

Neater Uni-Chair

Instruction Manual

User's Version

Note: for instructions on fitting and setting up the Neater Uni-Chair kit to a wheelchair, please refer to the Service Manual.

CE

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The Neater Uni-Chair was developed in Association with the University of Brighton

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Safety

Please read this complete instruction manual thoroughly to ensure that you are aware of all the safety issues. We also recommend that you read the instruction manual for an Invacare Action 3 wheelchair without the Neater Uni-Chair kit as it may contain relevant additional updated safety information.

Warranty Information

Your wheelchair has been modified for use by people with hemiplegia. The basic Action3 wheelchair, made by Invacare, has been fitted with a one-arm-drive kit made by Neater Solutions Ltd.. The modified wheelchair has been thoroughly tested by the wheelchair-testing division of the Medicines and Healthcare products Regulatory Association (MHRA). It is CE marked. The tests show it to be at least as strong as an unmodified Invacare Action3 wheelchair. However, because the Action3 wheelchair has been modified, Invacare's warranty is null and void. Instead, responsibility for the warranty now rests with the organisation that fitted the one-arm-drive kit to the wheelchair. For further information contact your dealer.

Although the wheelchair has been crash tested (to ISO 7176/19), we do not recommend you to sit in your wheelchair while being transported in another vehicle, even with proper restraints on the wheelchair. However, if you prefer to sit in the wheelchair while being transported, we advise you to fit a crash-tested headrest on your wheelchair.

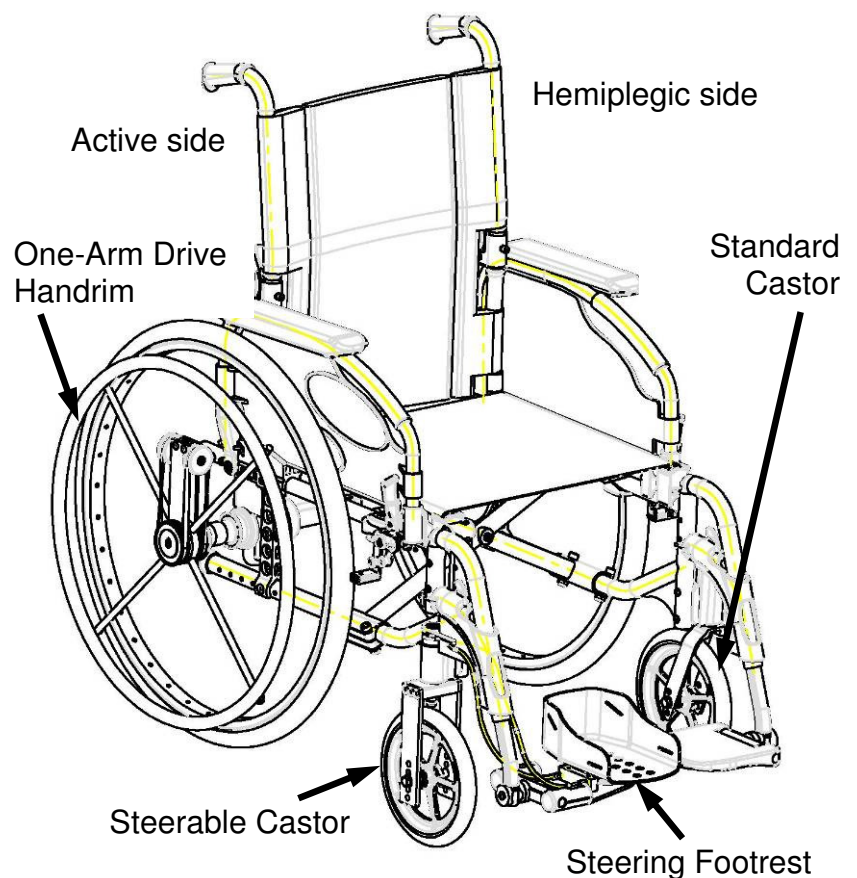
Please ask for written consent from Neater Solutions Limited before reproducing or duplicating any information in this document.

1. Foreword and Introduction

Your wheelchair was designed for people who have only one useful hand and one useful leg; such as people with hemiplegia, or people who have lost the use of one arm and one leg through an accident. The wheelchair is designed primarily for use indoors, but use outdoors is permitted under the following conditions:

1. The wheelchair is restricted to use on surfaces where all four wheels remain in contact with the ground simultaneously.
2. Avoid travel over gravel or grass. They increase the force required to push the handrim.
3. Avoid steep slopes.
4. Traffic regulations must be observed.

A novel and valuable feature of this wheelchair is its ability to do 3-point turns in confined spaces.



Neater Uni-Chair (right-handed set-up)

Your dealer will assist you in getting the best out of your wheelchair, by adjusting the positions and angles of the footrests and backrest so that you are comfortable. After a few weeks when you have become familiar with the chair you may feel that the footrests need minor readjustment for more comfort. This can be done by your dealer, who may also readjust the tension in the steering cables and drive belt after these components have settled in.

Your dealer is also the best person to maintain your wheelchair. Neater Solutions advises you to have the wheelchair serviced once per year.

This manual provides guidelines on the safety and operating limits of the wheelchair.

2. Care of the wheelchair

These operations are best left to your attendant. From time to time your attendant will need to make sure that:

- a. The wheelchair folds and unfolds easily. Check for wear and tear.
- b. The parking brakes in their 'off' position are clear of the tyres.
- c. The parking brakes in their 'on' position engage fully with the tyres, but not excessively. The lever should move on or off without excessive force.
- d. The parking brakes operate easily without excessive wear or looseness.
- e. The armrests are tightly screwed to the armrest frames.
- f. The armrests are fully engaged in their down position.
- g. The armrests can be released by pressing the upper button on the release mechanism, and swung into their upper position.
- h. The pads on the armrests are in good condition.
- i. The seat and backrest upholstery are in good condition.
- j. The seat is firmly pressed into place when the chair is unfolded, to ensure that the rear wheels are parallel
- k. The wheels are firmly engaged with the frame of the wheelchair.
- l. The handrim is not damaged or has sharp scratches.
- m. The spokes are tight and not bent or broken.
- n. The standard castor and its fork can be spun around the fork's axle, and then stop after one or two turns. If it spins for several turns, then the axle should be tightened. This prevents castor 'shimmy', whereby the standard castor oscillates from side to side.
- o. The castors are not loose within the forks. If loose, tighten the retaining nut beside the fork.
- p. Wash the upholstery with soap and water, and dry it. Take care to avoid excess water getting into bearings and other mechanical parts.
- q. If the chair has been in the rain, dry the upholstery when returning home.
- r. Avoid beaches. Seawater and sand can damage the wheel bearings.

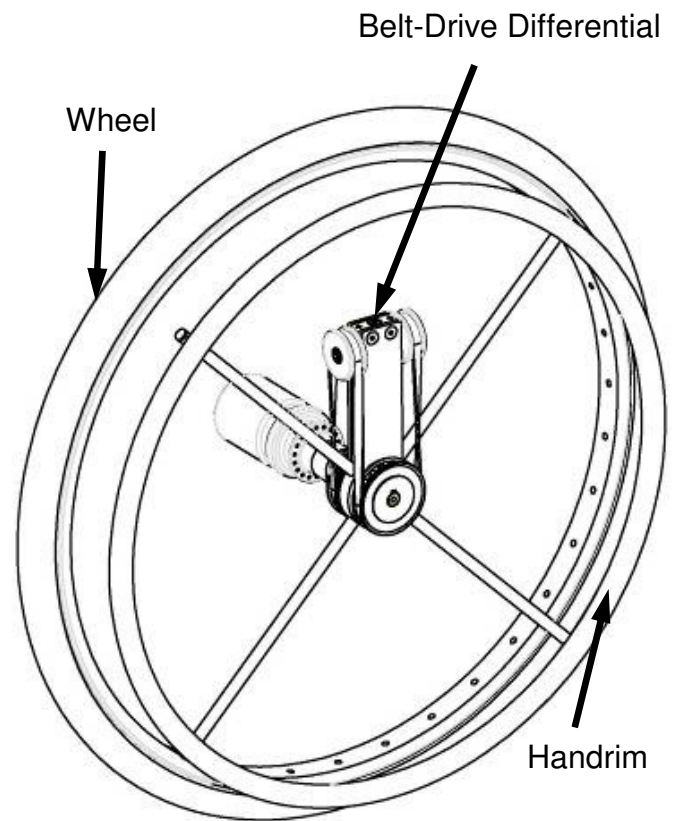
The following should be checked occasionally. Any adjustment will need to be carried out by your wheelchair dealer:

- s. The footrests are in a good position and angled correctly for your use and comfort.
- t. The tension in the steering cables is correct so that the steering is easy and positive without excessive play or loose movement.
- u. The tension in the differential drive belt is correct so that: 1) if you lift one wheel and turn the handrim, the belt-drive differential and the free wheel turn easily; but 2) there is not too much play or loose movement.

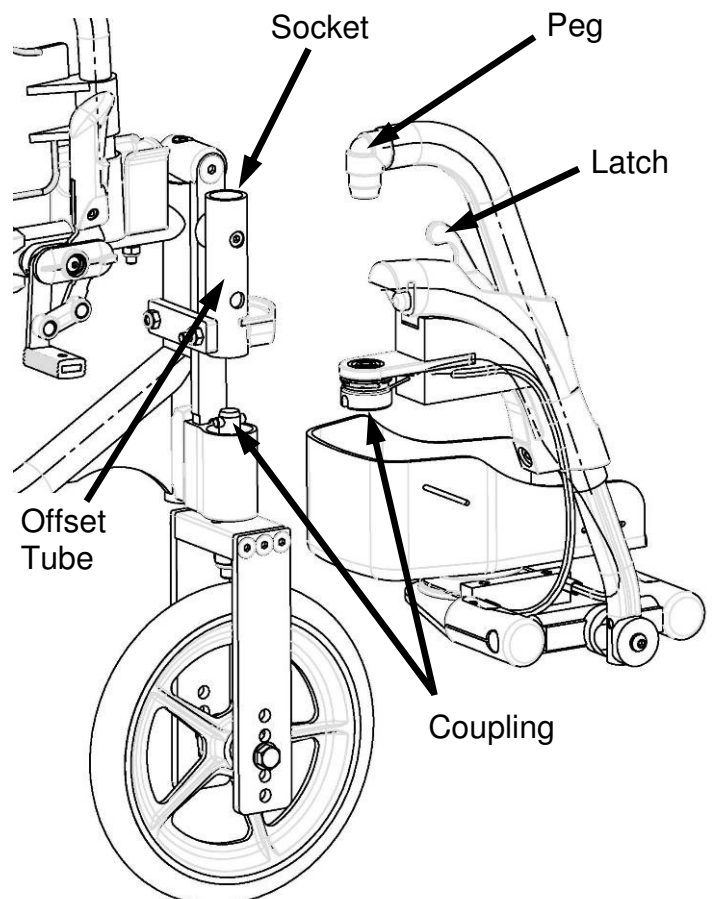
3. Basic use

The chair is designed to be propelled with your active hand on the single handrim and steered with your active foot on the steerable footrest. The wheelchair incorporates a mechanism whereby the handrim drives both rear wheels via a shaft. When you drive round a bend, the load on the handrim stays the same but the rear wheels travel at different speeds. Your active foot rests on a swivelling footrest. Rotate your foot to the right and the chair will turn to the right; rotate to the left and the chair will turn to the left. You can do this because the steerable castor sits directly below the castor pivot axis. This enables you to go either forwards or backwards with equal ease, and even do 3-point turns. With practice, very tight turns are possible, where the rear wheel on the inside of the turn is stationary. This is done by starting a gentle turn and then gradually turning more sharply.

One major difference between this wheelchair and a standard wheelchair is the foot-steering mechanism. The foot-steering is solely under your control; your attendant has no control over the steering, even when the attendant is pushing you. This requires you and your attendant to co-operate in deciding where you want to go when the attendant is pushing the chair. (This can be less effort for the attendant than pushing a conventional wheelchair). If you get out of the wheelchair to have a short walk, then your attendant will be able to steer the wheelchair.



Belt-Drive Differential and Handrim



Steering Footrest Assembly

Before getting into the wheelchair, make sure that both parking brakes are on. Also, to make it easier to get into the wheelchair, the footrests may be swung outward to the sides of the chair, and the armrests may be raised by depressing the upper button at the front of the armrest and then rotating the armrest to a near-vertical position. These operations are best done by your attendant before you enter the chair.

Before setting off in the chair, please note the following safety rules. You are heavier than the chair, so the bulk of your weight is high off the ground. Therefore it is advisable not to lean strongly to one side, but to sit as upright as you can. Also, it is advisable to keep the upper part of your body within the area of the seat. Your arms may reach outside the area of the seat -forwards, to the side, or to the rear (don't lean on the backrest) - but keep your body upright. If you lean further forward outside the area of the seat the chair may tip forward, especially when the castors are in their rearward position.

When alighting from the chair, make sure that the parking brakes are on. And do not stand on the footrests; your weight on the footrests will tip the chair forward. Instead, move the footrests to the sides.

The chair is recommended for active people not exceeding 100kg. Lighter people will have much more freedom to move without the danger of tipping.

3.1 Transfer from one seat to another

When transferring to the wheelchair from another seat, park the chair as close as possible to the seat, ensuring that both parking brakes are on. Then raise up the armrest nearest to the seat and slide your body sideways on to the wheelchair. Sideways transfer without help from your attendant requires that you have some upper body strength. Otherwise, ask your attendant to assist you during the transfer. Repeat this procedure when transferring sideways from the wheelchair to another seat.

If you are able to stand up, then keep both armrests down and walk to the front of the chair. Stand sideways to the seat, extend your active arm to the armrest on your active side, put your weight on that armrest, and then lower yourself into the seat. Try to sit as far back as possible; this will reduce the stress on the material of the seat.

3.2 Mounting kerbs

Even low kerbs will prevent you from mounting a pavement on your own.

Your chair should be provided with rearward extensions to the frame. After making sure that the handles are properly locked to the frame, your attendant will put their foot on one extension, and will pull back on the backrest handles to lift the castors above the kerb. The attendant will then rotate the chair backwards until it reaches the point of balance (when the weight on the handles is very low), and will push the chair forward so that the castors touchdown on the pavement. The attendant will then lift the handles and push them forward to ease the rear wheels over the low kerb.

When kerbs are high, the attendant is advised to turn the chair round so that the rear

wheels are against the kerb and then rotates the chair backwards to the point of balance. The attendant can then pull the chair up the kerb.

When descending from a high kerb, the attendant is advised to tilt the chair backwards to the point of balance, and then push the chair forward slowly until the rear wheels roll off the kerb. The chair can then be tilted forward until all the wheels are on the ground.

3.3 Climbing stairs

This requires two attendants, one at the rear and one at the front. (This is not recommended for patients over 125kg.) Turn the chair round so that the large rear wheels are facing the stairs. The first attendant at the rear needs to pull the chair backwards and go backwards up one or two stairs until the chair is in contact with the lowest stair. The first attendant can then tilt the chair to the point of balance. Then the second attendant at the front helps to lift the chair over the stair by holding firmly on a fixed part of the frame. (Do not lift the chair by holding the footrests or armrests.) The first attendant then goes up one stair and the process is repeated.

Avoid escalators.

3.4 Slopes

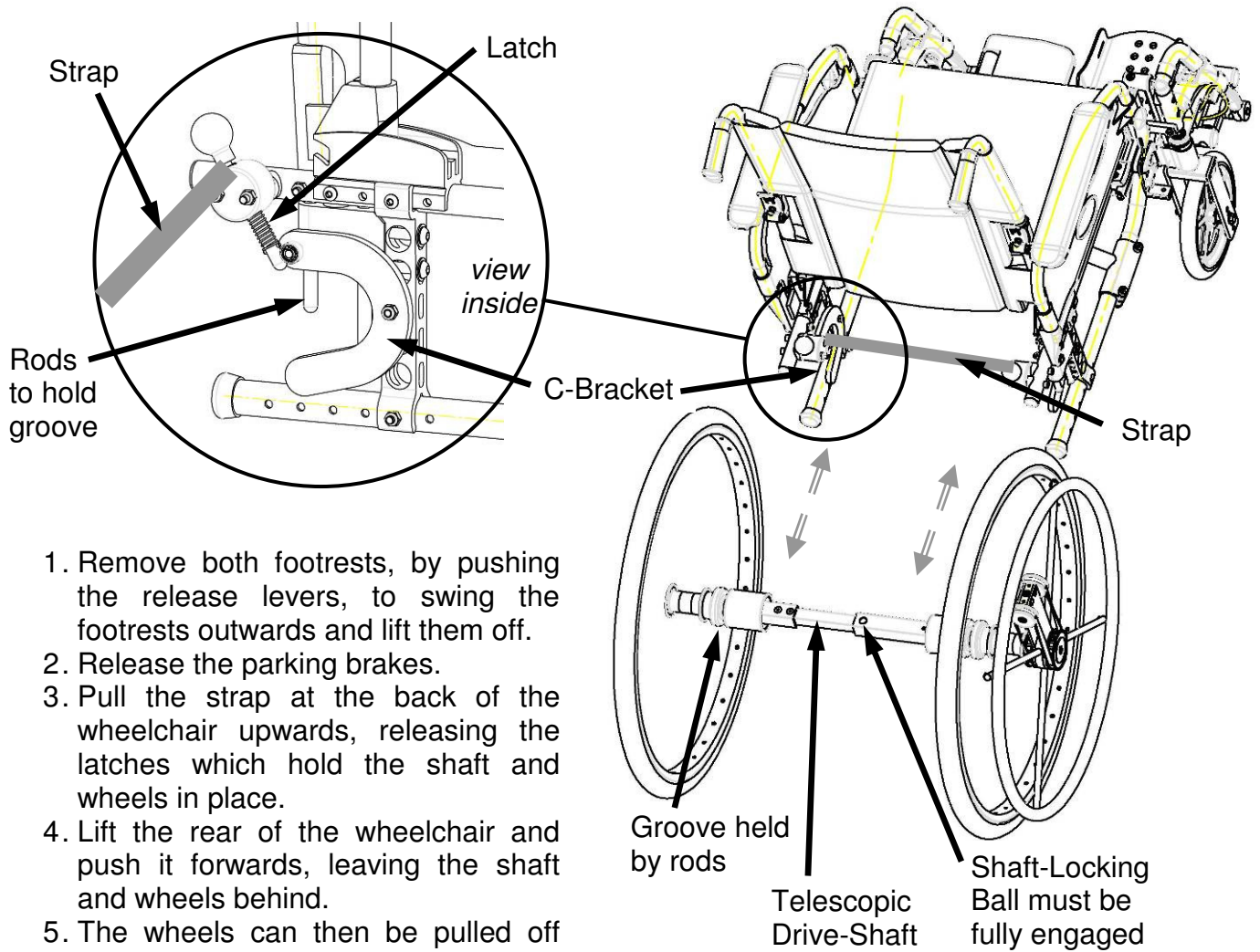
The maximum permitted steepness of a wheelchair-access ramp is 1 in 12 (i.e. the ramp rises one unit of height for every twelve units of length. This is equivalent to 4.75°). However, this may well be too steep for a wheelchair propelled by only one arm. Therefore it is advisable to ask your attendant to help you to get up the slope.

Caution is required when descending slopes. To prevent the chair from gathering speed when descending, your active hand should allow the handrim to slide in your hand. You can control your speed by tightening or relaxing your grip slightly. For extra safety, ensure that your body is leaning backward slightly while descending.

A unique feature of this wheelchair is the ability to traverse across a ramp or slope, provided that the slope is no steeper than 1 in 12. This is because the steerable castor will not automatically swivel to follow the slope, as happens with conventional wheelchairs. However, the user must ensure that they have the strength in their foot to control the steering before traversing a slope, and lean their body towards the top of the slope.

4. Dismantling the wheelchair

This task should be left to your attendant. The wheelchair is designed to be easily dismantled so that it can be stored in the boot of a car. The wheels and shaft assembly are completely removed leaving light-weight parts that are easy to lift and store. (Alternatively it is possible to leave the wheels attached and remove the Telescopic Drive-Shaft so that the wheelchair can be folded flat – see later section).



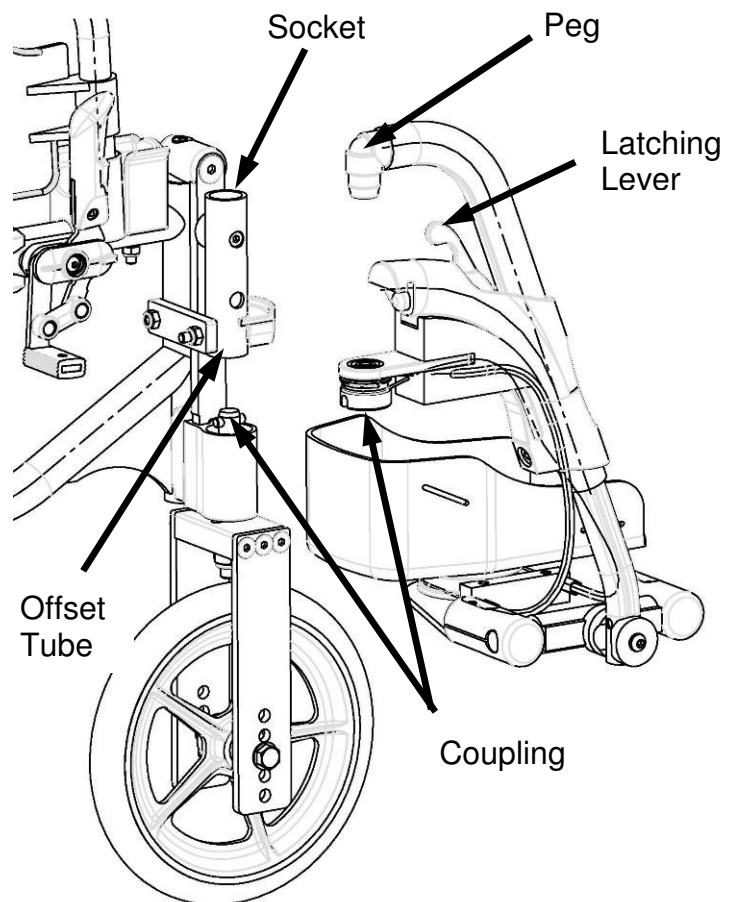
1. Remove both footrests, by pushing the release levers, to swing the footrests outwards and lift them off.
2. Release the parking brakes.
3. Pull the strap at the back of the wheelchair upwards, releasing the latches which hold the shaft and wheels in place.
4. Lift the rear of the wheelchair and push it forwards, leaving the shaft and wheels behind.
5. The wheels can then be pulled off the telescopic shaft.
6. Finally, fold the wheelchair by pulling upwards on the front and back edges of the seat.

Detachable Wheels and Shaft Assembly

4.1 Re-assembling the wheelchair

1. Pull the sides of the chair apart and then press down on the side tubes of the seat until they sit in the sockets of the frame.
2. **Important:** Make sure that the telescopic shaft is fully extended with the Shaft-Locking Ball fully engaged - clicked into place.
3. Assemble the wheels onto each end of the telescopic shaft.
4. With the shaft in contact with your shins, pull the wheelchair body towards the shaft assembly until the assembly clicks into place. (The groove in the black plastic cuff around the wheel bearings is held between the rods in the wheel retaining block. The C-bracket rotates upwards and is held by the latch).

5. Refit the footrests, taking particular care with the Steering Footrest. The Coupling should engage as you lower the Peg into the Socket in the Offset Tube. You can pivot the Steering Footrest Assembly and/or the castor around until the coupling fully engages allowing the assembly to sit down fully. Then pivot the Steering Footrest Assembly back around to the front until the Latching Lever clicks into place. Do not use significant force.



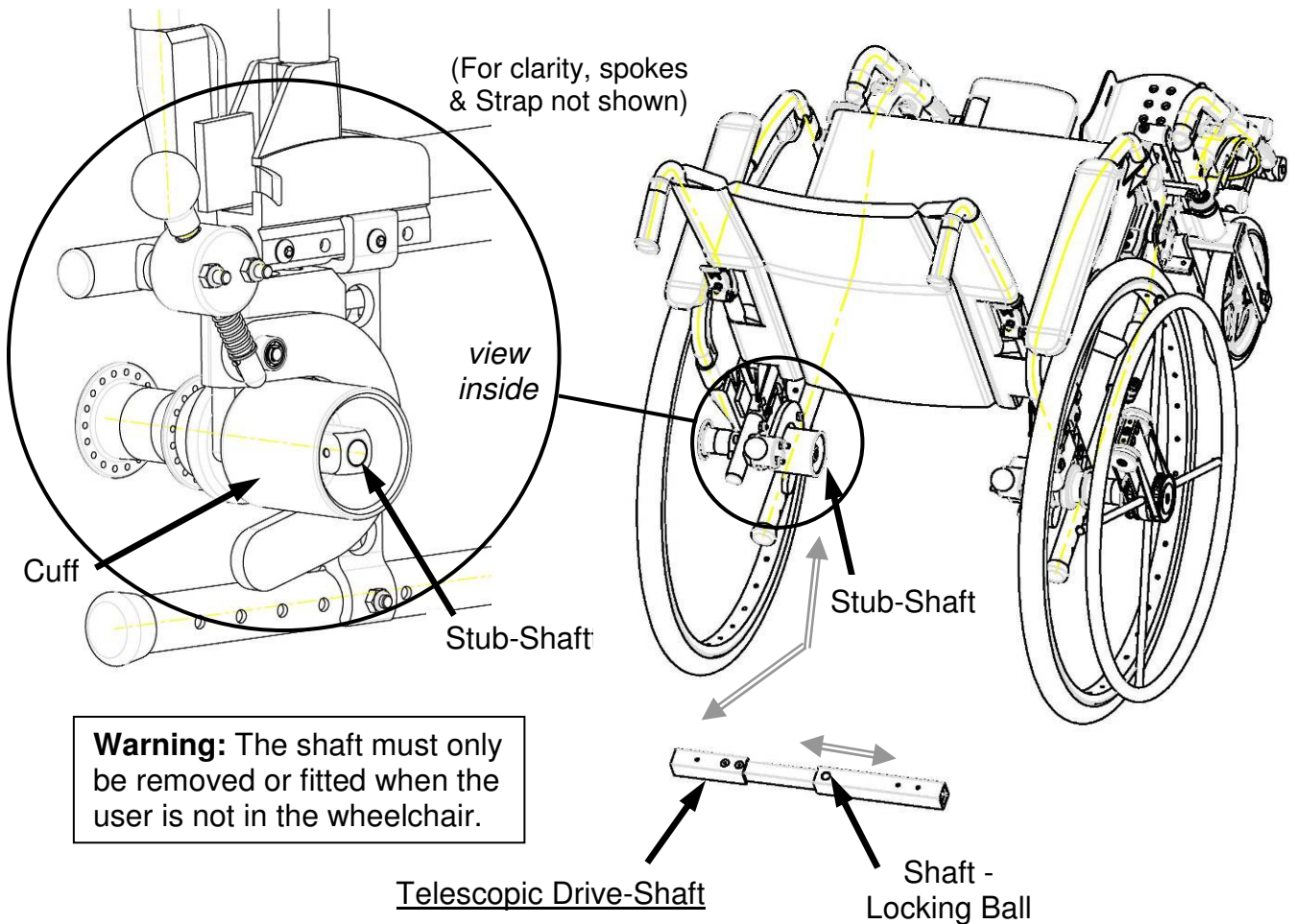
Steering Footrest Assembly

6. Having unfolded the chair, the attendant should ensure that the parking brakes on both wheels are on before you get into the chair.

Important Safety:

- Do not sit in the wheelchair unless the wheels are properly clicked into place (in the C-brackets and latches) and the telescopic drive shaft is fitted and fully extended with the Shaft-Locking Ball fully engaged – clicked into place.
- The Parking Brakes should be on as you get into or out of the wheelchair.

4.2 Folding the wheelchair flat leaving the wheels attached



1. Remove the Telescopic Drive-Shaft by pressing on the partly-exposed Shaft-Locking Ball and pulling inwards to telescope the two parts of the shaft together.
2. The wheelchair can then be folded by pulling upwards on the front and back edges of the seat.

4.3 Unfolding the wheelchair

1. Pull the sides of the chair apart and then press down on the side tubes of the seat until they sit in the sockets of the frame. Do not sit in the chair at this stage.
2. The collapsed shaft can be put into position, fitting it over the Stub-Shaft of the plain wheel (without the belt differential and handrim), and then extending the shaft towards the wheel with the belt differential and handrim.
3. If necessary, rotate the handrim slowly until the Stub-Shaft aligns with the Telescopic Drive-Shaft.
4. It is essential that the Telescopic Drive-Shaft is fully extended with the Shaft-Locking Ball clicked fully into place.
5. Having unfolded the chair, the attendant should ensure that the parking brakes on both wheels are on before you get into the chair.

Important Safety Note:

Do not sit in the wheelchair unless the wheels are properly clicked into place (in the C-brackets and latches) and the telescopic drive shaft is fitted and fully extended with the Shaft-Locking Ball fully engaged - clicked into place.