drive after switching on?
Check the drive-away lock (see chapter **"Activating / deactivating the immobilizer "** on page **41**) and the status bar indicator (see chapter **"ON/OFF diode (status display)"** on page **40**.).

7.6.1 How a wheelchair with "Indirect Steering" reacts to joystick movements.

"Indirect Steering" occurs by individually applying power to the drive wheels, and is found on wheelchairs with front, rear and middle wheel drive.



Travel direction

The further the joystick is moved in a particular direction, the more dynamically the wheelchair reacts.

Note:
To brake quickly, simply let go of the joystick. It will then automatically return to the middle position. The wheelchair will brake.

7.7 Operating the electric adjustment options

Electric adjustment options, like electric legrests or an electric backrest, are operated by using the joystick.

7.7.1 Activating adjustment mode

- Press the "activate adjustment mode" button (A). The remote switches to the adjustment mode last used. The driving mode display (B) switches to the appropriate symbol (one of the symbols shown below). The factory setting for controls is to display all symbols, irrespective of whether certain adjustment options are available or not! Your dealer can carry out individual modification of this setting.


Seat tilt


Backrest


Left legrest


Right legrest


Both legrests


Lifter

Information:
When using the REM 24 SD remote it is not necessary – as on previous remote versions – to push the joystick forward in order to access the adjustment mode. It is sufficient to operate the adjustment mode button just once.

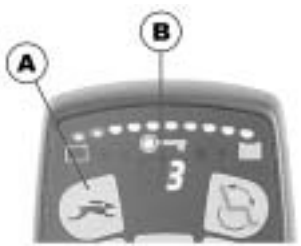
If the remote has been programmed appropriately, further modes can be accessed by repeatedly pressing the adjustment mode button, i.e. light mode or ECU mode (environment control unit). The standard REM 24 SD programming only supports the adjustment function. Please speak to your Invacare dealer if you have any questions in this respect.

7.7.2 Selecting and operating the adjustment option

- Move the joystick to the left or right = Select adjustment option on the submenu (A).
- Move the joystick forward/backward = Operate adjustment option (B).

7.7.3 Changing back to driving mode

- Briefly press the "Activate / scroll through driving mode" button (A). The remote switches back to the driving mode last used. The driving mode display indicates the drive level (B).



7.8 Error diagnosis

In the event that the electronics should show signs of failure, please consult the following troubleshooting guide in order to locate the error.

INFORMATION
Before beginning with the diagnosis, please ensure that the drive electronics are switched on.

If the status display is OFF:
Please check whether the drive electronics are SWITCHED ON.
Please check whether all cables have been connected correctly.
Please ensure that the batteries are not discharged.

If the status display is FLASHING:
Please count the number of flashing sequences and move on to the next section.

If the red diodes on the battery charger display and the status display are FLASHING, Drive mode display shows a horizontal bar:
Battery discharged. Please charge the battery.

7.8.1 Error codes and diagnostic codes

The drive electronics are capable of rectifying some errors automatically. In this case the status display will cease to flash. Please switch the remote on and off several times. Wait approx. 5 seconds each time before switching the remote on again. If this does not rectify the error, locate the error using the flash codes shown below.

FLASH CODE	FAULT	IMMEDIATE MEASURE	FURTHER HELP
1	Module defective.	-	• Contact your dealer or wheelchair provider
2	Lifter raised or lowered too far (seat not at driving height)	• If lifter is raised, lower in stages until the status display stops flashing. If lowered too far, raise lifter in stages until the status display stops flashing. If at all possible, only drive when the seat is at driving height.	• -
	Accessory error.	-	• Contact your dealer or wheelchair provider.
3	Connection on the left motor loose/defective	• Check plug-in connections.	• Contact your dealer or wheelchair provider.
	Left motor defective.	• Check/replace motor	• Contact your dealer or wheelchair provider.
4	Connection on the right motor loose/defective	• Check plug-in connections.	• Contact your dealer or wheelchair provider.

FLASH CODE	FAULT	IMMEDIATE MEASURE	FURTHER HELP
	Right motor defective.	• Check/replace motor	• Contact your dealer or wheelchair provider.
5	Fault/brake fault on left-hand motor. Connection loose/defective or motor defective.	• Check plug-in connections.	• Contact your dealer or wheelchair provider.
	Left motor disengaged (gearless motors)	• Engage motor. Shut electronics down and then switch on again.	• -
	Both motors disengaged (standard motors)	• Engage motors. Shut electronics down and then switch on again.	• -
6	Fault/brake fault on right-hand motor. Connection loose/defective or motor defective.	• Check plug-in connections.	• Contact your dealer or wheelchair provider.
	Right motor disengaged (gearless motors)	• Engage motor. Shut electronics down and then switch on again.	• -
7	Battery totally discharged.	• Charge battery	• Contact your dealer or wheelchair provider.
8	Battery voltage too high.	-	• Contact your dealer or wheelchair provider.
9 or 10	Faulty data transmission between modules.	-	• Contact your dealer or wheelchair provider.

FLASH CODE	FAULT	IMMEDIATE MEASURE	FURTHER HELP
11	Motors overstressed.	• Switch remote off and on again	• -
12	Compatibility problems between the modules.	-	• Contact your dealer or wheelchair provider.

8 Adjusting the wheelchair to the user's seating posture

WARNING: Danger of damage to the wheelchair and of accidents! With some combinations of adjustment options, collisions can occur between the legrest and the chassis or between the foot plates and the ground!This occurs in particular on wheelchairs with a lifter!

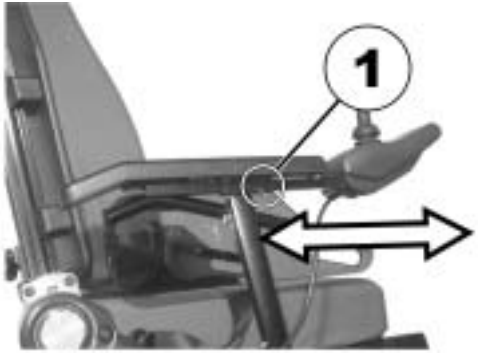
- *When adjusting seat angle, lifter and legrest please ensure that the legrest does not collide with the wheelchair chassis or the foot plates with the ground!*

8.1 Adjusting the armrests and the joystick box

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

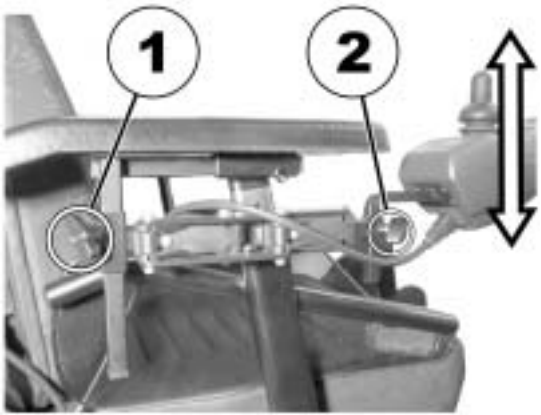
Requirements:
- Allen key 3 mm

- Loosen the socket head screw (1).
- Set remote to the desired length by pushing forward or backward.
- Tighten screw.



8.1.2 Setting the height of the remote

- Loosen one or both of the wing screws (1 and 2) that allow height adjustment of the joystick box.
- Adjust the joystick box to the desired height.
- Re-tighten the screw(s).



8.1.3 Setting the height of the armrests

- Loosen the release handle (1).
- Set the armrest at the desired height.
- Tighten the release handle.

8.1.4 Setting the height of the parallel sliding armrests

Requirements:
- Allen key 2 mm

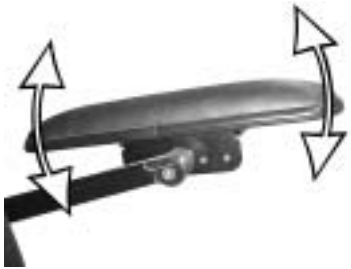
- Loosen the screws (1) with the 2 mm Allen key on both sides of the spindle.
- Turn the spindle clockwise (A). The armrest is raised.
- Turn the spindle anticlockwise (B). The armrest is lowered.
- Retighten the wing nuts.

8.1.5 Adjusting the angle of the armpad on the parallel sliding armrests

Requirements:
- Allen key 4 mm
- Open-end spanner 10 mm

- Loosen the screw (1, on the inner side of the armrest), which allows adjustment of the angle of the armpad, while countering the nut (2, outer side of the armrest) with the open-end spanner, if necessary.

- Adjust the angle of the armpad.
- Re-tighten the screw (1), while countering the nut (2).



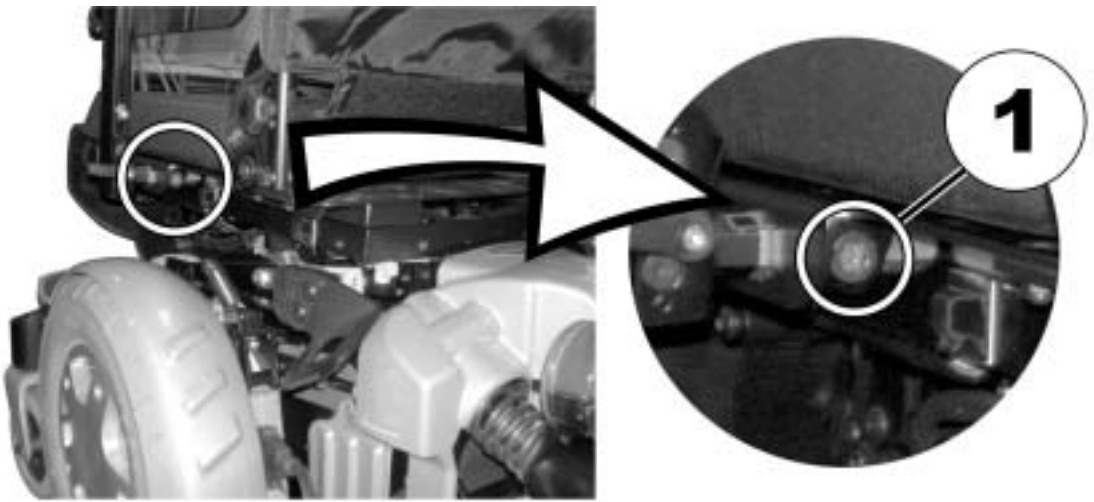
8.1.6 Setting the width of the side sections

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 figure below shows the position of the screws (1) which allow armrest width adjustment (only the left side is shown in the illustration).



Doing the adjustment

- Loosen screw (1)
- Adjust armrest to required position.
- Retighten the screw.
- Repeat this procedure for the second armrest.

8.2 Manually adjusting the seat tilt

The manual seat angle adjustment has an adjustable range of 0° to 15°.

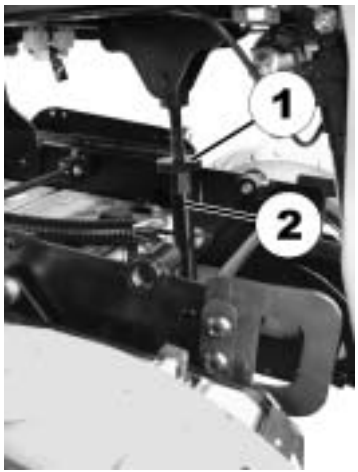
The seat angle is adjusted by means of a spindle, which is to be found at the front underneath the seat frame.

When adjusting the seat angle it should be ensured that at least 1cm of the threaded bolt always remains inside the spindle and is not completely unscrewed from the spindle.

NOTE
It is easier to adjust the angle of the seat when there is nobody sitting in the wheelchair.

The figure to the right shows the position of the spindle (1) for manual seat angle adjustment.

- Loosen the counter nut (1) of spindle.
- Adjust the seat angle by turning the spindle (2).
- Re-tighten the counter nut



8.3 Manually adjusting the backrest

8.3.1 Adjusting the backrest using the gas pressure spring

The lever for adjusting the backrest is located on the opposite side from the Joystick Box under the armrest.

The angle can be adjusted continuously between 0° and 30°.

Adjusting angle of the backrest

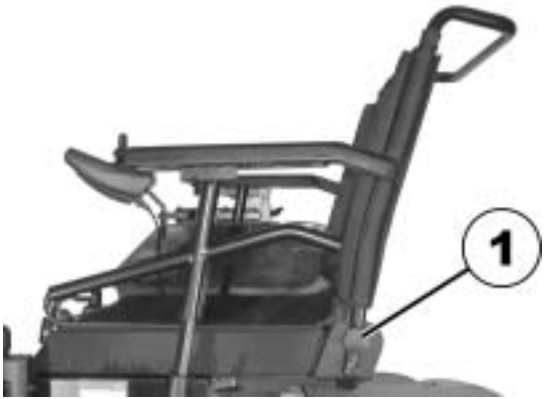
- Pull lever (1) upward.
- Adjust backrest angle by leaning forward or backward.
- Release the lever again. The backrest is locked at the desired angle.

NOTE
If the lever is pulled upwards and inwards at the same time, it will latch into a notch at the top. Push the lever out of the notch to release it, and allow it to be moved down again.

8.3.1.1 Adjust the backrest using the perforated plate

The angle of the backrest has six positions, from -10° to +30°.

- Unscrew the hand screws (1) on both sides.
- The backrest is adjusted by choosing a combination of one of the two bore holes in the backrest frame and one of the six bore holes in the fixing plate.
- Re-position the screws and tighten.



8.3.2 Flex and Contour Seats

- Set the angle by turning the hand wheel (1).

8.4 The Lifter

The electric lifter is operated via the remote. Please see chapter **"Operating the electric adjustment options"** on page **45**.

Information regarding operation of the lifter at temperatures of less than 0 °C
Our wheelchairs are fitted with safety mechanisms that prevent capacity overload of the electronic components. At operating temperatures below freezing point this can, in particular, lead to the lifter actuator being shut down after approx. 1 second operating time.

The lifter can be raised or lowered gradually by repeatedly operating the joystick. In many cases this generates sufficient heat for the actuator to operate as normal.

Please note – Speed restriction
The lifter is equipped with sensors that reduce the drive speed of the wheelchair as soon as the lifter is raised or lowered above a certain point.

This is in order to guarantee the tilt stability of the wheelchair or in order to avoid damage to the legrests.

When speed restriction is activated an appropriate blinking code is displayed on the remote. Please see chapter **"ON/OFF diode (status display)"** on page **40** and chapter **"Error codes and diagnostic codes"** on page **49**.

In order to revert to normal drive speed move the lifter to drive height: Raise the lifter slowly if the lifter has been lowered. If the lifter has been raised, lower the lifter until the status display stops blinking.

9 Adjusting footrests and legrests

9.1 Centre-mounted legrests

9.1.1 Electric legrest

The electric legrest is operated via the remote. Please see chapter **"Operating the electric adjustment options"** on page **45**.

The electric legrest can be lowered completely to assist getting out of the wheelchair. To do so, move your seat into the correct position by lowering the lifter or by means of a negative seat angle (tilted slightly to the front).

9.1.1.1 Lowering the electric legrest completely to assist getting out of the wheelchair

Warning! Misuse may destroy the legrest.

- *Please read and carefully follow the instructions below.*

Getting in/out of the wheelchair

- Set the lifter and tilt to a comfortable position.
- Put your feet on the footplate and pull the lever (1). The footplates will move smoothly down to the floor.
- Now you can get in/out of the wheelchair.

Lifting up the footplates

- You are sitting in the wheelchair.
- Put your feet beside the footplates.

- Pull the lever (1). The footplates rise up automatically.
- Let go the lever (1) and put your feet on the footplates.

Warning! Danger of damage to the legrest!

- *Always make sure that the footplates are fully raised to the uppermost position before adjusting the angle of the legrest!*
- *Disregarding this advice will cause damage to your legrest.*

Adjusting the legrest

- Now you can adjust the angle of the legrest.

9.1.2 Adjustable legrest

9.1.2.1 Adjusting the angle

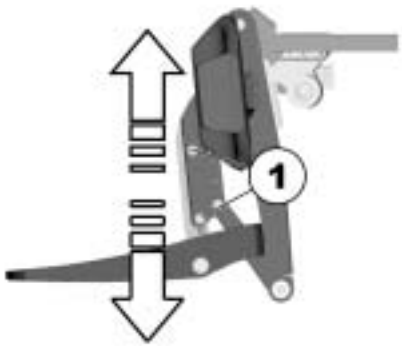
Prerequisites:
- 1x 10 mm open-ended spanner

- Use the open-ended spanner to loosen the counternut (1).
- Move the legrest to the desired position by turning the spindle (2).
- Tighten the counternut.

9.1.2.2 Adjusting the length of the legrest

Prerequisites:
- 1x 5 mm socket head spanner

- Use the socket head spanner to loosen the fastening screws (1).
- Slide the foot support to the desired height.
- Tighten the fastening screws.



9.1.2.3 Adjusting the calf plate to the calf width of the user

The calf plate of the legrest can be adapted to the user's calf width by bending apart or together.

- Bending the calf plate to the desired width.

9.1.2.4 Adjusting the angle of the foot plate

Prerequisites:
- 1x 5 mm socket head spanner

- Fold up the foot plates in order to access the adjusting screws.
- Use the socket head spanner to adjust the adjusting screws (1).
- Fold the foot plate down again.

9.2 Laterally mounted legrests

9.2.1 Standard footrest with pre-set angle

9.2.1.1 Swivelling the footrest outward and/or removing

The small unlocking button is located on the upper section of the footrest. When the footrest is unlocked, it can be swivelled inward or outward when getting into the wheelchair as well as being removed completely.

- Press the unlocking button (1) and swivel the footrest outward.
- Remove the footrest in an upward direction.

9.2.1.2 Setting the angle

PLEASE NOTE: Danger of injury due to incorrect adjustment of the footrests and legrests.

- *Before and during every journey it is imperative to ensure that there is an adequate distance between the legrests and the steering wheels or the ground!*

Pre-requisites:

- 1x 6 mm Allen key

- Loosen the screw (1) using the Allen key.
- If the footrest cannot be moved after loosening the screw, position a metal pin in the designated borehole (2) and use a hammer to knock on this lightly. The clamping mechanism in the interior of the footrest will be released by this. Repeat the procedure from the other side of the footrest if necessary.

- Loosen the screw (1) using the Allen key.
- Set the desired angle.
- Re-tighten the screw.

9.2.1.3 Setting the end stop of the footrest

Pre-requisites:

- 1x 6 mm Allen key
- 1x 10 mm open-ended spanner

The end position of the footrest is determined by means of a rubber stop (1).

The rubber stop can be screwed in or out (A) or pushed up or down (B).

- Use the Allen key to loosen the screw (1) and swivel the footrest upward in order to access the rubber stop.

- Use the open-ended spanner to loosen the counternut (1).

- Move the rubber stop to the desired position
- Re-tighten the counternut

- Move the footrest to the desired position.
- Re-tighten the screw.

9.2.1.4 Adjusting the length of the footrest

PLEASE NOTE: Danger of injury due to incorrect adjustment of the footrests and legrests.

- *Before and during every journey it is imperative to ensure that there is an adequate distance between the legrests and the steering wheels or the ground!*

Pre-requisites:

- 1x 5 mm Allen key

- Use the spanner to loosen the screw (1).
- Adjust to the desired length.
- Re-tighten the screw.

9.2.2 Manually height adjustable legrest 90° - 0°

9.2.2.1 Swivelling the legrest outward and/or removing

The small unlocking button is located on the upper section of the legrest. When the legrest is unlocked, it can be swivelled inward or outward when getting into wheelchair as well as being removed completely.

- Press the unlocking button (1) and swivel the legrest outward.
- Remove the legrest in an upward direction.

9.2.2.2 Setting the angle

PLEASE NOTE: Danger of injury due to incorrect adjustment of the footrests and legrests.

- *Before and during every journey it is imperative to ensure that there is an adequate distance between the legrests and the steering wheels or the ground!*

- Disengage the release handle (1).
- Adjust to the desired angle.
- Re-tighten the release handle.

9.2.2.3 Setting the end stop of the legrest

Pre-requisites:
- 1x 10 mm open-ended spanner

The end position of the legrest is determined by means of a rubber stop (A).

The rubber stop can be screwed in or out (A) or pushed up or down (B).

- Disengage the release handle (1) and swivel the legrest upward in order to access the rubber stop.

- Use the open-ended spanner to loosen the counternut (1).

- Move the rubber stop to the desired position
- Re-tighten the counternut

- Move the footrest to the desired position.
- Re-tighten the release handle.

9.2.2.4 Adjusting the length of the legrest

PLEASE NOTE: Danger of injury due to incorrect adjustment of the footrests and legrests.

- *Before and during every journey it is imperative to ensure that there is an adequate distance between the legrests and the steering wheels or the ground!*

Pre-requisites:

- 1x 6 mm Allen key

- Use the spanner to loosen the screw (1).
- Adjust to the desired length.
- Re-tighten the screw.

9.2.2.5 Adjusting the depth of the calf plate

The depth of the calf plate can be adjusted via the holding plate. The holding plate hole combinations allow 5 different depth settings.

Pre-requisites:
- 1x 10 mm open-ended spanner

- Use the open-ended wrench to loosen the nut (1) and remove.
- Adjust to the desired depth. Please observe that the round holes are intended for the calf plate retaining screw and the oblong holes for the aglet without thread.
- Screw the nut back on and tighten.

9.2.2.6 Adjusting the height of the calf plate

Pre-requisites:
- 1x 4 mm Allen key

- Use the Allen key to loosen the screws (1).
- Adjust to the desired position.
- Re-tighten the screws.

9.2.2.7 Unlocking and swivelling the calf plate backward when alighting

- Press the calf plate straight down.

- Unlock the legrest and swivel outward. The calf plate swivels backward on its own.

- Lift leg over the heel strap and place on the ground.

9.2.2.8 Adjusting the angle adjustable foot plate

Pre-requisites:
- 1x 5 mm Allen key

- Use the Allen key to loosen both set screws on the foot plate.
- Adjust to the desired angle.
- Re-tighten the screws.

9.2.2.9 Adjusting the angle and depth adjustable foot plate

Pre-requisites:
- 1x 5 mm Allen key

- Use the Allen key to loosen the set screw on the foot plate (1).
- Adjust the foot plate to the desired angle or depth.
- Re-tighten the screw.

9.2.3 Manually height adjustable legrest 80° - 0° with ergonomic length adjustment

9.2.3.1 Swivelling the legrest outward and/or removing

The small unlocking button is located on the upper section of the legrest. When the legrest is unlocked, it can be swivelled inward or outward when getting into wheelchair as well as being removed completely.

- Press the unlocking button(1) and swivel the legrest outward.
- Remove the legrest in an upward direction.

9.2.3.2 Setting the angle

PLEASE NOTE: Danger of crushing!

- *Do not reach inside the swivelling range of the legrest!*

PLEASE NOTE: Danger of injury due to incorrect adjustment of the footrests and legrests.

- *Before and during every journey it is imperative to ensure that there is an adequate distance between the legrests and the steering wheels or the ground!*

- Raising: Pull the legrest upward until the desired angle has been achieved.

- Lowering: Keep the legrest in the foot plate area, pull the lateral adjusting lever (1) and lower the legrest slowly.

9.2.3.3 Adjusting the length of the legrest

PLEASE NOTE: Danger of injury due to incorrect adjustment of the footrests and legrests.

- *Before and during every journey it is imperative to ensure that there is an adequate distance between the legrests and the steering wheels or the ground!*

Pre-requisites:

- 1x 5 mm Allen key

- Use the spanner to loosen the screw (1).
- Adjust to the desired length.
- Re-tighten the screw.

9.2.3.4 Adjusting the depth of the calf plate

The depth of the calf plate can be adjusted via the holding plate. The holding plate hole combinations allow 5 different depth settings.

Pre-requisites:
- 1x 10 mm open-ended spanner

- Use the open-ended wrench to loosen the nut (1) and remove.
- Adjust to the desired depth. Please observe that the round holes are intended for the calf plate retaining screw and the oblong holes for the aglet without thread.
- Screw the nut back on and tighten.

9.2.3.5 Adjusting the height of the calf plate

Pre-requisites:
- 1x 4 mm Allen key

- Use the Allen key to loosen the screws (1).
- Adjust to the desired position.
- Re-tighten the screws.

9.2.3.6 Unlocking and swivelling the calf plate backward when alighting

- Press the calf plate straight down.

- Unlock the legrest and swivel outward. The calf plate swivels backward on its own.

- Lift leg over the heel strap and place on the ground.

9.2.3.7 Adjusting the angle adjustable foot plate

Pre-requisites:
- 1x 5 mm Allen key

- Use the Allen key to loosen both set screws on the foot plate.
- Adjust to the desired angle.
- Re-tighten the screws.

9.2.3.8 Adjusting the angle and depth adjustable foot plate

Pre-requisites:
- 1x 5 mm Allen key

- Use the Allen key to loosen the set screw on the foot plate (1).
- Adjust the foot plate to the desired angle or depth.
- Re-tighten the screw.

9.2.4 Electrically height adjustable legrest 80° - 0° with ergonomic length adjustment

9.2.4.1 Swivelling the legrest outward and/or removing

The small unlocking button is located on the upper section of the legrest. When the legrest is unlocked, it can be swivelled inward or outward when getting into wheelchair as well as being removed completely.

- Press the unlocking button (1) and swivel the legrest outward.
- Remove the legrest in an upward direction.

9.2.4.2 Setting the angle

PLEASE NOTE: Danger of crushing!

- *Do not reach inside the swivelling range of the legrest!*

PLEASE NOTE: Danger of injury due to incorrect adjustment of the footrests and legrests.

- *Before and during every journey it is imperative to ensure that there is an adequate distance between the legrests and the steering wheels or the ground!*

The electrically height adjustable legrest is operated via the remote. Please see chapter **"Operating the electric adjustment options"** on page **45.**

9.2.4.3 Adjusting the length of the legrest

PLEASE NOTE: Danger of injury due to incorrect adjustment of the footrests and legrests.

- *Before and during every journey it is imperative to ensure that there is an adequate distance between the legrests and the steering wheels or the ground!*

Pre-requisites:

- 1x 10 mm open-ended spanner

- Use the spanner to loosen the screw (1).
- Adjust to the desired length.
- Re-tighten the screw.

9.2.4.4 Adjusting the depth of the calf plate

The depth of the calf plate can be adjusted via the holding plate. The holding plate hole combinations allow 5 different depth settings.

Pre-requisites:
- 1x 10 mm open-ended spanner

- Use the open-ended wrench to loosen the nut (1) and remove.
- Adjust to the desired depth. Please observe that the round holes are intended for the calf plate retaining screw and the oblong holes for the aglet without thread.
- Screw the nut back on and tighten.

9.2.4.5 Adjusting the height of the calf plate

Pre-requisites:
- 1x 4 mm Allen key

- Use the Allen key to loosen the screws (1).
- Adjust to the desired position.
- Re-tighten the screws.

9.2.4.6 Unlocking and swivelling the calf plate backward when alighting

- Press the calf plate straight down.

- Unlock the legrest and swivel outward. The calf plate swivels backward on its own.

- Lift leg over the heel strap and place on the ground.

9.2.4.7 Adjusting the angle adjustable foot plate

Pre-requisites:
- 1x 5 mm Allen key

- Use the Allen key to loosen both set screws on the foot plate.
- Adjust to the desired angle.
- Re-tighten the screws.

9.2.4.8 Adjusting the angle and depth adjustable foot plate

Pre-requisites:
- 1x 5 mm Allen key

- Use the Allen key to loosen the set screw on the foot plate (1).
- Adjust the foot plate to the desired angle or depth.
- Re-tighten the screw.

10 Electrical System

10.1 Electronics Protection System

The vehicle's electronics are equipped with an overload-protection system.

If the motors are put under considerable strain for a longer period of time (for example, when driving up a steep hill) and especially when the ambient temperature is high, then the electronic system could overheat. In this case the vehicle's power is reduced gradually until it finally comes to a halt. The Status Display shows a corresponding error code (see chapter **"Error codes and diagnostic codes"** on page **49**). By switching the power supply off and back on again, the error code is cancelled and the electronics are switched back on. It will take approximately five minutes until the electronics have cooled down enough for the motors to restore full power again.

When the motors are stalled by an insurmountable obstacle, such as a high kerb, and the vehicle driver allows the motors to strain against this hindrance for more than 20 seconds without moving, then the electronics will automatically switch off to prevent the motors from being damaged. The Status Display shows a corresponding error code (see chapter **"Error codes and diagnostic codes"** on page **49**). By switching off and back on again, the error code is cancelled and the electronics are switched back on.

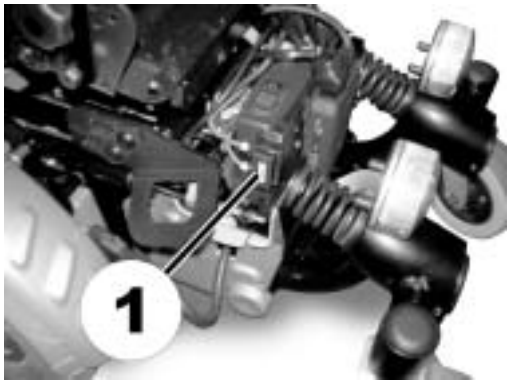
10.1.1 The main fuse

NOTE
A defective main fuse may be replaced only after checking the entire electric system. An Invacare® specialised dealer must perform the replacement. You can find information on the fuse type in chapter **"Technical Specifications"** starting on page **144**.

All electrical equipment fitted to the wheelchair is protected against overload by the main fuse.

The main fuse is located beneath the rear central panel to the left of the power module.

In order to access the main fuse, you must first remove the rear panel.



10.2 Batteries

10.2.1 What you need to know about batteries

Power is supplied by two 12V gel batteries. The batteries are maintenance-free and only need regular charging.

New batteries should always be fully charged once before their first use. New batteries will be at their full capacity after having run through approx. 10 - 20 charging cycles. How fast the batteries will be discharged will depend on many circumstances, such as ambient temperature, condition of the surface of the road, tyre pressure, weight of the driver, way of driving and utilisation of lighting, etc.

NOTE

Gel batteries are not hazardous goods. This classification is based on the German *GGVS Hazardous Goods Road Transport Ordinances*, and the *IATA/DGR Hazardous Goods Rail Transport / Air Transport Ordinances.* Gel batteries may be transported without restrictions, whether by road, rail or by air. Individual transport companies have, however, guidelines which can possibly restrict or forbid certain transport procedures. Please ask the transport company regarding each individual case.
Pay attention to the Battery Charge Indicator! Make sure to charge the batteries when the Battery Charge Indicator shows that battery charge is low. We recommend charging the batteries after each trip, as well as each night over night. Depending on the level of discharge, it can take up to 12 hours until the batteries are fully charged again.
Protect your charger from sources of heat such as heaters and direct sunlight. If the battery charger overheats, charging current will be reduced and the charging process delayed.
To avoid damaging the batteries, never allow them to be fully discharged. Do not drive on heavily discharged batteries if it is not absolutely necessary, as this will strain the batteries unduly and shorten their life expectancy.
In case your vehicle is not used for a longer period of time, then the batteries must be charged at least once a month to maintain a full charge. Alternatively, the vehicle can stay connected to the charger. The batteries cannot be overcharged with the specified charger.
Please use only charging devices in Class 2. This class of chargers may be left unattended during charging. All charging devices which are supplied by Invacare® and comply with these requirements.

10.2.2 Charging the batteries

- Make sure you read and understand the battery charger's User's Manual, if supplied, as well as the safety notes on the front and rear panels of the charger!

WARNING:

Danger of explosion and destruction of batteries if the wrong battery charger is used!

- *Only ever use the battery charger supplied with your vehicle, or a charger that has been approved by Invacare®!*

Danger of electric shock and damage to the battery charger if it is allowed to get wet!

- *Protect the battery charger from water!*
- *Always charge in a dry environment!*

Danger of short circuit and electric shock if the battery charger has been damaged!

- *Do not use the battery charger if it has been dropped or damaged!*

Danger of fire and electric shock if a damaged extension cable is used!

- *Only ever use an extension cable if it is absolutely necessary! In case you must use one, make sure it is in good condition!*

Charging the batteries

- Switch off the wheelchair at the Joystick Box.
- Connect the battery charger to the Joystick Box - the charging socket is located on the bottom of the Joystick Box (1).
- Connect battery charger to the mains outlet and switch on if necessary.
- After charging is complete, first disconnect the battery charger from the mains supply, then disconnect from the Joystick Box.

10.2.3 Removing and fitting batteries

WARNING:

Danger of injury if the batteries are not handled correctly during assembly and maintenance work!

- *New batteries should be installed by authorised technicians!*
- *Observe the warnings on the batteries!*
- *Take into account the heavy weight of the batteries!*
- *Only ever use the battery type defined in the technical specifications!*

Danger of fire and burns if battery terminals are short-circuited!

- *DO NOT short-circuit battery terminals with a tool!*

WARNING:

Corrosion and burns from acid leakage if batteries are damaged!

- *Remove clothes that have been soiled by acid immediately!*

After contact with skin:

- *Immediately wash affected area with lots of water!*

After contact with eyes:

- *Immediately rinse eyes under running water for several minutes; consult a physician!*

10.2.3.1 Removing the batteries

CAUTION: Risk of fire and burns if battery poles are bridged!

- *When replacing the batteries the battery poles MUST NOT come into contact with metal parts of the wheelchair causing bridging.*
- *Be sure to replace the battery pole caps after the batteries have been replaced.*

WARNING: Risk of fire and burns due to damage to the battery cables!

- *The battery cables and other cables are positioned in a cable duct above the batteries. The cable duct protects the cables against crushing and other damage. It may not be removed.*

Requirements:

- 6mm Allen key
- 5 mm Allen key
- Needle-nosed pliers

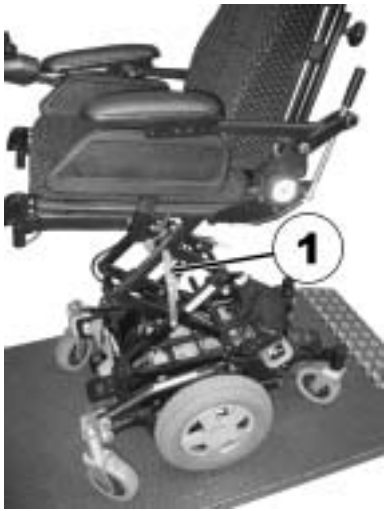
PLEASE NOTE:
If your wheelchair is fitted with a lifter the seat unit must be pulled upward in order to access the batteries. This work should be carried out by at least two people.

- Run the seat lifter to the top position.
- Remove legrests

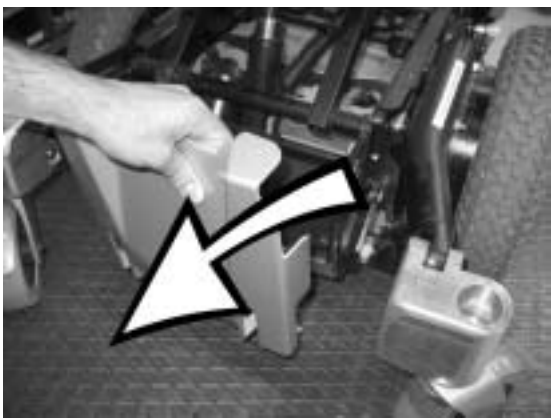
- Pull out the actuator bolt locking at the belt.

- One person now pulls the seat upwards, and a second person ensures that the actuator bolt head (1) is guided out of its mounting and does not jam.

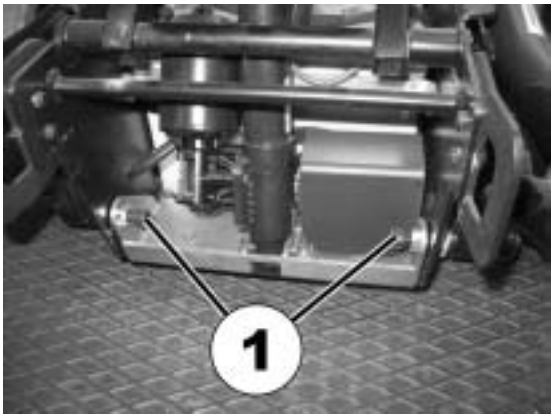
- Push the holding mechanism (1) completely to the front so that it engages.
- Run the actuator bolt down completely.



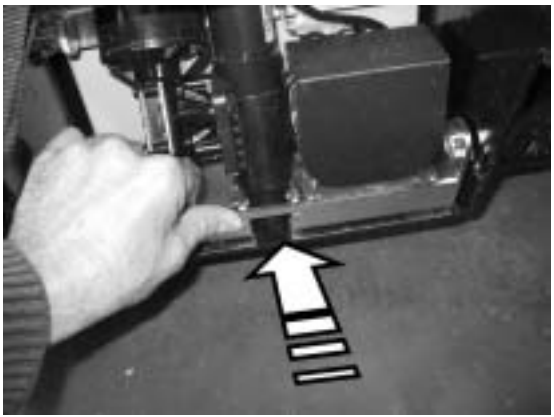
- Pull the cladding off forwards.



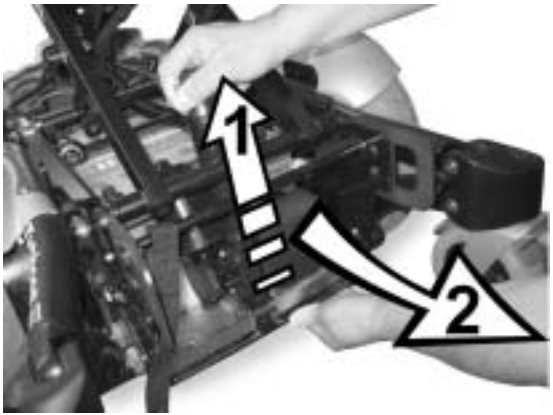
- Loosen the screws (1) on both sides with the 8 mm Allen key and remove.



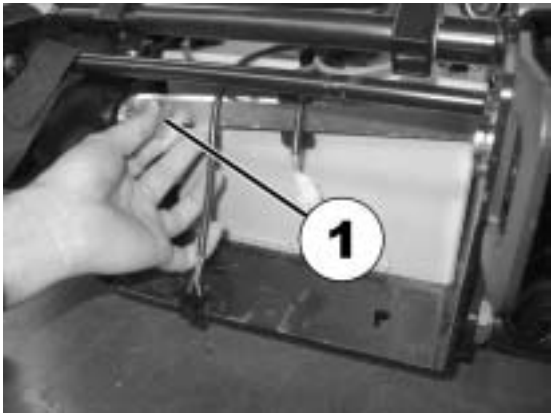
- Press the bottom actuator holder lightly inwards together with the regulator motor.



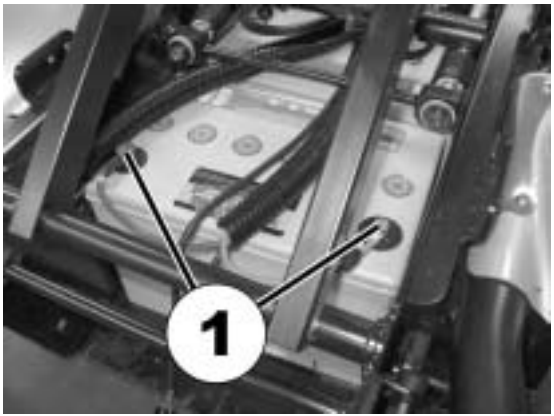
- .... then lift (1) and pull out completely to the front (2). In doing so it can be helpful to use one hand under the chassis to guide the actuator holder locking pin into the position from which it can be pulled out upwards.
- Disconnect all actuator connecting plugs, and place the actuator holder and all the connected components to one side.



- Loosen the battery locking bar closer (1) and pull out the rod.



- Remove the terminal cover from the battery terminals (1).
- First undo the bolt on the negative terminal (black cable) with the 11 mm jaw spanner.
- After this, undo the bolt on the positive terminal (red cable).



CAUTION! Danger of crushing!

- *The batteries are extremely heavy. Please ensure that they do not fall to the ground when they are removed from the chassis.*

- Pull out the batteries to the front.

CAUTION! Fire hazard! Cables can be jammed and frayed.

- *Please ensure that the cables are correctly located. They may not protrude into the lifter area. Use cable clamps if necessary.*

When installing new batteries, no cables may be located between the front battery and the lifter actuator! If so, they can be damaged when the lifter is actuated!

WRONG!

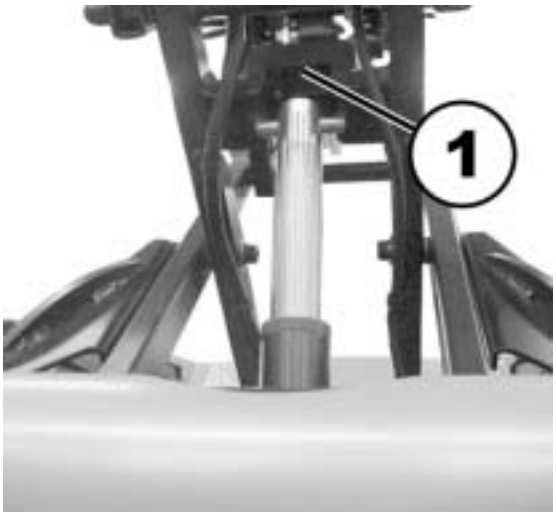
RIGHT!

- Installation takes place in reverse order.
  ?

Please note
The battery terminals on the rear battery must face the rear, and the terminals on the front battery must face the front. The batteries cannot be connected in any other alignment.

CAUTION! Danger of crushing!
- *Please ensure that the actuator head slides into the top bracket.*

- Run the actuator bolt into the top position and ensure that it slides into the top bracket (1).



- Raise the seat slightly and release the holding mechanism (1). Lower the seat slowly until the weight of the lifter is resting on the actuator again.

- Check all vehicle functions.
- Check the new battery status and charge completely.

10.2.3.2 How to handle damaged batteries correctly

WARNING:

Corrosion and burns from acid leakage if batteries are damaged!

- *Remove clothes that have been soiled by acid immediately!*

After contact with skin:

- *Immediately wash affected area with lots of water!*

After contact with eyes:

- *Immediately rinse eyes under running water for several minutes; consult a physician!*

Requirements:

- Safety goggles
- Acid-resistant gloves
- Acid-resistant receptacle for transportation

- Always wear appropriate safety clothing when handling damaged batteries.
- Place damaged batteries in an acid-resistant receptacle immediately after removing them.
- Only ever transport damaged batteries in an appropriate acid-resistant receptacle.
- Wash all objects that have come into contact with acid with lots of water.

Disposing of dead or damaged batteries correctly

Dead or damaged batteries can be given back to your dealer or directly to Invacare®.

11 Care and maintenance

NOTE:
Have your vehicle checked once a year by an authorised Invacare® dealer in order to maintain it's driving safety and roadworthiness.

Cleaning the vehicle

When cleaning the vehicle, pay attention to the following points:

- Only use a damp cloth and gentle detergent.
- Do not use any abrasive or scouring liquids.
- Do not subject the electronic components to any direct contact with water.
- Do not use high-pressure cleaning devices.

Disinfection

Spray or wipe disinfection using a tested and recognised product is permitted. A list of the current permitted disinfectants is available from the Robert Koch Institute at http://www.rki.de.

Maintenance Jobs	When Delivered	Weekly	Monthly
Seat and backrest padding:			
- Check for perfect condition.			✓
Side part and armrest:			
- Are all fastening elements installed?	✓	✓	
- Can armrests / side parts be removed and installed without too much physical effort?		✓	
- Are armrests secured in their positions?		✓	
Legrests:			
- Do legrests lock into place without any problem? (Only applies to detachable legrests)			✓
- Do the different adjustment functions work without any problem?			✓
Tyres:			
- Have tyres checked for specified air pressure (2,5 bar).	✓	✓	
Front wheel forks / Front wheels			
- Front wheels must be running smoothly.		✓	
- Check fork bearing for firm seat.			✓
Rear wheels:			
- Test wheel for firm seat on the axle drive shaft.			✓
- Rear wheels must turn without wobbling			✓

Maintenance Jobs	When Delivered	Weekly	Monthly
Electronics / Electrical System:			
- Check all plug connections for condition and firm seat.			✓
- Have all batteries been fully charged before the daily operation?	Before every trip		
- Are all holders, screws firmly fixed, tight and safe?			✓
- Are all electric bulbs of the lighting system (if applicable) in working order?	Before each trip		
Cleaning:			
- Clean all parts carefully.	When necessary		

Have your vehicle inspected and serviced once a year by your authorised dealer. A complete checklist of necessary maintenance work can be found in the Service Manual, which can be obtained from Invacare®.

12 Maintenance- and repair work

The following are instructions on maintenance and repairs that can be performed by the user. For the specifications of spare parts please see "**Technical Specifications**" on page **144**, or consult the Service Manual, available from Invacare® (in this connection please see the addresses and phone numbers in section "**How can you get in touch with Invacare®?**" on page **2**). In case you require assistance, please contact your Invacare® Dealer.

12.1 Repairing a flat tyre

WARNING: Danger of damage or injury if the vehicle is accidentally set into motion during repairs!

- *Switch the power off (ON/OFF Button)!*
- *Engage the motors!*
- *Secure the vehicle against rolling away by placing wedges under the wheels!*

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! Please install all shim rings in exactly the same positions they were in before dismantling.*

12.1.1 Repairing punctures (drive wheel with GB motor and pneumatic tyres)

EXPLOSION HAZARD!

The wheel will explode if you do not let the air out of the tyre before removing the wheel!

- *Always let the air out of the tyre before removing it (press in the pin in the middle of the valve)!*

Injury hazard!If the wheel has been insufficiently tightened during assembly, it can become loosened during driving!

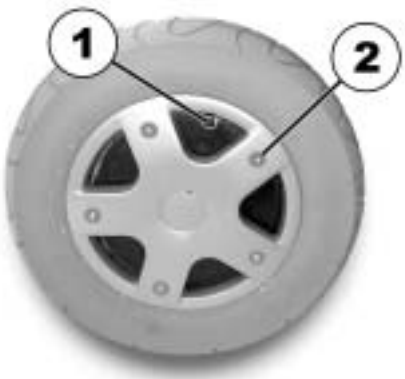
- *When reassembling the drive wheels, tighten the Allen screws at a torque of 25 Nm!*

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

- Block up the vehicle (place wooden blocks under frame).
- Unscrew valve cap.
- Depressurise tyre by pressing in the pin in the valve (1).
- Unscrew 5 screws (2).
- Remove the wheel rim halves.
- Remove the inner tube from the tyre.



NOTE:
If the old inner tube is to be 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.

- Repair inner tube and replace, or insert new.
- Replace the inner tube in the tyre.
- Insert the wheel rim halves once again.
- Insert the screws and tighten slightly.
- Pump a little air into the inner tube.
- Screw the wheel rims tightly together.
- Ensure that the tyre outer is seated correctly.
- Pump the wheel up to its prescribed air pressure (see **"Technical Specifications"** on page **144**
- Check that the tyre is seated correctly once again.
- Screw the valve cap back on.

13 Transport

13.1 Transferring the wheelchair to another vehicle

WARNING: Danger of tipping over, if the wheelchair is transferred to another vehicle with the user seated in it!

- *If the wheelchair has to be transferred to another vehicle over a ramp, then it must be secured against tipping over by an attendant standing behind it during the transfer process!*

- Drive or push your wheelchair into the transport vehicle using a suitable ramp.

13.2 Transportation of the wheelchair and use as a vehicle seat

Please note
In order to use a wheelchair as a motor vehicle seat, it needs to be equipped with attachment points to enable anchoring in the motor vehicle. These accessories are not included in the standard scope of wheelchair order and delivery, but can be obtained from Invacare as an option.

This electric wheelchair complies with the requirements of ISO 7176/19-2001 and may be used as a vehicle seat in connection with an anchoring system that has been checked and approved in accordance with ISO 10542. The wheelchair has undergone a crash test in which it was anchored in the transporting vehicle's direction of travel. Other configurations were not tested. The crash test dummy was secured using pelvic and upper body seatbelts. Both types of seatbelt should be used in order to minimise the risk of injuries to head or upper body. It is imperative that the wheelchair is inspected by an authorised dealer before being used again after being involved in a crash. Alterations to the wheelchair anchoring points may not be carried out without the manufacturer's permission.

Caution: There is a danger of injury if the wheelchair is not properly secured during use as a vehicle seat!

- *If possible, the user should always leave the wheelchair to use a vehicle seat and the seatbelts provided with the vehicle!*
- *The wheelchair should always be anchored facing in the transport vehicle's direction of travel if possible!*
- *Please only use anchoring systems that have been checked and approved in accordance with ISO 10542!*
- *The wheelchair must always be secured in the anchoring system in accordance with the manufacturer's operating manual!*
- *Always remove and secure any accessory parts fixed to the wheelchair such as chin controls or tables!*

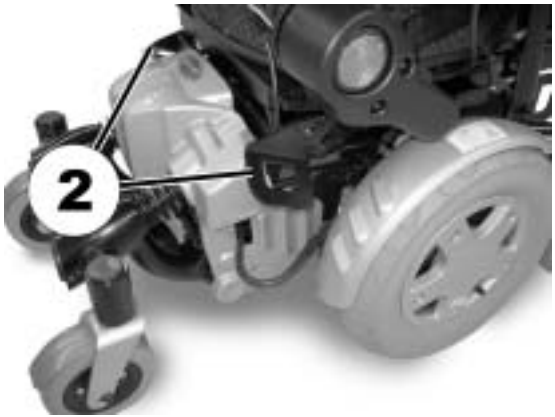
WARNING: Danger of injury exists if a powerchair that is not equipped spill-proof batteries is transported in a vehicle!

- *Only ever use spill-proof gel batteries!*

13.2.1 How the wheelchair is anchored in a vehicle for use as a vehicle seat

The electric wheelchair is fitted with four anchoring points, which are labelled with the symbol shown on the right. Snap hooks or belt loops can be used for fixation.

- Secure the wheelchair at the front (1) and at the rear (2) with the anchoring system belts.
- Secure the wheelchair by tensioning the belts in accordance with the anchoring system manufacturer's operating manual.

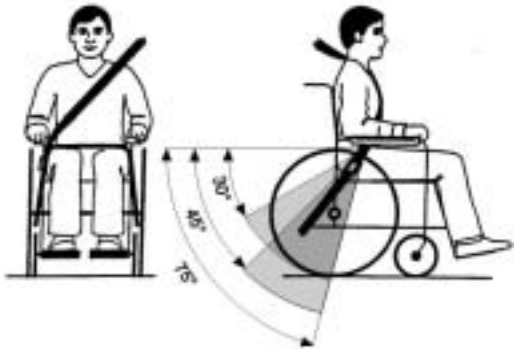


13.2.2 How the user is secured within the wheelchair

Caution: there is a danger of injury if the user is not properly secured within the wheelchair!

- *Even if the wheelchair is fitted with a securing belt, this is no substitute for a proper seatbelt in a travelling vehicle! Always use the transport vehicle seatbelt!*
- *Seatbelts must be in contact with the user's body! They must not be held at a distance from the user's body using parts of the wheelchair such as armrests or wheels!*
- *Seatbelts must be pulled as tightly as possible without causing the user discomfort!*
- *Seatbelts must not be positioned while twisted!*

Seat belts may not be held at a distance from the user's body using parts of the wheelchair such as armrests or wheels.

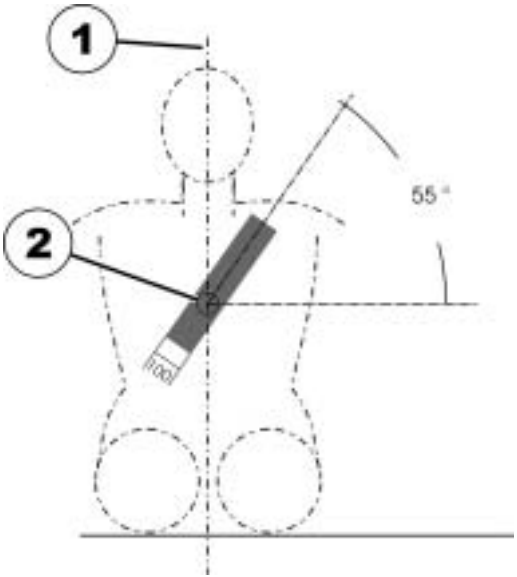


The pelvic belt should be positioned in the area between the user's pelvis and thighs so that it is unobstructed and not too loose. The ideal angle of the pelvic belt to the horizontal is between 45° and 75°. The maximum permissible angle is between 30° and 75°. The angle should never be less than 30°!

The safety belt of the transporting vehicle should be applied as shown in the illustration at right.

1) Centre line of the body

2) Centre of the sternum



13.3 Securing the wheelchair for transport without passengers

CAUTION: Injury hazard!

- *If you are unable to fasten your electric wheelchair securely in a transport vehicle, we recommend that you do not transport it!*

- Before transporting your wheelchair, make sure the motors are engaged and that the Joystick Box is switched off.
- We urgently recommend securing the wheelchair to the floor of the transporting vehicle.

14 Refurbishment

The product is suitable for refurbishment. Actions to be carried out:

- Cleaning and disinfection. Please see chapter **"Care and maintenance"** on page **127**.
- Inspection according to service plan. Please consult service instructions, available from Invacare®.
- Adaptation to the user. Please see chapter **"Adjusting the wheelchair to the user's seating posture"** on page **52**.

15 Disposal

- The equipment wrapping is potentially recyclable.
- The metal parts are used for scrap metal recycling.
- The plastic parts are used for plastic recycling.
- Electric components and printed circuit boards are disposed of as electronic scrap.
- Disposal must be carried out in accordance with the respective national legal provisions.
- Ask your city or district council for details of the local waste management companies.

16 Technical Specifications

Permissible Operating and Storage Conditions	
Temperature range for operation according to ISO 7176-9:	• -25 … +50 °C
Temperature range for storage according to ISO 7176-9:	• -40 … +65 °C

Electrical system	
Motors	• 2 x 500 W
Batteries	• 2 x 12V / 60 Ah, leakproof/gel
Main fuse	• 80 A

Charging device	
Output current	• 8A ± 8%
Output voltage	• 24V nominal (12 cells)
Input voltage	• 200 – 250V nominal
Operating temperature (surroundings)	• -25° ... +50°C
Storage temperature	• -40° ... +65°C

Drive wheel tyres	
Tyre type	• 3.00 - 8 pneumatic or puncture-proof
Tyre pressure	• 2.8 bar

Driving characteristics	
Speed	• 6 km/h • 10 km/h • 12 km/h
Max. hill-climbing ability without overturning	• 20% (11.3°)
Max. climbable obstacle height	• 7,5 cm
Turning radius	• 56 cm
Drive range in accordance with ISO 7176 ***	• 52 km

Dimensions	Standard	Contour	Recaro	Flex
Total height	• 94	• 105	• 124	• 98
Drive unit width	• 63 cm	• 63 cm	• 63 cm	• 63 cm
Total seat width (with standard armrests)	-	-	• 72 cm	-
Seat width 39 cm	• 60 cm	• 60 cm	-	• 60 cm
Seat width 43 cm	• 64 cm	• 64 cm	-	• 64 cm
Seat width 48 cm	• 69 cm	• 69 cm	-	• 69 cm
Total seat width (with travelling armrests)	-	-	-	-
Seat width 39 cm	• 64 cm	• 64 cm	-	• 64 cm
Seat width 43 cm	• 68 cm	• 68 cm	-	• 68 cm
Seat width 48 cm	• 73 cm	• 73 cm	-	• 73 cm
Total length (incl. standard legrests)	• 116 cm	• 116 cm	• 116 cm	• 116 cm

Dimensions	Standard	Contour	Recaro	Flex
Seat height ****	• 40 cm (+30 cm with lifter) • 47 cm (+30 cm with lifter) • 45 cm • 47 cm	• 40 cm (+30 cm with lifter) • 47 cm (+30 cm with lifter) • 45 cm • 47 cm	• 40 cm (+30 cm with lifter) • 47 cm (+30 cm with lifter) • 45 cm • 47 cm	• 40 cm (+30 cm with lifter) • 47 cm (+30 cm with lifter) • 45 cm • 47 cm
Seat width (armrest adjustment range in brackets)	• 43 cm (44 - 48 cm**)	• 48 cm (49 - 53 cm**) • 43 cm (44 - 48 cm**)	• 36 cm (49 - 53 cm**)	• 38 cm (39) • 43 (44 - 48 cm**) • 48 (49 - 53 cm**)
Seat depth	• 41 / 46 / 51cm	• 41 / 46 / 51cm	• 46 -51 cm	• 41 / 46 / 51cm
Backrest height ****	• 48 / 54 cm	• 64 cm	• 77 - 83 cm	• 55 cm
Seat cushion thickness	• 5 cm	• 7 cm	-	• 7 cm
Backrest angle	• -10°, 0°, +7.5°, +15°, +22.5°, +30°	• -10°...+45° (electr.)	• 0°...+45°	• -10°...+45°
Armrest height	• 25-35 / 29-39 cm	• 25-35 / 29-39 cm	• 25-35 / 29-39 cm	• 25-35 / 29-39 cm

Dimensions	Standard	Contour	Recaro	Flex
Legrest lengths • Short (for leg length 32-38 cm) • Medium (for leg length 38-44 cm) • Long (for leg length 44-50 cm)	• 29.5 - 35.5 cm • 35.5 - 41.5 cm • 41.5 - 47.5 cm	• 29.5 - 35.5 cm • 35.5 - 41.5 cm • 41.5 - 47.5 cm	• 29.5 - 35.5 cm • 35.5 - 41.5 cm • 41.5 - 47.5 cm	• 29.5 - 35.5 cm • 35.5 - 41.5 cm • 41.5 - 47.5 cm
Seat angle, electronic adjustment (wheelchair without lifter)	• 0° ... +15°	• 0° ... +15°	• 0° ... +15°	• 0° ... +15°
Seat angle, manual adjustment (wheelchair without lifter)	• 0° ... +15°	• 0° ... +15°	• 0° ... +15°	• 0° ... +15°
Seat angle, electronic adjustment (wheelchair with lifter)	• 0° ... +35° • -10 ... +35°	• 0° ... +35° • -10 ... +35°	• 0° ... +35° • -10 ... +35°	• 0° ... +35° • -10 ... +35°

Weight	Without lifter	With lifter
Weight empty (with standard seat and gearless GB motors)	• 160 kg	• 180 kg

Loading	
Max. load	• 150 kg

Axle loads	
Max. front axle load	• 110 kg
Max. rear axle load	• 60 kg
Max. centre axle load	• 160 kg

* Approximate.

** Width adjustable for side panel adjustment.

*** Note: The drive range of an electric wheelchair is strongly influenced by external factors, such as the charging state of the batteries, surrounding temperature, local topography, road surface characteristics, tyre pressure, weight of driver, drive style and use of batteries for lighting, servos etc.

**** Measured without seat cushion

17 Inspections Performed

It is confirmed by stamp and signature that all jobs listed in the inspection schedule of the Service and Repair Instructions have been properly performed. The list of the inspection jobs to be performed can be found in the Service Manual which is available through Invacare®.

Delivery Inspection	1st Annual Inspection
Stamp of authorised Dealer / Date / Signature	Stamp of authorised Dealer / Date / Signature
2nd Annual Inspection	3rd Annual Inspection
Stamp of authorised Dealer / Date / Signature	Stamp of authorised Dealer / Date / Signature
4th Annual Inspection	5th Annual Inspection
Stamp of authorised Dealer / Date / Signature	Stamp of authorised Dealer / Date / Signature

Order No. of this Manual: 1521645.DOC
Release Date: 19.03.08

English