

Helix^{3D} Hip Joint System

Way Of Proceeding With C-Leg

Academy



Quality for life

Goals and Contents



Goals

Systematic adjustments of the functional components:

- Helix^{3D} Hip Joint System
- C-Leg

Integration A-B-C

- A. Alignment
- B. Fitting
- C. Alignment and adjustment optimization



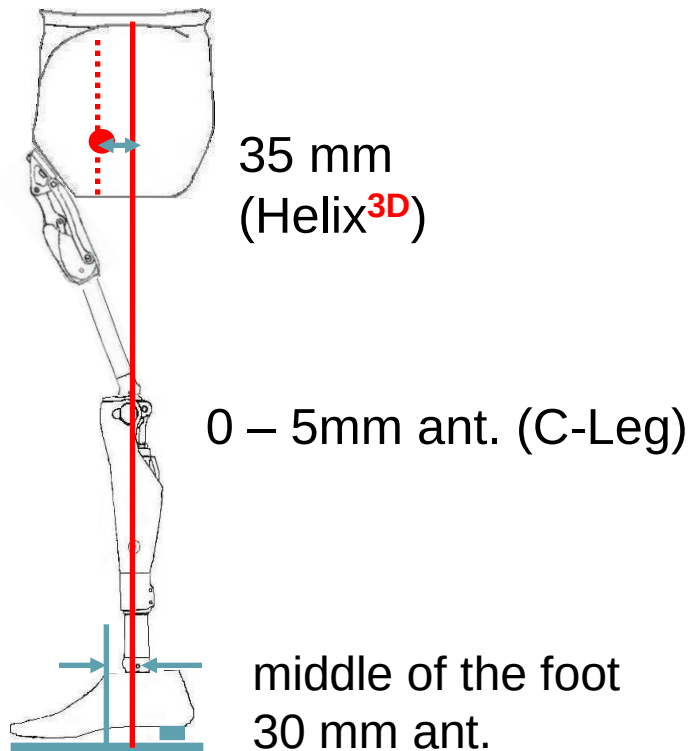
Adjusting the hip disarticulation prosthesis - proceeding

Overview

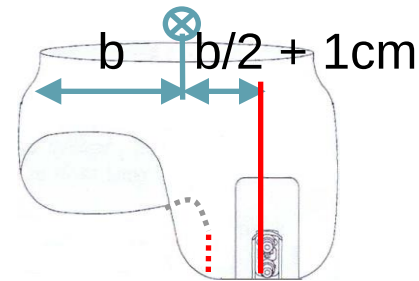
- Calibration and first adjustment of C-Leg
- First adjustment of Helix^{3D}
- Bench alignment with L.A.S.A.R. Assembly
- Optimising of the prosthesis length
- Zero setting and first adjustment of C-Leg
- Static alignment optimization with L.A.S.A.R. Posture
- C-Leg adjustment
- Helix^{3D} adjustment

Adjusting the hip disarticulation prosthesis - proceeding

Sagittal plane



Frontal plane



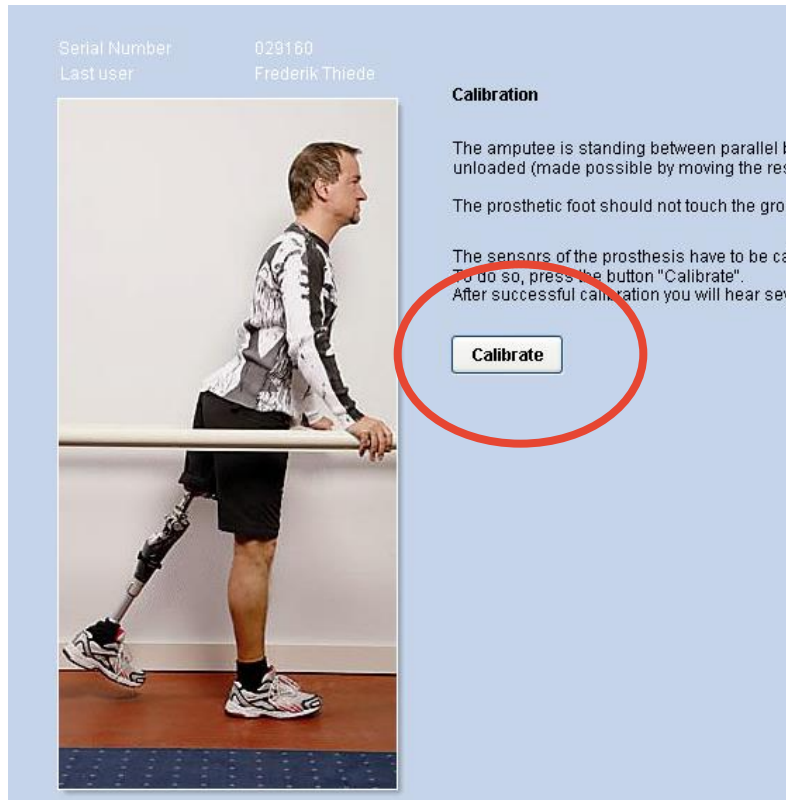
⊗ = centre of the body (navel)

- Alignment reference line
- L.A.S.A.R. Assembly
- L.A.S.A.R. Posture

Adjusting the hip disarticulation prosthesis - proceeding

Calibration with C-Soft

Calibration the C-Leg **without the patient.**



- Calibrates the sensors of the C-Leg
- This is a mandatory first step before any programming of the C-Leg can be done
- With **no load** on the foot and the knee in **full extension**, click the »calibration« button on the C-Soft screen

Adjusting the hip disarticulation prosthesis – proceeding

Pre-adjustment with C-Soft

Set the **Maximum toe load** (forefoot load) of the C-Leg as well as **Stance phase damping** to the maximum possible value.

Maximum toe load: 255

Stance phase damping: 120

C-Leg is stiff for standing and first steps

- **secure adjustment**



Adjusting the hip disarticulation prosthesis – proceeding

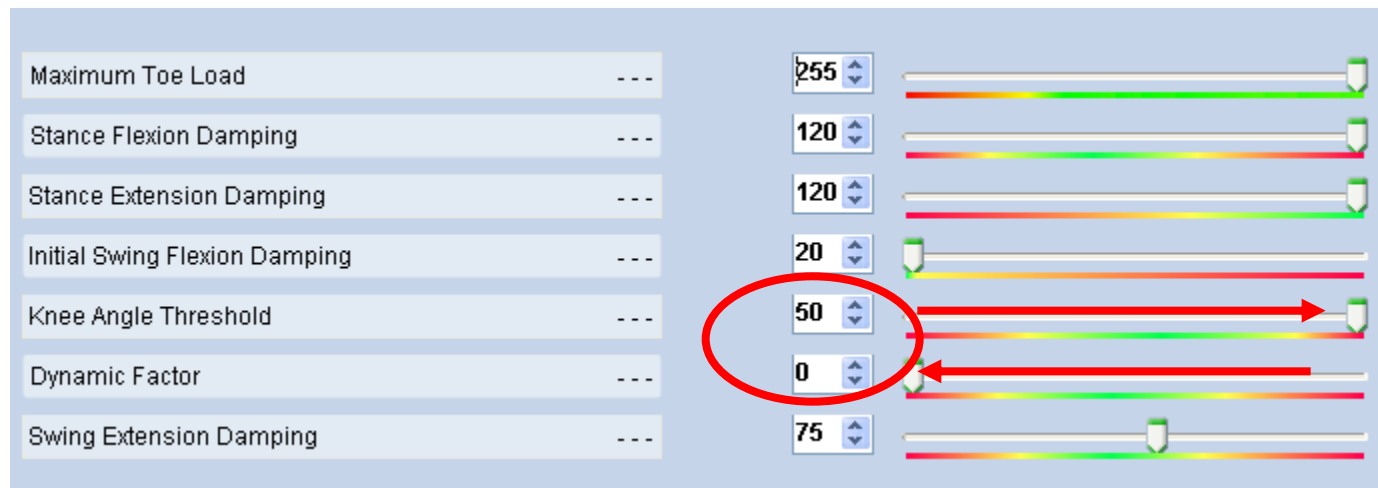
Pre-adjustment with C-Soft

Set Dynamic Fakcor to 0 (min.) and Knee Angle Threshold to 50 (max.).

Dynamic Factor: 0

Knee Angle Threshold : 50

- The C-Leg now will work during swing phase, with least resistance



Adjusting the hip disarticulation prosthesis - proceeding

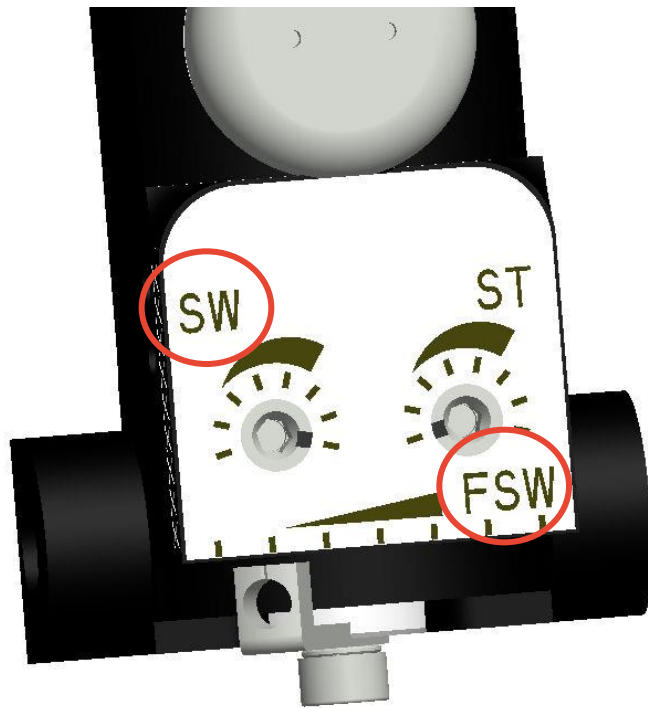
Length of the prosthesis



Have the patient put the prosthesis on and step **between parallel bars** to verify the length of the prosthesis.

Adjusting the hip disarticulation prosthesis - proceeding

Hydraulic Swing Phase



Begin as follows:

Control: Set ST to minimum (factory setting)

Set FSW to minimum, and set SW to maximum

- Hip is stiff for standing and first steps
- secure adjustment

FSW – Free Swing Phase (step length)

SW – Swing Phase Resistance (flexion resistance)

ST – Stance Phase Resistance
(extension resistance)

Adjusting the hip disarticulation prosthesis - proceeding

Alignment optimization with L.A.S.A.R. Posture



Have the patient with the prosthesis stand on the L.A.S.A.R Posture and make alignment optimization by **exclusively** adjusting the **plantar flexion** of the prosthetic foot:

Knee joint: Load line 30 mm anterior to knee rotation axis

Additional reference dimensions:

Foot: Load line approx. 50 mm anterior to ankle adapter

TMS: 0 ± 10 mm around load line

Adjusting the hip disarticulation prosthesis - proceeding

Helix^{3D} and C-Leg adjustments

1. C-Leg: switch over from stance to swing phase mode
2. Helix^{3D} Hip: hydraulically controlled swing phase resistance **SW**
3. C-Leg: Stance phase resistance
4. Helix^{3D} Hip: hydraulically controlled stance phase resistance **ST**

Adjusting the hip disarticulation prosthesis - proceeding

C-Leg adjustment

Prosthetic foot length: 27 cm

Patient weight: 80 kg

Maximum toe load estimation: 200

Options

Maximum Toe Load	200
Stance Flexion Damping	120
Stance Extension Damping	120
Initial Swing Flexion Damping	20
Knee Angle Threshold	50
Dynamic Factor	0
Swing Extension Damping	75

2nd Mode adjustment

Basic Flexion Damping	20
Increased Damping with Knee Angle	0

Knee Angle: 4.8°

Toe- and heel load

Exit program

Determine **maximum toe load**:

With help of C-Soft:

Enter foot size and patient weight

- Assume value

Practical evaluation (Expert mode):

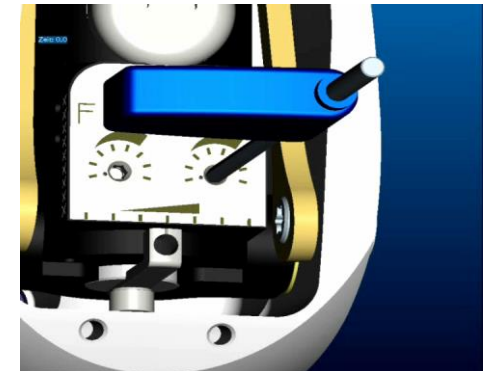
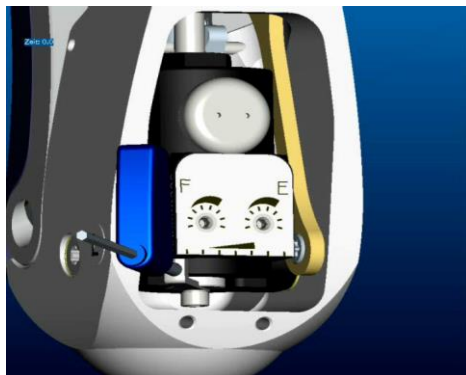
One-leg standing on the prosthesis side with the prosthesis placed slightly backwards and without load-relieving support through the arms

- Adaptation of the maximum toe load value according to the scale

Adjusting the hip disarticulation prosthesis - proceeding

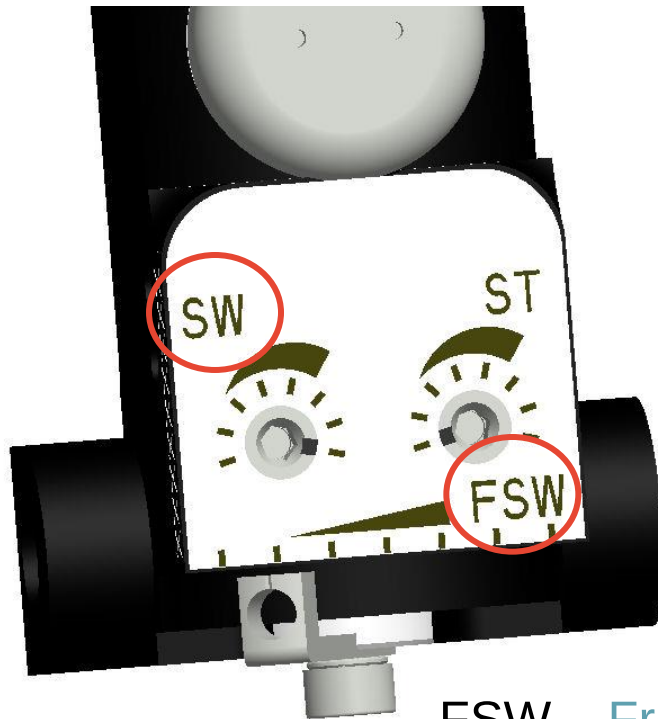
Helix^{3D} Adjustment

Adjust the Helix^{3D} hip joint **step by step**
(for walking on level plane).



Adjusting the hip disarticulation prosthesis - proceeding

Hydraulic Swing Phase



1. Increase **FSW** step by step
2. Decrease **SW** step by step

Target: **Step length** analogue to the contralateral side with **comfortable damping** of flexion movement

Attention: **FSW** and **SW** have an effect on one another (e.g.: reduction of SW can increase the step length ⇒ reduce FSW, if necessary)

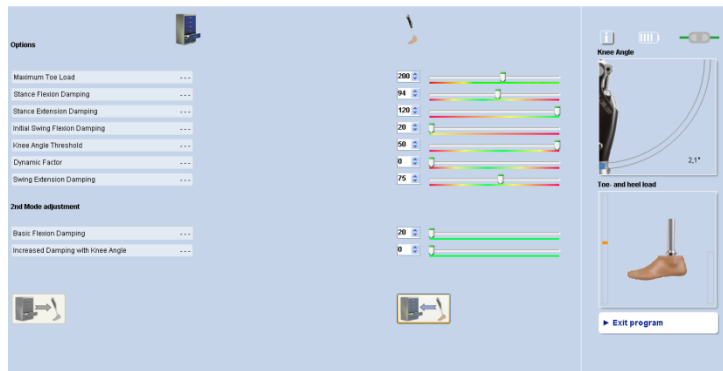
FSW – **Free Swing Phase** (step length)

SW – **Swing Phase Resistance** (flexion resistance)

ST – **Stance Phase Resistance** (extension resistance)

Adjusting the hip disarticulation prosthesis - proceeding

Further C-Leg adjustments



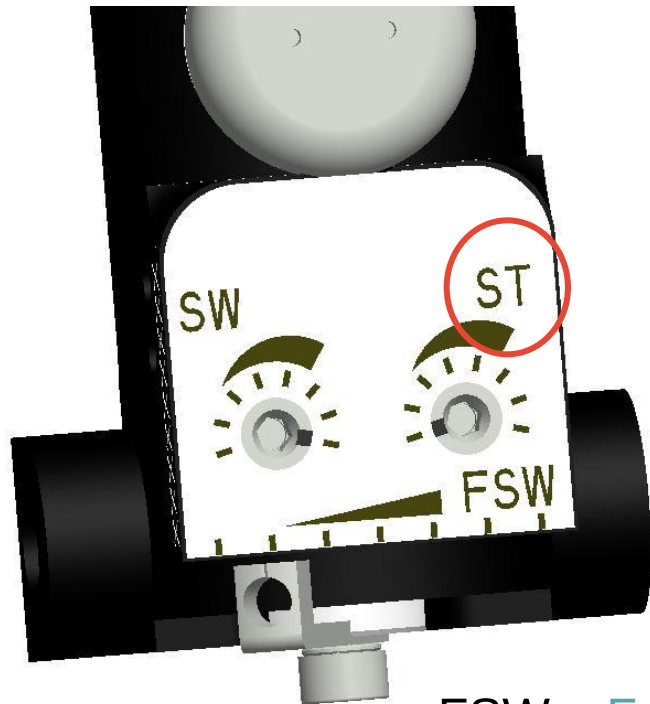
Adjust the stance phase resistance of the C-Leg **in chronological order**:

1. Sitting down
2. Walking on level ground
3. Stairs
4. Ramp



Adjusting the hip disarticulation prosthesis - proceeding

Hydraulic Stance Phase



First adjust ST to minimum and then increase **step by step**

Pay attention to knee stability!

Stance phase flexion of the C-Leg increases at higher ST:

- Do not immediately increase the stance phase resistance of the C-Leg
- Increase the "Yielding extension resistance" in the C-Leg (usually 120)

Allow the patient to get used to it!

FSW – Free Swing Phase (step length)

SW – Swing Phase Resistance (flexion resistance)

ST – Stance Phase Resistance (extension resistance)

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