LINK®

MP Reconstruction System

Uncemented & Cemented B

Surgical Technique

CE 0482

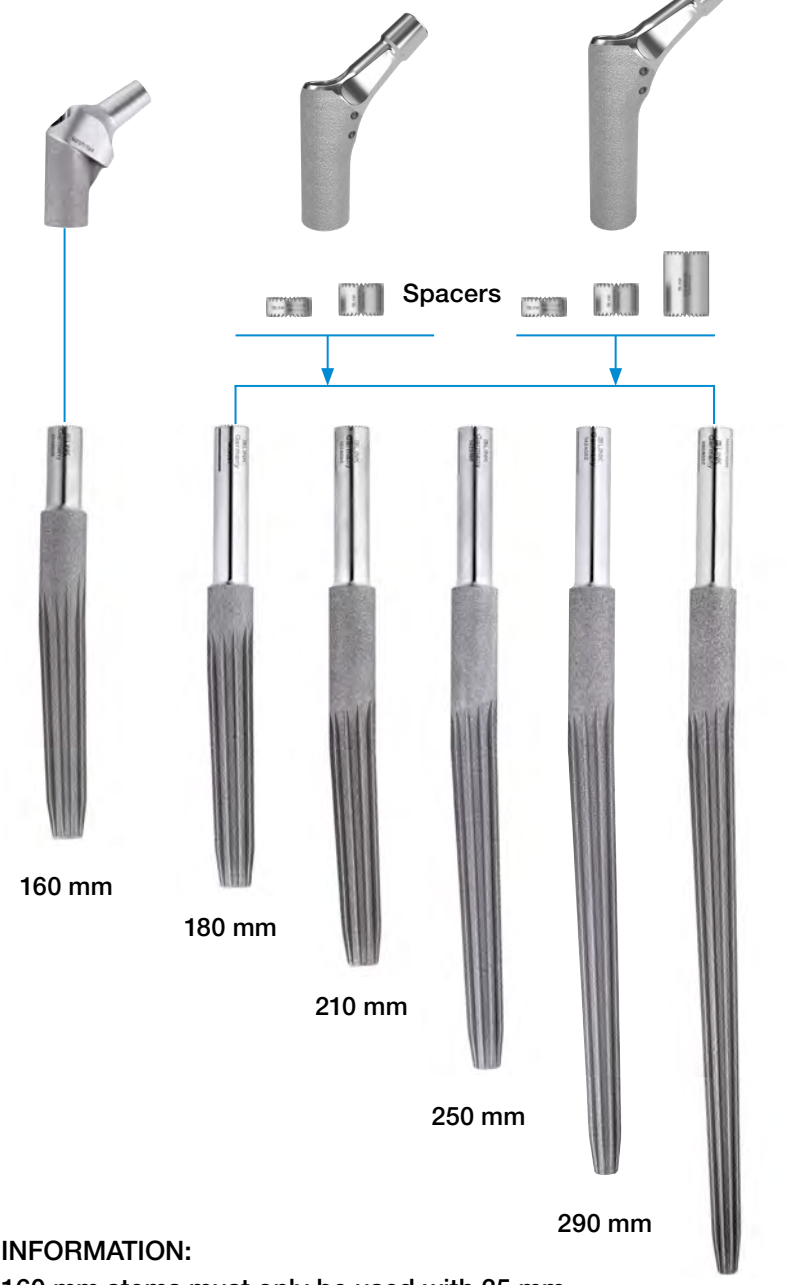
Explanation of Pictograms			
	Manufacturer	REF	Article number
MAT	Material number	CE	Product meets the applicable requirements, which are regulated in the EU harmonization legislation for the affixing of the CE marking.

MP Reconstruction System

Uncemented & Cemented B

Hip Prosthesis Stems, uncemented
MAT Tilastan-S
160 - 210 mm - Ø 12 mm
160 - 330 mm - Ø 14, 16, 18, 20, 22.5, 25 mm

Expansion bolts
41 + 61 mm



Neck segments

Standard
35 mm, CCD 126° and 135°

Slim
45 + 65 mm, CCD 126°, 131°, 136°

with suture holes Standard
35 mm, CCD 126°

35 mm neck segments must only be used without proximal spacers

Modular Revision Stems, cemented
Material: EndoDur-S (CoCrMo alloy)

INFORMATION:
160 mm stems must only be used with 35 mm neck segment and without proximal spacers.

210 mm long stems with 12 mm diameter must only be used without proximal spacers.

The MP Reconstruction System is for uncemented use.
Only cemented labeled modular stems are indicated for cemented use.

Preoperative Planning

It is important to plan the intervention preoperatively in order to select the correct implant type and size and its final intraosseous position based on the patient‘s individual anatomy. The surgeon should perform a careful evaluation of the patient´s clinical condition and consider their level of physical activity before performing hip replacement. For optimal results, the surgery should be planned in advance using the appropriate templates. The magnification factor of the X-ray images must be compatible with the factor on the templates. Special MP Reconstruction System X-ray templates are available in standard 1.1:1. The implant size must be chosen from adequate AP and ML X-rays with sufficient quality. Each X-ray should be large enough to apply the whole template. A second X-ray of the unaffected joint is often helpful. Inadequate pre-operative planning can lead to improper selection of the implants and/or incorrect implant positioning.

CAUTION:
Preoperative planning provides an initial estimation of the final situation but cannot conclusively determine the most adequate size to be used. The ultimate decision can only be taken intraoperatively.

As general rule, the hip prosthesis stem should be measured in such a way that positive-fit fixation of the prosthesis is created over a sufficient length in vital bone. To this end, it is necessary to make allowance for reaming the femoral canal. Achieving anatomically appropriate head-neck length is of paramount importance. The MP Reconstruction System offers three offsets with intraoperative different CCD angles. This combined with femoral heads with up to four head-neck lengths, allows the surgeon great flexibility.

The surgical instructions below for reconstructing a damaged hip joint with the MP Reconstruction System describe an idealized surgical situation. However, every procedure has individual particularities, and the surgeon decide during surgery which method can be expected to achieve the most outcome in each case.

In-situ implants and the bone cement must be completely removed before implanting an MP Reconstruction System.

INFORMATION:
Preoperative planning may be time-consuming, but the time spent results in better intraoperative support and enhanced quality assurance.

Preoperative planning supports optimal surgical outcomes by ensuring the most appropriate implant selections for the patient. The key objectives are to correctly position the central rotational point of the hip, to achieve the correct leg length and finally preserve or restore sufficient soft tissue tension by avoiding medialization of the femur.

Planning should ideally be based on two X-rays: an AP film of the pelvis and a mediolateral X-ray of the hip to be revised. When performing the pelvic X-ray, it is important to ensure that:

1. Both femurs are shown in adequate length, to show the preoperative geometry.

2. The femurs are straight and parallel and, if possible, internally rotated approximately 5° in that position.

3. Key landmarks needed for planning are visible: the inferior margins of the obturator foramen and of the acetabular teardrop.

When evaluating the X-rays, it is important to calculate the magnification factor. Two factors are decisive (Fig. 1):

1) Focal distance
Focal spot X-ray tube ⟷x⟶ Film cassette
A focal distance of 100 cm gives magnification of about 10%.

2) Object film distance
Femoral axis ⟷x⟶ Film cassette

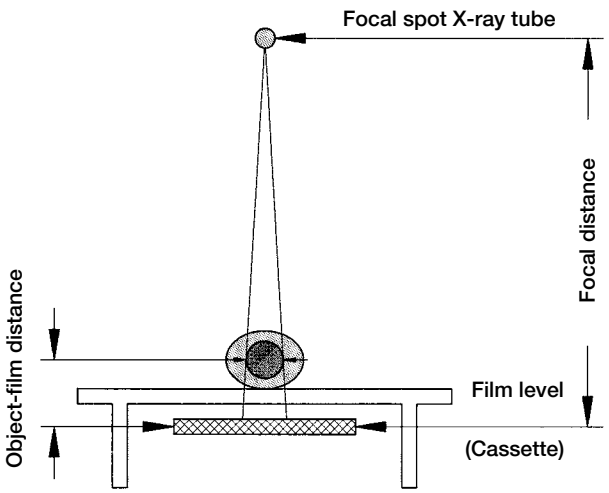


Fig. 1

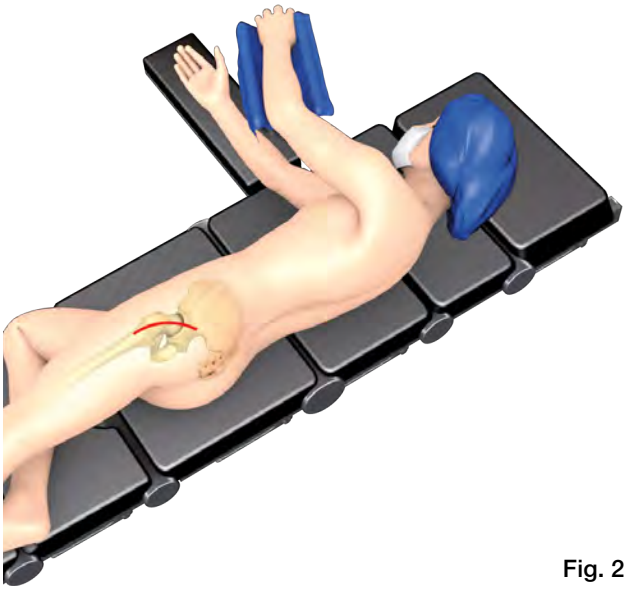


Fig. 2

Patient positioning/Surgical approaches

The surgeon is free to choose the surgical approach on the basis of their experience and judgment, and according to the specific situation. The following illustration shows the visualization with a posterior approach and with the patient in the lateral position (Fig. 2).

Fig. 3

The surgical instructions below for reconstructing a damaged hip joint using the MP Reconstruction System depict an idealized surgical situation. However, every procedure has individual particularities, and the surgeon decides during the surgery which method can be expected to achieve the most success in each case.

Opening

After careful removal of the previous implant and any associated cement, the greater trochanter and proximal femur are cleared with the Proximal Start Reamer, in order to allow easy, axial access into the femoral canal (Fig. 3).

Fig. 4

Preparation of the femoral canal
Reamers are chosen according to the planned hip prosthesis stem length. Reaming must be performed by hand. Assemble the reamer with the reamer driver adapter and T-handle as shown (Fig. 4).

Fig. 5

Start with a reamer at least two sizes smaller than the preoperatively planned stem diameter. Carefully ream progressively until adequate endosteal engagement is achieved. The Distal Stem implant size should match final Distal Reamer size in order to obtain the desired press-fit of the implant. Care should be taken that the reamer is always oriented straight down into the femoral canal to avoid varus positioning (Fig. 5).

CAUTION:
Care should be taken to avoid fracture of the GT. The reamer must run before touching the bone, in order to decrease the risk of FX.

Fig. 6

The depth of reaming should be determined by the preoperative planning. Two lines on the reamer driver adapter are used for orientation. The upper mark “T” indicates the centre of rotation of the seated stem construct without the use of spacers and +0 mm head. This mark is oriented at the top of the greater trochanter. The lower mark “C” indicates the proximal end of the seated distal implant stem. This line should be at the proximal end of the lesser trochanter (Fig. 6).

The +10 mm, +20 mm and +30 mm marks on the adapter can be used as visual aids, in case spacers are used. The procedure can now be continued following two options.
Option 1 - trialing off the reamer (optional)
Option 2 - impaction of the implant stem

CAUTION:
In cases with weak bone or an extended trochanteric osteotomy, reaming to the “T” or “C” line is recommended. If the proximal bone is completely intact, reaming to the 10 mm mark at the calcar (“C”) or trochanter (“T”) is recommended to avoid the risk of the stem sitting to proud.

If a stem length 160 mm is used, please consider page 14 Implantation of 160 mm stems.

Option 1 - Trialing off the reamer
If desired, a trial reduction off the reamer can be conducted to obtain an early indication of the leg length. Disconnect the reamer adapter and T-handle from the reamer to trial off the modular reamer. Three proximal body trials are available to replicate the three different offset versions. There is no change in leg length between the different offset versions.
The short neck segments (length 45 mm) can only be combined with +5 mm and +10 mm spacers. If the proximal cavity is not cleared enough or the greater trochanter is overhanging it might be necessary to remove bone to fit the trial necks. This can be done with a rongeur.

To assemble the trial neck onto the reamer, the trial neck is slid over the rod (Fig 7a) until the desired height is achieved. Fix the neck the desired height and anteversion by tightening the screw in the neck with the torque-limiting screwdriver. (Fig 7b)

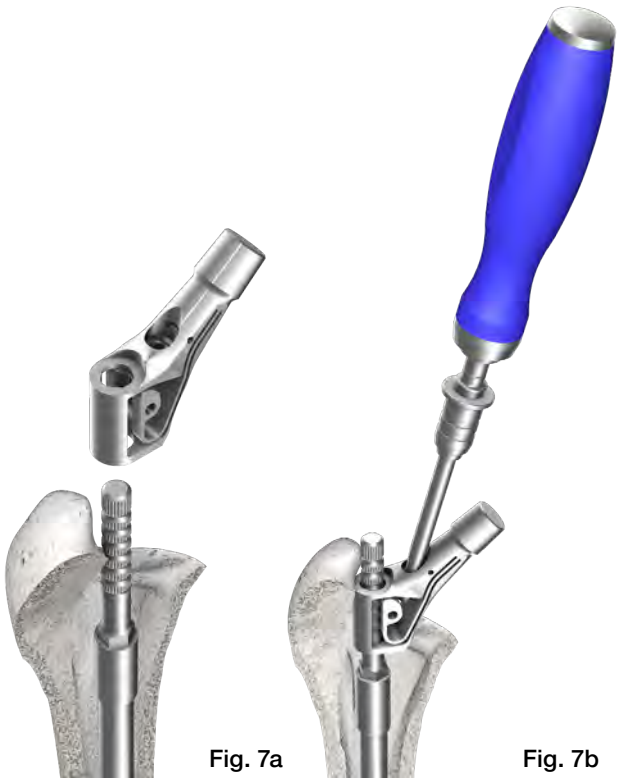


Fig. 7a

Fig. 7b

Fig. 7c

A plastic trial head is placed on the trunnion and a trial reduction can be performed (Fig. 7c).

INFORMATION:
Depending on the orientation of the kink of the final implant, the reconstructed offset might vary from trialing off the reamer. Trialing off the reamer can only help assessing the reconstructed leg length for that reason. It is highly recommended to trial off the final stem to establish the correct offset and leg length. Depending on the bone quality, the seating of the final stem might vary slightly from the reamer.

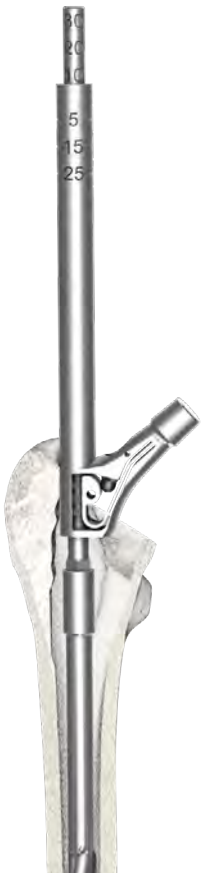


Fig. 8a

Fig. 8b

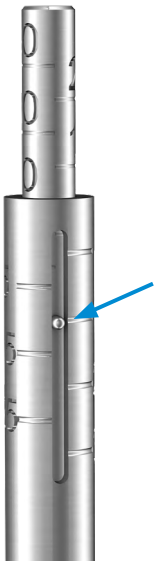


Fig. 8c

In order to determine which spacers are needed, slide the spacer gauge over the reamer shaft, so that the post of the spacer gauge is pushed up (Fig. 8a).
There are two ways to read off the gauge.

1. Height markings on the height gauge post align with the top of the tube (Fig. 8b)
2. Height markings on the height gauge tube align with the pin (Fig. 8c)

The spacer gauge is removed and the screw in the trial neck is loosened with the screwdriver until the trial neck is loose and can be removed.
Reattach the reamer adapter and T-handle and remove the reamer.

Fig. 9

Option 2 - Impaction of implant stem
The selected stem of the MP Reconstruction System, which corresponds to the size of the last reamer, is connected to the stem adapter.
The stem adapter is screwed into the thread in the proximal end of the implant stem by using the hex screwdriver (Fig. 9).

Assemble the impactor handle to the implant and stem adapter as shown in Fig. 10a.

INFORMATION:
The laser line on the implant stem identifies the side of the stem which indicates the 3° kink. It should be aligned with the laser line on the impactor handle (Fig. 10b). The markings are used for better orientation during impaction. The arrow on the strike plate now indicates where the angle of the stem is. This makes it possible to insert the MP stem into the femoral canal precisely aligned to the natural curvature of the femur.

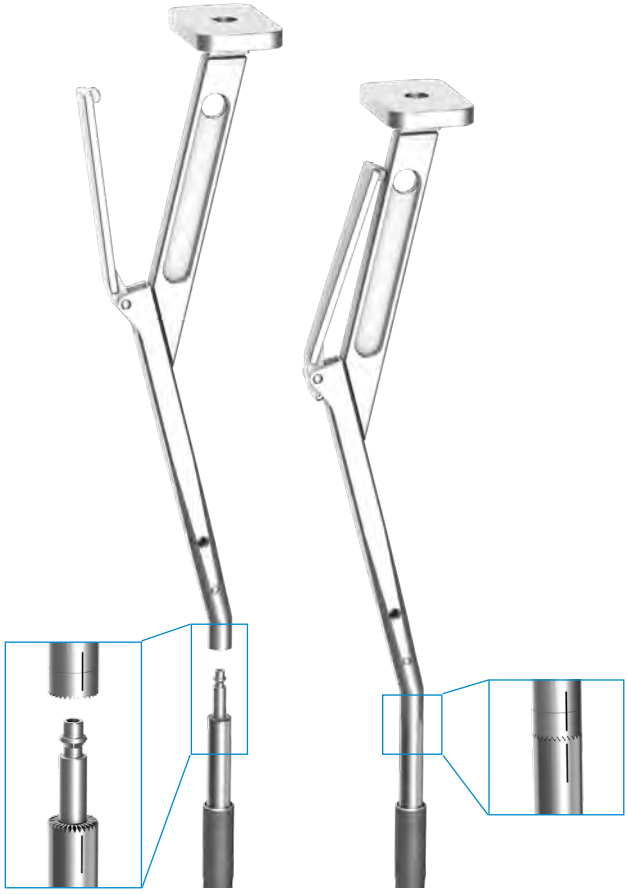


Fig. 10a Fig. 10b

The stem is placed in the prepared femoral canal by hand until safe bony engangement is achieved and it is then driven into its definitive position with a few hammer strokes.
The stability of the fixation can be recognized in the following way:

1) The prosthesis penetrates deeper into the medullary cavity with each hammer stroke, until the required stability has been achieved and the prosthesis no longer moves under continued hammer strokes.
2) At the same time, the sound of the hammering changes to a higher pitch.

INFORMATION:
If the stem protrudes after impaction, in order to have an adequate positioning of the stem, it is recommended to remove the implant again and repeat the reaming process. This time the reaming depth should be up to 10 mm deeper than before.

The impactor handle is now removed.

Fig. 11

Preparation of the proximal femur
The reaming guide that corresponds to the used neck segment is pushed onto the implant adapter until it is seated (Fig. 11).

Fig. 12

The short reaming guide is used for the long neck segments. The long reaming guide is used for the short neck segments (Fig. 12).

Body height	Reaming guide
short (45 mm)	long - gold
long (65 mm)	short - silver

Fig. 13

The tubular reamer is then used on power to clear out the metaphyseal medullary space by reaming over the reaming guide until the reamer is stopped in depth by the reaming guide. The reamer must turn before touching the bone (Fig. 13).

INFORMATION:
In case of weak bone, care should be taken. When the short reaming guide is used and the greater trochanter does not allow for the tubular reamer to be guided on the reaming guide before touching the bone, reaming can be performed in two steps. First use the long reaming guide to clear the proximal part of the greater trochanter. The short reaming guide can then be used in a second reaming step to prepare for the neck segment in sufficient depth.

Reamer and reaming guide and stem adapter are removed.

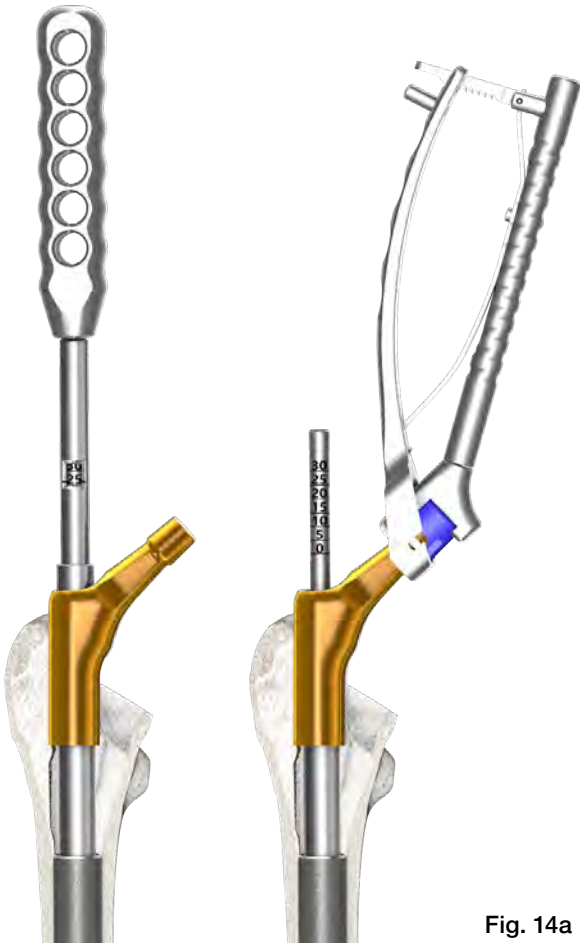


Fig. 14a

Trialing with trial neck

Insert the guide rod into the stem using the hex screwdriver. The trial neck segment is then slid over the guide rod onto the stem either by hand or by using the insertion forceps (Fig. 14a right).
The neck can be driven into its final position with gentle hammer strokes, using the neck inserter / screwdriver (Fig. 14a left).
If spacers are used, trial spacers are slid over the guide rod before inserting the neck segment.

The final position of the neck segments on the prosthesis stem within the bone is indicated by the scale within the window of the neck inserter. If the markings of the guide rod and neck inserter touch, the height of spacers used is shown in the window of the neck inserter (Fig. 14b). If no spacer is used, the “0” line is referenced (Fig. 15b). If spacers are used, the corresponding line of reconstruction height of the spacers is used as the reference, e.g., if 5 mm + 10 mm spacers are used, the reference line is “15”.
The guide rod is removed and the trial neck is fixed with a trial screw using the hex screwdriver.
If no spacer(s) or up to +10 mm are required, the short screw is used. If spacers are used from +15 mm to +30 mm, the long screw is used.

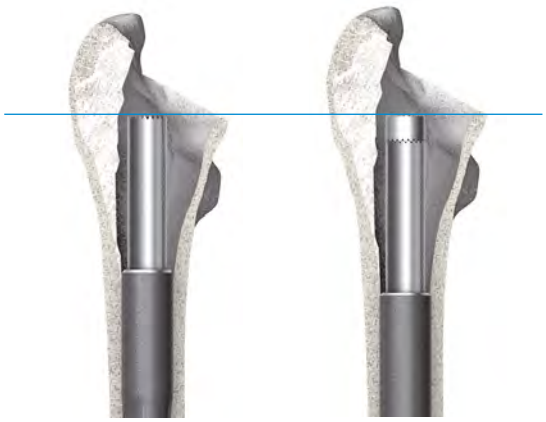
Fig. 14b

Fig. 14c

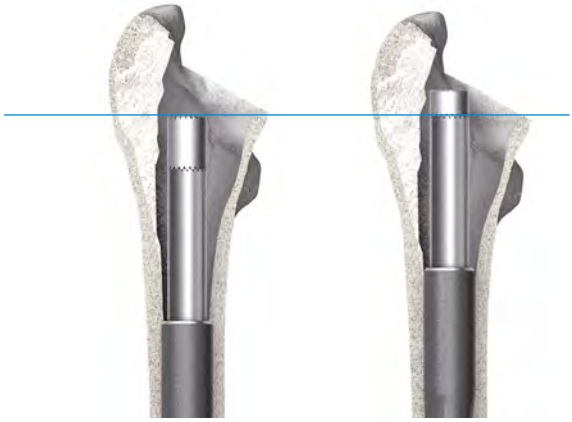
Various trial heads are used to check for optimal offset, rotation, correct leg length and adequate stability. The range of motion is also checked in order to exclude any impingement of bone or implant with the acetabular cup (Fig. 14c).

The trial components are removed.

Use of proximal spacers:



Leg length: ± 0 mm ± 0 mm



± 0 mm + 10 mm

Leg Length and Lateralization

Leg length can be corrected by 5 mm, 10 mm, 15 mm, 20 mm, 25 mm or 30 mm (or combination of any, but no more than two proximal spacers) by using trial proximal spacers.

Fine tuning of the leg length and different lateralization of the hip prosthesis stem can be achieved by selecting:

- Neck segment with low, standard, or high offset with no change in leg length or
- Trial head with suitable head-neck length; changing both leg length and offset

Short trial neck segments must not be used with more than +10 mm proximal spacers.

Rotation of the neck segment

The rotation can be corrected by turning the trial neck segment after loosening the fixation screw. The desired position should then be marked on the bone so that the final neck segment can be positioned correctly.

CAUTION:
A short trial fixation screw is required if no trial proximal spacer, a 5 mm or a 10 mm trial proximal spacer is used. Any spacer combination that exceeds +10 mm requires the use of the long trial fixation screw and expansion bolt.

INFORMATION:
Use of a longer trial neck segment to replace one of the 45 mm trial neck segment with a 65 mm trial neck segment can require the use of the tubular reamer due to the longer distal part of the 65 mm neck segment.
In this case, please proceed as described in "Preparation of the proximal femur".

Once the leg length, rotation and joint stability have been checked, the trial prostheses can be removed.

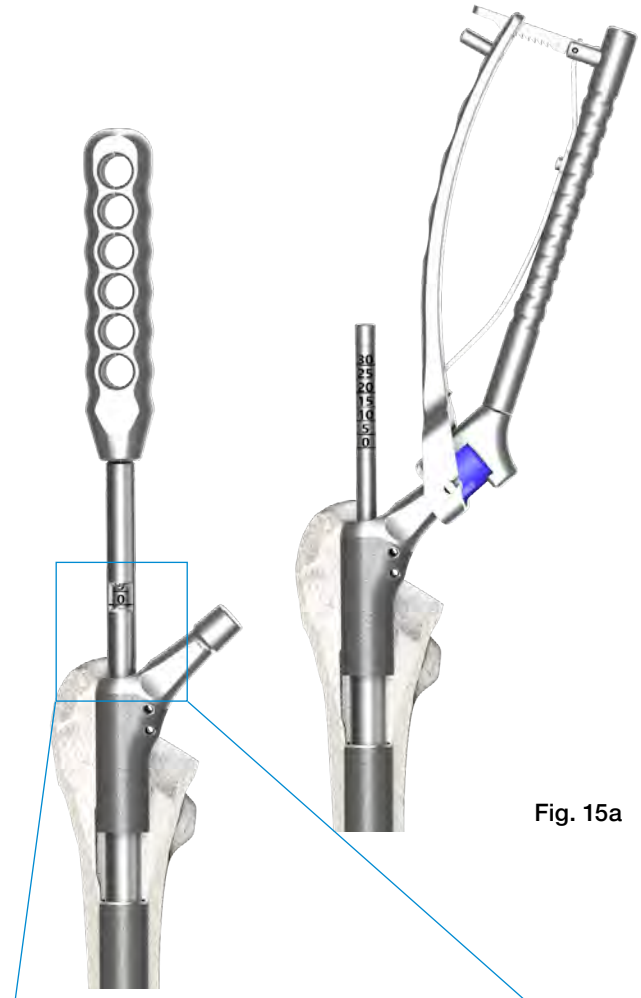


Fig. 15a

Fig. 15b

Implantation of neck segment
Insert the guide rod into the stem using the hex screwdriver. The neck segment is then slid over the guide rod onto the stem either by hand or by using the insertion forceps (Fig. 15a right).
The neck can be driven into its final position with gentle hammer strokes, using the neck inserter / screwdriver (Fig. 15a left).
If spacers are used, they are slid over the guide rod before inserting the neck segment.

INFORMATION:
All components and interfaces must be clean before assembly.

The final position of the neck segments on the prosthesis stem within the bone is indicated by the scale within the window of the neck inserter (Fig. 15b). If the markings of the guide rod and neck inserter touch, the height of spacers used is shown in the window of the neck inserter. If no spacer is used the “0” line is referenced, if spacers are used, the corresponding line of reconstruction height of the spacers is used as reference, e.g., if 5 mm +10 mm spacers are used, the reference line is “15”.

The guide rod is removed and the neck fixed with the expansion bolt, using the neck inserter.
If no spacer(s) up to +10 mm are required, the short expansion bolt is used. If spacers are used from +15 mm to +30 mm, the long expansion bolt is used.

A final trial reduction can be achieved using a plastic trial head. If necessary, the rotation can now be corrected by loosening the expansion bolt again. The guide rod is then reinserted into the stem and the neck segment can be rotated by slightly lifting it up before rotating. Then the steps of inserting and checking are repeated as described above.

Fig. 16

Final assembly of the implant

After the expansion bolt is hand tightened with the neck inserter / screwdriver, the expansion bolt is tightened with the torque wrench. When tightening the expansion bolt with the torque wrench, the insertion forceps is used as a counter torque by gripping the neck segment over the trunnion. Once the necessary torque is reached, the torque wrench emits a loud snap (Fig. 16).

INFORMATION:
The plastic sleeves (taper caps) of the insertion forceps must be checked for damage before use.

CAUTION:
LINK implants and expansion bolts can only be used once. It is not possible to reuse them because no expansion occurs when the bolt is tightened a second time.

Fig. 17

Attaching the prosthesis head

The trunnion of the neck segment is carefully cleaned and dried. This is particularly important with ceramic heads. Then the head is attached by hand with a rotational movement, applying axial pressure.
To finish, the driver is used to tap the prosthesis head into position (Fig. 17).

Final reduction of the joint

After cleaning the joint surfaces, the joint is reduced. The wound is closed in layers.

Implantation of 160 mm stems

If a 160 mm stem is used, only 35 mm neck segments can be used and no use of spacers is permitted. In this case the instruments for MP Modular 160 mm are necessary.

All surgical steps, but trialing off the reamer, are identical to the surgical technique described above for uncemented stems. Trialing off the reamer can be done with the low offset reamer trial neck, but note that the offset value will vary from trial to implant. The reamer trial neck will not give you an accurate leg length assessment.
For the preparation of the proximal femur, the long silver reaming guide 134-205/35 is used. When the insertion forceps is used, the taper cap 131-830/04 has to be used instead of 179-122/01.

Fig. 18

Fig. 19

Surgical Technique, cemented

Procedure

If use of a cemented stem is planned, the 180 mm long MP trial stems (134-070/00), the additional instrument set for the cemented surgical technique (134-346/00), and a UHMWPE insertion sleeve (134-212/00) are required in addition to the basic instrument set.

The medullary canal is prepared with the standard reamers to accept the hip prosthesis stem. It is recommended to start with the smallest diameter and open up the medullary canal millimeter by millimeter until contact with the cortical bone is identified distally around the circumference.

To achieve an cement coating of approximately 1 mm all the way around, the medullary space must be excavated to a diameter at least 2 mm larger than the stem used.

It might be necessary to clear the proximal femur to allow for the use of the plastic sleeve. If this can not be achieved using the start reamer, please proceed with the following steps.

Once the medullary space has been prepared to the required diameter, a trial stem measuring 180 mm in length is inserted, corresponding to the diameter of the last medullary space reamer used.

The trial stem is secured to the inserter using the hex screwdriver, and then inserted into the femur up to the planned proximal marking (Fig. 18).

CAUTION:
Do not exert too much pressure, as the trial stem is not intended to achieve a press fit, and can thus be driven further into the femur than planned.

The stem adapter (134-202/02) is screwed onto the trial stem. The reaming guide that corresponds to the neck segment used is pushed onto the implant adapter until it is seated. Then the proximal bone is reamed away for the cemented preparation with the tubular reamer (134-211/00) (Fig. 19).
The reamer guide is removed an the stem adapter is unscrewed again and the trial stem is removed from the femur with the aid of the inserter. This can be done using the slap hammer.

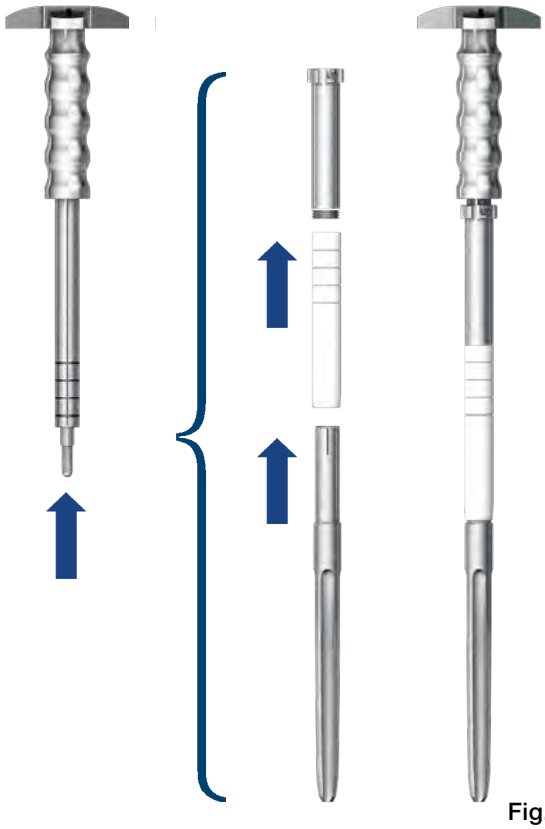


Fig. 20

The plastic sleeves must be checked for damage before use.

The plastic sleeve is screwed to the insertion sleeve, pushed onto the proximal section of the implant stem, and then screwed to the inserter (Fig. 20).

The medullary space is then sealed with a bone dowel or a medullary plug a little below the intended position of the stem tip. Following application of the cement, the hip prosthesis stem is introduced into the medullary space. The markings on the plastic sleeve correspond to the markings on the inserter used in the uncemented surgical technique. As such, the lowest line marks the proximal end of the stem.

CAUTION:
When applying the cement, it is essential to ensure secure fixation of the distal end of the stem. Proximal oozing of the cement should be avoided and any escaping cement removed before it sets.

Fig. 21

The stem is held in the required position with the inserter until the cement sets. The plastic sleeve prevents excess cement from coming into contact with the proximal portion of the stem (Fig. 21).
Once the cement has completely set, the inserter is disconnected from the implant and removed along with the plastic sleeve.

Fig. 22

To remove the plastic sleeve, the extractor is inserted in the sleeve and the bayonet mount is locked. The plastic sleeve can now be twisted free from the cement and removed (Fig. 22).

The implant adapter is screwed onto the prosthesis stem and the further preparation of the proximal femur can continue as shown on page 08.

Any excess cement is then removed from the area of the proximal femur at the next reaming stage and with the tubular reamer (134-211/00).

INFORMATION:
We recommend checking the cement application and the associated prosthesis positioning with radioscopic control.

Hip Prosthesis Stems, uncemented

MAT Tilastan-S

INFORMATION:
160 mm long stems must only be used with short neck segments and without proximal spacers. 210 mm long stems with 12 mm diameter must only be used without proximal spacers.

*** CAUTION:**
Stems combined with a neck/head combination creating an offset higher than 40.0 mm could not be proven to fulfill the mechanical normative requirements.

**** CAUTION:**
These stems are NOT be used with prosthesis heads size L or XL, when the offset of the neck segment is 40 mm or larger if proximal spacers are used.

REF microporous	Prox. stem-Ø mm	Dist. stem-Ø mm	Length mm
172-916/14	14.0	12.0	160
172-916/16	16.0	14.0	160
172-916/18	18.0	16.0	160
172-916/20	20.0	18.0	160
172-916/22	22.5	21.0	160
172-916/25	25.0	23.0	160
172-918/12	12.0	10.0	180
172-918/14	14.0	12.0	180
172-918/16	16.0	14.0	180
172-918/18	18.0	16.0	180
172-918/20	20.0	18.0	180
172-918/22	22.5	21.0	180
172-918/25	25.0	23.0	180
172-921/12	12.0	10.0	210
172-921/14**	14.0	12.0	210
172-921/16	16.0	14.0	210
172-921/18	18.0	16.0	210
172-921/20	20.0	18.0	210
172-921/22	22.5	21.0	210
172-921/25	25.0	23.0	210
172-925/14*	14.0	11.0	250
172-925/16	16.0	13.0	250
172-925/18	18.0	15.0	250
172-925/20	20.0	17.0	250
172-925/22	22.5	19.0	250
172-925/25	25.0	22.0	250
172-929/14*	14.0	9.0	290
172-929/16	16.0	11.0	290
172-929/18	18.0	13.0	290
172-929/20	20.0	15.0	290
172-929/22	22.5	18.0	290
172-929/25	25.0	20.0	290
172-930/14*	14.0	8.0	330
172-930/16	16.0	10.0	330
172-930/18	18.0	12.0	330
172-930/20	20.0	14.0	330
172-930/22	22.5	16.0	330
172-930/25	25.0	19.0	330

Hip Prosthesis Stems, cemented, anatomically curved

MAT EndoDur-S (CoCrMo alloy)

REF	Description	Diameter	Length
172-900/12	**Hip prosthesis stem,** uncemented	12 mm	200 mm
172-900/14	**Hip prosthesis stem,** uncemented	14 mm	200 mm
172-900/16	**Hip prosthesis stem,** uncemented	16 mm	200 mm
172-901/12	**Hip prosthesis stem,** uncemented	12 mm	240 mm
172-901/14	**Hip prosthesis stem,** uncemented	14 mm	240 mm
172-901/16	**Hip prosthesis stem,** uncemented	16 mm	240 mm
172-902/12	**Hip prosthesis stem,** uncemented	12 mm	280 mm
172-902/14	**Hip prosthesis stem,** uncemented	14 mm	280 mm
172-902/16	**Hip prosthesis stem,** uncemented	16 mm	280 mm
172-903/12	**Hip prosthesis stem,** uncemented	12 mm	320 mm
172-903/14	**Hip prosthesis stem,** uncemented	14 mm	320 mm
172-903/16	**Hip prosthesis stem,** uncemented	16 mm	320 mm

CAUTION:
Stems of length 240 mm or longer combined with necks and head that create an offset higher than 43.2 mm could not be proven to fulfill the mechanical normative requirements.

Neck Segments

MAT Tivastan, Taper 12/14 mm

REF	Description	Length mm	Version	CCD angle	Offset mm
172-965/26	**Neck Segment, standard**	35	short	126°	31
172-965/35	**Neck Segment, standard**	35	short	135°	29
172-981/26	**Neck Segment, XXL**	35	short	126°	40
172-981/35	**Neck Segment, XXL**	35	short	135°	40

REF	Description	Length mm	Version	CCD angle	Offset mm
99-0984/32	**Neck Segment with suture holes, standard**	35	short	126°	31
99-0984/28	**Neck Segment with suture holes, XXL**	35	short	126°	40

REF	Description		Length mm	Version	CCD angle	Offset mm
137-045/32	**Neck Segment, low offset**	Slim	45	short	136°	32
137-045/38	**Neck Segment, standard**	Slim	45	short	131°	38
137-065/38	**Neck Segment, standard**	Slim	65	long	131°	38
137-065/46	**Neck Segment, lateralized**	Slim	65	long	126°	46
137-145/38	**Neck Segment, standard**	Defect Reconstruction	45	short	131°	38
137-165/38	**Neck Segment, standard**	Defect Reconstruction	65	long	131°	38
137-165/46	**Neck Segment, lateralized**	Defect Reconstruction	65	long	126°	46

*** CAUTION:**
These neck segments are NOT to be combined with uncemented stems Ø 14 mm of length 250 mm and longer when prosthesis heads size L or XL are used.

Spacers

MAT EndoDur-S (CoCrMo alloy)

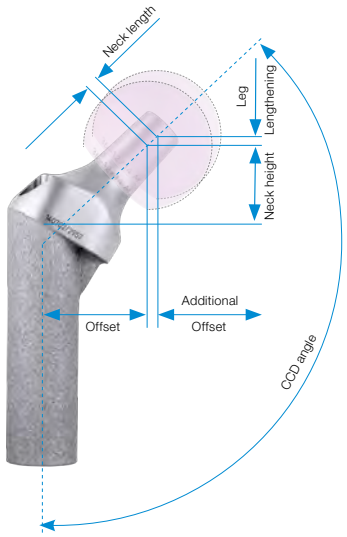
REF	Description	Length mm
172-950/05	**Proximal Spacer**	5
172-950/10	**Proximal Spacer**	10
172-950/20	**Proximal Spacer**	20

Expansion Bolts

MAT EndoDur-S (CoCrMo alloy)

REF	Description	SW mm	Length mm
172-947/38	**Expansion Bolt**	8 mm	41
172-947/58	**Expansion Bolt**	8 mm	61

Offset- and length values using different Neck Segments and Heads



	CCD angle 136°	CCD angle 131°	CCD angle 126°
	Head Ø 28 - 40 mm size M	Head Ø 28 - 40 mm size M	Head Ø 28 - 40 mm size M
Offset	32 mm	38 mm	46 mm
Neck height	26 mm	26 mm	26 mm

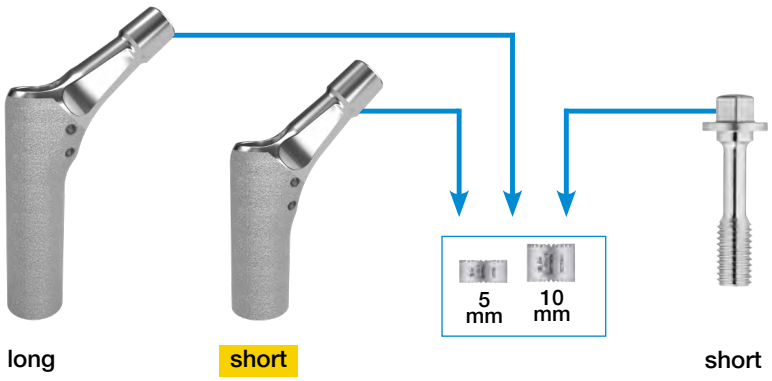
	CCD angle 136° Offset 32 mm				CCD angle 131° Offset 38 mm				CCD angle 126° Offset 46 mm			
	Head Ø 28mm				Head Ø 28mm				Head Ø 28mm			
	S	M	L	XL	S	M	L	XL	S	M	L	XL
	-3.5	0	+3,5	+10.5	-3.5	0	+3,5	+10.5	-3.5	0	+3,5	+10.5
Additional offset	-2.4	0	2.4	7.3	-2.6	0	2.6	7.9	-2.8	0	2.8	8.5
	29.6	32	34.4	39.3	35.4	38	40.6	45.9	43.2	46	48.8	54.5
Leg lengthening	-2.5	0	2.5	7.5	-2.3	0	2.3	6.9	-2.1	0	2.1	6.2

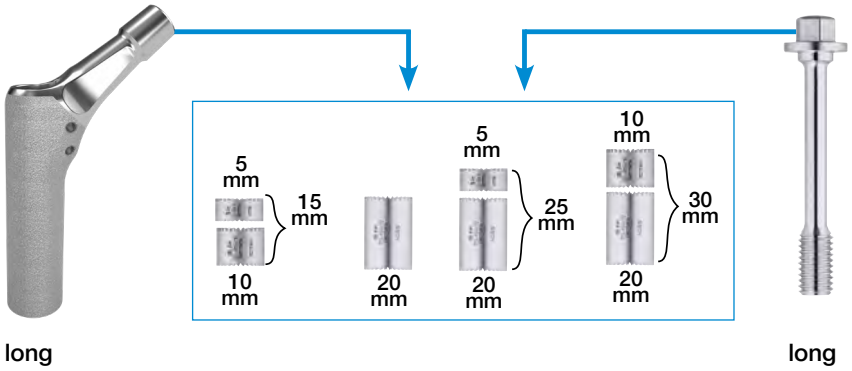
	CCD angle 136° Offset 32 mm				CCD angle 131° Offset 38 mm				CCD angle 126° Offset 46mm			
	Head Ø 32-36mm				Head Ø 32-36mm				Head Ø 32-36mm			
	S	M	L	XL	S	M	L	XL	S	M	L	XL
	-4	0	+4	+8	-4	0	+4	+8	-4	0	+4	+8
Additional offset	-2.8	0	2.8	5.6	-3.0	0	3.0	6.0	-3.2	0	3.2	6.5
	29.2	32	34.8	37.6	35.0	0	41.0	44.0	42.8	46	49.2	52.5
Leg lengthening	-2.9	0	2.9	5.8	-2.6	0	2.6	5.3	-2.4	0	2.4	4.7

Compatibility between Neck Segments, Spacers and Expansion Bolts

Spacer height (mm)	Expansion bolt length	Body options	Offset (mm)
0	short	short (45 mm) or long (65 mm)	32, 38, 46
5	short	short (45 mm) or long (65 mm)	32, 38, 46
10	short	short (45 mm) or long (65 mm)	32, 38, 46
15	long	long (65 mm)	38, 46
20	long	long (65 mm)	38, 46
25	long	long (65 mm)	38, 46
30	long	long (65 mm)	38, 46

Expansion bolt length
Proximal spacers (trial + implant)

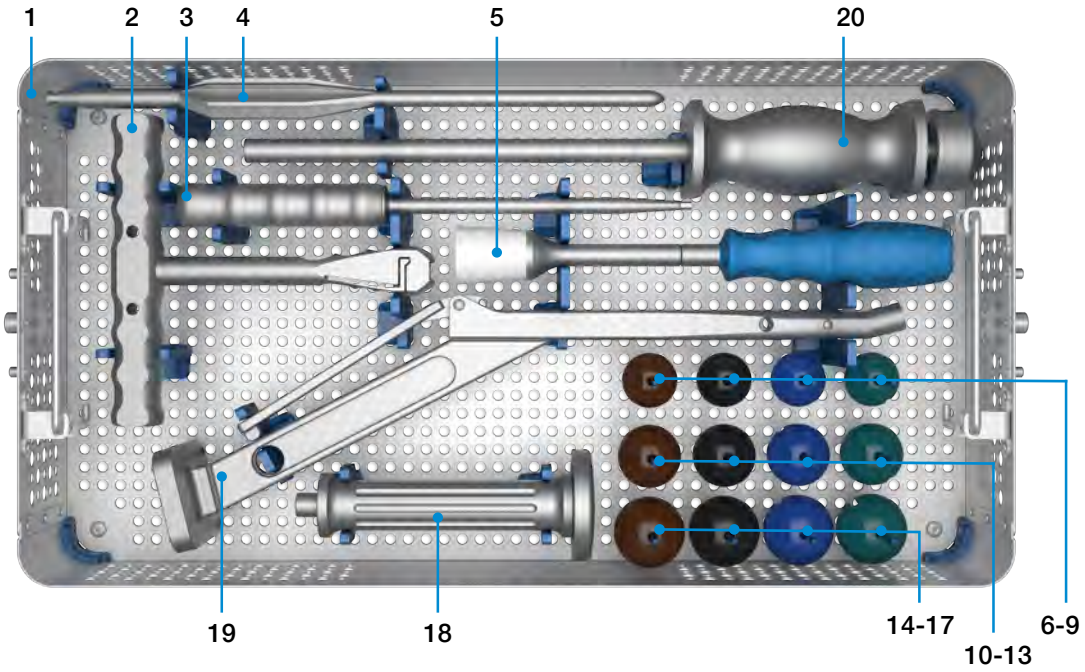




Body height	Reaming guide
short (35 mm)	long - silver
short (45 mm)	long - gold
long (65 mm)	short - silver

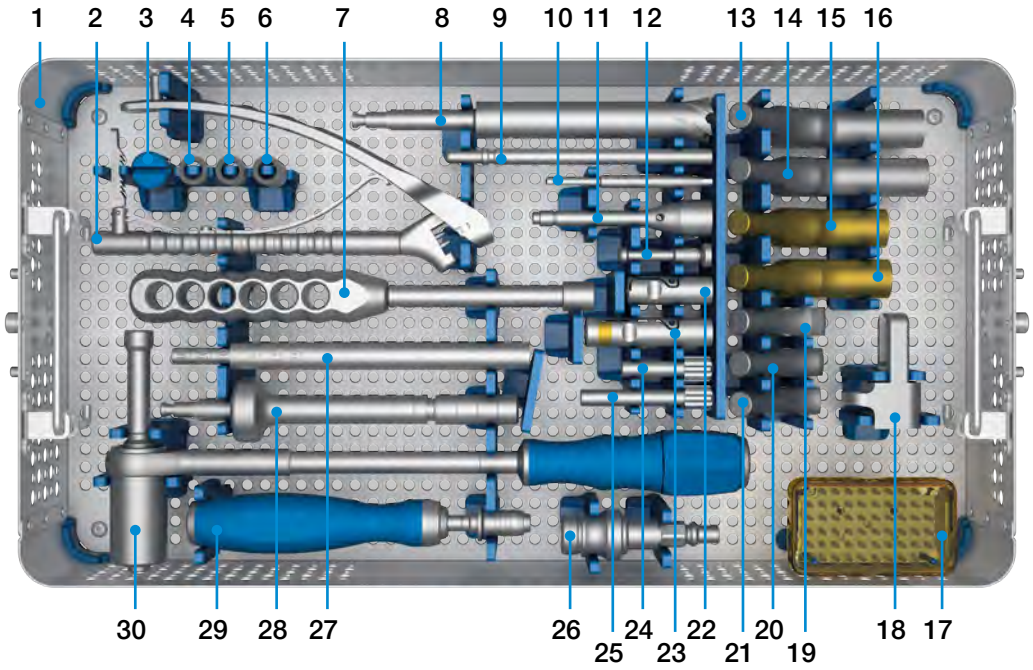
INFORMATION:
160 mm long stems must only be used with 35 mm short neck segments and without proximal spacers.

134-341/00 MP General Instruments



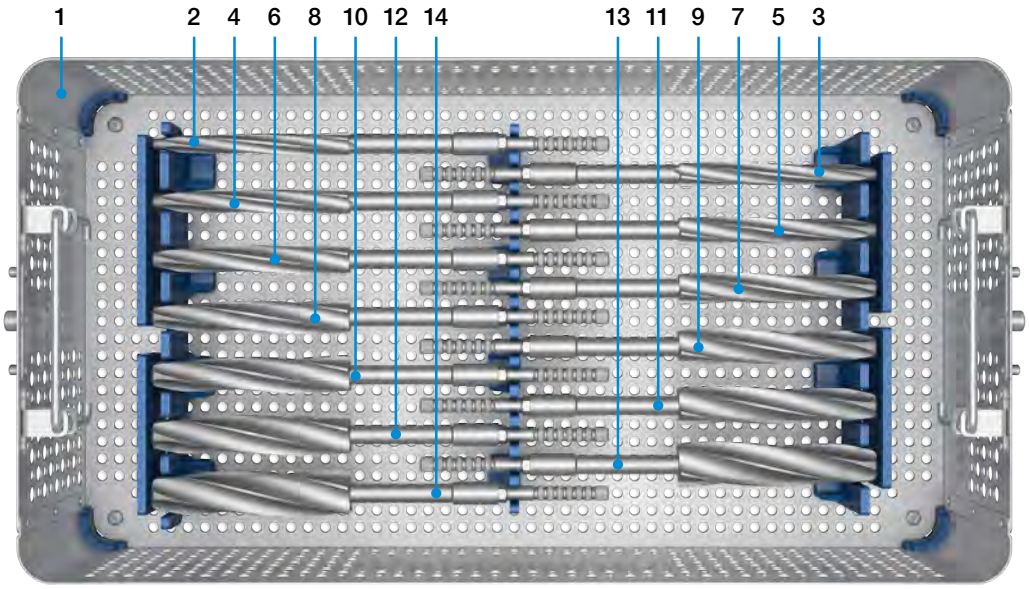
	REF	Description		
1	134-341/01	**MP General Instruments**, empty		
2	15-6053/00	**T-handle**		
3	136-203/00	**Hex Screwdriver**		
4	136-200/00	**Proximal Start Reamer**		
5	175-360	**Head Impactor**		
6	175-928/11	**Trial Head**	28 mm	s
7	175-928/12	**Trial Head**	28 mm	m
8	175-928/13	**Trial Head**	28 mm	l
9	175-928/14	**Trial Head**	28 mm	xl
10	175-932/11	**Trial Head**	32 mm	s
11	175-932/12	**Trial Head**	32 mm	m
12	175-932/13	**Trial Head**	32 mm	l
13	175-932/14	**Trial Head**	32 mm	xl
14	175-936/11	**Trial Head**	36 mm	s
15	175-936/12	**Trial Head**	36 mm	m
16	175-936/13	**Trial Head**	36 mm	l
17	175-936/14	**Trial Head**	36 mm	xl
18	136-210/01	**Detachable Handle**		
19	136-210/00	**Stem Inserter**		
20	317-661	**Slap Hammer**		

134-342/00 MP Modular Basic Instruments



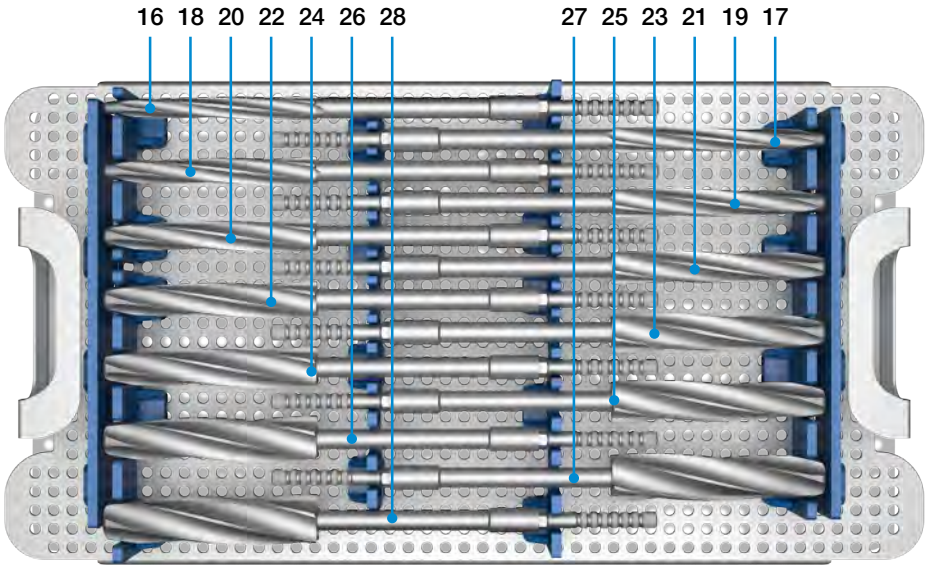
	REF	Description		
1	134-342/01	**MP Modular Basic Instruments**, empty		
2	179-122	**Insertion Forceps**		
3	179-122/01	**Taper Cap**		
4	131-398/05	**Trial Spacer**	5 mm	
5	131-398/10	**Trial Spacer**	10 mm	
6	131-398/20	**Trial Spacer**	20 mm	
7	134-216/00	**Screwdriver / Neck Inserter**	hex 8 mm	
8	134-217/00	**Tubular Reamer**		
9	134-215/00	**Guide Rod**		
10	134-220/02	**Hex Screwdriver**, 3.5mm	modular	
11	134-202/03	**Implant Extractor**		
12	134-202/06	**Neck Extractor Bolt**		
13	134-219/46	**Trial Neck**	lateralized	long
14	134-219/38	**Trial Neck**	standard	long
15	134-218/38	**Trial Neck**	standard	short
16	134-218/32	**Trial Neck**	low offset	short
17	319-601/30	**Sterilizing Box**, contains:		
	134-220/01	**Screws for Reamer Trial Neck**, 3 pcs.		
	134-202/02	**Stem Adapter**		
18	134-202/04	**Neck Extractor Base**		
19	134-220/32	**Reamer Trial Neck**	low offset	
20	134-220/38	**Reamer Trial Neck**	standard	
21	134-220/46	**Reamer Trial Neck**	lateralized	
22	134-205/65	**Reaming Guide** for 65 mm neck segments		
23	134-205/45	**Reaming Guide** for 45 mm neck segments		
24	134-100/41	**Trial Screw**	short	
25	134-100/61	**Trial Screw**	long	
26		**Adapter**, optional		
	16-3283/01	**Adapter Hudson female / Jacobs male**		
	16-3284/00	**Adapter Hudson female / AO male**		
	16-3286/00	**Adapter Hudson female / Harris male**		
27	134-220/04	**Spacer Gauge**		
28	134-501/01	**Reamer Driver Adapter**		
29	134-220/03	**Torque Limiting Handle**	3 Nm	
30	134-140/00	**Torque Wrench**	hex 8 mm	

134-343/00 MP Reamers Core Lengths



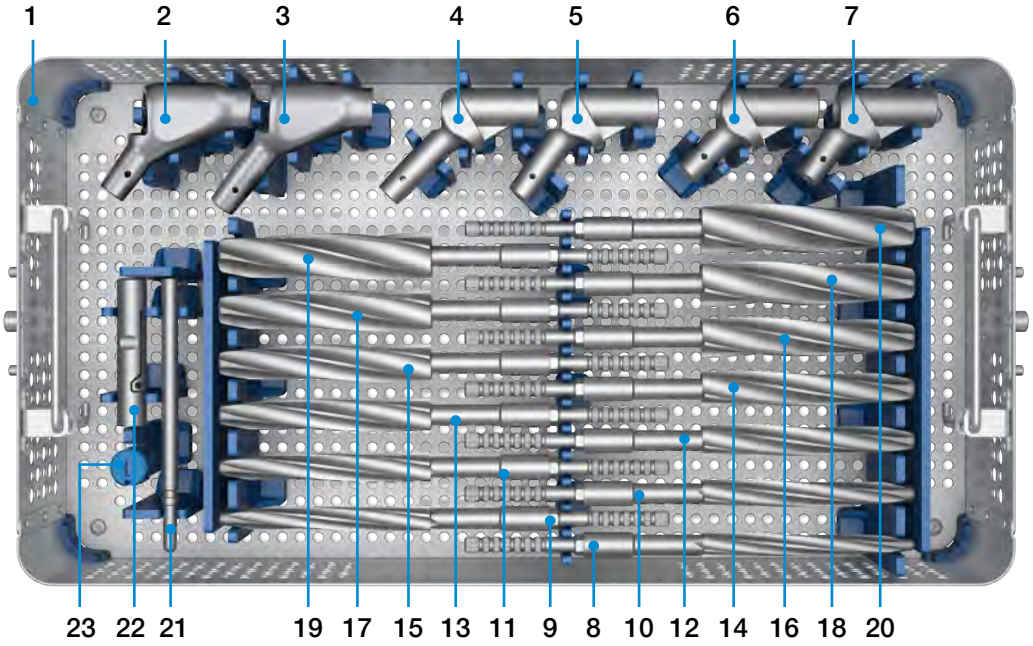
	REF	Description		
1	134-343/01	**MP Reamers core lengths**, empty		
2	134-518/12	**Reamer, modular**	12 mm	180 mm
3	134-518/13	**Reamer, modular**	13 mm	180 mm
4	134-518/14	**Reamer, modular**	14 mm	180 mm
5	134-518/15	**Reamer, modular**	15 mm	180mm
6	134-518/16	**Reamer, modular**	16mm	180 mm
7	134-518/17	**Reamer, modular**	17 mm	180 mm
8	134-518/18	**Reamer, modular**	18 mm	180 mm
9	134-518/19	**Reamer, modular**	19 mm	180 mm
10	134-518/20	**Reamer, modular**	20 mm	180 mm
11	134-518/21	**Reamer, modular**	21 mm	180 mm
12	134-518/01	**Reamer, modular**	22.5 mm	180 mm
13	134-518/24	**Reamer, modular**	24 mm	180 mm
14	134-518/25	**Reamer, modular**	25 mm	180 mm

134-343/00 MP Reamers Core Lengths



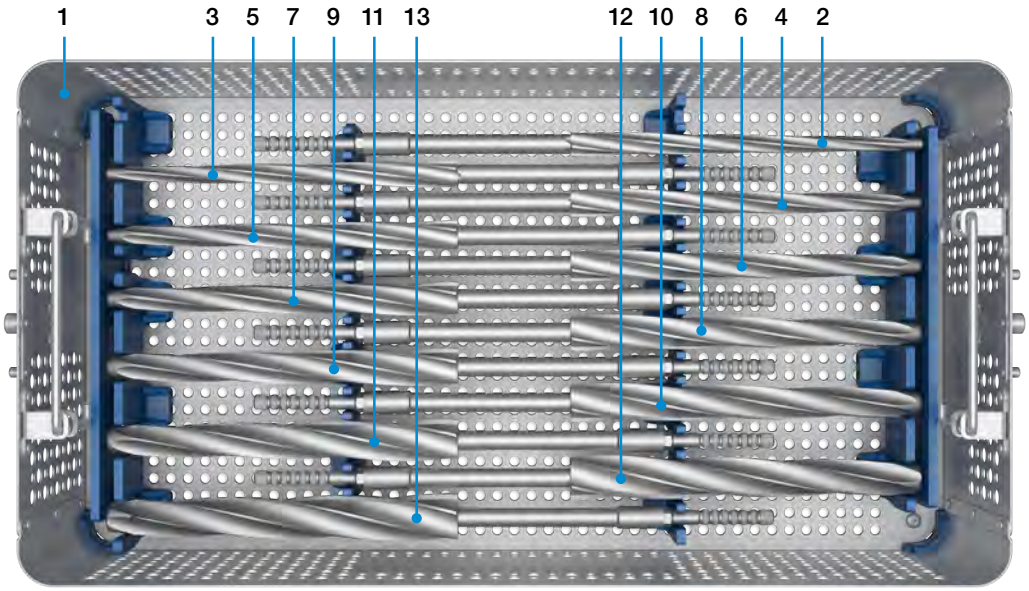
	REF	Description		
		MP Reamers core lengths, empty		
16	134-521/12	**Reamer, modular**	12 mm	210 mm
17	134-521/13	**Reamer, modular**	13 mm	210 mm
18	134-521/14	**Reamer, modular**	14 mm	210 mm
19	134-521/15	**Reamer, modular**	15 mm	210 mm
20	134-521/16	**Reamer, modular**	16 mm	210 mm
21	134-521/17	**Reamer, modular**	17 mm	210 mm
22	134-521/18	**Reamer, modular**	18 mm	210 mm
23	134-521/19	**Reamer, modular**	19 mm	210 mm
24	134-521/20	**Reamer, modular**	20 mm	210 mm
25	134-521/21	**Reamer, modular**	21 mm	210 mm
26	134-521/01	**Reamer, modular**	22.5 mm	210 mm
27	134-521/24	**Reamer, modular**	24 mm	210 mm
28	134-521/25	**Reamer, modular**	25 mm	210 mm

134-344/00 MP Modular 160 mm



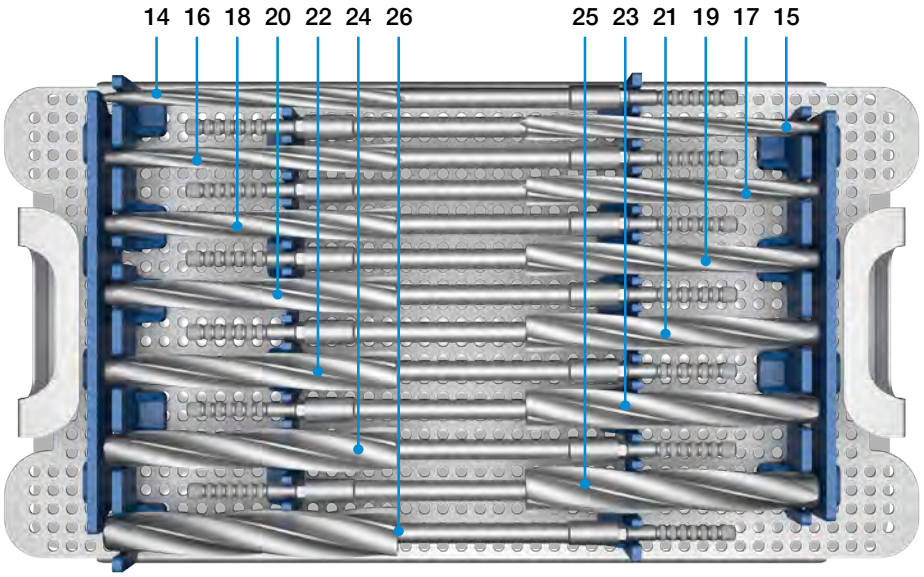
	REF	Description		
1	134-344/01	**MP Modular 160 mm**, empty		
2	99-0984/33	**Trial Neck**, with suture holes	35 mm	126°
3	99-0984/29	**Trial Neck XXL**, with suture holes	35 mm	126°
4	131-393/35	**Trial Neck XXL**	35 mm	135°
5	131-393/26	**Trial Neck XXL**	35 mm	126°
6	131-395/26	**Trial Neck**	35 mm	126°
7	131-395/35	**Trial Neck**	35 mm	135°
8	134-516/12	**Reamer, modular**	12 mm	160 mm
9	134-516/13	**Reamer, modular**	13 mm	160 mm
10	134-516/14	**Reamer, modular**	14 mm	160 mm
11	134-516/15	**Reamer, modular**	15 mm	160 mm
12	134-516/16	**Reamer, modular**	16 mm	160 mm
13	134-516/17	**Reamer, modular**	17 mm	160 mm
14	134-516/18	**Reamer, modular**	18 mm	160 mm
15	134-516/19	**Reamer, modular**	19 mm	160 mm
16	134-516/20	**Reamer, modular**	20 mm	160 mm
17	134-516/21	**Reamer, modular**	21 mm	160 mm
18	134-516/01	**Reamer, modular**	22.5 mm	160 mm
19	134-516/24	**Reamer, modular**	24 mm	160 mm
20	134-516/25	**Reamer, modular**	25 mm	160 mm
21	134-215/01	**Guide Rod**, short for MP stem D12 mm only		160 mm
22	134-205/35	**Reaming Guide** for 35 mm neck segment		
23	131-830/04	**Taper Cap**		

134-345/00 MP Reamers Long Stems



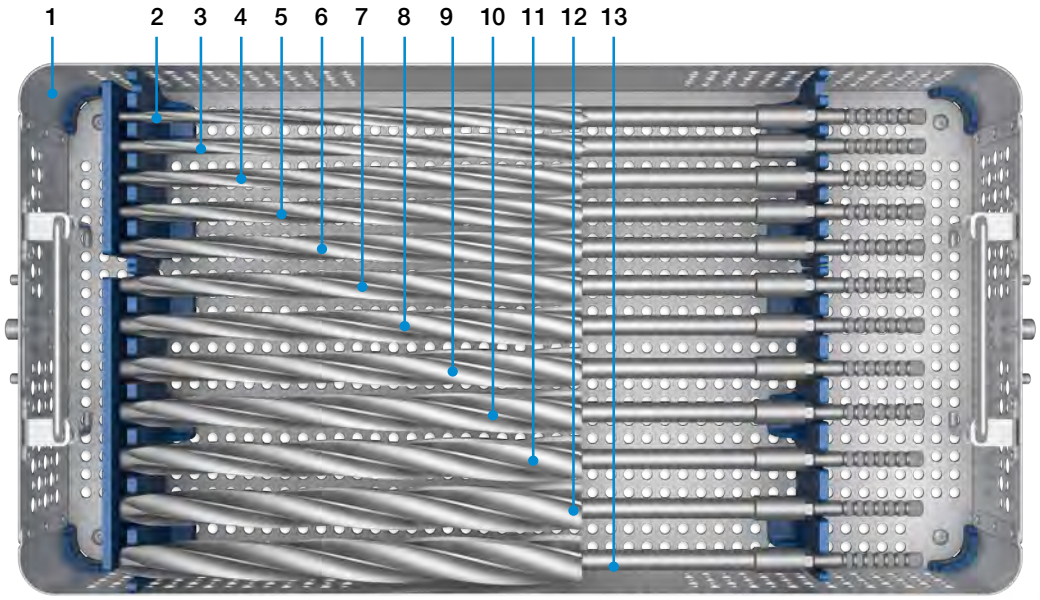
	REF	Description		
1	134-345/01	**MP Reamers Long Stems**, empty		
2	134-529/13	**Reamer, modular**	13 mm	290 mm
3	134-529/14	**Reamer, modular**	14 mm	290 mm
4	134-529/15	**Reamer, modular**	15 mm	290 mm
5	134-529/16	**Reamer, modular**	16 mm	290 mm
6	134-529/17	**Reamer, modular**	17 mm	290 mm
7	134-529/18	**Reamer, modular**	18 mm	290 mm
8	134-529/19	**Reamer, modular**	19 mm	290 mm
9	134-529/20	**Reamer, modular**	20 mm	290 mm
10	134-529/21	**Reamer, modular**	21 mm	290 mm
11	134-529/01	**Reamer, modular**	22.5 mm	290 mm
12	134-529/24	**Reamer, modular**	24 mm	290 mm
13	134-529/25	**Reamer, modular**	25 mm	290 mm

134-345/00 MP Reamers Long Stems



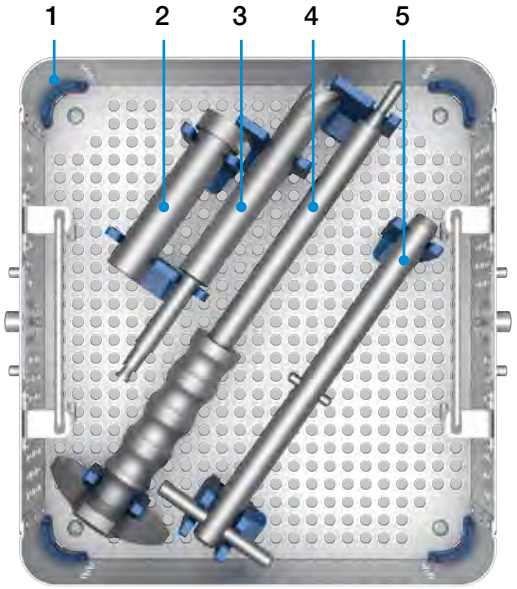
	REF	Description		
		MP Reamers Long Stems, empty		
14	134-525/12	**Reamer, modular**	12 mm	250 mm
15	134-525/13	**Reamer, modular**	13 mm	250 mm
16	134-525/14	**Reamer, modular**	14 mm	250 mm
17	134-525/15	**Reamer, modular**	15 mm	250 mm
18	134-525/16	**Reamer, modular**	16 mm	250 mm
19	134-525/17	**Reamer, modular**	17 mm	250 mm
20	134-525/18	**Reamer, modular**	18 mm	250 mm
21	134-525/19	**Reamer, modular**	19 mm	250 mm
22	134-525/20	**Reamer, modular**	20 mm	250 mm
23	134-525/21	**Reamer, modular**	21 mm	250 mm
24	134-525/01	**Reamer, modular**	22.5 mm	250 mm
25	134-525/24	**Reamer, modular**	24 mm	250 mm
26	134-525/25	**Reamer, modular**	25 mm	250 mm

134-351/00 MP Reamers 330 mm



	REF	Description		
1	134-351/01	**MP Reamers 330 mm**, empty		
2	134-533/13	**Reamer, modular**	13 mm	330 mm
3	134-533/14	**Reamer, modular**	14 mm	330 mm
4	134-533/15	**Reamer, modular**	15 mm	330 mm
5	134-533/16	**Reamer, modular**	16 mm	330 mm
6	134-533/17	**Reamer, modular**	17 mm	330 mm
7	134-533/18	**Reamer, modular**	18 mm	330 mm
8	134-533/19	**Reamer, modular**	19 mm	330 mm
9	134-533/20	**Reamer, modular**	20 mm	330 mm
10	134-533/21	**Reamer, modular**	21 mm	330 mm
11	134-533/01	**Reamer, modular**	22.5 mm	330 mm
12	134-533/24	**Reamer, modular**	24 mm	330 mm
13	134-533/25	**Reamer, modular**	25 mm	330 mm

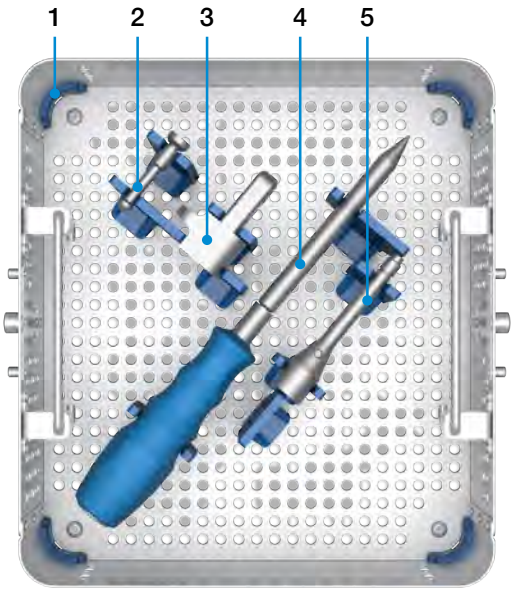
134-346/00 MP Modular Cemented Stems



	REF	Description
1	134-346/01	**MP Modular Cemented Stems**, empty
2	134-213/00	**Insertion Sleeve**
3	134-211/00	**Tubular Reamer**
4	134-210/00	**Stem Impactor**
5	134-214/00	**Extractor**

	REF	Description
	134-212/00	**Inserter Sleeve** for Cemented Stems

134-350/00 Extraction Instruments



	REF	Description
1	134-350/01	**Extraction Instruments**, empty
2	134-202/06	**Neck Extractor Bolt**
3	134-202/04	**Neck Extractor Base**
4	134-202/05	**Extraction Plunger**
5	134-202/03	**Implant Extractor**

X-ray Templates
110% natural size

(**X-ray templates** 120% natural size available on request)

REF	Description			
134-516/77	**160 mm Stems**	uncemented		
134-518/77	**180 mm Stems**	uncemented		
134-521/77	**210 mm Stems**	uncemented		
134-525/77	**250 mm Stems**	uncemented		
134-529/77	**290 mm Stems**	uncemented		
134-533/77	**330 mm Stems**	uncemented		
134-520/77	**200 mm Stems**	cemented		
134-524/77	**240 mm Stems**	cemented		
134-528/77	**280 mm Stems**	cemented		
134-532/77	**320 mm Stems**	cemented		
134-555/77	**Neck Segments**	slim	low, standard, high	short & long
134-555/78	**Neck Segments**	defect reconstruction	standard, high	short & long

Cleaning and Care Instructions

Corresponding instructions for the instrument sets are available from info@link-ortho.com on request.

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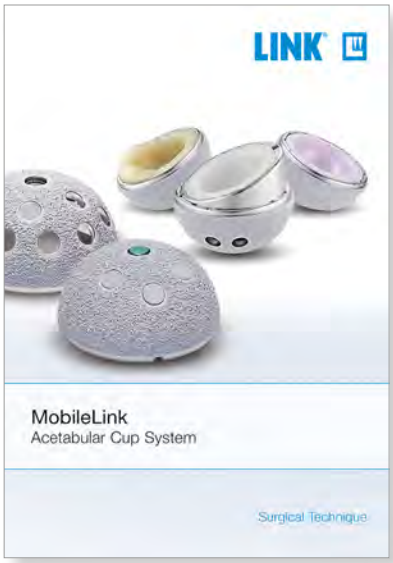
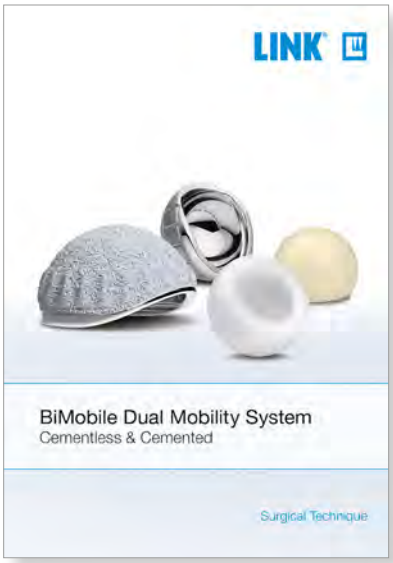
The Journal of Arthroplasty, In Press, Corr. Proof, Av. online 19 Oct 2012 (H174)

Additional Literature





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Important Information

Please note the following regarding the use of our implants:

Follow the instructions for use!
For detailed product information, including indications and contraindications, precautions and warnings, etc. please consult the product's Instructions for Use (IFU) prior to use.

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The Surgical Technique document described has been written to the best of our knowledge and belief, but it does not relieve the surgeon of their responsibility to duly consider the particularities of each individual case.

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