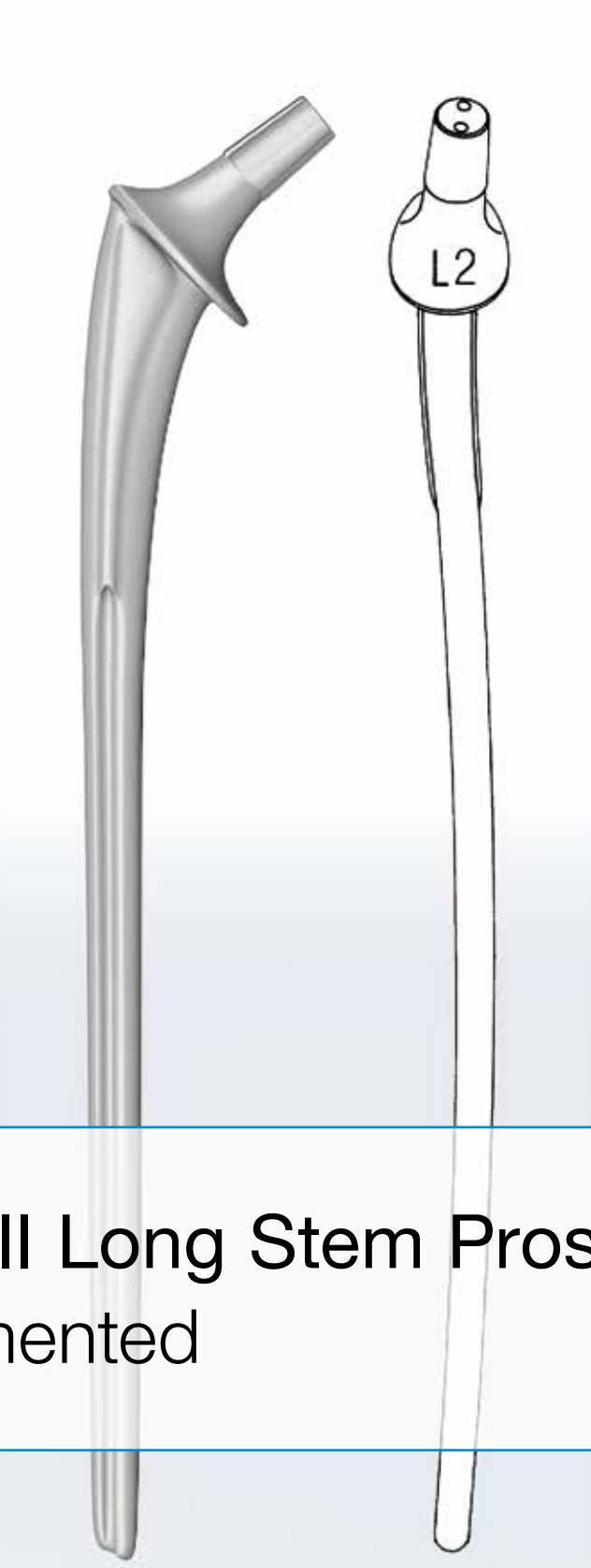
LINK®



SP II Long Stem Prostheses, cemented

Surgical Technique

Explanation of Pictograms					
	Manufacturer	REF	Article number	MAT	Material number

SP II Long Stem Prostheses, cemented

System Description

The number of primary hip prostheses implanted each year throughout the world continues to grow. Alongside these primary replacements, the number of revision surgeries is increasing at a percentage in double figures. It is clear that both the number and the complexity of revision surgeries will grow strongly in the short and medium term.

A range of cementable revision hip prosthesis stems is available for this group of patients. They differ markedly from primary hip prostheses in their design and function and in the surgical techniques used for their implantation. These differences often call for an individual approach when identifying indications, planning the surgery, choosing surgical techniques and caring for patients after surgery.

SP II Long Stem Prostheses with a 12/14 mm taper, are available as right and left side versions (anatomical design) with stems lengths of 200-350 mm and in three different stem thicknesses (M, L, and XL).

Preoperative Planning

Measurement tables and X-ray templates are available to aid preoperative planning of hip stem revision. They allow the surgeon to plan precisely which implants are to be used.
Exact preoperative planning is based on X-ray images which are either true to scale or supplied with precise details of the enlargement factor employed. LINK X-ray templates use a standard enlargement factor of 110% when depicting implants. If different scales are required we can supply them as long as this is technically possible. On request we can provide producers of digital planning software with the relevant data in standard formats.

In spite of good preoperative planning, revision cases frequently involve extensive bone loss. This presents an unforeseeable challenge to surgeons that is rarely encountered in primary hip replacement. The procedures used to compensate for this bone loss vary greatly depending on the situation in the individual case. Where tumor prostheses are involved, structural changes in muscles/ ligaments, fixation etc. also need to be taken into account when planning the surgery. As a result the treatment of patients with extensive bone loss represents a special problem and is subject to greater risk than is the implantation of normal hip prostheses.

Surgical Approaches

The choice of the approach depends on the surgeon‘s experience and his/her decision based on the individual situation.

The following approaches are usual:

- antero-lateral - **Watson Jones** (Fig. A)

- direct lateral - **Hardinge** (Fig. B)

- postero-lateral - **Moore** (Fig. C)

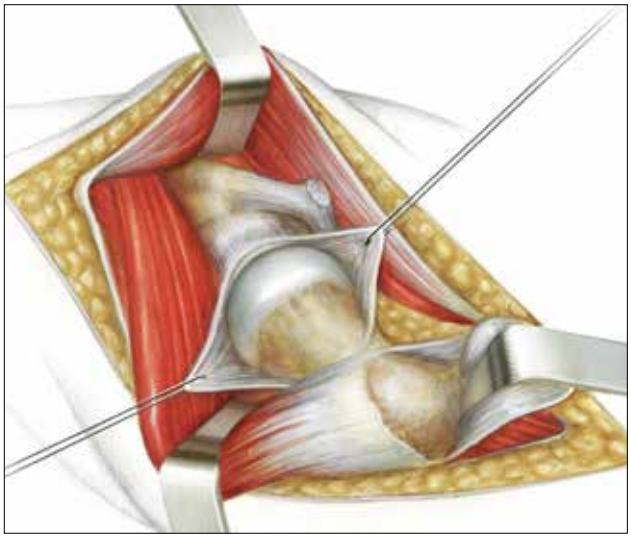
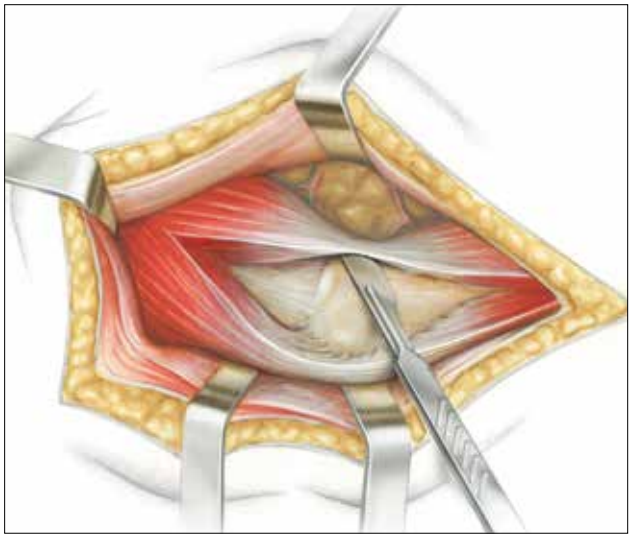


Fig. A: Watson Jones



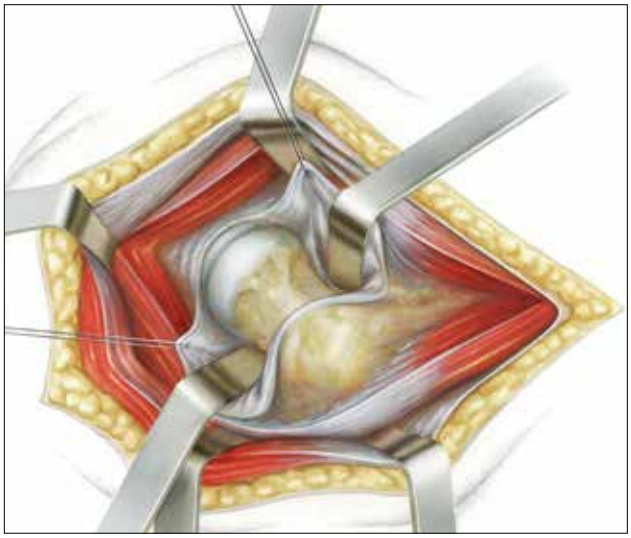
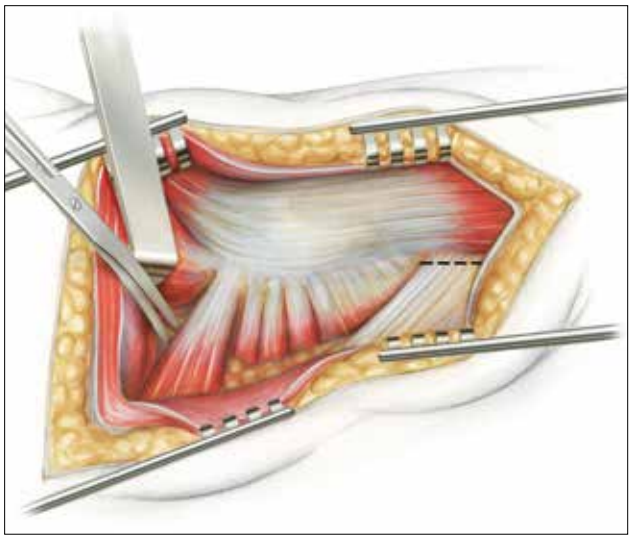


Fig. B: Hardinge



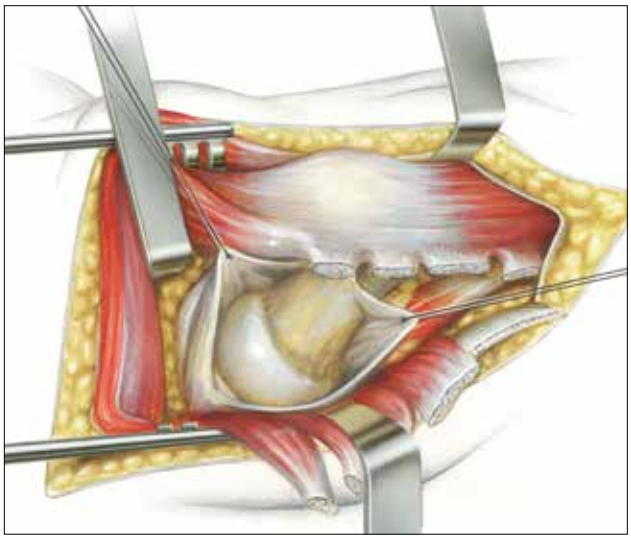


Fig. C: Moore

Surgical Technique

Any implants in situ must be completely removed before a revision stem can be implanted. This can be performed either with specific instruments for the implant system being removed or with the LINK revision instrument set, **130-698/01**.
Any bone cement residues must be completely removed.

Fig. 1

Fig. 1

The femoral canal is opened with the Femoral Canal Opener and bone is removed from the greater trochanteric region. The presence of this bone will be largely dependent on the stem previously implanted and the stem removal process. Use the Femoral Canal Opener to remove lateral bone as shown. Removing lateral bone is important for maintaining neutral stem placement in respect to the femoral axis.

The medullary canal has to be prepared with a reamer of corresponding length. In order to ensure a consistent cement application, the diameter of the reamer has to be larger than the tip of the prosthesis.

Fig. 2

Fig. 2

Flexible Reamers are used to widen the diaphysis. The diameters of the Femoral Reamers must be at least 2 mm greater than the distal tip of the chosen SP II Long Stem Prosthesis. Starting with one size smaller than the planned hip stem the reamer size must be incrementally increased until it is equal to the planned hip stem.

Fig. 3

Fig. 4

Fig. 3

The Rasp Stem is inserted with coupled Rasp Handle.

Due to the anatomical form of the Rasps the anteversion usually adjusts itself automatically when they are driven in. The femoral canal is prepared with rasps of increasing size until the planned size is reached.

Note
In order to widen the proximal lateral part the rasp can be run up and down a couple of times. Thus giving more space for the cement in this area.

The size of the Rasp corresponds roughly with the implants (Rasp has an oversize of 0.75 mm comparing to the Implant).
In order to create a cement mantle of about 2-3 mm the implanted stem shall be one size smaller than the Rasp last used. (e.g. rasp stem R3 = prosthesis stem R2).

Fig. 4

The Rasp is then left in situ. The Rasp stem sits slightly lower than the lowest point of the resection level.

Fig. 5

Fig. 5

The Calcar Reamer is now used to create plane parallel seat on the proximal femur to allow precise seating of the collar.

Caution
To prevent the Reamer from being damaged it must be pushed as far as possible caudally on the guide pin before starting to ream.

Fig. 6

Fig. 6

Trial reduction is carried out with the final size of Rasp in situ. The handle is removed and the Trial Neck Segment selected in the preoperative planning (right/ left, CCD angle), is placed on the Rasp. The different Trial Heads are then used to check for optimal offset and correct leg length and to test whether stability is adequate. The range of movement is also checked to avoid impingement of bone and implant and rule out any instability.

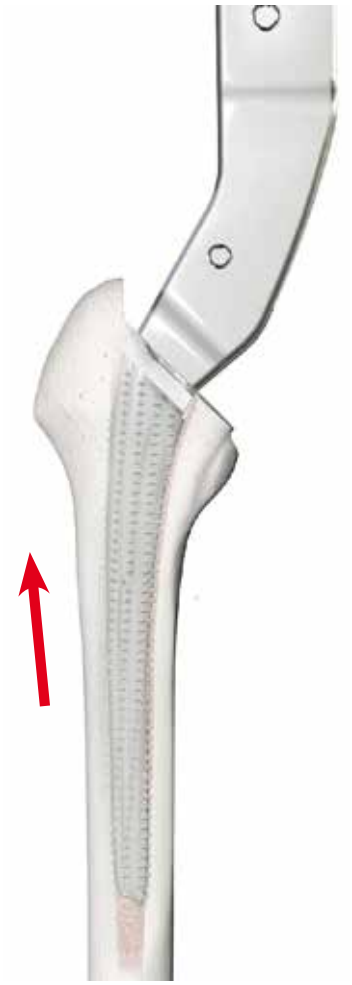


Fig. 7

Fig. 7

After trial reduction, the Trial Head and Neck are removed by hand and the Rasp is removed with the Rasp Handle.

Fig. 8

Fig. 8

The medullary space is blocked a few centimeters below the planned position of the tip of the femoral stem using either a bone plug or a Medullary Plug. After cement application, the SP II stem is introduced into the femoral cavity as far as possible by using the Insertion Forceps (Fig. 9).

Note

The SP II Long Stem provides inbuilt anatomical antetorsion. Further correction of anteversion, as done with straight stems, is to be avoided.

Fig. 9

Fig. 10

The SP II Long Stem is driven into its final position using the Impactor. While the cement hardens, the stem is pressed firmly into the cement bed with the tip of the Impactor positioned in the hemispherical depression at the lateral collar, thus avoiding transmission of the surgeon's movements to the stem.

Fig. 12

Fig. 10

Fig. 11

Fig. 11

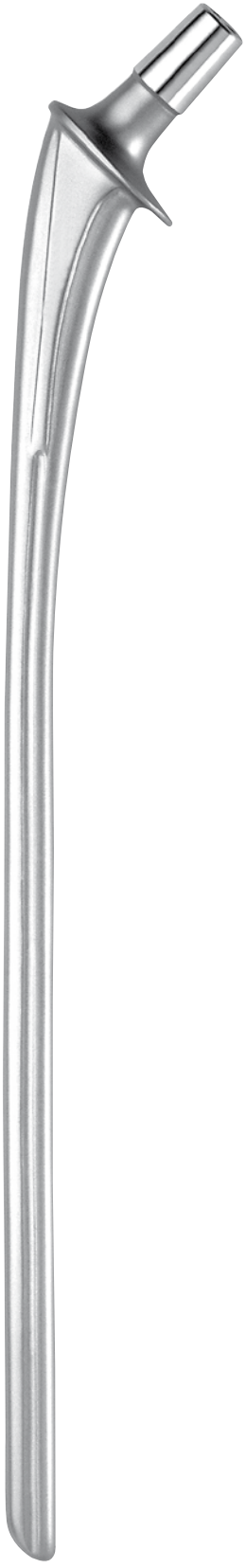
To be on the safe side, a final trial run is performed using the colored Plastic Trial Heads.

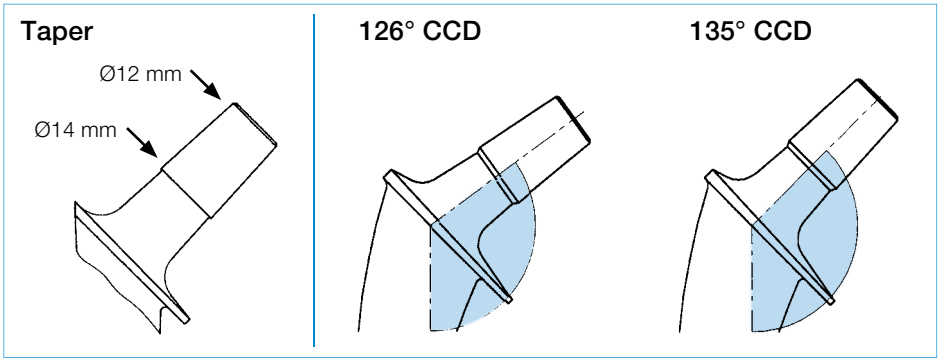
Fig.12

The final Femoral Head is placed on the carefully cleaned taper of the stem and fixed with a light tap on the Impactor.

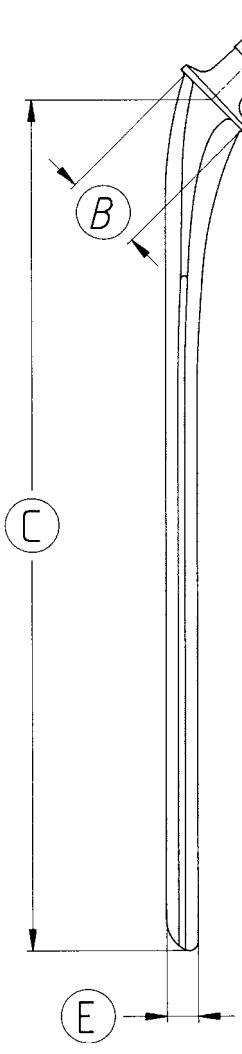
SP II Long Stem Prostheses

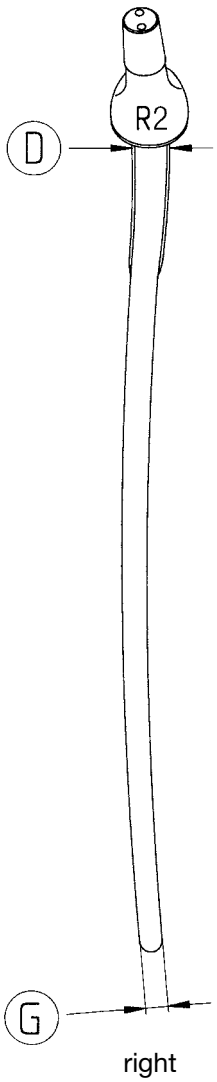
MAT EndoDur, taper 12/14 mm



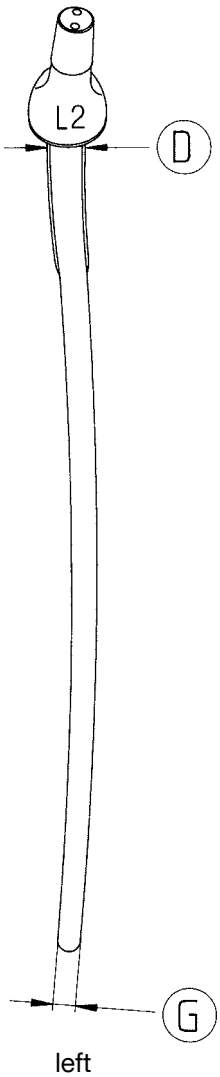


R = right
L = left
2 = medium
3 = large
4 = extra large





right



left

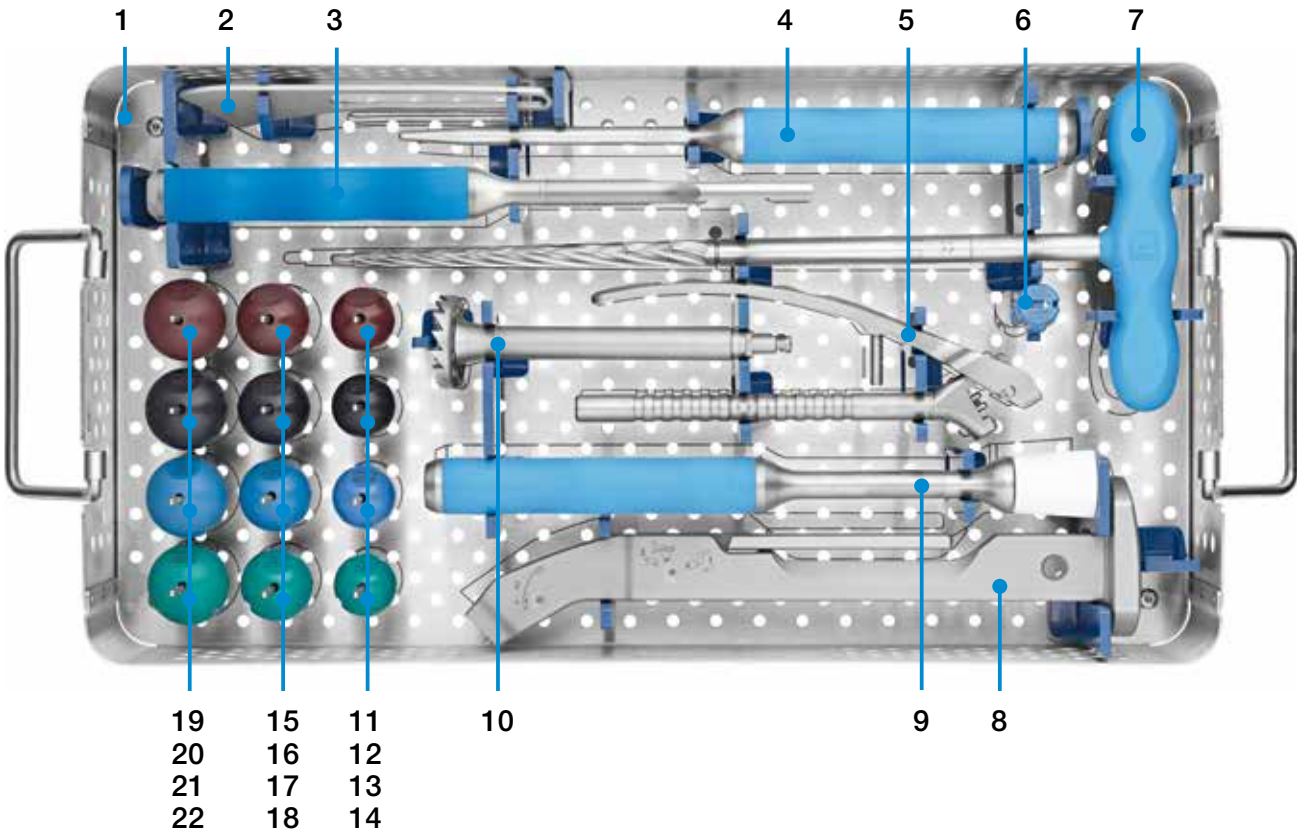
SP II Long Stem Prostheses

MAT EndoDur, taper 12/14 mm

- **right and left version**
- **3 stem sizes**
- **4 stem lengths**
- **2 CCD angles**

CCD∢126° REF	CCD∢135° REF	Identification mark on collar	Measurements					
			Stem width	Ⓑ mm	Ⓒ mm	Ⓓ mm	Ⓔ mm	Ⓖ mm
Version right								
127-910/26	127-910/35	R 2	medium	27.5	350	14	11	8
127-912/26	127-912/35	R 3	large	29.5	350	15	12	9
127-914/26	127-914/35	R 4	extra large	31.5	350	16	13	10
127-916/26	127-916/35	R 2	medium	27.5	300	14	11	8
127-918/26	127-918/35	R 3	large	29.5	300	15	12	9
127-920/26	127-920/35	R 4	extra large	31.5	300	16	13	10
127-922/26	127-922/35	R 2	medium	27.5	250	14	11	8
127-924/26	127-924/35	R 3	large	29.5	250	15	12	9
127-926/26	127-926/35	R 4	extra large	31.5	250	16	13	10
127-928/26	127-928/35	R 2	medium	27.5	200	14	11	8
127-930/26	127-930/35	R 3	large	29.5	200	15	12	9
127-932/26	127-932/35	R 4	extra large	31.5	200	16	13	10
Version left								
127-911/26	127-911/35	L 2	medium	27.5	350	14	11	8
127-913/26	127-913/35	L 3	large	29.5	350	15	12	9
127-915/26	127-915/35	L 4	extra large	31.5	350	16	13	10
127-917/26	127-917/35	L 2	medium	27.5	300	14	11	8
127-919/26	127-919/35	L 3	large	29.5	300	15	12	9
127-921/26	127-921/35	L 4	extra large	31.5	300	16	13	10
127-923/26	127-923/35	L 2	medium	27.5	250	14	11	8
127-925/26	127-925/35	L 3	large	29.5	250	15	12	9
127-927/26	127-927/35	L 4	extra large	31.5	250	16	13	10
127-929/26	127-929/35	L 2	medium	27.5	200	14	11	8
127-931/26	127-931/35	L 3	large	29.5	200	15	12	9
127-933/26	127-933/35	L 4	extra large	31.5	200	16	13	10

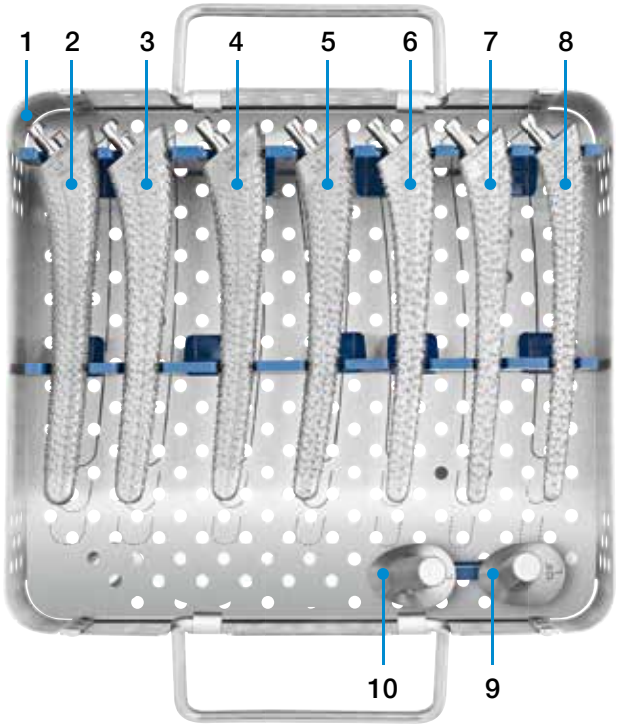
130-100/15 Instrument Tray, complete



1	130-100/10	**Instrument Tray**, only, for basic instrument set
2	130-614	**Resection Guide,** 160 mm
3	130-616	**Box Chisel**, 290 mm
4	130-613	**Impactor**, 296 mm
5	131-830/03	**Insertion Forceps**, 200 mm
6	131-830/04	**Taper Cap,** exchangeable
7	130-617	**Femoral Canal Opener**, 365 mm
8	130-394/01	**Handle** for rasp stems and bone compressors, 285 mm
9	130-610/01	**Driver for prosthesis heads**, with exchangeable plastic head, 280 mm
10	130-407/02B	**Calcar Reamer** with CoCr inner cylinder, **Hudson-Fitting**, Ø 40 mm, 150 mm
		Adapter, optional:
	130-407/02D	with **AO Fitting**
11	175-928/14	**Trial Heads**, X-ray positive, Taper 12/14, Ø 28 mm, brown, extra long
12	175-928/13	**Trial Heads**, X-ray positive, Taper 12/14, Ø 28 mm, black, long
13	175-928/12	**Trial Heads**, X-ray positive, Taper 12/14, Ø 28 mm, blue, medium
14	175-928/11	**Trial Heads**, X-ray positive, Taper 12/14, Ø 28 mm, green, short
15	175-932/14	**Trial Heads**, X-ray positive, Taper 12/14, Ø 32 mm, brown, extra long
16	175-932/13	**Trial Heads**, X-ray positive, Taper 12/14, Ø 32 mm, black, long
17	175-932/12	**Trial Heads**, X-ray positive, Taper 12/14, Ø 32 mm, blue, medium
18	175-932/11	**Trial Heads**, X-ray positive, Taper 12/14, Ø 32 mm, green, short
19	175-936/14	**Trial Heads**, X-ray positive, Taper 12/14, Ø 36 mm, brown, extra long
20	175-936/13	**Trial Heads**, X-ray positive, Taper 12/14, Ø 36 mm, black, long
21	175-936/12	**Trial Heads**, X-ray positive, Taper 12/14, Ø 36 mm, blue, medium
22	175-936/11	**Trial Heads**, X-ray positive, Taper 12/14, Ø 36 mm, green, short

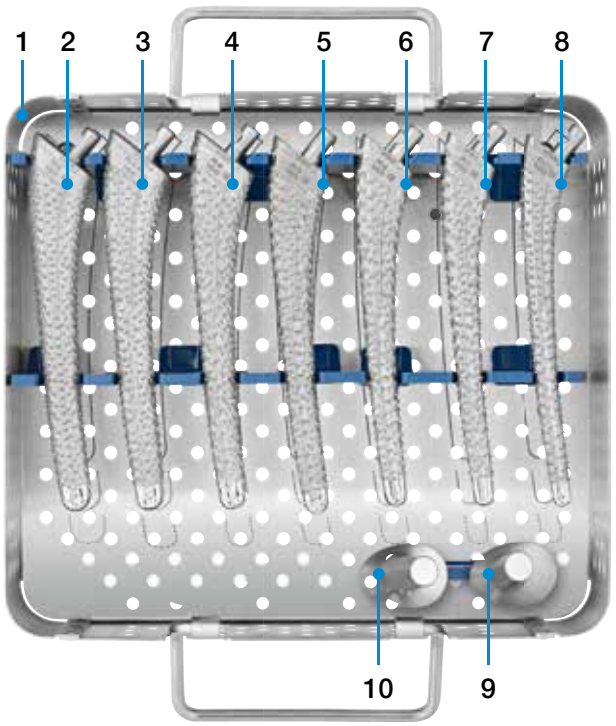
Sets of Rasp Stems

LEFT



1	130-100/30	**Tray**, empty, left
2	130-555/07	**Rasp Stem,** 170 mm, left
3	130-555/06	**Rasp Stem,** 170 mm, left
4	130-555/05	**Rasp Stem,** 170 mm, left
5	130-555/04	**Rasp Stem,** 170 mm, left
6	130-555/03	**Rasp Stem,** 170 mm, left
7	130-555/02	**Rasp Stem,** 170 mm, left
8	130-555/01	**Rasp Stem,** 170 mm, left
9	131-531/26	**Trial Neck Segment**, 126°
10	131-531/35	**Trial Neck Segment**, 135°

RIGHT



1	130-100/20	**Tray**, empty, right
2	130-554/07	**Rasp Stem,** 170 mm, right
3	130-554/06	**Rasp Stem,** 170 mm, right
4	130-554/05	**Rasp Stem,** 170 mm, right
5	130-554/04	**Rasp Stem,** 170 mm, right
6	130-554/03	**Rasp Stem,** 170 mm, right
7	130-554/02	**Rasp Stem,** 170 mm, right
8	130-554/01	**Rasp Stem,** 170 mm, right
9	131-530/26	**Trial Neck Segment**, 126°
10	131-530/35	**Trial Neck Segment**, 135°

Coupling of the Rasp

1
To couple Rasp and Handle, the catch is retracted fully (arrow, left). Then, the Rasp fitting is inserted into the mount on the front of the Handle (arrow, right).

2
To secure the connection between Rasp and Handle, the catch is pushed forwards (arrow).

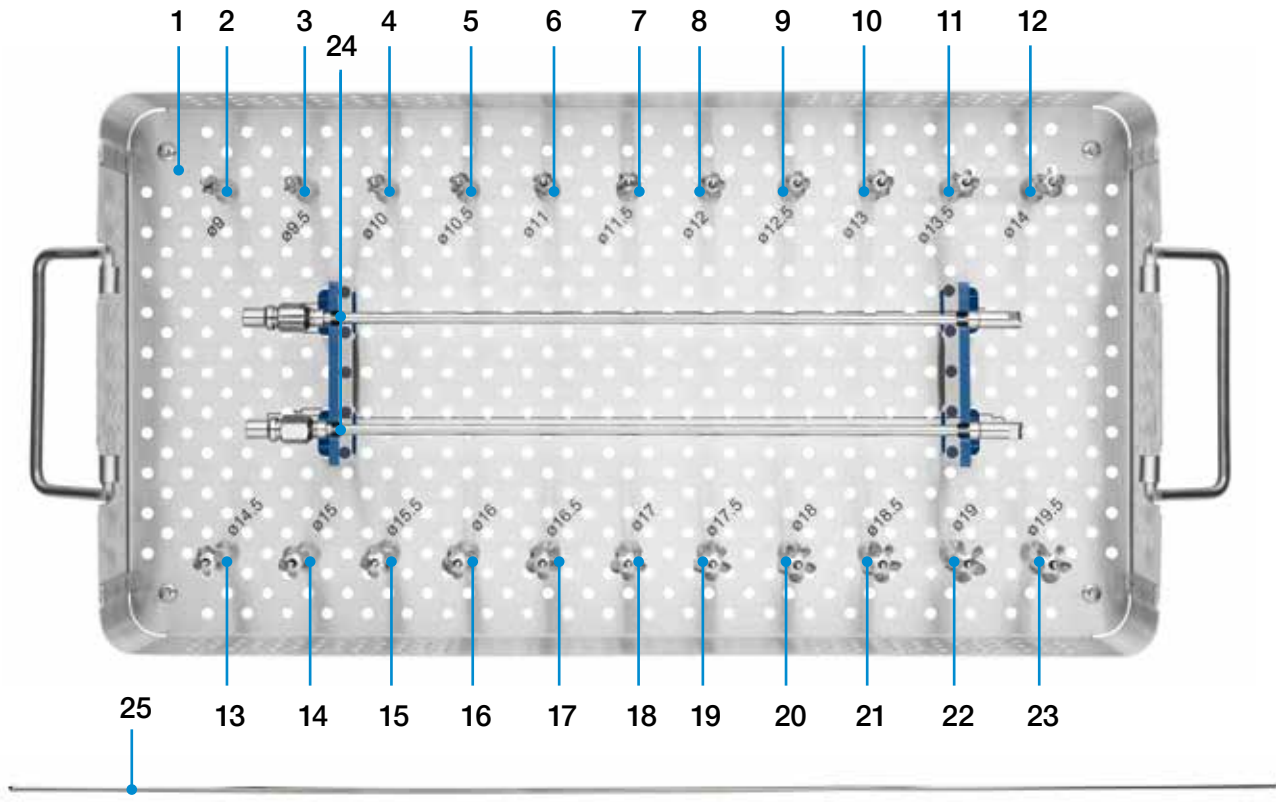
3
To disengage open the Handle (arrow).
The Handle can then be detached from the Rasp.

Instruments

Colored Plastic Trial Heads, Taper 12/14 mm

REF	Ø (mm)	Neck length	Head neck length (mm)	Color	Qty.
131-924/01	24	short	-3.5	green	1
131-924/02	24	medium	0.0	blue	1
175-940/11	40	short	-4.0	green	1
175-940/12	40	medium	0.0	blue	1
175-940/13	40	long	+4.0	black	1
175-940/14	40	extra long	+8.0	brown	1

130-250/00 Femoral Reamers, flexible for medullary canal opening



	REF	Description	Ø (mm)
1	130-251/00	**Tray**, only, sterilizable, with product illustrations	
2	130-370/01	**Reamer Head**	9.0
3	130-370/02	**Reamer Head**	9.5
4	130-370/03	**Reamer Head**	10.0
5	130-370/04	**Reamer Head**	10.5
6	130-370/05	**Reamer Head**	11.0
7	130-370/06	**Reamer Head**	11.5
8	130-370/07	**Reamer Head**	12.0
9	130-370/08	**Reamer Head**	12.5
10	130-370/09	**Reamer Head**	13.0
11	130-370/10	**Reamer Head**	13.5
12	130-370/11	**Reamer Head**	14.0
13	130-370/12	**Reamer Head**	14.5
14	130-370/13	**Reamer Head**	15.0
15	130-370/14	**Reamer Head**	15.5
16	130-370/15	**Reamer Head**	16.0
17	130-370/16	**Reamer Head**	16.5
18	130-370/17	**Reamer Head**	17.0
19	130-370/18	**Reamer Head**	17.5
20	130-370/19	**Reamer Head**	18.0
21	130-370/20	**Reamer Head**	18.5
22	130-370/21	**Reamer Head**	19.0
23	130-370/22	**Reamer Head**	19.5
24	130-376B	**Flexible Reamer Shaft**, Length 350 mm, 2 pcs	
25	130-376/01	**Guide Wire**, Length 670 mm, Ø 3.0 mm	

Instruments for Hip Implantation

Dederich Bone Retractor with hollow handle
The design makes it possible to hold the instrument comfortably for long periods.

REF	Version	Width	Length
15-1032	medium	18 mm	150 mm
15-1033	wide	43 mm	195 mm

Soft Tissue Retractors
with retrograde curved

REF	Version	Width	Length
66-3470	small	22 mm	325 mm
66-3472	wide	43 mm	325 mm

Hohmann Retractor

REF	Version	Width	Length
130-100	small	10 mm	240 mm
130-105	medium	22 mm	260 mm
130-110	wide	43 mm	240 mm

Instruments for Hip Implantation

130-114 **LINK Bone Retractor**
with fenestrated handle
30 mm wide, 260 mm long

130-115 **Rake Retractor**
6 pronged, with T-handle, 210 mm

130-120 **Bone Hook**
single prong, with T-handle, 210 mm

Instruments for Hip Implantation

68-1475
Bircher Meniscus/Cartilage Clamp
with spiked jaws, 200 mm

130-139
Cartilage Scissors
250 mm

50-2562
Cartilage Scissors
straight, 220 mm

50-2564
Cartilage Scissors
curved, 220 mm

Instruments for Hip Implantation

Thabe Acetabulum Excision Forceps
240 mm

REF	Version
130-309/01	straight
130-309/02	curved

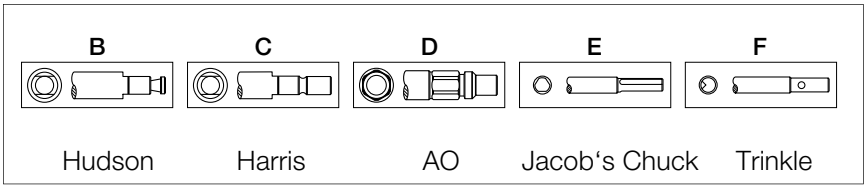
This Forceps is constructed like a Rongeur. It has sharp cupped jaws with sharp teeth at the front. The Forceps is designed for grasping coarse tissue and is particularly useful during the excision of the acetabular capsule.

130-160
Lubinus Steinmann Pin
with impact head and extraction hole
Ø 5 mm, 185 mm

Steinmann Pins are hammered into the bone to keep the incision open. One is inserted into the ischium and another is placed about 2 cm above the cranial area of the cup.

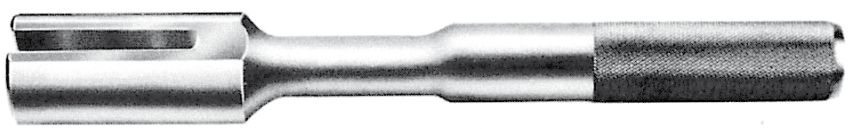
To remove them a second pin is inserted through the hole in the head. The first pin can then be removed easily by turning.

When ordering please indicate which fitting is required:
B Hudson, **C** Harris, **D** AO,
E Jacob‘s Chuck, **F** Trinkle



Example:
130-311/35C = with Harris fitting

130-686 **Slotted Driver** for handle (for rasp stems) and stem extractor
270 mm



Instruments for Hip Implantation

130-165 **Mallet**
Ø 30 mm, 270 mm, 600 g

15-1078/08 **Key for Jacob‘s Chuck**

130-610 **Cement Packer**
Ø 10 mm, 300 mm

X-ray Templates

X-ray Templates for LINK SP II Long Stem Prostheses
Head Ø 28 mm and 32 mm, taper 12/14 mm, 110 % actual size

REF	CCD	Head Ø mm	for stem length mm	Set of sheets
131-423/26	126°	28/32	200, 250, 300, 350	4
131-423/35	135°	28/32	200, 250, 300, 350	4

Instructions of Cleaning and Maintenance

Specific instructions for instruments are available on request from info@linkbio.com

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Indicated indications and contraindications: SP II Long Stem Prostheses
General Indications
Mobility-limiting diseases, fractures or defects of the hip joint or proximal femur which cannot be treated by conservative or osteosynthetic procedures
Indications
Intractable pain and immobility resulting from osteo, traumatic, or rheumatoid arthritis.
For persistent or recurrent pain and physical impairment subsequent to joint replacement or other conventional techniques.
Where bone quality is deficient/inadequate for a more conservative technique and total reconstruction involving the joint replacement is the considered surgical solution.
Contraindications
Presence of osteomyelitis or any infection in or in proximity to the operative joint.
Systemic deficiencies affecting neuromuscular, vascular or skeletal mechanisms, secondary to pathological conditions where the affected joint or extremity has been compromised, and its condition would clearly contraindicate the surgery.
Rapid joint destruction or bone resorption apparent on roentgenograms
Elevation of sedimentation rate unexplained by other disease, elevation of W.B.C. count, or more marked shift in differential count. Additional distant foci of infection such as genitourinary, pulmonary, skin, or other sites are a relative contraindication, because hematogenous transmittal to the implant site may occur. The foci of infection should be treated prior to, during, and after the surgery.
Use of this implant in conditions or for purposes other than those for which it was originally designed.

Please note:
This device is intended for cemented use.

Please note:
These indications/contraindications refer to standard cases. The ultimate decision on whether or not an implant is suitable for a patient must be made by the surgeon based on his/her individual analysis and his/her experience.

Please note:
LINK Lubinus SP II Hip Stems can be combined with prostheses heads up to +4mm additional neck length.

Important Information

Please note the following regarding the use of our implants:

1. **Choosing the right implant is very important.**
   The size and shape of the human bone determines the size and shape of the implant and also limits the load capacity. Implants are not designed to withstand unlimited physical stress. Demands should not exceed normal functional loads.

2. **Correct handling of the implant is very important.**
   Under no circumstances should the shape of a finished implant be altered, as this shortens its life span. Our implants must not be combined with implants from other manufacturers. The instruments indicated in the Surgical Technique must be used to ensure safe implantation of the components.

3. **Implants must not be reused.**
   Implants are supplied sterile and are intended for single use only. Used implants must not be used again.

4. **After-treatment is also very important.**
   The patient must be informed of the limitations of the implant. The load capacity of an implant cannot compare with that of healthy bone!

5. **Unless otherwise indicated, implants are supplied in sterile packaging.**
   Note the following conditions for storage of packaged implants:
- Avoid extreme or sudden changes in temperature.
- Sterile implants in their original, intact protective packaging may be stored in permanent buildings up until the “Use by” date indicated on the packaging.
- They must not be exposed to frost, dampness or direct sunlight, or mechanical damage.
- Implants may be stored in their original packaging for up to 5 years after the date of manufacture. The “Use by” date is indicated on the product label.
- Do not use an implant if the packaging is damaged.

6. **Traceability is important.**
   Please use the documentation stickers provided to ensure traceability.

7. **Further information** on the material composition is available on request from the manufacturer.

Follow the instructions for use!

Waldemar Link GmbH & Co. KG, Hamburg

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