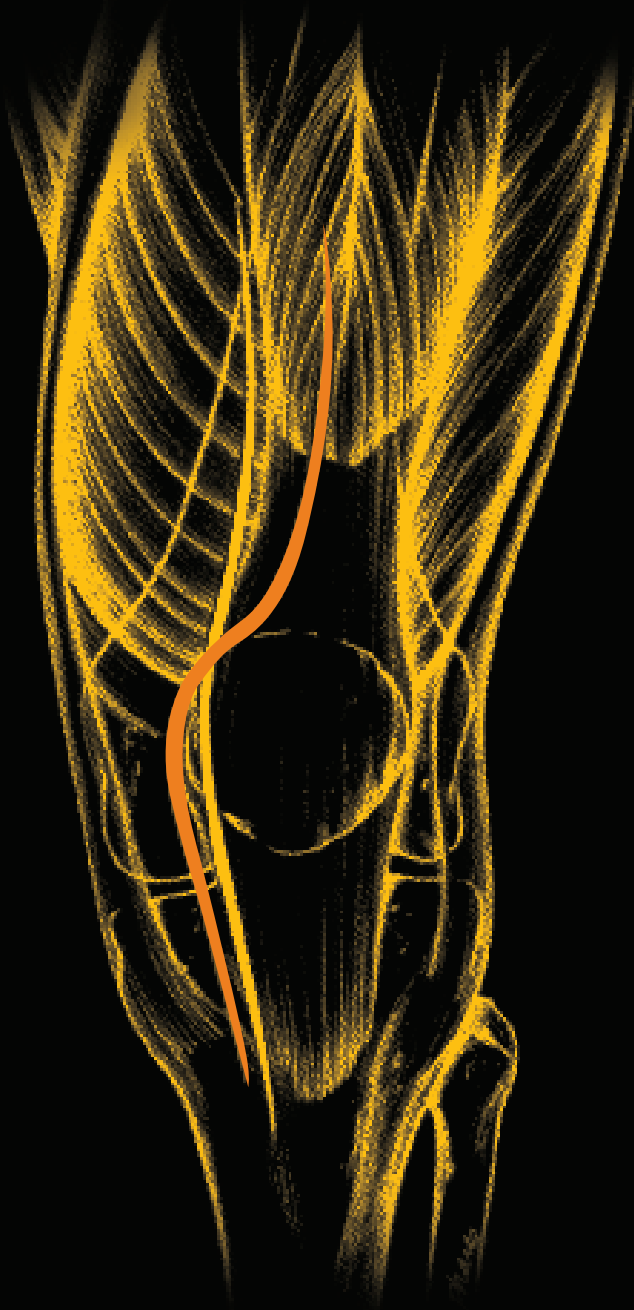


Monogram®

Total Knee Instruments



**Modular Rotating Hinge
Knee System – Keel
Baseplate**

**Using Monogram IM
Revision Instruments**

Monogram®

Total Knee Instruments

Modular Rotating Hinge Knee System Using Monogram IM Revision Instruments

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Stryker also recognizes the contribution of the following surgeons who assisted in the evaluation and development of the Monogram IM Revision Instruments:

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The Modular Rotating Hinge Knee System

The system has been designed for knees with severe joint destruction and/or ligament instability where a condylar style implant is not thought appropriate. While the hinge mechanism has been designed for those knees in which the soft tissue envelope is compromised, where possible the collateral ligaments should be preserved to enhance the longevity of the device.

In the revision situation, severe bone deficit may be encountered. Where this is symmetrical, the defect may be made up by thicker implants. However, it is not uncommon to require an asymmetrical augment medially or laterally. The Modular Rotating Hinge prosthesis has a selection of femoral and tibial augments which can be attached to the device after suitable bone preparation using intramedullary instrumentation.

This device provides considerable restraint, and it is recommended that a minimum stem length of 80 mm is used. Due to the design modularity, this device can be used

with stems in a variety of diameters, lengths and offsets, thus maximizing surgical options.

Surgical Technique

The surgeon should utilize his/her normal technique for mobilizing the knee prior to implant surgery. If necessary, the medial or lateral collateral ligaments and quadriceps mechanism should be mobilized while preserving the soft tissue envelope to maintain tension in the capsule ligament system. Insertion of a rotating hinge does not compensate for inadequate soft tissue release. Tissue tightness may also result in poor access and secondary malalignment.

Prior to definitive implant insertion, trial reduction should be carried out to ensure correction of alignment and stability with estimation of the range of motion.

Occasionally, particularly in staged reconstruction for infection, the femoral component may require down-sizing or placement posteriorly to reduce tension to allow soft tissue closure.

This publication sets forth detailed recommended procedures for using Stryker devices and instruments. It offers guidance that you should heed, but, as with any such technical guide, each surgeon must consider the particular needs of each patient and make appropriate adjustment when and as required.

Indications

Rotating Hinge Knee Systems are intended to be implanted with bone cement for the following condition(s):

1. There is destruction of the joint surfaces, with or without significant bone deformity.
2. The cruciate and/or collateral ligaments do not stabilize the knee joint.
3. The ligaments are inadequate and/or the musculature is weak. And/or,
4. Revision is required of a failed prostheses where there has been gross instability, with or without bone loss or inadequate soft tissue.

Contraindications

Absolute contraindications include:

1. overt infection;
2. distant foci of infections (which may cause hematogenous spread to the implant site);
3. rapid disease progression as manifested by joint destruction or bone resorption apparent on roentgenogram;
4. skeletally immature patients;
5. cases where there is poor bone stock which would make the procedure unjustifiable.

Conditions presenting an increased risk of failure include:

1. uncooperative patient or patient with neurologic disorder, incapable of following instructions;
2. osteoporosis;
3. metabolic disorders which may impair bone formation or cause bone loss;
4. osteomalacia; and,
5. previous arthrodesis.

A higher incidence of implant failure has also occurred in paraplegics, cerebral palsy and patients with Parkinson's disease.

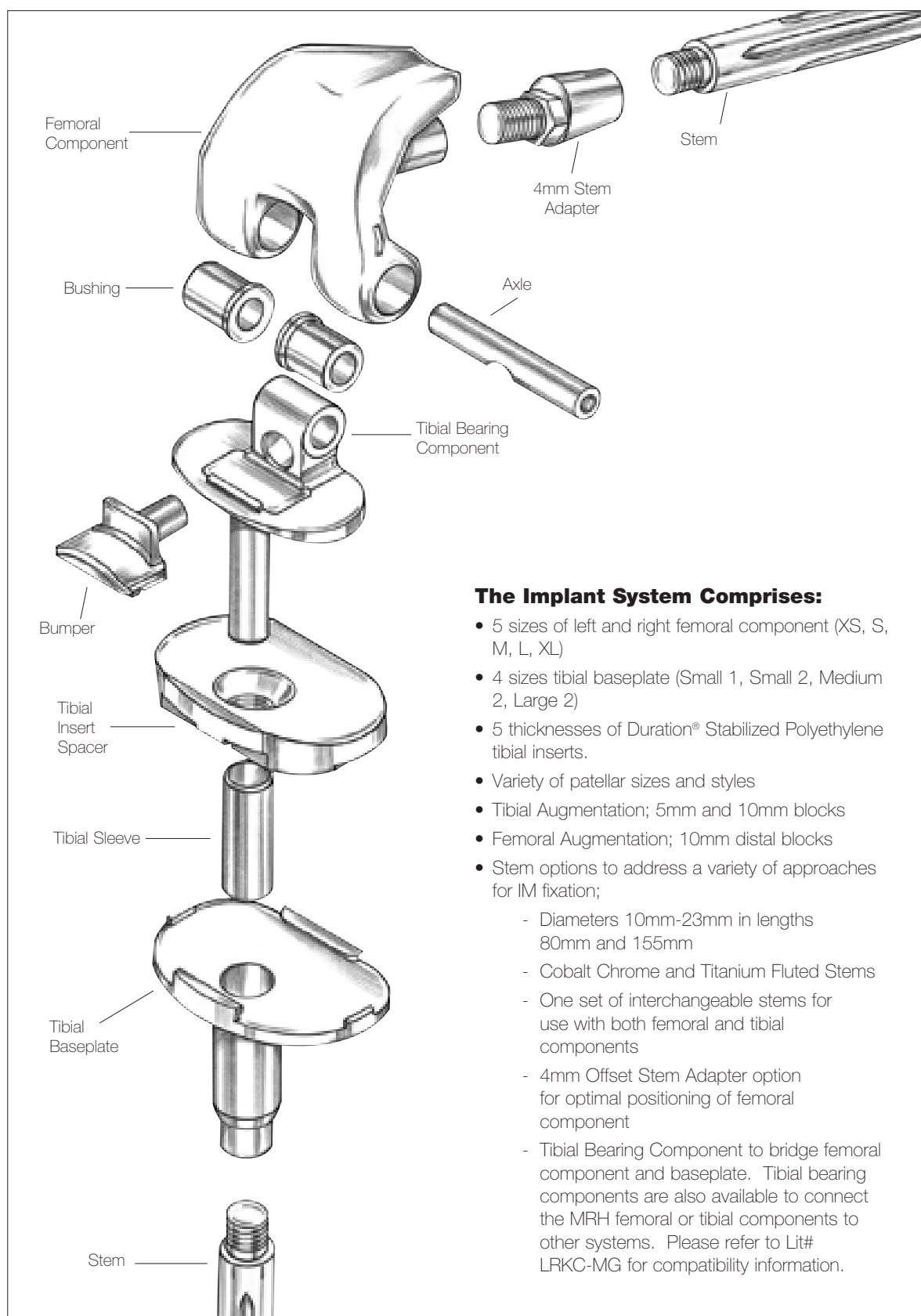
See package insert for warnings precautions, adverse effects, information for patients, and other essential product information.

Before using Monogram IM Revision Instrumentation, verify:

- Instruments have been properly disassembled prior to cleaning and sterilization;
- Instruments have been properly assembled post-sterilization;
- Instruments have maintained design integrity; and,
- Proper size configurations are available.

For Instructions for Cleaning, Sterilization, Inspection and Maintenance of Orthopaedic Medical Devices, refer to LSTPI-B.

Implant Overview



Modular Rotating Hinge

Operative Technique

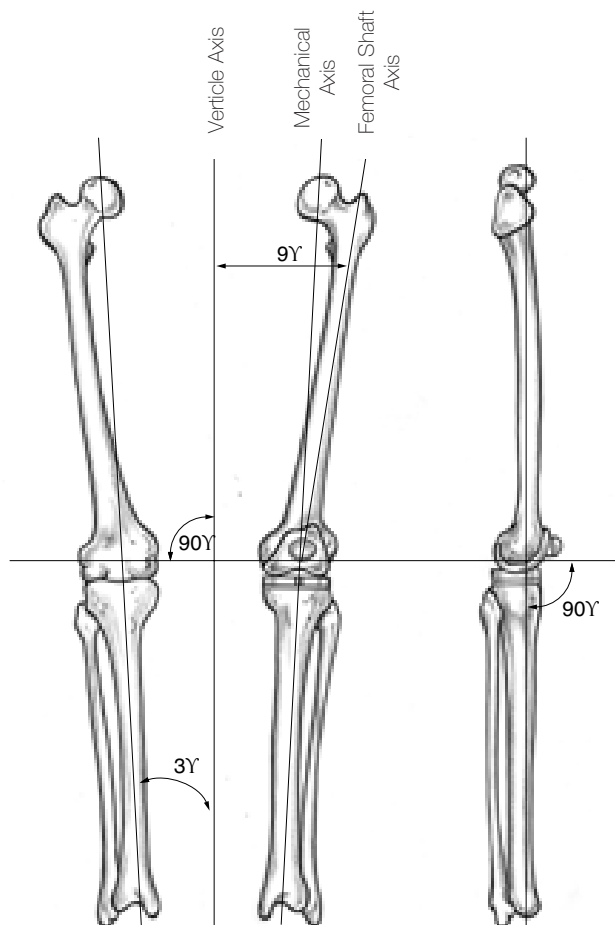
Alignment Rationale

The Modular Rotating Hinge femoral and tibial components are positioned at 90° to the coronal and sagittal planes, with alignment references taken from the intramedullary (IM) canal.

The Monogram IM Revision Instruments provide for the sizing, alignment and positioning of the bone cuts and preparation for stems and augmentation blocks.

By referencing and maintaining fixation in the IM canal, Monogram® IM Revision Instruments provide a stable construct for reliable and accurate bone preparation and implant placement.

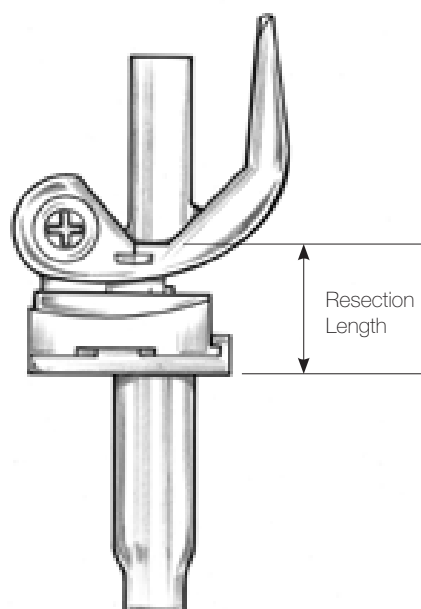
Options are also provided for extramedullary alignment to be used where intramedullary referencing is not possible, for example where the canal is severely bowed.

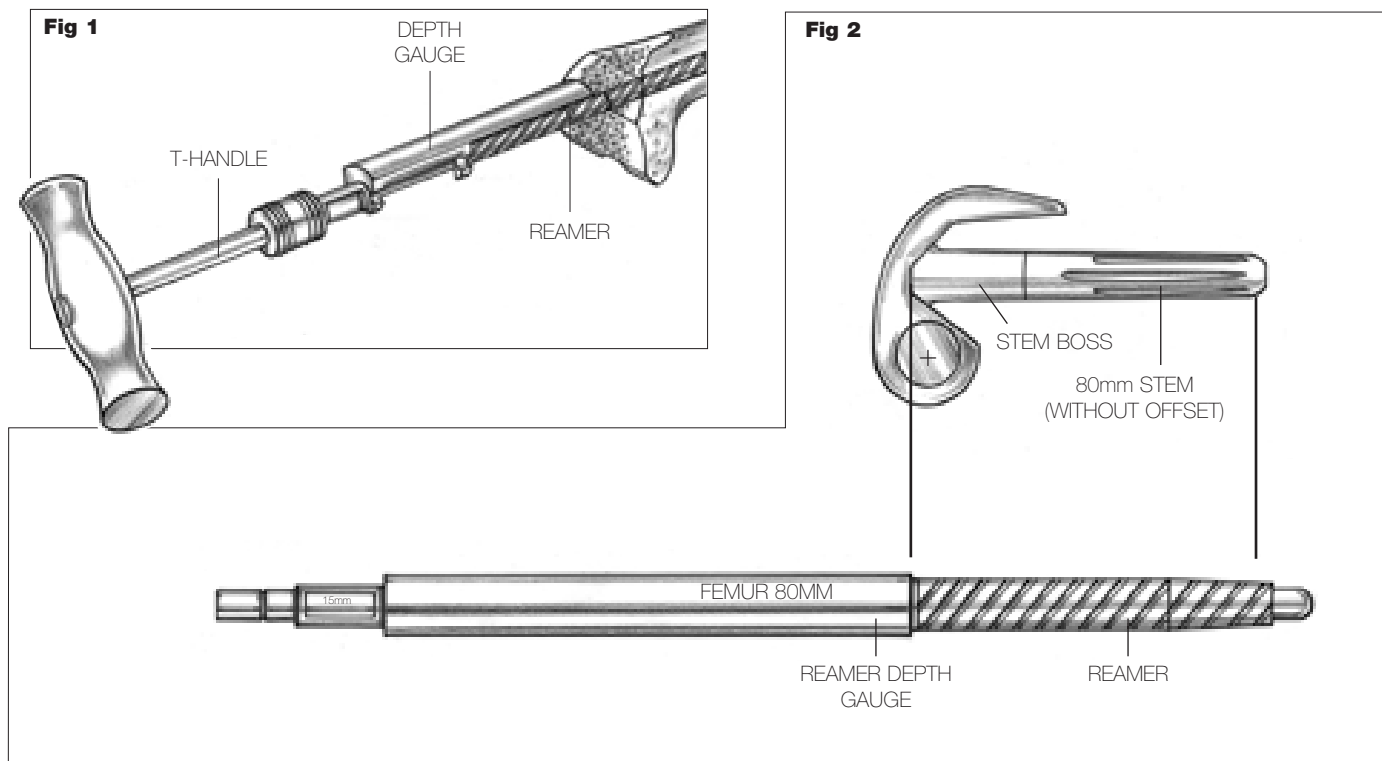


Resection Length

The Modular Rotating Hinge Knee offers a wide range of assembly options with 5 thicknesses of Duration® Stabilized polyethylene tibial inserts and an array of femoral and tibial augmentation blocks.

The minimum resection length is 27mm, the maximum including full augmentation options is 61mm.





Femoral Canal Preparation

A Stem of at least 80mm should be used on the Femoral and Tibial Components for Modular Rotating Hinge procedures.

The medullary canal must be reamed in order to accommodate the new implant. Fluted reamers, available in diameters 8-23mm, are sequentially advanced into the canal until the tip of the appropriate depth gauge reaches the level of the most prominent bony aspect of the distal femur (**Figure 1**).

Note: Reamer Depth Gauges for femoral preparation are available in two lengths for neutral stems and two lengths for offset stems. 80mm and 155mm refer to the depth required to properly seat the implant with the respective 80mm and 155mm length Stem.

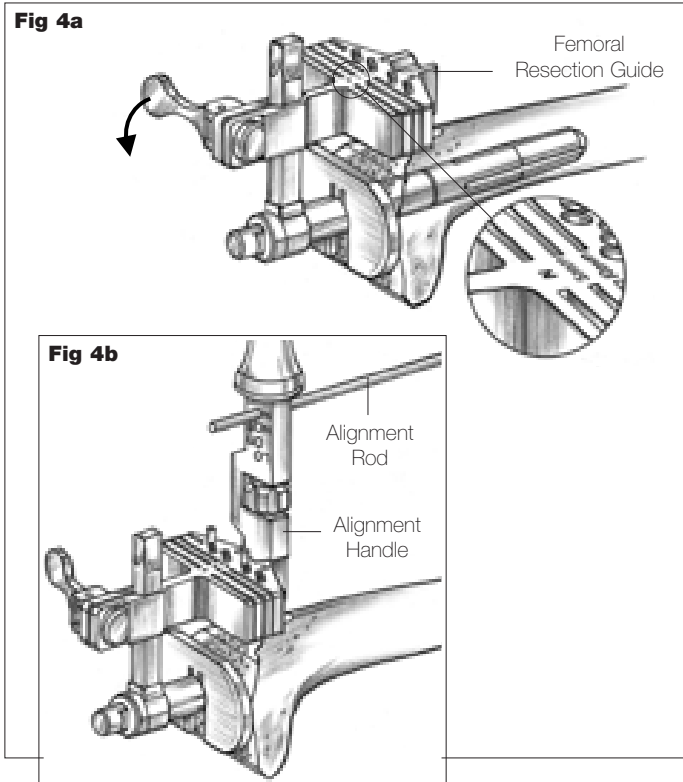
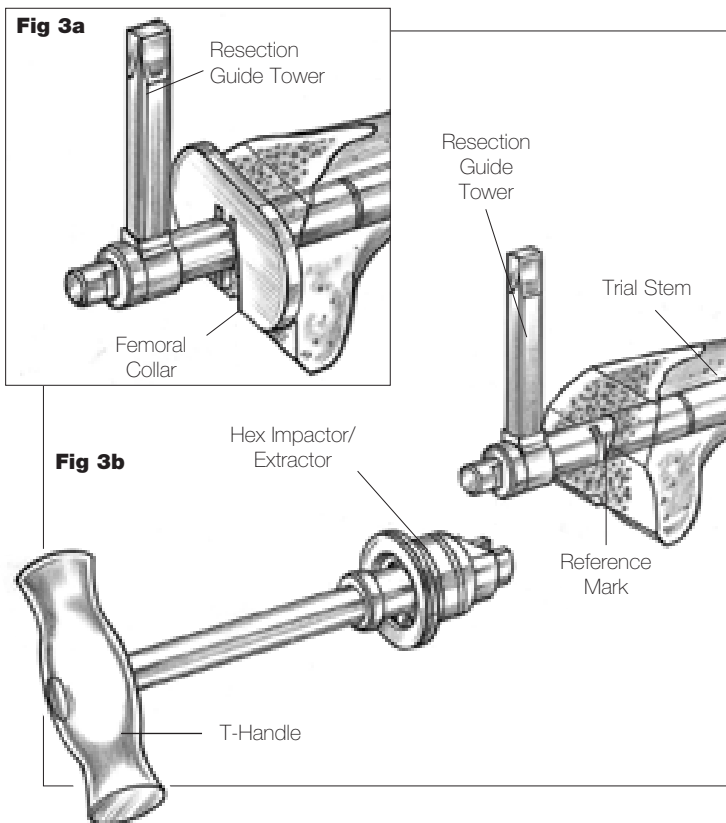
Figure 2 gives an example of depth gauge marking, and how it relates to preparation of the medullary canal for a given combination of implants.

Technical Hint: In situations where stem diameters of 14mm or less are being used, it is necessary to ream the medullary canal of the distal femur with a 15mm reamer to at least 40mm. This reaming provides the necessary clearance to fully seat the cutting guide tower instrument and the "stem boss" portion of the stemmed femoral component.

It is strongly recommended that intra-medullary reaming be performed manually to avoid bone perforation and/or fracture.

Modular Rotating Hinge

Operative Technique



Femoral Distal Resection

After preparing the medullary canal, the corresponding diameter stem trial is selected and attached to the resection guide tower.

The assembly is inserted into the canal until the reference mark on the resection guide tower is aligned with the most prominent bony aspect of the distal femur. This position will allow a 2mm distal femoral "clean up" cut to be made.

The appropriate left or right femoral collar may be attached to the tower to assist in setting the final depth and rotation of the instrument (**Figure 3a**).

Technical Hint: To impact and extract the assembly in and out of the medullary canal, the T-Handle Impactor Extractor can be utilized (Figure 3b).

The 6° Valgus Femoral Resection Guide is assembled onto the tower, slid down to touch the anterior femur and secured using the cam-lock mechanism (**Figure 4a**).

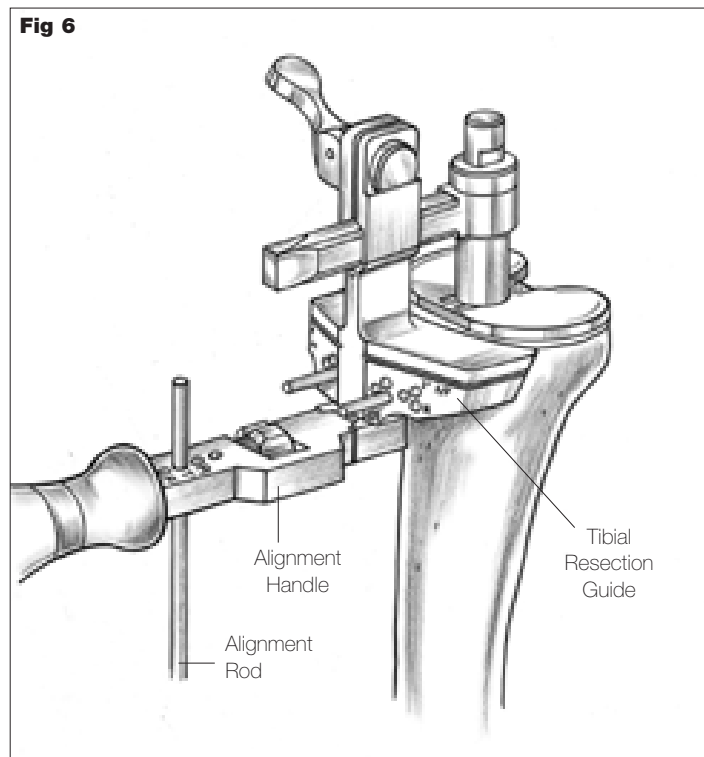
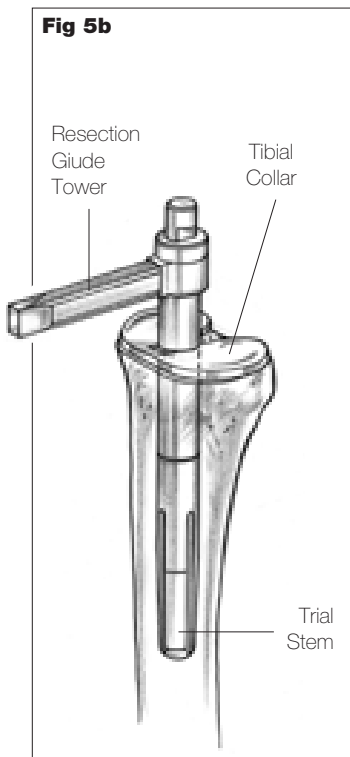
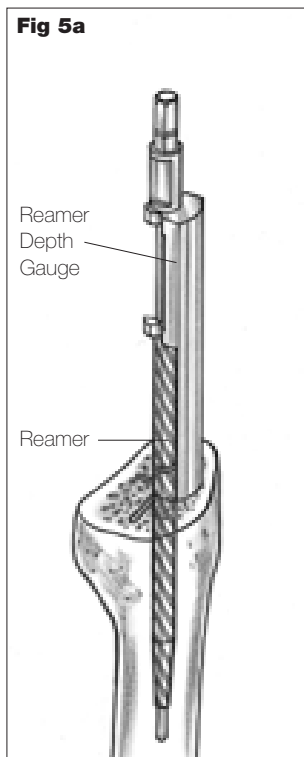
Further fixation to the femur can be achieved by adding 1/8" (3.2mm) drills through the guide. A pin may also be inserted obliquely into the "X" drill hole to provide additional stability.

With the Femoral Resection Guide securely fixed to the stem assembly for enhanced stability, the 2mm "clean up" cut is performed using the slot marked "N" for neutral.

If Distal Femoral Augments are required, the 10mm cutting guide slots are used.

Note: If a further resection is required, the cutting guide can be re-positioned referencing the pins placed on the distal femur through the 2mm or 4mm pin holes on the resection guide. If this is done, the medullary canal should be reamed a further 2mm or 4mm in order to ensure the implant will be fully seated.

Technical Hint: Before fixing the resection guide with 1/8" drills, alignment can be verified by referencing the position of the femoral head with the extramedullary rod inserted through the "NF" hole on the alignment handle, attached to the Femoral Resection Guide (Figure 4b). The position of the femoral head is determined from pre-operative X-ray templating.



Tibial Preparation

Fluted reamers, available in diameters 8-23mm are sequentially advanced into the medullary canal until the tip of the Tibial Reamer Depth Gauge reaches the level of the most prominent bony aspect of the proximal tibia (**Figure 5a**).

Note: Reamer Depth Gauges for tibial preparation are available in two lengths. 80mm and 155mm refer to the depth required to properly seat the implant with the respective 80mm and 155mm length Stem.

After preparing the medullary canal, the corresponding diameter stem trial is selected and attached to the resection guide tower. The tibial collar is attached to the tower to assist in setting the final depth and rotation of the instrument (**Figure 5b**). The assembly is inserted into the canal until the tibial collar contacts the most prominent bony aspect of the proximal tibia. This position should allow a 2mm proximal tibial "clean up" cut to be made.

Technical Hint: To impact and extract the assembly in and out of the medullary canal, the T-Handle Impactor Extractor can be utilized.

The Tibial Resection Guide (making a Neutral-Neutral cut relative to the mechanical axis) is assembled onto the tower, slid down to touch the anterior tibia and secured using the cam-lock mechanism (**Figure 6**).

Fixation to the tibia can be achieved by adding 1/8" (3.2mm) drills through the guide. A pin may also be inserted obliquely into the "X" drill hole to provide additional stability.

With the assembled construct stabilized, the 2mm "clean up" cut is performed through the slot on the guide while the stem assembly is still in place, providing enhanced stability.

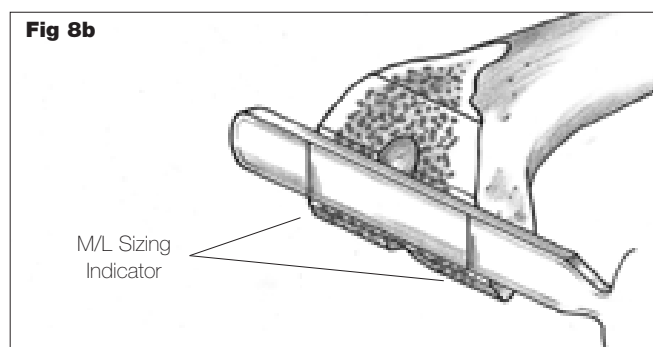
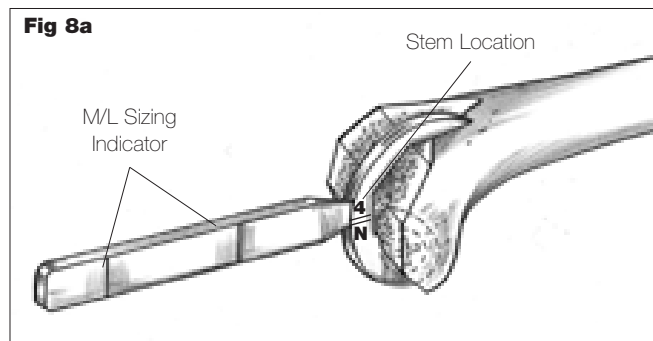
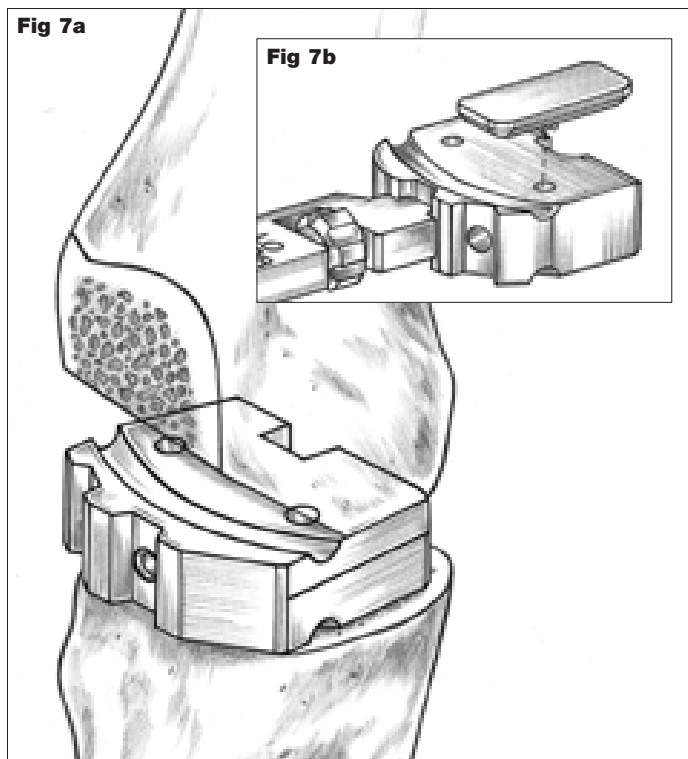
Note: If a further resection is required, the cutting guide can be re-positioned referencing the pins placed on the proximal tibia through the 2mm or 4mm pin holes on the resection guide. If this is done, the medullary canal should be reamed a further 2mm or 4mm in order to ensure the implant will be fully seated.

Technical Hint: Before fixing the resection guide with 1/8" (3.2mm) drills, rotational alignment can be verified by referencing the center of the ankle with the extramedullary rod inserted through the "NT" hole on the alignment handle, attached to the Tibial Resection Guide (Figure 6**).**

Note: A/P alignment should not be referenced by use of the handle, since the handle has a 3° slope.

Modular Rotating Hinge

Operative Technique



Extension Gap Assessment

A Spacer Block can be used to assess the extension gap, but not the size of the final flexion gap as the posterior cut has not been made.

Select the appropriate thickness Spacer Block and place it into the joint gap with the knee in full extension

(Figure 7a).

Modular 5mm and 10mm Half Spacers can be attached to the appropriate faces of the Spacer block to compensate for bone loss in order to carry out soft tissue evaluation (Figure 7b).

Technical Hint: The position of the patella is a helpful indicator in deciding where to locate the position of the femoral and tibial implants. The distal femur can be built up with 10mm augmentation blocks. The proximal tibia can be built up with the 5 and 10mm augmentation blocks and/or thicker tibial insert spacers.

Femoral Sizing

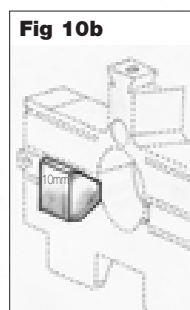
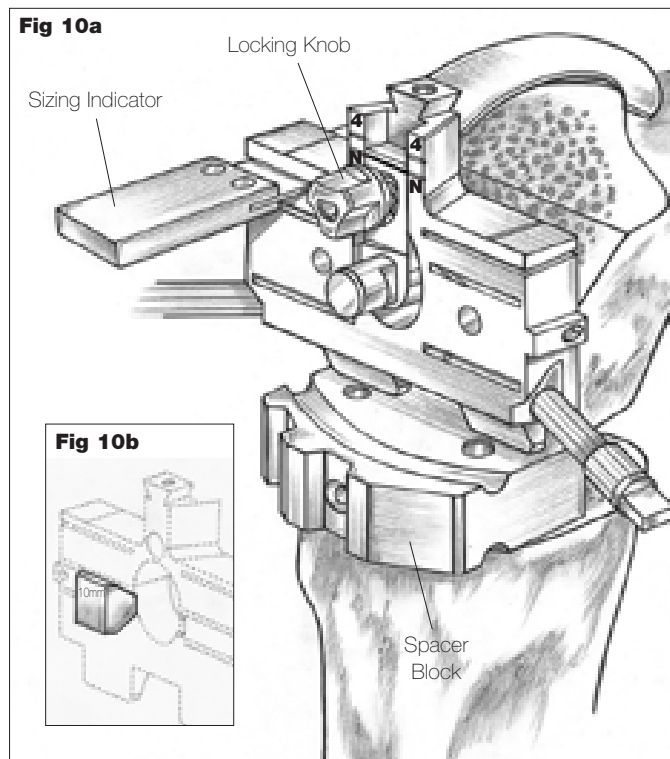
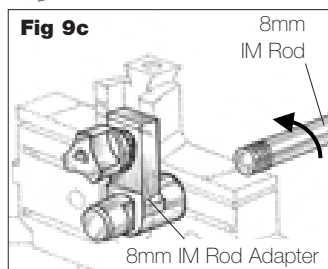
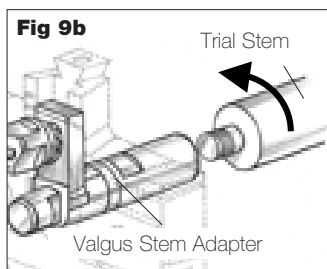
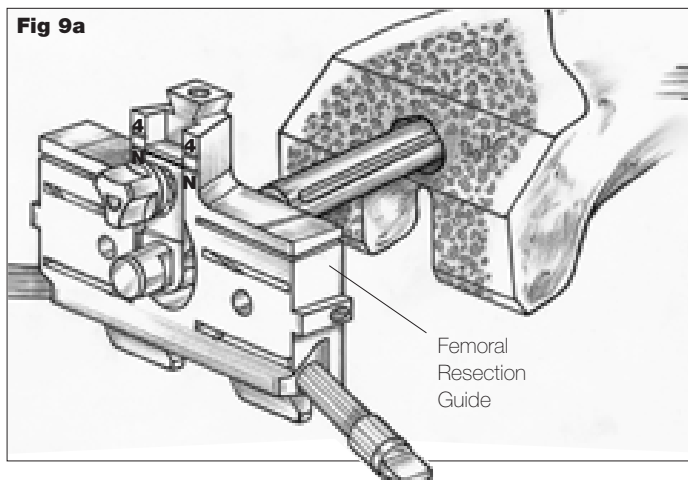
In addition to pre-operative templating, femoral sizing can be accomplished using the femoral sizing template, by placing the posterior aspect of the template in the intercondylar notch to enable the internal cuts profile to seat flush against the bone (Figure 8a).

The handle of the template also provides markings that correspond to the M/L width of the implant (Figure 8b).

To accurately locate the template using the fixed stem position of the implant as the A/P reference point, replace the resection guide tower and trial stem in the femur,

and position the sizing template so that the etched line marked "N" ("neutral" stem position) is coincident with the center line of the guide tower and the medullary canal. If an anterior gap is present, reposition the sizing template posteriorly so the engraved line marked "4mm" is coincident with the center line of the guide tower and reassess the fit of the template in this "4mm offset stem" position.

Repeat this process with a different size template if necessary to determine the best size femoral component and whether a 4mm offset stem is required.



Intramedullary Alignment

The appropriate left or right 6° Valgus Stem Adapter is assembled to the selected size Femoral A/P Chamfer Resection Guide and set to the “N” line on the resection block if no offset is to be used. If the 4mm posterior offset is to be used, the Valgus Stem Adapter should be locked at the “4” line.

The Trial Stem is then attached (**Figure 9b**), and inserted into the canal until the Resection Guide rests against the cut distal femur (**Figure 9a**).

If a 10mm distal augment cut has been made on the femur, as detailed in **Figure 4a**, a magnetic 10mm Resection Guide Spacer should be attached to the Femoral Resection Guide (**Figure 10b**).

Option: An 8mm IM Rod can be used to reference the medullary canal, if the 8mm IM Rod Valgus Adapter is attached to the Femoral Resection Guide (**Figure 9c**).

Femoral Sizing and Resection

Femoral sizing can be verified using the Sizing Indicator, referencing the anterior cortex, as indicated (**Figure 10a**).

If it is desirable at this stage to change the position of the Resection Guide to Neutral or 4mm posterior offset, this can be done by releasing the Locking Knob on the Valgus Adapter one half turn and sliding the Resection Guide to its new position. Then tighten the Locking Knob.

Correct internal/external rotation of the Femoral Resection Guide can be achieved by setting the Resection Guide parallel to the transepicondylar axis. The Resection Guide can then be fixed using 1/8” (3.2mm) drills or pins.

The anterior femoral cut may now be made using a .050” (1.27mm) oscillating sawblade through the most anterior slot on the guide.

Technical Hint: The tabs on the posterior aspect of the Femoral Resection Guide represent the external profile of the posterior condyles of the Femoral Component. With the knee in flexion, the correct rotation of the Femoral Resection Guide can also be assessed by referencing the spacer block between the resected tibial surface and the posterior condyle tabs on the Resection Guide to ensure a parallel flexion gap (**Figure 10a**).

Modular Rotating Hinge

Operative Technique

Fig 11

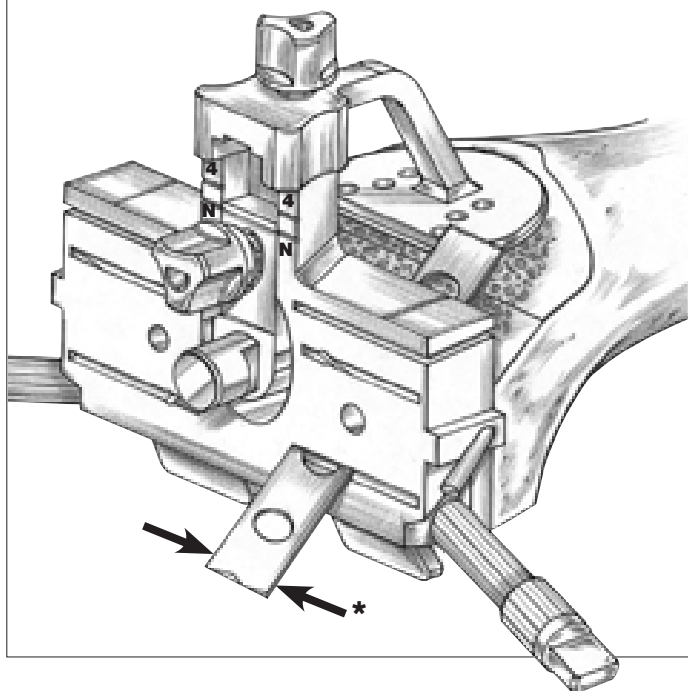


Fig 12a

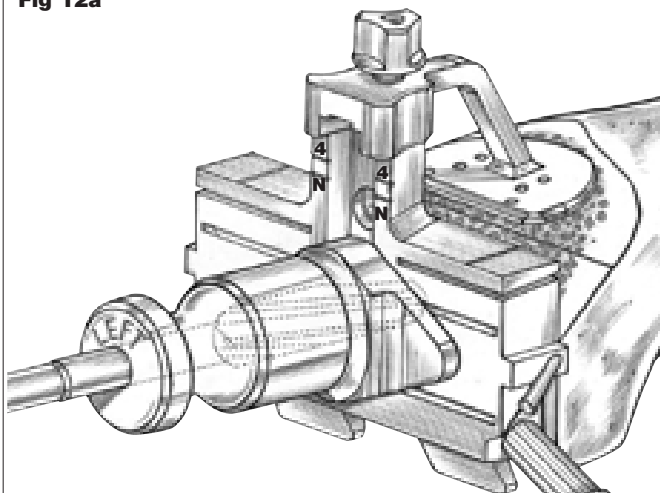


Fig 12b

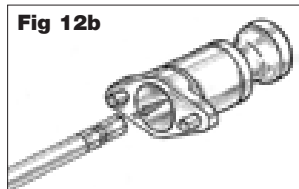
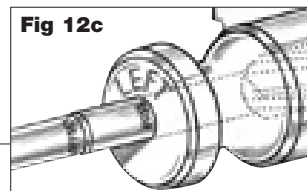


Fig 12c



Femoral Sizing and Resection (Continued)

The Anterior Shim Plate can be attached to the Femoral Resection Guide to provide stability for the Resection Guide assembly during the anterior and posterior chamfer resections (**Figure 11**).

Technical Hint: A narrow oscillating sawblade of approximately 1/2" (12.5mm) is recommended for the chamfer cuts.

Option: If IM referencing is not used, the Anterior Shim Plate can be attached to the Femoral Resection Guide to reference the existing anterior cut. Care should be taken in checking that the original anterior cut is not malrotated.

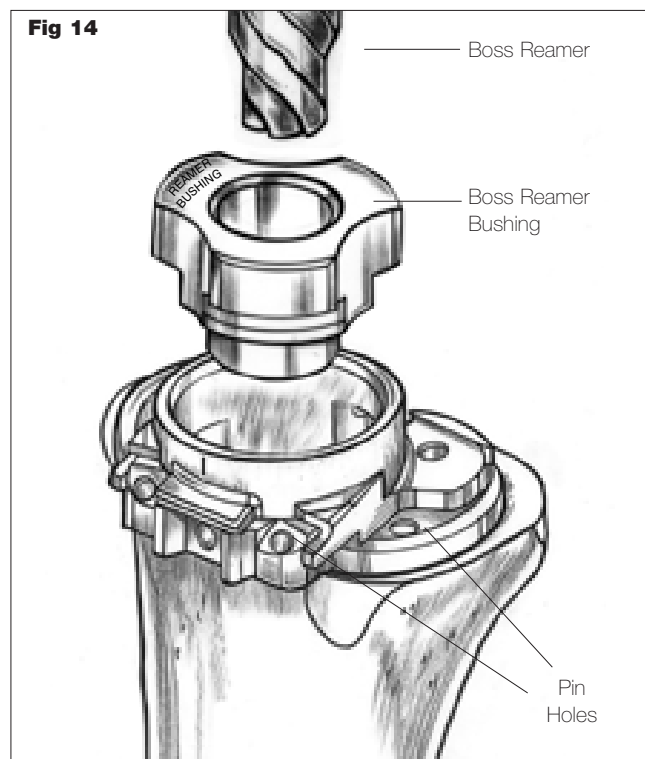
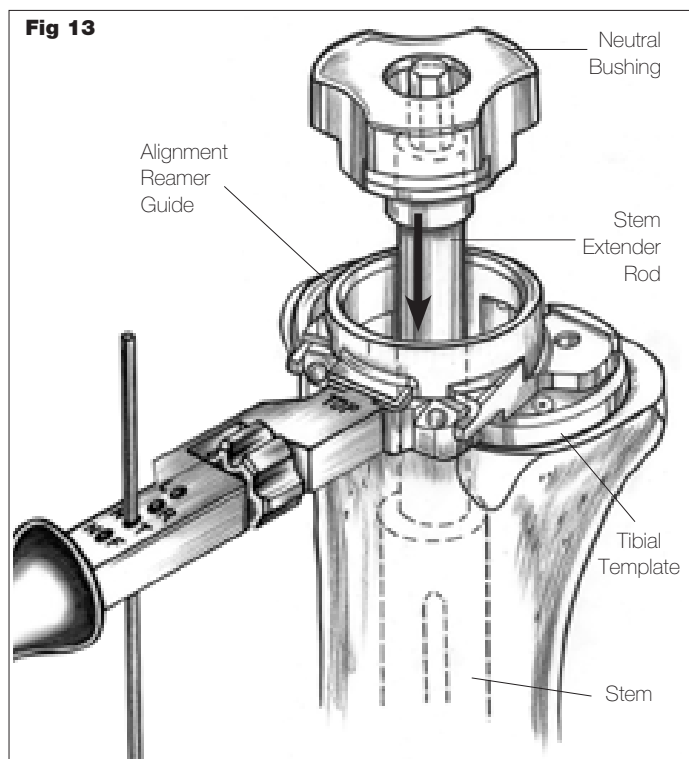
Offset Stem Preparation

If the 4mm Offset Stem Adapter Implant is being used it is necessary to ream the femur to prepare for the new posterior position of the Femoral Component Stem Boss and Offset Adapter (**Figure 12a**).

Remove the Trial Stem and Valgus Adapter and assemble the Femoral Offset Reamer and assemble the Femoral Offset Reamer through the Reamer Bushing (**Figure 12b**). Attach the Bushing to the Femoral Resection Guide and ream to the "Offset" reamer depth marking.

Note: If a straight stem with a diameter of 14mm or less is used on the Femoral Component, the Offset Reamer and Reamer Bushing should be used to the "Boss" reamer depth marking (Figure 12c) to prepare the distal femur for the stem boss of the femoral component.

If the 8mm IM Rod has been used for IM referencing (shown in **Figure 9c**), stem reaming should be completed at this stage for at least an 80mm length stem.



Tibial Preparation

Select the size of Tibial Template which best matches the cut proximal tibia without overhanging the cortex.

Use the Stem Rod, attached to a Trial Stem, through the Alignment Reamer Guide and Neutral Bushing to center the Template with the Stem construct in the canal (**Figure 13**).

With the knee in full flexion, and the Alignment Handle attached to the Template, an Alignment Pin is placed through the "NT" hole position of the Handle to verify alignment. The tibial tuber-

cle will normally be positioned just lateral to the pin which should be centered distally over the center of the ankle.

When alignment is correct, the Template is secured with Headed Nails or pins through holes located anteriorly and posteriorly on the template.

Then ream the Stem Boss using the Stem Boss Bushing and Stem Boss Reamer to the "Boss" depth marking (**Figure 14**).

Modular Rotating Hinge

Operative Technique

Fig 15

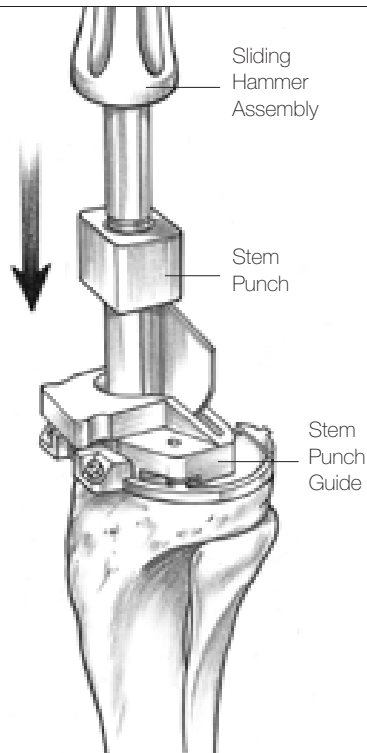


Fig 16a

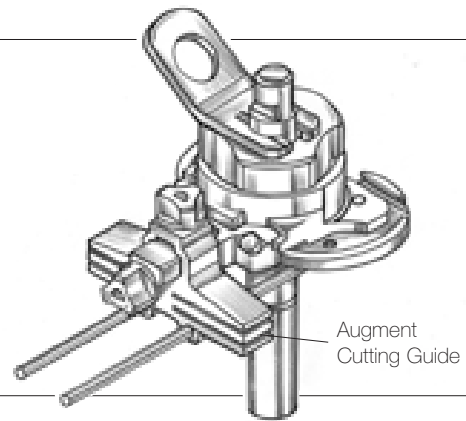
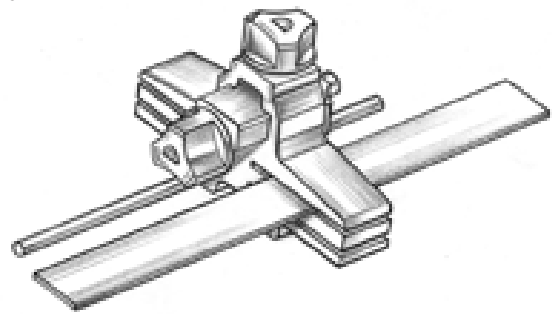


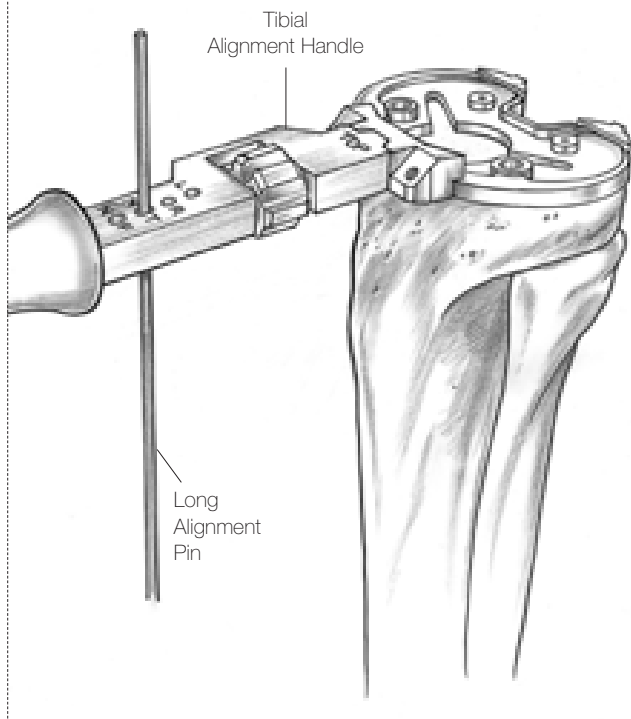
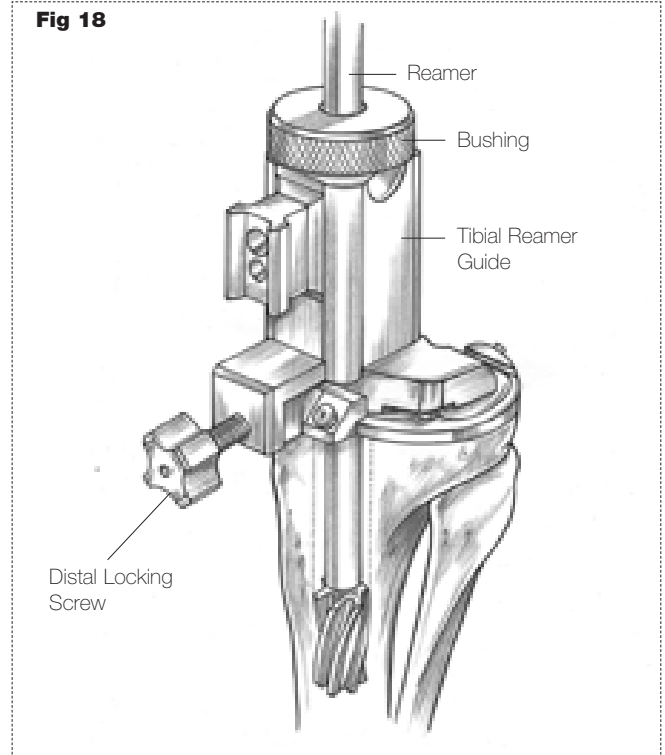
Fig 16b



For the Keel Baseplate, the Stem Punch Guide is placed in the corresponding locking holes in the Tibial Template (**Figure 15**). Attach the Stem Punch to the Sliding Hammer Assembly. The Stem Punch fits into the cut out on the guide.

Tibial Bone Augment Preparation

Prior to punching for the tibial baseplate, assess the need for tibial augmentation. Based on the nature of the deformity, attach the appropriate resection guide to the tibial template and secure by tightening the locking knob. Drill pins through the holes located on the augment-cutting guide (**Figure 16**). Remove the tibial template and complete the cut through the appropriate slot.

Fig 17**Fig 18**

Tibial Preparation: Primary Option

It is possible to prepare the tibia for a Modular Rotating Hinge Tibial Baseplate using the Monogram primary tibial instruments.

Select the size of Tibial Template which best matches the cut proximal tibia without overhanging the cortex.

With the knee in full extension, and the Alignment Handle attached to the Template, an Alignment Pin is placed through the "NT" hole position of the Handle to verify alignment (**Figure 17**). The tibial tubercle will normally be positioned just lateral to the pin which should be centered distally over the center of the ankle.

When alignment is correct, the Template is secured with Headed Nails or pins through holes located anteriorly and posteriorly on the template.

Tibial Stem Reaming

The Tibial Reamer Guide and Stem Boss Reamer can be used to ream the canal for the Tibial Baseplate "Stem Boss". If the medullary canal has not been prepared for at least an 80mm Stem as described on page 5, then this should be done at this stage using the appropriate diameter stem reamer.

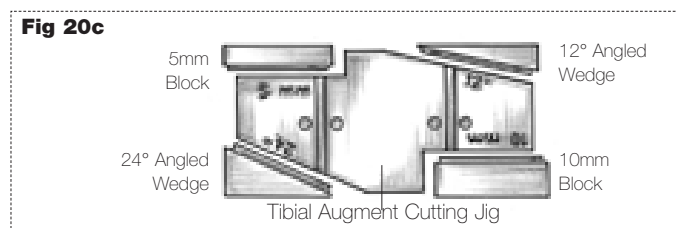
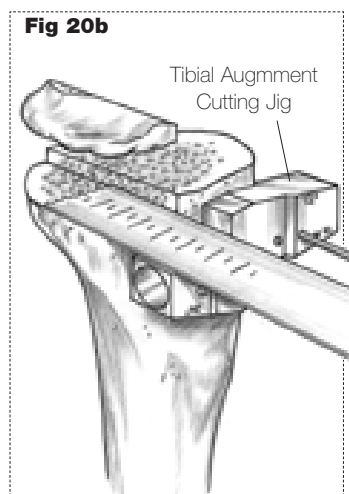
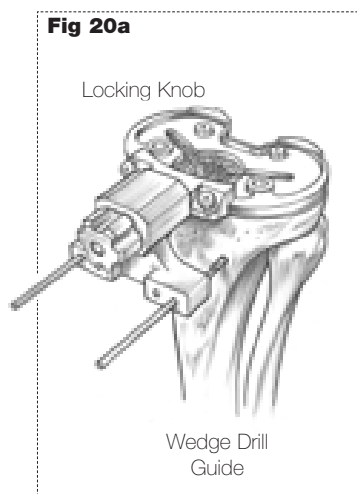
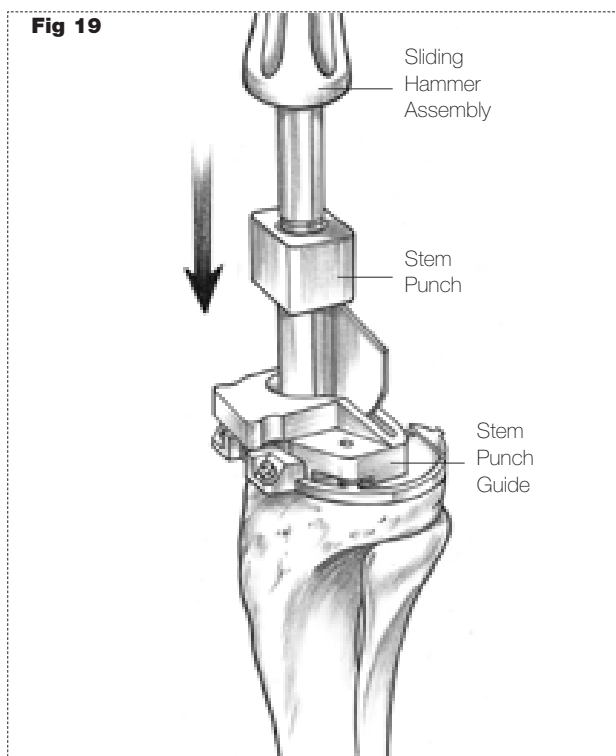
The Tibial Reamer Guide is placed onto the Tibial Template and the distal Locking Knob is tightened, securing the assembly (**Figure 18**).

With the bushing in place, ream to the appropriate depth, indicated by the 80 and 155mm markings on the Reamer shaft.

Technical Hint: The Alignment Handle can be attached to the Anterior face of the Tibial Reamer Guide to enable an extramedullary alignment check before reaming.

Modular Rotating Hinge

Operative Technique



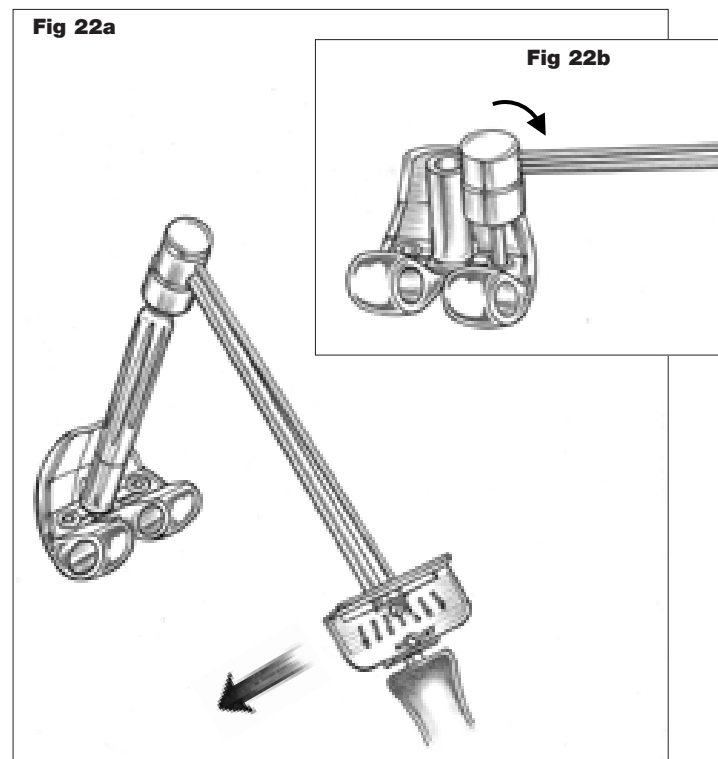
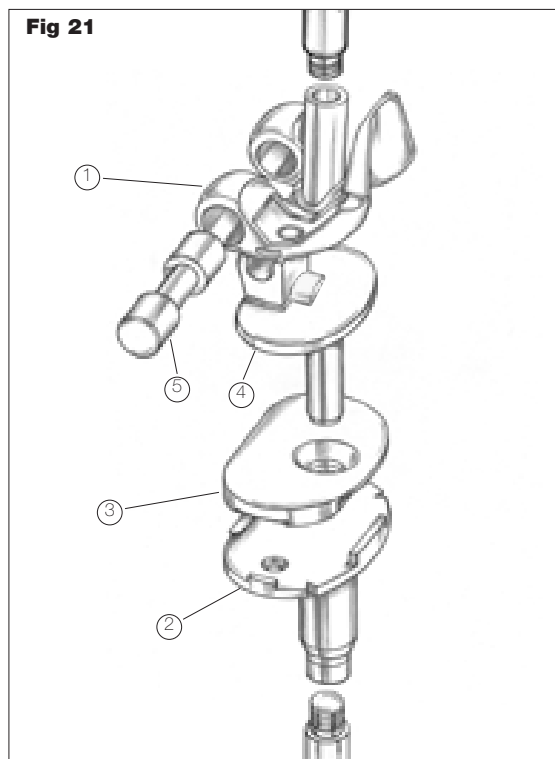
The Stem Punch Guide is placed in the corresponding locking holes in the Tibial Template (**Figure 19**). Attach the Stem Punch to the Sliding Hammer Assembly. The stem punch fits into the cut out on the guide.

Tibial Bone Augment Preparation

Prior to punching, the Augment Drill Guide is attached, by tightening the Locking Knob to the anterior face of the Tibial Template (**Figure 20a**). Two 1/8" (3.2mm) drill bits are placed through the guide into the tibia. The drill guide is then removed. After punching the Tibial Template is removed and the Tibial Augment Cutting Jig is then placed on the 1/8" (3.2mm) drill bits.

The Tibial Augment Cutting Jig allows accurate defect resection to provide full bony contact for the configured component (**Figure 20b**).

The Jig offers four options: a 12° or 24° angled wedge resection, and a 5mm or 10mm flat resection for full or half spacers (**Figure 20c**).



Trialing

On completion of the femoral and tibial bone preparation a trial reduction should then be performed to confirm that appropriate motion, stability and patellar tracking have been achieved.

The Trial Femoral Component (1) and Trial Tibial Baseplate (2) can be fitted with the appropriate Trial Augments and Trial Stems before being placed onto the prepared bones. If a 4mm offset adapter is to be used, this can be attached to the femoral component in the same way as the implant, as detailed on pages 16 and 17.

Place the appropriate thickness Trial Tibial Insert (3) onto the Trial Tibial Baseplate and drop in the appropriate Trial Tibial Bearing Component (4).

Insert the Trial Axle (5) into the bore of the Trial Femoral Component until the groove lines up with the intercondylar gap between the condyles. Engage the Trial Axle down into the "snap-fit" hinge on the Trial Bearing Component (4).

Femoral Implant Assembly

The implant Femoral Spacers are attached by screw fixation to the distal condylar area of the femoral component. The Torque Wrench is attached to the Distal Locking Screw Adapter. A locking torque of 60 - 80 in/lbs is applied to the screw head in order to lock the Spacer and Femoral Component together (**Figure 22b**).

To attach a CoCr Stem to the implant, hand tighten the stem into the Femoral Stem Boss as far as possible. Attach the Stem Socket Wrench to the Torque Wrench, insert the male hex tip of the wrench into the hex recess on the Stem and tighten to 120 in/lbs - 180 in/lbs (**Figure 22a**).

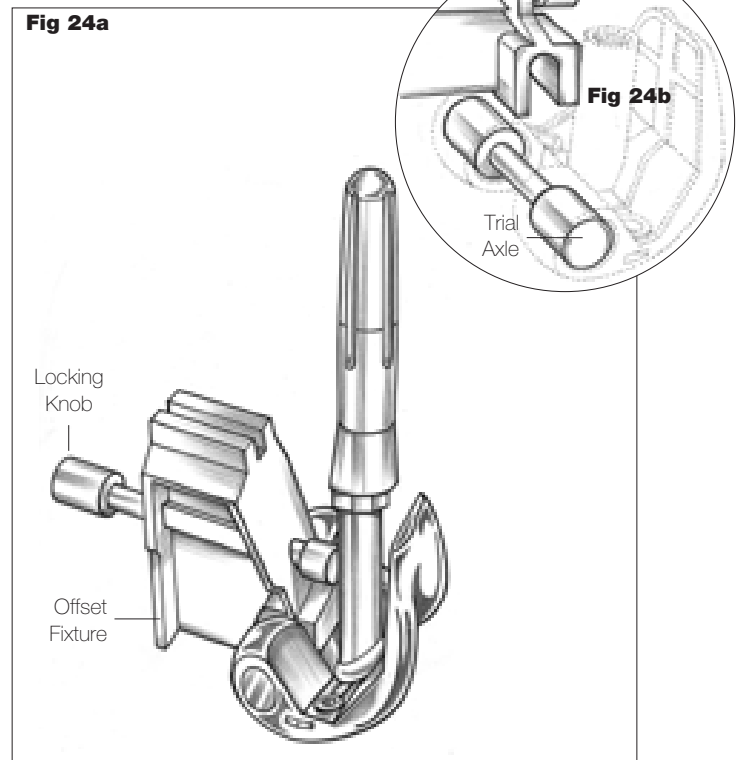
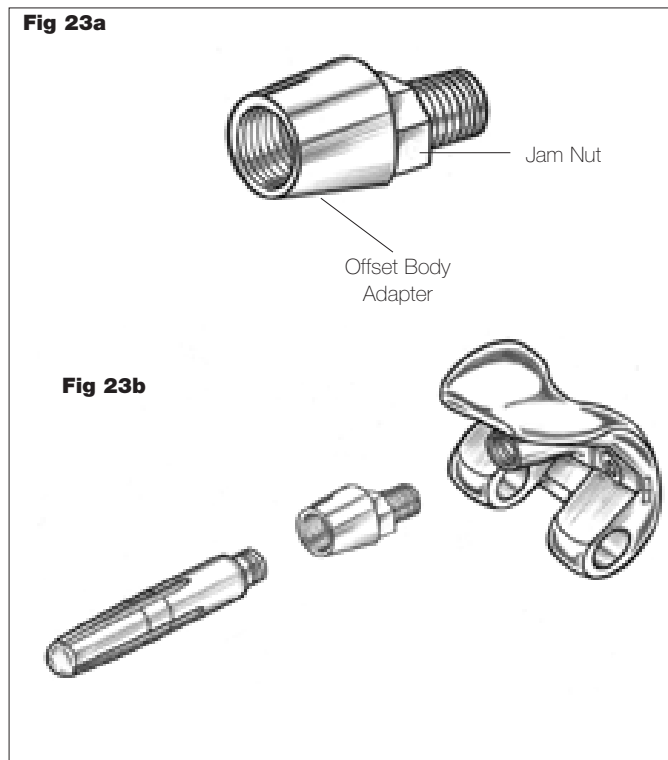
Option: If using a 155mm Titanium Fluted Stem, tighten to 120 in/lbs - 180 in/lbs with the Tri-Fluted Stem Wrench, illustrated in **Figure 25b**.

If using a CoCr Stem, hand tighten the Stem into the Femoral Stem Boss as far as possible. The Combination Wrench is then used to fully tighten.

Note: A Stem of at least 80mm should be used on the Femoral Components for Modular Rotating Hinge procedures.

Modular Rotating Hinge

Operative Technique



Femoral Offset Stem Assembly

STEP 1

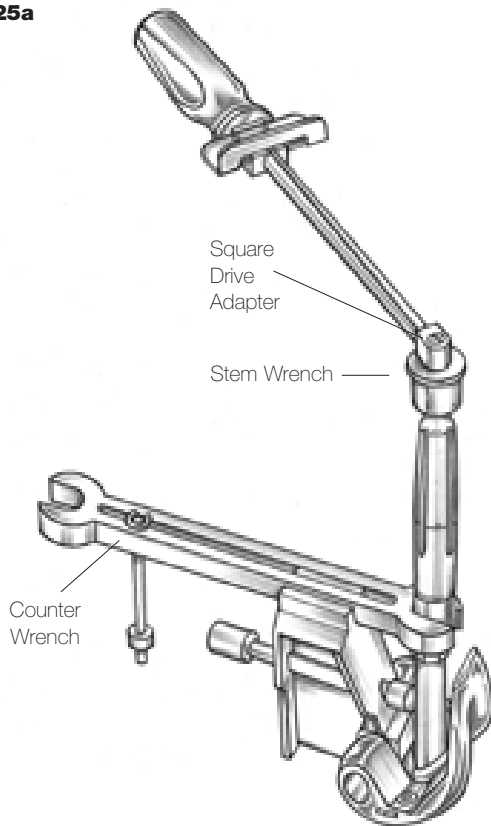
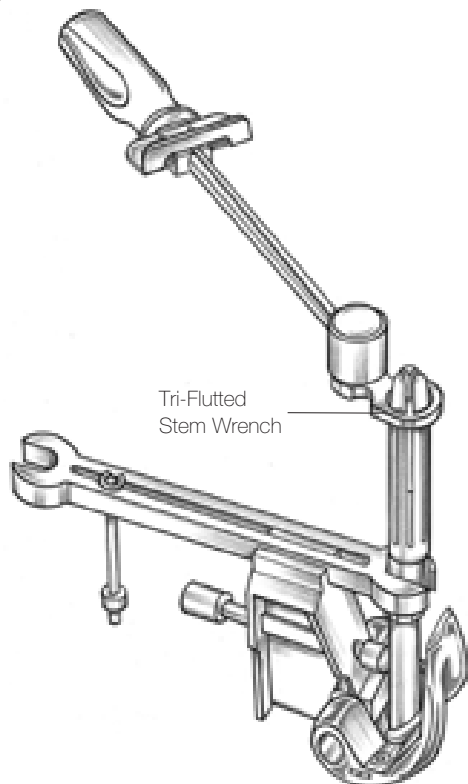
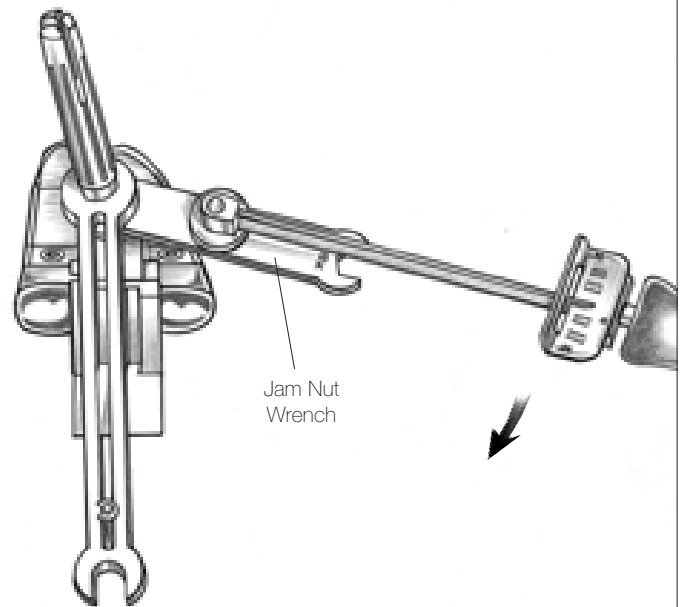
Turn the jam nut along the threaded stud until it contacts the offset adapter body (**Figure 23a**). Screw the offset adapter into the boss of the femoral component implant until it is fully seated. Tighten the stem into the adapter by hand as far as possible.

STEP 2

Slide the Trial Axle into the Femoral Component implant and drop the Offset Fixture onto the axle between the condyles (**Figure 24b**). Tighten the locking knob by hand until it sits firmly against the stem boss of the femoral component implant (**Figure 24a**).

STEP 3

Turn the offset adapter body counter-clockwise until the stem is anterior to the boss of the femoral component (**Figure 24a**). **DO NOT EXCEED ONE FULL TURN.**

Fig 25a**Fig 25b****Fig 26****STEP 4**

Attach the counter wrench to the appropriate left or right positioning rail on the offset locking jig and engage the offset adapter body. Using the stem wrench (hex tip **(Figure 25a)** or tri-fluted **(Figure 25b)** and torque wrench, tighten the stem to the adapter body to a torque value of 120 in/lbs - 180 in/lbs **(Figure 25)**.

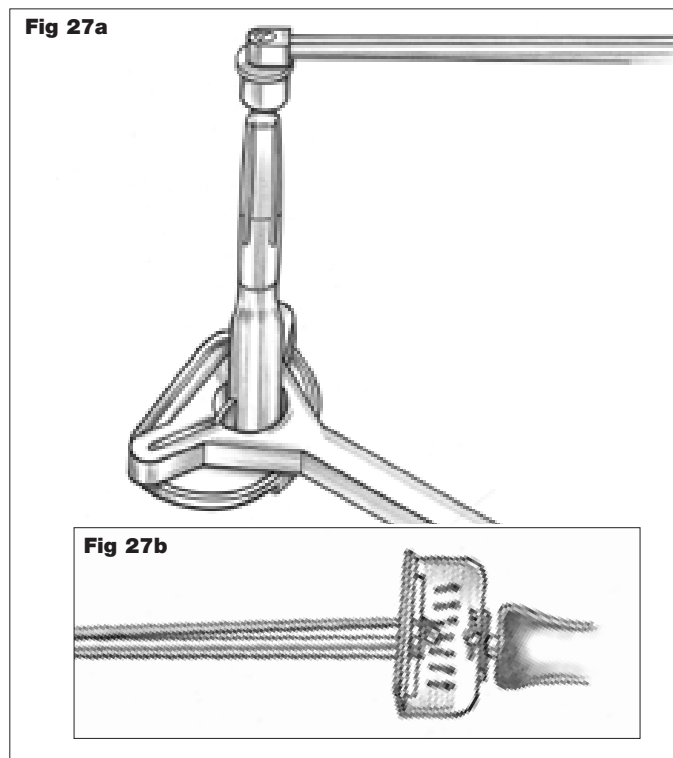
STEP 5

Attach the jam nut wrench to the torque wrench. Engage the jam nut with the torque wrench assembly while holding the counter wrench and tighten to 120 in/lbs - 180 in/lbs **(Figure 26)**.

Note: Orient the square drive adapter, tri-fluted stem wrench and jam nut wrench with the long axis of the torque wrench.

Modular Rotating Hinge

Operative Technique

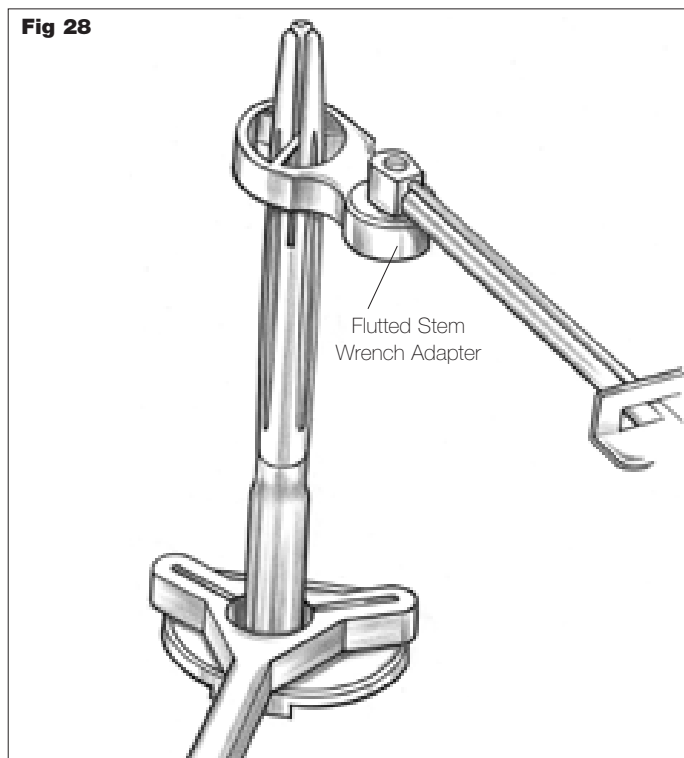


Tibial Stem Implant Assembly

To attach a CoCr Stem to the implant, hand tighten the stem into the Tibial Stem Boss as far as possible. Attach the Stem Socket Wrench to the Torque Wrench, insert the male hex tip of the wrench into the hex recess on the Stem and tighten to 120in/lbs – 180in/lbs (**Figure 27a and 27b**).

Note: A Stem of at least 80mm should be used on the Tibial Components for Modular Rotating Hinge procedures.

Option: If CoCr Stem are to be used, hand tighten the stem into the Tibial Stem Boss as far as possible. The Combination Wrench and Counter Wrench are then used to fully tighten.



Titanium Tri-Fluted Stem Option:

When using a 155mm Titanium Fluted Stem, the Tri-Fluted Stem Wrench Adapter must be used to apply the final torque to the implant. This adapter is attached to the Torque Wrench and slid into the slots of the Stem until it has bottomed out on the implant. The Stem must be tightened to the final locking torque of 120in/lbs – 180in/lbs (**Figure 28**).

Fig 29a

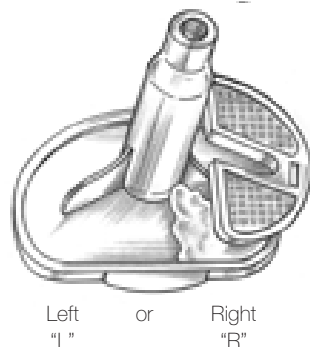


Fig 29b

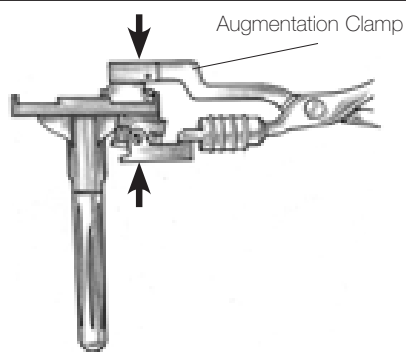
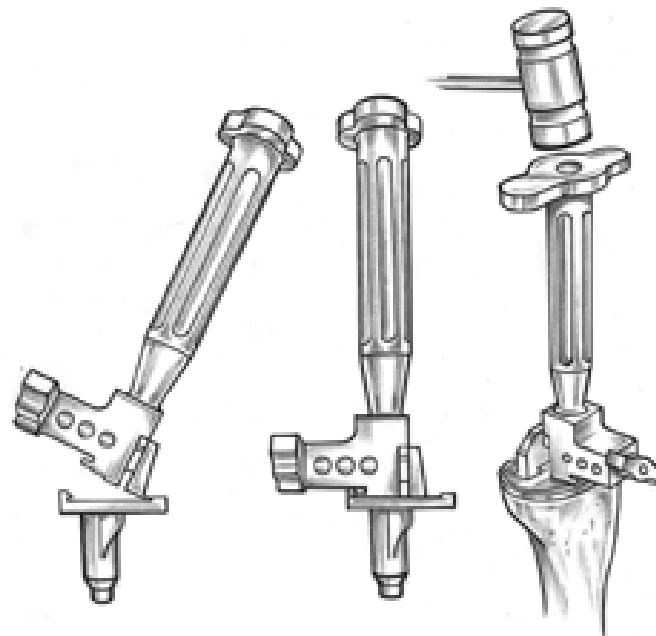


Fig 30



Tibial Spacer Implant Assembly

Cement is placed onto the surface of the Baseplate and the undersurface of the Tibial Spacer. The lip on the Spacer is placed into the rim of the Baseplate (**Figure 29a**), and the Augmentation Clamp is attached to the assembly and left in place until the cement has fully hardened (**Figure 29b**).

The Full or Half Augment Clamp and Clamp Pad should be used when cementing the appropriate Full or Half Augments.

Note: The Trial Spacers are colour coded, by size, to match the appropriate implant package.

Tibial Baseplate Implantation

The Tibial Impactor Extractor (**Figure 30**) is used to impact the Tibial Baseplate to its full depth, ensuring the Keel engages in the prepared bone.

Modular Rotating Hinge

Operative Technique

Fig 31

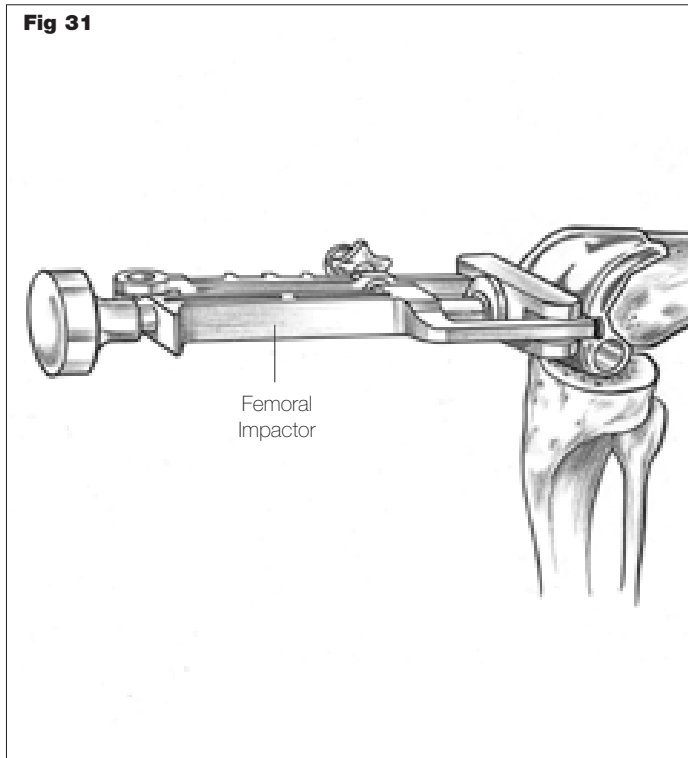
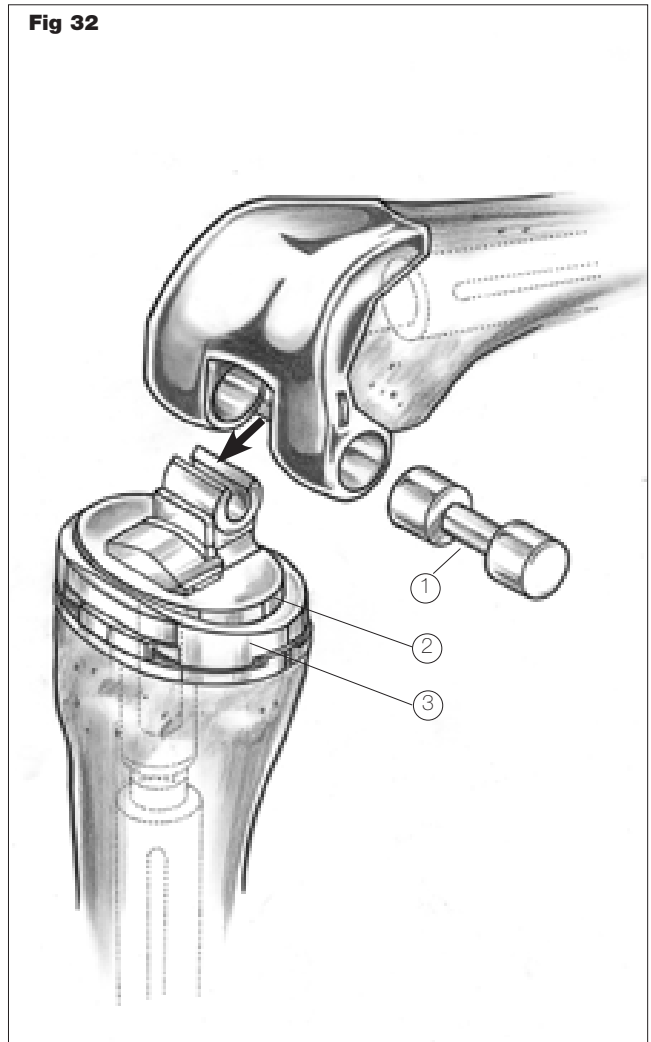


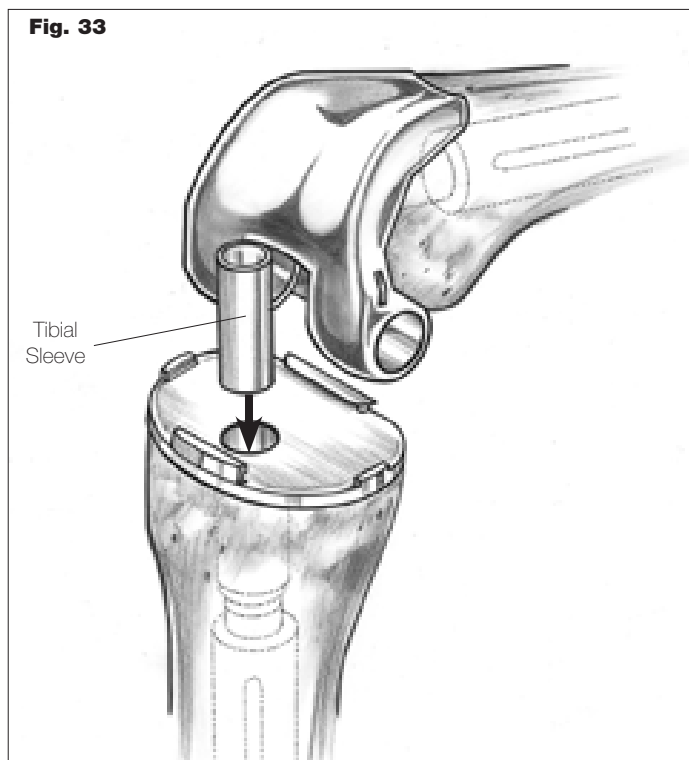
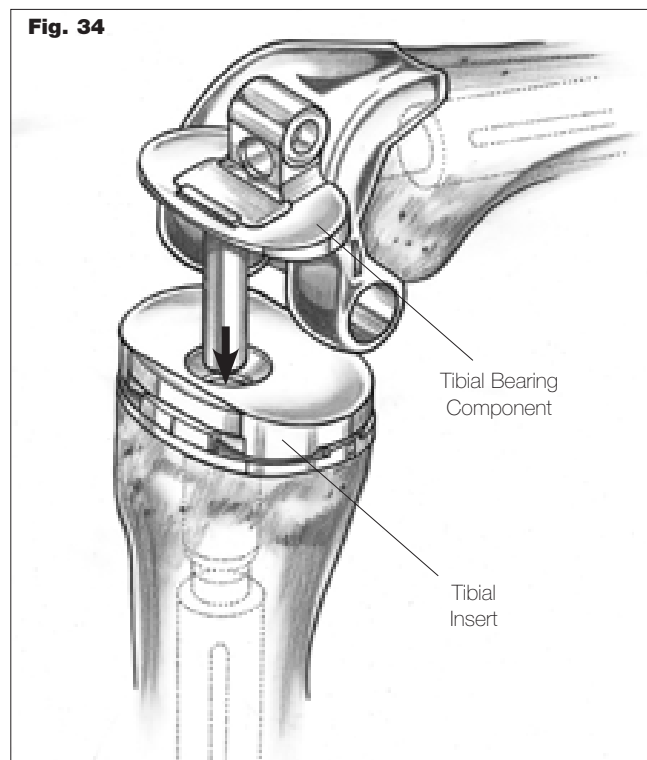
Fig 32



Femoral Implantation

The implant Femoral Component Assembly is attached to the Femoral Impactor Extractor, guided onto the femur and impacted flush (**Figure 31**).

With the Femoral Component and Tibial Baseplate implanted, it is possible to use the Trial Axle (1) with the Trial Bearing Component (2) and Trial Tibial Insert Spacer (3) to verify that the appropriate motion, stability and patellar tracking have been achieved. With the knee in full extension this also assists in loading the femoral and tibial baseplate components while the cement is curing to provide an optimal bond between implant and bone.

Fig. 33**Fig. 34**

Final Implant Assembly

To complete the assembly of the final implant components, insert the Tibial Sleeve into the Tibial Baseplate until it is flush with the surface.

There are two sizes of Tibial Insert Spacer, Small 1/ Small 2 and Medium 1/ Large 2, which fit with the corresponding Tibial Baseplates. They both come in 5 different thicknesses of 10mm, 13mm, 16mm, 20mm and 24mm.

Snap in the appropriate thickness Tibial Spacer, chosen at the trialing stage and drop in the Tibial Bearing Component.

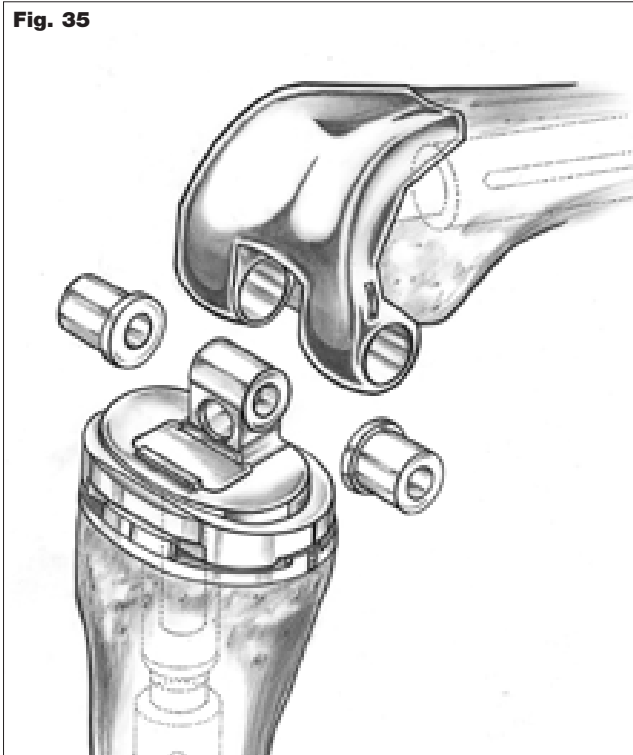
Option: An additional Tibial Bearing component with 3mm posterior offset is available for Large and Extra Large Femoral components. This component offsets the Femoral component posteriorly, relative to the tibial stem, a further 3mm to enable optimal patellar tracking.

Note: Other Tibial Bearing Components can be substituted if the Modular Rotating Hinge Femur or Baseplate is being used in conjunction with another system (i.e. GMRS). The hinge mechanism assembly is identical regardless of the Tibial Bearing Component that is selected. Please refer to Lit# LRKC-MG for compatibility information.

Modular Rotating Hinge

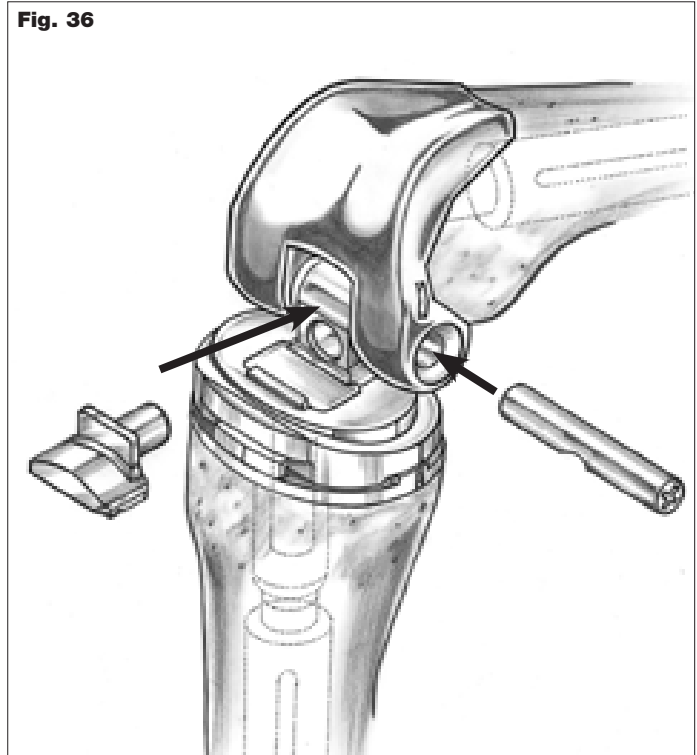
Operative Technique

Fig. 35



Insert the two Femoral Bushings into the Femoral Component so that the flanges are inside the intercondylar cut out (**Figure 35**).

Fig. 36



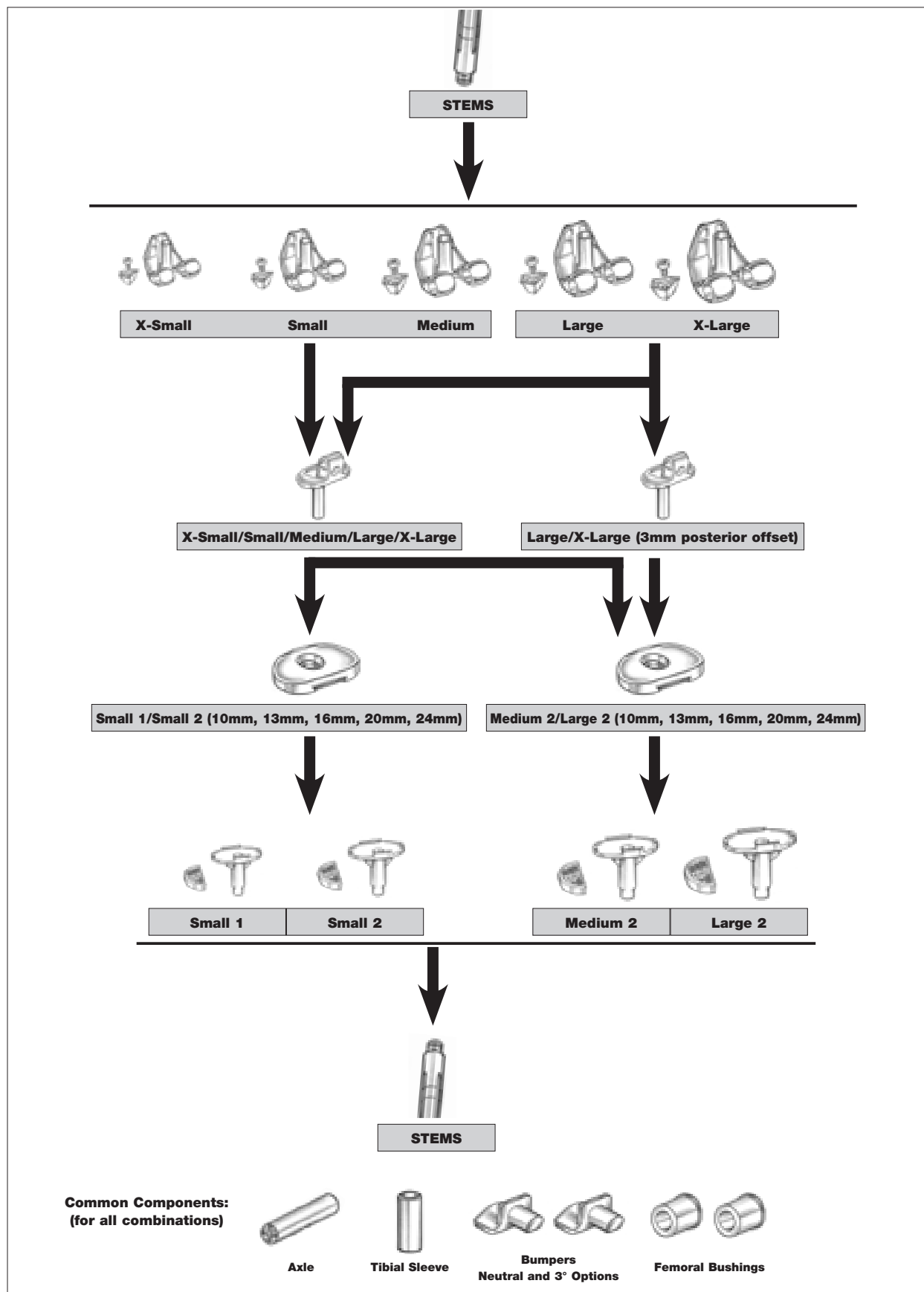
Line up the Tibial Bearing Component with the holes of the Femoral Component Bushings and slide the implant Axle into the assembly until the “recess” in the Axle can be seen through the Tibial Bearing Component from the front. Twist the Axle so that the “recess” is inferior. The grooves on the end of the axle which engage into the Axle Introducer Handle are a helpful indicator in aligning the Axle.

With the Axle correctly oriented the Bumper can now be inserted. This should be impacted into the Tibial Bearing Component until it is flush with the hinge housing and has cleared the “snap-fit” lip on the Tibial Bearing Component.

Note: With the Bumper inserted the axle should not be further rotated.

Option: The Bumper implant is available in two options, neutral and 3° flexion.

Assembly Options



Modular Rotating Hinge

Operative Technique



Description	Size	Implant Cat. No. Left	Implant Cat. No. Right	Trial Cat. No. Left	Trial Cat. No. Right
Femoral Component	Extra-Small	6481-1-100	6481-1-101	6481-1-300	6481-1-301
Femoral Component	Small	6481-1-110	6481-1-111	6481-1-310	6481-1-311
Femoral Component	Medium	6481-1-120	6481-1-121	6481-1-320	6481-1-321
Femoral Component	Large	6481-1-130	6481-1-131	6481-1-330	6481-1-331
Femoral Component	Extra-Large	6481-1-140	6481-1-141	6481-1-340	6481-1-341



Description	Size	Implant Cat. No.	Trial Cat. No.
Tibial Keel Baseplate	Small 1	6481-3-110	6481-3-410
Tibial Keel Baseplate	Small 2	6481-3-111	6481-3-411
Tibial Keel Baseplate	Medium 2	6481-3-112	6481-3-412
Tibial Keel Baseplate	Large 2	6481-3-113	6481-3-413



Description	Size	Implant Cat. No.	Trial Cat. No.
Tibial Insert 10mm	Small 1/Small 2	6481-3-210	6481-3-510
Tibial Insert 13mm	Small 1/Small 2	6481-3-213	6481-3-513
Tibial Insert 16mm	Small 1/Small 2	6481-3-216	6481-3-516
Tibial Insert 20mm	Small 1/Small 2	6481-3-220	6481-3-520
Tibial Insert 24mm	Small 1/Small 2	6481-3-224	6481-3-524
Tibial Insert 10mm	Medium 2/Large 2	6481-3-310	6481-3-610
Tibial Insert 13mm	Medium 2/Large 2	6481-3-313	6481-3-613
Tibial Insert 16mm	Medium 2/Large 2	6481-3-316	6481-3-616
Tibial Insert 20mm	Medium 2/Large 2	6481-3-320	6481-3-620
Tibial Insert 24mm	Medium 2/Large 2	6481-3-324	6481-3-624



Description	Size	Implant Cat. No.	Trial (All sizes)
Femoral Block, Distal 10mm	Extra-Small	6481-1-200	6481-1-400
Femoral Block, Distal 10mm	Small	6481-1-210	
Femoral Block, Distal 10mm	Medium	6481-1-220	
Femoral Block, Distal 10mm	Large	6481-1-230	
Femoral Block, Distal 10mm	Extra-Large	6481-1-240	
Trial Femoral Block, Distal 10mm	(All sizes)		6481-1-400



Description	Size	Implant Cat. No.	Trial Cat. No.
Tibial Bearing Component	Extra Small-Extra Large	6481-2-100	6481-3-500
Tibial Bearing Component (3mm posterior offset)	Large - Extra Large	6481-2-101	6481-3-600
Crossover Bearing Component	Short	6481-2-103*	6481-4-103*
Crossover Bearing Component	Long	6481-2-104*	6481-4-104*
Crossover Bearing Component	Pediatric	6481-2-107*	6481-4-107*
Crossover Bearing Component	Reverse	6481-2-108*	6481-4-108*
Femoral bushing (1 per pack)	All Sizes	6481-2-110	—
Tibial Sleeve	All Sizes	6481-2-140	—
Bumper Insert - Neutral	All Sizes	6481-2-130	—
Bumper Insert, 3 Degrees	All Sizes	6481-2-133	—
Axle	All Sizes	6481-2-120	6481-2-220



Description	Implant Cat. No.	Trial Cat. No.
Offset Adapter 4mm (including Jam Nut)	6478-6-490	—
Trial Offset Adapter 4mm (not including Jam Nut)	—	6778-6-490
Jam Nut Trial	—	6778-6-485

* Not in standard set

Implant Listing

Tibial Augmentation	Size	Left		Right	
		Implant	Trial	Implant	Trial
Hemi Flat Wedge 5mm	Small 1	6630-6-125	6633-9-505	6630-6-105	6633-9-506
Hemi Flat Wedge 5mm	Small 2	6630-6-170	6633-9-505	6630-6-150	6633-9-506
Hemi Flat Wedge 5mm	Medium 2	6630-6-270	6633-9-509	6630-6-250	6633-9-510
Hemi Flat Wedge 5mm	Large 2	6630-6-370	6633-9-513	6630-6-350	6633-9-514
Hemi Flat Wedge 10mm	Small 1	6630-6-130	6633-9-523	6630-6-110	6633-9-524
Hemi Flat Wedge 10mm	Small 2	6630-6-175	6633-9-523	6630-6-155	6633-9-524
Hemi Flat Wedge 10mm	Medium 2	6630-6-275	6633-9-527	6630-6-255	6633-9-528
Hemi Flat Wedge 10mm	Large 2	6630-6-375	6633-9-531	6630-6-355	6633-9-532

Tibial Augmentation	Size	Left		Right	
		Implant	Trial	Implant	Trial
Full Flat Block 10mm	Small 1	6630-6-510	6630-6-710	6630-6-510	6630-6-710
Full Flat Block 10mm	Small 2	6630-6-515	6630-6-710	6630-6-515	6630-6-710
Full Flat Block 10mm	Medium 2	6630-6-525	6630-6-720	6630-6-525	6630-6-720
Full Flat Block 10mm	Large 2	6630-6-535	6630-6-730	6630-6-535	6630-6-730

Stems	CoCr Cat. No.	Titanium Fluted CoCr Cat. No.	Trial Cat. No.	Cemented Stems	Implant Cat. No.	Trial Cat. No.
10mm x 80mm	6478-6-395	6478-6-600	6778-6-395	80mm 155mm	6476-8-260 6476-8-270	6778-7-060 6778-7-065
11mm x 80mm	6478-6-396	6478-6-605	6778-6-396			
12mm x 80mm	6478-6-397	6478-6-610	6778-6-397			
13mm x 80mm	6478-6-398	6478-6-615	6778-6-398			
14mm x 80mm	6478-6-399	6478-6-620	6778-6-399			
15mm x 80mm	6478-6-400	6478-6-625	6778-6-400			
16mm x 80mm	6478-6-405	6478-6-630	6778-6-405			
17mm x 80mm	6478-6-410	6478-6-635	6778-6-410			
18mm x 80mm	6478-6-415	6478-6-640	6778-6-415			
19mm x 80mm	6478-6-420	6478-6-645	6778-6-420			
21mm x 80mm	6478-6-425	6478-6-655	6778-6-425			
23mm x 80mm	6478-6-430	6478-6-665	6778-6-430			
10mm x 155mm	6478-6-435	6478-6-680	6778-6-435			
11mm x 155mm	6478-6-436	6478-6-685	6778-6-436			
12mm x 155mm	6478-6-437	6478-6-690	6778-6-437			
13mm x 155mm	6478-6-438	6478-6-695	6778-6-438			
14mm x 155mm	6478-6-439	6478-6-705	6778-6-439			
15mm x 155mm	6478-6-440	6478-6-710	6778-6-440			
16mm x 155mm	6478-6-445	6478-6-715	6778-6-445			
17mm x 155mm	6478-6-450	6478-6-720	6778-6-450			
18mm x 155mm	6478-6-455	6478-6-725	6778-6-455			
19mm x 155mm	6478-6-460	6478-6-730	6778-6-460			
21mm x 155mm	6478-6-465	6478-6-740	6778-6-465			
23mm x 155mm	6478-6-470	6478-6-750	6778-6-470			

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