Netti® DYNAMIC

Netti® DYNAMIC SYSTEM
Patent EP 2836184

User Manual and mounting description

CE This product conforms to 2017/745/EU for medical products.

UM0116 UK 2021-03

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CONTENTS

1. INTRODUCTION

The Netti Dynamic System Concept:
What is Netti Dynamic Seating?

Netti Dynamic System is a tilt and recline wheelchair which allows controlled Open Kinetic Chain (OK-C) movements of the user. Static comfort wheelchairs can be accommodated to support the user's distal segments. The controlled OK-C movement has an extra impact: The distal segments can move, with a moderate resistance. OK-C helps to gain control of the proximal segments, especially when the user cannot inhibit muscle movements due to their medical condition.

Netti Dynamic System is a modular system that can be customized and adjusted according to the user's need.

Typically Netti Dynamic System or its components may be used for wheelchair users with involuntary movements.

EXAMPLES OF INVOLUNTARY MOVEMENTS ARE:

- **Dystonia** – involuntary, sustained or intermittent muscle contractions that can cause twisting and repetitive movements, abnormal posture or both. Muscle tone varies from normal or hypotonia to hypertonia.
- **Athetosis** – slow, involuntary writhing movement.
- **Chorea** – brief, irregular jerking movements.
- **Tremor** – this is a rhythmic movement of part of the body.
- **Hemiballism** – these are wild flinging / throwing movements of one arm or leg, usually occurring as a result of a cerebrovascular event.
- **Clonus** – rapid muscle jerks that are frequently repetitive.

Before using Netti Dynamic System (NDS) or any of its components, a seating assessment should be carried out by a trained professional.

Next page you can see a matrix based on different diagnosis and suggestions of Netti Dynamic System parts that could be used. We emphasize that this is an overview of possible applications and possible product options / suggestions of Netti Dynamic System or components. The final solutions should be based on the findings of an individual seating assessment, conducted by a trained professional.

ABOUT THIS MANUAL

In order to avoid damages while using the Netti Dynamic System wheelchair, please study this manual carefully before starting to use the chair. A wheelchair with dynamic system must be adjusted and operated different than static wheelchairs.

Please also pay careful attendtion to the user manual for the wheelchair where the dynamic system has been mounted.

The following symbols are used to point out important points:

Symbol of forbidden actions. No warranty can be claimed whenever these actions are implemented.

Symbol of warning. Whenever this symbol is used, caution has to be taken.

Symbol for important information.

Symbol for useful tips.

Symbol for tools.

WHAT TYPE OF INVOLUNTARY MOVEMENTS CAN YOU EXPECT WITH THE FOLLOWING DIAGNOSES?									
	CP	ALS	CVA	Intel Disorder	Parkinson's	MS	TBI	SCI	Huntington
Dystonia	✓	✓	✓		✓	✓	✓		✓
Athetosis	✓		✓				✓		✓
Chorea	✓		✓						✓
Tremor	✓		✓		✓	✓	✓	✓	✓
Hemiballism			✓				✓		
Clonus	✓		✓			✓		✓	✓
Stereotypic Movement Disorder	✓			✓			✓		

WHICH TYPE OF NETTI DYNAMIC SYSTEM CONFIGURATION COULD BE INDICATED?

Before any product selection a seating evaluation should be conducted by a trained professional.

1. If your client exhibits involuntary movements of the lower extremities only, the Netti Dynamic leg support system only could be considered, this will be a dynamic component added to a Netti III HD, Netti 4U CED/S or Netti 4U BASE.

2. If your client exhibits involuntary movements of the trunk only, the Netti Dynamic recline system only could be considered, this will be a dynamic component added to a Netti III HD, Netti 4U CED/S or Netti 4U BASE..
3. If your client exhibits involuntary movements of the head only, the Netti Dynamic head support system only could be considered, this will be a dynamic component added to a Netti III HD, Netti 4U CED/S or Netti 4U BASE.

4. If your client exhibits involuntary movements of the head and trunk only, the Netti Dynamic recline system in combination with the Netti Dynamic head support could be considered, these will be two dynamic components added to a Netti III HD, Netti 4U CED/S or Netti 4U BASE.

5. If your client exhibits involuntary movements of the head and trunk and lower extremities, the full Netti Dynamic System are to be considered, these dynamic components will be added to a Netti III HD, Netti 4U CED/S or Netti 4U BASE.

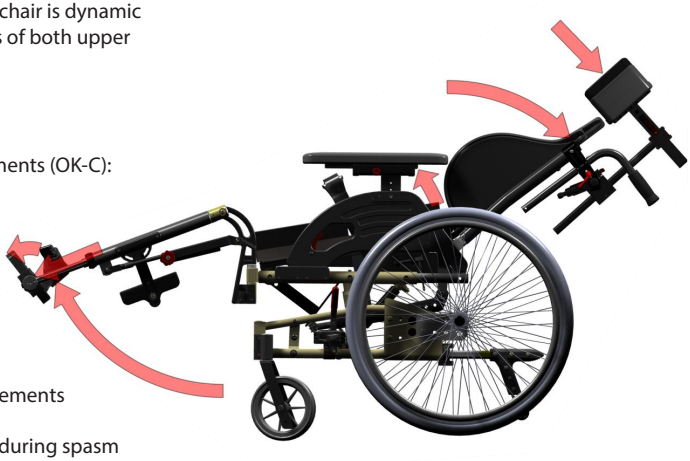
Definitions of the above-mentioned movement patterns are listed on previous page.

Definitions of the above mentioned diagnosis are listed in 10. Appendix.

INTENDED USE

Netti Dynamic System is an advanced mobility aid for users affected by dystonia. It is for users with extensive movement patterns resulting in strong spasms and contractions of the user's musculoskeletal apparatus causing joint dislocations, involuntary movements, sliding, loss of function and also challenging the strength of the wheelchair.

The patented Netti Dynamic System accommodates the user's extension movements letting the wheelchair work in synergy with the user's movements. When accommodating the spastic extensions pattern, muscle tone and frequency of spasms could be reduced. The wheelchair is dynamic and will follow the user's movements of both upper and lower body.



NETTI DYNAMIC SYSTEM

allows for Open Kinetic Chain movements (OK-C):

- Leg movements
- Hip movements
- Back movements
- Head movements
- Foot movements

IMPORTANT BENEFITS

- The wheelchair adapts to the movements of the user.
- The user will have less discomfort during spasm as the wheelchair supports the movement.
- After a spasm the user returns to the original sitting position securing a good position and pressure distribution.
- It prevents unintentional change of position.
- It prevents the user from sliding forward in the chair and thereby getting a bad sitting position and inadequate distribution of pressure.
- Extends the lifetime of the wheelchair.

CONTRA INDICATIONS

Limitations of the Netti Dynamic system

- when allowing movements leads to destructive postures.
- when allowing movements increases extension tone and spasms.
- when the client may not be able to return to a neutral position.

NETTI DYNAMIC SYSTEM

is a modular system that can be customized and adjusted according to the user's need. The Netti Dynamic System seat and back unit can be ordered with these chair models:

- Netti Dynamic III and HD (2 models)
- Netti Dynamic 4U CED (S) (2 models)
- Netti Dynamic 4U BASE

USER REQUIREMENTS

* If you choose a Netti III model, we recommend the reinforced frames Netti III HD due to hard use and uncontrollable muscle movements of the user. In order to get the right model, width, heights etc. a seating evaluation should be performed by a trained clinician.

Netti Dynamic Components:
The Netti Dynamic head support and leg supports can be mounted on a wide range of our static comfort wheelchairs:
Netti III models, Netti 4U CED/S and BASE models,.

Netti Dynamic III HD with Dynamic System with a pelvic stabilizer and ankle huggers

HOW TO USE THIS MANUAL

This manual focuses on the adjustments and use of the Netti Dynamic System seat, back and head support.

⚠ **This manual is to be used together with the user manual of the wheelchair.**

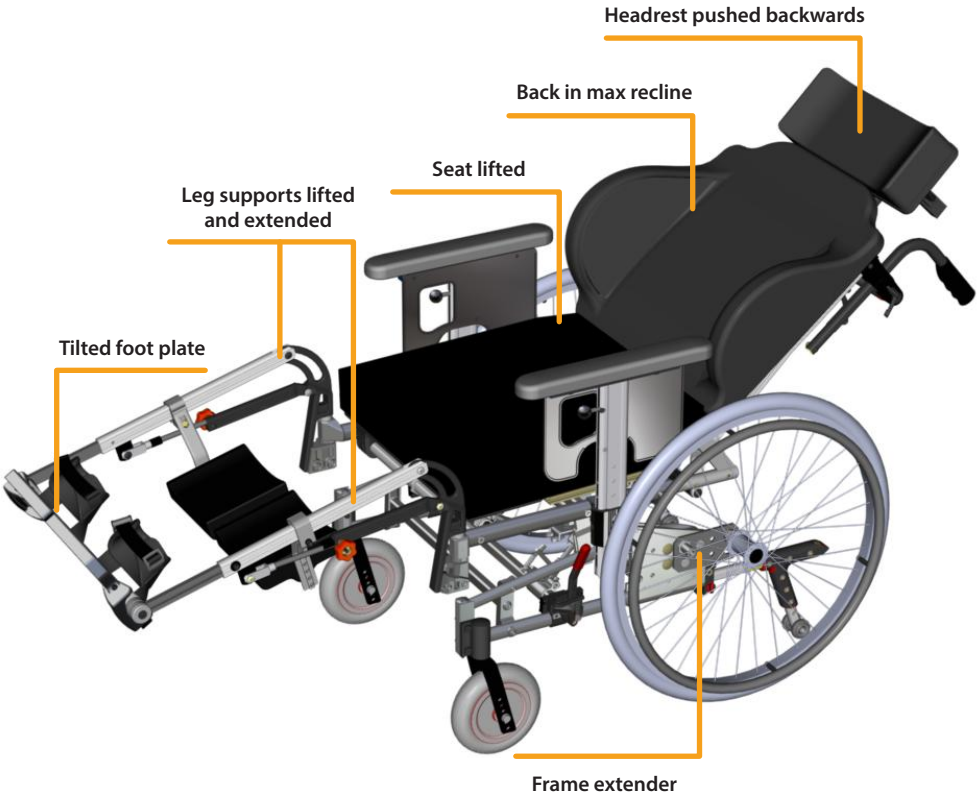
The User manual UM0115 for Netti Dynamic leg supports contains all necessary information about mounting, adjustments and use of the Netti Dynamic Leg supports "Dual".

The user manuals for each relevant Netti static wheelchairs models contains all necessary information about mounting, adjustments and use of the static wheelchair parts and basis frame for the Netti Dynamic System, and is delivered as a part of the complete product.

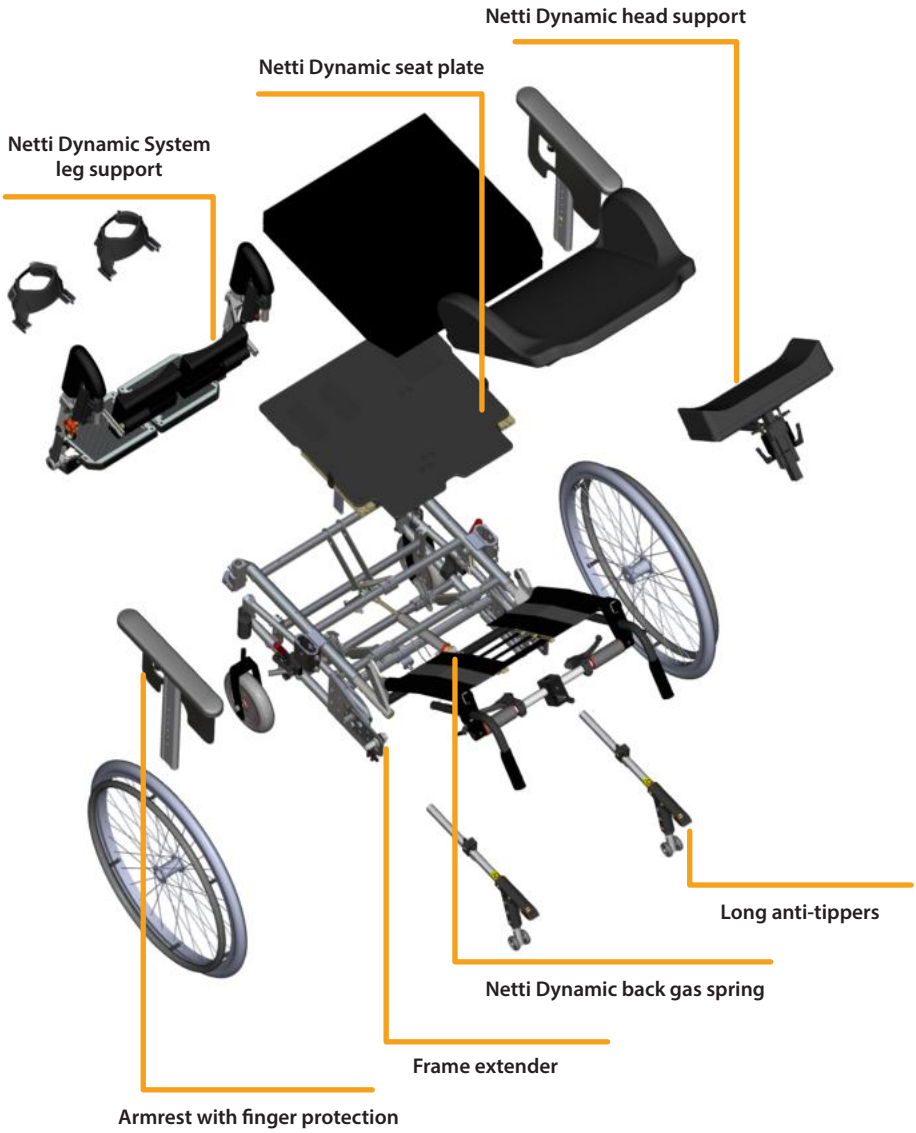
Netti Dynamic CED

NETTI DYNAMIC SYSTEM

The dynamic elements moved into max extension applied to a Netti III wheelchair.



EXPLODED VIEW OF NETTI DYNAMIC SYSTEM



2. ADJUSTING THE WHEELCHAIR TO THE USER

INITIAL ADJUSTMENTS

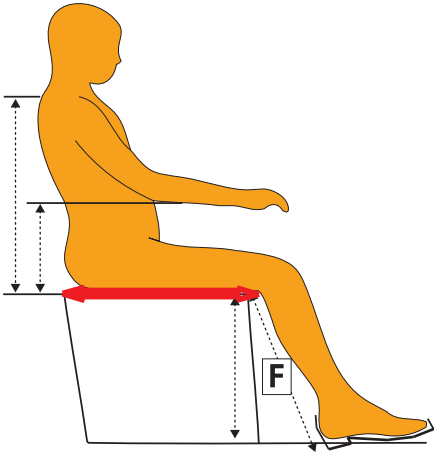
Start with normal relaxed seating position.

SEAT ADJUSTMENTS – BALANCING THE CHAIR
It is vital to adjust the seat correct.
Adjustments to the seat change the centre of gravity which effects the balance of the wheelchair.

Proper adjusted seat provide stability and the ability to manoeuvre the wheelchair, even during a max extension of the dynamic parts of the wheelchair.

- Correct seat depth depends on the user's thigh length and is measured while seating – see the red horizontal arrow on the illustration.
- Seat depth can be adjusted on the back of the chair by moving the back hinge brackets followed by adjusting the back cylinder head.
- Seat depth can be adjusted in the front by adjusting the extension pieces where the leg supports are mounted.
- The relationship between seat angle and backrest angle should be constant when the tilt function is used to create variation for the user.
- Seat height is to be seen together with the leg supports.
- Leg supports need to be adjusted to accommodate the seat height.

Please note: the Netti Dynamic System leg support adjustments are described in detail in a separate mounting description. Please, see the illustrations on next page regarding seat depth adjustments.



SEAT DEPTH ADJUSTMENTS IN THE BACK:

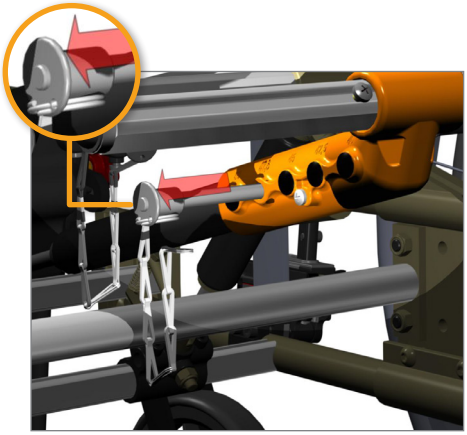
When the chair is equipped with a main wheel larger than 12" or 16", remove the main wheels first.

Back hinge adjustment

- Remove the screws on each side which are holding the back hinge.
- Pull the bracket on each side back or push it forward to desired position before the screws are fixed again.

Recline cylinder head position:

- Remove the bolt holding the **recline cylinder head**.
- Reposition it in the corresponding number hole as the previously adjusted chair back bracket.
- This will also have influence on the chair back angle.



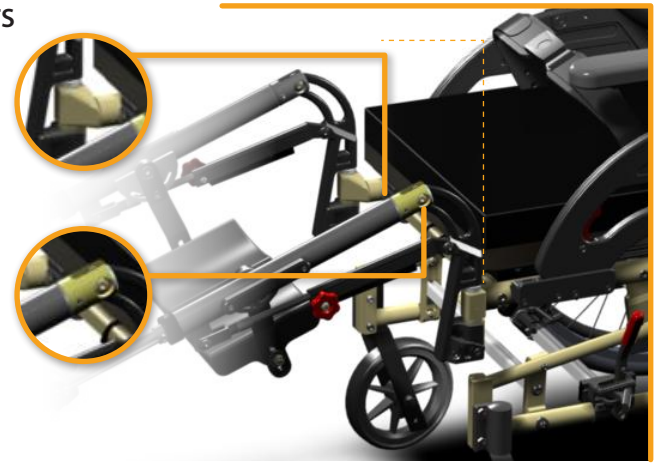
By choosing another hole you can change the angle of the back support which means that the back angle or hip angle will be more open or more closed.

See separate table in the chapter:
"Technical specification and options of Netti Dynamic back support gas cylinders" and separate mounting description MD0120UK.

SEAT DEPTH ADJUSTMENTS IN THE FRONT:

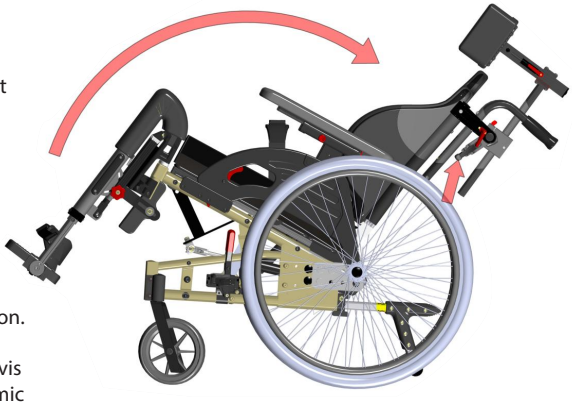
The extension pieces are adjusted by removing the screws holding them and pulling the extension pieces out to desired position.

The aim is to have the centre of the users knee joint aligned with the center of the leg support rotation centre – while the user at the same time is having good back support of his lower back – also when the leg support angle is changed.



SEAT ANGLE ADJUSTMENT:

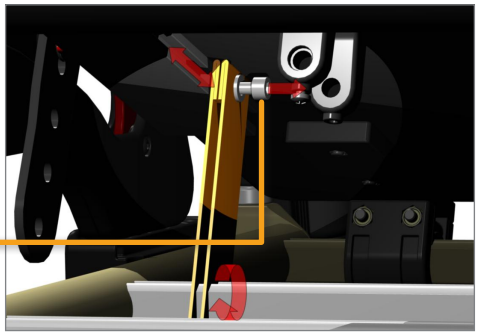
Can be adjusted at any time by the use of the tilt handles.



SEAT PLATE ADJUSTMENT:

The Netti Dynamic System seat plate is pivoted in the front of the seat. This allows the seat to rise in the rear when doing a hip extension. The pelvic stabilizer which is fixed to the seat plate, is necessary to make this happen. The pelvis stabilizer must be used together with the dynamic seat plate.

⚠ **The pelvic stabilizer must be firmly tightened to minimize the risk ofthe user sliding forwards.**

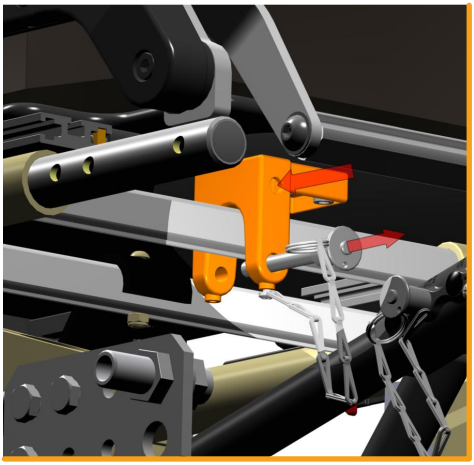


To prevent the seat plate to pivot too high, there are seat plate limiters – belts – between the seat plate and the chair frame. The seat plate limiters can be adjusted to allow for max seat pivoting. Adjustment of the seat plate limiter is done by loosening the screw holding the seat plate limiter belt under the seat and sliding it back or forward to find the desired movement of the seat plate.

SEAT PLATE LOCK

In some cases it may be necessary for safety reasons to lock the movement of the seat. This is when the wheelchair is used as a seat in a car or when driving the chair on rough surface where a sudden spastic extension may cause the chair and user to become unstable.

The seat plate lock is easy to use; remove the QR-Axcle by pressing the head to release it and move it from its upper position and push it into the lower position.



⚠ **Remember to unlock the seat plate when you are back in smooth areas, allowing the Netti Dynamic System to work.**

ASSESSMENT AND CHOICE OF NETTI DYNAMIC BACK SUPPORT GAS CYLINDER

The chair back position is defined by the chair back cylinder. There are two different type of cylinder available for the Netti Dynamic System:

OPTION 1: NETTI DYNAMIC 15° MOVEMENT

BACK SUPPORT CYLINDER 15° is never fixed / locked but allows for a 15° flex at any position where the chair back has been reclined to. The cylinder is suitable for users with open kinetic chain (OKC) movements with max extension less than 15°. If 15° closes the kinetic chain movement, more forces will have impact on the leg support.

The leg support might break if it is not correct adjusted meaning that the user leg extension reaches the end of the leg support dynamic area, or if the user has slid forward.

Netti Dynamic System wheelchair with Netti Dynamic 15° movement back support cylinder is not approved for being used as a seat in a vehicle.

Netti Dynamic 15° movement back support cylinders are available in 80, 120 and 160 N force.

The recline function is controlled by the recline handle on the bar behind the back support. This cylinder is NOT lockable.

OPTION 2:
NETTI DYNAMIC FREE MOVEMENT

BACK SUPPORT CYLINDER allows the back support to move backwards to full recline, giving full support during extension movement. When the user starts to relax the cylinder move the back support to its original position.

The strength of the full free cylinder has to be fitted individually according to body weight. A cylinder that is too strong will not allow the back support to move. A cylinder that is too weak will not be strong enough to lift the back support to its original position. Standard cylinder forces are: 600, 800, 1000 and 1200 N.

NETTI DYNAMIC FREE MOVEMENT BACK SUPPORT CYLINDER – LOCKING

The free cylinder is lockable in any reclined angle – when the recline handle on the back is in neutral position. This may be necessary / required, when the chair is used as seat in a car or driven on rough ground where a sudden spastic extension may make the chair unstable. Or when the user needs to lay back for a rest.

If you recline the chair back on a wheelchair with free cylinder, locking it in reclined position, it is only the Netti Dynamic Leg supports, seat plate and head support that will respond to spastic movements.
If you lock the free cylinder, it is important that the user is correct positioned and not sliding forward, to prevent skin damage and damage on the leg support.

NETTI DYNAMIC FREE MOVEMENT BACK SUPPORT CYLINDER – ACTIVATED

The dynamic back solution of Netti Dynamic System is activated by pulling the recline handle.

The back support cylinder should be assessed. It can be replaced by another cylinder (more / less Newton) if needed; either because of new or changed user needs, or if the weight of the user has changed.

Please contact your local dealer for advice on which new cylinder to choose. At the end of this manual the change of gas cylinder is described.

ASSESSMENT OF DYNAMIC BACK SUPPORT GAS CYLINDER FORCES, SUITING USER STRENGTH AND MOVEMENT PATTERNS

An assessment of the user is needed to find the right power of the cylinder.

Correct solution:
The back cylinder gives full support on a full, open kinetic chain movement during the user's extension pattern. When the user starts to relax, the cylinder move the back support to its original position.

HOW TO ASSESS AND CHOOSE THE RIGHT POWER OF THE DYNAMIC BACK SUPPORT CYLINDER?

Main factors to be considered by a trained professional:

- The user's weight, width and height
- The character and strength, extent of the movements and movement patterns.
- Goals and improvement regarding the user's "Activity daily life" and health condition.

The user's movement pattern and muscle tone may also change over time. It is relevant to assess and monitor the fitting of the wheelchair and the power of gas cylinders according to the development of the user's movement pattern and muscle tone over time. If the gas spring is too strong, the user will not be able to make an extension. It will be a "closed kinetic chain", or a static position for the user.

If the gas spring is too weak, the user will not be lifted back to his / hers original seating position after an extension of the upper body part.

OVERVIEW OF AVAILABLE DYNAMIC RECLINE CYLINDERS AND SEAT WIDTHS

The **user's width** is an indicator to assess regarding the choice of minimum gas spring force.
The **user's weight** is an indicator to assess regarding the choice of minimum gas spring force:

FREE MOVEMENT BACK SUPPORT CYLINDER MODELS – LOCKABLE		USER WEIGHT	SEAT WIDTHS							
Newton (N)		Minimum kg	250 mm	300 mm	350 mm	380 mm	400 mm	430 mm	450 mm	500 mm
200 N		20 kg	✓	✓						
300 N		30 kg	✓	✓						
400 N		40 kg		✓	✓					
500 N		50 kg			✓	✓				
600 N		60 kg			✓	✓	✓	✓		
700 N		70 kg			✓	✓	✓	✓	✓	
800 N		80 kg				✓	✓	✓	✓	✓
900 N		90 kg					✓	✓	✓	✓
1000 N		100 kg						✓	✓	✓
1100 N		110 kg						✓	✓	✓
1200 N		120 kg								✓
1300 N		130 kg								✓
15° FREE CYLINDER										
80 N – 15° back support cylinder	82408 KIT									
120 N – 15° cylinder	82409 KIT									
160 N – 15° cylinder	82410 KIT									

TECHNICAL SPECIFICATION AND OPTIONS OF NETTI DYNAMIC BACK SUPPORT GAS CYLINDERS

FREE MOVEMENT BACK SUPPORT CYLINDER:
Combination of seat depths, front bracket hole and cylinder head – short and long.

The recline angle range is approximately 40° and valid for all wheelchair-models with free movement cylinder locking.
Netti Dynamic recline solutions have a starting angle of app. 90°.

Please note: The separate Mounting Description MD0120UK NDS-Free solution – Back angle Matrix for Netti III, CED, BASE gives a detailed description of how to adjust the cylinders and possible combinations.

RECOMMENDED COMBINATIONS FOR NETTI III MODELS

SEAT DEPTH IN MM	FRONT BRACKET HOLE (A–B–C) A IS UPPER HOLE	CYLINDER HEAD SHORT 38 MM	CYLINDER HEAD LONG 96 MM	STARTING ANGLE IN DEGREES °
500	A		X	98
475	A		X	87
475	B		X	97
450	B		X	85
450	C		X	95
425	A	X		92
425	B	X		101
425	C		X	85
400	B	X		91

* Orange colour is the standard adjustment for the chosen seat depth.

* Grey colour could be an option. Other combinations of seat depths, front bracket holes and cylinder head sizes are not recommended.

RECOMMENDED COMBINATIONS FOR NETTI III HD MODELS

SEAT DEPTH IN MM	FRONT BRACKET HOLE (A–B–C) A IS UPPER HOLE	CYLINDER HEAD SHORT 38 MM	CYLINDER HEAD LONG 96 MM	STARTING ANGLE IN DEGREES °
400	B	X		91
425	A	X		92
450	C		X	95
475	A		X	87
500	A		X	98

STARTING RECLINE ANGLE FOR NETTI DYNAMIC CEDS

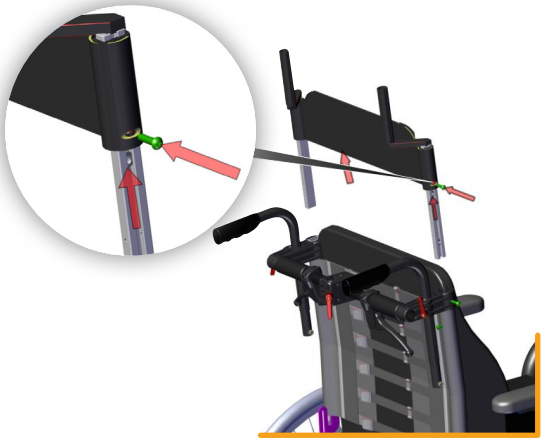
FRONT CYLINDER BRACKET HOLE (A–B–C). A IS UPPER HOLE. B IS THE POSSIBLE OPTION. A AND C WILL NOT WORK.	SEAT DEPTH (SD) 375 MM	SEAT DEPTH (SD) 400 MM	SEAT DEPTH (SD) 425 MM	SEAT DEPTH (SD) 450 MM
B: with first hole on cylinder hinge	92	104	N/A	N/A
B: with second hole on cylinder hinge	83	92	104	N/A
B: with third hole on cylinder hinge	N/A	83	92	104
B: with fourth hole on cylinder hinge	N/A	N/A	83	92

STARTING RECLINE ANGLE FOR NETTI DYNAMIC CED / BASE

FRONT CYLINDER BRACKET HOLE (A–B–C). A IS UPPER HOLE. B IS THE POSSIBLE OPTION.	SEAT DEPTH (SD) 425 MM	SEAT DEPTH (SD) 450 MM	SEAT DEPTH (SD) 475 MM	SEAT DEPTH (SD) 500 MM
B: with first hole on cylinder hinge	92	104	N/A	N/A
B: with second hole on cylinder hinge	83	92	104	N/A
B: with third hole on cylinder hinge	N/A	83	92	104
B: with fourth hole on cylinder hinge	N/A	N/A	83	92

CHAIR BACK HEIGHT

It can be extended by mounting a back extension.

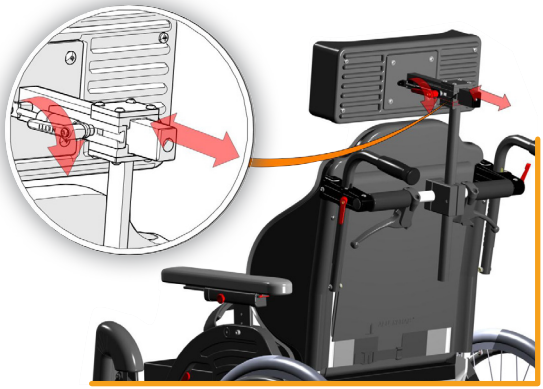


NETTI DYNAMIC HEAD SUPPORT

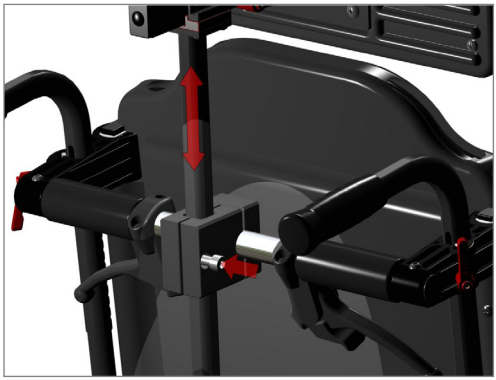
The Netti Dynamic System
is equipped with a dynamic head support. The head support follows the extension movement of the neck.

The depth of the head support should be adjusted to barely touch the back of the user's head when sitting relaxed.

For head support depth adjustment simply:
- Unlock the 2 two levers, one on each side of the head support holder.
- Move the head support forwards or backwards to desired position.
- Fix firmly the two levers.



The height of the head support needs to be adjusted to fit directly behind the head:
- Open the screw on the bracket holding the vertical pole of the head support.
- Pull the head support to desired height and fix the crew firmly.



ARM SUPPORT POSITION

Depending on the wheelchair model the arm support may vary.
The arm supports are static and adjustable (no "Open Kinetic Chain movement concept"). The adjustments of arm support are described in the user manual of each type of static comfort wheelchair:
Netti III (Netti Dynamic III),
Netti 4U CED (Netti Dynamic CED),
Netti BASE (Netti Dynamic BASE) etc.
Arrow **A** points to depth adjustment knob on the arm support on a wheelchair with swing away arm support (Netti Dynamic CED). Height adjustment is done once loosening the screw **B** and fixing it in correct height.

MOUNTING, POSITIONING AND ADJUSTMENTS OF PELVIC SUPPORTS AND SUPPORTIVE HARNESSES

Netti Dynamic System can be equipped with several different types of pelvic stabilizer and supportive harnesses each type developed to give the user the best stabilization support depending on the conditions:

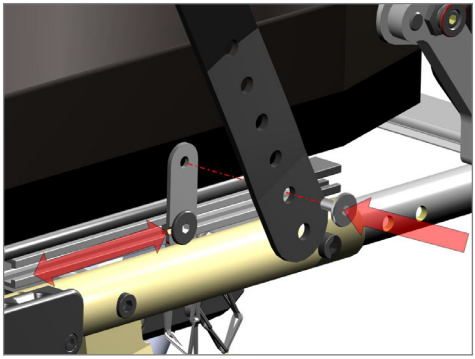
- Pelvic stabilizer – (included in Netti Dynamic System)
- Upper body harnesses
- Ankle huggers
- Shoe shells
- Pelvic stabilizer, mounted to the seat plate, helps the user to keep his position on the seat even under full spastic extension.

See separate Mounting Description for upper body harnesses.

HOW TO ADJUST THE PELVIC STABILIZER

The pelvic stabilizer is mounted on the guide-rail under the seating plate as shown on the illustration.

- Slide the pelvic stabilizer to a position where it crosses the upper thighs, angle: 70 – 90 degrees.
- Adjust the harness mounting point so that the harness can be tightened.

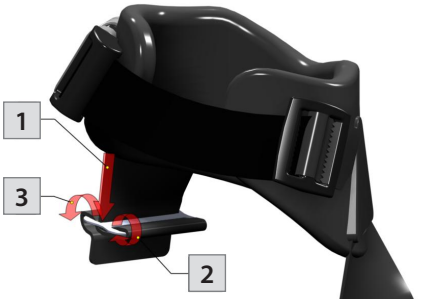


Remember to shorten the stabilizer beneath the last used hole to avoid any conflict with chair frame.

ANKLE HUGGERS AND SHOE SHELLS

helps to keep the feet on the foot board not letting them slide of during an extension spasm.

The ankle huggers are mounted by threading them through the slots in the foot board on the leg support and fixing the belt on the underside of the foot plate, threading shown in the illustration – follow the numbers.



LEG SUPPORT HEIGHT AND ANGLE

Please see separate user manual for Netti Dynamic System Leg support.

TABLE

Please do a user assessment to determine if a table is suitably. By special or extensive movement patterns a table may brake or cause danger to the user or 3rd parties because the table is statically fixed to the armrests while the movements of the user are dynamic.

3. EVERYDAY USE OF THE NETTI DYNAMIC SYSTEM

A Netti wheelchair with Dynamic System is an advanced mobility aid. When delivered it has been adjusted and adapted by professionals to fit the user. The adjustments listed in chapter 2 must not be changed except from trained professionals. Change of adjustments will be necessary as the user grows or the movement pattern changes.
Please contact your supplier for adjustments.

Please study this manual and become familiar with the wheelchair and all its possibilities.

MAX USER WEIGHT for a wheelchair with DYNAMIC SYSTEM IS 135 KG.

After the wheelchair has been correctly adjusted to the user described in the previous chapters, you as an attendant need to learn how take advance of the dynamic functions and the tilt and recline features to give the user the most benefits of the chair.

⚠ **Make sure the belts and harnesses are fixed in the best way for the user.**

- **Practice opening and closing the dynamic functions and explore how the user reacts to the freedom for movement he / she becomes when the dynamic functions are open.**
- **Practice using the tilt function leaning the complete seating unit backwards and forward, experiencing and testing how the user react. The tilt function is recommended to be used for varying seating positions, leaning backwards for resting – see page 22 – 25 for details.**
- **Practice using the recline function by changing the back angle. This is used when applying a hoist to transfer the user in and out of the chair. Please return to dynamic back function after transfer.**

TRANSFER TO / FROM THE CHAIR

Techniques for transferring to / from the wheelchair should be practiced well with the persons involved.

Some important advices for preparation of the chair:

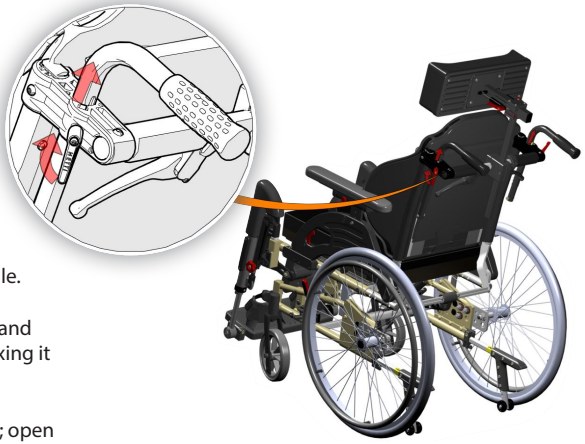
- The wheelchair should be placed as close as possible to the destination of the transfer.
- Pull the wheelchair 50-100 mm backwards in order to have the front castors turned forward.
- Make sure the anti-tips are turned downwards.
- Remove the leg support and revolve / remove the arm support on the side of the transfer.
- Make sure the brakes of the wheelchair are activated to prevent it rolling away.

USING A PATIENT HOIST

- Tilt the chair a little backwards.
- Open the back support angle slightly.
- **Option:** Remove the arm supports and get closer to the patient.
- Remove the leg support.
- Replace the components when the transfer is finished.

ATTENDANT USE

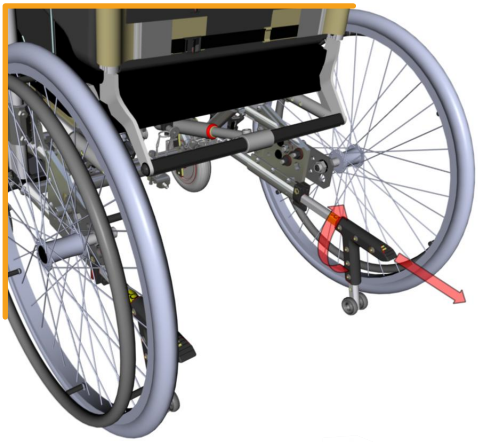
PUSH BOWS AND PUSH HANDLES



For safe manoeuvring the wheelchair, and preventing injuries for the attendant, the push bow or push handles should be adjusted according to attendants arm height when the elbow is in an 90 º angle.

- Open the latch holding the push handle and push or pull it to desired height before fixing it again. Repeat on the other side.
- Adjusting the push bow is done similarly; open the latches, pull the push bow to desired height and lock the latches.

ANTI-TIPS



⚠ **Always use anti-tips to ensure a safe and stable wheelchair. When the "OK-C" Netti Dynamic System parts are active, it is essential to use the anti-tips at all times.**

- The anti-tips are pulled and swung away when passing obstacles etc.

BRAKES

⚠ **Always use the brakes whenthe wheelchair is left without attendant standing behind.**

- Push the red brake handle forward to lock the brake.

ARM SUPPORT

When the user is to leave the chair, the arm support can be removed or swung away, depending on which type of wheelchair you have. This makes the transfer much easier.

Please, see the illustration of a chair with swing-away arm support.

LEG SUPPORTS

Netti Dynamic leg supports are mounted like this:

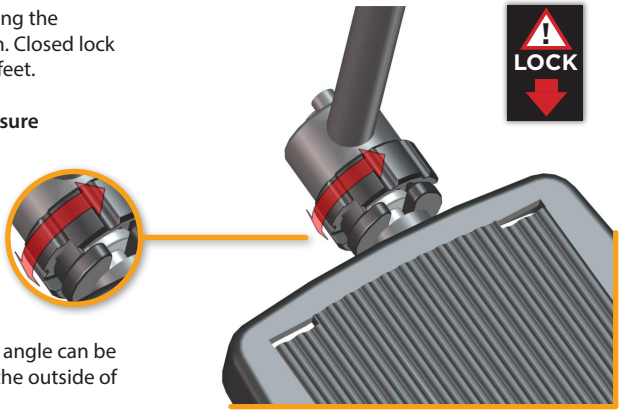
- Push the leg support fixing bolt vertical into the extension piece on the wheelchair – keeping the leg support slightly turned outwards. The leg support will fall in place and turn into place itself.
- To remove them: Unlock the foot plate.
- Pull the leg rest slightly upward and swing it outwards before lifting and detaching it from the chair.

FOOT BOARD LOCK

With both leg supports in place, let the foot board swing down and put the bolt into the lock, see picture below:

The foot board lock is operated by turning the ribbed wheel to open or closed position. Closed lock ensures a sturdy foot board for restless feet.

Always lock the foot board to ensure it is stable!



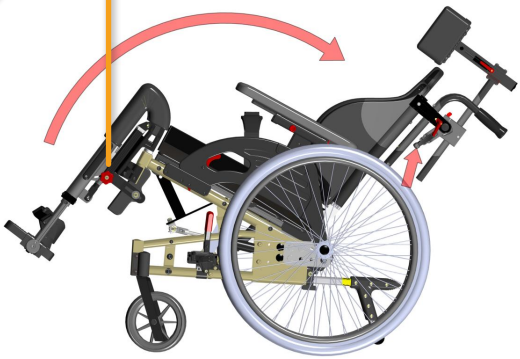
THE LEG SUPPORT ANGLE

The **Netti Dynamic System** leg support angle can be locked by tightening the red wheel on the outside of the leg support. **See illustration:**

HARNESSES

are to be opened or closed with traditional car belt lock or by backpack clips.
Use harnesses, ankle huggers and shoe shells to give the user stabilizing support when needed.

A pelvic stabilization belt must always be used when using upper body harness.



KEY WORDS REGARDING TILT AND RECLINE OF STATIC COMFORT WHEELCHAIRS, AND COMMON FEATURES OF DYNAMIC WHEELCHAIRS

Tilt and recline are the basic benefits of a comfort wheelchair. It allows for varying seating positions during the time in the wheelchair.
We have reviewed the clinical eviden-ces regarding tilt and recline, and found there are several studies or best practice guidelines suggesting that the tilt and recline sequence is important to reduce shear and sliding:

FIRST TILT THEN RECLINE AFTERWARDS. When bringing the client upright again, the sequence should be reduce recline first then reduce tilt. It would seem that the most shear would be induced when going upright from a recline and tilted position.

DECREASE THE POSSIBILITY OF SLIDING, SHEAR AND PRESSURE SORES:

Use the tilt angle to achieve variation of the seating position for the user.

It is common knowledge that recline should not be adjusted after the back angle is accommodated to the user's best seating position.
The muscle tone of the neck and back should be as low as possible for the user to prevent sliding, and a change of the recline angle from the original position will interrupt and destroy the correct body position, and cause an increased muscle tone in the neck.

If the recline function is used during a transfer situation or other situations, it is very important that the recline angle is adjusted back to the correct, original position when the user is back to a normal seating position.

Wrong usage of recline causes an increased possibility of sliding, and this means an increased danger of shear (vertical and horizontal forces) and pressure sores.

ASSURE THAT THE USER IS SAFE WHEN THE TILT OR RECLINE FEATURES ARE GOING TO BE ADJUSTED:

The tilt and recline functions of all Netti comfort wheelchair models is a «one hand operation», including the dynamic wheelchair models. This is a great benefit for the user: The care giver is able to establish eye contact with the user when the tilt or recline function is going to be used.

The care giver is also able to communicate with the user before the tilt or recline function is used. The user will feel more safe when he/she is aware that the tilt or recline function is going to be used.

TILT OG RECLINE OF DYNAMIC COMFORT WHEELCHAIRS WITH «OK–C» MOVEMENT

The Dynamic System with free movement cylinder continues to be active if the chair is **tilted,** allowing full extension of the back- and the leg supports.

If you recline and lock the chair back on a wheelchair with free movement cylinder, it is only the Dynamic leg supports, seat plate and head support that will respond to a spastic movement.

A wheelchair with Netti Dynamic 15° movement cylinder has a 15° flexing wherever the recline angle is positioned.

The functions recline and tilt are operated with the handles on the back of the chair. See details next page.

OPERATING TILT HANDLE: TILTING THE SEATING UNIT

Press the left handle on the push bar and put pressure to the push bar to tilt the seating unit with one of your hands, while you have eye contact with the user and put the other hand on the arm support.

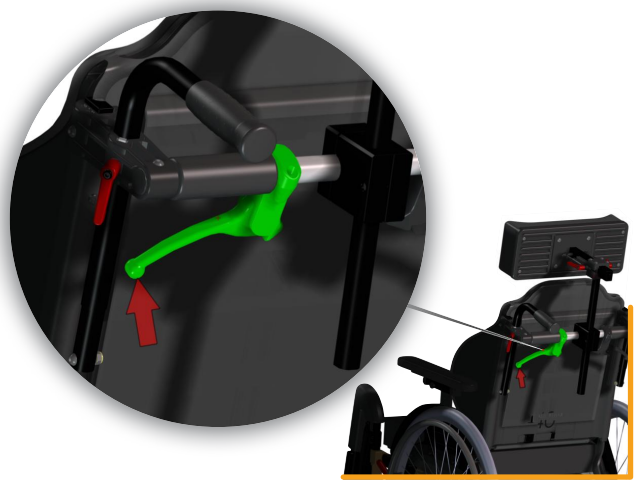
The correct relative angle between the body parts remain the same when the seating unit is tilted.

Wherever you let the handle loose, the seating unit will stay in this position.

To bring the seating unit up, press the handle and the tilt cylinder will assist you lifting the seating unit up.

A backward tilted seat unit gives a steeper seating angle in relation to the surface, and prevent sliding of the wheelchair user.

The tilt sign sits on the push bar, and it looks like this:



Model: Netti Dynamic System
Language: English **Version:** 2021-03

OPERATING RECLINE HANDLE: RECLINING THE CHAIR BACK

Press the right handle and put pressure to the push bar to recline the back with one of your hands, while you have eye contact with the user and put the other hand on the arm support.

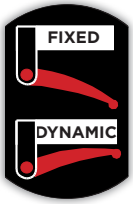
Wherever you let the handle loose, the chair back will stay fixed and locked.

Wheelchair with Netti Dynamic 15° movement back support cylinder will however still allow for 15° degrees flexing. The illustration shows a recline handle position for a locked back.

DYNAMIC BACK:
To have the back behave dynamic, you have to activate the recline handle with the smaller, red handle attached to it.

Pull the recline handle tight to the push bar, the red handle automatically clics in. Let go.
The handle stays close to the push bar and the back can be freely moved backwards.

To stop the dynamic recline, simply press the handle again; the little, red handle is released and the back is fixed.
The recline sign sits on the push bar, it looks like this:



On the recline handle there is a label reminding you that the back is behaving dynamic when the recline handle is activated and that the back is fixed when the handle is open.

SAFETY GUIDELINES WHEN LEAVING A USER IN THE WHEELCHAIR

If you are leaving a user in a wheelchair, make sure that the brakes are locked, the anti-tips are active and that harnesses (when used), are closed.

WHEELCHAIR USED AS SEAT IN A CAR

See chapter 6 – Transport and User manual U0131 how to use a wheelchair as a seat in a car.

When a wheelchair with Netti Dynamic System is to be used as seat in a car, make sure that all dynamic functions are locked:

- The leg supports are locked in vertical position.
- The seat plate is locked.
- The back support is locked in an upright position.

All to make sure the user does not hurt himself or others by sudden involuntary movements.
Make sure the user is secured as described in the user manual for the wheelchair.

The wheelchair is to be fixed in the car as described in the user manual for the static comfort wheelchairs (Netti III, Netti 4U CED, Netti MOBILE.

MAX USER WEIGHT 135 kg
when used as a seat in a vehicle.

Netti Dynamic System wheelchair with Netti Dynamic 15° movement back support cylinder is not approved for being used as a seat in a vehicle.

LIFTING THE WHEELCHAIR

- Avoid lifting a wheelchair with the user in it.
- Always lift a wheelchair holding on to the marked lifting points on the frame.
- Keep a sturdy, well balanced stand lifting from your legs.
- Never lift alone.
- Never lift a wheelchair in its leg support or arm supports.

DRIVING A WHEELCHAIR WITH NETTI DYNAMIC SYSTEM

When driving a wheelchair with **Netti Dynamic System**, careful driving is mandatory.
Watch out for obstacles that could be in the reach if the dynamic parts of the wheelchair is fully extended. Otherwise the user, third parties or surroundings may get hurt.

Always obtain good balance of the chair as it may be challenged when suddenly full extension happens.

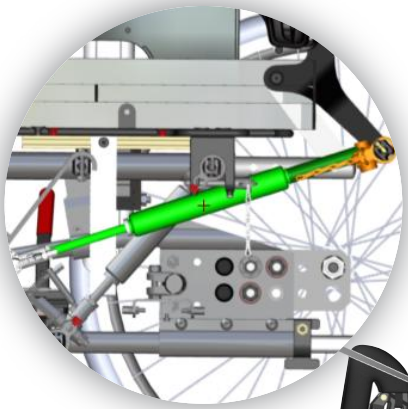
4. MOUNTING DESCRIPTION

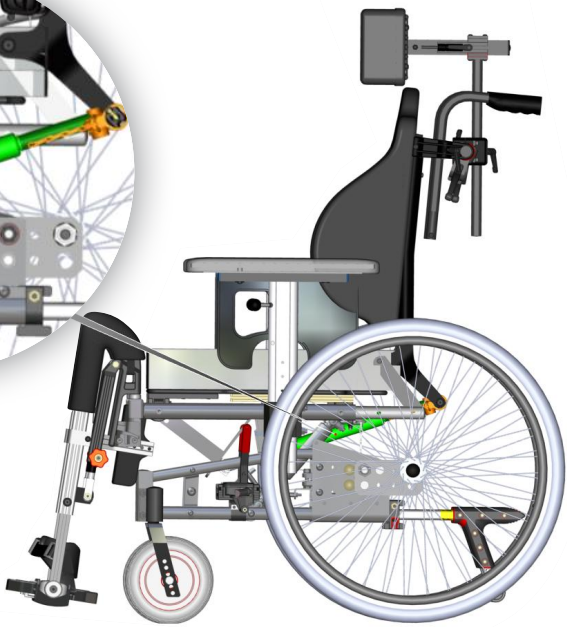
CHANGING THE BACK GAS CYLINDER

Described on hand of Netti II illustrations
The functionality on other dynamic wheelchairs is the same.

- Recline the chair back backwards at least 15°.
- Disconnect the cylinder hinge from gas cylinder by pulling the quick release bolt (locking pin).
- Pull the gas cylinder hinge outwards. There may be different styles to the cylinder hinges, but the function is the same.

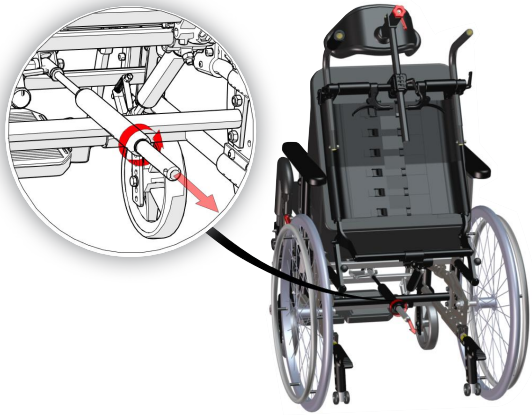
See the cut illustration showing the cylinder hinge in orange and the cylinder in green.





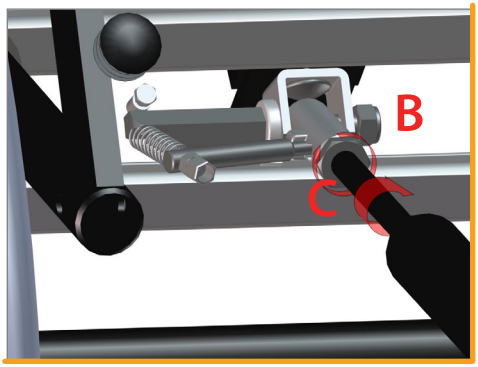
- Fold the chair back forwards.

- Remove the old gas cylinder. Use a 17 mm open end spanner to open the nut **C**.



- Connect the gas cylinder locking head **A**, if not mounted, to the new cylinder.

- Screw the gas cylinder into the head until it touches the cross bolt **B**, no play. Leave the nut **C** loose till the cylinder has correct depth.
- If the cylinder sits too loose, you cannot release it with the operating handle; when it is too tight, the operating handle will not lock the cylinder.
- Tighten the nut **C** close to the head with the 17 mm open end spanner and fix the gas cylinder firmly.



- Connect the gas cylinder locking head to the cylinder hinge, reconnect the quick release bolt.
- If the cylinder seems too long , use the lower cross bar on the chair back to press the cylinder shorter till it fits into the cylinder hinge.

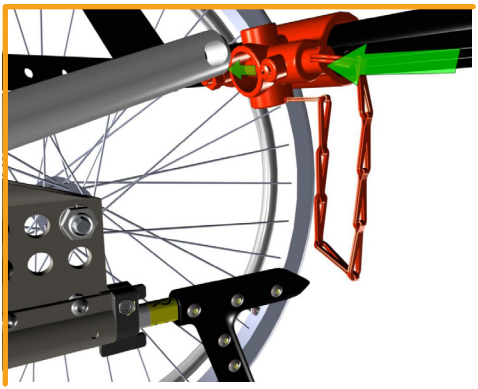
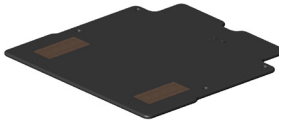
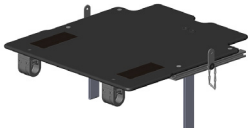
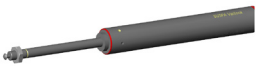
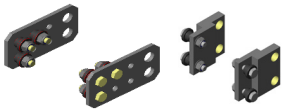
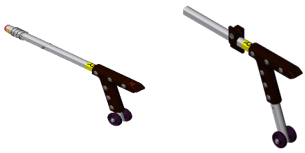
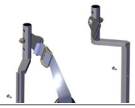
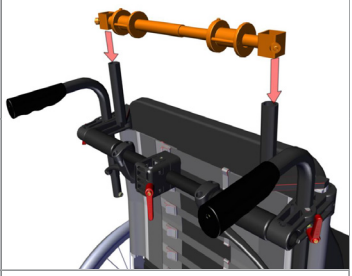


TABLE FOR GAS CYLINDER
MODEL SUITING USER STRENGTH AND WEIGHTS
ON NEXT PAGE.

5. NETTI DYNAMIC COMPONENTS AND ACCESSORIES

COMPONENTS AND ACCESSORIES FOR NETTI DYNAMIC SYSTEM	ARTICLE NUMBER	DESCRIPTION	PICTURES
HEAD SUPPORTS			
Head Support Dynamic **Head Support lock**	82161 82025	Flexes Backwards	
SEATING PLATE			
Seat Plate	Please study the spare part catalogue on our homepage for all alternatives	Seat widths: 35 – 38 – 40 – 43 – 45 and 50 cm	
Seat Plate Dynamic – hinged, with belt fixing, seat plate lock, seat plate angle stopper, and seat plate bumper	Please study the spare part catalogue on our homepage for all alternatives	Seat widths: 35 – 38 – 40 – 43 – 45 and 50 cm	
BACK ANGLE CYLINDERS			
Netti Dynamic Free movement back suport cylinder – lockable			
Netti Dynamic 15° movement Back Support Cylinder – not lockable – NOT approved for wheelchairs used as a seat in a vehicle			
FRAME EXTENDERS			
Frame Extender Kit Netti III family **Frame Extender Kit Netti 4U**			
ANTI-TIPS			
Anti-tips long-long with spring – Netti III **Anti-tips 4U**	25418 26056 28972		

For complete and anytime updated overview, please see the product catalogue on our home page **www.My-Netti.com**

COMPONENTS AND ACCESSORIES FOR NETTI DYNAMIC SYSTEM	ARTICLE NUMBER	DESCRIPTION	PICTURES
LEG SUPPORTS			
Netti Dynamic DUAL Leg Support	Please study the spare part catalogue on our homepage for all alternatives	Allows for uneven forces from the legs	
BELTS			
H-Belt Adaptor Kit – Mini	86888	Seat widths: 40 cm	
H-Belt Adaptor Kit – Medium	86892	Seat widths: 45 cm	
H-Belt Adaptor Kit – Large	86894	Seat widths: 60 cm	
Pelvic Support Evoflex – Medium	82788	Medium	
Pelvic Support Evoflex – Large	82789	Large	
4-Point Belt padded M	45013	Medium	
4-Point Belt padded L	45014	Large	

For complete and anytime updated overview, please see the product catalogue on our home page **www.My-Netti.com+**

COMPONENTS AND ACCESSORIES FOR NETTI DYNAMIC SYSTEM	ARTICLE NUMBER	DESCRIPTION	PICTURES
HARNESSES			
Stayflex Vest w/o zipper	45015	Medium	
Stayflex Vest w/o zipper	45016	Large	
Pivotfit M	45017	Medium Unisex	
Pivotfit L	45018	Large Unisex	
LOWER EXTREMITIES			
Calf Support	45019	Medium	
Calf Support	45020	Large	
Ankle Huggers S	44863	Small 17 – 20 cm	
Ankle Huggers M	44864	Medium 19 – 23 cm	
Ankle Huggers L	44865	Large 22 – 29 cm	
Ankle Huggers XL	44904	X-Large 28 – 33 cm	

For complete and anytime updated overview, please see the product catalogue on our home page **www.My-Netti.com**

6. TRANSPORT

Wheelchairs with **Netti Dynamic System** can be used as seat in a car if the wheelchair has been tested and approved to **ISO 7176-19**.

Please follow the description for fixing the chair and the user as described in the User manual for the wheelchair and the User manual UM0131 how to use a wheelchair as a seat in a car.

Max user weight when a wheelchair with Dynamic System is used as a seat in a vehicle: 135 kg.

The Netti Dynamic System back, seat plate and leg supports has to be locked when the wheelchair is used as a seat in a car.

Netti Dynamic System wheelchair with Netti Dynamic 15° movement back support cylinder – not lockable – is not approved for being used as a seat in a vehicle.

7. MAINTENANCE

All wheelchairs equipped with Netti Dynamic System will require special attention to maintenance compared with wheelchairs without dynamic system, due to the heavy and strong use.

Follow the wheelchair maintenance description in the wheelchair User Manual.
Pay special attention to tightening all screws and inspecting all joints regularly on a weekly basis.

Inspect the belts and harnesses on tear and wear. Replace if necessary.

In some cases it can occur sound from the moving parts if they are not regularly lubricated.

8. TROUBLESHOOTING

Please study the recommendations in the User Manual for the wheelchairs where the **Netti Dynamic System** has been adapted to.

9. TESTS & WARRANTY

The guarantee claims stated in the User Manual for the wheelchair also applies for wheelchairs with **Netti Dynamic System** when the **Netti Dynamic System** or parts are mounted and adjusted for the user under supervision of a **Netti Dynamic System** certified person.

Netti wheelchair with Dynamic System has been tested according to EN 12183:2014 at TÜV SÜD Germany.

It is also crash tested according to ISO 7176-19:2008 amm 2014 and is approved for being used as a seat in a vehicle.

MAX USER WEIGHT for a wheelchair with DYNAMIC SYSTEM is 135 kg.

Netti Dynamic System wheelchair with Netti Dynamic 15° movement back support cylinder – not lockable – is NOT approved for being used as a seat in a vehicle.

Contact your local dealer if you have questions regarding certified persons for Netti Dynamic System.

Updated data about the wheelchair and the Netti Dynamic System is found on www.My-Netti.com

10. APPENDIX

Medical terms and diagnosis with reference to Netti Dynamic System and relevant user groups:

- **CP:** Cerebral palsy is a disorder that affects muscle tone, movement, and motor skills (the ability to move in a coordinated and purposeful way).
- **ALS:** Amyotrophic Lateral Sclerosis (ALS) is a rapidly progressive, neuromuscular disease. It attacks the motor neurons that transmit electrical impulses from the brain to the voluntary muscles in the body. When they fail to receive messages, the muscles lose strength, atrophy and die.
- **CVA:** Stroke or Cerebral Vascular Accident (CVA). A stroke is the sudden death of brain cells due to a problem with the blood supply.
- **Intellectual disorders:** Intellectual disability is a disability characterized by significant limitations in both intellectual functioning and in adaptive behavior, which covers many everyday social and practical skills.
- **Parkinson's Disease:** a progressive disease of the nervous system marked by tremor, muscular rigidity, and slow, imprecise movement. It is associated with degeneration of the basal ganglia of the brain and a deficiency of the neurotransmitter dopamine.
- **MS:** a chronic, typically progressive disease involving damage to the sheaths of nerve cells in the brain and spinal cord, whose symptoms may include numbness, impairment of speech and of muscular coordination, blurred vision, and severe fatigue.
- **TBI:** Or traumatic brain injury is an intracranial injury, generally the result of a sudden blow to the head. The brain is launched into a collision course with the inside of the skull, resulting in possible bruising of the brain, tearing of nerve fibers and bleeding.
- **SCI:** or spinal cord injury, result of a sudden, violent blow or a damage to any part of the spinal cord or nerves at the end of the spinal canal.
- **Huntington's disease:** A hereditary disease marked by degeneration of the brain cells and causing chorea and progressive dementia.

Model: Netti Dynamic System
Language: English **Version:** 2021-03

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