

LEGION TKS

Distal Cut First Preparation with Universal Instruments



LEGION[◊] Total Knee System

Distal Cut First Preparation

Primary Total Knee Arthroplasty

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Nota Bene

The technique description herein is made available to the healthcare professional to illustrate the authors' suggested treatment for the uncomplicated procedure. In the final analysis, the preferred treatment is that which addresses the needs of the patient.

Additional LEGION Total Knee System surgical technique brochures are available for the other LEGION components and sets. LEGION instruments listed within reflect examples in the LEGION Universal Instrument Set.

Introduction

The LEGION® Total Knee System has been designed to offer the orthopaedic surgeon solutions to address intraoperative situations. Implant function is directly related to accurate surgical technique. LEGION instrumentation has been developed to be an easy-to-use system that will assist the surgeon in obtaining accurate and reproducible knee alignment. The instrumentation can be used in minimally invasive or standard exposures.

While it has been the designers' objective to develop accurate, easy-to-use instrumentation, each surgeon must evaluate the appropriateness of the following technique based on his or her medical training, experience and patient evaluation.

Indications

The general principles of good patient selection and sound surgical judgment apply to the total knee procedure. Preoperative planning and meticulous surgical technique are essential to achieve optimum results. Considerations of anatomic loading, soft-tissue condition, and component placement are critical to minimize a variety of postoperative complications.

Indications for Total Knee Replacement:

1. Rheumatoid arthritis
2. Post-traumatic arthritis, osteoarthritis or degenerative arthritis.
3. Failed osteotomies or unicompartmental replacement or total knee replacement.

Contra-indications

1. Cases where there is poor bone stock which would make the procedure unjustifiable.
2. Active, local infection or previous intra-articular infections.
3. Mental or neurologic conditions that tend to pre-empt the patient's ability or willingness to restrict activities.
4. Neuropathic (Charcot) joint.
5. Conditions that tend to place increased loads on implants such as age, weight, and activity level, which are incompatible with a satisfactory long-term result.
6. Collateral ligament insufficiency (except in cases where a constrained knee system is indicated and used).
7. Skeletal immaturity.
8. Use of a supracondylar nail through intercondylar notch of PROFIX® primary femoral components.
9. Use of slotted femoral and tibial stems without adequate bone support.

Technique highlights

Distal femoral resection

Use the 9.5mm drill to open up the femoral canal and slide the valgus alignment assembly until at least one side contacts the distal femur.



After the assembly is placed in neutral rotation, impact the floating spikes into the distal femur and secure the distal block with pins.



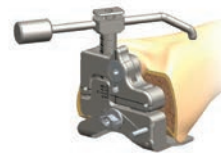
Remove the IM rod, unlock the lever on the valgus alignment guide and remove the valgus alignment assembly using the universal extractor.



Resect the distal femur.

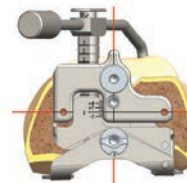


Position the sizing guide flush against the distal femur, while ensuring that the posterior paddles are contacting the underside of both posterior condyles.



To set rotation

Pin through lateral pivot pinhole, located on the lower lateral corner of the sizing guide. Adjust external rotation of the sizing guide by turning the rotational adjustment knob clockwise (0-6°).



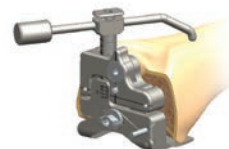
Fixed posterior referencing

Ensure the sizing guide is set in the '0' position. Drill and insert two pins through the locator holes of the sizing guide. Determine the size of the component by the graduations on the stylus. If the femur is in-between two sizes, choose the larger size.

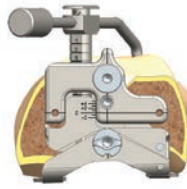


Adjustable anterior referencing

Position the sizing guide stylus so that it contacts the lateral ridge of the anterior cortex and determine the size from the graduations on the shaft of the stylus.



If the indicated size is in-between two sizes, turn the upper hex screw clockwise to the next lower size for anterior referencing or turn the upper hex screw counterclockwise to the next larger size. To lock in position, tighten the locking hex screw. Drill to mark the locator holes for the A/P cutting block.



Place the correctly sized A/P cutting block on the distal femur and make anterior, posterior and chamfer cuts.



Tibial resection

Place the extramedullary tibial guide with the non-spiked (shown) or spiked rod and place on tibia. Align guide over medial third of the tibial tubercle and parallel to the tibia.



Attach the tibial stylus to the tibial cutting block and lower the cutting block until the stylus touches the low point on the least affected side of the tibia. Once the resection level is determined, insert pins to secure and remove alignment assembly.



Resect the proximal tibia.



Size the tibia.



Posterior stabilized housing resection

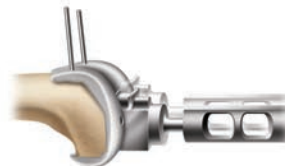
Pin trial through anterior flange. Select the Housing Resection Collet matching the femoral trial size (either 1-2 or 3-8).



Ream through the collet in the anterior position until the depth stop makes contact. Remove the reamer and move the collet to the posterior position. Ream through the collet once more until contact is made.



Impact the Housing Box Chisel anteriorly and then posteriorly through the Housing Resection Collet to square the corners of the PS box resection.



Select the appropriate size femoral trial cam module, insert the arms of the cam module into the anterior aspect of the femoral trial box and rotate posteriorly.



Final preparation

After trial range of motion and alignment checks, select the appropriate trial fin punch and punch through the trial.



Place the femoral implant on the femur and use the femoral impactor to fully seat the implant.

Apply tibial baseplate cover to protect tibial baseplate.



Seat the tibial implant with the tibial impactor.



Insert the articular insert by placing the insert assembly tool into the center notch of the anterior lock detail (handle up) and engage the two tabs of the tool into the two recesses on the anterior periphery of the insert. Squeeze the tool handle until the insert is fully seated within the tibial component.



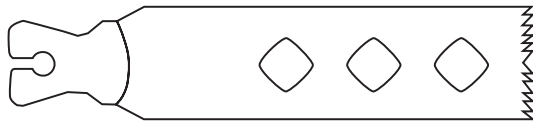
Preoperative planning

Determine the angle between the anatomical and the mechanical axes. This measurement will be used intraoperatively to select the appropriate valgus angle so that correct limb alignment is restored. (Beware of misleading angles in knees with a flexion contracture or rotated lower extremities.)

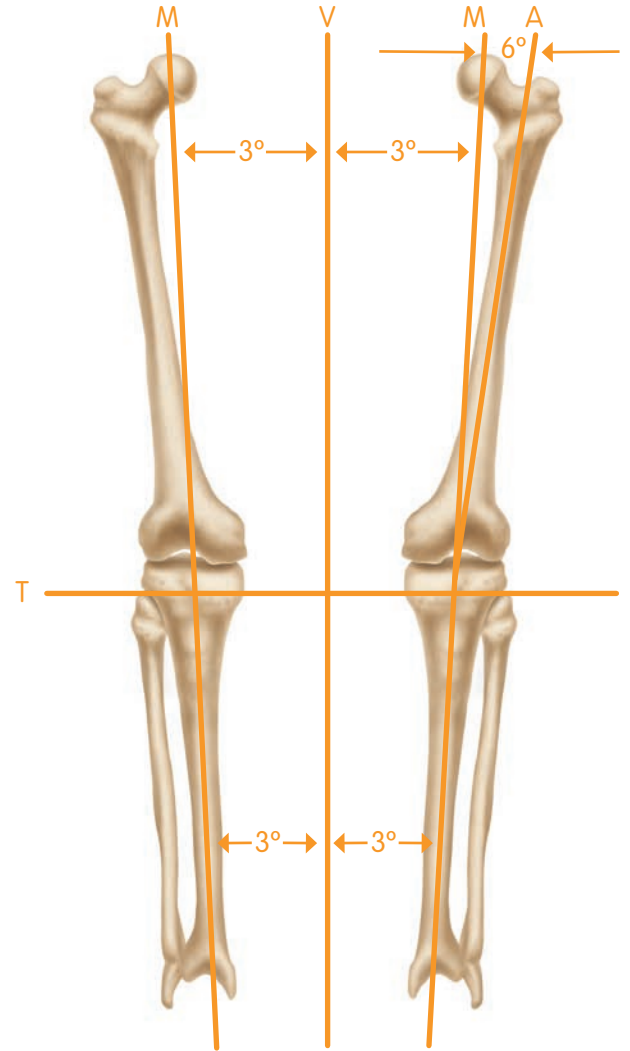
Tip Many surgeons prefer to simply select a standard angle for the distal femoral cut (ie, 5°, 6° or 7°) based on the patient and surgical experience.

Recommended sawblades

1.27 Sawblade (for standard blocks)
Cutting thickness and blade thickness should be 0.050" or 1.27mm.



1.35 Sawblade (for MIS blocks)
Cutting thickness and blade thickness should be 1.35mm.



M = Mechanical Axis

A = Anatomical Axis

T = Transverse Axis

V = Vertical Axis

Instrument assembly

IM femoral assembly

- 1 Attach the selected valgus angle bushing (5°, 6° or 7°) to the valgus alignment guide. Check the bushing position to make sure that 'left' is facing anteriorly when operating on a left knee and 'right' is facing anteriorly when operating on a right knee.
- 2 Attach a modular T-handle to the IM rod and insert through the alignment assembly (Figure 1).
- 3 Assemble the distal femoral cutting block onto the valgus alignment guide. Positioning the block at the 'primary' resection level will ensure the cut will equal the distal thickness of the femoral prosthesis. Lock by pressing the lever in a horizontal position toward the medial side.



Figure 1

Extramedullary tibial alignment guide

Insert the ankle clamp into the distal end of the alignment tube and thread the locking pin into the ankle clamp (Figure 2).

After the ankle clamp is moved into the proper position, lock into place with the gold knob.

Choose the correct left or right tibial cutting block. Select the spiked or non-spiked fixation rod.



Figure 2

Valgus Bushing	Alignment Guide	T-handle	IM Rod	Distal Cutting Block	Ankle Clamp
5° 7144-0014	7144-1144	7111-0080	Long 7151-2040	7144-1147	7144-0444
6° 7144-0016			Short 7151-2035		
7° 7144-0018					Alignment Tube 7144-0448

Non-spiked fixation rod

Place the appropriate left or right tibial cutting block on top of the disc on the non-spiked fixation rod (Figure 3). Tighten the central knob to lock the block into position.

Introduce the rod into the extramedullary assembly and adjust and lock the cam in the assembly.

Spiked fixation rod

Place the spiked fixation rod through the hole in the tibial cutting guide; adjust the block and tighten the central knob to lock the block into position.

Introduce the spiked fixation rod into the proximal end of the alignment assembly and adjust and lock the cam on the assembly (Figure 4).



Figure 3

Figure 4

Tibial Cutting Block	Non-spiked	Spiked Fixation Rod
Left	7144-1136	7144-0198
Right	7144-1137	
	Fixation Rod	
	7144-0446	

DCF Femoral resection

Intramedullary alignment

- 1 Open the femoral canal with a 9.5mm intramedullary drill (Figure 5).

Tip If desired, the distal femoral cutting block may be set to resect an additional +2, +5 or +7mm of bone.

- 2 Slide the intramedullary rod of the assembly into the femoral canal until the alignment guide contacts the distal femur (Figure 6).

Tip There may be times when only one side of the guide will touch bone.

- 3 Orient rotation of the assembly neutral to the posterior condyles (Figure 7) and impact one or both of the floating spikes into the distal femur.



Figure 5

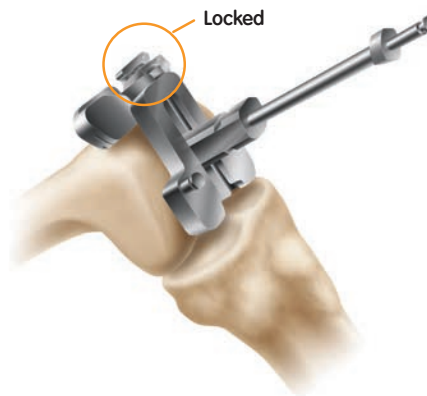


Figure 6

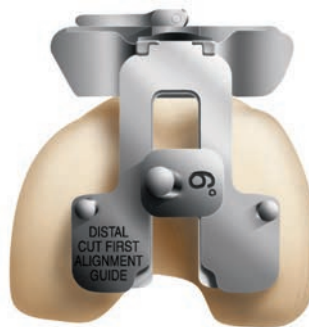


Figure 7

Valgus Bushing	Alignment Guide	T-handle	IM Rod	Distal Cutting Block	IM Drill
5° 7144-0014	7144-1144	7111-0080	Long 7151-2040	7144-1147	7401-2111
6° 7144-0016			Short 7151-2035		
7° 7144-0018					

Distal resection

- 1 Using non-headed pins, pin the distal femoral cutting block to the anterior femur using the holes marked '0'. Once adequate distal femoral resection is noted, an additional headed or non-headed pin should be placed obliquely to provide additional stability (Figure 8).
- 2 Unlock the lever on the valgus alignment guide, remove the intramedullary rod and the valgus alignment assembly using the universal extractor (Figure 9). Only the distal femoral cutting block should remain on the femur.
- 3 Resect the distal femur (Figure 10) then remove the distal femoral cutting block.

Tip If the distal femoral resection is not adequate, remove the oblique pin, and reposition the block through the pin holes marked +2 or +4mm for the desired level of resection and re-insert the oblique pin.

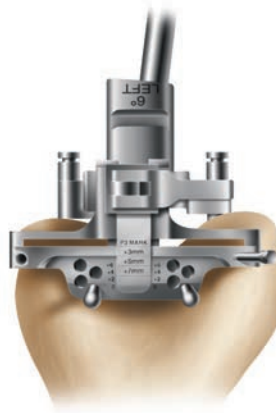


Figure 8

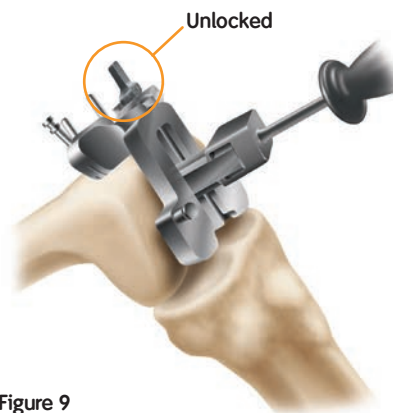


Figure 9



Figure 10

Valgus Bushing	Alignment Guide	Universal Extractor	IM Rod	Distal Cutting Block
5° 7144-0014	7144-1144	7144-0366	Long 7151-2040	7144-1147
6° 7144-0016			Short 7151-2035	
7° 7144-0018				

Sizing guide procedure

The sizing guide allows for external rotation to be set from 0-6° based on surgeon preference and patient anatomy. Rotational alignment may be checked by aligning the A/P axis with the pointer on the sizing guide or by ensuring that the laser marked lines on the face of the guide are parallel with the epicondylar axis. The rotational adjustment knob on the lower portion of the guide is turned to dial in rotation (Figure 11).

The guide can be used for fixed posterior referencing or can be adjusted anteriorly or posteriorly for fine tuning. When in-between sizes, the surgeon can choose to adjust sizing up to 4mm anteriorly, thereby taking up to an additional 4mm off the posterior condyles, or up to 2mm posteriorly, taking up to an additional 2mm off of the anterior cortex.

If the anterior surface of the guide is in-between two sizes when it is at the zero position, the upper hex screw can be rotated to shift the anterior face of the sizing guide up to the next smaller size or down to the next larger size on the stylus. As a result, the locator holes for the A/P cutting block are shifted either anteriorly or posteriorly to align with the next implant size (Figure 12).

Tip The gap between the top of the sizing guide and the stylus graduation line indicates how much bone will be removed from either the anterior cortex or posterior condyles by choosing the next larger size (Figure 13).

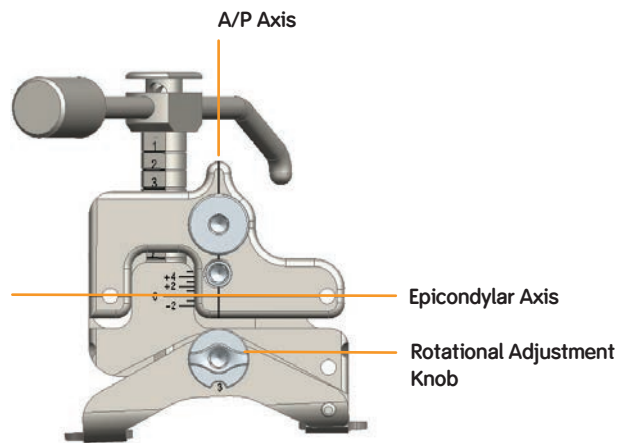


Figure 11

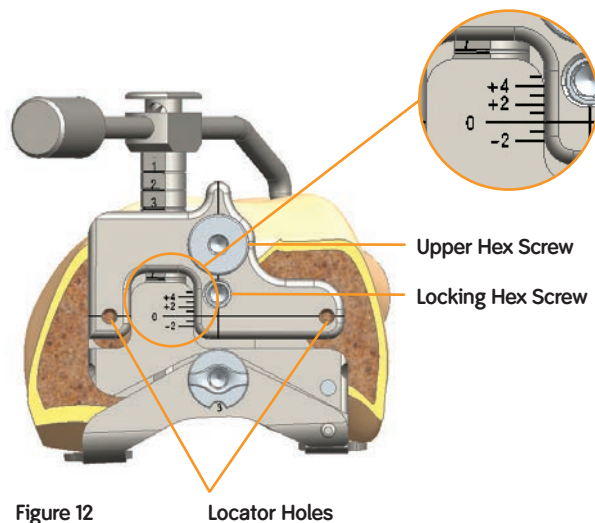


Figure 12



Figure 13

Sizing Guide	Sizing Stylus	Hex Screwdriver
Left 7144-0007	7144-1140	11-5035
Right 7144-0008		

Sizing guide procedure: rotation

- 1 Flex the knee, approximately 90° so the posterior condyles are accessible.
- 2 Choose appropriate sizing guide, '**Left**' for a left knee and '**Right**' for a right knee.
- 3 Position the femoral sizing guide flush against the distal femur, while ensuring the posterior paddles are contacting the underside of both posterior condyles. Once correct position of sizing guide is established, place a pin through lateral pivot pinhole located in the posterior/lateral corner on the face of the sizing guide (Figure 14).
- 4 Adjust the external rotation of the sizing guide to be aligned anatomically with the epicondylar and/or A/P axis. This can be achieved by turning the rotational adjustment knob (0-6°) using a hex screwdriver (Figure 15).
- 5 Once rotation is set, sizing can be established either by fixed posterior referencing or adjustable referencing.

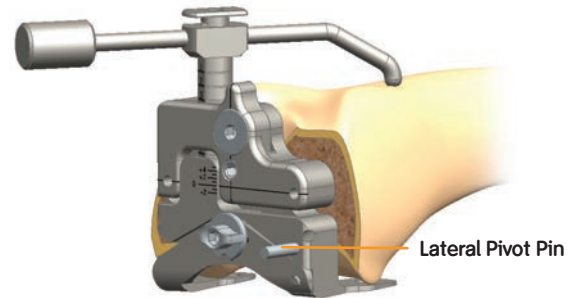


Figure 14

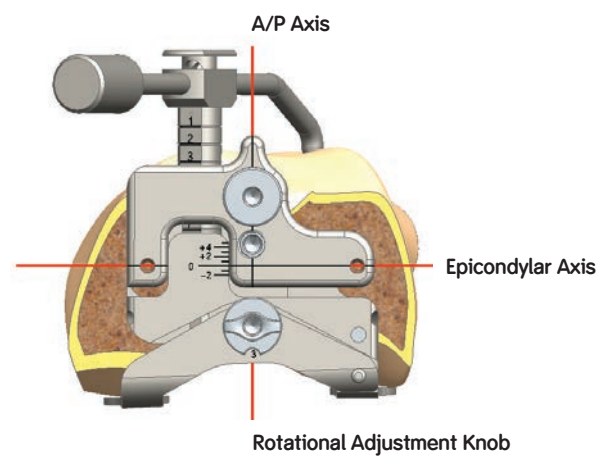


Figure 15

Sizing Guide	Sizing Stylus	Hex Screwdriver
Left 7144-0007	7144-1140	11-5035
Right 7144-0008		

Sizing guide procedure: fixed posterior referencing

- 1 Ensure that the anterior surface of the sizing guide is set in the '0' position.
- 2 Drill and insert two pins through the locator holes of the sizing guide to secure the guide.
- 3 Position the sizing guide stylus so that it contacts the lateral ridge of the anterior femoral cortex (highest point on the anterior cortex of the femur) (Figure 16).
- 4 Determine the size of the component from the graduations on the shaft of the stylus.
- 5 If the femur is between sizes, chose the larger size.
- 6 Remove the pins and the sizing guide.



Figure 16

Sizing Guide	Sizing Stylus	Hex Screwdriver
Left 7144-0007	7144-1140	115035
Right 7144-0008		

Sizing guide procedure: adjustable anterior referencing

- 1 Ensure that the anterior surface of the sizing guide is set in the '0' position.
- 2 Drill and insert two pins through the oblique holes of the sizing guide to secure the guide.
- 3 Position the sizing guide stylus so that it contacts the lateral ridge of the anterior femoral cortex (highest point on the anterior cortex of the femur) (Figure 17).
- 4 Determine the size of the component from the graduations on the shaft of the stylus.
- 5 If the indicated size is in-between sizes, you can turn the upper hex screw to shift the anterior surface up to an additional 4mm to the next smaller size or down an additional 2mm to the next larger size (Figures 18a and b). Once the appropriate size is selected, turn the locking hex screw to lock the anterior surface and locator holes into position (Figure 17).
- 6 Drill the locator holes to set the position for the cutting block.
- 7 Remove the pins and sizing guide.

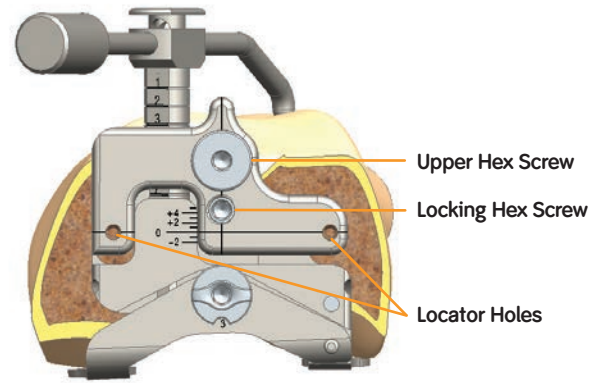
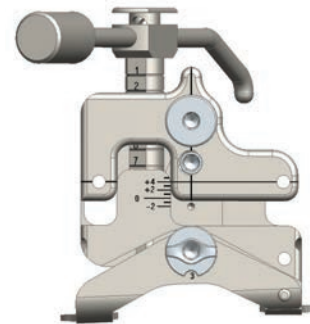
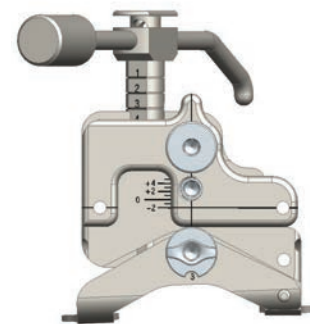


Figure 17



Anterior Reference Shift of 4mm

Figure 18a



Posterior Reference Shift of 2mm

Figure 18b

Sizing Guide	Sizing Stylus	Hex Screwdriver
Left 7144-0007	7144-1140	11-5035
Right 7144-0008		

A/P resection

- 1 Position the fixed spikes on the A/P cutting block into the predrilled holes.

Tip It is not necessary that the block be centered M/L on the distal femur.

- 2 Ensure that the cutting block is flush with the resected distal femur. Several holes in the A/P block allow fixation of the block. Place one pin centrally through one of the middle holes just medial or lateral to the quick-connect attachment. For additional stability, a headed pin may be placed through the holes on the medial or lateral side of the block (Figure 19).

- 3 Complete the anterior, posterior and chamfer cuts (Figures 20-23). The block is designed to allow for angling of the sawblade during the cuts.

Tip To maintain block stability, the anterior chamfer cut should be completed last.



Figure 19



Figure 20



Figure 21



Figure 22



Figure 23

Downsizing the femoral component

- 1 Attach the downsizing drill guide to the cut femur, placing the spikes on the back of the plate into the same location holes used for the A/P cutting block (Figure 24).
- 2 Drill new location holes through the downsizing drill guide (shifted 2mm anterior).
- 3 Place the smaller A/P cutting block into the new location holes. Redo the posterior, anterior and chamfer cuts.

Tip It is useful to mark the original pin track holes with a marking pen in order to properly identify the new holes.



Figure 24

Extramedullary (EM) tibial resection

EM tibial preparation

When using the extramedullary tibial alignment, the surgeon may use a non-spiked or spiked fixation rod.

Non-spiked fixation

- 1 Place the arms of the extramedullary alignment clamp around the ankle, and adjust the distal M/L slide directly over the middle of the tibiotalar joint, which is also approximated by the second ray of the foot proximal to the malleoli (Figure 25).

The cutting block on the proximal end of the assembly should be proximal to the tibial tubercle (Figure 26).

- 2 Assess rotation of the alignment guide and slope of the cutting plane. The goal is to align the extramedullary alignment assembly rotationally so that it aligns over the medial third of the tibial tubercle and over the second toe (Figure 27).

- 3 Rotational alignment is critical due to the 3° posterior sloped cut. The slope can be adjusted according to the patient's anatomy (Figure 28).

Note 3-5° of slope is built into the articular insert (depending on which insert is chosen) and 3° of slope is built into the tibial cutting block. A neutral or slightly sloped alignment should usually be chosen.

Tip Neutral or minimally sloped alignment may be achieved by palpating the fibula followed by aligning the alignment guide parallel to the fibula. Tibial bowing and soft tissue bulk may make external tibial referencing unreliable.



Figure 25



Figure 26



Figure 27



Figure 28

Ankle Clamp	Alignment Tube	Tibial Cutting Block	Non-spiked Fixation Rod
7144-0444	7144-0448	Left 7144-1136 Right 7144-1137	7144-0446

Spiked fixation

- 1 Place the arms of the extramedullary alignment clamp around the ankle, and adjust the distal M/L slide directly over the middle of the tibiotalar joint, which is also approximated by the second ray of the foot proximal to the malleoli (Figure 29).

The cutting block on the proximal end of the assembly should be proximal to the tibial tubercle (Figure 30).

- 2 Impact the longer spike of the spiked fixation rod into the proximal tibia (Figure 31).

- 3 Assess rotation of the alignment guide and slope of the cutting plane. The goal is to align the extramedullary alignment assembly rotationally so that it aligns over the medial third of the tibial tubercle and over the second toe (Figure 32).

- 4 Rotational alignment is critical due to the 3° posterior sloped cut. The slope can be adjusted according to the patient's anatomy (Figure 33). Impact the second spike to secure the assembly (Figure 34).

Note 3-5° of slope is built into the articular insert (depending on which insert is chosen) and 3° of slope is built into the tibial cutting block. A neutral or slightly sloped alignment should usually be chosen.

Tip Neutral or minimally sloped alignment may be achieved by palpating the fibula followed by aligning the alignment guide parallel to the fibula. Tibial bowing and soft tissue bulk may make external tibial referencing unreliable.

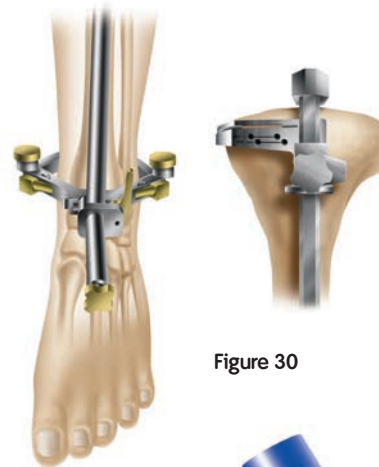


Figure 29



Figure 30



Figure 31



Figure 32



Figure 33



Figure 34

Ankle Clamp
7144-0444

Alignment Tube
7144-0448

Tibial Cutting Block
Left 7144-1136
Right 7144-1137

Spiked Fixation Rod
7144-0198

Tibial resection

- 1 Attach the tibial stylus to the tibial cutting block by inserting the stylus foot into the cutting slot.
- 2 Lower the cutting block until the stylus touches the low point on the least affected side of the tibia (Figure 35). The stylus can be adjusted for a 1-13mm tibial resection by twisting the knob on top of the stylus. If the affected side of the tibia is to be used as a reference, the stylus may be adjusted for a 1-9mm resection level.
- 3 Pin the tibial cutting block to the tibia by inserting pins first through the central holes; then the oblique hole.



Figure 35

Tip Pinning through the central holes marked 0mm with smooth pins will allow the block to be moved +2mm should additional resection be required (Figure 36).

Tip A 9mm resection is recommended since 9mm of metal and plastic is the thinnest available component.

Tip To do an extramedullary alignment check, place the extramedullary alignment rod through the tibial cutting block.



Figure 36

- 4 To remove the assembly:
 - a For the assembly with spiked rod, release the cam at the top of the alignment tube and use the universal extractor to remove the spiked fixation rod (Figure 37) after loosening the thumbscrew.
 - b The assembly with the non-spiked rod may be left in place or removed by loosening the thumbscrew and lowering the non-spiked rod to disengage from the tibial cutting block.



Figure 37

Tibial Stylus	Alignment Rod	Tibial Cutting Block
7144-1143	7144-1148	Left 7144-1136
		Right 7144-1137

5 Cut the tibia by first directing the blade in the posterior direction and then laterally (Figure 38).

Check Alignment and Balance

- 1 Assemble the Quick Connect Handle to the Flexion/Extension block. Attach desired thickness of Flexion/Extension Spacer onto the Flexion/Extension block.
- 2 Insert the Flexion/Extension block into the extension gap. Evaluate alignment, balance, and extension space (Figure 39)
- 3 Adjust the thickness of the spacer as needed to determine the extension space.
- 4 Remove the block and reassemble desired thickness of spacer for flexion gap evaluation.
- 5 With the knee flexed to 90 degrees, place the Flexion/Extension Block into the joint space.
- 6 Apply a varus/valgus force and assess the medial and lateral compartment laxity levels of the flexion space. Then adjust the thickness of the spacer as needed to determine the flexion space.
- 7 When the flexion space is determined, compare the thickness selected relative to the extension space previously determined.



Figure 38

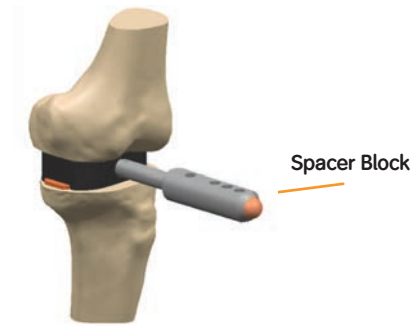


Figure 39

Note: Remember any difference between the Extension and Flexion Gap Assessments as this will affect how the femoral implant is positioned in the steps ahead (e.g. 10mm Ext - 11mm Flex = -1mm Flex Imbalance).

Universal Extractor	Tibial Cutting Block	Flexion/Extension Block Standard	Flexion/Extension Spacers	Quick Connect Handle
7144-0366	Left 7144-1136 Right 7144-1137	7401-8603	9mm 7401-8608 11mm 7401-8611 13mm 7401-8613 15mm 7401-8615 18mm 7401-8618 21mm 7401-8621	7144-0044

Tibial sizing

Option A – stemless tibial trials

- 1 Attach a quick-connect handle to a stemless trial one size below the femoral component size and place on the cut tibia to assess coverage (Figure 40). As needed, additional sizes should be templated using the stemless trials.
- 2 Once the appropriate size is determined, pin the medial side of the selected stemless trial with a short headed pin.
- 3 Place a trial insert into the stemless tibial trial tray and perform a trial range of motion to allow the baseplate to center on the femoral trial. (As a secondary check, the surgeon may pass the alignment rod through the quick-connect handle to assess alignment) (Figure 41). Pin the lateral side of the trial.

Tip After putting the knee through a trial range of motion, the surgeon should note the proper rotation of the trial tibial component on the proximal tibia and mark the tibia for future reference.

Tip The center-line marks on the femoral and tibial trial components should line up.

- 4 Using the tibial fin/stem punch, rotational alignment may be set now or at the time of trial placement.

Tip If the tibial bone is sclerotic, first drill for the stem using the 11mm tibial drill. Begin the fin slot with a burr or thin sawblade before using the fin punch to prevent tibial fracture.

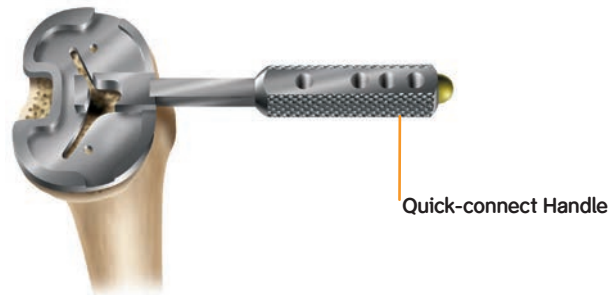


Figure 40

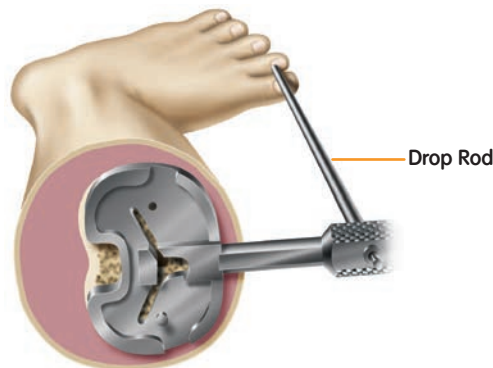


Figure 41

Quick-connect Handle	Stemless Trials	Fin/Stem Punch	11mm Tibial Drill
7144-0044	Left sz 4 7143-0167 Right sz 4 7143-0183	sz 3-4 7144-9993	7144-0040

**Option B – stemmed tibial trials
(NOT AVAILABLE IN UNIVERSAL INSTRUMENT SETS)**

- 1 Place a tibial drill guide one size below the femoral component size on the cut tibia to assess coverage. As needed, additional sizes should be templated (Figure 42).
- 2 Once the tibial drill guide has been centralized on the proximal tibia, pin the drill guide in place. Retract the gold collar on the drill guide handle and insert the 11mm tibial collet.
- 3 With the 11mm tibial collet in place, drill with the 11mm tibial drill (Figure 43) and punch with the 11mm tibial punch (Figure 44).
- 4 Remove the tibial drill guide.
- 5 Place the stemmed tibial trial into the prepared hole.
- 6 Using the tibial fin punch, rotational alignment may be set now or at the time of trial placement.

Tip After putting the knee through a trial range of motion, the surgeon should note the proper rotation of the trial tibial component on the proximal tibia and mark the tibia for future reference.

Tip The center-line marks on the femoral and tibial trial components should line up.



Figure 42

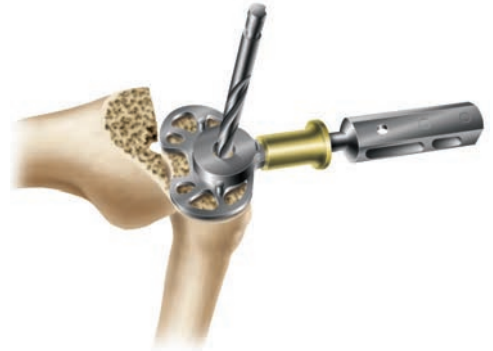


Figure 43

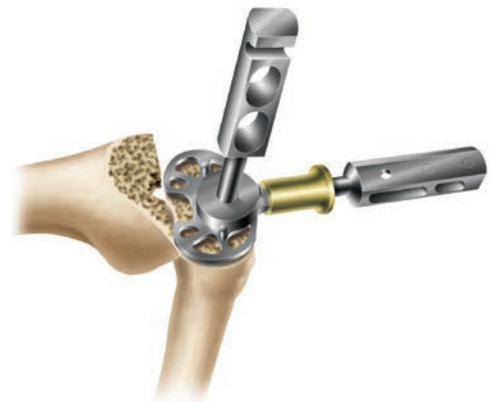


Figure 44

11mm Tibial Punch
7144-0262

11mm Tibial Drill
7144-0040

Stem Trials
Left
sz 4 7143-0166
Right
sz 4 7143-0182

Fin/Stem Punch
sz 3-4 7144-0266

Component trialing

Femoral component trialing

- 1 Flex the knee to 90° and insert the femoral trial using the femoral trial impactor (Figure 45).
- 2 Perform a trial range of motion to assess patellar tracking. With cruciate-retaining knees, medial/lateral placement of the femoral trial can be adjusted to optimize patellar tracking (Figure 46).
- 3 For cruciate-retaining femorals, prepare the femoral lug holes through the femoral trial with the femoral lug punch (Figure 47).

Note: It is recommended to leave the femoral trial on at this point to perform full component trialing. However, if desired, you may attach the end of the universal extractor to the femoral trial and remove the femoral trial (Figure 48).



Figure 45

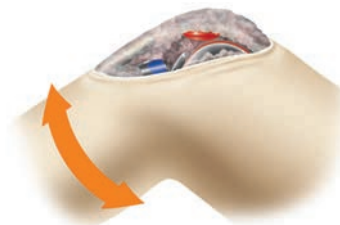


Figure 46

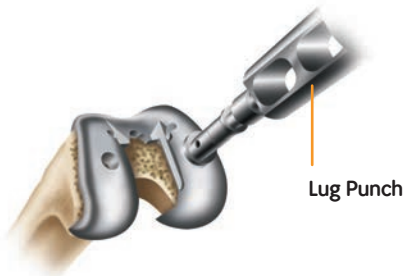


Figure 47



Figure 48

Femoral Trial	Femoral Trial	Lug Punch	Universal Extractor
Left	Impactor	7144-0183	7144-0366
sz 5 7143-3345	7144-0009		
Right			
sz 5 7143-3355			

Posterior stabilized resection

Femoral housing box resection

- 1 Pin the femoral trial through the anterior flange (Figure 49).
- 2 Choose the housing resection Collet matching the femoral trial size (either 1-2 or 3-8). Attach the Collet to the femoral trial by sliding the Housing Collet (anterior to posterior) into the slots on the distal face of the femoral trial and threading the two posts into the femoral trial. The Housing Collet should be secured in the anterior position first and then shifted to the posterior position and screwed (Figure 50).



Figure 49

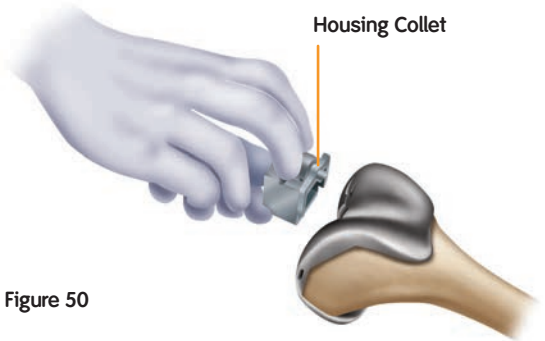


Figure 50

Femoral Trial	Housing Collet Resection
Left	
sz 5 7143-3345	sz 3-8 7143-4424
Right	
sz 5 7143-3355	

3 Attach the Housing Reamer Dome and the PS Reamer Sleeve to the Patellar Reamer Shaft (Figure 51).

Ream through the housing resection Collet in both the anterior and posterior positions until the depth stop contacts the Collet (Figure 52).

4 Impact the Housing Box Chisel through the Housing Resection Collet to square the corners of the housing. The Housing Box Chisel should be used anteriorly and then posteriorly to ensure that the full length of the box is prepared (Figure 53).

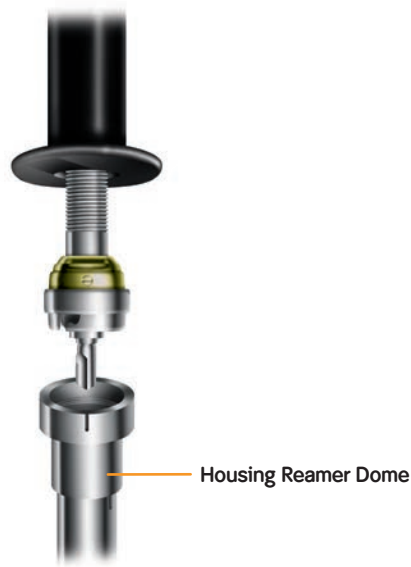


Figure 51

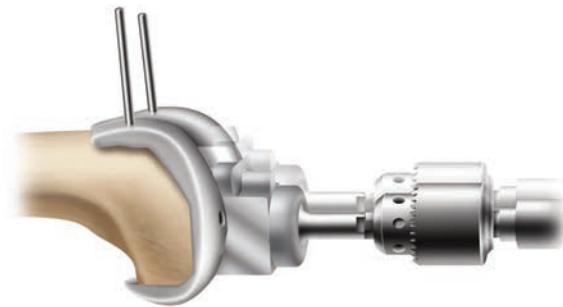


Figure 52

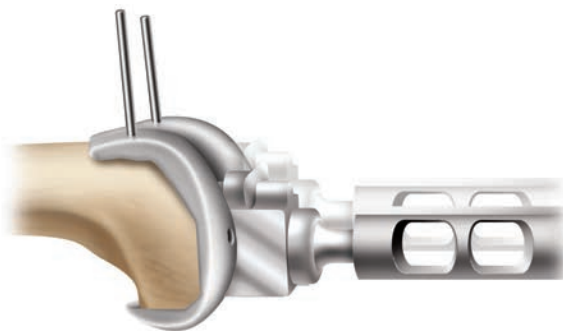


Figure 53

Housing Reamer Dome 7144-0145	Housing Box Chisel 7144-0373	Patellar Reamer Shaft 7144-0324	Reamer Sleeve 7144-0464
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Femoral trial cam module assembly

- 1 Select the appropriate sized femoral trial cam module (matching the femoral trial size selected).
- 2 Insert the arms of the femoral cam module into the anterior aspect of the femoral trial box and rotate posteriorly until seated (Figures 54 and 55).

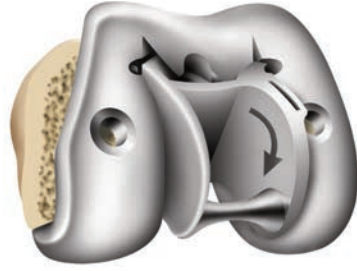


Figure 54



Figure 55

Cam Modules	Femoral Trial
sz 5 7143-3365	Left
	sz 5 7143-3345
	Right
	sz 5 7143-3355

Tibial component trialing

- 1 Use the appropriate insert trial (begin with a 9mm trial) to determine stability and alignment.
- 2 Perform a trial range of motion. The alignment marks on the front of the femoral and tibial trials should line up (Figure 56). The quick-connect handle may be attached to the tibial trial and used to set the appropriate rotational alignment.

Optional Extend the knee fully with the handle attached to the tibial trial. Pass the extramedullary rod through the handle to assess full leg alignment (Figure 57).



Figure 56

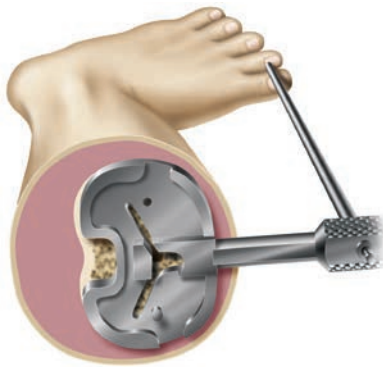


Figure 57

PS High Flex Insert Trials	PS Insert Trials	Constrained Insert Trials	Insert Trial Spacers
9mm	9mm	9mm	13mm
sz 3-4 7143-0408	sz 3-4 7143-0815	sz 3-4 7144-0473	sz 3-4 7403-3634
10mm	11mm	11mm	15mm
sz 3-4 7143-3453	sz 3-4 7143-0817	sz 3-4 7143-0524	sz 3-4 7403-3635
11mm	CR Insert Trials	Deep Dished Insert Trials	18mm
sz 3-4 7143-0409	9mm	9mm	sz 3-4 7403-3636
12mm	sz 3-4 7143-0490	sz 3-4 7143-0766	21mm
sz 3-4 7143-3454	11mm	11mm	sz 3-4 7403-3637
	sz 3-4 7143-0492	sz 3-4 7143-0768	
CR Deep Flex Insert Trials			
9mm			
sz 3-4 7143-0444			
10mm			
sz 3-4 7143-3443			
11mm			
sz 3-4 7143-0445			
12mm			
sz 3-4 7143-3444			

Note: 10 and 12mm Insert Trials are an Add-On Set

3 Mark correct tibial rotational alignment on the anterior tibia using a cautery knife (Figure 58).

4 If not previously performed, select the appropriate tibial fin punch to prepare the fins and punch through the tibial trial (Figure 59).

Tip If the tibial bone is sclerotic, begin the fin slot with a burr or thin sawblade before using the fin punch to prevent tibial fracture.

6 Remove the femoral and tibial trials.



Figure 58



Figure 59

Component implantation

Femoral implantation

Cemented

- 1 Mix and prepare bone cement for femoral component and distal femur. Apply to the femoral component or prepared bone, based on the surgeon's preference.

Tip Many surgeons put cement on the bone rather than, or supplemental to, cement on the underside of the implant.

- 2 Place the femoral implant onto the femur and use the femoral impactor to fully seat the implant (Figure 60).
- 3 Remove excess cement. Extend the knee to remove cement anteriorly without retracting the proximal soft tissue.

Tip After tibial implant is implanted, place the tibial insert trial onto the tibial implant and extend the leg to pressurize the cement.

Tip Place the CR tibial trial in the tibial implant tray to assist with aligning the femoral component during implantation.

Porous

- 1 Ensure that flat, clean cuts are made to all of the femoral resection cuts. This will help to achieve an optimal press-fit.

Tip Lavaging during resection helps ensure flat, clean cuts.

- 2 Place the femoral implant onto the femur and use the femoral impactor to fully seat the implant.

Tip If extraction of the femoral component is needed, attach the locking impactor and move in side-to-side motions to leverage off, then adjust and reimpact.

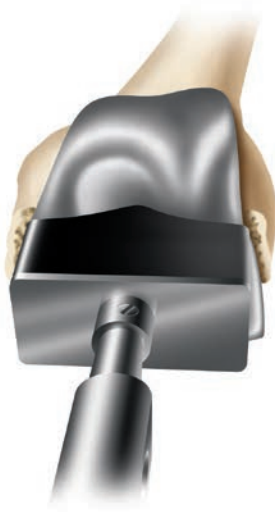


Figure 60

OXINIUM® CR Impactor (Universal Impactor) 7144-0890	Femoral Impactor 7144-0190	PS Femoral Impactor 7144-0005
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Tibial implantation

Apply cement on the proximal tibia and/or the implant, tibial insert covers on the articular surface of the baseplate, and seat the tibial implant with the tibial impactor (Figure 61). Remove excess cement.

Recommended Insert Placement Method

- 1 Clear any debris from the locking mechanism and manually slide the insert into the tibial baseplate engaging the locking mechanism until the insert periphery is within 1-2mm of the Tibial Component periphery.
- 2 Insert the tip of the JOURNEY® Articular Insert Tool into the center notch of the anterior lock detail (handle up) and engage the two tabs of the Tool into the two recesses on the anterior periphery of the insert (Figure 62).

Note: Make sure the tool is level with the plane of the baseplate.

- 3 Squeeze the tool handle until the insert is fully seated within the Tibial Component. The insert should not move under any pressure in flexion or extension.

Cruciate-retaining, dished and posterior stabilized insert placement

- 1 Determine the correct articular insert thickness.
- 2 Clear any debris from the locking mechanism and manually slide the insert into the tibial baseplate engaging the locking mechanism. For the PS insert, begin insertion in flexion and extend the leg to engage the locking mechanism.
- 3 Attach the articular inserter/extractor to the tibial tray. Lift the inserter superiorly until the anterior lip of the articular insert is fully seated (Figure 63).



Figure 61



Figure 62



Figure 63

Tibial Base Impactor 7401-8901	Articular Inserter/ Extractor 7144-0194	JOURNEY Articular Inserter Tool 7401-8911
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PS and CR high flex insert placement

- 1 Attach the appropriately sized impactor head (either 1-2 or 3-8) to the impactor handle.
- 2 Position the knee in approximately 90° flexion.
- 3 Align the articular insert with the locking mechanism of the tibial baseplate.
- 4 Push the insert posteriorly until the top of the anterior rail of the baseplate is visible.
- 5 Place the impactor head on the anterior chamfer of the insert. The mating surfaces should be very conforming (Figures 64 and 65).
- 6 Impact the handle until the insert is fully seated.



Figure 64



Figure 65

High-flex Impactor Head	High-flex Impactor Handle
sz 1-2 7144-1553	7144-1552
sz 3-8 7144-1554	

MIS PS high flex insert placement

When using the PS high flex insert in a minimally invasive procedure, the femoral cam mechanism is likely to prevent the insert from fully seating into the locking mechanism while the knee is in flexion. To use the PS high flex insert in a MIS case:

- 1 Flex the knee to 90° and push the insert as far back as it will go posteriorly with the knee in flexion (Figure 66).

Tip Lift the distal femur to prevent scratching of the posterior condyle of the component.

- 2 Placing your thumb on the anterior of the insert to hold it on the baseplate (Figure 67), move the knee into extension.
- 3 Use the impactor handle with the appropriately sized impactor head to fully seat the insert and engage the anterior portion of the dovetail locking mechanism (Figure 68).

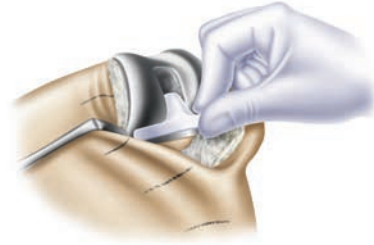


Figure 66

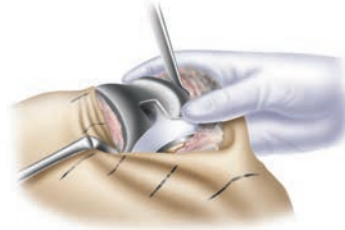


Figure 67

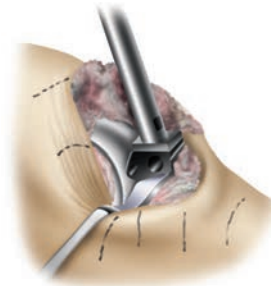


Figure 68

Options/Alternatives

Patella preparation

Instrument assembly

Patellar Reamer Guide

Determine the appropriate diameter patellar implant, and select the correctly-sized Patellar Reamer Collet and slide it into place on the Patellar Reamer Guide (Figure 69).

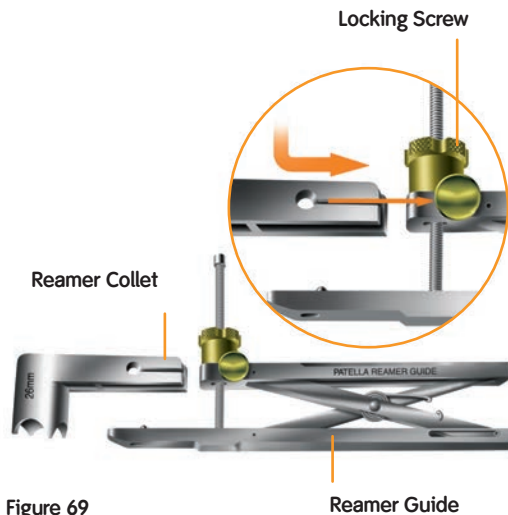


Figure 69

Depth gauge and reamer assembly

- 1 Attach the appropriate patellar depth gauge (red = resurfacing, black = large resurfacing/round) to the Reamer Guide (Figure 70).
- 2 Attach the matching sized patellar reamer dome and patellar depth stop to the patellar reamer shaft (Figures 71 and 72). Lower the assembly through the patellar Reamer Guide until the reamer dome contacts the patella.

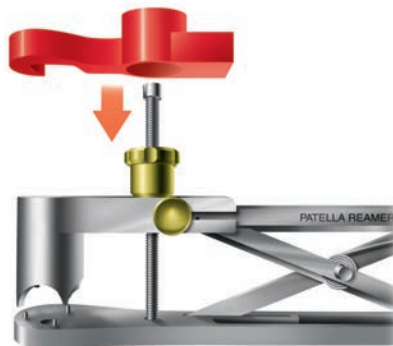


Figure 70



Figure 71



Figure 72

Reamer Collet	Resurfacing Depth Gauge	Patellar Depth Stop	Reamer Shaft
26mm 7144-0512	7144-0330	7144-0326	7144-0324
29mm 7144-0514			Reamer Dome
32mm 7144-0516	Large Resurfacing/ Oval Depth Gauge	Large Resurfacing/ Oval Depth Stop	26mm 7144-0348
35mm 7144-0518	7144-0431	7144-0427	29mm 7144-0342
Reamer Guide			32mm 7144-0344
7144-0311			35mm 7144-0346

Resurfacing patellar preparation

The surgeon can choose from a freehand cutting technique with towel clips, or if desired, he or she can choose one of the following instrumented techniques.

Reaming technique

The objective of this technique is to resurface the articular surface of the patella with the precision of a reaming technique. The reamed patellar surface can accommodate an oval or round resurfacing patellar component.

- 1 Trim tissue surrounding the patella using electrocautery (bovie) (Figure 73).
- 2 Use a rongeur to remove osteophytes and reduce the patella to its true size (Figure 74). It is recommended to leave the superior rim of bone intact. The bovie should also be used to release soft tissue attachments to the estimated level of resection.
- 3 Place the collet over the patella so that it fits snugly around the patellar diameter (Figure 75). The goal is to reduce the patella to its smallest diameter so that the smallest possible collet will fit around the entire patella. Use the patellar reamer collet as a sizing template to select the appropriately sized collet and reamer.

Tip The collet should be resting on the soft tissue surrounding the patella. If the patella does not enter the collet evenly but instead enters at an angle, the collet may not be completely surrounding the patella, but instead resting on part of the bone. If the collet is only slightly smaller than the patella, you may trim 1-2mm of the medial and lateral edges of the patella to ensure a snug fit. If the collet is far smaller than the patella, choose the next size up and assess fit.



Figure 73



Figure 74



Figure 75

Resurfacing Drill Guide	Drill	Patellar Calipers	Reamer Collet
26mm 7144-0402	7144-0360	11-4943	26mm 7144-0512
29mm 7144-0403			29mm 7144-0514
32mm 7144-0404			32mm 7144-0516
35mm 7144-0405			35mm 7144-0518

4 Measure patella thickness with the patellar calipers (Figure 76).

Tip The patella should measure a minimum of 19mm before reaming to use this resurfacing technique.

Determine the design and diameter of the patellar implant to be used. The round resurfacing patella is 9mm thick, and the depth stop for this technique prepares for 9mm of resection.

Tip Minor adjustments may be necessary at the time of resection to accommodate the largest diameter oval patellar implants. (Please see chart on page 44).

5 Rotate the appropriate resurfacing patellar depth gauge (red = round) around so that the hooked end or 'claw' surrounds the patellar reamer shaft (Figure 77). Lower the depth stop by compressing the button until it meets the depth gauge (Figure 78). Remove the depth gauge from the assembly. Ream the patella until the depth stop engages the patellar Reamer Guide (Figure 79).

Tip Excessive force on the reamer shaft may alter the depth of resection, causing overreaming.



Figure 76

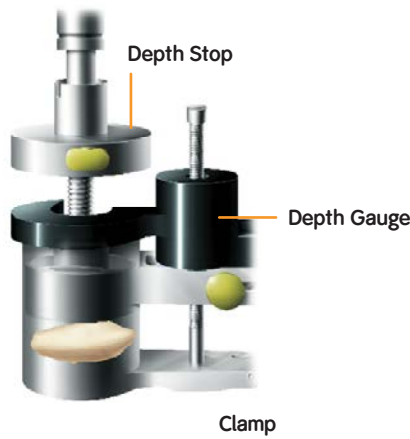


Figure 77



Figure 78

Figure 79

Resurfacing Depth Stop	Reamer Dome	Reamer Guide
7144-0326	26mm	7144-0348
	29mm	7144-0342
	32mm	7144-0344
	35mm	7144-0346

Resurfacing Depth Gauge
7144-0324
7144-0330

6 After reaming, the patella should have a completely flat articular surface (Figure 80). Measure the resected patella to ensure adequate resection (the resected patella should measure its original depth minus 9mm).

7 Drill the appropriate fixation holes for the resurfacing patellar implant using the correctly sized drill guide and resurfacing drill (Figure 81).

8 Place the patellar trial into the prepared patella. If desired, use the calipers to remeasure the composite thickness of bone and trial (Figure 82).

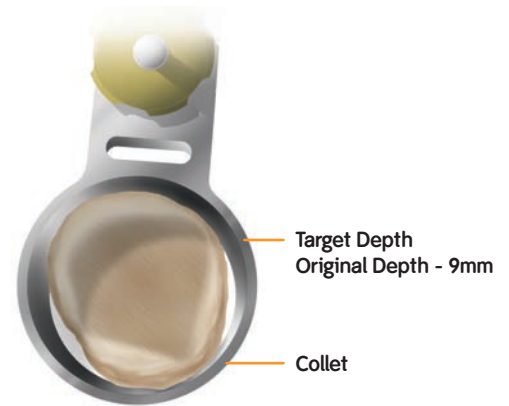


Figure 80

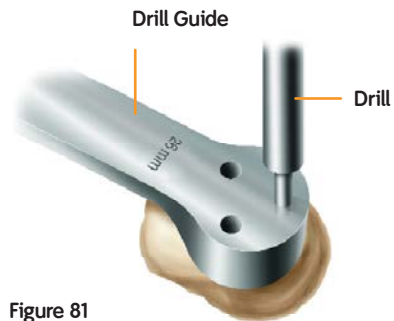


Figure 81



Figure 82

Resurfacing Drill Guide	Drill	Patellar Calipers
26mm 7144-0402	7144-0360	11-4943
29mm 7144-0403		
32mm 7144-0404		
35mm 7144-0405		

Component trialing

- 1 Place the patellar trial into the prepared patella (Figure 83).
- 2 Perform a trial range of motion to assess patellar tracking. Medial/lateral placement of the femoral trial can be adjusted to optimize patellar tracking (Figure 84).



Figure 83

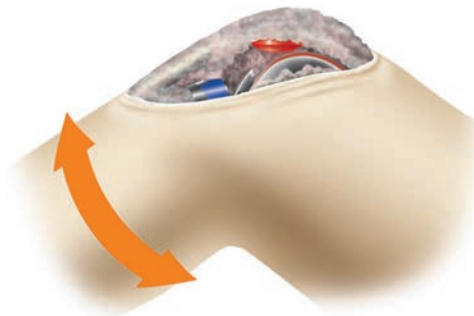


Figure 84

Patellar implantation

- 1 Assemble the patellar cement clamp to the patellar Reamer Guide.
- 2 Apply bone cement to the patella.
- 3 Place the patellar implant onto the patella and clamp into the bone (Figure 85). Remove excess cement.

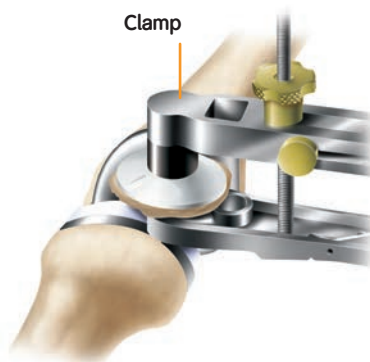


Figure 85

Resurfacing Patellar Trial	Reamer Guide	Cement Clamp
26mm 7143-0580	7144-0311	7144-0322
29mm 7143-0574		
32mm 7143-0576		
35mm 7143-0578		

Intramedullary (IM) tibial preparation

Technique highlights

Place the intramedullary alignment assembly on the tibia. The alignment rod should align with the medial third of the tibial tubercle. Impact assembly.



Attach the tibial stylus to the tibial cutting block and lower the cutting block until the stylus touches the low point on the least affected side of the tibia. Once the resection level is determined, insert pins to secure and remove alignment assembly.



Resect the proximal tibia.



Size the tibia.



Final preparation

After trial range of motion and alignment checks, select the appropriate trial fin punch and punch through the trial.



Seat the tibial implant with the tibial impactor.



Insert the articular insert by placing the insert assembly tool into the center notch of the anterior lock detail (handle up) and engage the two tabs of the tool into the two recesses on the anterior periphery of the insert. Squeeze the tool handle until the insert is fully seated within the tibial component.



Instrument assembly

Intramedullary Tibial Alignment Guide

- 1 Insert the external rod of the Intramedullary Tibial Alignment Guide through the hole on the correct left or right Tibial Cutting Block and lock the cam (Figure 86).
- 2 Attach the T-handle to the IM Rod and pass it through the cannulated alignment sleeve on the alignment assembly (Figure 87).

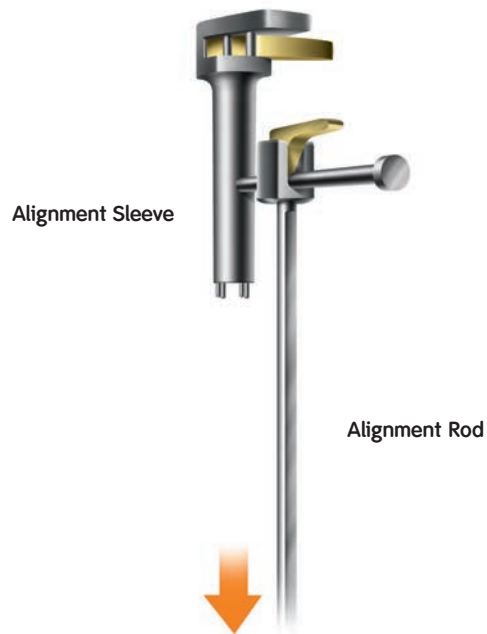


Figure 86



Figure 87

T-handle 7111-0080	Tibial Cutting Block Left 7144-1136 Right 7144-1137	IM Alignment Guide 7144-0200	IM Rod Short 7151-2035 Long 7151-2040
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IM tibial preparation

- 1 Make a 9.5mm pilot hole into the tibial canal (Figure 88). A preliminary resection of the tibial spine may facilitate seating of the tibial drill guide onto the proximal tibia.
- 2 Slowly insert the IM rod into the tibial canal.
- 3 Assess rotation of the intramedullary tibial alignment guide. Rotational alignment is critical due to the 3° posterior sloped cut. The alignment rod of the intramedullary tibial alignment assembly should align with the medial third of the tibial tubercle (Figure 89).
- 4 Impact the proximal end of the cannulated alignment sleeve to drive the distal spikes into the proximal tibia to lock rotational alignment (Figure 90).



Figure 88



Figure 89

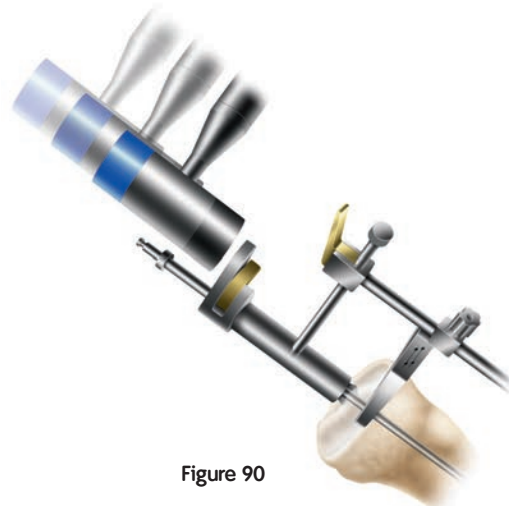


Figure 90

IM Drill
7401-2111

Tibial Cutting Block
Left 7144-1136
Right 7144-1137

IM Alignment
Guide
7144-0200

IM Rod
Short 7151-2035
Long 7151-2040

Tibial resection

- 1 Attach the Tibial Stylus to the Tibial Cutting Block by inserting the stylus foot into the cutting slot.
- 2 Lower the cutting block until the stylus touches the low point on the least affected side of the tibia (Figure 91). The stylus can be adjusted for a 1-13mm tibial resection by twisting the knob on top of the stylus. If the affected side of the tibia is to be used as a reference, the stylus may be adjusted for a 1-9mm resection level.
- 3 Pin the Tibial Cutting Block to the tibia by inserting pins first through the central holes; then the oblique hole.



Figure 91



Figure 92

Tip Pinning through the central holes marked 0mm with smooth pins will allow the block to be moved +2mm should additional resection be required (Figure 92).

Tip A 9mm resection is recommended since 9mm of metal and plastic is the thinnest available component.

Tip To do an extramedullary alignment check, place the extramedullary Alignment Rod through the tibial cutting block.

Tibial Stylus	Tibial Cutting Block	Alignment Rod
7144-1143	Left 7144-1136	7144-1148
	Right 7144-1137	

- 4 To remove the assembly:
Use the universal extractor leaving the cutting block on the anterior tibia (Figure 93) after loosening the thumbscrew.
- 5 Cut the tibia by first directing the blade in the posterior direction and then laterally (Figure 94).
- 6 Check alignment and balance with spacer block and rod. Balance ligaments in standard fashion.



Figure 93



Figure 94

Universal Extractor (Slap Hammer) 7144-0366	Flexion / Extension Spacers 9mm 7401-8608 11mm 7401-8611	Quick Connect Handle 7144-0044	Alignment Rod 7144-1148
Flexion / Extension Block Standard 7401-8603	13mm 7401-8613 15mm 7401-8615 18mm 7401-8618 21mm 7401-8621	Tibial Cutting Block Left 7144-1136 Right 7144-1137	

Appendix A

Implant size interchangeability

	Femoral Size							
Insert Size	1	2	3	4	5	6	7	8
1-2 PS, DD, Con	●	●	●					
1-2 PSHF, CRHF	●	●	●	●				
3-4 PS, DD, Con		●	●	●	●			
3-4 PSHF, CRHF		●	●	●	●	●		
5-6 PS, DD, Con				●	●	●	●	
5-6 PSHF, CRHF				●	●	●	●	●
7-8 PS, DD, Con						●	●	●
7-8 PSHF, CRHF						●	●	●

PS – Standard posterior stabilized

DD – Deep dish

Con – Constrained

PSHF – Posterior stabilized high flex

CRHF – Cruciate retaining high flex

Note: CR – Standard cruciate retaining inserts are interchangeable with all size femoral components

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