

Invader 480S26=20000_K

EN Instructions for use

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1 Foreword

INFORMATION

Date of last update: 2021-03-17

- ▶ Please read this document carefully before using the product and observe the safety notices.
- ▶ Instruct the user in the safe use of the product.
- ▶ Please contact the manufacturer if you have questions about the product or in case of problems.
- ▶ Report each serious incident related to the product to the manufacturer and to the relevant authority in your country. This is particularly important when there is a decline in the health state.
- ▶ Please keep this document for your records.

INFORMATION

- ▶ New information regarding product safety and product recalls as well as the declaration of conformity can be obtained at ccc@ottobock.com or from the manufacturer's service department (see inside or outside of back cover for addresses).
- ▶ You can request this document as a PDF file at ccc@ottobock.com or from the manufacturer's service department (see inside or outside of back cover for addresses). The PDF file can also be displayed in a larger size.

Please read these instructions for use before you start using the product. In order to exclude injuries of any type, familiarise yourself with the handling, functions and intended use of the product. These instructions for use provide you with the related necessary information.

Please note the following in particular:

- All users and/or their attendants must be trained by qualified personnel in the use of the product. In particular, users and/or attendants must be informed of the residual risks with the aid of the safety notices in the instructions for use (user).
- The product was adapted to the needs of the user. Subsequent changes may be made only by qualified personnel. We recommend checking the product settings **once per year** to ensure optimal treatment over the long term.
- The product has a permanently welded frame. Therefore, the product is not suitable for users who require adjustments to the settings due to rapidly changing clinical pictures.
- Your product may differ from the models shown. In particular, not all the options described in these instructions for use will be installed on your product.
- The manufacturer reserves the right to make technical changes to the model described in these instructions for use.

2 Product description

2.1 Function

The wheelchair is intended exclusively for transporting one person on the seat.

The wheelchair is intended for use in indoor sports on smooth floors.

This wheelchair was developed in cooperation with competitive athletes who have practical experience. Professional and recreational athletes are the primary user groups. The wheelchair can be used by youths and adults.

The wheelchair is designed to be made to measure. Every wheelchair is custom-made to measure – tailored precisely to the size, needs and abilities of the user.

The welded frame is made from hardened aluminium 7020 T6. The material and its processing ensure great stability and durability.

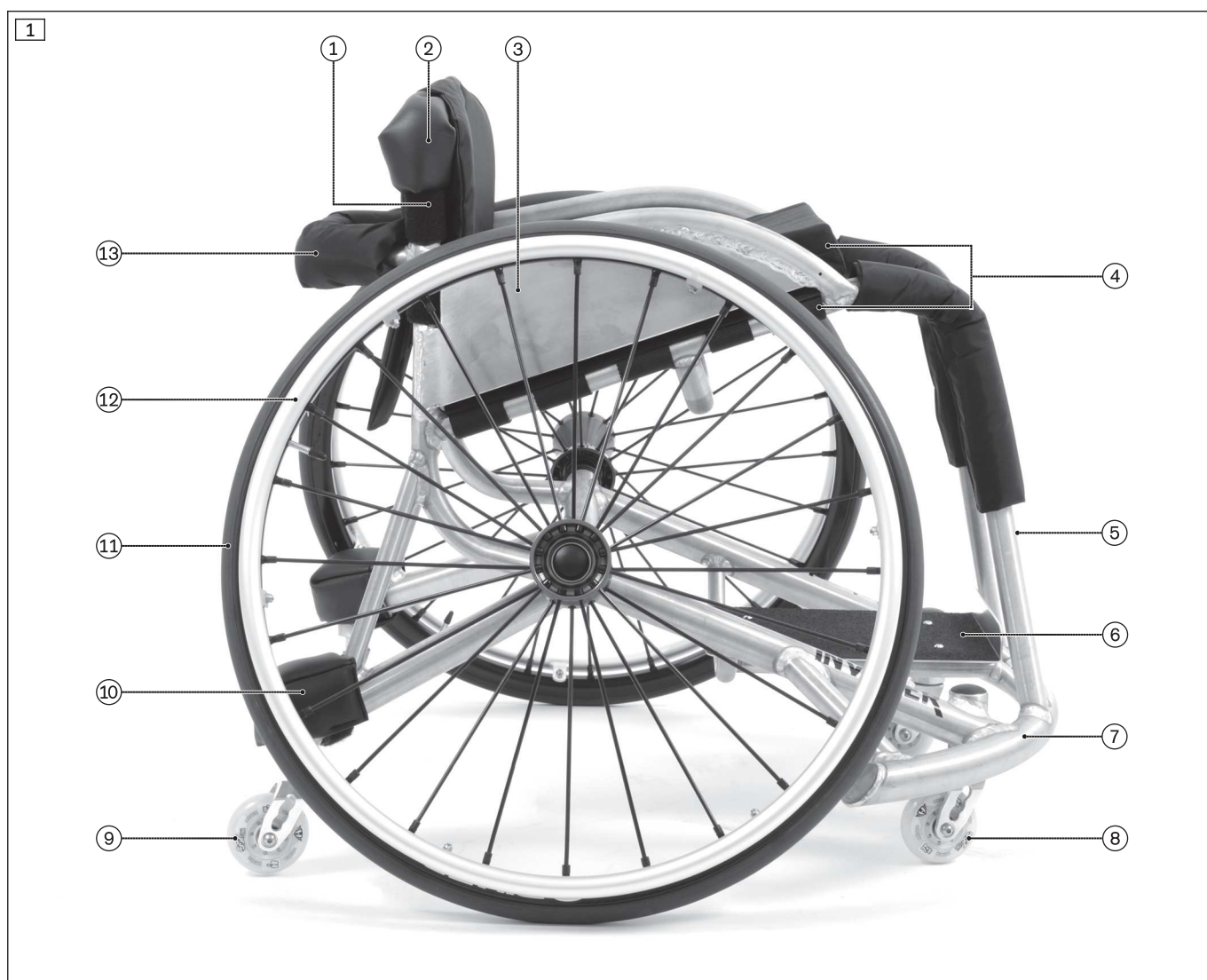
The drive wheels are attached to the frame using a reinforced (Ø 15.8 mm) or oversize (Ø 25 mm) quick-release axle.

The Invader wheelchair line includes:

- Wheelchair for everyday active use (see 647H575=*_INT instructions for use)
- Basketball sports wheelchair
- Basketball ULW sports wheelchair (ultra lightweight)
- Rugby Offense sports wheelchair
- Rugby Defense sports wheelchair

2.2 Product overview

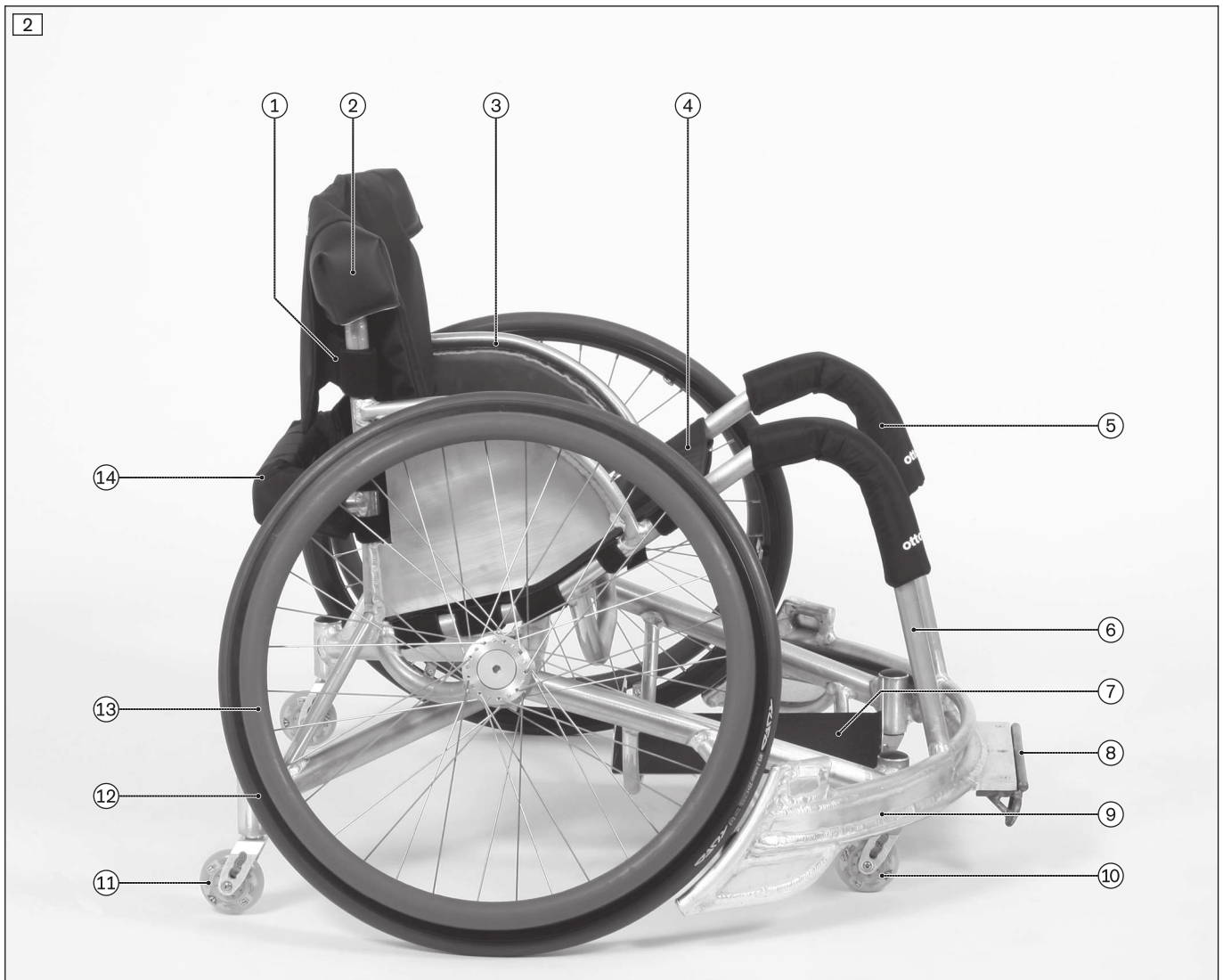
2.2.1 Invader Basketball



Invader – Basketball version; Basketball ULW version (ultra lightweight)

1	Back support with back support upholstery	8	Caster wheel
2	Leather corner (protective pad)	9	Anti-tipper wheel
3	Side panel	10	Anti-tipper pad
4	Seat upholstery/seat cushion	11	Drive wheel
5	Frame	12	Handrim
6	Foot plate	13	Back support bracket with padding
7	Bumper		

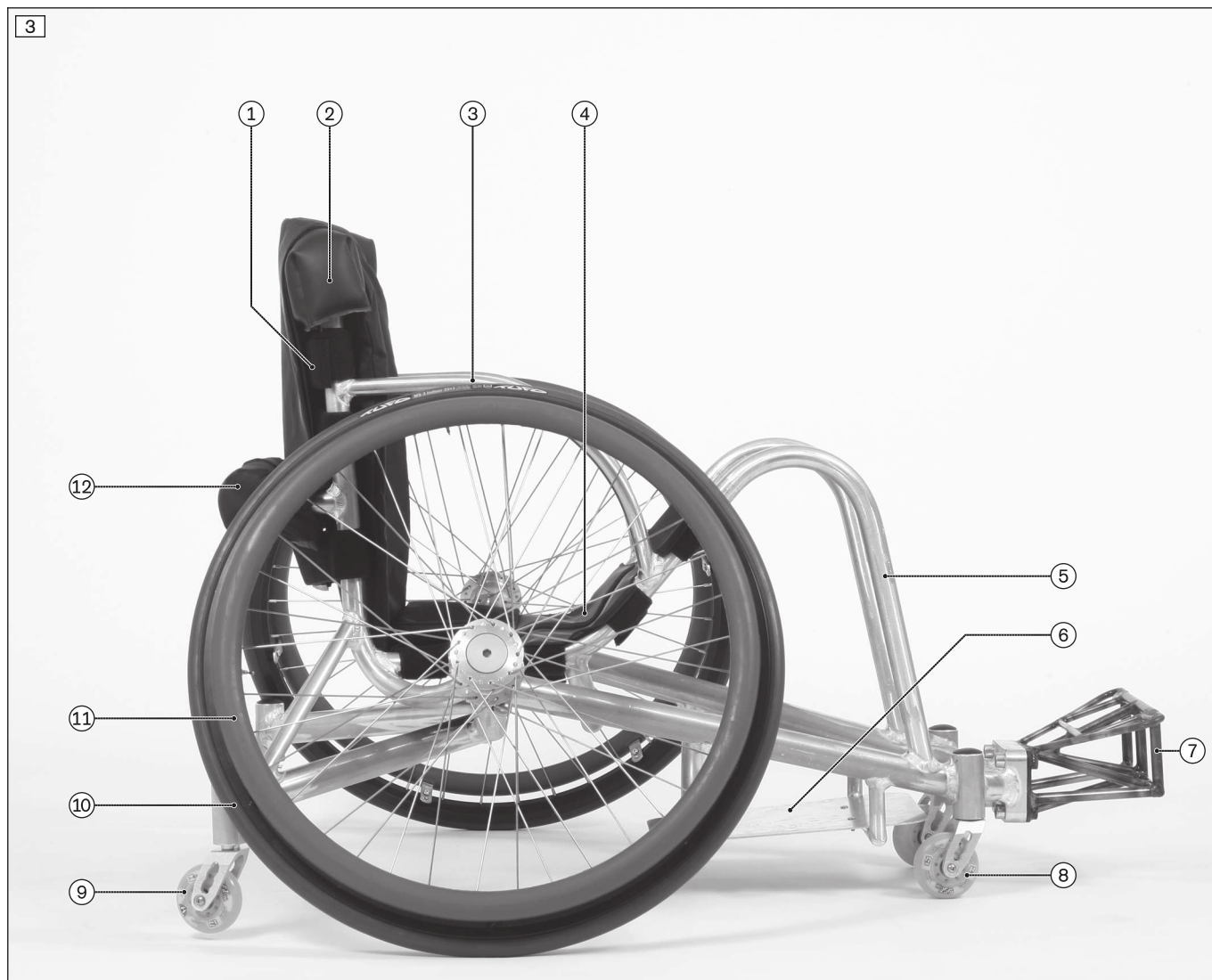
2.2.2 Invader Rugby Offence



Invader – Rugby Offense version

1	Back support with back support upholstery	8	Bumper (steel)
2	Leather corner (protective pad)	9	Wing
3	Side panel	10	Caster wheel
4	Seat upholstery	11	Anti-tipper wheel
5	Frame pads	12	Drive wheel
6	Frame	13	Handrim
7	Foot plate	14	Back support bracket with padding

2.2.3 Invader Rugby Defense



Invader – Rugby Defense version

1	Back support with back support upholstery	7	Pickbar (steel)
2	Leather corner (protective pad)	8	Caster wheel
3	Side panel	9	Anti-tipper wheel
4	Seat upholstery	10	Drive wheel
5	Frame	11	Handrim
6	Foot plate	12	Back support bracket with padding

3 Intended use

The safe use of the product can only be ensured in case of intended use in accordance with the information contained in these instructions for use. The user is ultimately responsible for accident-free operation.

3.1 Indications for use

The sports wheelchair is exclusively suited for temporary use in wheelchair sports on smooth floor coverings.

Any other or additional use is considered improper. Using the sports wheelchair outdoors or for overcoming obstacles is prohibited.

The product is suitable for users with intact skin whose anatomy (such as body dimensions and weight) permits the intended use of the product.

The wheelchair may be used only with the options listed on the product order form.

Ottobock assumes no liability for combinations with medical devices and/or accessories for a medical device from other manufacturers outside the modular system.

Combinations based on a combination agreement that have been evaluated for effectiveness and safety are an exception to this.

3.2 Indications

- Minor to pronounced or complete restrictions of mobility

3.3 Contraindications

3.3.1 Absolute Contraindications

- None known

3.3.2 Relative Contraindications

- Failure to meet physical or mental requirements




The product has a permanently welded frame. Therefore, the product is not suitable for users who require changes to settings due to rapidly changing clinical pictures.

3.4 Qualification


Installation and adjustment tasks may only be carried out by qualified personnel. Compliance with all manufacturer specifications and all applicable legal provisions is required. Please contact the manufacturer's service department for further information (see inside or outside of rear cover for addresses).

4 Safety

4.1 Explanation of warning symbols

 WARNING	Warning regarding possible serious risks of accident or injury.
 CAUTION	Warning regarding possible risks of accident or injury.
 NOTICE	Warning regarding possible technical damage.

4.2 Safety instructions for assembly and adjustments

<p> WARNING</p> <p>Making incorrect adjustments</p> <p>Risk of falling, tipping over or malposition of the user due to incorrect settings</p> <ul style="list-style-type: none"> ▶ Settings may only be changed by qualified personnel unless otherwise prescribed. ▶ Before testing setting changes with the user seated, all screw connections must be firmly tightened. ▶ Check the product for safety and functionality after changing the settings.
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4.3 Safety instructions for use

Hazards during preparation for use

⚠ WARNING

Independent modification of settings

Serious injuries to the user due to improper changes to the product

- ▶ Do not modify the settings established by the qualified personnel. Only the settings described in the section "Use" in these instructions for use may be adjusted independently.
- ▶ In case of problems with the settings, please contact the qualified personnel who adjusted your product.

⚠ WARNING

Improper handling of packaging materials

Risk of suffocation due to neglect of the duty to supervise

- ▶ Packaging materials must be kept out of the reach of children.

Risk of hand injuries

⚠ CAUTION

Pinching on components

Pinching, crushing due to lack of caution in danger areas

- ▶ Do not reach between the drive wheel and side panel when driving your wheelchair.
- ▶ Do not reach between the spokes of the drive wheel.
- ▶ Pay attention not to pinch parts of your body between the side or frame parts.

⚠ CAUTION

Heat development when braking with handrims

Burns due to insufficient hand protection

- ▶ Wear wheelchair gloves when travelling at high speeds.

Hazards while driving

⚠ CAUTION

Lack of driving experience

Tipping over, falling due to errors in handling the product

- ▶ Practise on level, open ground first.
- ▶ Learn with the support of an assistant how the product reacts to changes in centre of gravity, e.g. downward or upward slopes, inclines or when overcoming obstacles.

⚠ CAUTION

Driving through confined spaces

Pinching of the hands, damage to the product due to getting stuck

- ▶ Due to the large wheel camber, the wheelchair is considerably wider than conventional wheelchairs.
- ▶ Do not operate in confined spaces or passages.

Hazards when overcoming obstacles

⚠ WARNING

Overcoming obstacles (e. g. stairs) is prohibited

Falling of the user or damage to the product due to failure to observe the indications for use

- ▶ The wheelchair is designed for use on level floors/surfaces with no obstacles. Do not negotiate stairs, steps or high curbs.
- ▶ Crossing obstacles higher than **3 mm** leads to a loss of traction or getting stuck.

⚠ WARNING**Improper lifting by attendants**

Tipping over, falling of the user due to lifting on components that come loose or are not intended for lifting

- ▶ Only lift the product on permanently welded components (e.g. main frame).
- ▶ Do not lift the product on components installed with screw connections or add-on components.

Hazard in case of broken skin**⚠ CAUTION****Skin damage**

Skin damage or pressure points due to overloading

- ▶ Check your skin for intactness before and during use of the product.
- ▶ Pay attention to diligent skin care and pressure redistribution during interruptions in using the product.
- ▶ If skin damage or other problems occur during use, stop using the product. Consult the qualified personnel.

Hazards due to fire, heat and cold**⚠ CAUTION****Extreme temperatures**

Hypothermia or burns due to contact with components, failure of components

- ▶ Do not expose the product to any extreme temperatures (e.g. direct sunlight, sauna, extreme cold).
- ▶ Do not leave the product in the immediate vicinity of heaters.

Hazards due to improper use of the product**⚠ WARNING****Overloading**

Severe injuries if the product tips over due to overloading, damage to the product

- ▶ Do not exceed the maximum load capacity (see the nameplate and section "Technical data").
- ▶ Please note that certain accessories and add-on components will reduce the remaining load capacity.

⚠ WARNING**Exceeding the service life**

Serious injuries due to failure to observe the manufacturer's requirements

- ▶ Using the product beyond the specified expected service life leads to increased residual risk.
- ▶ Observe the specified service life.

⚠ CAUTION**Use of the product during diagnostic examinations and therapeutic treatment**

Impairment of the examination results or the effectiveness of treatment due to interactions of the product with devices that are used

- ▶ Make sure that examinations and treatments are carried out exclusively under the prescribed conditions.

⚠ CAUTION**Uncontrolled driving behaviour, unexpected sounds or odours**

Falling, tipping, collision with persons or nearby objects due to defects

- ▶ If any faults, defects or other hazards that can lead to personal injury are detected, the product must be taken out of service immediately. This includes uncontrolled movements as well as sounds that are unexpected or previously not noted or odours that deviate significantly from the state of the product at the time of delivery.
- ▶ Contact the qualified personnel.

NOTICE**Use under incorrect environmental conditions**

Damage to product due to abrasion

- ▶ Avoid sand or other particles that may damage the wheel bearings.

4.4 Side effects

The following side effects may occur during use of the product:

- Neck, muscle and joint pain
- Circulatory disorders, risk of pressure sores

Contact a doctor or therapist in case of problems.

4.5 Further information

INFORMATION

The serial number required for enquiries and ordering spare parts and accessories is found on the nameplate. For explanations of the nameplate, see the section "Nameplate" (see page 12).

4.6 Nameplate and warning labels

4.6.1 Nameplate

The nameplates are found on the frame.

Label	Meaning
	A Manufacturer's product name
	B CE marking
	C Maximum load (see section "Technical data")
	D Manufacturer information/address
	E Serial number ¹⁾
	F Manufacturing date ²⁾
	G Symbol for medical device
	H WARNING! Read the instructions for use before using the product. Observe important safety-related information (e.g. warnings, precautions).
	I The product has not been approved by the manufacturer for use as a seat in vehicles for transporting persons with reduced mobility
	J Manufacturer's reference number for the product variant
	K Serial number (PI) ^{3),1)}
	L Global Trade Item Number (DI) ⁴⁾

1) YYYY = year of manufacture; WW = week of manufacture; PP = production site; XXXX = sequential production number

2) YYYY = year of manufacture; MM = month of manufacture; DD = day of manufacture

3) UDI-PI to GS1 standard; UDI = Unique Device Identifier, PI = Product Identifier

4) UDI-DI to GS1 standard; UDI = Unique Device Identifier, DI = Device Identifier

4.6.2 Warning labels

Label	Meaning
	Sports equipment – for indoor use only!

5 Delivery

5.1 Scope of delivery

- Wheelchair ready for use
- Instructions for use
- Instructions for use for accessories (depending on equipment)

5.2 Storage

5.2.1 Storage during daily use

The product should always be stored so it is protected against external influences.

5.2.2 Storage during extended disuse

The product must be stored in a dry place. Specific information for extended storage: see page 35.

It is not necessary to disassemble the product.

Maintain sufficient clearance from sources of heat. If the product is parked for an extended period of time or the tyres overheat (e.g. in the vicinity of radiators or in case of exposure to strong sunlight behind glass), the tyres may become permanently deformed.

During extended storage, the knee lever wheel lock on wheelchairs with PU tyres (= tubeless tyres) must be released since tyre deformation may otherwise result.

6 Preparing the product for use

6.1 Assembly

⚠ CAUTION

Failure to verify readiness for use before putting into operation

Tipping, falling due to incorrect adjustment or installation

- ▶ Before you start using the wheelchair for the first time, check the chosen wheelchair settings with the support of authorised personnel.
- ▶ After every assembly, check for proper mounting of the drive wheels. The drive wheels must be securely locked in the quick-release axle housings.
- ▶ Pay particular attention to the stability against tipping and free running of the drive wheels.
- ▶ Check the tyre pressure. The correct tyre pressure is printed on the sidewall. Ensure that the pressure is the same in both tyres.

The wheelchair is preassembled on delivery:

- Basketball version, Basketball ULW version (ultra lightweight; see fig. 4)
- Rugby version (see fig. 5, the "Rugby Offense" version is illustrated)

It takes just a few simple steps to prepare the wheelchair for use:

- 1) Attach the drive wheels to the quick-release axle mountings (see page 24).
- 2) **If necessary:** Fit the seat cushion. The seat cushion is secured against sliding by being pressed on to the hook-and-loop fastener (see page 21).



7 Settings and assembly instructions

7.1 Prerequisites

⚠ WARNING

Making incorrect adjustments

Tipping over, falling or malposition of the user due to incorrect adjustments

- ▶ Adjustment and assembly work may be carried out only by qualified personnel.
- ▶ Only the adjustments described in these instructions for use may be carried out.
- ▶ Settings may only be changed within the allowable adjustment ranges; otherwise, the stability of the product may be impaired (see this section and the "Technical data" section). If you have questions, contact the manufacturer's service department (see inside back cover for addresses).
- ▶ Only conduct tests in the presence of an assistant.
- ▶ Unless expressly described, you may not change any settings with a person sitting in the product.
- ▶ Secure the user against falling out during all tests.
- ▶ Before testing setting changes with the user seated, firmly tighten all screw connections.
- ▶ Check for safe function before delivering the product.

⚠ CAUTION

Unsecured screw connections

Pinching, crushing, tipping over, falling of user due to assembly errors

- ▶ Always firmly re-tighten the mounting screws and nuts after changing settings. Observe the specified torques in doing so.
- ▶ Any time you loosen a screw connection with thread lock, replace it with a new screw connection with thread lock or secure the old screw connection with medium strength thread locker (e.g. Loctite 241).
- ▶ Always replace self-locking screws and nuts with new self-locking screws and nuts after disassembly.

Fine-tuning and adjustments should always be carried out in the presence of the user. The user should be sitting upright in the wheelchair while making adjustments.

All parts of the product should be cleaned thoroughly before adjustments are made.

The tools required for adjustments and maintenance tasks as well as the torque values for screw connections are listed in the section "Appendices" (see page 36).

7.2 Safety Instructions for Assembly

⚠ WARNING

Improper assembly of removable wheels

Tipping, falling over of the user due to wheels coming off

- ▶ After each assembly, verify the proper fit of the removable wheels. The quick-release axles must be firmly locked in the wheel attachment.

⚠ CAUTION

Use of unsuitable tools

Pinching, crushing or damaging the product due to use of unsuitable tools

- ▶ When completing the tasks, only use tools that are suitable for the conditions at the place of work and for which safety and the protection of health are assured with proper use.
- ▶ Observe the specifications in the section "Required Tools".

NOTICE

Tipping or falling of the product

Damage to product due to lack of attachment

- ▶ When you work on the product, secure it so that it cannot tip over or fall over.
- ▶ Use a clamping fixture to secure the product whenever you work on it at a workbench.

7.3 Adjusting the drive wheels

7.3.1 Adjusting the quick-release axle

The quick-release axle should be set so the wheel is correctly engaged, with no play on the axle.

- 1) Hold the tip of the quick-release axle with a wrench.
- 2) Adjust the play by turning the nut on the end of the quick-release axle (see fig. 6, item 1) in or out.



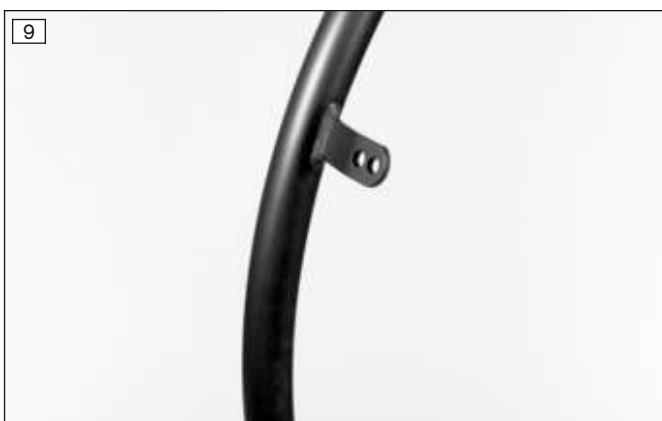
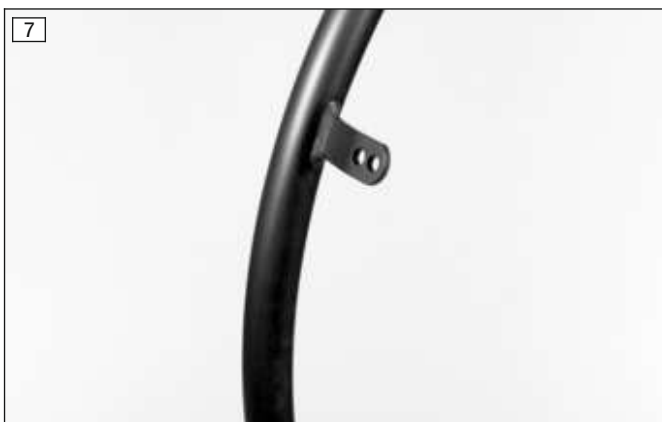
7.3.2 Adjusting the handrims

INFORMATION

This section does not apply to standard wheels.

All handrims are designed for a spacing from the drive wheel of **15 mm** (standard setting) and **25 mm**.

- 1) Loosen/remove the handrim screw connection from the rim (see fig. 8).
- 2) Tightly screw the handrims onto the rim in narrow or wide installation position.



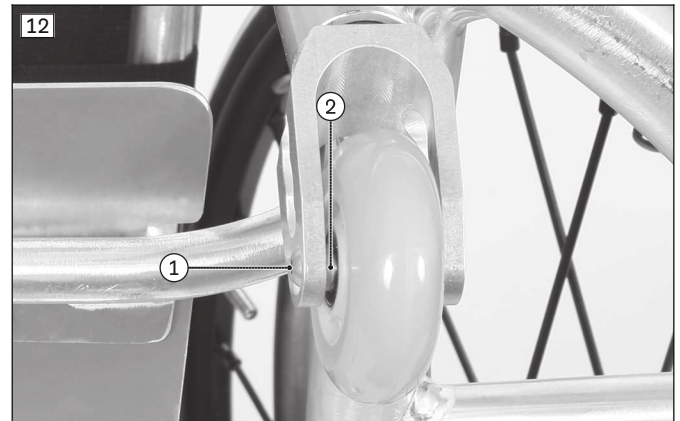
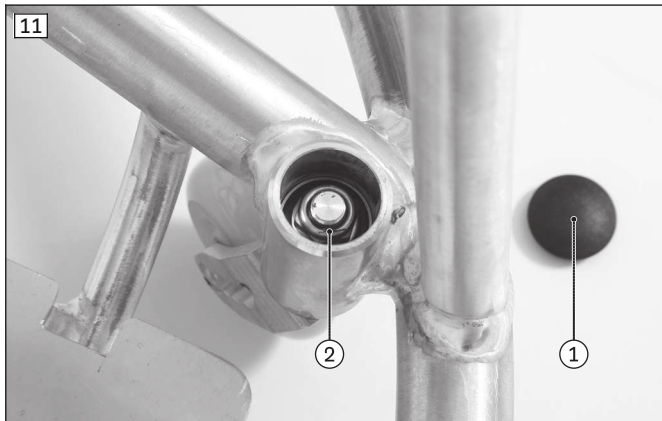
7.4 Adjusting the caster wheels

With this wheelchair type, the caster wheel position and caster wheel journal angle cannot be adjusted.

7.4.1 Replacing the caster wheels

The caster wheels can be replaced in case of wear.

- 1) Loosen the caster wheel axle screw connection (see fig. 12, item 1).
- 2) Remove the caster wheel axle/spacers (see fig. 12, item 2).
- 3) Remove and replace the caster wheels.
- 4) Install the caster wheels together with the spacers. Tighten the caster wheel axle screw connection to **8 Nm**.



7.5 Adjusting the back support upholstery / seat upholstery

7.5.1 Adjusting the back support upholstery

INFORMATION

A well-adjusted backrest provides lasting comfort for the wheelchair user and reduces the risk of secondary damage and pressure zones. Do not create too much pressure.

INFORMATION

Ensure that the user's pelvis is positioned as far back in the wheelchair as possible, i.e. between the backrest tubes.

The back upholstery is attached to the frame tubes with hook-and-loop straps.

- 1) Fold up the backrest padding.
- 2) Open and loosen the hook-and-loop straps one after the other (see fig. 13).
- 3) Sit and position the user in the wheelchair.
- 4) From the bottom to the top, adjust the tension of the hook-and-loop straps to the weight and anatomical condition of the user and fasten the straps (see fig. 14).

INFORMATION: The two ends of the hook-and-loop strap have to overlap by at least 100 mm in each case.

INFORMATION: Adjust the respective lower hook-and-loop straps somewhat tighter.

INFORMATION: Deviating adjustments may be required in specific cases; this is the responsibility of the attending therapist.



7.5.2 Adjusting the seat upholstery

The seat upholstery usually does not need to be adjusted during the initial fitting. However, the tension can be changed.

The seat upholstery is attached to the frame tubes with hook-and-loop straps.

- 1) **If necessary:** Place the seat cushion on the seat upholstery.
- 2) Open and loosen the rear hook-and-loop straps. Attach a hook-and loop strap from the middle diagonally over the straps to secure them (see fig. 15).
- 3) Sit and position the user in the wheelchair.
- 4) Adjust the tension of the hook-and-loop straps to the weight and anatomical condition of the user, and fasten them one after the other (see fig. 16).

INFORMATION: The two ends of the hook-and-loop strap have to overlap by at least 100 mm in each case.

INFORMATION: Keep the respective front hook-and-loop straps tight.

INFORMATION: Deviating adjustments may be required in specific cases; this is the responsibility of the attending therapist.



7.6 Adjusting the leg supports

The distance between the footplates and the sitting surface influences sitting stability. The height adjustment acts on the pelvis and ischial bones.

7.6.1 Adjusting the height of the foot plate

The height of the foot plate can be subsequently adjusted by inserting spacers.

- 1) Loosen and remove the screw connection under the foot plate (see fig. 25).
- 2) Insert the four spacers according to the desired height.
- 3) Firmly retighten the screw connection.

7.7 Adjusting the anti-tipper

⚠ CAUTION

Incorrect installation of the anti-tipper

Tipping over, falling of the user due to incorrect adjustment

- ▶ Verify that the anti-tipper has been installed and adjusted properly. Find the appropriate position with the assistance of a helper.

The anti-tipper wheel is height-adjustable within a narrow range.

- 1) Open the hook-and-loop closure of the protective pad and remove the protective pad (see fig. 49).
- 2) Use a screwdriver to pry open the cap on the housing (not illustrated).
- 3) Loosen the Allen head screw in the housing (see fig. 39, item 1/2).
- 4) Pull the swivel axle down and out of the housing.
- 5) Place a washer onto the ball bearings in order to change the ground clearance.
- 6) Insert the swivel axle.
- 7) Install the Allen head screw in the housing (see fig. 39, item 1/2).
- 8) Close the housing.
- 9) Attach the protective pad and fasten the hook-and-loop closure (see fig. 49).

7.8 Attaching the seat belts

⚠ WARNING

Improper installation of the seat belts

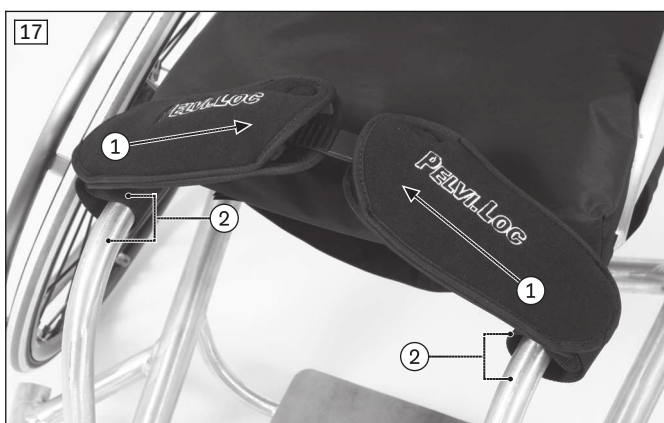
Strangulation, suffocation due to failure to observe specifications

- ▶ Observe the information in the instructions for use included with the seat belt for installation.
- ▶ The correct positioning of all retainers in terms of orientation and tension of the seat belts is very important so that the user is held securely in accordance with their disability.

The installation instructions below provide a brief overview of seatbelt installation. Comprehensive information on the respective installation is found in the instructions for use included with the seatbelts.

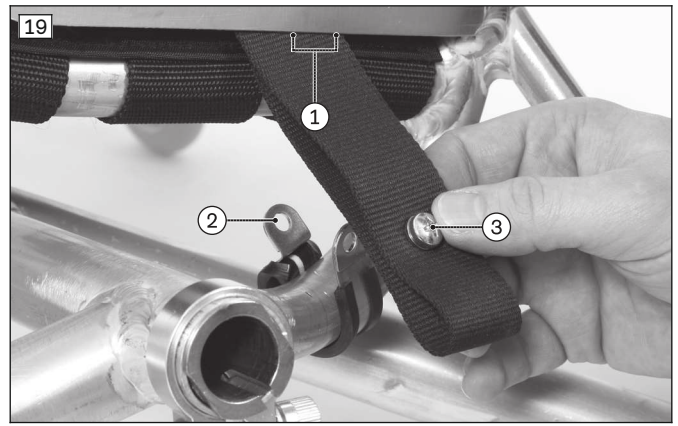
Lower leg strap, thigh strap

- 1) Pull the strap pads to the inside (see fig. 17, item 1).
- 2) Open the hook-and-loop strap which is now exposed.
- 3) Loop the straps around the frame tube (see fig. 17, see 2).
- 4) Fasten the hook-and-loop straps.
- 5) Push the strap pads to the outside, up against the frame tubes.



Lap belt

- 1) Pull the strap ends through between the seat bottom and side panel (see fig. 18; see fig. 19, item 1).
- 2) Slide the clamp fittings onto the back tube (see fig. 19, item 2).
- 3) Screw the strap ends to the clamp fittings (see fig. 19, item 3).



Leg strap, chest strap

- 1) Open the hook-and-loop straps on the belts.
- 2) Loop the straps around the frame tube:
 - Pull the leg strap through between the side panels, underneath the seat bottom (see fig. 20).
 - Loop the chest strap round the outside of the back tubes (see fig. 43).
- 3) Fasten the hook-and-loop straps (leg strap example: see fig. 21).



7.9 Adjusting the seat belts

⚠ WARNING

Incorrect adjustment/application of the seat belts

Strangulation, suffocation due to failure to observe specifications

- ▶ Observe the information in the instructions for use included with the seat belt for correct adjustment/application.
- ▶ Always use the wheelchair in conjunction with correctly adjusted seat belts.
- ▶ Following the preliminary adjustment of the belt lengths, final adjustments have to be made in the presence of the user.
- ▶ If a medically correct positioning cannot be achieved by means of the strap adjustment, the attachment points and brackets must be correspondingly moved.

⚠ CAUTION

Lack of instruction

Injuries, malpositions, illness of the user due to incorrect information

- ▶ The qualified personnel is responsible for making sure that the user and/or attendant/nursing staff has understood the proper adjustment, use, maintenance and care of the belt system.
- ▶ In particular, ensure that the user and/or attendant/care staff knows how to quickly loosen and open the product to avoid delays in case of emergency.

Information on the settings can be found in the manufacturer's instructions for use accompanying each product.

8 Delivery

8.1 Final inspection

A final check must be carried out before the wheelchair can be handed over:

- Do the quick-release axles rotate freely and lock securely?
- Have the tyres been correctly inflated?
INFORMATION: The correct tyre pressure is printed on the tyre sidewall. For drive wheels with high-pressure tyres, the minimum air pressure is 7 bar.
- Only after adjustments: Has the anti-tipper been adjusted correctly?

8.2 Transport to the customer

The wheelchair should be transported to the user in disassembled state using the outer packaging.

8.3 Handing over the product

WARNING

Lack of instruction

Tipping over, falling of the user due to lack of knowledge

- ▶ Instruct the user or the attendant in the proper use of the product when handing it over.

The following steps must be performed for the safe delivery of the product:

- A sitting test has to be conducted with the user of the product. Pay special attention to proper positioning according to medical considerations.
- The user and any attendants must be instructed in the safe use of the product. In particular, the enclosed instructions for use are to be used.
- The instructions for use must be given to the user/attendant upon delivery of the wheelchair.
- **Depending on equipment:** The supplied instructions for use for accessories have to be handed over in addition.

9 Use

9.1 Instructions for use

- Attaching loads (e.g. backpacks) can adversely affect stability. Therefore, suspending additional loads on the wheelchair is not permitted.
- The recommended overall width for manual wheelchairs in an operational state is **700 mm**. This specification should ensure unhindered use of escape routes, for example. Note that the product dimensions can exceed the recommended values for dimensions and the movement range of manually powered wheelchairs in versions with very large seat widths (for more information see see page 35 ff.).

9.2 Getting in and transferring

CAUTION

Incorrect handling when getting in

Falling, tipping or rolling away due to incorrect handling

- ▶ Before getting into/out of the wheelchair, always secure it against rolling away.

Users can choose the method for getting into and out of the wheelchair which is most suitable for them. The respective procedure should be discussed and practised with a therapist.

As a rule, the frame tubes, seat bottom or side panels can be used as supports for getting into the wheelchair.

If getting in independently is not possible, transferring or getting in always has to be performed with the help of an assistant. The manufacturer also offers transfer aids for getting in, such as transfer boards.

9.3 Legrests

CAUTION

Improper use of the leg supports

Abrasions due to sharp edges, skin irritation

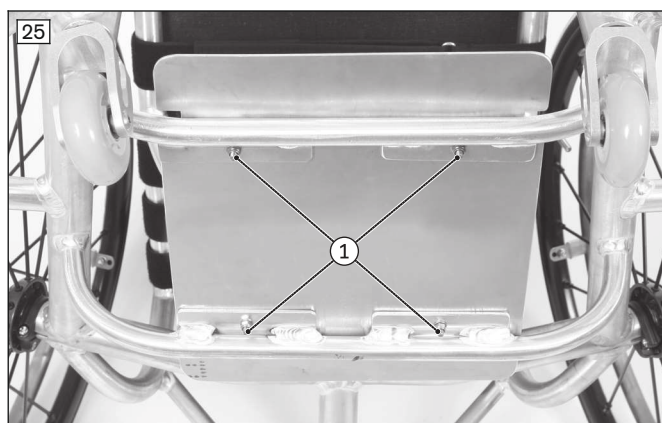
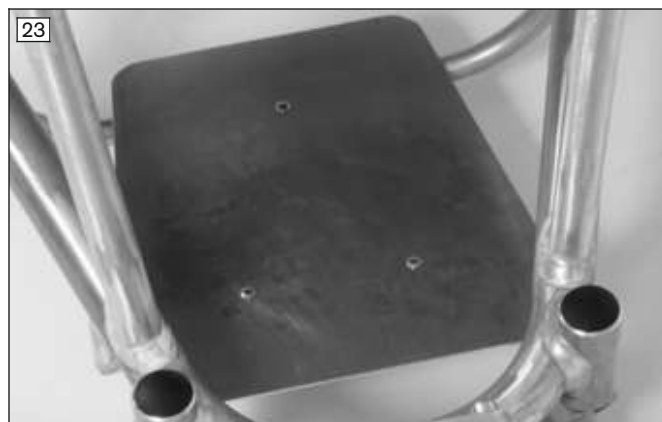
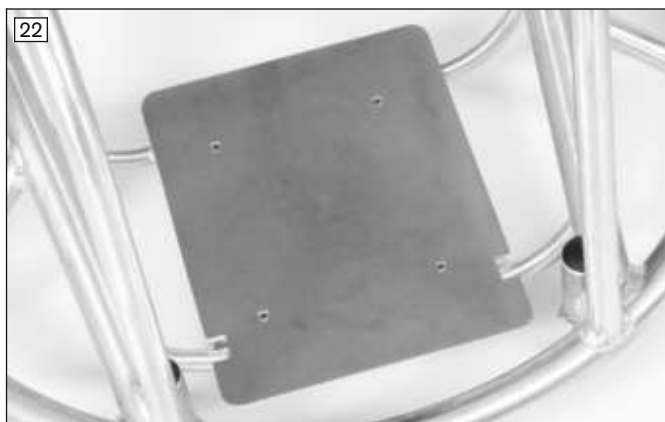
- ▶ To prevent injuries on the soles of the feet, do not use the leg supports while barefoot.

The user's feet can be placed on the leg support.

A single-panel foot plate (see fig. 22; see fig. 23), a single-panel foot plate with upturned edges (see fig. 24) or an open tube foot support (not illustrated) may be installed depending on the order.

Aluminium or carbon foot boxes can be ordered as well (not illustrated). The upturned edge of a foot box provides added support for the feet.

An anti-slip material may also be glued to the foot plates (see fig. 24).



9.4 Seat and back upholstery

⚠ WARNING

Seat cushions and back support pads may ignite

Burns due to user error

- ▶ The seat and back support upholstery as well as seat cushions, padding and covers fulfil the normative requirements for flame resistance. However, they may still ignite if fire is handled improperly or negligently.
- ▶ Keep away from all ignition sources, especially lit cigarettes.

⚠ CAUTION

Wear of the seat and back upholstery

Loss of functionality due to prohibited continued use

- ▶ Have the seat and back upholstery replaced immediately in case of damage.

The product is equipped with seat and back upholstery. Hook-and-loop fasteners on the seat upholstery are used to attach the seat cushion. The seat cushion ensures pressure relief during use of the wheelchair. It was chosen by qualified personnel according to the needs of the user.

9.4.1 Removing and fastening the seat cushion

The seat cushion can be removed for cleaning.

- 1) Remove the seat cushion from the seat pad (see fig. 26).
- 2) **After cleaning (see page 30):** Place the seat cushion on the seat pad. The seat cushion is secured against sliding by being pressed on to the hook-and-loop fastener.



9.4.2 Removing and fastening the back support pad

The backrest pad can be removed for cleaning.

- 1) Remove the seat cushion from the seat pad.
 - 2) Pull the lower end of the backrest pad off the hook-and-loop fastener on the seat pad (see fig. 27).
 - 3) Pull the back padding up and off (see fig. 28).
 - 4) **After cleaning (see page 30):** Put the back padding back onto the back upholstery. Position the seam of the backrest padding exactly over the upper upholstery strap (see fig. 29, item 1).
 - 5) Pull the backrest padding down and attach it to the hook-and-loop fastener on the back upholstery.
 - 6) Attach the lower end of the backrest padding to the hook-and-loop fastener on the seat pad (see fig. 30).
- INFORMATION: This prevents sliding and protects against draughts.**
- 7) Fasten the seat cushion to the hook-and-loop fastener on the seat pad.



9.5 Side panels

⚠ CAUTION

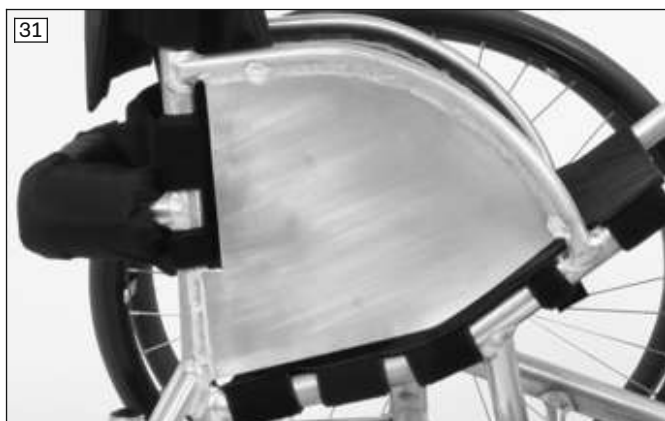
Pinching at the side panels

Pinching, crushing due to lack of caution in danger areas

- ▶ Pay attention not to pinch parts of your body between the side panel or frame parts.

The side panels protect the user from dirt and in case of a collision during competitive sports. They also ensure that the user is securely supported in the wheelchair.

Welded side panels with fixed sidewall (see fig. 31) or welded side panels with tensioning belts (see fig. 32) may be installed, depending on the order. The tensioning belts with hook-and-loop closures can be adapted to the requirements of the user.



9.6 Drive wheels

⚠ WARNING

Improper installation of removable wheels

Tipping, falling over of the user due to wheels coming off

- ▶ After each assembly, verify the proper fit of the drive wheels.
- ▶ The quick-release axles must be firmly locked in the wheel attachment device.
- ▶ The clamp axles have to be fully countersunk and the clamp brackets must be closed to the stop.

⚠ CAUTION

Defective tyres

Accidents/falling due to poor traction, reduced braking force or lack of manoeuvrability

- ▶ Maintain sufficient tyre pressure. The correct tyre pressure is printed on the tyre sidewall.
- ▶ Ensure that the pressure is the same in both tyres.
- ▶ Ensure that the tyres have sufficient tread depth.

⚠ CAUTION

Reaching into exposed drive parts

Crushing, pinching due to incorrect handling

- ▶ Do not reach between the drive wheel and side panel when driving your wheelchair.
- ▶ Do not reach into the spokes of the rotating drive wheel.

⚠ CAUTION

Heat development when braking with handrims

Burns due to insufficient hand protection

- ▶ Wear wheelchair gloves when travelling at high speeds.

The wheelchair is moved, steered, braked and stopped with the help of the handrims on the drive wheels. To make transport easier, drive wheels with quick-release axle can be taken off the wheelchair.

9.6.1 Removing and mounting the drive wheels

⚠ CAUTION

Incorrect removal/attachment of the wheels

Tipping, falling due to incorrect installation

- ▶ The user is not permitted to sit in the wheelchair during wheel replacement.
- ▶ For changing wheels, set the wheelchair onto a solid surface.
- ▶ To change the wheels, secure the wheelchair against tipping over or rolling away.
- ▶ If the drive wheel does not lock securely or has too much sideways play, contact the qualified personnel promptly.

Drive wheels with quick-release axle

- 1) Release the wheel lock.
- 2) Grip the area between the spokes near the hub with your fingers.
- 3) Use your thumb to press in the push-button on the quick-release axle.
- 4) Remove or mount the drive wheel.

After mounting: The drive wheels must not be removable after releasing the push-button on the quick-release axle.



Drive wheels with quick-release mechanism

The \varnothing 25 mm wheel axle is permanently attached to the wheel hub.

- 1) Release the clamping lever (see fig. 35).
- 2) Pull off/push on the drive wheel.
- 3) Firmly close the clamping lever to the stop (see fig. 36).



9.7 Caster wheels and caster forks

⚠ WARNING

Failure of caster wheels or caster forks

Falling, severe injury due to the wheelchair tipping over

- ▶ Regularly inspect the caster wheels and caster forks for damage.
- ▶ Regularly clean and oil the caster wheel axles and the threaded axles on the caster forks, especially in case of stiffness.
- ▶ Inform the responsible qualified personnel in case of permanent changes to the driving characteristics.

The combination of caster wheels and caster forks ensures the ability to hold a straight line and navigate bends securely.

The caster wheels and caster forks have been assembled by the qualified personnel according to the order.



9.7.1 Approach in case of stiffness

In case of stiffness, the caster forks or caster wheel axles should be cleaned and oiled.

Oiling the caster forks

- 1) Use a screwdriver to pry the cap off the caster fork housing (see fig. 11, item 1).
- 2) Remove dirt from the caster fork around the hexagon nut (see fig. 11, item 2).
- 3) Add a few drops of thin, resin-free oil to the housing (sewing machine oil).
- 4) Close the housing.

Oiling the caster axle

- 1) Remove dirt from the caster axle (e.g. hairs).
- 2) Lubricate the caster axle between the caster wheel and caster fork with a few drops of thin, resin-free oil (sewing machine oil) (see fig. 12, item 2).

9.8 Anti-tipper

⚠ WARNING

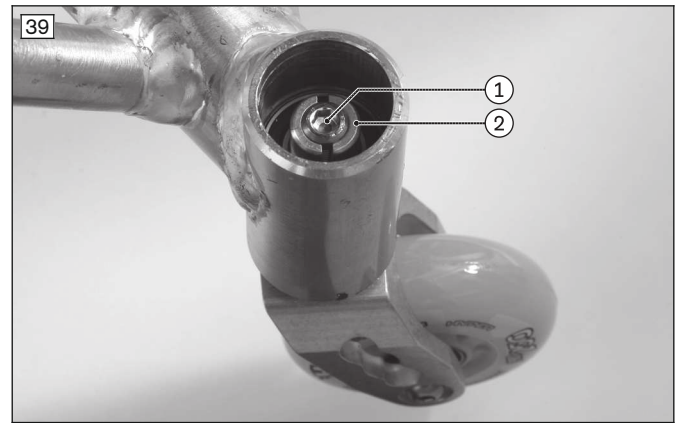
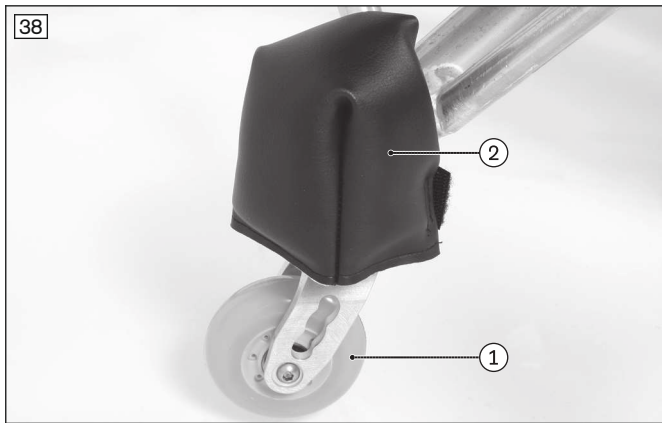
Incorrectly adjusted anti-tipper

Risk of falling as a result of incorrectly adjusted anti-tipper.

- ▶ The anti-tipper may only be adjusted by qualified personnel.

One or two anti-tipper wheels may be installed depending on the wheelchair version (see fig. 38, item 1).

In the Basketball version, an anti-tipper pad protects the respective anti-tipper housing (see fig. 38, item 2).



9.9 Seatbelts (option)

⚠ CAUTION

Improper adjustments

Injuries, malpositions, illness of the user due to adjustment changes

- ▶ The belt system is an important part of an individual seating unit/seating solution. Do not modify the installation position and basic settings established by the qualified personnel.
- ▶ In case of problems with these adjustments (such as an unsatisfactory sitting position), promptly contact the qualified personnel who fitted the product.
- ▶ **Immediately** consult the qualified personnel if you notice signs of discomfort or fear when using a belt system.
- ▶ Have the basic settings of the belt system checked regularly. Adjustments may be required due to the growth of the user or because of changes in the course of the disease.

The wheelchair can be equipped with various belts.

Seatbelts from the company A2J

These seatbelts are fastened using a closure system (ratchet strap and catch):

- Lower leg strap (not illustrated)
- Thigh strap (see fig. 40)
- Lap belt (see fig. 41)



Seatbelts with hook-and-loop closure

These seatbelts are fastened with hook-and-loop closures:

- Leg strap (see fig. 42)
- Chest strap (see fig. 43)



9.9.1 Using the seat belts

⚠ WARNING

Incorrect adjustment/application of the seat belts

Strangulation, suffocation due to failure to observe specifications

- ▶ Observe the information in the instructions for use included with the seat belt for correct adjustment/application.
- ▶ Always use the wheelchair in conjunction with correctly adjusted seat belts.
- ▶ Following the preliminary adjustment of the belt lengths, final adjustments have to be made in the presence of the user.
- ▶ If a medically correct positioning cannot be achieved by means of the strap adjustment, the attachment points and brackets must be correspondingly moved.

The usage information that follows provides a brief overview of using the seatbelts. Detailed information on adjustment and use is provided in the instructions for use included with the seatbelts.

Lower leg strap, thigh strap, lap belt

- 1) Adjust the belt length by opening the catch and moving the ratchet strap (see fig. 44).
CAUTION! At the most, pull the ratchet strap out so that 2 sections are still behind each catch.
- 2) Opening and closing during use is performed in the same manner.



Leg strap, chest strap

- 1) Adjust the belt length by opening and moving the hook-and-loop strap (see fig. 45; see fig. 46).
- 2) Opening and closing during use is performed in the same manner.



9.10 Protective pads (option)

For the protection of users, some components of the wheelchair can be equipped with protective pads:

- Back bar pad (see fig. 47)
- Frame pad (see fig. 48)
- Anti-tipper pad (see fig. 49)
- Leather corners (see fig. 50)



9.10.1 Removing/installing the protective pads

The protective pads can be removed for cleaning.

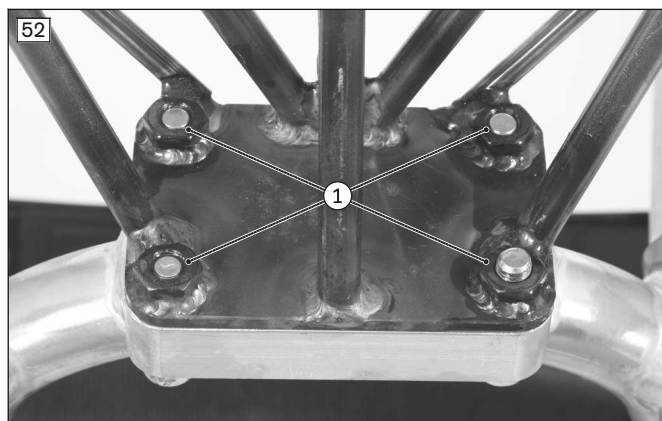
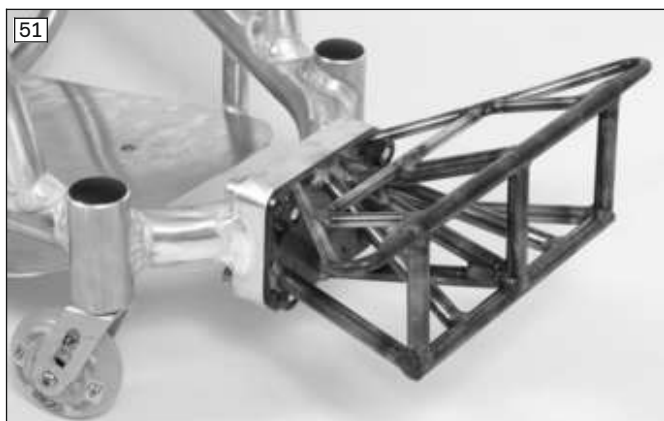
- 1) Open the hook-and-loop closures and remove the protective pads (illustration see previous section).
- 2) **After cleaning (see page 30):** Secure the protective pads on the wheelchair again, respectively with the hook-and-loop fasteners to prevent slipping.

9.11 Additional add-on components

Depending on the version, the wheelchair may be equipped with additional add-on components.

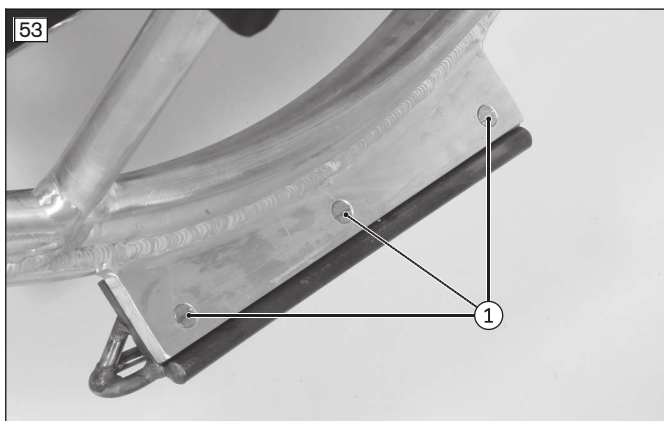
Pickbar

Steel component on the Rugby Defense version (see fig. 51). The wear and tear part "bumper" can be unscrewed and replaced when needed (see fig. 52, item 1).



Bumper

Steel component on the Rugby Offense version (see fig. 53). The wear and tear part "bumper" can be unscrewed and replaced when needed (see fig. 53, item 1).



9.12 Additional options

The product may be equipped with additional options.

The options are firmly mounted to the product by qualified personnel or the manufacturer and are pre-adjusted by qualified personnel at delivery.

9.13 Disassembly and transport

The wheelchair must be prepared for transport in a passenger vehicle.

- 1) Remove the drive wheels (see page 24).
- 2) Place the disassembled wheelchair and components safely in the vehicle.
- 3) Securely reattach the drive wheels during reassembly.

9.14 Use in vehicles for transporting persons with reduced mobility

⚠ WARNING

Improper use in vehicles for transporting persons with reduced mobility

Risk of serious injury when using the product as a seat

- ▶ The product has **not** been approved by the manufacturer for use as a seat in vehicles for transporting persons with reduced mobility.
- ▶ In vehicles for transporting persons with reduced mobility, only use the seats installed in the vehicle with the corresponding personal restraint systems.
- ▶ Information on the current status of our measures is available from the qualified personnel.

The Invader wheelchair has not been approved by the manufacturer for use as a seat in vehicles for transporting persons with reduced mobility.

9.15 Care

9.15.1 Cleaning

9.15.1.1 Cleaning by hand

- 1) Clean the padding and upholstery with warm water and a mild detergent.
- 2) Remove any spots with a sponge or a soft brush.
- 3) Rinse with clear water and let the components dry.

Important information on cleaning

- Do not use any aggressive cleaners, solvents or hard brushes etc.
- Clean plastic parts, frame parts and the chassis and wheels with a mild cleaner and a damp cloth. Dry thoroughly afterwards.
- To care for aluminium or chrome, use conventional aluminium or chrome care and cleaning products.
- Do not spray the product with a pressure washer.

9.15.1.2 Cleaning the seat cushion

Standard seat cushion

- ▶ Clean the seat cushion according to the attached care label.

Seat cushion with foam core

- 1) Open the zipper and remove the foam core (see fig. 54).
- 2) Clean the cover according to the attached care label.
- 3) Wash all foam parts by hand at **40°C** using a mild, environmentally friendly detergent. Allow to air dry.
- 4) Reinsert the foam core with proper alignment. Close the zipper.



Important information on cleaning

- For more information on cleaning seat cushions, see the care instructions on the product or the supplied instructions for use.

9.15.1.3 Cleaning belts/straps

Cleaning a belt system with metal closure

INFORMATION

Observe the washing recommendations on the product and the information in the corresponding instructions for use provided for the product.

- Straps with metal closures **may not be washed in the washing machine** as the penetration of water could cause corrosion and subsequent malfunctions.
- Clean the belt straps by gently dabbing them with warm soapy water (with some disinfectant) or carefully wipe with a dry, clean, absorbent cloth.

Cleaning a belt system with plastic closure

- Depending on the model, belts/straps with plastic buckles can be washed in the washing machine between **40 °C** and **60 °C**.
- Recommendation:** Use a laundry bag or net and mild detergent.
- Alternatively, the belt straps can be cleaned by gently dabbing them with warm soapy water (with some disinfectant) or carefully wiped with a dry, clean, absorbent cloth.

Additional cleaning instructions

- Allow the belts to air dry. Ensure that the belts and pads are completely dry before installation.
- Do not expose the belts to direct heat (e.g. sunshine, stove or radiator).
- Do not iron or bleach the belts.

9.15.2 Disinfection

- Thoroughly clean the pads and handles before disinfecting.
- Wipe all parts of the wheelchair with a disinfectant.

Important information about disinfecting

- If the product is used by more than one person, using a conventional disinfectant is required.
- Only use colourless water-based disinfectants. Observe the instructions for use provided by the manufacturer.

10 Maintenance and repair

10.1 Maintenance

WARNING

Insufficient maintenance

Severe user injuries, damage to the product due to failure to observe maintenance intervals

- Only carry out the maintenance tasks described in this section. All other maintenance and service tasks may only be carried out by qualified personnel.
- The functionality and operating safety of the product must be verified and a service performed at least **once per year**.
- For users with a changing anatomy (for example body dimensions, weight) or users with a changing clinical picture, have the product inspected, adjusted and serviced at least **once every six months**.

- The function of the product should be checked **before each use**.
- The product should not be used if defects are noted. This applies in particular in case of altered driving characteristics as well as problems with the user's seating position or the stability of the seat. Inform the qualified personnel promptly for the rectification of defects.
- This also applies if loose, worn, bent or damaged components, cracks in the frame or broken frame components are identified.
- Some maintenance tasks can be carried out to a certain extent by the user at home (see the sections "Maintenance intervals" and "Maintenance tasks").
- Failure to maintain the product can lead to injuries for the user of the product.

10.1.1 Maintenance intervals

The functions described below must be checked by the user or an attendant at the specified intervals:

When	Inspection task	Comments
Before each use	Check all components with screw connections for firm fit	Check the following in particular: Attachment of the seat belt and back strap, attachment of the foot plate; function of the quick-release axles.
	Check the tyre pressure High-pressure tyres: 8.0 bar (116 psi) Indoor sport tyres: 11.0 bar (160 psi) 16.0 bar (232 psi)	Use a pressure gauge. If none is available: use the "thumb pressure method".
Before each use	Check the tyre tread	Perform a visual inspection.

When	Inspection task	Comments
Before each use		If the tyre tread is worn or the tyre is damaged, contact the qualified personnel.
	Check the back support tubes and frame tubes for damage	In case of deformation or the formation of cracks in the area of the welding seams, contact the qualified personnel promptly. Risk of accident!
Every 8 weeks (depending on strain)	Oil components (with a few drops of oil): all axles on the wheelchair	Remove old oil residue from components before oiling. Make sure that oil does not pollute the environment.
	Check screw connections for firm fit	
	Check the legibility of all labels on the product	
Every 6 months (depending on frequency of use)	Check cleanliness and overall condition	Observe the information in the section "Care".

10.1.2 Maintenance tasks

To ensure smooth operation at all times, users or attendants with some technical skills can maintain some parts of the product:

- Screw connections must be periodically checked for tightness, especially during the initial period of use or after adjustments have been made to the wheelchair. If a screw connection loosens repeatedly, contact the qualified personnel promptly.
- Particles of dirt and hair accumulate on the caster wheel axle and threaded axle of the caster fork over time. This makes the steering stiffer. Regularly remove dirt and oil the axles. See the section "Approach in case of stiffness".
- The drive wheels are equipped with a quick-release axle system as standard equipment. To keep this system operational, ensure that no dirt adheres to the quick-release axle or receiver bushing. Periodically lubricate the quick-release axle lightly with thin, resin-free oil (sewing machine oil).
- The drive wheels may be equipped with optional clamp axles. It is essential to ensure that particles of dirt do not get between the axle and receiver bushing. The system is tolerance-free. Particles of dirt can prevent the clamp axle from being removed.
- The spokes should be lightly lubricated with petroleum jelly on occasion.
- If the wheelchair becomes wet, it should be rubbed dry again.

10.2 Inspection

- For reasons of product safety, an annual inspection is to be performed on this wheelchair type according to the list below.
- Under more severe conditions – e.g. in case of increased strain – the user should have an interim inspection of the frame and chassis performed.
- Product inspections may only be carried out by qualified personnel.

Inspection task		Check off after completion
Preparation	Remove the seat cushion and back support pad	
	Clean the product	
Visual inspection	Check the frame for damage and corrosion	
	Check welding seams for the formation of cracks	
	Check wear and tear parts (e.g. tyres, bearings) for wear and dirt	
	Check add-on components and accessories for damage and corrosion	
General inspection	Check all screw connections for firm fit	
	Check the attachment of all add-on components	
	Check hook-and-loop closures, add-on components and accessories	
Drive wheels	Check that wheel mounts are securely fastened	

Inspection task		Check off after completion
Drive wheels	Check that wheels rotate freely and without axial runout	
	Check the driving characteristics of the wheelchair	
	Check the spoke tension	
	Check the handrims for damage	
Caster wheels	Check that the fork is seated in the adapter without play	
	Check that wheels rotate freely and without axial runout	
	Check that the mounting nuts are tight	
Leg supports	Check for functionality and firm fit	
	Check leg supports for damage	
Padding/straps	Ensure that padding is in perfect condition	
	Check adjustment straps for signs of wear	
Tyres	Check tyre pressure (see tyre sidewall)	
	Check for sufficient tread depth (min. 1 mm)	
	Check for damage	
Oil/grease	Oil pivot points and bearing points of control levers and movable components	
	Grease spokes	
Final inspection	Check the general functionality of the mechanical adjustment mechanisms	
	Driving test	

10.3 Repair

⚠ WARNING

Prohibited repairs

Severe user injuries, damage to the product due to adjustment and installation errors

- ▶ Only carry out the repairs described in this section. All other repairs may only be carried out by the qualified personnel.

10.3.1 Inner tube, rim tape and tyre replacement

⚠ CAUTION

Improper tyre replacement

Injuries to the user due to incorrect installation, product damage

- ▶ No person is permitted to sit in the wheelchair during tyre replacement
- ▶ Before removing a wheel, support the product so it cannot tip over.
- ▶ Always replace the tyres in pairs. Two differently worn tyres affect the directional stability of the wheelchair.

INFORMATION

TUFO tyres with tubes can be ordered as an option for this wheelchair type. They have to be replaced entirely in case of damage.

Repairing flat tyres requires only the necessary tools and users may change tyres themselves if they wish:

Removal and preparing for installation

- 1) Carefully remove the tyre from the rim using appropriate tools.
INFORMATION: Take care not to damage the rim or the inner tube.
- 2) Unscrew the valve nut from the valve and remove the tube.
- 3) Repair the tube according to the directions in the repair kit or replace it with a new tube.
- 4) Before fitting the tyre again, inspect the rim bed and tyre inner wall for foreign objects. This could have caused the puncture.
- 5) Before installing the tube, check that the rim band is in proper condition. The rim band protects the tube from being damaged by the ends of the spokes.



Replacing the rim band (only when necessary)

- 1) If the rim band needs to be replaced, remove it from the rim.
- 2) Install the new rim band on the inside of the rim, making sure the valve opening is in the right position.
- 3) Glue the rim band in place if this is intended. Ensure that all spoke ends are covered.

Installing the tube and tyre

- 1) Behind the valve, push one side of the tyre over the edge of the rim.
- 2) Slightly inflate the tube until it starts to assume its round shape.
- 3) Unscrew the valve nut from the tube and push the valve through the valve opening in the rim.
- 4) Insert the tube into the tyre.
- 5) Mount the other side of the tyre on the rim, starting from the position across the valve. Ensure that the tube is not pinched between the tyre and rim during this process.



Inflating the tube

- 1) Ensure that the valve is positioned perpendicularly for proper positioning of the tube and tyre in the region of the valve.
- 2) Firmly screw on the valve nut.
- 3) Inflate the tube so that the tyre can still be pressed in easily with your thumb.
INFORMATION: If the circumferential lines on the two sides of the tyre are both at an even distance from the rim, the tyre is centred. If not, let some air out and realign the tyre.
- 4) Inflate the tube to the maximum pressure specified by the tyre manufacturer (see information printed on the tyre sidewall).
- 5) Firmly screw the valve cap onto the valve.

11 Disposal

11.1 Disposal information

Return the product to the qualified personnel for disposal.

All components of the product must be disposed of properly in accordance with the respective national environmental regulations.

11.2 Information on re-use

⚠ CAUTION

Used seat padding

Functional and/or hygienic risks due to re-use

- ▶ Replace the seat padding if the wheelchair is to be re-used.

The product is generally suitable for re-use. However, please note that the product with its permanently welded dimensions was tailored to one individual.

Similar to second-hand machines or vehicles, products that are being re-used are subject to increased strain. Features and functions must not change in a way that could endanger users or other persons during re-use.

The product must first be thoroughly cleaned and disinfected before it can be re-used. Then the product must be examined by an authorised specialist to check the condition and to look for wear and possible damage. All worn and damaged parts as well as components which do not fit or are unsuitable for the new user must be replaced.

Detailed information on replacing components as well as information on the required tools and the prescribed service intervals can be found in the service manual.

12 Legal information

All legal conditions are subject to the respective national laws of the country of use and may vary accordingly.

12.1 Liability

The manufacturer will only assume liability if the product is used in accordance with the descriptions and instructions provided in this document. The manufacturer will not assume liability for damage caused by disregarding the information in this document, particularly due to improper use or unauthorised modification of the product.

12.2 Warranty

Further information on the warranty terms and conditions can be obtained from the qualified personnel that has fitted this product or the manufacturer's service (see inside back cover for addresses).

12.3 Lifetime

Expected lifetime: **4 years**

The design, manufacturing and requirements for the intended use of the product are based on the expected lifetime. These also include the requirements for maintenance, ensuring effectiveness and the safety of the product.

13 Technical data

INFORMATION

All information in the following tables refers to the respective custom-made model. The dimensional tolerance is +/-15 mm, +/-2°.

Dimensions	
Frame length	Custom fabrication
Lower leg length [mm]	Custom fabrication
Minimum frame length [mm]	Custom fabrication
Minimum rear seat height [mm]	330
Maximum front/rear seat height [mm]	Custom fabrication
Width ¹⁾	Overall width = seat width + 20 mm per degree of wheel camber
Overall height	Custom size
Back height [mm]	from 220
Armrest height	Custom size
Length with footrest	Custom size
Length without footrest	Custom size
Seat cushion thickness [mm]	30; 50; 60; 90

Weights	
Maximum load capacity (maximum user weight) [kg]	120
Transport weight [kg]	
Basketball version	10 – 15
Basketball ULW version (ultra lightweight)	8 – 13
Rugby version	25 – 30

Wheels	
Caster wheel Ø (sports caster) [mm]	72; 80
Drive wheel Ø [mm]	
High-pressure tyres	610 (24"); 66 (26")
Indoor sport tyres	610 (24"); 66 (26")
Drive wheel axle Ø [mm]	
Quick-release axle	15.8
Oversize axle	25

Recommended tyre pressure (examples)²⁾	
Schwalbe RightRun	
[bar] (minimum/maximum)	6 / 10
[psi] (minimum/maximum)	85 / 145
Schwalbe SpeedAir	
[bar] (minimum/maximum)	6 / 10
[psi] (minimum/maximum)	85 / 145
TUFO MS3	
[bar] (minimum/maximum)	12 / 16
[psi] (minimum/maximum)	175 / 230

¹⁾ Operational; for 24"/25" drive wheels

²⁾ Varies according to tyre option; see the print on the tyre wall

Ambient conditions

Temperatures and relative humidity	
Temperature during use [°C (°F)]	-10 to +40 (14 to 104)
Transport and storage temperature [°C (°F)]	-10 to +40 (14 to 104)
Relative humidity [%]	45 to 85; non-condensing

14 Appendices

14.1 Required tools

The following tools are required for adjustments and maintenance work:

- Allen wrenches in sizes 3, 4, 5, 6
- Ring and open-ended wrenches in sizes 8, 10 and 13
- Phillips screwdrivers PH or PZ size 0, 1, 2
- Screwdriver (blade width: 2.5 mm)

14.2 Torque values of the screw connections

Unless otherwise specified, screw connections are tightened with the following torque values:

- Thread diameter M4: 3 Nm
- Thread diameter M5: 5 Nm
- Thread diameter M6: 10 Nm
- Thread diameter M8: 25 Nm
- Thread diameter M10: 50 Nm
- Thread diameter M12: 85 Nm



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