ELEOS™
Limb Salvage System

Surgical Technique:
Hinge Knee Replacement

The ELEOS Limb Salvage System offers options for patients with significant bone loss due to cancer, trauma, or previous surgical procedures. The locking taper design has a history of clinical use in a variety of orthopaedic applications. With an array of options in a multitude of sizes, the ELEOS system provides the surgeon the ability to meet a variety of patient needs.

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Precision Orthopaedic Oncology

- ELEOS™ Limb Salvage Solutions
- My3D® Personalized Solutions
- GenVie™ Regenerative Biologics

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ELEOS™
Limb Salvage System

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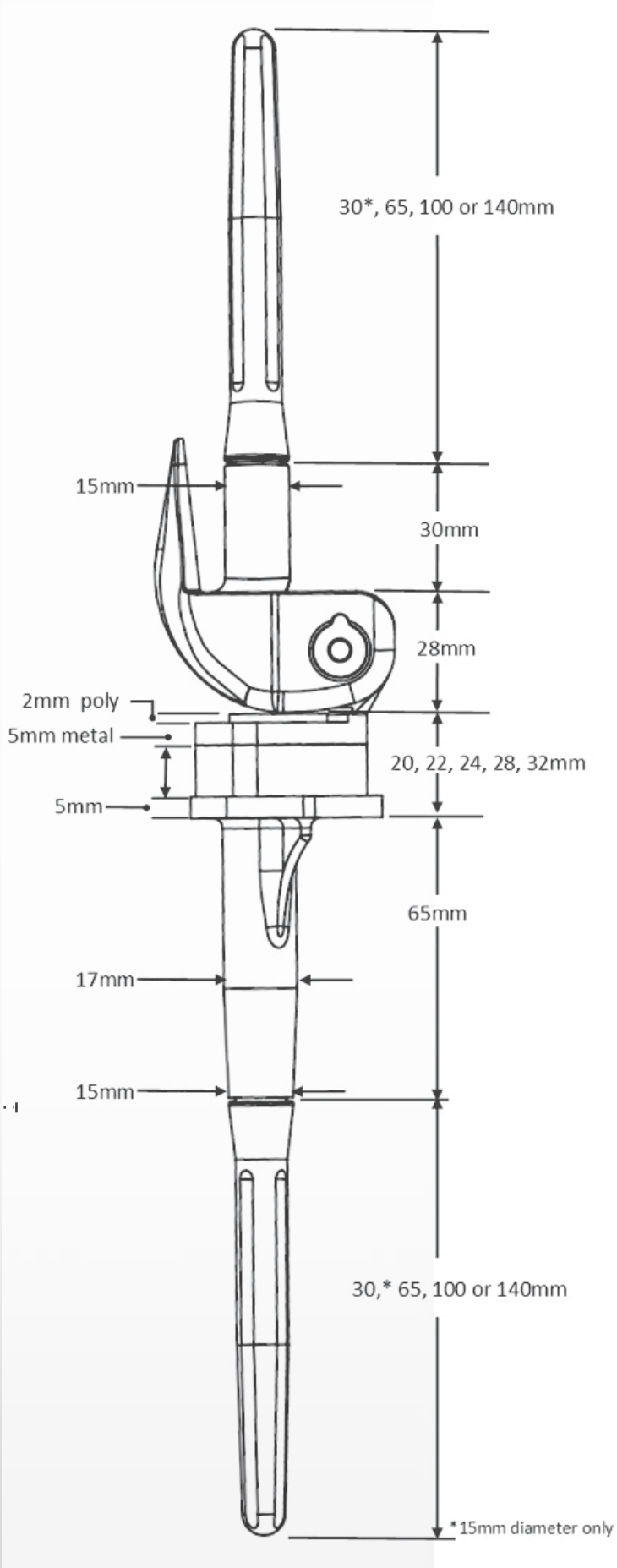
Set configurations

Please refer to document CORP 06.01.21 for a full listing of implant and instrument set requirements, images, and part listings.

Construct overview

The ELEOS™ Hinge Knee System consists of nine components that create a hinged knee: stem extension, resurfacing femur, optional resurfacing femur tapered screw, tibial hinge component, axial pin, tibial polyethylene spacer, tibial baseplate, optional tibial baseplate tapered screw, and optional stem extension.



Component overview

Stem extensions

Stem Extensions are available in lengths ranging from 30–140mm in either cemented or canal filling options. | Table 1

Table 1.

Stem	Description	Length	Diameter	Collar
Stem Extensions – Cemented				
KSC01530E	Straight Cylindrical, Fluted, Titanium (bullet tip)	30mm	15mm	None
KSC0(XX)65E	Straight Cylindrical, Fluted, Titanium	65mm	10, 12, 14, 16mm	None
KSC(XX)100E	Straight Cylindrical, Fluted, Titanium	100mm	10, 12, 14, 16, 18mm	None
Stem Extensions – Canal Filling				
KSP(XX)100E	Straight, Cylindrical, Splined, Slotted, Titanium	100mm	11, 12, 13, 14, 15, 16, 17, 18, 19, 21mm	None
KSP(XX)140E	Straight, Cylindrical Splined, Slotted, Titanium	140mm	11, 12, 13, 14, 15, 16, 17, 18, 19, 21mm	None

Resurfacing femur, tapered screw, and axial pin

The Resurfacing Femur features a deepened patellar groove and a 5° valgus angle to assist in the restoration of patello-femoral kinematics, reduction of patellar subluxation, and promotion of normal loading patterns. Internal/external rotation of the hinge can be controlled with a component that has a stop set for +/- 15° or a hinge component without a stop can be used. The Resurfacing Femur is available in three sizes for intraoperative flexibility, shown in Table 2. A Resurfacing Femur Tapered Screw is available to reinforce the construct. Please reference page 18 for the optional surgical technique.

Table 2.

Part #	Description	Size
Resurfacing Femur, Tapered Screw, and Axial Pin		
RF-L002E-01M	Resurfacing Femur, Left	60mm M/L; Size 2
RF-L003E-01M	Resurfacing Femur, Left	65mm M/L; Size 3
RF-L004E-01M	Resurfacing Femur, Left	70mm M/L; Size 4
RF-R002E-01M	Resurfacing Femur, Right	60mm M/L; Size 2
RF-R003E-01M	Resurfacing Femur, Right	65mm M/L; Size 3
RF-R004E-01M	Resurfacing Femur, Right	70mm M/L; Size 4
RF-TSCRW-01M	Resurfacing Femur Tapered Screw	One size
25002112E	Resurfacing Femur Axial Pin	Size 2
25002113E	Resurfacing Femur Axial Pin	Size 3
25002114E	Resurfacing Femur Axial Pin	Size 4

Component overview

Tibial poly spacer and hinge[1]

The Tibial Poly Spacer is available in 8mm, 10mm, 12mm, 16mm, and 20mm thicknesses. The hinge is available with and without an internal/external rotational stop set for +/- 15˚. | Table 3

Table 3.

Tibial poly spacer and hinge[1]		
Part #	Description	Size
25001208E	Tibial Poly Spacer	8mm
25001210E	Tibial Poly Spacer	10mm
25001212E	Tibial Poly Spacer	12mm
25001216E	Tibial Poly Spacer	16mm
25001220E	Tibial Poly Spacer	20mm
THSMWRS01M	Tibial Hinge With Rotational Stop	One size
THSMWOS01M	Tibial Hinge Without Rotational Stop	One size

1 - Note the following for revision scenarios:
Any ELEOS or Guardian procedures prior to September 2021 that require revision and replacement of the Resurfacing Femur component are required to have the Tibial Hinge component replaced. The replacement Tibial Hinge Component must be either THSMWRS01M or THSMWOS01M.

Tibial baseplate and tapered screw

The Tibial Baseplate is available in five sizes for optimal tibial coverage, shown in Table 4. An optional tibial baseplate tapered screw may be used to further reinforce the construct. Please reference page 19 for the optional surgical technique.

Table 4.

Tibial Baseplate and Tapered Screw		
Part #	Description	Size
TB-2201E-01M	Tibial Baseplate	60mm M/L; Size 1
TB-2202E-01M	Tibial Baseplate	65mm M/L; Size 2
TB-2203E-01M	Tibial Baseplate	70mm M/L; Size 3
TB-2204E-01M	Tibial Baseplate	75mm M/L; Size 4
TB-2205E-01M	Tibial Baseplate	80mm M/L; Size 5
TB-TSCRW-01M	Tibial Baseplate Tapered Screw	One size
KSC01500E	Modular Tibial Base Stem Cap	One size

Surgical technique steps

Femoral preparation

Note: It is surgeon preference if the femoral resection or tibial resection is done first.

Femoral reaming

1. Initiate an opening in the femoral canal with the Starter Drill Bit 3/8 in. The entry point is placed medial and anterior to the anteromedial corner of the intercondylar notch. | Figure 1

Caution: Hand reaming may be appropriate to avoid a thin femoral cortex that could result in a fracture. Care should be taken if reaming with power.

2. Utilize the cylindrical reamer to continue preparing the femoral canal for the stem extension.

3. If the femoral resection has been completed, ream to the appropriate depth of the femoral construct (shown in Figure 2 in red).

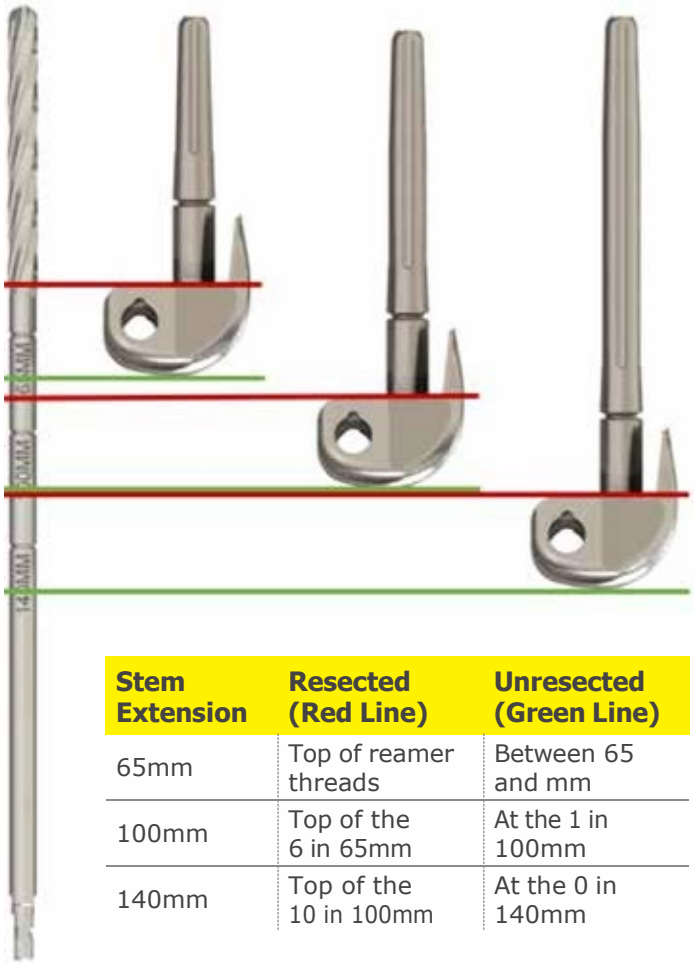
4. If the femoral resection has not been completed, ream approximately 20mm beyond that distance (shown in Figure 2 in green) to account for the appropriate full depth of the femoral component.

Note: Consider an additional 20mm to account for the placement of a cement restrictor in the distal end of the prepared femoral canal.

5. When desired reaming is complete, ensure the Reamer provides a stable construct for additional femoral preparation.

Figure 1

Figure 2



Stem Extension	Resected (Red Line)	Unresected (Green Line)
65mm	Top of reamer threads	Between 65 and mm
100mm	Top of the 6 in 65mm	At the 1 in 100mm
140mm	Top of the 10 in 100mm	At the 0 in 140mm

Surgical technique steps

Note: The Stem Extension diameters from Table 1 are equal to Reamer diameters. When determining the appropriate Cylindrical Reamer size for the desired cement mantle, the difference will represent the cement mantle. For instance, reaming to a 13mm diameter will provide a line-to-line fit with a 13mm stem. Reaming to a 14mm will provide a 0.5mm cement mantle per side, while reaming to 15mm will provide a 1mm cement mantle per side. When determining the appropriate Cylindrical Reamer size for the canal filling stems, the difference will represent the fit. For instance, reaming to a 13mm diameter will provide a line-to-line fit with a 13mm stem, while reaming to 12mm will provide a 1mm press fit.

6. Make sure to ream in an elliptical fashion with the first few reamers to ensure that the distal bone does not dictate the path of the reamer.

Caution: During the reaming process, the intramedullary canal of the femur should be repeatedly irrigated and aspirated to reduce the chance of fat emboli.

7. With desired reaming complete, ensure that the Reamer provides a stable construct for additional femoral preparation.

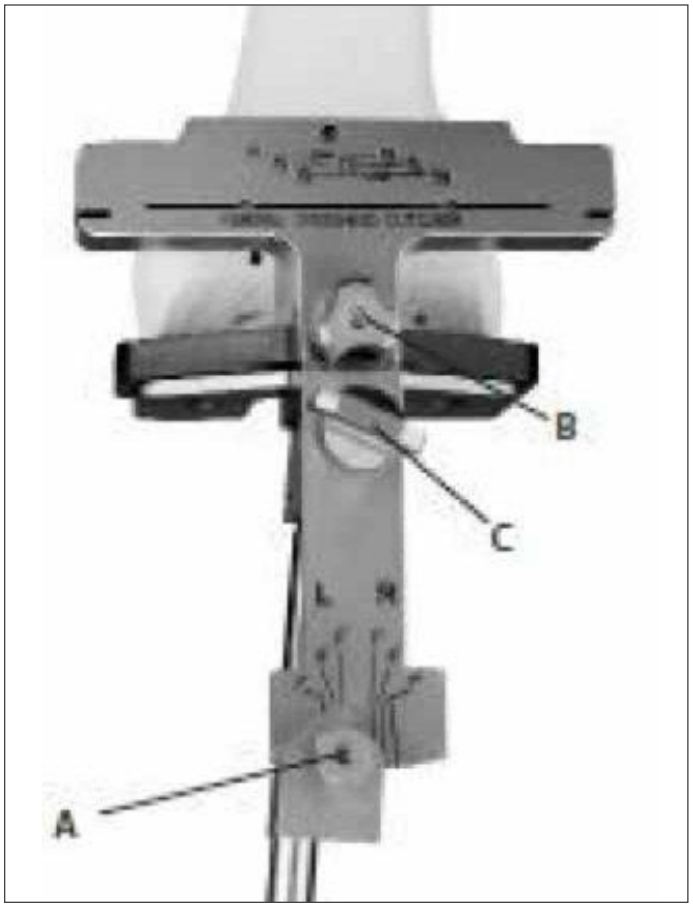
Distal femoral alignment

1. The Valgus Angle Alignment Guide should be set at 5° (left or right) to match the 5° valgus orientation of the Resurfacing Femur. Set the valgus angle to 5° and tighten the small thumb screw A shown in Figure 3.

2. Attach the Distal Femoral Resection Guide to the Valgus Angle Alignment Guide and tighten the small screw by hand or with a screwdriver B shown in Figure 3.

3. Slide the entire construct over the fixed Cylindrical Reamer and lock the guide to the reamer by tightening the large thumb screw C shown in Figure 3.

Figure 3



Surgical technique steps

Distal femoral resection

Note: All femoral resection slots are designed for use with a .050" (1.3mm) thick saw blade. The distal femoral resection depth is set using the 9mm Femoral Distal Spacer between the platform of the Valgus Angle Alignment Guide and the most proximal condyle if a femoral component was removed as in a revision situation. | Figure 4

1. The 9mm Femoral Distal Spacer accounts for the distal thickness of a primary femoral implant that was removed. Once assembled, the spacer will provide a 28mm resection along the most prominent condyle surface from the joint line.

2. A secondary check is available by referencing the small slots on the Distal Femoral Resection Guide. By matching the position of these slots to the transepicondylar axis, a theoretical placement of the original joint line is indicated. | Figure 5

Caution: Placing the Valgus Angle Alignment Guide shown in Figure 4 or the 9mm Femoral Distal Spacer, if needed, flush against the distal surface, will result in a 28mm distal resection from the joint line (where the paddles touch the femur).

3. With the guide properly positioned, pin the Distal Femoral Resection Guide by placing 1/8" (3.2mm) Headless Fixation Pins or Drill Bits into the holes, marked "STD" A shown in Figure 6. The distal femoral resection can be performed with or without the Cylindrical Reamer and Valgus Angle Alignment Guide in place. If the guide is left, take caution to avoid the IM reamer while making the resection. To remove the guide, loosen both thumb screws B shown in Figure 6 and disengage the Valgus Angle Alignment Guide from the Distal Femoral Resection Guide. Utilize the Quick Disconnect T-handle to remove the reamer. A distal resection is performed through the resection slot C shown in Figure 6.

4. After the resection is complete, remove the Distal Femoral Resection Guide and pins from the bone.

Figure 4

Figure 5

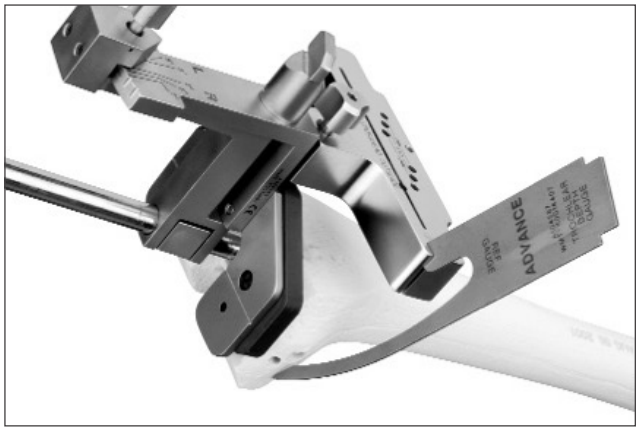
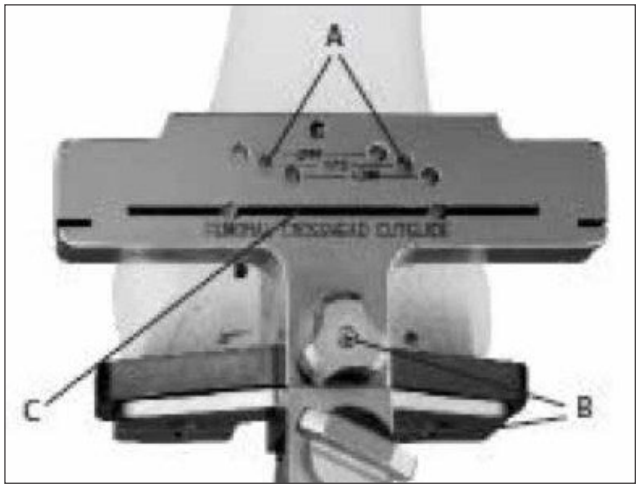


Figure 6



Surgical technique steps

Femoral sizing

Femoral implant sizing can be approximated by one of the following methods:

1. Use of trial femoral components.
2. Preoperative radiographic evaluation of both knees.

Anterior and posterior resections

If the Cylindrical Reamer was removed to make the distal resection, the Reamer needs to be inserted again to accommodate attachment of the Femoral A/P Resection Guide.

1. Select the Femoral A/P Resection Guide corresponding to the size Resurfacing Femur previously determined. Assemble the 5° intramedullary (IM) Revision Angle Locator with the correct "Left" or "Right" marking facing the arrow on the Femoral A/P Resection Guide A shown in Figure 7, and place the entire assembly over the fixed Cylindrical Reamer. Two laser marks on the face of the block indicate the M-L width of the Resurfacing Femur for a final check of femoral sizing B shown in Figure 7.
2. External rotation can be set by referencing either the medial and lateral epicondyles (transepicondylar axis) or A/P axis of the femur (perpendicular plane to the patella groove).
3. Tighten the thumbscrew C shown in Figure 7 and stabilize the block using fixation pins on the medial and lateral sides of the block. The fixation holes can be predrilled with a Drill Bit 1/8 in. Femoral resections are performed through the anterior and posterior resection slots. The anterior femoral resection is 6° divergent to the posterior resection.

Resurfacing femur trial assembly

Assemble the appropriate size Trial Stem Extension to the Trial Resurfacing Femur. Using the Femoral Impactor, impact the Trial Resurfacing Femur onto the prepared bone. | Figure 8

Figure 7

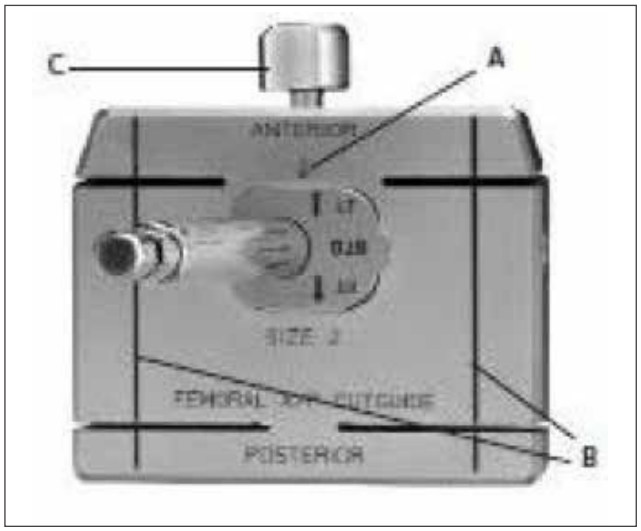


Figure 8

Surgical technique steps

Tibial preparation

Resect the tibia using the provided Intramedullary (IM) Resurfacing Instrumentation. Consider that the Tibial Components (Tibial Baseplate, Tibial Polyethylene Spacer, and Tibial Hinge Component) will add 20mm of length when using an 8mm spacer; confirm that enough tibial bone is removed.

Note: The ELEOS™ Tibial implants are designed for a perpendicular tibial base orientation to the IM canal. Hence, IM instrumentation helps ensure a neutral resection.

Tibial reaming

1. Initiate an opening in the proximal tibia with the 3/8 in. Starter Drill Bit. The opening should be slightly posterior to the anterior cruciate ligament tibial attachment.
2. Attach the Quick Disconnect T-handle to the 11 in. Reamer/IM Rod.
3. Ream to establish the anatomical axis of the proximal tibia and to allow for the assembly of the IM Tibial Alignment Guide. | Figure 9
4. Drill to approximately 1 to 1.5 inches in depth.
5. Toggle the drill to increase the opening diameter. Remove the T-Handle quick connect, leaving the reamer shaft/IM Rod in the bone.

Note: If using a Stem Extension, continue reaming with consecutive larger reamer diameters until thedesired canal diameter is achieved. This is ideally done after making the tibial resection.

Caution: Hand reaming is recommendedwhen a patient has poor bone quality.

Figure 9

Surgical technique steps

Tibial resection

1. Preassemble the IM Tibial Alignment guide and IM Tibial Resection guide on the back table. Remove the Quick Disconnect T-Handle from the 11 inch Reamer/IM Rod.

2. Slide the IM Tibial Alignment and Resection Guide Assembly onto the 11 inch Reamer/IM Rod until the bottom surface of the guide rests against the tibial surface. | Figure 10

3. Turn the locking screw to lock the guide to the 11 inch Reamer/IM Rod A shown in Figure 10. The Depth Stylus and/or Dual Reference Gauge (also known as crab claw/angel wing) can be used to set the proximal/distal position of the IM Tibial Resection guide to the desired level of tibial resection B shown in Figure 10. The Depth Stylus can be set to measure a depth of resection of 2mm or 10mm.

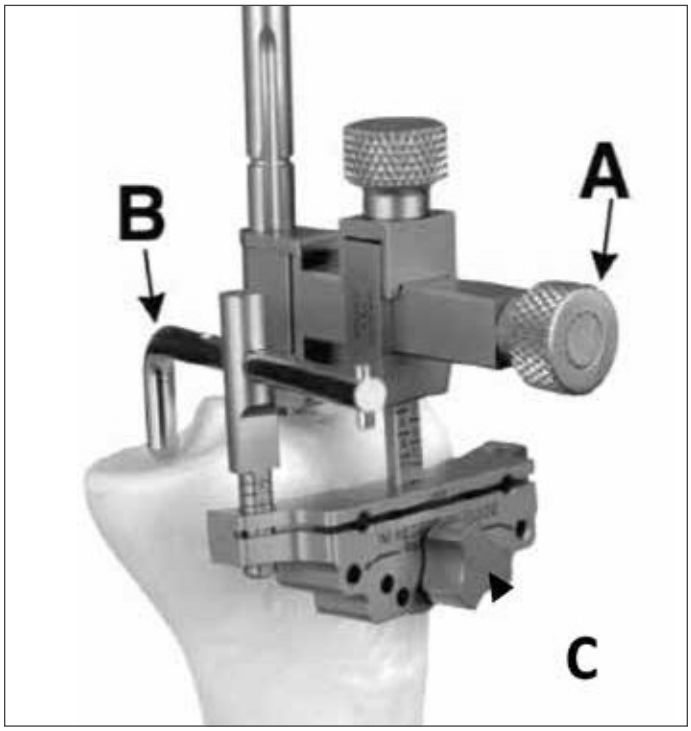
   Note: The IM Tibial Resection Guide can be moved an additional 3mm down if the initial pin is placed in the "0" hole to get the desired resection level. Due to patient specific anatomy or pathology, greater resection may be required to accommodate the hinge component. The Distal Femoral Resection Template may aid in identifying the tibial resection and minimize the need for additional resections.

4. After desired resection level is achieved, tighten the knob on the IM Tibial Resection Guide C shown in Figure 10. Pin the IM Tibial Resection Guide to the proximal tibia.

5. After the desired alignment is achieved and pins are in place, loosen the locking screw shown in Figure 10 and knob on the IM Tibial Resection Guide C shown in Figure 10. Remove the top of the IM Tibial Alignment Guide leaving the IM Tibial Resection Guide pinned into the tibia.

6. Make the tibial resection and remove the IM Tibial Resection Guide.

Figure 10



Surgical technique steps

Optional Tibial stem extension

1. Stem Extensions are available in either canal-filling or cemented options shown in Table 1. If a Stem Extension is to be used, continue reaming with consecutive larger reamer diameters until the desired diameter is achieved.

2. Utilize the cylindrical reamer to continue preparing the tibial canal for the Stem Extension.

3. If the tibial resection has been completed, ream to the appropriate depth of the tibial construct (shown in Figure 11 in red).

4. If the tibial resection has not been completed, ream approximately 20mm beyond that distance (shown in Figure 11 in green) to account for the tibial baseplate tray, general poly spacer, and tibial hinge component.

   - Note: Consider an additional 20mm to account for the placement of a cement restrictor in the distal end of the prepared tibial canal.

5. When desired reaming is complete, ensure that the Reamer provides a stable construct for additional tibial preparation.

   - Caution: Hand reaming may be appropriate to avoid thinning the tibial cortex which could result in a fracture.

   - Note: The Stem Extension diameters from Table 1 are equal to Reamer diameters. When determining the appropriate Cylindrical Reamer size for the desired cement mantle, the difference will represent the cement mantle. For instance, reaming to a 13mm diameter will provide a line-to-line fit with a 13mm stem. Reaming to a 14mm will provide a 0.5mm cement mantle per side, while reaming to 15mm will provide a 1mm cement mantle per side. When determining the appropriate Cylindrical Reamer size for the canal filling stems, the difference will represent the fit. For instance, reaming to a 13mm diameter will provide a line-to-line fit with a 13mm stem, while reaming to 12mm will provide a 1mm press fit.

Figure 11

Stem Extension	Resected (Red Line)	Unresected (Green Line)
30mm	Top of reamer threads	Between 65mm letters
65mm	Top of 65mm etching	Between 100mm letters
100mm	Top of 100mm etching	Between 140mm letters
140mm	Top of 140mm etching	20mm past top of 140mm

Surgical technique steps

Tibial baseplate preparation

1. Select the Trial Tibial Baseplate Template that provides the optimal proximal tibial bone coverage. | Figure 12

   Note: If Augments are used, see "Block Augments (Optional)" on page 23 and attach the appropriate size and thickness Trial Augment to the Trial Tibial Baseplate Template. | Figure 12

2. Place the Trial Tibial Baseplate Template on the proximal tibia.

   Note: To ensure optimal Trial Tibial Baseplate Template sizing and location, the template may be initially placed over the Cylindrical Reamer. Slide the Trial Tibial Base Handle/Drill Guide over the reamer until it interfaces with the template, centering the template on the tibial canal. Change the template size if required to optimize proximal tibial bone coverage.

3. Once size and alignment are confirmed, pin the Trial Tibial Baseplate Template to the proximal tibia using Tibial Fixation Pins. After pinning, remove the reamer and attach the Trial Tibial Base Handle/Drill Guide and External Check Rod to the Trial Tibial Baseplate Template. | Figure 13

   Note: Align the distal end of the External Check Rod with the second toe.

4. Remove the Tibial Baseplate Handle and External Check Rod.

5. Loosely attach the Keel Punch Guide Handle to the Keel Punch Guide. Align the pegs on the bottom of the Keel Punch Guide to the center holes in the Trial Tibial Baseplate Template A shown in Figure 14.

6. Secure the Keel Punch Guide to the Trial Tibial Baseplate by turning the knurled handle, ensuring that the Keel Punch Guide Handle is in the correct orientation A shown in Figure 14.

Figure 12

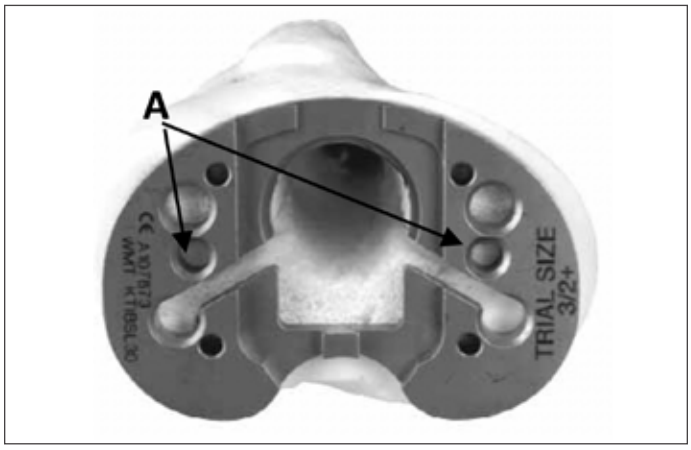


Figure 13

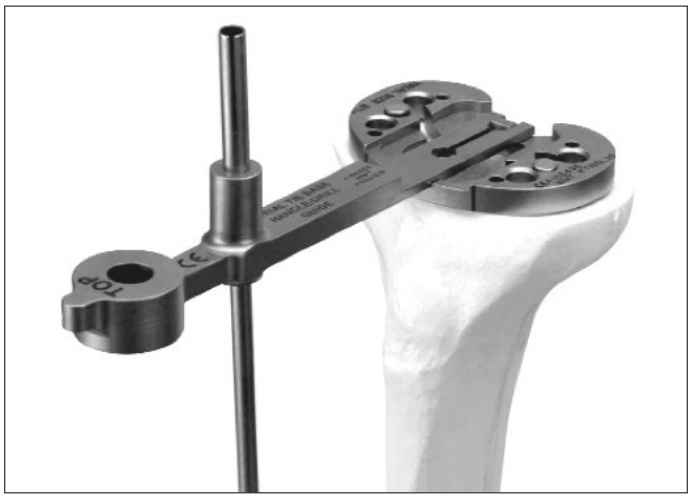
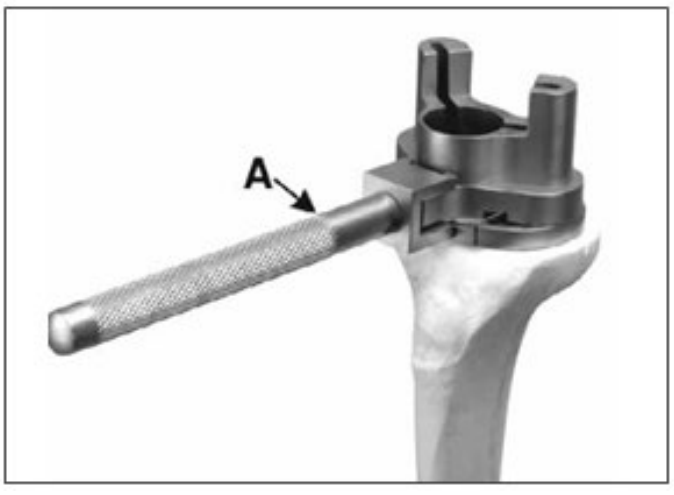


Figure 14



Surgical technique steps

Tibial baseplate reaming

1. Align the Press Fit Reamer Guide or Cemented Reamer Guide through the Keel Punch Guide A shown in Figure 15. If a thin cement mantle is preferred, utilize the Press Fit Reamer Guide and Press Fit Reamer; if a thicker cement mantle is preferred, use the Cemented Reamer Guide and Cemented Reamer.

2. Using the appropriate reamer, ream until no teeth are visible above the Reamer Guide. | Figure 15

Note: Make certain that the Tibial Baseplate Template stays flush to the resection surface during the reaming and punching steps.

3. Remove the Reamer Guide from the Keel Punch Guide.

Tibial baseplate keel punch

1. Using the Keel Punch Impactor and the Press Fit or Cemented Keel Punch, slide the punch through the guide until the punch is fully seated as shown in Figures 16 and 17. The Keel Punch is fully seated when the knurled handle is flush against the guide, which acts as a positive stop. If Stem Extension reaming was performed, attach the appropriate size Trial Stem Extension to the chosen Keel Punch.

2. Disassemble and remove all tibial preparation instruments. Use the Pin Puller to remove fixation pins.

Figure 15

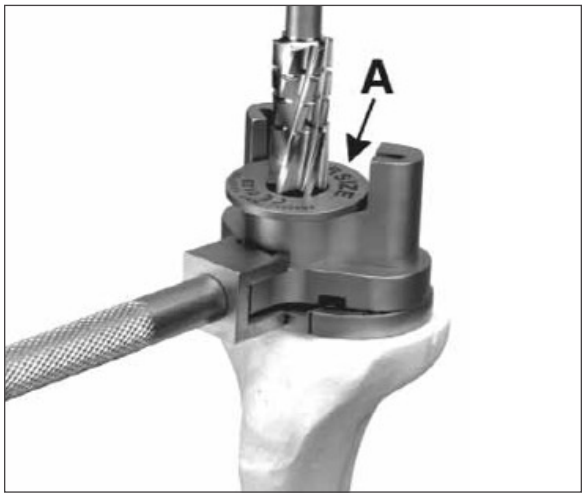


Figure 16

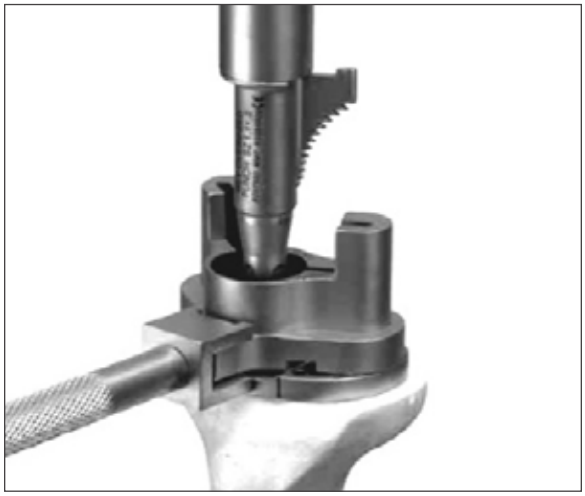
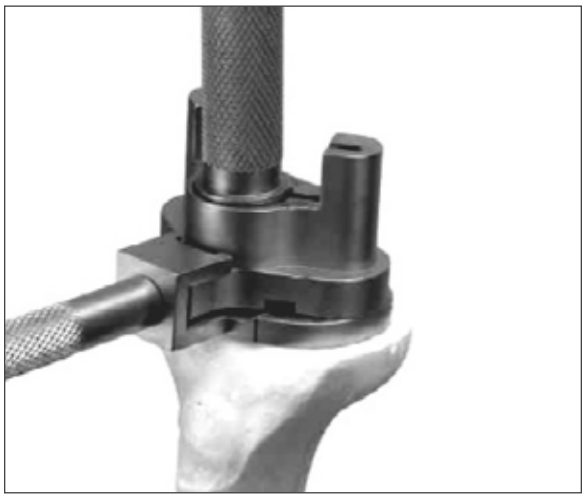


Figure 17



Surgical technique steps

Trialing

Tibial trial assembly

1. Assemble the Trial Tibial Baseplate, Trial Stem Extension (optional), Trial Tibial Poly Spacer, Trial Block Augment (optional), and Trial Tibial Hinge Component according to previously determined sizes chosen.

2. Insert the trial tibial component assembly into the tibia. | Figure 18

3. Reduce the Trial Femoral Construct onto the Trial Hinge Component. Next, insert the Trial Axial Pin to attach the Trial Distal Femur to the Trial Tibial Hinge Component to secure the construct for trial reduction. | Figure 19

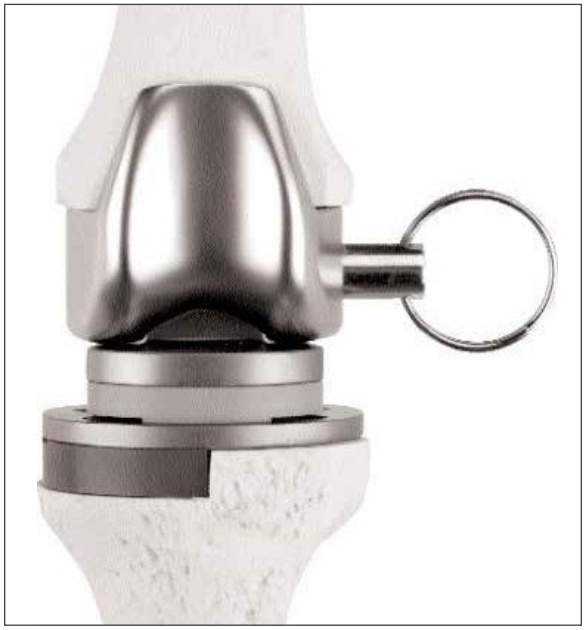
Note: The Axial Pin can be inserted from the medial or lateral side.

Trial reduction

Perform a trial reduction. If the soft tissues require adjustment, minor changes can be accomplished by selecting alternate Tibial Poly Spacers. More significant adjustments may require changing the resection level.

Figure 18

Figure 19



Surgical technique steps

Component assembly

- Caution: Mallet assembly must be performed over or near the support legs of a rigid back table and not on an unstable surface such as the mayo stand. Ensure that the components are free from debris and are dry prior to assembly. If required, wipe/dry components with a sterile lap sponge.
- Note: Recommend using 2lb. mallet from general surgical OR instruments.

Femoral component

On the back table, place the Resurfacing Femur and Stem Extension in the Femoral Assembly Platform using the Trial Axial Pin, and assemble with five hard mallet blows using the Stem Assembly Impactor. | Figure 20

- Note: Utilize the match mark on the Stem Extension so that the slot accommodates the bow of the femur.

Tibial component

1. If not using a Stem Extension, insert the Poly Plug included in the Tibial Baseplate package into the distal taper. Alternatively, a Modular Tibial Base Stem Cap (KSC01500E) can be inserted and impacted using the instructions for a Stem Extension. This will prevent cement from extruding into the implant during insertion.

   If using a Stem Extension, place the Tibial Baseplate on the Tibial Baseplate Assembly Platform. A marking on the anterior portion of the Tibial Baseplate boss provides a reference to align the slot of the Stem Extension when a canal filling stem is indicated. | Figure 21

- Note: The slot on the Stem Extension B shown in Figure 21 should align with the marking on the Tibial Baseplate boss A shown in Figure 21.

2. Assemble the Stem Extension onto the Tibial Baseplate using five hard mallet blows directly on the tip of the Stem Extension with the Stem Assembly Impactor. | Figure 22

- Note: Make sure to remove the protective cap on the tip of the Stem Extension before assembly.

If augments are to be used, see "Block Augments (Optional)."

Figure 20

Figure 21

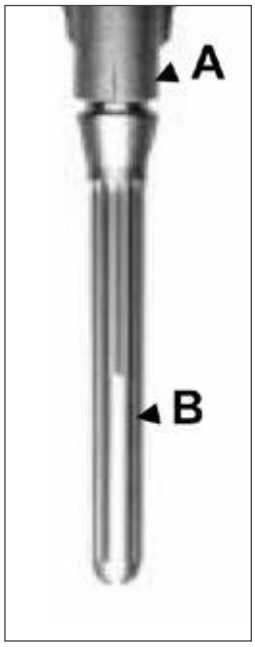


Figure 22

Surgical technique steps

Optional Step

Resurfacing Femur Tapered Screw

1. Assemble the Extension Driver shaft to the Screwdriver Handle.

   Note: Confirm that the proper Tapered Screw has been selected. The Tibial Baseplate Tapered Screw is 16.5mm in length and the Resurfacing Femur Tapered Screw is 25.5mm in length. They are not cross-compatible.

   Manually insert the Resurfacing Femur Tapered Screw into the Resurfacing Femur chamber. Using the driver, hand tighten the Resurfacing Femur Tapered Screw into the threads of the assembled Stem Extension. **| Optional Step: Figure 1**

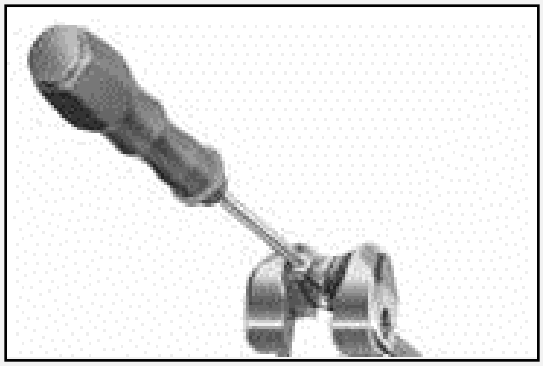
   Remove the Extension Driver from the Resurfacing Femur.

2. Assemble the second Extension Driver Shaft to the Torque Wrench. Insert the Resurfacing Femur and Stem Extension into the Counter Torque Instrument by sliding the stem extension into the Resurfacing Femur side of the Counter Torque Instrument. **| Optional Step: Figure 2.**

3. Ensure that the Resurfacing Femur is fully seated against the surface of the instrument with the white counter rotation block located between the condyles. **| Optional Step: Figure 3**

4. Insert the assembled Torque Wrench and Extension Driver shaft into the chamber until it engages with the head of the screw. Turn until the Torque Wrench clicks (8 Nm) indicating that the tightening torque has been reached **| Optional Step: Figure 4**

5. Remove the Torque Wrench from the Resurfacing Femur and the Resurfacing Femur assembly from the Counter Torque Instrument.



Optional Step: Figure 1

Optional Step: Figure 2

Optional Step: Figure 3

Optional Step: Figure 4

Surgical technique steps

Optional Step

Tibial Baseplate Tapered Screw

1. Assemble the Extension Driver shaft to the Screwdriver Handle.

   Note: Confirm that the proper Tapered Screw has been selected. The Tibial Baseplate Tapered Screw is 16.5mm in length and the Resurfacing Femur Tapered Screw is 25.5mm in length. They are not cross-compatible.

   Insert the Tibial Baseplate Tapered Screw into the Tibial Baseplate chamber. Using the driver, hand tighten the Tibial Baseplate Tapered Screw into the threads of the assembled Stem Extension. **| Optional Step: Figure 1**

   Remove the Extension Driver from the Tibial Baseplate.

2. Assemble the second Extension Driver Shaft to the Torque Wrench. Insert the Tibial Baseplate and Stem Extension into the Counter Torque Instrument by sliding the stem extension into the Tibial Baseplate side of the Counter Torque Instrument. **| Optional Step: Figure 2.**

3. Ensure the Tibial Baseplate keel is aligned with the slots in the Counter Torque Wrench and that the Tibial Baseplate is fully seated against the surface. **| Optional Step: Figure 3**

4. Insert the assembled Torque Wrench and Extension Driver shaft into the chamber until it engages with the head of the screw. Turn until the Torque Wrench clicks (8 Nm) indicating that the tightening torque has been reached **| Optional Step: Figure 4**

5. Remove the Torque Wrench from the Tibial Baseplate and the Tibial Baseplate assembly from the Counter Torque Instrument.

   Note: If using Tibial Augments, see "Block Augments (Optional) on page 23.

Optional Step: Figure 1

Optional Step: Figure 2

Optional Step: Figure 3

Optional Step: Figure 4

Surgical technique steps

Cement Preparation

Begin cement mixing process. Clean the femoral and tibial canals using pulsating lavage, and then dry with a sponge or other type of drying mechanism. An optional cement restrictor can be placed into the canal. Inject cement into the canal in a pressurized retrograde fashion.

Component insertion

Femoral component

1. Place the resurfacing femur Stem Extension into the femoral canal. Guide and impact the Resurfacing Femur into the canal with the Femoral Impactor until the implant is fully seated at the resected plane. | Figure 23

2. Remove excess cement. Proper positionof the implant should be maintained until the cement cures.

Tibial component

1. Place the Tibial Baseplate and Tibial Poly Spacer into the canal using the Tibial Impactor shown in Figure 24. Care should be taken to anchor the final components in the appropriateposition until the cement has fully set.

Caution: If a Stem Extension is not used, ensure that the Tibial Baseplate Poly Plug or Modular Tibial Base Stem Cap is firmly in place prior to insertion.

Figure 23

Figure 24

Surgical technique steps

Tibial hinge assembly

1. Insert the tibial portion of the hinge assembly into the tibia. | Figure 25
2. Align the Resurfacing Femur with the Tibial Hinge Component. | Figure 26
3. Insert the Resurfacing Femur Axial Pin using the Axial Pin Inserter/Extractor. The Resurfacing Axial Pin size should match the size of the Femoral Resurfacing component chosen. | Figures 27–30
4. The Resurfacing Femur Axial Pin can be inserted either on the medial or lateral side. The Axial Pin key must fall into the corresponding keyway in the femoral component. Make sure the Axial Pin is flush with the side of the Resurfacing Femur. | Figure 30

Note: To help align the components, the Trial Axial Pin can be inserted part way into the opposite side of the final Resurfacing Axial Pin insertion. Then insert the Axial Pin into the other end and advance the pin forward, ejecting the Trial Axial Pin. Engage the Axial Pin until it is flush on both sides of the Resurfacing Femur.

Figure 25

Figure 26

Surgical technique steps

Figure 27

Figure 28

Figure 29

Figure 30

Surgical technique steps

Optional Step

Block augments

1. During the tibial resection step of the surgical technique, if Block Augments are necessary, begin by making a proximal "clean-up" resection along the most prominent condyle through the 0mm resection slot marked "STD" in the Revision Block Augment Resection Guide A shown in Figure 31.

Note: The Revision Block Augment Resection Guide is available in a right- and left-hand version.

2. If block augmentation is needed, the Revision Block Augment Resection Guide provides resection slots for the 5mm, 10mm, and 15mm Augments. B shown in Figure 31.

3. These augments can be placed independently on the medial or lateral side of the tibia.

4. During tibial baseplate preparation, if an augment is to be used, attach the appropriate size Block Augment to the Trial Tibial Baseplate Template and proceed with tibial preparation, as specified above. | Figures 32–33

5. Using the packaged screws, assemble the Augments through the Tibial Baseplate. Plastic starter handles are provided with each augment screw and should be removed once the screw is tightened as shown in Figure 34. A final tightening of the augment should be completed with a standard 3.5mm hex head screwdriver.

Figure 31

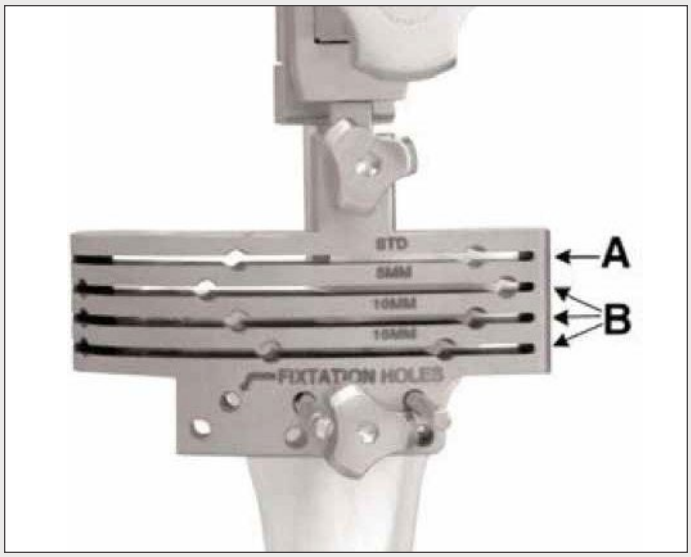


Figure 32

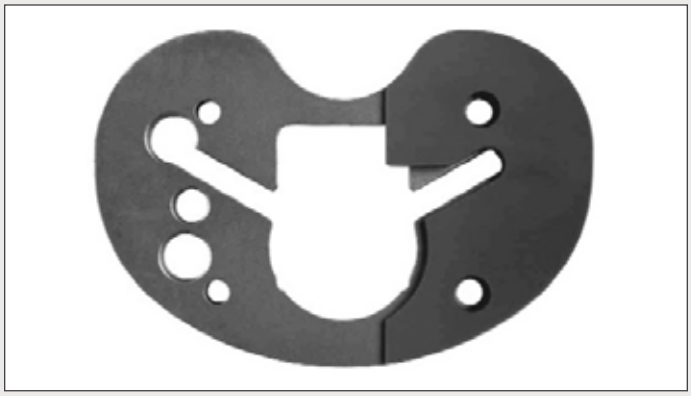


Figure 33

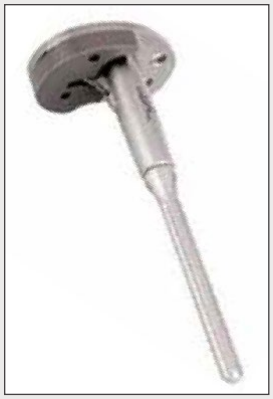


Figure 34

Surgical technique steps

Optional Step

Patella reconstruction

Patella resurfacing is determined based on medical judgment of the clinical situation. If severe degeneration or arthritis is present on the articular surface of the patella, resurfacing may be indicated. If the patella is otherwise normal, it may be acceptable to resurface the patella or to leave it in its natural state.

Resurfacing patella

1. The Resurfacing Patella Resection Guide can be used with or without Resurfacing Patella Resection Depth Gauges or Resurfacing Patella Minimum Thickness Gauges shown in Figure 35. When used without gauges, the Resurfacing Patella Resection Guide is positioned at the desired level of resection.

2. Securely clamp the jaws into the patella and resect the patellar bone. For a calibrated resection, the appropriate Resection Depth Gauge corresponding to the implant diameter should be attached to the top of the Resection Guide with the lock screw. Position the Resection Guide jaws parallel to the articular margin and securely clamp the guide to the bone, assuring that the gauge is contacting the apex of the articular surface. The gauge can be removed to increase visibility.

Figure 35

Resurfacing Patella Minimum Thickness Gauges are available for preservation of 10mm or 15mm bone stock. Use of the Minimum Thickness Gauge is based on intraoperative assessment of bone quality and thickness. | Table 5

Table 5.

Resurfacing Patella, All-Poly, Tri-Peg			
Part #	Description	Diameter	Thickness
KPONTP29E	ELEOS™ Resurfacing Patella	29mm	8mm
KPONTP32E	ELEOS Resurfacing Patella	32mm	8mm
KPONTP35E	ELEOS Resurfacing Patella	35mm	8mm
KPONTP38E	ELEOS Resurfacing Patella	38mm	10mm
KPONTP41E	ELEOS Resurfacing Patella	41mm	11mm

Surgical technique steps

Optional Step

Patella reconstruction

Resurfacing patella (cont.)

3. The Resurfacing Patella Peg Drill Guide is used to size the patella and prepare holes in the bone for the implant pegs. Attach the Resurfacing Patella Drill Guide to the Patella Clamp. The Drill Guide has grooves on their surfaces indicating the patella diameter options. The Resurfacing Patella Peg Drill is used to prepare the peg holes. | Figure 36

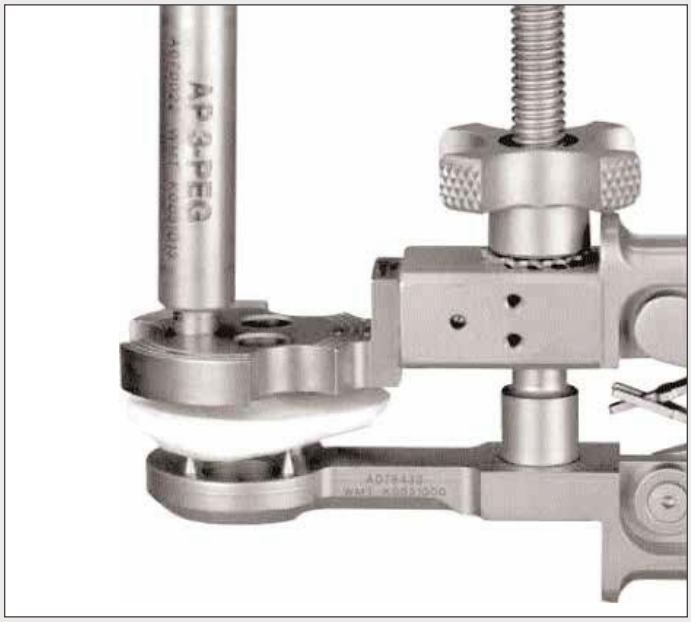
Note: The Resurfacing Patella has the same peg patterns between sizes and can be easily changed during trial reduction.

Note: A Patella/Femoral Head Sizing Caliper is available for assessment of thickness.

4. Remove the Resurfacing Patella Drill Guide from the Patella Clamp and insert the Patella Clamp Seater in its place.

5. Once the patella surface is prepared, mix cement, wash and dry the bone, pressurize the cement, and insert the patella pegs into the prepared holes. Use the Patella Clamp with the Patella Clamp Seater attached to fully seat the patella. Remove residual cement and keep the Patella Clamp in place until cement is cured.

Figure 36



Component disassembly

To disengage the ELEOS™ tapers, insert the Taper Disassembly Tool into the hole on the side of the implant. Strike the end of the tool with a mallet until the components separate as shown in Figures 37 and 38. Support the implant during disassembly.

Alternatively, or in concert with disassembly tools, insert the Taper Disassembly Fork around the outside of the implant, below the seam between the two components to be disassembled. Strike the end of the fork to disengage the tapers as shown in Figures 39 and 40. Again, support the implant during disassembly.

Figure 37

Figure 38

Figure 39

Figure 40

Explantation information

In a revision case, when stem explantation is required, use the Stem Extractor Attachment to attach to the Slap Hammer Extractor Handle to remove the stem. To disengage Stem Extensions, use the Stem Implant Extractor-Adaptor. Assemble it to the Slap Hammer Pin Extractor. Next, thread the full assembly to the Stem Extension that needs to be removed. A trephine from general surgical instrumentation can also be used to remove the stem by placing the trephine over the stem to ream the interface between the stem and the bone.

Contact us to learn more:
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The ELEOS™ Limb Salvage System is compatible with the following MicroPort Orthopedics systems trademarked by MicroPort: Guardian, Advance, Gladiator, Lineage, and Transcend.

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