

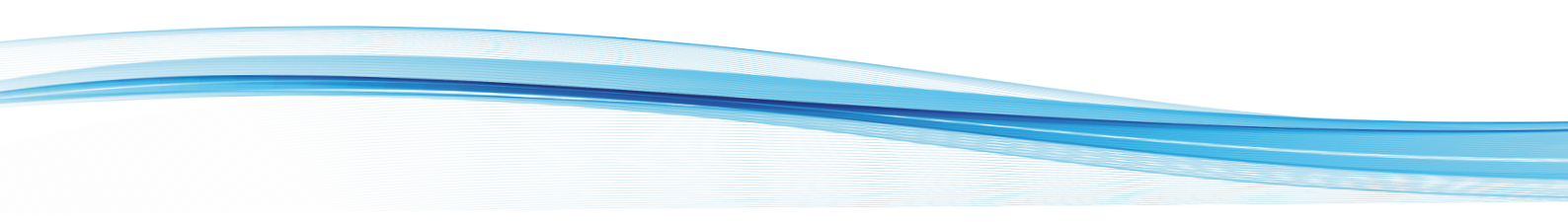
ABM

REVISION STEM

Operative Technique

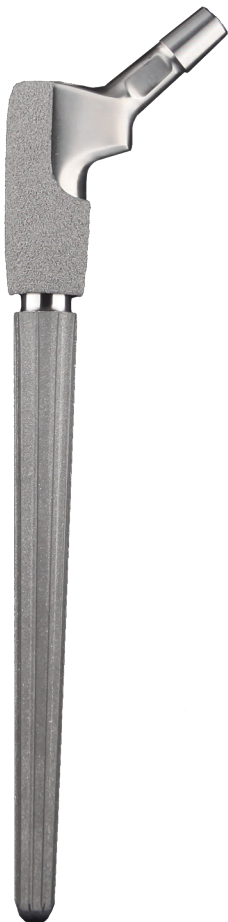


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The ABM Modular Revision Femoral Stem

The ABM Modular Revision Femoral Stem is based on the design of the successful Wagner style prosthesis. There are 8 longitudinal ridges in the distal stem that aid preservation of the cancellous bone, maintain rotational stability, and provide additional strength to the implant itself.



Long term success of the prosthesis depends upon osseointegration between the prosthesis and the host bone. Whilst the tapered distal end gains immediate stability within the femoral canal, osseointegration between the host bone and the rough surface of the prosthesis follows with time leading to long-term stability of the ABM Modular Revision Femoral Stem.

Modularity of the stems and proximal bodies provides easy adjustment of length and version of the prosthesis, thereby allowing for correct biomechanical reconstruction of the joint.

The circular cross-section and assembly design of the ABM Cone Body allows for simple adjustment of the anteversion angle of the femoral stem, thereby offering greater flexibility to the Surgeon.



The ABM Modular Revision Femoral Stem has a 2.5° Taper, and is available in 2 stem lengths, 155mm and 195mm. Cone bodies are available in lengths of 70mm, 80mm, 90mm and 100mm and in diameters ranging from 19mm to 31mm.

Indications

The indications for use of the ABM Modular Revision Stem include:

1. Patients with degenerative or inflammatory arthritis and bone loss within the proximal femur.
2. Patients with periprosthetic fractures.
3. Patients with with degenerative or inflammatory arthritis and a proximal femoral deformity where and osteotomy may be required.
4. Patients with proximal femoral fractures, such as intertrochanteric fractures, who require reconstruction of the proximal femur.

Contraindications

1. Severe osteoporosis cannot provide reliable fixation for the revision prosthesis.
2. The femoral bone cavity is severely narrowed.
3. Poor bone stock.
4. Active infection.

Preoperative Planning

Pre-operative planning is recommended in order to help recreate the centre of hip rotation and lateral offset and to determine stem length and stem diameter.

X-ray Requirements

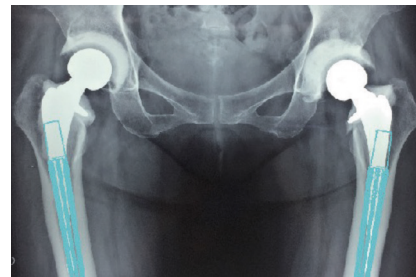
In order to undertake accurate preoperative planning, X-ray films must have a constant magnification (Figure 1).



1. X-ray of the hip joint and femur

1. Selecting the Stem Length

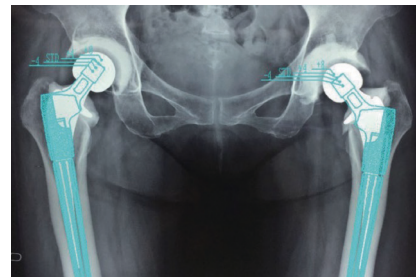
The template measurement helps determine the appropriate length of the prosthesis, with the final decision made at the time of surgery.



2. Templating the length of the revision prosthesis

2. Selection of the Prosthesis Diameter

A common mistake is to undersize the diameter of the stem. The template to be chosen is the stem that overlaps 1mm into the inner cortex of both medial and lateral in the area where fixation is to be achieved. If there is significant bone loss secondary to osteolysis or fracture, the stem needs to achieve fixation over a distance of 40 - 80mm distal to the defect.



3. Templating to measure the Stem, Cone Body and Head

Primary Surgery

A femoral neck osteotomy is made with an oscillating saw at a level determined by preoperative templating.

In order to ensure correct placement of the stem in both the AP and lateral planes, the entry point for the reamer needs to be at the piriformis fossa. It is important when removing bone from the femoral neck, either with a box chisel or an osteotome to start well lateral at the base of the greater trochanter and this will ensure entry is into the piriformis fossa. If entry is made down the femoral neck, there is every possibility the stem may be positioned in varus on the AP view and 'front to back' on the lateral.

Revision Surgery

For revision surgery, remove the femoral prosthesis with the appropriate instruments. If cement has been used during a previous reconstruction this must be removed along with any other foreign material which may be present in the femoral canal e.g broken screws, before the reaming process commences.

Distal Reaming

Use the T-Handle or connect the smallest Tapered Distal Reamer directly to power to start reaming. The diameters of the Tapered Distal Reamers range from 11mm - 28mm in 1mm increments (Figure 3).

There are (blue) groove marks on the Tapered Distal Reamers. These marks measure both the Distal Stem Length (155mm and 195mm) and the Cone Body Heights (70mm, 80mm, 90mm, 100mm). These marks reference to the distance from the tip of the greater trochanter to the tip of the distal tip of the Distal Stem (Figure 4).

The tip of the greater trochanter is often at the same horizontal level as the centre of rotation of the femoral head.

Ream with the 'starter' reamer until the chosen length mark / groove reaches the tip of the greater trochanter. Change the reamer and progressively increase the diameter of the reamer until one can feel firm resistance to further twisting of the reamer. Often called 'cortical chatter' if power reaming.

Note: The Tapered Distal Reamers match the specific distal size of the prosthesis.

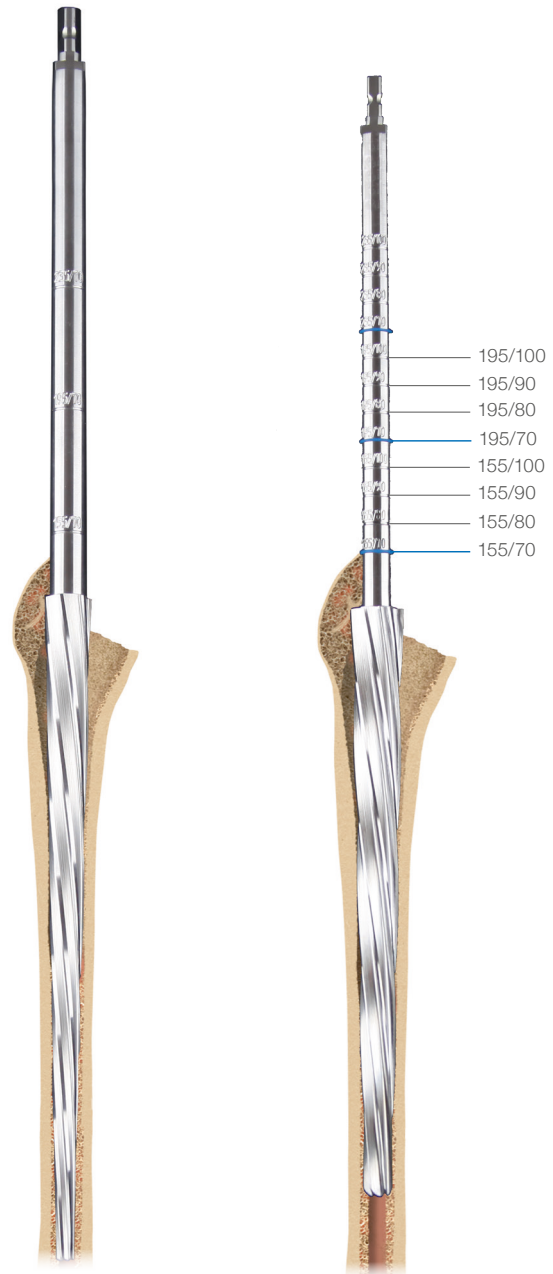


Figure 3

Figure 4

Femoral Stem Insertion

Engage the appropriate size Femoral Stem onto the Distal Stem Inserter (G21121) and turn clockwise until the Femoral Stem is firmly attached.

There are 4 depth marks on the femoral stem holder, these correspond to the proximal body lengths (70mm, 80mm, 90mm, 100mm) (Figure 5)

When there is a femoral cortical defect, the preoperative plan needs to ensure that the distal end of the femoral stem extends beyond the bone defect by a minimum length of 2.5 times the diameter of the medullary canal at that level. This will allow for adequate fixation of the stem distally.

With a hammer impact the distal stem inserter until the selected marking on the femoral stem inserter reaches the tip of the greater trochanter. This should be a series of taps as opposed to one big hit. If the stem suddenly sinks down, consider an iatrogenic periprosthetic fracture. If the stem struggles to get down to the chosen level and will not move any further, remove the stem and reinsert the reamer or consider a different cone body length to what which was suggested by the preoperative planning. Once at the selected level and if the distal stem inserter cannot be twisted, the stem will have achieved rotatory and axial stability.

Use the depth marks on the distal femoral stem inserter to choose and decide which cone body length (70mm, 80mm, 90mm, 100mm) will be used.

Should the Femoral Stem sink when compared to the preoperative plan or reaming depth, the Cone Bodies have 4 heights to help restore leg length. If the Femoral Stem sits more than 30mm below the required height then increase the size of



Figure 5

the required Stem by 1mm. Ream an additional 1mm and then repeat the Femoral Stem Insertion as described.

Disengage the Distal Stem Inserter from the femoral stem end by turning the Handle counterclockwise.

Proximal Reaming for the Cone Body

Reamers come in 7 different diameters ranging from 19mm - 31mm in 2mm increments. They are the same size as the prostheses.

The Proximal Body Reamer Guide protects the taper junction from damage from the proximal body reamer and provides a guide to accurate reaming depth. A blue line is visible through the proximal body reamer window verifying that the reamer is correctly seated and that reaming depth is accurate (Figure 7a).

If hand reaming use the T-Handle (G21120) and attach it to the 19mm Proximal Body Reamer. (Figure 7). The Proximal reaming is increased in 2mm increments until contact with the proximal bone is satisfactory. As mentioned, progress until blue line is visible in the window.

The markings on the Proximal Body Reamer (70mm, 80mm, 90mm, 100mm) correspond to the heights of the Cone Bodies used.

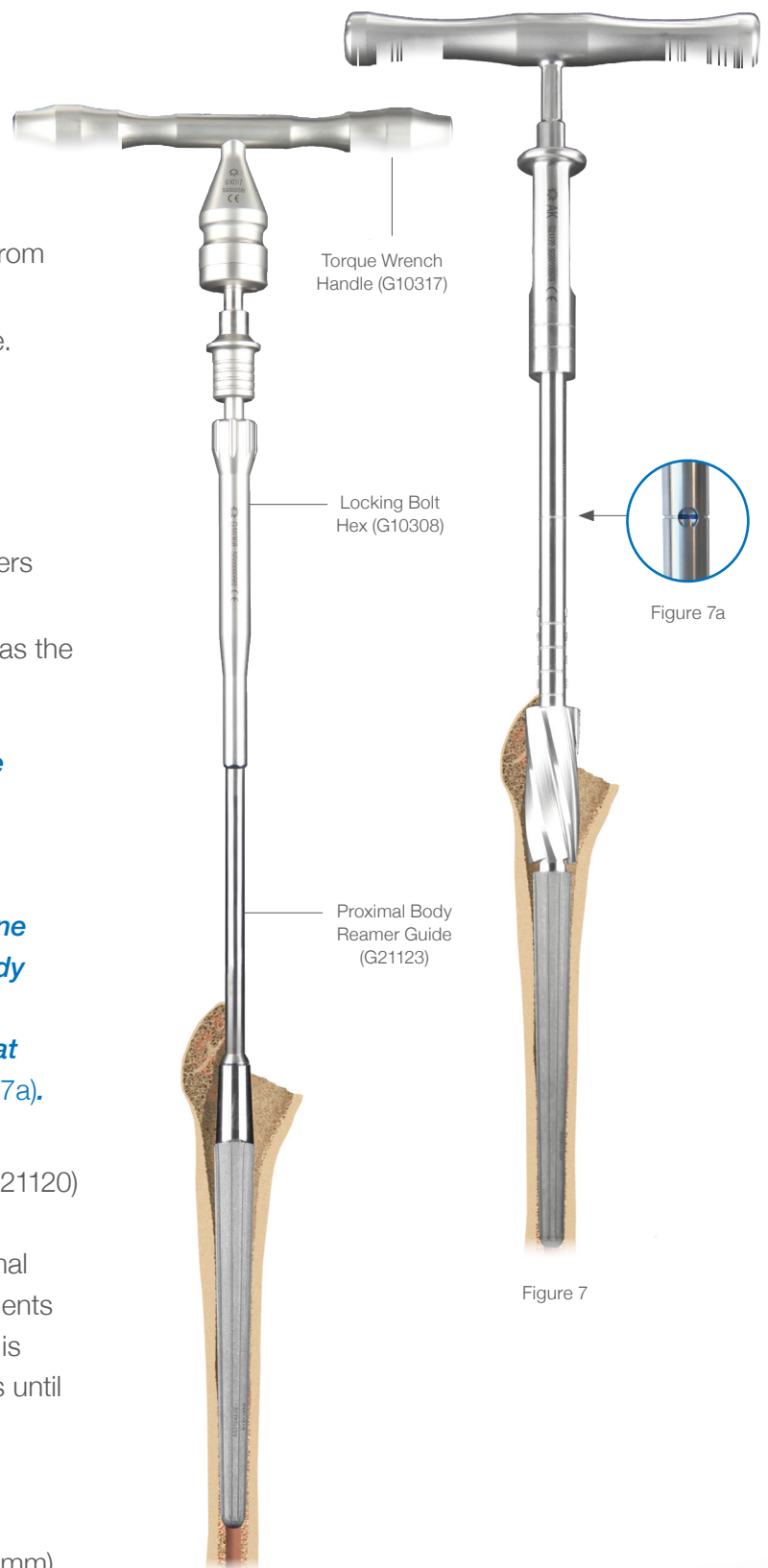


Figure 6

Figure 7

Cone Body Trial

Select the Cone Body Trial that matches the final Proximal Body Reamer and the height referenced from the markings (70mm, 80mm, 90mm, 100mm). Remove the Trial Locking Bolt from the Trial Proximal Body. Connect the Trial Proximal Body to the blue handled Cone Body Inserter (G21182, Figure 8).

Adjust the version of the Proximal Body Trial to the appropriate angle. Re-insert the Trial Locking Bolt and then tighten using the Locking Bolt Hex (G10308) and the Torque Wrench Handle (G10317).

Trial Head

Select the diameter of the Trial Head according to the size of the liner and the neck length based on the preoperative planning.

Perform a trial reduction and assess joint stability, range of motion and leg length. If necessary, adjust the version of the Trial Cone Body and/or change the Trial head for optimum stability and soft tissue tension.

Cone Body Trial Removal

After removing the Trial Head, loosen the Trial Locking Bolt and then use the Cone Body Trial Removal Tool attached to the Slap Hammer to remove the Cone Body Trial (figure 9).



Figure 8



Figure 9

Cone Body Insertion

Clean and dry the Femoral Stem trunnion. Attach the selected Cone Body to the blue handled Cone Body Inserter (G21182), align for appropriate anteversion (check the previously marked position) and impact the Cone Body onto the trunnion of the Femoral Stem. (figure 10).

Note: *This set of instruments is equipped with a proximal/distal pressurizer, this is used to securely engage the Cone Body and Femoral Stem.*

To assemble, thread the Proximal Body Driver (G21183) through the Cone Body and Femoral Stem until flush with the Cone Body (Figure 11). Attached the Torque Counter Force Handle (5301) to the trunnion to maintain the require anteversion and then slowly turn the Proximal Body Driver clockwise to impact compact the junction of the Cone Body and Femoral Stem. Turn counter clockwise to remove (Figure 11).

Place the locking bolt into the Cone Body and tighten with the Torque Wrench Handle and Locking Bolt Hex. Use the Torque Counterforce Handle to maintain the required anteversion of the Cone Body.

Apply the required torque to tighten the locking bolt (Figure 12).

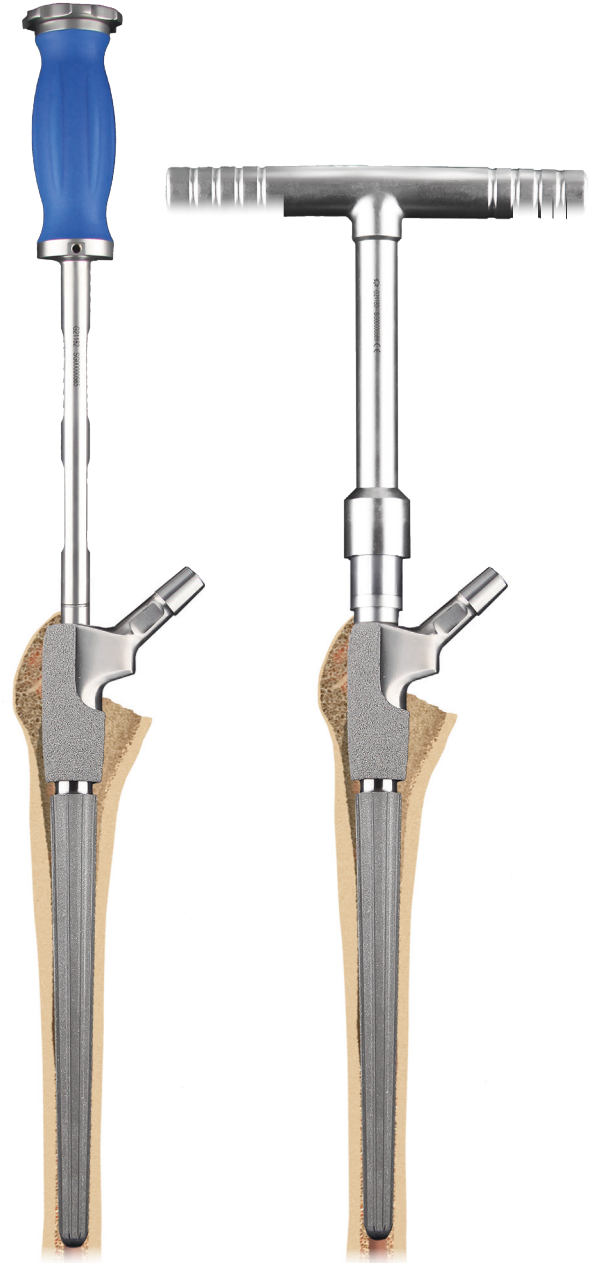


Figure 10

Figure 11

Femoral Head Impaction

After the final trial reduction, select the required femoral head, wipe, and dry the Cone Body taper and impact the head with the Femoral Head Impactor.

Reduce Joint and Close

Reduce the hip and check the passive range of movement and joint stability. Close the surgical wound according to your preference.

Prosthesis Removal

If the implanted prosthesis needs to be disassembled during the initial surgery or at a later time (e.g the anteversion angle needs to be adjusted) follow this method.

Carefully Inspect the components to ensure neither the Cone Body nor the Distal Stem are damaged. If either show damage, however small, then they must be replaced with new components.

Note: *Cone Body Removal must be removed prior to using the stem removal instruments (Figure 12). Insert the assembled T-handle and Body/ Stem Separator into the Cone Body, rotate and tighten, until the body is released. Unscrew the Body / Stem Separator, once the Cone Body and the Femoral Stem have been separated (Figure 13).*

Femoral Stem Removal

Assemble the slide hammer and then connect the slap hammer assembly to the threaded end of the Femoral Stem. Use the Slap Hammer to remove the Femoral Stem.



Figure 12

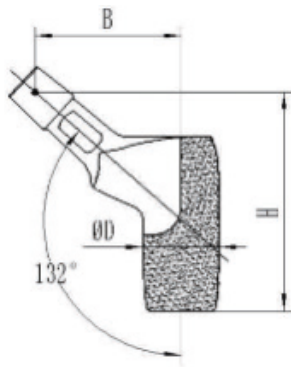


Figure 13

ABM REVISION STEM IMPLANTS & INSTRUMENTATION



Product No.	Specification model	CCD angle	Offset	Diameter D x Length H
A2167-3230	BG-XII-30#	132°	40	φ 19 × 70
A2167-3232	BG-XII-32#		40	φ 21 × 70
A2167-3234	BG-XII-34#		46	φ 23 × 70
A2167-3236	BG-XII-36#		46	φ 25 × 70
A2167-3238	BG-XII-38#		46	φ 27 × 70
A2167-3240	BG-XII-40#		46	φ 29 × 70
A2167-3242	BG-XII-42#		46	φ 31 × 70
A2167-3244	BG-XII-44#		40	φ 19 × 80
A2167-3246	BG-XII-46#		40	φ 21 × 80
A2167-3248	BG-XII-48#		46	φ 23 × 80
A2167-3250	BG-XII-50#		46	φ 25 × 80
A2167-3252	BG-XII-52#		46	φ 27 × 80
A2167-3254	BG-XII-54#		46	φ 29 × 80
A2167-3256	BG-XII-56#		46	φ 31 × 80
A2167-3258	BG-XII-58#		40	φ 19 × 90
A2167-3260	BG-XII-60#		40	φ 21 × 90



Product No.	Specification model	CCD angle	Offset	Diameter D x Length H
A2167-3262	BG-XII-62#	132°	46	φ 23 × 90
A2167-3264	BG-XII-64#		46	φ 25 × 90
A2167-3266	BG-XII-66#		46	φ 27 × 90
A2167-3268	BG-XII-68#		46	φ 29 × 90
A2167-3270	BG-XII-70#		46	φ 31 × 90
A2167-3272	BG-XII-72#		40	φ 19 × 100
A2167-3274	BG-XII-74#		40	φ 21 × 100
A2167-3276	BG-XII-76#		46	φ 23 × 100
A2167-3278	BG-XII-78#		46	φ 25 × 100
A2167-3280	BG-XII-80#		46	φ 27 × 100
A2167-3282	BG-XII-82#		46	φ 29 × 100
A2167-3284	BG-XII-84#		46	φ 31 × 100

Locking Bolt is supplied with the Implant



Product No.	Specification model	Diameter D	Length H
A2164-1415S	φ 14 × 155S	14	155
A2164-1419S	φ 14 × 195S	14	195
A2164-1515S	φ 15 × 155S	15	155
A2164-1519S	φ 15 × 195S	15	195
A2164-1615S	φ 16 × 155S	16	155
A2164-1619S	φ 16 × 195S	16	195
A2164-1715S	φ 17 × 155S	17	155
A2164-1719S	φ 17 × 195S	17	195
A2164-1815S	φ 18 × 155S	18	155
A2164-1819S	φ 18 × 195S	18	195



Product No.	Specification model	Diameter D	Length H
A2164-1915S	φ 19 × 155S	19	155
A2164-1919S	φ 19 × 195S	19	195
A2164-2015S	φ 20 × 155S	20	155
A2164-2019S	φ 20 × 195S	20	195
A2164-2115S	φ 21 × 155S	21	155
A2164-2119S	φ 21 × 195S	21	195
A2164-2215S	φ 22 × 155S	22	155
A2164-2219S	φ 22 × 195S	22	195
A2164-2315S	φ 23 × 155S	23	155
A2164-2319S	φ 23 × 195S	23	195
A2164-2415S	φ 24 × 155S	24	155
A2164-2419S	φ 24 × 195S	24	195
A2164-2515S	φ 25 × 155S	25	155
A2164-2519S	φ 25 × 195S	25	195
A2164-2615S	φ 26 × 155S	26	155
A2164-2619S	φ 26 × 195S	26	195
A2164-2715S	φ 27 × 155S	27	155
A2164-2719S	φ 27 × 195S	27	195
A2164-2815S	φ 28 × 155S	28	155
A2164-2819S	φ 28 × 195S	28	195

BIOLOX® *delta* CERAMIC HEADS



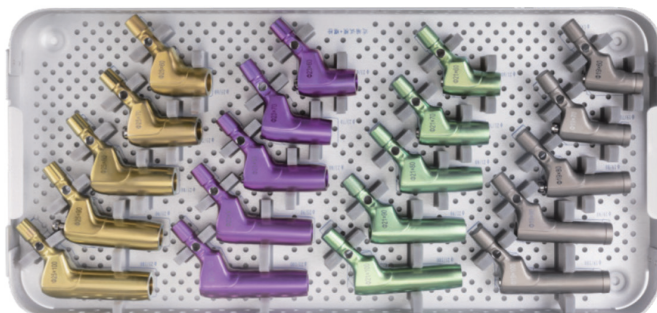
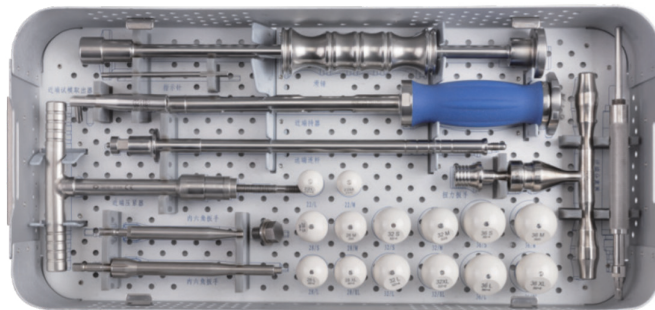
Product No.	Size
2202-0028	28-S/-4
2202-0128	28-M/0
2202-0228	28-L/+4
2202-0032	32-S/-4
2202-0132	32-M/0
2202-0232	32-L/+4
2202-0332	32-XL/+8
2202-0036	36-S/-4
2202-0136	36-M/0
2202-0236	36-L/+4
2202-0336	36-XL/+8

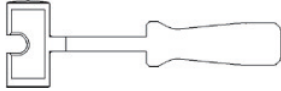
CoCr HEADS

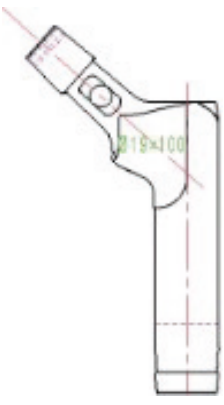


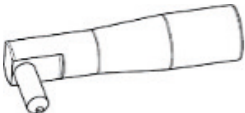
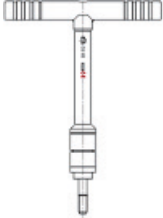
Product No.	Size
1200-0122	22/0
1200-0222	22/+4
1200-0028	28/-4
1200-0128	28/0
1200-0228	28/+4
1200-0328	28/+8
1200-0232	32/+4
1200-0132	32/+0
1200-0032	32/-4
1200-0036	36/-4
1200-0136	36/0
1200-0236	36/+4
1200-0336	36/+8

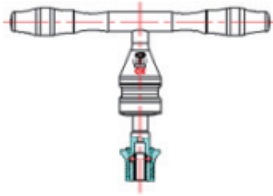
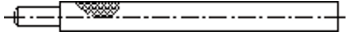
INSTRUMENT TRAYS



Product No.	Description	Specification	Product image
G21121	Distal Stem Inserter		
G30015	Mallet		
G21123	Proximal Body Reamer Guide		
G21124	Proximal Body Reamer	φ 19mm	
G21125		φ 21mm	
G21126		φ 23mm	
G21127		φ 25mm	
G21128		φ 27mm	
G21129		φ 29mm	
G21130		φ 31mm	
G21132	Proximal Body Trial	φ 19/70	
G21133		φ 19/80	
G21134		φ 19/90	
G21135		φ 19/100	
G21137		φ 21/70	
G21138		φ 21/80	
G21139		φ 21/90	
G21140		φ 21/100	
G21142		φ 23/70	
G21143		φ 23/80	
G21144		φ 23/90	
G21145		φ 23/100	
G21147		φ 25/70	
G21148		φ 25/80	
G21149		φ 25/90	
G21150		φ 25/100	
G21167		φ 27/70	

Product No.	Description	Specification	Product image
G21168	Proximal Body Trial	φ 27/80	
G21169		φ 27/90	
G21170		φ 27/100	
G21171		φ 29/70	
G21172		φ 29/80	
G21173		φ 29/90	
G21174		φ 29/100	
G21175		φ 31/70	
G21176		φ 31/80	
G21177		φ 31/90	
G21178		φ 31/100	
G21151	Proximal Body Trial Bolt	70	
G21152		80	
G21153		90	
G21154		100	
G21101	Tapered Distal Reamers	φ 11mm	
G21102		φ 12mm	
G21103		φ 13mm	
G21104		φ 14mm	
G21105		φ 15mm	
G21106		φ 16mm	
G21107		φ 17mm	
G21108		φ 18mm	
G21109		φ 19mm	
G21110		φ 20mm	
G21111		φ 21mm	
G21112		φ 22mm	
G21113		φ 23mm	
G21114		φ 24mm	
G21115		φ 25mm	
G21116		φ 26mm	
G21117		φ 27mm	
G21118		φ 28mm	

Product No.	Description	Specification	Product image
G10308	Locking Bolt Hex		
G30002	Trial Head	22/0, 22/+4, 28/-4, 28/0, 28/+4, 28/+8, 32/-4, 32/0, 32/+4, 32/+8, 36/-4, 36/0, 36/+4, 36/+8	
G21181	Cone Body Trial Removal Tool		
G21182	Cone Body Trial Inserter		
G21183	Proximal Body Driver		
G21184	Stem Body Separator		
G21185	Slap Hammer		

Product No.	Description	Product image
G10317	Torque Wrench Handle	
G21187	Indicator Needle	
G21188	Distal Trial Connector Rod	
5033	Hexagonal Bolt Hex	
5031	Torque Counterforce Handle	
G30016	Head Impactor	

Manufactured by



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