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JOINT
ORTHOPEDICS

KLASSIC[®] REVISION KNEE SYSTEM
SURGICAL TECHNIQUE MANUAL

EVOLUTION OF STABILITY[®]

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This surgical technique provides direction for the Klassic® Knee System for PS-Post® and Revision components.

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Jason M. Jennings, MD, DPT *Denver, Colorado*
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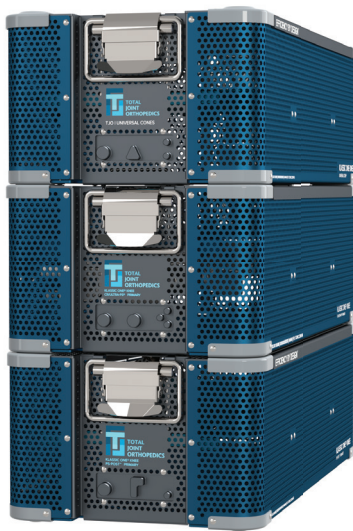
Jason M. Hurst, MD *New Albany, Ohio*
Jason M. Jennings, MD, DPT *Denver, Colorado*
Michael J. Morris, MD *New Albany, Ohio*
Michael P. Morwood, MD *Portsmouth, New Hampshire*
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MISSION-DRIVEN®

Built on the demand for excellent patient care and on the coattails of a humanitarian endeavor (one of our founders, Dr. Lawrence Dorr, established Operation Walk), our cornerstone is giving back by supporting organizations such as Operation Walk. From minimizing packaging to take up less shelf space, to facilitating seamless surgeries, we apply ingenuity to all levels of our products for everyone who interacts with them. We strive for each surgeon to achieve the same post-operative result whether performing 50 surgeries per year or 500.



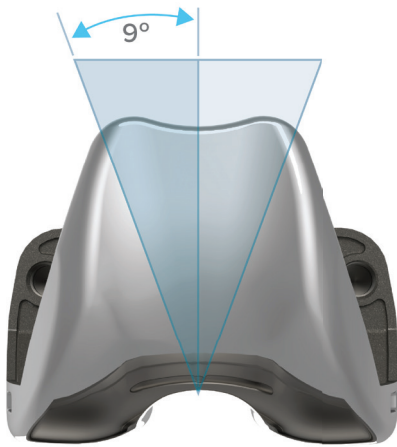
Operation Walk founder Lawrence Dorr, MD with a patient



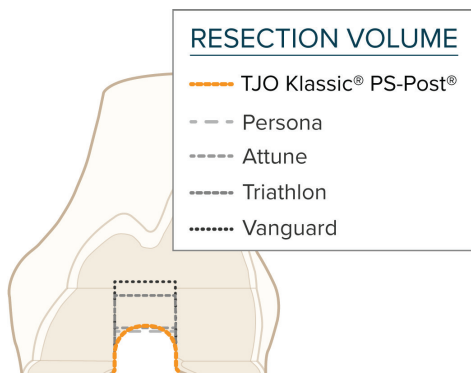
Complete revision TKA in 3 trays



Scan or visit tjoinc.com to calculate your potential cost savings



A 9° double Q-angle optimizes patellar tracking on both left and right anatomy (shown on the Klassic® PS-Post® Femur)^{6,7}



The low volume anatomical resection of the Klassic® PS-Post® is an industry-leading design for bone conservation⁹

EFFICIENCY BY DESIGN®

Designed from the ground up for efficiency, the Klassic® Revision Knee System is carefully designed for precise, intuitive surgical flow allowing for a complete revision knee solution with every bearing option in three trays without the need for patient-specific customization, templating, pre-operative imaging, or disposables.

Our Evolution of Stability® simplifies knee replacement surgeries by streamlining instruments and inventory needs and offering workflow customization without changing a surgeon's preferred technique.

A surgeon may prepare a cruciate-retaining primary knee through a revision with stems, augments, and cones using only three trays of instruments.

Reducing the number of trays required for each surgery reduces OR time and sterilization costs, helps reduce the incidence of infection, and optimizes efficiency and ergonomics. Using the Klassic® Revision Knee System could save up to \$1,350 per case (compared to a typical eight tray implant system).¹⁻⁴ More importantly, in the OR, this simplicity enables the surgeon to focus less on the back table and more on patient care.

KLASSIC® REVISION KNEE SYSTEM

The Klassic® Knee is a modern universal knee design that restores bony anatomy, reproduces near-normal kinematics, and provides rotational stability throughout range of motion.⁵ Earlier universal knee designs failed to keep up with the advances of multi-radius J-Curves and trochlear designs. The patented⁶ **Klassic® PS-Post® Femur** addresses these issues and features a unique deepened trochlear groove that allows optimal patellar tracking along a 9° double Q-angle for both left and right anatomy while retaining a neutral profile of the anterior flange.⁷ Features include anatomically tapered posterior condyles, a proportional AP/ML ratio, and an optimized bone-covering geometry that minimizes potential lateral overhang.

The Klassic® PS-Post® Femur offers a bone-conserving option for primary PS cases while providing the modularity needed for complex revisions. It offers a post-and-cam mechanism to ensure femoral rollback during high flexion while the articular surface of the insert provides stability through the entire range of motion.⁸ Currently, the Klassic® PS-Post® Femur is only available for use with cement.

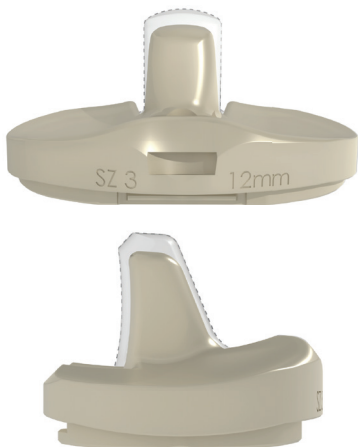
The low-profile box cut is prepared with an industry-leading anatomical resection to conserve bone and eliminate stress risers while supporting a 14mm minimum jump height.⁹



The Klassic® Revision Knee System



Universal® Cone taper angle on sizes 1, 4, and 7



Overlay comparison of Klassic® PS-Post® and Klassic® PS-Max® Inserts

The Klassic® PS-Post® Femur is compatible with both the Klassic® PS-Post® Insert and the Klassic® PS-Max® Insert for maximum varus/valgus stability without removing additional bone. This transition to additional constraint requires no modification to the femoral preparation or implants. All bone cuts and peg locations are shared between primary and revision femoral implants, and the PS-Post® and PS-Max® Inserts are compatible with both the Klassic® Tibial Baseplate and Klassic® Revision Tibial Baseplate. Implant choice may be made intraoperatively without requiring alternative instruments.

The Klassic® PS-Post® Femur offers Modular Pegs to provide additional rotational stability as well as Femoral Augments, Stems, and Universal® Cones to address bone loss and provide a multitude of options for the complex revision.

The **Klassic® Femoral Augments** are available for the distal or posterior condyles in five and ten millimeter thicknesses.

The **Klassic® Cemented Stems** are compatible with both the Klassic® PS-Post® Femur and the Klassic® Revision Baseplate and are available with a 14mm diameter (lengths: 50, 70, and 120mm) and 12mm diameter (lengths: 70 and 120mm). A Femoral Stem Adapter is used with the Klassic® PS-Post® Femur to provide 5° of valgus for right and left femurs.

The patent-pending¹⁰ **Universal® Cone System** is a bone-conserving solution that provides stable metaphyseal fixation in both the femur and tibia. Anatomically tapered cones feature a variety of angles to better match lost bone during a revision without excess resection. The ream-only instrumentation increases the efficiency of the system by simplifying the workflow and accurately preparing the bone.

The **Klassic® PS-Post® Insert** was designed to provide smooth articulation across the range of sizes. The PS-Post® achieves a low-velocity interaction between the post-and-cam in deep flexion by optimizing the femur and insert conformity. During roll-back, cam engagement is low on the post to reduce cyclic stress on the contact areas and to increase jump height during high flexion. The enhanced congruity of the anterior condyles offers outstanding mid-flexion stability until the post-and-cam engagement initiates rollback.¹¹

The **Klassic® PS-Max® Insert** requires no additional preparation and offers the same low velocity interaction in deep flexion. The more substantial post provides increased varus/valgus stability ($\pm 1.6^\circ$) while maintaining the kinematics of the primary PS-Post®.



The Klassic® Tibial Baseplate has a 4° sweptback keel and is stemmable to 150mm. Augments may be cemented on.



The Klassic® Revision Tibial Baseplate is 2mm thicker and has a lower profile keel than the Klassic® Tibial Baseplate. Augments are attached via screws.

Klassic® Tibial Inserts are matched one-to-one with their corresponding tibial baseplate sizes to maximize articular congruency, enhance mid-flexion stability and allow for compatibility with femoral components one size larger or smaller. The posterior lip for all Klassic® Tibial Inserts is relieved to minimize impingement and maximize flexion.

The Klassic® Tibial Insert's locking mechanism incorporates a Tibial Set Screw along with an anterior snap and M/L constraints. The smooth proximal surface and the aggressive locking mechanism of the Klassic® Tibial Baseplate combine to minimize polyethylene wear.^{12,13} The Insert features an anti-backout mechanism to ensure retention of the Screw.

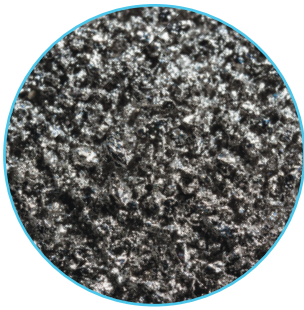
The titanium **Klassic® Tibial Baseplate** is designed to optimally cover the tibial plateau using a universal geometry. The M/L edges of the Tibial Baseplate and Inserts have matching conforming geometry to provide consistent polyethylene thickness all the way to the peripheral edges.¹⁴⁻¹⁶

The Tibial Baseplate offers a central stemmable keel and four peripheral pegs for mechanical fixation and rotational stability.^{17,18} The keel is angled posteriorly 4° to allow for slope-matching in primary cases. Klassic® Tibial Stem Extensions are available to provide additional stability in primary or revision cases, or for heavier patients.^{19,20}

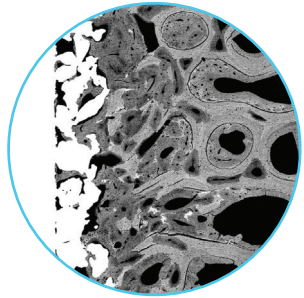
The titanium **Klassic® Revision Tibial Baseplate** offers the same universal geometry sizing, Tibial Insert locking mechanism, and tibial plateau coverage as the Primary Klassic® Tibial Baseplate. The Klassic® Revision Baseplate also offers a shorter and perpendicular keel for optimal Universal® Cone compatibility, a 2mm thicker metal platform to accommodate bone loss, and threaded distal holes for Klassic® Tibial Augment fixation. The Klassic® Revision Tibial Baseplate is compatible with the Klassic® Cemented Stems.

The **Klassic® Tibial Augments** have shared sizing with the Klassic® Tibial Baseplates to reduce instrumentation. They are cemented onto the Klassic® Tibial Baseplate, screw onto the Klassic® Revision Tibial Baseplate, and are available in 5 and 10mm thicknesses.

The geometrically-forgiving **Klassic® Sombrero** and **Klassic® Domed Patellae** optimize patellofemoral contact area during tracking. Pegs are uniformly placed to provide intraoperative flexibility between sizes.



Ti-coat® ultraporous coating



Magnification of bony ingrowth on Ti-Coat®. Ti-Coat® features a mean porosity of 60% for proven bony ingrowth.



E-Link® Polyethylene

FIXATION

The backside of the Klassic® PS-Post® Femur and Klassic® Tibia have recessed, grit-blasted pockets to improve implant cement fixation.^{21,22}

The Universal® Cone utilizes Ti-Coat®, an ultra-porous commercially pure titanium coating comprised of hand-applied asymmetrical grains with demonstrated bony ingrowth.²³

The internal surface of the Universal® Cones offers a grit-blasted surface with machined steps to optimize cement mantle adherence.²⁴ The Universal® Cone has a line-to-line fit with ream-only instrumentation system.

MATERIALS

E-Link® Poly is a Vitamin E stabilized highly cross-linked ultra high molecular weight polyethylene (UHMWPE). Vitamin E is blended into the GUR 1020 UHMWPE in powder form, compression molded, and cross-linked by Gamma radiation to 10MRads. E-Link® Poly utilizes Vitamin E to quench free radicals generated during the cross-linking process, yielding oxidative stability.²⁴

A never-irradiated, compression-molded **standard polyethylene** is also available in some products. Similar polyethylenes have been shown to resist oxidation throughout long use.²⁵

The PS-Post® Insert is available only in E-Link® Poly. This material provides excellent articular wear resistance with appropriate toughness to support the high loads transmitted through the post and cam.²⁶

The PS-Max® Insert is available only in standard polyethylene. Virgin polyethylene has the highest toughness and durability compared to polyethylene that undergoes radiation crosslinking, making it a better material for the demands of a maximally stabilized implant.²⁷ The PS-Max® post has been shown to retain constraint after high-cycle, high load fatigue loading simulating varus/valgus, and internal/external torques experienced by the knee.²⁸

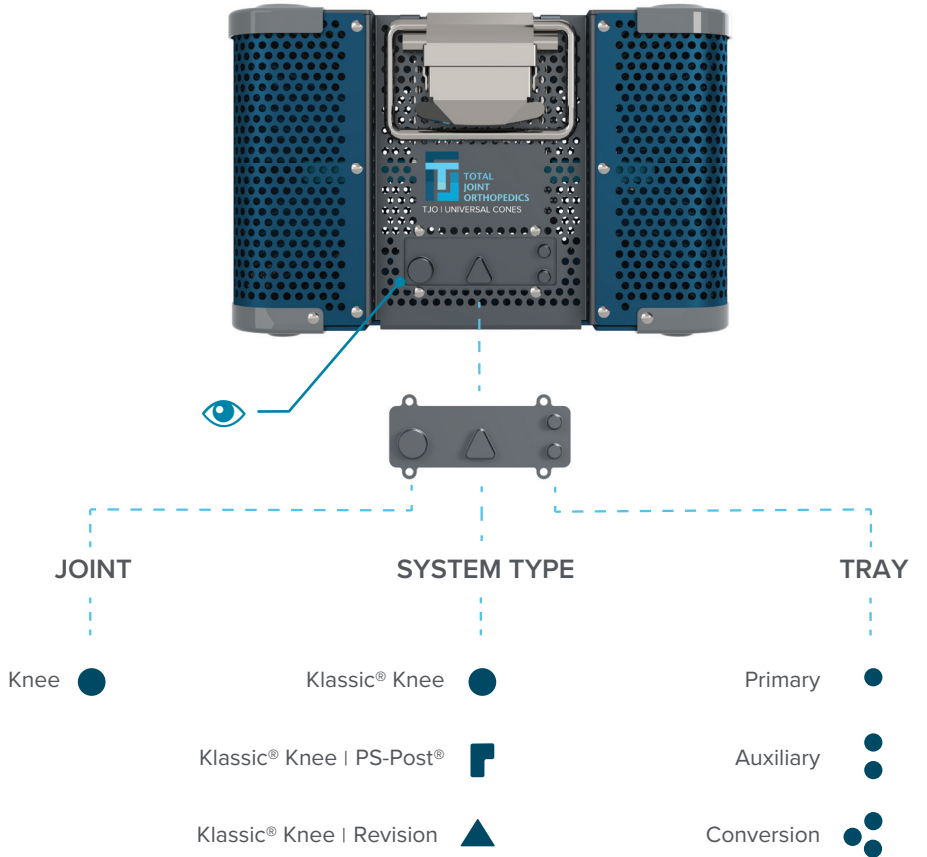
All of TJO's polyethylene products are **ethylene-oxide (EtO) sterilized** to minimize oxidative potential.

PHYSICAL INDICATORS

The innovation for the Klassik ONE® Revision instrumentation includes a complete overhaul of functionality, aesthetics, and ergonomics. The resulting instruments are light weight and intuitive, allowing for only three total trays for a revision.

Physical Indicators

TJO has developed a proprietary physical indicator system for tray identification through touch. The purpose of the system is to allow tray identification through the sterile wrapping to reduce the incidence of confusion for mis-labeled or unlabeled sterile sets.



TRAY CONFIGURATIONS

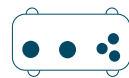
KLASSIK® KNEE



Klassik ONE® Knee
CR/Ultra-PS® Primary



Klassik ONE® Knee
CR/Ultra-PS® | Auxiliary



Klassik ONE® Knee
CR/Ultra-PS® | Conversion

KLASSIK® KNEE | PS-POST®



Klassik ONE® Knee
PS-Post® | Primary



Klassik ONE® Knee
PS-Post® | Auxiliary

KLASSIK® REVISION KNEE



Klassik ONE® Knee
PS-Max® | Stems + Augments



Universal® Cone System |
Revision Baseplate

The Klassic® Revision Knee instrumentation uses 3.2mm pins throughout the surgical technique to provide consistent instrument performance. Disposable Pin Packs are available depending on surgeon preference. Though any type of 3.2mm pin may be used with this system, the technique described in this manual primarily uses a combination of headed Guide Screws and non-headed Pins.

Guide Screws

Guide screws are used whenever a surgeon would like to tighten an instrument down against the bone. They have a low profile head which makes them easier to work around while in place. These may be used throughout trialing to secure the Tibial Baseplate Sizer/Trial and the PS-Post® Femur Trial and require the use of the Hex Head Driver for installation and removal.

Pins

Non-headed pins such as the Short or Long Smooth Pins are used when the surgeon may reposition the instrument by sliding it off of the pins. For example, the Universal Cut Block can be repositioned by removing it and replacing it over the Pins at a different resection level. Smooth Pins are inserted by hand into a pre-drilled hole and are removed with the Pin Puller.

Additional pin types to accommodate a variety of work flows are available by request.

PIN GUIDE

STERILE DRILL & PIN SET | SMOOTH 2703.00.000



3.2mm Twist Drill (x1)



Long Smooth Pin (x2)



Short Smooth Pin (x4)

STERILE DRILL & PIN SET | SHARP 2704.00.000



3.2mm Twist Drill (x1)



Long Smooth Pin (x2)



Short Sharp Pin (x4)

STERILE DRILL & PIN SET | SCREW 2705.00.000



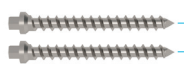
3.2mm Twist Drill (x1)



Long Smooth Pin (x2)



Short Smooth Pin (x2)



Guide Screw, Hex Head, 33mm (x2)

For use with



Hex Head Driver 2007.00.000

MISCELLANEOUS



Guide Screw, Hex Head, 33mm (x2)

For use with



Hex Head Driver 2007.00.000



Guide Screw, Hex Head, 50mm (x2)



Fluted Pin, Square Head, 89mm (x4)

For use with



Square Pin Driver 2008.00.000



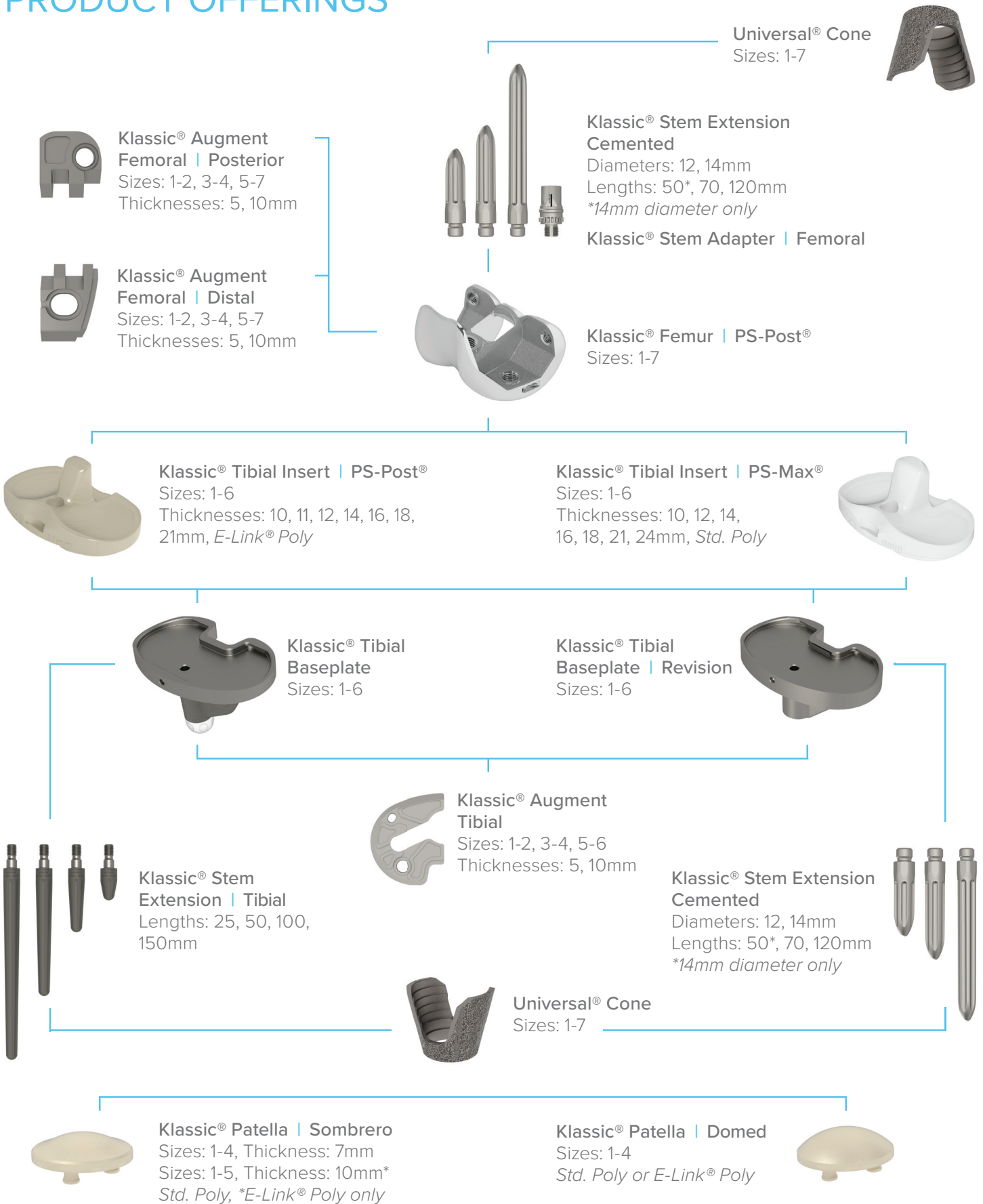
Guide Pin, Triangle Head, 76mm (x2)

For use with



Triangle Driver 2013.00.000

KLASSIC® REVISION KNEE SYSTEM PRODUCT OFFERINGS



SURGICAL STEPS | REVISION



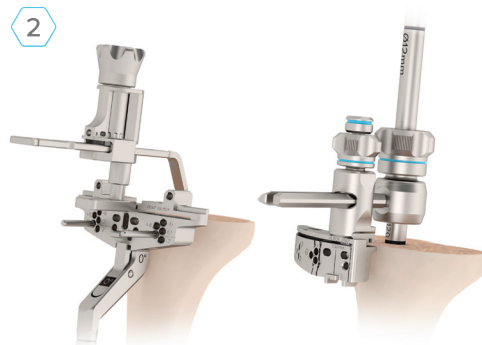
Scan for
Cemented Stem
Workflow Video

1



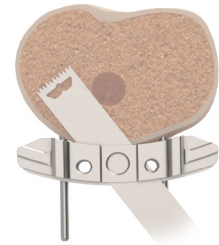
Ream the IM canal to the proper depth for the desired Stem and Cone.

2



Use the Extramedullary (left) or Intramedullary (right) Tibial Alignment Guide and the Adjustable Stylus to set desired resection. Pin the Cut Block in place, and remove alignment jigs.

3



Resect the proximal tibia.

4



Use the IM Reamer (left) or the Cone Reamer Guide (right) to reference the IM canal and ream to the desired Cone size.

5



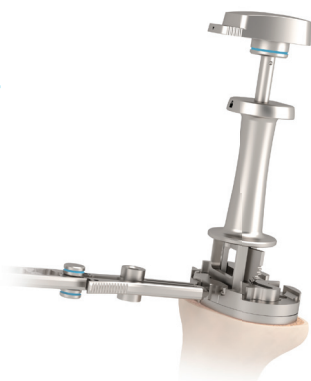
Impact the Cone Trial into the prepared bone. Remove before tibial preparation.

6



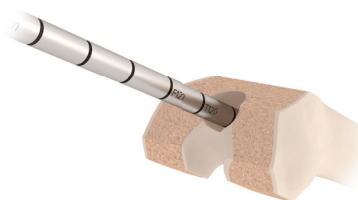
Size the tibia, assemble the Baseplate Trial with Augments and Stem.

7



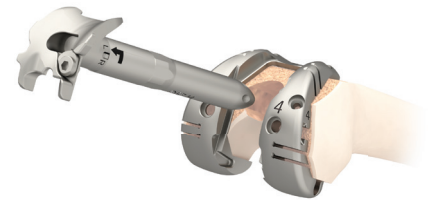
Verify tibial alignment and prepare for the keel with the Revision Modular Tibial Broach and Broach Impactor.

8



Ream the IM canal to the proper depth for the desired Stem and Cone.

9



Attach the Femur Trial/Stem Trial Adapter and the Stem Trial to the PS-Post® Femoral Trial and assess fit and positioning.

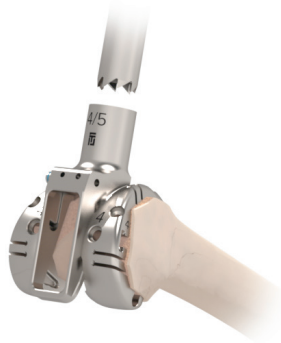
SURGICAL STEPS | REVISION

10



Secure the Femoral Trial in place. If preparing Augments, make the appropriate cuts through the Trial slots.

11



Remove the Femur Trial/Stem Trial Adapter and Stem Trial and attach the PS-Post® Reamer Guide. Prepare the box using the PS-Post® Box Reamer. Leaving the Guide in place, clean up the edges with the saw blade.

12



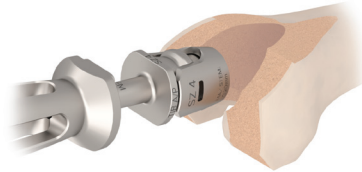
Slide the Femoral Stem Adapter Reamer Guide onto the PS-Post® Femoral Trial and bottom out the Femoral Stem Adapter Reamer. *Not needed if using Universal® Cones.*

13



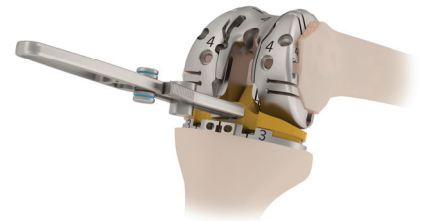
Use the Cone Reamer Guide (top) or the IM Reamer (bottom) to reference the IM canal and ream to the desired Cone size.

14



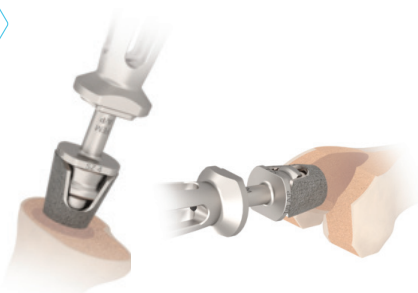
Impact the Cone Trial into the prepared bone.

15



Assemble the Box Trial and Femur Trial. Insert all Trials including the Stems and Augments, check range of motion, and make adjustments to soft tissue as needed. Remove the Trials.

16



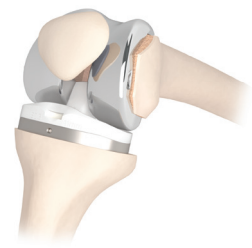
Implant the desired Cone(s). Assemble Baseplate and Femur constructs and apply cement. Implant Revision Constructs.

17



Engage the Tibial Insert locking mechanism. Use the Screwdriver to engage the Tibial Set Screw until it bottoms out. Do not apply excessive force.

18



Verify range of motion, irrigate, and close the wound.

PREOPERATIVE PLANNING

Obtain full-length standing anteroposterior and lateral radiographs to assess alignment, component positioning, and bone stock. The entire femur should be visualized to rule out any structural abnormality as the distal femoral cut will be referenced from an Intramedullary Rod in the medullary canal.

Templating for size is most accurate on the lateral radiograph since many patients present with a flexion contracture that distorts magnification on the anteroposterior radiograph.

1. EXPOSING THE JOINT

Expose the knee joint with the surgeon's preferred method. It is essential that the exposure allow safe visualization and access for the instrumentation and implant removal. After completing the arthrotomy, flex the knee. Remove existing primary implants using preferred method and prepare the joint space for revision.

Surgical Pearl: If revising a Klassic® Knee, to disengage the locking mechanism on the Tibial Insert, remove the Set Screw using the 3.5mm Hex Screwdriver (standard large frag) and place a .50in osteotome in the anterior aspect of the polyethylene (after the bone cement has cured) and lift upward on the polyethylene to release the Baseplate locking mechanism without damaging the Baseplate itself.

2. PREPARING THE PROXIMAL TIBIA

Cutting the proximal tibia first allows the removal of remaining cement mantle (if any), reducing the majority of the work to remove the cement and creating a flat surface with which to work.

The proximal tibial resection should produce a recut resection surface that:

1. Is perpendicular to the mechanical axis of the tibia in neutral varus/valgus
2. Has the appropriate posterior slope
3. Provides a stable surface to build on

The Klassic® Tibial Baseplate has a 4° keel and the Klassic® Revision Tibial Baseplate has a 0° keel. The PS-Post® and PS-Max® Inserts are designed to be implanted at 0-3° slope.

The proximal tibial resection can be made with either an Extramedullary or Intramedullary guide.

EXTRAMEDULLARY RESECTION

To assemble the extramedullary Tibial Alignment Guide, stand the base of the Lower Tower on the table and tighten the varus/valgus and slope adjustment knobs to lock the Tower portion upright. Insert the Upper Tower into the Lower Tower. Attach the Universal Cut Block to the top of the Upper Tower using the quick connect button such that the elevated pin holes (frog eyes) are up and the curve matches the anterior portion of the proximal tibia (Fig. 1). Alternatively, low profile left and right Tibial Cut Blocks are available.

 *The Tibial Alignment Guide features a quick connect button for easy assembly/disassembly.*

After adjusting the Tibial Alignment guide to the approximate tibial length, place the ankle cradle in a neutral position placed against the length of the tibia. Attach the ankle strap (Fig. 2). Set the rotational alignment by using the tibial tubercle as a guide.

If desired, stabilize rotational alignment by inserting a pin through the central vertical slot in the Universal Cut Block. This will maintain rotational stability while allowing slope and varus/valgus adjustments to be made prior to the final pinning.

Insert the Adjustable Stylus into the cut slot of the Universal Cut Block. The displacement between the resection plane of the cut slot and the tip of the stylus may be adjusted with the knob on the Adjustable Stylus. Once the desired resection is indicated, lock the height adjustment knob of the Tibial Alignment Guide (Fig. 3).

The large knob at the base of the Tibial Alignment Guide allows the slope and varus/valgus to be adjusted based on surgeon preference.

Check varus/valgus alignment by aligning the Tibial Alignment Guide with the tibial tubercle and using the center of the ankle as a reference. The Tower is available in 0, 3, and 6° of slope to allow for flexibility in positioning.

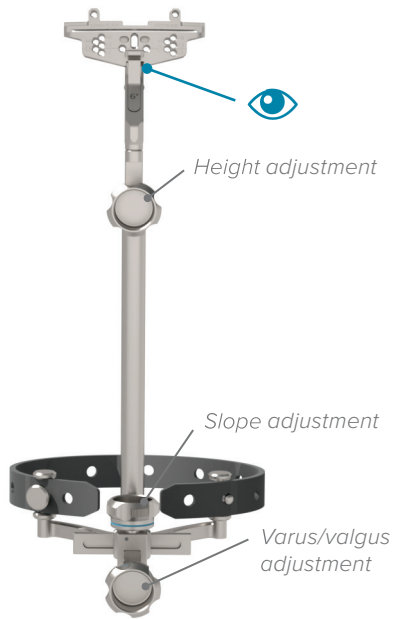


Fig. 1: Assemble the Tibial Alignment Guide

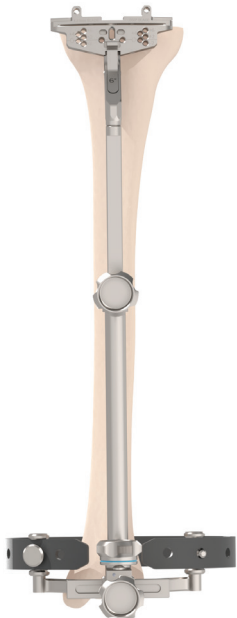


Fig. 2: Place the assembled Tibial Cut Guide on the tibia

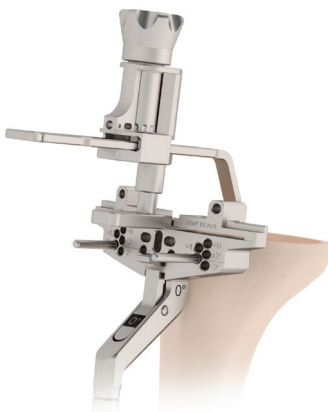


Fig. 3: Use the Adjustable Stylus to set desired resection depth



Fig. 4: Stabilize the Universal Cut Block with pins, then remove the Adjustable Stylus and the Tibial Alignment Guide, if desired

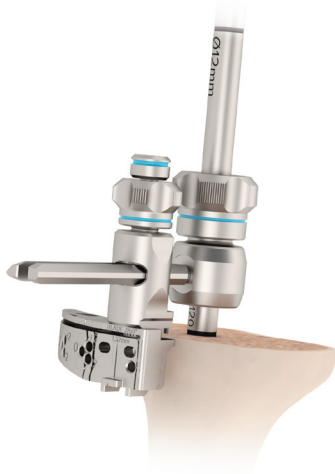


Fig. 5: Slide the Tibial Resection Tower over the rails of the Intramedullary Guide Adapter

Adjust the guide as needed using the large knob at the base. Stabilize the Universal Cut Block with two pins through the [0] holes (Fig. 4). Use a Kocher clamp on one of the pins to secure the Universal Cut Block in place.

Note: The Tibial Alignment Guide may remain in place for the proximal tibial cut; it does not need to be removed prior to making the cut. The Tibial Alignment Guide may be removed after the Cut Block is secured.

INTRAMEDULLARY RESECTION

The Intramedullary Reamer can be referenced to guide the proximal tibial cut. Connect a 10mm Intramedullary Reamer to power and ream to the desired depth. If a cone will be used, a depth of at least 175mm (F120 mark) will be required post tibial resection.

**Ensure the power handpiece is set to [Ream], not [Drill].
The Reamer should be spinning prior to engagement with the bone to help prevent fracture.**

Place the Intramedullary Guide Adapter over the Intramedullary Reamer with the large knob pointing up. Attach the Universal Cut Block or low profile Left or Right Cut Block to the Tibial Resection Tower using the quick connect button. Slide the Tibial Resection Tower over the rails of the Intramedullary Guide Adapter until the cut block is at the desired offset from the bone (Fig. 5). Tighten the knob on the top of the Tibial Resection Tower. This assembly will set a 0° resection perpendicular to the axis of the Intramedullary Reamer.

Insert the Adjustable Stylus into the cut slot of the Cut Block. The displacement between the resection plane of the cut slot and the tip of the stylus may be adjusted with the knob on the Adjustable Stylus. Once the desired resection is indicated, lock the Intramedullary Guide Adapter to the Intramedullary Reamer using the large knob at the top of the Adapter.

Stabilize the Cut Block with two pins through the [0] holes (Fig. 4). Use a Kocher clamp on one of the pins to secure the Cut Block in place.

If desired, use the Modular Alignment Handle and the Alignment Rod to verify the alignment. The tip of the Alignment Rod should fall 1-2cm lateral of the center of the ankle for a 2° varus cut, or to the center of the ankle for a perpendicular cut (Fig. 6).

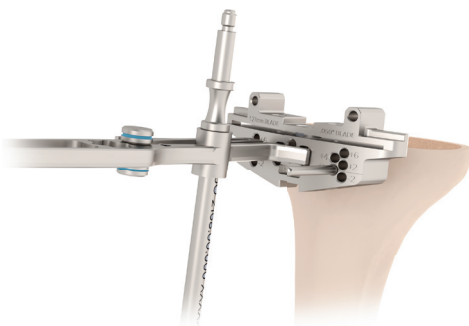


Fig. 6: Check varus/valgus alignment with the Alignment Rod dropped through the Modular Alignment Handle

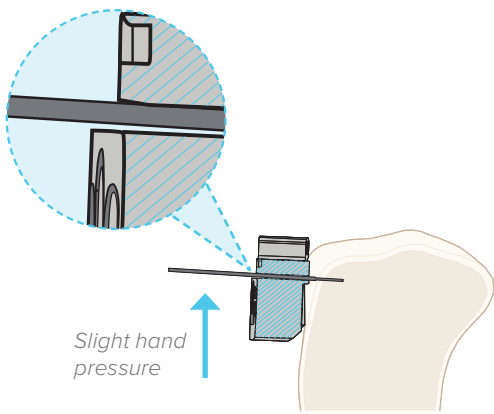


Fig. 7: Use the saw capture as a guide to ensure an accurate cut by keeping the spring of the blade toward the bone

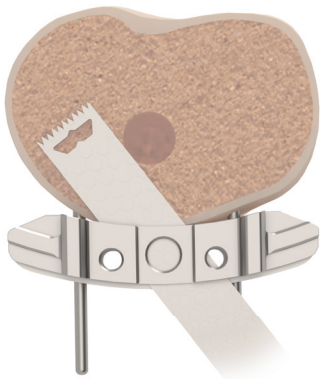


Fig. 8: Cut the proximal tibia



Fig. 9: Ream IM canal to a depth of 175mm (F120 mark)

Surgical Pearl: Saw captures are an integral part of accurate cutting technique. The tolerance of the saw capture using the appropriate 1.27mm (.050" blade), with slight hand pressure toward the cut surface, will ensure accurate cuts (Fig. 7). Too much pressure may bind the blade and potentially tilt the block, creating inaccurate cuts.

Saw blade temperatures may exceed 200°C; thermal necrosis occurs at 55°C.²⁹ Irrigating the saw blade with saline when making cuts will help ensure the freshly cut bone remains viable.³⁰

Additional proximal tibial resections may be made by shifting the Cut Block in 2mm increments if the initial resection is deemed inadequate. The varus/valgus angle of the cut may be adjusted by using the 2.5° Varus/Valgus Cut Block, which uses the same pin pattern as the Universal Cut Block.

Using a 1" wide, 1.27mm (.050") thick saw blade, cut the proximal tibia through the slot of the Universal Cut Block (Fig. 8).

Remove the Cut Block and remove the pins using the Pin Puller.

Remove the central core of cement in the metaphysis (if present), using the IM Drill and osteotomes to loosen if necessary.

Surgical Pearl: If preparing for a Universal® Cone, removing cement will facilitate the reaming process.

3. PREPARING THE TIBIA FOR A UNIVERSAL® CONE

If not using Universal® Cones on the tibia, proceed to section 4.

The Universal® Cone preparation is guided by the Stem placement and reamers. Connect the desired diameter of the Intramedullary Reamer to power and ream to a depth of at least 175mm (F120 mark) so that the Universal® Cone Reamer Assembly will not interfere with the cutting flutes of the Intramedullary Reamer (Fig. 9).

Ensure the power handpiece is set to [Ream], not [Drill]. The Reamer should be spinning prior to engagement with the bone to help prevent fracture.

Evaluate the tibial defect and place an inverted Universal® Cone Trial over the defect to determine the approximate Universal® Cone size. Select the corresponding Universal® Cone Reamer, Basket based on the approximate Cone size.

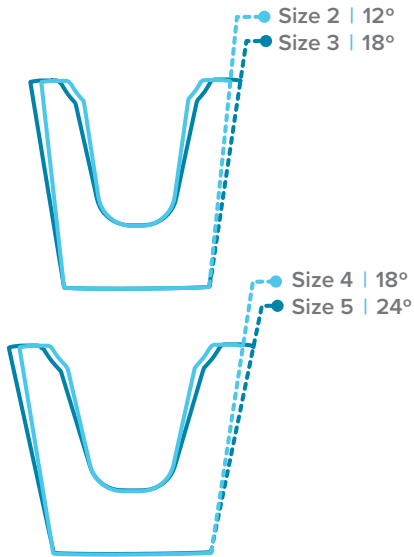


Fig. 10: Taper angle changes between sizes 2-3 and 4-5



Fig. 11: Option 1 - Guided Reamer assembly



Fig. 12: Option 2 - IM Reamer assembly

UNIVERSAL® CONE SIZING

Size	Taper Angle (°)	Height (mm)	Defect Diameter (mm)	Max Stem Diameter (mm)
1	12	32.5	28	16
2	12	32.5	30	18
3	18	32.5	33	18
4	18	32.5	35	20
5	24	32.5	39	20
6	24	32.5	41	22
7	24	32.5	43	24

Due to the change in taper angles per size, the appropriate Reamer must be used corresponding to the desired Cone size to ensure adequate bone contact (Fig. 10). Reaming with the correct size reamer ensures consistent press fit and complete bone contact with ingrowth surfaces.

All Universal® Cone sizes are compatible with all Klasic® Tibial Baseplates.

Surgical Pearl: Place the Tibial Baseplate Trial on the cut surface of the proximal tibia to visualize Cone placement prior to reaming.

There are two options when reaming for the Universal® Cone:

Ream with the Guide

Slide the Cone Reamer Guide into the Universal® Cone Reamer, Basket and connect to power using the Modular Cone Reamer, Handle. Remove the Intramedullary Reamer from the tibia and slide the tip of the Cone Reamer Guide into the reamed canal to locate the final M/L and A/P position of the Universal® Cone implant (Fig. 11).

Ream over IM Reamer

Connect the Universal® Cone Reamer, Basket to power using the Modular Cone Reamer, Handle. Slide the cannulated Universal® Cone Reamer Assembly over the Intramedullary Reamer shaft to locate the final M/L and A/P position of the Universal® Cone implant (Fig. 12).

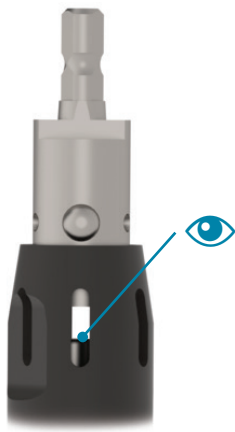



Fig. 13: Reamer window

 Ensure the Cone Reamer is not bottoming out on the Intramedullary Reamer by looking for the end of the Intramedullary Reamer in the window of the Cone Reamer (Fig. 13).

Ensure the power handpiece is set to [Ream], not [Drill]. The Universal® Cone Reamer Assembly should be spinning prior to engagement with bone to help prevent fracture.

Ream until the desired Cone size marking on the Universal® Cone Reamer, Basket is flush with the proximal tibial cut (Fig. 14).

Due to the change in taper angles per size, the appropriately angled Reamer must be used corresponding to the desired Cone size to ensure adequate bone contact.

Note: The line of the Reamer indicates where the top of the Universal® Cone Trial will sit.

Surgical Pearl: Place the Universal® Cone slightly distal to the proximal cut of the tibia (countersink) to fit a saw blade or osteotome between the top of the Cone and the bottom of the Tibial Baseplate in the event of future revision surgeries.

Note: Removing bone from the flutes of the Reamer throughout reaming can facilitate in smoother reaming.

Once the desired Cone size and depth is achieved, choose the corresponding Impactor size and attach the Universal® Cone Impactor Head to the Modular Handle (Fig. 15). Ensure the Universal® Cone Trial is in the correct orientation for tibial placement (cutouts placed M/L) and gently tap the Cone Impactor to seat the Universal® Cone Trial in the tibia.

To limit fracture risk, do not over-impact the Universal® Cone Trial to achieve desired depth. Re-ream or downsize the Universal® Cone Trial if needed.

Note: The Impactor Head has a slip fit with the Cone Trial and does not rigidly attach to the Trial.

Alternatively, the Cone Extractor can interface with the slots in the Cone Trial to be used for impaction (Fig. 15).

The Cone Extractor does not lock onto the Cone Trial and must stay engaged with a squeezing force.

Remove the Cone Impactor/ Cone Extractor, leaving the Universal® Cone Trial in place. The Universal® Cone Trial should not protrude above the proximal tibial cut to ensure proper Classic® Tibial Baseplate Implant assembly.

Note: The final implant will likely sit within 1mm of the Trial as the Reamer prepares a line-to-line fit with the final implant.



Fig. 14: Ream for a Tibial Cone. Size markings indicate Cone depth.



Fig. 15: Impactor assembly

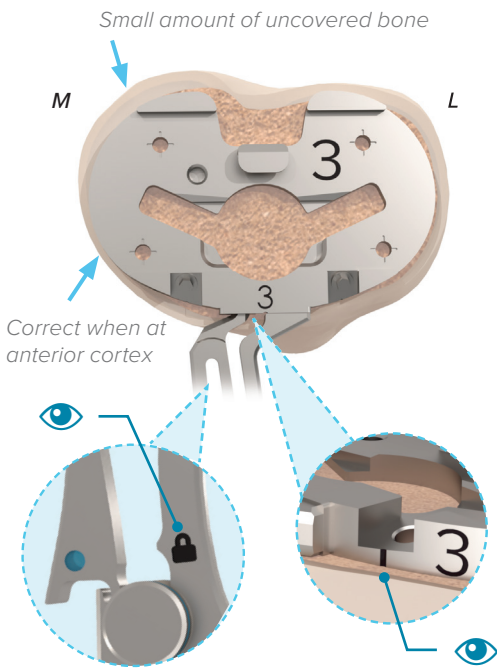


Fig. 16: Determine the tibial sizing and rotation

If a larger Cone is desired, follow the previous steps and ream to a larger Cone size.

It is recommended that the Cone Trial is removed for additional tibial preparation.

4. SIZING THE TIBIA

Attach the Modular Alignment Handle to the Tibial Baseplate Sizer/Trial. The Primary and Revision Tibial Baseplate Sizer/Trials have identical outer profiles, but the Revision Sizer is 2mm thicker to account for additional implant thickness and includes the stem boss.

The Klassic® PS-Post® or PS-Max® Inserts are not compatible with an in-tact PCL.

To rigidly lock the Modular Alignment Handle to the Tibial Baseplate Sizer/Trial or other instrument, slide the button toward the Lock icon (🔒).

Place the Tibial Baseplate Sizer/Trial on the resected proximal tibia at the anterior medial cortex. Select the Revision Tibial Baseplate Sizer/Trial that does not overhang and allows some lateralization (Fig. 16).

Vertical lines on the anterior face of the Tibial Baseplate Sizer/Trial may be used as a reference point for marking rotation.

Optimized congruency is achieved when either the femur and tibia are matched in size or when the femur is one size larger than the tibia. If using a larger size of tibia than femur, care should be taken to closely evaluate external rotation and other alignment to ensure proper joint function and kinematics.

KLASSIC® TIBIAL BASEPLATE SIZING

Size	A/P (mm)	M/L (mm)
1	41	63
2	43	67
3	45	71
4	47	75
5	49	79
6	51	84

5. PREPARING THE TIBIA FOR STEMS AND AUGMENTS

PREPARING FOR THE PRIMARY BASEPLATE

If desired, verify the alignment by placing the Alignment Rod through the Modular Alignment Handle. Once alignment is accepted and position verified, set the position with two Guide Screws through the anterior holes (Fig. 17).

This step will set rotation for the final implant; avoid internal rotation.

If using a Stem Extension, assemble the Reamer Tower to the Tibial Baseplate Sizer/Trial. Ream to the line on the Stem Extension Reamer to prepare for a 25mm Stem Extension and to full depth for a 50mm Stem Extension (Fig. 18).

Attach the Broach Tip to the Tibial Broach and connect it to the Tibial Broach Impactor. Rotate the strike plate 180° so that the marks are aligned and the Tibial Broach Assembly is locked. Place the Broach Tower on the Tibial Sizer/Trial and ensure it is securely seated (Fig. 19). A Kocher clamp on the anterior portion of the Tibial Broach Assembly may be used to add additional stability.

👁 Holes in the Tibial Broach Tower, Reamer Tower and Tibial Baseplate Sizer/Trial accept a Kocher clamp for enhanced stability.

The standard Starter Broach Tip is 13mm long; a 25 or 50mm Stem Extension Broach may be attached to the Tibial Broach Impactor for Stem Extension use.

Broach the tibia with a mallet. The Tibial Broach may be disconnected by rotating the top of the Tibial Broach Impactor.

Using the Tibial Broach without a Starter Tip or Broach Extension may cause damage to the tibia.

To leave the Tibial Broach in place, rotate the Strike Plate of the Broach Impactor 180° to separate the Broach Impactor from the Broach. It may be removed later by reattaching the Broach Impaction Handle or by using the Slap Hammer.

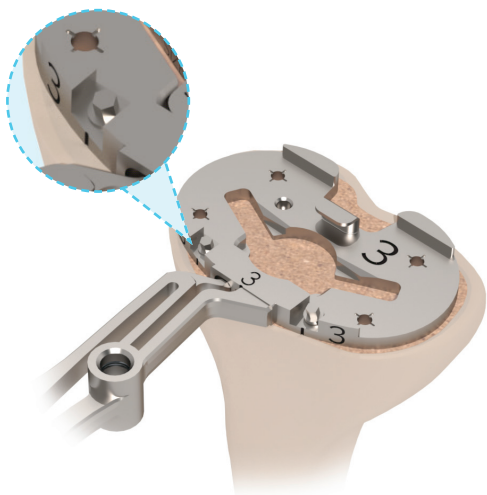


Fig. 17: Once the alignment is set, pin the Tibial Baseplate Sizer/Trial in place

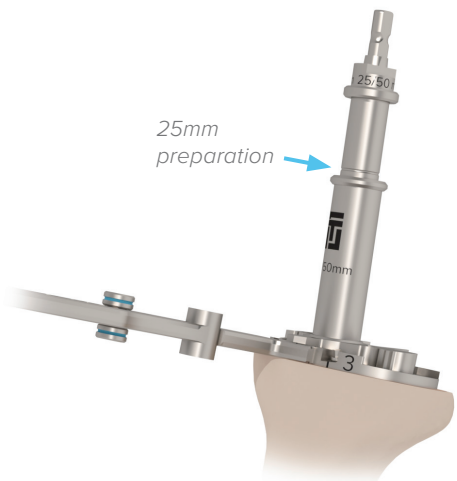


Fig. 18: Ream to prepare for 25 or 50mm Stem Extension

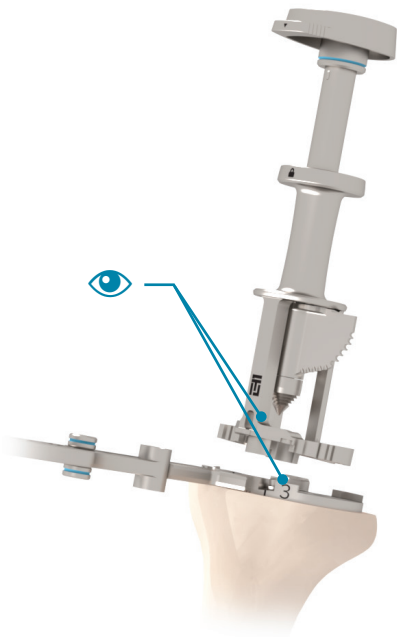


Fig. 19: Broach Keel and Stem

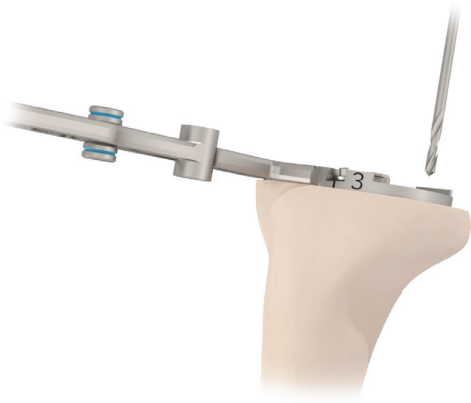


Fig. 20: Drill the peripheral peg holes

Use a 3.2mm (1/8”) Drill to prepare all four holes through the proximal surface of the Tibial Baseplate Sizer/Trial. All four holes must be prepared at least 5mm deep to accommodate the four peripheral pegs on the final implant (Fig. 20). A Stop Drill is provided if an alternate method is preferred. Remove Tibial Baseplate Sizer/Trial.

If a unilateral Tibial Augment is required, freehand the 5mm or 10mm resection or use the Intramedullary Guide and Adjustable Stylus to set the resection level.

PREPARING FOR THE REVISION BASEPLATE

Connect the 10mm Intramedullary Reamer to power, and ream to the preferred stem depth (50, 70, or 120mm) (Fig. 21).

REAM MARKING SCHEME FOR 2026.XX.000 REAMER

Stem Length (mm)	Ream Depth in Tibia (mm)	Reamer Marking
50	75	T50
70	100	F50/T70
120	150	T120

Ream sequentially to 2mm larger than the implant (ream to 16mm for a 14mm diameter stem and to 14mm for a 12mm diameter stem).

Note: Depth markings on the reamer indicate full ream depth from the cut surface required for the 50, 70, or 120mm Stem Extension.

If not using a Cone and Stem, or using a Stem smaller than 14mm, ream to the marking labeled “TIB” with a 16mm reamer.

Attach the Stem Trial corresponding to the desired implant to the bottom of the Revision Tibial Baseplate Sizer/Trial using the Stem Wrench in the Modular Alignment Handle. If desired, attach Tibial Augment Trials to the Revision Tibial Baseplate Sizer/Trial with the 3.5mm Hex Screwdriver (Fig. 22). Should additional tibial resection be necessary to accommodate Tibial Augments, the resection level can be set with the Intramedullary Guide and Adjustable Stylus. Insert the assembly into the joint space.



Fig. 21: Ream IM canal to the preferred stem depth (50, 70, or 120mm)



Fig. 22: Attach Augment Trials to the Baseplate Trial using the 3.5mm Screwdriver

KLASSIC® TIBIAL AUGMENT | KLASSIC® TIBIAL BASEPLATE COMPATIBILITY

Klassik® Tibial Baseplate Size	Klassik® Tibial Augment Size		
	1-2	3-4	5-6
1	✓		
2	✓		
3		✓	
4		✓	
5			✓
6			✓

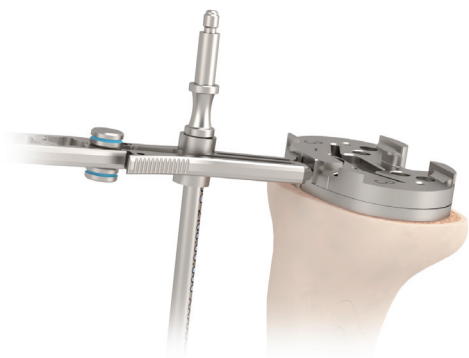


Fig. 23: Verify tibial alignment

If desired, verify the alignment by placing the Alignment Rod through the Modular Alignment Handle (Fig. 23). Once alignment is accepted and position verified, set the position with two Guide Screws through the anterior holes. Two posterior holes also accept Guide Screws for additional fixation.

This step will set rotation for the final implant; avoid internal rotation.

Connect the Revision Modular Tibial Broach to the Revision Tibial Broach Impactor. Rotate the strike plate 90° so that the Revision Tibial Broach Assembly is locked. Place the Assembly on the Revision Tibial Sizer/Trial and ensure it is securely seated (Fig. 24).

Broach the tibial keel with a mallet.

To leave the Revision Modular Tibial Broach in place for additional stability during trialing, rotate the Strike Plate of the Revision Tibial Broach Impactor 90° to separate the Broach Impactor from the Broach. It may be removed later by reattaching the Broach Impactor Handle.

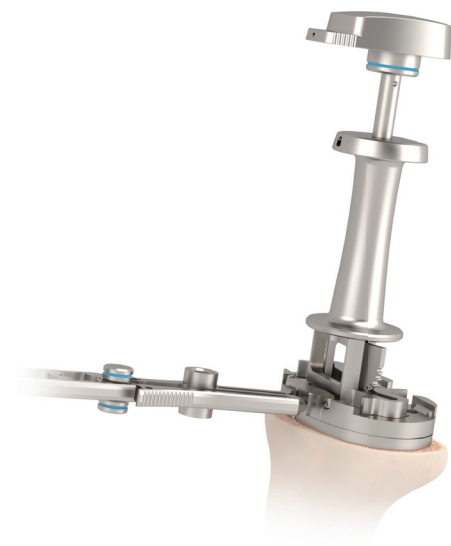


Fig. 24: Prepare for the keel with the Revision Modular Tibial Broach and Broach Impactor

6. PREPARING THE FEMUR FOR STEMS AND AUGMENTS

Select an appropriately sized Femur Trial to determine femoral sizing, ensuring adequate coverage, especially medial to lateral.

Surgical Pearl: Sizing with the Femur Trial may help assess the need for Femoral Augments to determine final rotation.

KLASSIC® PS-POST® FEMUR SIZING

Size	A/P (mm)	M/L (mm)
1	54	59
2	57.5	63
3	61	67
4	64.5	71
5	68	75
6	71.5	79
7	75	83

There is a 3.5mm difference between sizes at the anterior cortex.

Femoral pegs are uniform in distance between sizes. Selecting an alternate femur after drilling the peg holes does not require drilling additional holes.

The Intramedullary Alignment Guide may be used to verify the alignment of the distal femoral resection.

KLASSIC® FEMORAL AUGMENT | KLASSIC® PS-POST® FEMUR COMPATIBILITY

Klassik® PS-Post® Femur Size	Klassik® Femoral Augment Size		
	1-2	3-4	5-7
1	✓		
2	✓		
3		✓	
4		✓	
5			✓
6			✓
7			✓

The Klassik® Revision Knee System is designed to trial with the Cemented Stem Trial in position in order to check the accuracy of the 4-in-1 cuts and the path of the Cemented Stem within the intramedullary canal before reaming the box.

Connect the 10mm Intramedullary Reamer to power, and ream to the preferred stem depth (50, 70, or 120mm) (Fig. 25). This ream position will determine final M/L position of the femoral implant.

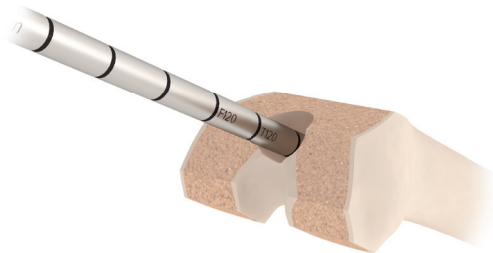


Fig. 25: Ream IM canal to the preferred stem depth (50, 70, or 120mm)

REAM MARKING SCHEME FOR 2026.XX.000 REAMER

Stem Length (mm)	Ream Depth in Femur (mm)	Reamer Marking
50	100	F50/T70
70	125	F70
120	175	F120

Ensure the power handpiece is set to [Ream], not [Drill].
The Reamer should be spinning prior to engagement with bone to help prevent fracture.

Ream sequentially to 2mm larger than the implant (ream to 16mm for a 14mm diameter stem and to 14mm for a 12mm diameter stem).

If a 12mm diameter Cemented Stem is being used without a femoral cone, the 16mm Reamer must be inserted to depth of 75mm (or “T50 mark”) to account for the stem’s wrench flats.

Note: Depth markings on the reamer indicate full ream depth from the distal cut surface required for the 50, 70, or 120mm Stem Extension.

Remove the Reamer from the canal.

To assemble the Femur Trial/Stem Trial Adapter and the Stem Trial, line up the arrow to the appropriate side (R or L) (Fig. 26). Hand-tighten the Stem Trial into the Femur Trial/Stem Trial Adapter. If needed, use the Stem Wrench in the Modular Alignment Handle to secure the Stem Trial to the Femur Trial/Stem Trial Adapter.

Slide the Femur Trial/Stem Trial Adapter with the Stem Trial into the PS-Post® Femoral Trial.

 Align arrow with ‘L’ for left knee, or ‘R’ for right knee.

Secure the Femur Trial/Stem Trial Adapter with the Stem Trial to the PS-Post® Femoral Trial by turning the locking mechanism clockwise with the 3.5mm Hex Screwdriver.

Assess fit and positioning of the complete femoral construct. The Femur Trial/Stem Trial Adapter allows for initial trialling with the CR Insert Trials prior to making the box resection.

Note: Distal and Posterior Femoral Augments are available in both 5mm and 10mm options.

If Femoral Augments are needed, use the cutting slots provided on the PS-Post® Femoral Trial to resect the appropriate amount of bone from the femur (Fig. 27). Remove Femoral Trial Assembly and slide Trial Augments into the posterior and/or distal channels of the Femoral Trial.

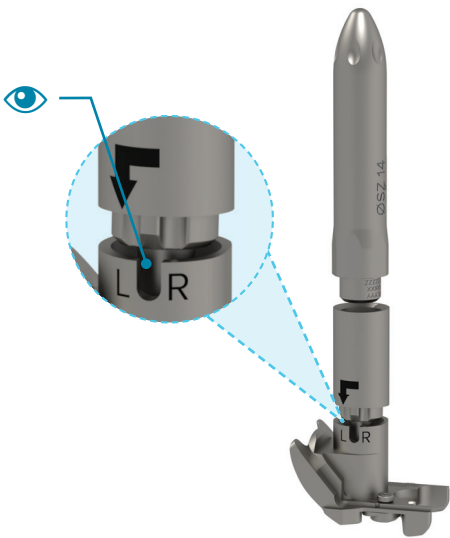


Fig. 26: Assemble the Femur Trial/Stem Trial Adapter and the Femoral Stem Trial, line up the arrows of the Femur Trial/Stem Trial Adapter

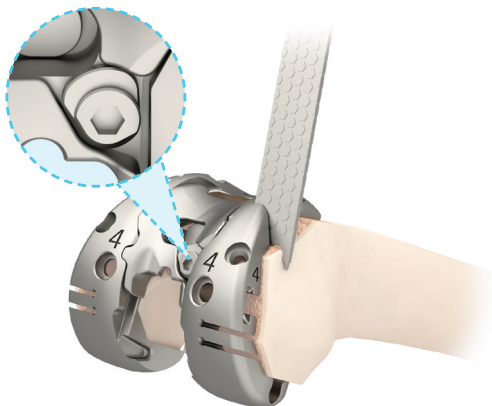


Fig. 27: Secure the Femur Trial/Stem Trial Adapter with the Femoral Stem Trial to the PS-Post® Femoral Trial; if Augments are needed, use the cut slots to prepare the femur

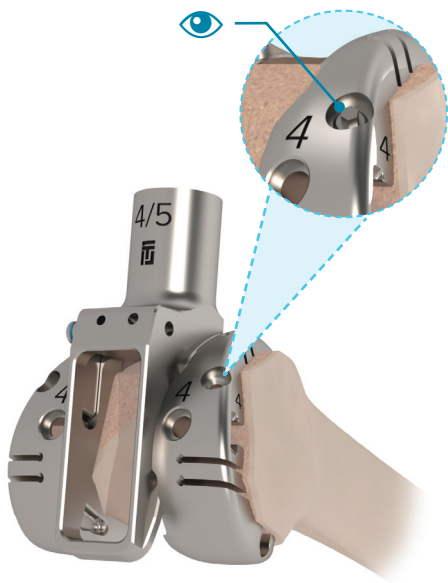


Fig. 28: Place the PS-Post® Femur Trial and secure with stabilizing Screws or Pins

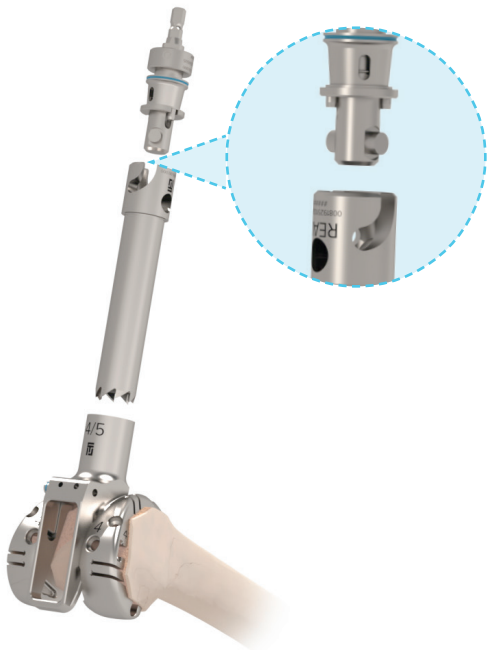


Fig. 29: Attach the Reaming Guide. Ensure it snaps fully into place prior to reaming

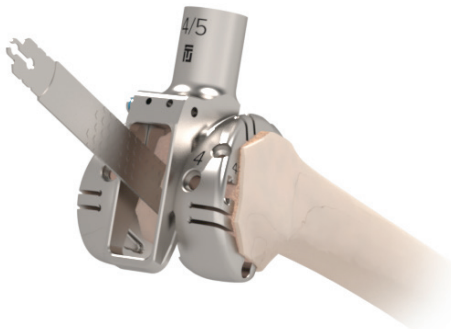



Fig. 30: Use sides of the Reaming Guide to remove remaining bone

The Trial may be stabilized using the lateral anterior and distal medial pin fixation (Fig. 28). Note that using a distal Trial Augment will block the corresponding pin fixation hole.

Remove the Femur Trial/Stem Trial Assembly from the Femur Trial.

Insert the PS-Post® Reaming Guide into the PS-Post® Femur Trial, ensuring it is fully captured.

 Fixation holes are fully countersunk so Guide Screws may be left in place throughout trialing.

Attach the PS-Post® Box Reamer to power using the Modular Driver, and insert the Reamer into the Reaming Guide (Fig. 29).

Ensure the power handpiece is set to [Ream], not [Drill]. The Reamer should be spinning prior to engagement with bone to help prevent fracture.

Ream to the stop without excessive pressure. Ensure the reaming guide remains fixed during reaming. Leave the Reaming Guide in place, using the sides as a guide to remove any remaining bone with an oscillating saw (Fig. 30).

Ensure the vertical walls of the box cut are flush with the Reaming Guide. Overhanging bone left after box preparation may cause a femoral condyle fracture when the final implant is placed.

If using the optional modular Femoral Pegs, drill the peg holes using the 3-in-1 Drill.

Note: If using the Femoral Pegs with Distal Femoral Augments, the Augments must be cemented.

Remove the PS-Post® Reaming Guide by depressing the button. Leaving the Femur Trial in place, attach the appropriately sized Intercondylar Box Trial. If the Box Trial does not fully seat into the Femur Trial, remove any remaining bone and soft tissue to ensure clearance.

The PS-Post® Femur is compatible with both PS-Post® and PS-Max® Inserts. It is NOT compatible with Ultra-PS®, CR/ Congruent Inserts, or the All-Poly Tibia.

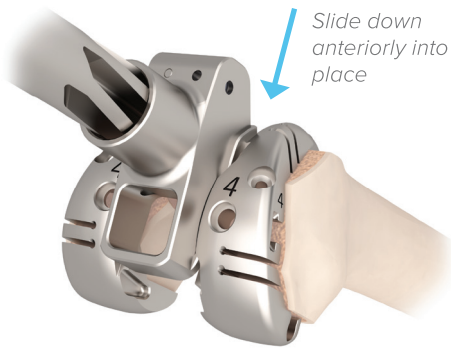


Fig. 31: Attach the Reamer Guide and ensure it snaps fully into place prior to reaming, then insert the Femoral Stem Adapter Reamer into the Adapter Reaming Guide and ream until it stops (not necessary if using a Universal® Cone)

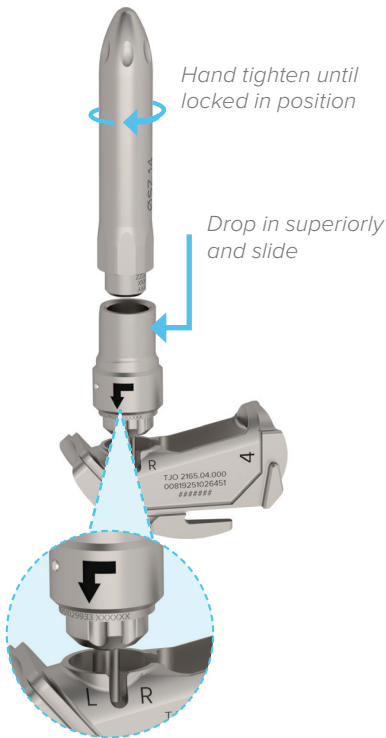


Fig. 32: Slide the Femoral Stem Adapter Trial into the PS-Post® Box Trial. Align the L/R indicator and drop into place. Hand-tighten the Femoral Stem Trial into the Femoral Stem Adapter Trial.

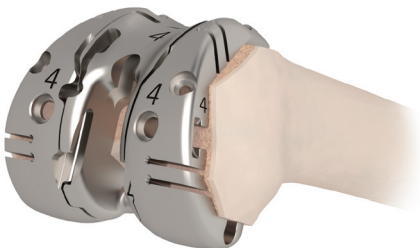


Fig. 33: Assess the fit and positioning of the complete femoral construct, including the Stem and Adapter Trials

Connect the Femoral Stem Adapter Reamer Guide to the PS-Post® Femoral Trial by sliding it down anteriorly into place. (Fig. 31). There will be an audible click when the Femoral Stem Adapter Reamer Guide is in place.

Connect the Femoral Stem Adapter Reamer to power using the Modular Driver. *This step is not necessary if using a Universal® Cone.*

**Ensure the power handpiece is set to [Ream], not [Drill].
The Reamer should be spinning prior to engagement with bone to help prevent fracture.**

Insert the Femoral Stem Adapter Reamer into the Adapter Reaming Guide and ream until it stops (Fig. 31). Remove the Femoral Stem Adapter Reamer from the Femoral Stem Adapter Reamer Guide.

Remove the Reamer Guide from the PS-Post® Femoral Trial by depressing the button and sliding the Reamer Guide anteriorly, leaving the PS-Post® Femur Trial in place.

Slide the Femoral Stem Adapter Trial into the appropriately sized Femur Box Trial by dropping the Femoral Adapter Trial in superiorly and sliding the hanging bolt toward the anterior of the box. Align the Stem Adapter Trial into the left or right configuration based on patient anatomy and drop into place.

Hand-tighten the Stem Trial into the Femoral Stem Adapter Trial until the Stem Trial and Femoral Stem Adapter Trial are locked into position with the PS-Post® Box Trial (Fig. 32).

Use the Stem Wrench in the Modular Alignment Handle to secure the Stem Trial.

Slide the Femoral Box, Femoral Stem Adapter, and Stem Trial Assembly into the PS-Post® Femoral Trial to assess proper fit. There will be an audible click when in place and the PS-Post® Box Trial will be flush with the articular surface. Assess the fit and positioning of the complete femoral construct, including the Stem and Adapter Trials (Fig. 33).



Fig. 34: Ream IM canal to a depth of 225mm

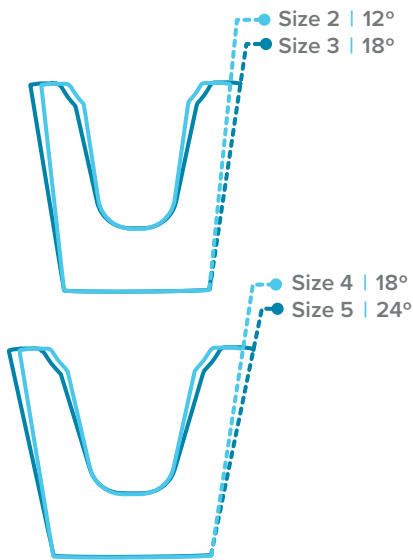


Fig. 35: Taper angle changes between sizes 2-3, and 4-5

7. PREPARING THE FEMUR FOR A UNIVERSAL® CONE

If not using Universal® Cones on the femur, proceed to section 8.

Connect the Intramedullary Reamer to power and ream to a depth of at least 225mm to prevent the Universal® Cone Reamer Assembly from interfering with the cutting flutes in the next step (Fig. 34).

**Ensure the power handpiece is set to [Ream], not [Drill].
The Reamer should be spinning prior to engagement with the bone to help prevent fracture.**

Evaluate the femoral defect and place an inverted Universal® Cone Trial over the defect to determine the approximate Universal® Cone size. Select the corresponding Universal® Cone Reamer, Basket based on the approximate Cone size.

UNIVERSAL® CONE SIZING

Size	Taper Angle (°)	Height (mm)	Defect Diameter (mm)	Max Stem Diameter (mm)
1	12	32.5	28	16
2	12	32.5	30	18
3	18	32.5	33	18
4	18	32.5	35	20
5	24	32.5	39	20
6	24	32.5	41	22
7	24	32.5	43	24

Due to the change in taper angles per size, the appropriate Reamer must be used corresponding to the desired Cone size to ensure adequate bone contact (Fig. 35). Reaming with the correct size reamer ensures consistent press fit and complete bone contact with ingrowth surfaces.

Refer to the table below for Universal® Cone and Klassic® PS-Post® Femur compatibility.

UNIVERSAL® CONE | FEMORAL COMPATIBILITY

Klassic® PS-Post® Femur Size	Universal® Cone Size						
	1	2	3	4	5	6	7
1	✓	✓	✓	✓			
2	✓	✓	✓	✓	✓		
3	✓	✓	✓	✓	✓	✓	
4	✓	✓	✓	✓	✓	✓	✓
5	✓	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	✓	✓	✓	✓
7	✓	✓	✓	✓	✓	✓	✓



Fig. 36: Option 1 - Guided Reamer assembly



Fig. 37: Option 2 - IM Reamer assembly

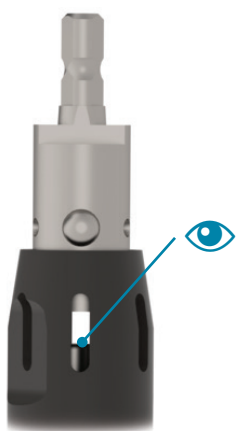


Fig. 38: Reamer window

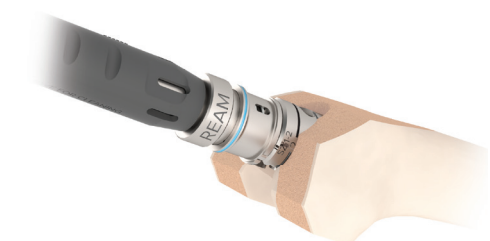


Fig. 39: Ream for a Femoral Cone. Size markings indicate the Cone depth that is certain to clear the boss of the PS Femur.

There are two options when reaming for the Universal® Cone:

Ream with the Guide

Slide the Cone Reamer Guide into the Universal® Cone Reamer, Basket and connect to power using the Modular Cone Reamer, Handle. Remove the Intramedullary Reamer from the femur and slide the tip of the Cone Reamer Guide into the reamed canal to determine the final M/L and A/P position of the Universal® Cone implant (Fig. 36).

Ream over IM Reamer

Connect the Universal® Cone Reamer, Basket to power using the Modular Cone Reamer, Handle. Slide the cannulated Universal® Cone Reamer Assembly over the Intramedullary Reamer shaft to determine the final M/L and A/P position of the Universal® Cone implant (Fig. 37).

**Ensure the power handpiece is set to [Ream], not [Drill].
The Universal® Cone Reamer Assembly should be spinning prior to engagement with bone to help prevent fracture.**

👁️ Ensure the Cone Reamer is not bottoming out on the Intramedullary Reamer by looking for the end of the Intramedullary Reamer in the window of the Cone Reamer (Fig. 38).

Ream until the selected Cone size marking on the Universal® Cone Reamer Assembly is flush with the distal femoral cut (Fig. 39).

Due to the change in taper angles per size, the correct size Reamer must be used to ensure adequate bone contact.

Note: The Universal® Cones are intended to sit proximal to the distal femoral cut to avoid interference with the femoral box and anterior flange. The tibial depth markings per size indicate where the top of the Cone Trial will sit.

The Cone compatibility is based on the Cone Reamer being concentric with the Stem. Flexibility with Cone placement is possible, but extra care needs to be taken to ensure compatibility (see Preoperative Planning for Cone placement depth).

Note: Removing bone from the flutes of the Reamer throughout reaming can facilitate in smoother reaming.

Once the desired Cone size and depth is achieved, remove all components from the femur.



Fig. 40: Impactor assembly

Choose the corresponding Impactor size and attach the Universal® Cone Impactor Head to the Modular Handle (Fig. 40). Ensure the Universal® Cone Trial is in the correct orientation for femoral placement (cutouts placed A/P) and gently tap the Cone Impactor to seat the Universal® Cone Trial in the femur.

To limit fracture risk, do not over-impact the Universal® Cone Trial to achieve desired depth. Re-ream or downsize the Universal® Cone Trial if needed.

Note: The Impactor Head has a slip fit with the Cone Trial and does not rigidly attach to the Trial.

Alternatively, the Cone Extractor can interface with the slots in the Cone Trial to be used for impaction (Fig. 40).

Note: The Cone Extractor does not lock onto the Cone Trial and must stay engaged with a squeezing force.

Remove the Cone Impactor/ Cone Extractor, leaving the Universal® Cone Trial in place.

Note: The final implant will likely sit within 1mm of the Trial as the Reamer prepares a line-to-line fit with the final implant.

If a larger Cone is desired, follow the previous steps and ream to a larger Cone size.

It is recommended that the Cone Trial be removed for additional femoral preparation.

8. PREPARING THE PATELLA

Assess the patella to determine if needs to be replaced. In many cases, the existing patella can be retained, especially when it is well-fixed. Given the limited bone stock typically available, preserving the native patella can be advantageous.

Note: The Klassic® Knee System offers patellae in multiple thicknesses in case there is bone loss.

If needed, place the leg in full extension. Evert the patella and stabilize it with two inverted towel clips. Excise the soft tissue around the patella, avoiding the quadriceps tendon and the patellar ligament and remove any large osteophytes. Before making any bone cuts, determine the maximum thickness of the patella using the Patella Calipers (Fig. 41).

Avoid overthickening the patella to prevent overstuffing the patellofemoral joint.

Use the 3.2mm (1/8") Drill to drill the highest point (patella apex) of the medial facet perpendicular to the articular surface. This acts as a guide for proper medialization of the patella (Fig. 42).



Fig. 41: Use the Patella Calipers to determine maximum thickness



Fig. 42: Drill the apex of the medial facet



Fig. 43: Resect the patella using the Patella Osteotomy Guide

Select the desired resection thickness (see sizing chart) and adjust the stylus on the Patella Osteotomy Guide accordingly. Place the Patella Osteotomy Guide over the patella and tighten with the knob.

KLASSIC® DOMED PATELLA SIZING

Size	Diameter (mm)	Thickness (mm)
1	28	8
2	31	9
3	34	10
4	37	11

KLASSIC® SOMBRERO PATELLA SIZING

Size	Diameter (mm)	Thickness (mm)
1	28	7 or 10
2	31	7 or 10
3	34	7 or 10
4	37	7 or 10
5	40	10 only

Patella pegs are spaced uniformly regardless of size. Choosing an alternate size does not require drilling new holes.

Resect the patella such that the implanted component will replace the resected thickness (e.g. 7mm if using a 7mm thick Sombrero Patella) (Fig. 43).

Attach the Modular Patella Sizer/Drill Guide to the Patella Clamp. Medialize the Modular Patella Sizer/Drill Guide and, using the radial marks, select the largest size of patella that will not overhang to optimize patellar tracking (Fig. 44).³¹ The previously drilled marker provides a reference location. Using the 3-in-1 Drill Tip, drill the patellar peg holes. If desired, the clamp may be held in place with the attached nut.

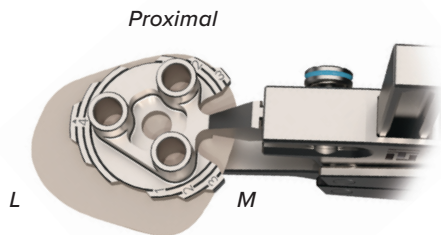


Fig. 44: Size the patella using the Modular Patella Sizer/Drill Guide

9. TRIALING

Insert the appropriately-sized Patella Trial (Fig. 45).

Select the Tibial Trial Assembly and place it on the resected tibia. If there is interference between the Universal® Cone and the assembly, remove the Tibial Trial Assembly and reposition the Cone or further ream to slightly countersink the selected size of Universal® Cone.

Replace the Femur Trial Assembly. If there is interference between the Universal® Cone and the Assembly, remove the Femur Trial Assembly and reposition the Cone or further ream to slightly countersink the selected size of Universal® Cone.

Select the desired thickness of Tibial Insert Trial and attach it to the Modular Alignment Handle. Insert the Tibial Insert Trial into the joint space, and place it on the Tibial Baseplate Trial.

Check stability throughout the range of motion. Any fine-tuning, soft tissue releases, or other adjustments should be made at this time (Fig. 46). Refer to the Troubleshooting Balance chart on the next page.

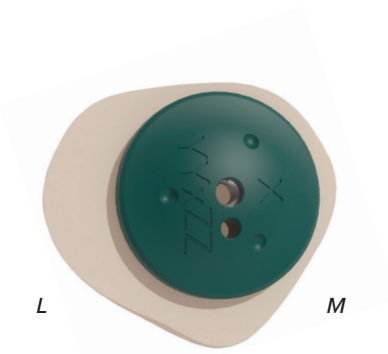


Fig. 45: Insert the Patella Trial

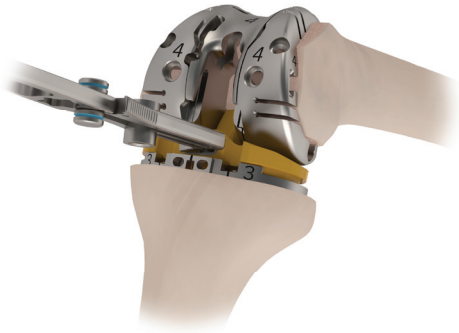
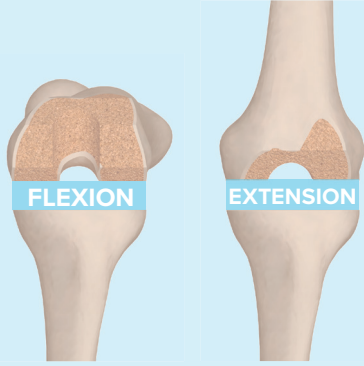


Fig. 46: Insert Trials, check range of motion and make adjustments to soft tissue as needed, then remove Trials

TROUBLESHOOTING BALANCE

		EXTENSION GAP		
		LOOSE	BALANCED	TIGHT
FLEXION GAP	LOOSE	<p>CAUSES</p> <ol style="list-style-type: none"> 1 Over-resection of tibia or tibial sided bone defect 2 Femoral joint line elevation and loss of posterior condylar offset <p>POSSIBLE SOLUTION(S)</p> <ol style="list-style-type: none"> 1 Increase tibial poly thickness -or- Add symmetric tibial sided augments to restore bone loss and use midrange poly thickness to balance 2 Restore femoral joint line by using distal femoral augments -and- Increase posterior condylar offset by posteriorly shifting the femur and/or up-sizing the femoral component and adding posterior femoral augments 	<p>CAUSES</p> <ol style="list-style-type: none"> 1 Loss of posterior condylar offset 2 Excessive tibial slope <p>POSSIBLE SOLUTION(S)</p> <ol style="list-style-type: none"> 1 Increase posterior condylar offset by posteriorly shifting the femur and/or up-sizing the femoral component and adding posterior femoral augments -or- Resect additional distal femur to make extension looser to match the flexion gap (rare solution - recheck the offset first). 2 Aim for a more neutral tibial slope (0-3°) 	<p>CAUSES</p> <ol style="list-style-type: none"> 1 Femur is distalized, with a lack of posterior condylar offset 2 Excessive tibial sided thickness attempting to inadequately fill a loose flexion gap and overly tighten the extension gap, with femur having appropriate distal resection <p>POSSIBLE SOLUTION(S)</p> <ol style="list-style-type: none"> 1 Proximalize femur by re-cutting distal femur -and- Increase posterior condylar offset by posteriorly shifting the femur and/or up-sizing the femoral component and adding posterior femoral augments 2 Assess for excess tibial thickness. If present, decrease tibial thickness, maintain the distal femur position -and- Increase posterior condylar offset by posteriorly shifting the femur and/or up-sizing the femoral component and adding posterior femoral augments
	BALANCED	<p>CAUSES</p> <ol style="list-style-type: none"> 1 Over-resection of distal femur 2 Overly increased posterior condylar offset/oversized femoral component and excessive posterior femoral positioning, leading to the flexion space feeling balanced before the extension space has been balanced by the appropriate tibial thickness <p>POSSIBLE SOLUTION(S)</p> <ol style="list-style-type: none"> 1 Add distal femoral augments to distalize the femur 2 Anteriorly shift the femur or down-size the femoral component and decrease posterior augments, then increase tibial thickness to fill the now looser flexion space and loose extension space simultaneously 	<p>DESIRED GAP BALANCE</p> 	<p>CAUSES</p> <ol style="list-style-type: none"> 1 Excessive distal femoral augment or distalized femoral position 2 Excessive tibial sided thickness filling a loose flexion gap to make it feel balanced and overly tightening the extension gap with the femur having appropriate distal resection <p>POSSIBLE SOLUTION(S)</p> <ol style="list-style-type: none"> 1 Remove distal femoral augments or resect additional distal femur 2 Decrease the tibial thickness, and maintain the distal femoral joint line -and- Increase posterior condylar offset by posteriorly shifting the femur and/or up-sizing the femoral component and adding posterior femoral augments
	TIGHT	<p>CAUSES</p> <ol style="list-style-type: none"> 1 Excessive distal femoral resection or elevation of femoral joint line with excessive tibial thickness 2 Overly increased posterior condylar offset or oversized femoral component with excessive posterior positioning with inadequate tibial thickness 3 Excessive tibial sided thickness attempting to inadequately fill a loose extension gap due to excessive distal femur resection and overstuffing the flexion gap <p>POSSIBLE SOLUTION(S)</p> <ol style="list-style-type: none"> 1 Distalize the femur with distal femoral augments and downsize the tibial thickness to loosen the tight flexion gap 2 Anteriorly shift the femur or down-size the femoral component and decrease posterior augments, then increase tibial thickness to simultaneously balance the now looser flexion gap and loose extension gap 3 Combination of distalizing the femur with distal femur augment and downsize femur/decrease posterior condylar offset with adjustment of tibial thickness 	<p>CAUSES</p> <ol style="list-style-type: none"> 1 Excessive distal femoral resection with excessive tibial thickness 2 Excessive posterior condylar offset (rare) 3 Reversed tibial slope (rare) <p>POSSIBLE SOLUTION(S)</p> <ol style="list-style-type: none"> 1 Distalize the femur with distal femoral augments to increase extension gap tightness and downsize the tibial thickness to loosen the now tighter flexion gap and tight flexion gap simultaneously 2 Anteriorly shift femur or down-size the femoral component and/or decrease posterior augments 3 Improve tibial slope (target 0-3° of posterior tibial slope) 	<p>CAUSES</p> <ol style="list-style-type: none"> 1 Distalized femoral joint line and excessive posterior condylar offset 2 Excessive tibial thickness <p>POSSIBLE SOLUTION(S)</p> <ol style="list-style-type: none"> 1 Resect additional distal femur or reduce distal femoral augments -and- Anteriorly shift femur or down-size the femoral component and/or decrease posterior augments 2 Decrease poly thickness, remove tibial augments, or resect additional tibia

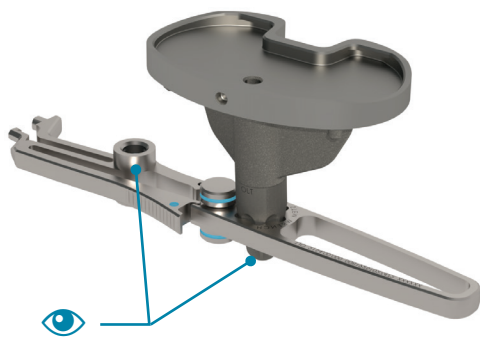


Fig. 47: Tighten Tibial Stem Extension to the Tibial Baseplate

Assemble the Slap Hammer by sliding the small end of the Slap Hammer Rod through the axial hole on the square end of the Modular Impactation Handle. Snap the other end of the handle onto the Rod to complete assembly.

Ensure that all guide screws are removed prior to trial extraction.

Place the Slap Hammer in the intracondylar notch to remove the Femoral Trial Assembly prior to final implantation. The small end of the Slap Hammer may be used to remove the Tibial Trial Assembly. (Disassemble the Slap Hammer by depressing the button near the top of the Handle.)

Use the Cone Extractor to remove the Cone Trial(s).

10. ASSEMBLING THE FINAL COMPONENTS

Copiously wash the wound.

Use caution when opening the Tibial Baseplate Assembly. The Tibial Insert Set Screw is included in the packaging for the Tibial Baseplate Assembly and is required to fully engage the locking mechanism on the Tibial Insert.

Note: Additional Tibial Insert Set Screws are packaged separately for revision use or in the event the enclosed screw is dropped.

Attach the desired Stem to the tibia using the Stem Wrench in the Modular Alignment Handle. Securely tighten the Stem to the Tibial Baseplate (Fig. 47).

👁 *The Modular Alignment Handle also serves as the wrench for assembling Tibial and Femoral Stems.*

The Klassic® Tibial Augment is packaged with a screw that is for use with the Klassic® Revision Tibial Baseplate. If it is being used with the Klassic® Tibial Baseplate, the screw can be discarded.

If using Klassic® Tibial Augments with the Klassic® Tibial Baseplate, cement the Augments to the bottom of the Tibial Baseplate by applying cement to both the Baseplate and the Augment. Hold in place until cured.

If using Klassic® Tibial Augments with the Klassic® Revision Tibial Baseplate, secure the Augment to the tibia with the Augment Screw using the 3.5mm Hex Screwdriver (Fig. 48).

Place the PS-Post® Femur on the Femoral Assembly Cradle (Fig. 49).



Fig. 48: Attach the Klassic Tibial Augment to the Klassic® Revision Tibial Baseplate using an Augment Screw



Fig. 49: Place the PS-Post® Femur on the Femoral Assembly Cradle

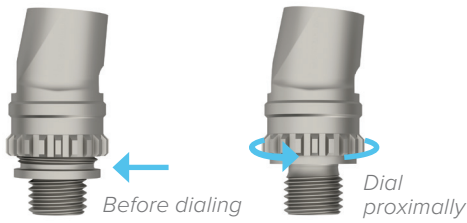


Fig. 50: The external nut on the Femoral Stem Adapter must be completely dialed proximally prior to insertion in the PS-Post® Femur

Make sure the Classic® Femoral Stem Adapter is completely retracted proximally prior to inserting into the femoral implant. If the sleeve of the Adapter is extended, rotate the Splined Nut of the Adapter until the Sleeve of the Adapter is fully flush against the Splined Nut (Fig. 50).

Thread in clockwise and hand-tighten the Femoral Stem Adapter until bottomed out in the PS-Post® Femur (Fig. 51).

Rotate the Femoral Stem Adapter counterclockwise until the 'Align L/R' line on the Adapter is lined up to the indicating markers for the appropriate PS-Post® Femur orientation (left or right).

Do not rotate the Adapter more than one rotation counterclockwise from the hand-tightened position.

Slide the Femoral Stem Adapter Wrench onto the Femoral Assembly Cradle. Slide forward until it is firmly gripping the Stem Adapter, locking it into the left or right orientation. The Wrench will not connect if the Adapter is not properly aligned.

While the Femoral Stem Adapter Wrench is engaged, finger-tighten the lock nut on the Stem Adapter clockwise (Fig. 51).

Assemble the Spline Wrench by sliding the Cover into the handle until it clicks, then slide the Spline Wrench tip into the handle (Fig. 52).

Slide the Femoral Stem Adapter Wrench back on the Cradle, insert the spline wrench onto the Stem Adapter and slide it down until the Spline Wrench engages the splines (Fig. 53). Slide the Femoral Stem Adapter Wrench back in position to firmly constrain the Stem Adapter in the proper orientation.

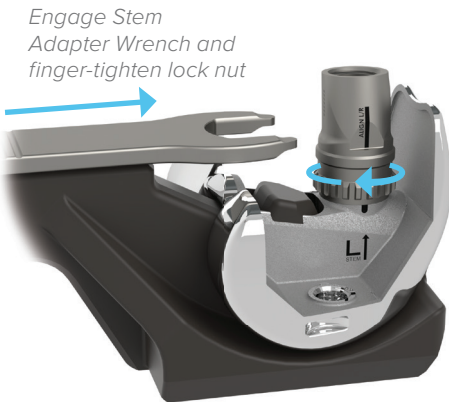


Fig. 51: Engage the Stem Adapter

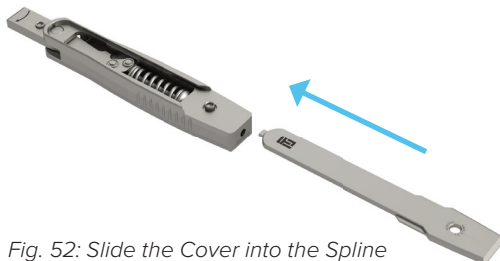


Fig. 52: Slide the Cover into the Spline Wrench Handle

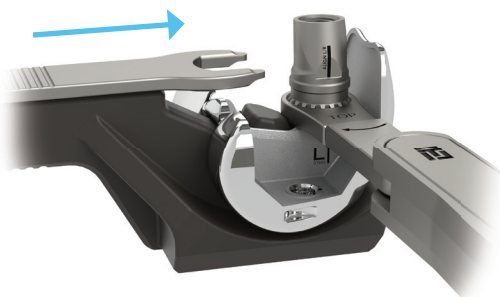


Fig. 53: Slide the Femoral Stem Adapter Wrench onto the Stem Adapter to lock its orientation



Scan for
Cemented Stem
Workflow Video

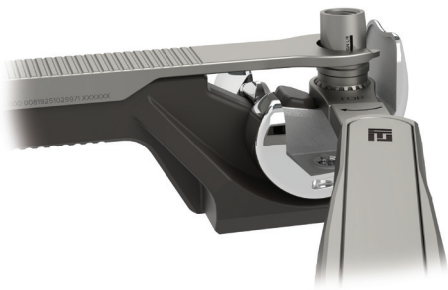


Fig. 54: Rotate the Spline Wrench clockwise until there is an audible click

With one hand on the Femoral Assembly Cradle and Femoral Stem Adapter Wrench, and the other on the Spline Wrench, rotate the Spline Wrench clockwise by pulling in line with the textured grip of the Spline Wrench Handle until an audible click is heard and felt in the Handle (Fig. 54). Readjust the Spline Wrench on the Stem Adapter if the posterior condyle interferes with tightening. Ensure the Femoral Stem Adapter Wrench is in position to constrain the Stem Adapter in the proper orientation while tightening with the Spline Wrench.

Slide the Spline Wrench up from the splines and remove.

Insert the selected Stem into the Femoral Stem Adapter and hand tighten clockwise until it stops.

While holding the Cradle and Femoral Stem Adapter Wrench, use the Stem Wrench in the Modular Alignment Handle to finish tightening the Femoral Stem to the Femoral Stem Adapter (Fig. 55).

Surgical Pearl: After the femoral construct has been assembled on the Cradle, remove it and perform a final tightening of the Cemented Stem. Ensure the “L/R” hash are aligned to verify proper assembly.

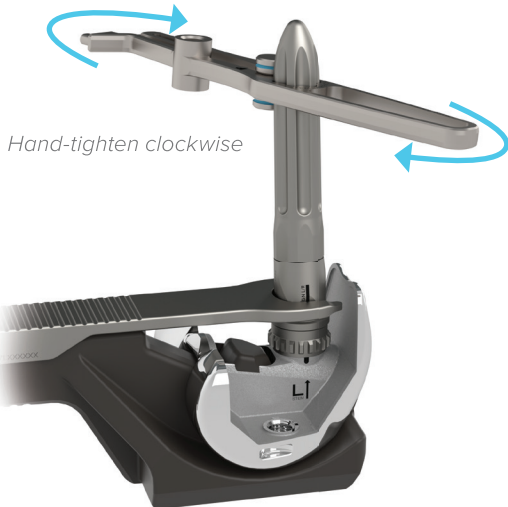


Fig. 55: While holding the Femoral Assembly Cradle and Femoral Stem Adapter Wrench, secure selected Femoral Stem with the Modular Alignment Handle

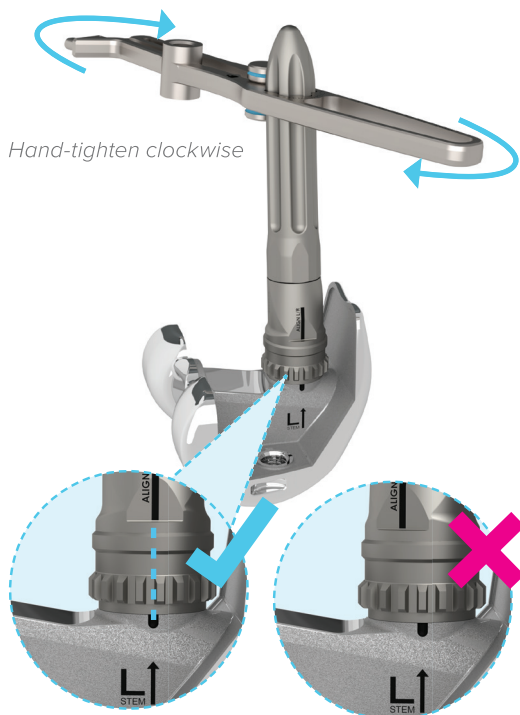


Fig. 56: Remove the Femoral Construct from the Cradle and perform a final tightening to verify proper assembly



Fig. 57: Attach the Augments to the Femoral Construct with the 3.5mm Hex Screwdriver. Ensure the Distal Augment is placed as close to the peripheral edge as possible.

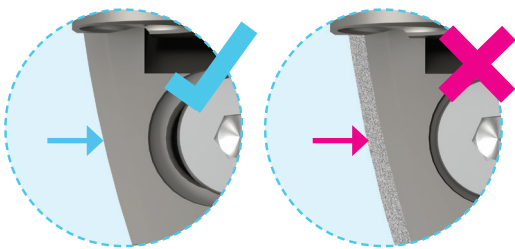


Fig. 58: Place the Distal Augment as close to the peripheral edge as possible

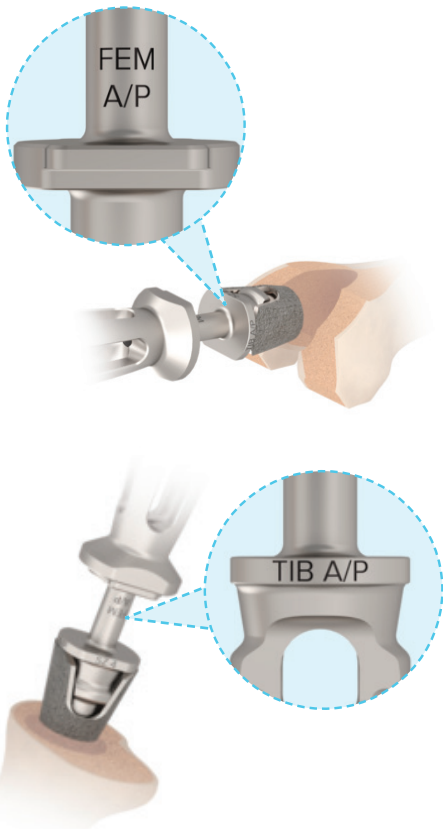


Fig. 59: Impactor Assembly – Femur A/P (top), Tibia A/P (bottom)

Slide the Femoral Stem Adapter Wrench off of the Stem Adapter. Using the Modular Alignment Handle, tighten the Femoral Stem (Fig. 56). If the marking lines on the Stem Adapter and PS-Post® Femur have moved and are not coincident, place the PS-Post® Femur back onto the Femoral Assembly Cradle, slide the Femoral Stem Adapter Wrench onto the Assembly, and use the Spline Wrench and Femoral Stem Adapter Wrench to loosen the Femoral Stem. Repeat implant assembly steps, ensuring the Stem Adapter is sufficiently tightened to the PS-Post® Femur.

If using Femoral Pegs, attach them now and tighten using the 3.5mm Hex Screwdriver.

If Femoral Augments are needed, secure the Augment to the posterior and/or distal portion of the femur with the Augment Screw using the 3.5mm Hex Screwdriver (Fig. 57).

Ensure the Distal Augment is placed as close to the peripheral edge as possible (Fig. 58).

11. IMPLANTING THE FINAL COMPONENTS

If using Universal® Cones, assemble the Universal® Cone Impactor Head with the Modular Handle and the Universal® Cone implant size that was prepared for. Ensure the Universal® Cone is in the correct orientation for femoral (cutouts A/P) or tibial (cutouts M/L) placement and gently tap the Cone Impactor to seat the Universal® Cone (Fig. 59).

To limit fracture risk, do not over-impact the Universal® Cone to achieve desired depth.

Note: The Impactor Head has a slip fit with the Universal® Cone and does not rigidly attach to the Implant.

Remove the Cone Impactor, leaving the Universal® Cone implant in place. The Cone uses cementless fixation with the bone, but cemented fixation with other implants. Ensure the Universal® Cone is filled with cement before implanting tibia/femur constructs.

Attach the appropriate Tibial Impactor Head to the Modular Impaction Handle.

Use the Large Retractor on the resected distal femur to push the tibia forward to ensure maximal exposure.



Fig. 60: Impact the Klassic® Tibial Baseplate

Impact the Tibial Baseplate Assembly into the proximal tibia (Fig. 60).

Ensure the cement is pressurized into the bone.

Surgical Pearl: Proper cement technique is essential to achieve long-term survivorship.³² Use a scalpel to cut the excess cement around the implant before removing it with a curette. This technique helps retain the cement mantle under the baseplate on sclerotic bone.

Remove the Tibial Impactor Head from the Modular Impaction Handle and replace it with the Femoral Impactor Head. Implant the femur using the Femur Impactor Assembly, the Femur Extractor/Impactor, or the Notch Impactor (Fig. 61). Ensure that proper alignment is maintained in extension and the Femur is fully seated. If cementing, remove excess cement.

Remove the Femoral Impactor Head from the Modular Impaction Handle and replace it with the Tibial Insert Impaction Head. Lightly impact with a mallet to engage the Tibial Insert locking mechanism using the Tibial Insert Impactor Assembly (Fig. 62).

Insert the Tibial Insert Set Screw into the hole in the Tibial Insert and tighten it with a 3.5mm Hex Screwdriver until it bottoms out (Fig. 63).

Do not apply excessive force.

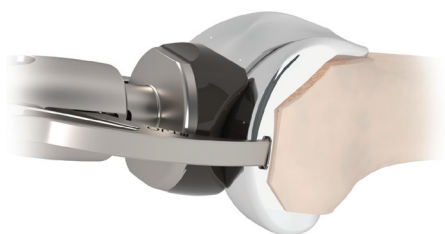


Fig. 61: Impact the Klassic® PS-Post® Femur



Fig. 62: Engage the Klassic® Tibial Insert locking mechanism



Fig. 63: Engage the Tibial Insert Set Screw

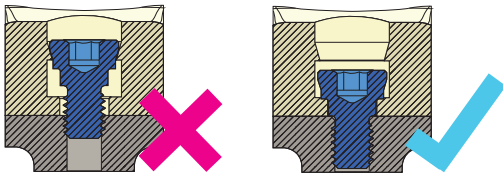


Fig. 64: Proper insertion of the Tibial Insert Set Screw

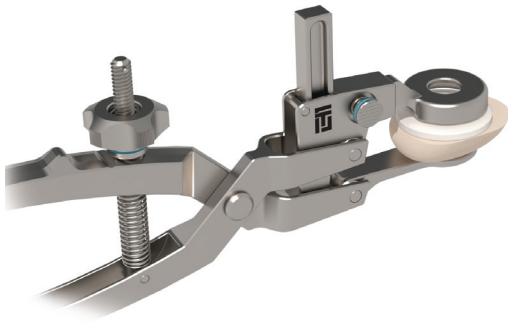


Fig. 65: Implant the Klassic® Patella with the Patella Clamp

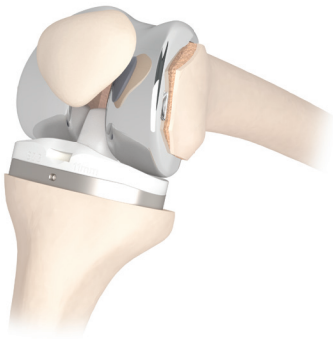


Fig. 66: Check the range of motion and ligament stability

The anti-backout feature of the Tibial Insert will provide some resistance while tightening the Screw; completely bottom out the Screw with the Baseplate to ensure that it is tightened appropriately (Fig. 64).

Surgical Pearl: To disengage the locking mechanism on the Tibial Insert, simply remove the Set Screw using the 3.5mm Hex Screwdriver (standard large frag) and place a .50in osteotome in the anterior aspect of the polyethylene (after the bone cement has cured) and lift upward on the polyethylene to release the Baseplate locking mechanism without damaging the Baseplate itself.

Note: Additional Tibial Insert Set Screws are packaged separately for revision use or in the event the enclosed screw is dropped.

The Klassic® CR/Congruent, Ultra-PS®, and All-Poly Tibia Inserts are not compatible with the Klassic® PS-Post® Femur.

Remove the Modular Patella Sizer/Drill Guide from the Patella Clamp, and replace it with the Patella Cement Clamp Tip. Implant the patella by lining up the patellar pegs with the previously drilled holes and tightening the Patella Clamp (Fig. 65).

Reduce the joint, ensure that components are fully seated, and check the range of motion and ligament stability again (Fig. 66). Measure the final patellar thickness and ensure proper patellar tracking.

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WARNINGS AND PRECAUTIONS

Please refer to the Total Joint Orthopedics Klassic® Knee System Instructions For Use at tjoinc.com/ifu for warnings, precautions, adverse effects, and other essential product information.

Total Joint Orthopedics, Inc.
1567 East Stratford Ave.
Salt Lake City, Utah 84106
888.890.0102 tjoinc.com

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