ZIMMER BIOMET
Your progress. Our promise.®

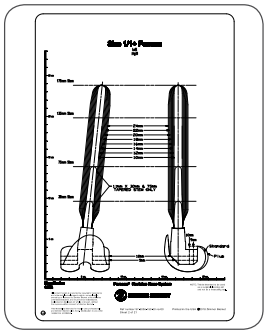
Persona® Revision Knee System

Surgical Technique

Table of Contents

Appendices

Quick Reference:
Abbreviated Surgical Technique



Step 1:
Optional Preoperative Templating

Step 2:
Tibial Canal Preparation

Step 3:
Optional Proximal Tibial Resection

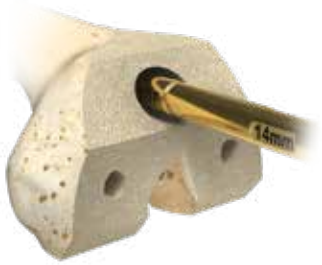
Step 4:
Tibial Sizing and Positioning

Step 5:
Tibial Stem Housing Preparation

Step 6:
Keel Preparation

Step 7:
Tibial Provisional Assembly and Insertion

Step 8:
Optional Tibial Augment Preparation



Step 9:
Femoral Canal Preparation

Step 10:
Optional Distal Femoral Resection and Augment Preparation

Step 11:
Optional Femoral Sizing and Positioning

Step 12:
Femoral Stem Housing Preparation

Step 13:
Femoral Provisional Assembly and Insertion

Step 14:
Trial Reduction (TASP)

Step 15:
Femoral Box Cut

Step 16:
Patella Resurfacing

Step 17:
Final Trialing

Step 18:
Implant Assembly

Step 19:
Two Stage Cementing Technique

Step 20:
Bearing Assembly and Insertion

Step 21:
Close Incision

Quick Reference:

Instrumentation Overview

Note: Do not use implants and/or instruments from other knee systems unless expressly labeled for such use.

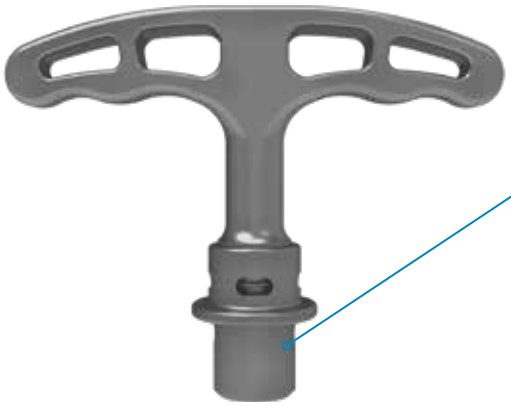
Note: Do not use implants and/or instruments from the Persona Revision Knee System with other knee systems unless expressly labeled for such use.

Quick Connect (QC) Handle

Attaches to:

- Tibial and femoral impactor pads
- Tibial central and perimeter cone impactor heads
- Femoral central and metaphyseal cone impactor head
- Persona Primary Femoral 4-in-1 Cut Block

T-Handle



Attaches to:

- Canal Reamers
- Stem extension post
- Broach pilot adapter
- Cannulated reamers
- Tilt reamers
- 5 mm hex driver
- Tapered stem drill bits

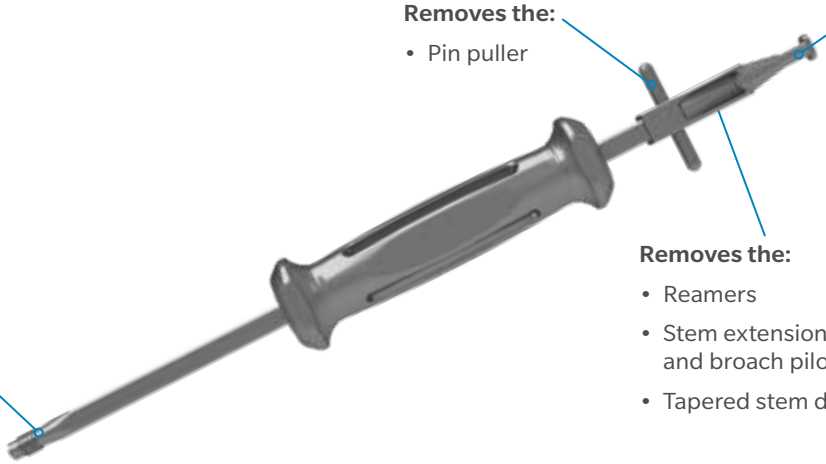
Slap Hammer

Removes the:

- Pin puller

Removes the:

- Tibial and femoral provisionals
- Persona Primary Femoral 4-in-1 Cut Block
- Cone provisionals



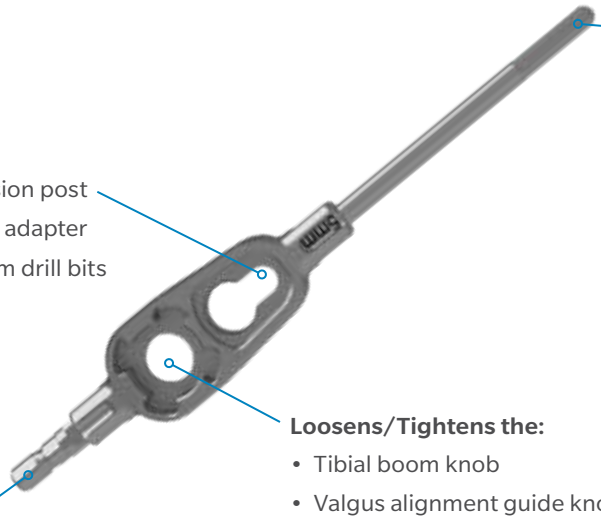
Attaches to:

- Stem extractor
- Stem provisionals

Removes the:

- Reamers
- Stem extension post and broach pilot adapter
- Tapered stem drill bits

5 mm Hex Driver



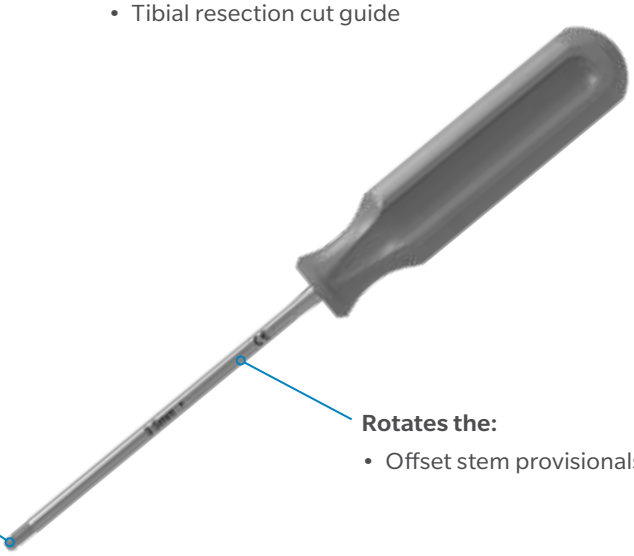
Fastens the:
- Tibial and femoral provisional components to stem provisionals
- Tibial and femoral cone drill guides to the stem extension post
- Femoral straight and offset reamer adapters to the reamer
- Femoral/sizing cut guide adapters to the cut guide

Removes the:
- Reamers
- Stem extension post
- Broach pilot adapter
- Tapered stem drill bits

Loosens/Tightens the:
- Tibial boom knob
- Valgus alignment guide knob
- Tibial resection cut guide

Attaches to:
- T-Handle

3.5 mm Hex Driver

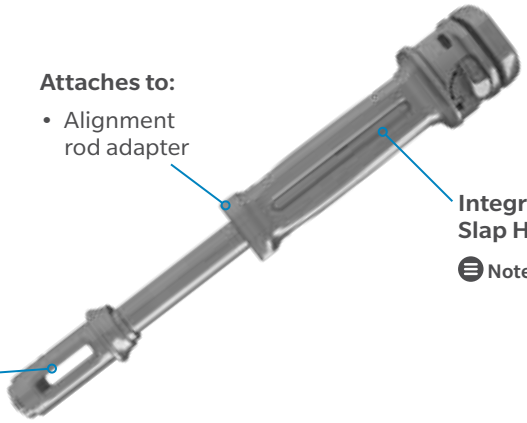


Fastens the:
- TASP locking screw
- Tibial and femoral augment implant screws

Rotates the:
- Offset stem provisionals

Diaphyseal Referencing (DR) Handle

Note: Do not use over a canal reamer. The DR handle passes over the stem extension post or broach pilot adapter.



Attaches to:
- Alignment rod adapter

Integrated Slap Hammer

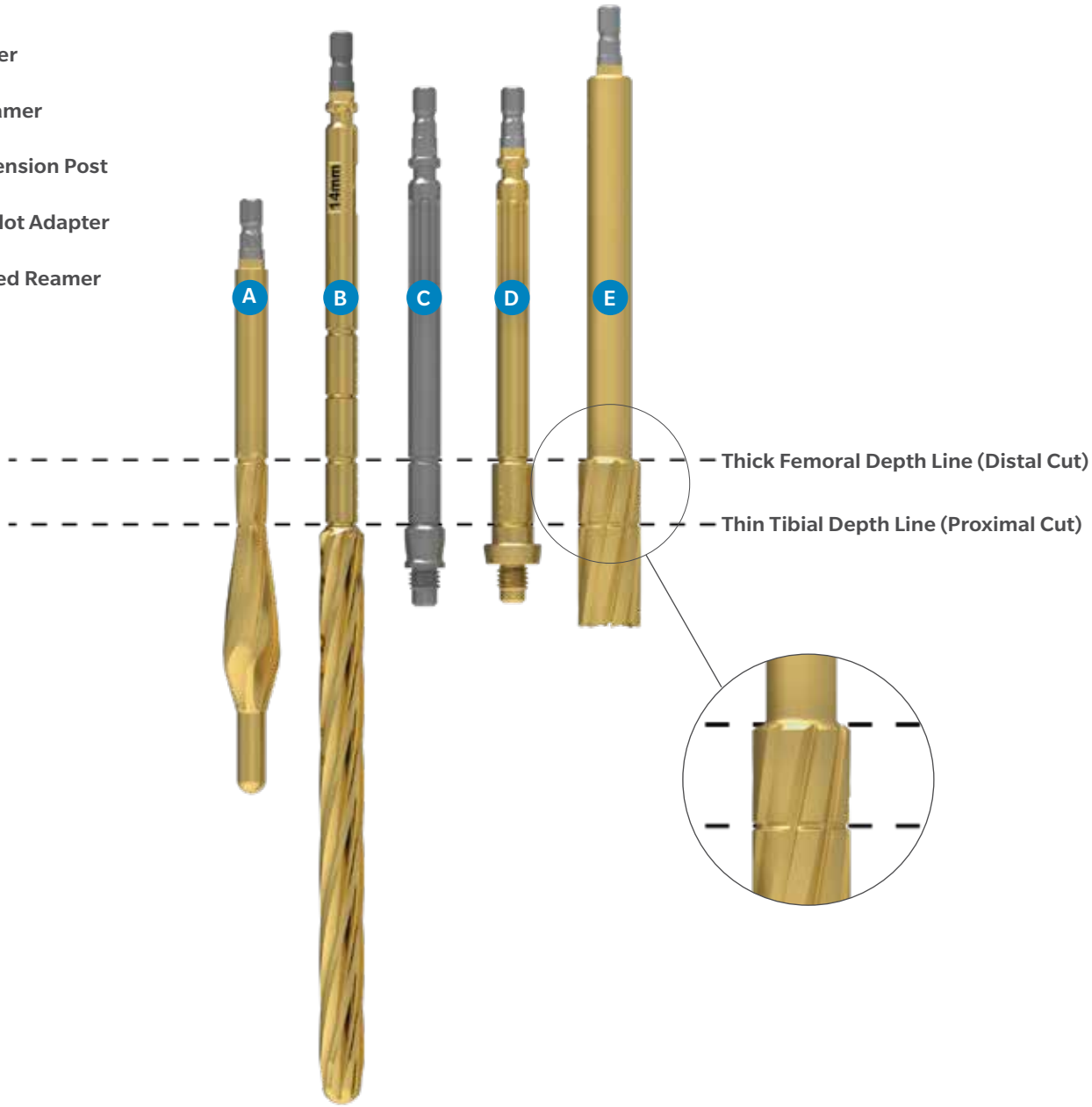
Note: Can be locked in the up or down position using lock/unlock lever

Attaches to:
- Gold cone broaches
- Silver cone broaches
- Tibial keel broaches

Instrumentation Overview (cont.)

Femoral/Tibial Depths

- **A** Tilt Reamer
- **B** Canal Reamer
- **C** Stem Extension Post
- **D** Broach Pilot Adapter
- **E** Cannulated Reamer



Device Description

The Persona Revision Knee System is designed for use in both complex primary and revision arthroplasty. Persona Revision Knee System is a constrained revision knee prosthesis consisting of anatomically designed components including:

- Femoral Components
- Articular Surfaces (Bearings)
- Tibial Baseplates
- Stem Extensions
- Femoral and Tibial Augments
- Femoral and Tibial Trabecular Metal™ Cones

Optional Preoperative Templating

Obtain a 36 inch or 53 inch standing anteroposterior and lateral radiograph of the extremity, as well as a sunrise view of the patella. Utilize the supplied surgical templates to preoperatively plan for necessary implants (Figure 1).

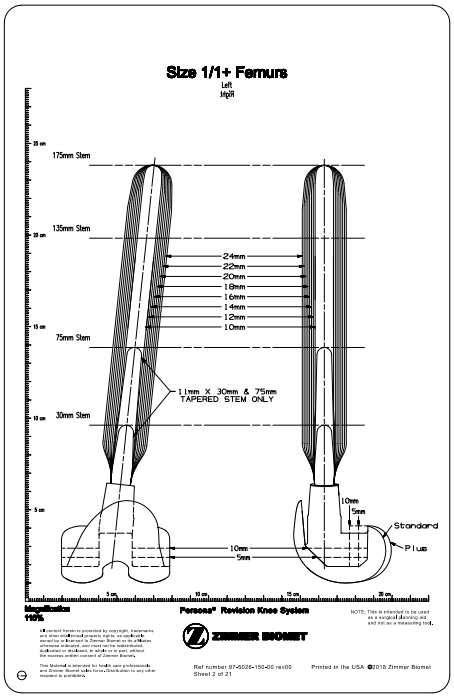


Figure 1

Patient Preparation

If desired, provide a thigh tourniquet and inflate with the knee in hyperflexion to maximize the portion of the quadriceps that is below the level of the tourniquet. Once the patient is draped and prepped on the operating table, determine the landmarks for the surgical incision (Figure 2).

Figure 2

Surgical Approach and Exposure

Exposure should be performed by the surgeon's preferred approach. Typically the approach is made through the previous incision. Care should be taken to avoid avulsion of the patellar tendon. Various extensile exposures may be utilized including an extended medial parapatellar arthrotomy, quadriceps snip, quadriceps turn down and tibial tubercle osteotomy. Depending on surgeon preference, the patella can be either everted or subluxed laterally.

Component Removal

Femoral Removal

Fully flex the knee and remove the bearing, allowing greater access to the implant/cement interface of both the femur and tibia. Disrupt the femoral implant/bone interface with flexible osteotomes or thin saw blades with an oscillating saw. Once the prosthetic bone interface is loosened, a femoral extraction tool may be used to aid in removal of the femoral component from the bone. If there is still a great deal of resistance in removing the femoral component, attention should be redirected to the prosthetic cement bone interface and thin flexible osteotomes should be reinserted to further loosen the component.

Note: In the case of a porous component, disrupt the bone/implant interface using a gigli saw, thin blade of a reciprocating saw or flexible osteotomes.

Tibial Removal

Disrupt the cement along the tibial plateau with a thin blade reciprocating saw prior to using a mallet and extraction device. In the case of stemmed components, remove screws, if equipped, and disengage the tapers. This allows for direct access to the stem once the tibial component is removed. Once access to the stem is achieved, disrupt the cement interface around the stem with either osteotomes or a pencil-tipped high-speed burr. Then attempt to remove the stem. Prior to tibial or femoral preparation, remove all existing cement and complete a full debridement.

Preliminary Flexion and Extension Gap Analysis

Figure 3

The spacer blocks may be used to assess flexion and extension gaps. The spacer block represents the combined thicknesses of the tibial baseplate, bearing and femoral component. The size labeled on the spacer block represents the bearing thickness needed to balance the flexion/extension gaps.

Start by inserting the spacer block into the joint. Check flexion and extension gaps. Increase the thickness of the spacer blocks until the desired thickness is achieved (Figure 3).

Figure 4

Note: Spacer blocks are offered in 10–18 mm in 2 mm increments. A +10 mm spacer block adapter is available to increase the thickness of the spacer block to represent the 20, 22, 24 and 26 mm bearings. For example, to increase the thickness of the 10 mm spacer block to 22 mm, insert the post of the +10 mm adapter block into the pocket of the 12 mm spacer block (Figure 4).

Tibial Preparation

Figure 5

Figure 6

Figure 7

Tibial Intramedullary Canal Preparation

Stem Type	Stem Length (mm)	Diameters (mm)	Offset
Smooth	+135/+175	10– 24 Even Sizes Only	Straight Only
Splined	+135/+175	10–18, 20, 22, 24	Straight, 3 mm, 6 mm
Tapered	+30/+75	11, 14	N/A

Note: + in addition to stem housing

Note: For specific tapered stem preparation steps, proceed with the standard technique until the Tibial Stem Housing Preparation section on page 15. Then proceed to Appendix A for Tapered Stem Preparation steps on page 49.

Fully flex the knee and locate the canal position of the tibia. Use the 8 mm stepped drill bit to create a medullary canal entry hole, if necessary (Figure 5).

Canal Preparation and Alignment

If desired, alignment may be checked while reaming. To assist with proper reamer alignment, attach the alignment rod with coupler to the reamer alignment guide and connect to the reamer post (Figure 6).

Note: The guide is designed with a slip fit in order for it to remain in place while reaming.

Using a T-handle or power, ream the tibial intramedullary canal to the appropriate depth, progressively increasing the reamer diameter size until cortical chatter is achieved. The Persona Revision Reamer shafts are marked with the minimum ream depth marks to prepare for a 135 mm or 175 mm stem extension implant for the tibia and femur respectively (Figure 7). A "T" indicates the line for the proximal tibial resection plane and a "F" indicates the distal femoral resection plane.

Leave the final reamer diameter used in the tibial canal for proximal tibial resection, if necessary.

Note: The Persona Revision Tibial Baseplates are designed with a 0° cut slope. Take caution while reaming. The weight of a drill can push the reamer into flexion.

Record the diameter and the tibial stem length reamed.

Figure 8

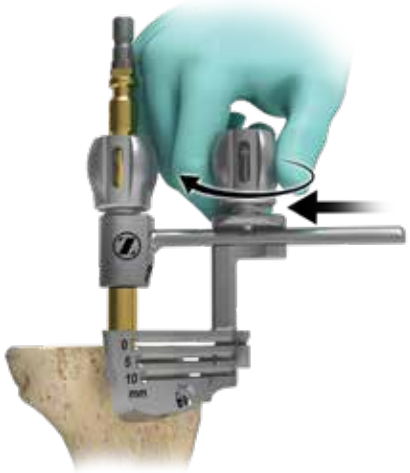


Figure 9

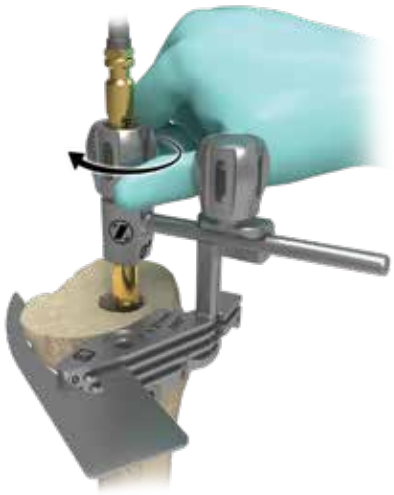


Figure 10

Optional Proximal Tibial Resection

Assess the remaining proximal tibial bone. Remove the least amount of bone necessary to provide for a stable tibial provisional construct.

Optional Proximal Tibial Bone Preparation

If the tibial bone needs to be resected, slide the IM tibial resection boom over the reamer (Figure 8). Attach the "Left" or "Right" tibial resection cut guide to the IM tibial resection boom. Secure by tightening the tibial resection cut guide knob in a clockwise direction (Figure 9).

Use the resection guide (angel wing) to determine the amount of bone to resect. Adjust the height and rotation of the tibial resection cut guide by moving the IM tibial resection boom. Secure by tightening the tibial resection boom knob in a clockwise direction (Figure 10).

- **Note:** Alternatively, the 2/10 mm tibial stylus can be used to determine the amount of bone to resect.
- **Note:** If excessive bone was resected, ream distally until the tibial line is flush with the new proximal tibial surface.

Figure 11

Figure 12

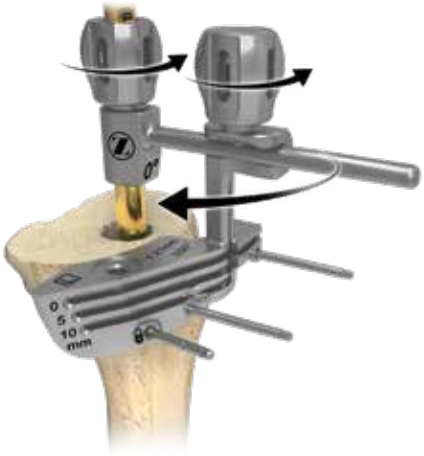


Figure 13

Optional Proximal Tibial Resection (cont.)

If necessary, pin the tibial resection cut guide to the tibia (Figure 11). Cut the tibia through the top slot on the tibial resection cut guide (Figure 12).

If desired, the tibial resection boom and reamer can be removed if additional space is needed. To remove, loosen the tibial resection cut guide knob and the tibial resection boom knob in a counterclockwise direction (Figure 13). To remove the construct, rotate the tibial resection boom medially and attach the slap hammer or T-handle to the reamer and extract (Figure 14).

Note: The pocket of the 5 mm hex driver can be used if the knobs cannot be loosened by hand.

Figure 14

Figure 15

Figure 16

Optional Proximal Tibial Cut (cont.)

Optional Tibial Augment Resection

If a tibial augment is necessary, use the resection guide (angel wing) to estimate the amount of bone resection needed to establish a supportive plateau through the tibial cut guide augment slots.

Use a reciprocating saw to make the vertical augment resection through the cut guide to the planned depth (Figure 15). Use an oscillating saw to make a 5 mm or 10 mm bone resection (Figure 16). Remove the instruments and finish cuts if needed.

Note: If two 10 mm or 15 mm tibial augments are being utilized, they will cover the fins of the keel reducing rotational resistance. Consider using a Trabecular Metal Cone to restore rotational resistance.

Note: Tibial augment resection can also be prepared using the tibial augment cut guide at a later stage in the surgical procedure in the Optional Tibial Augment Resection section on page 20.

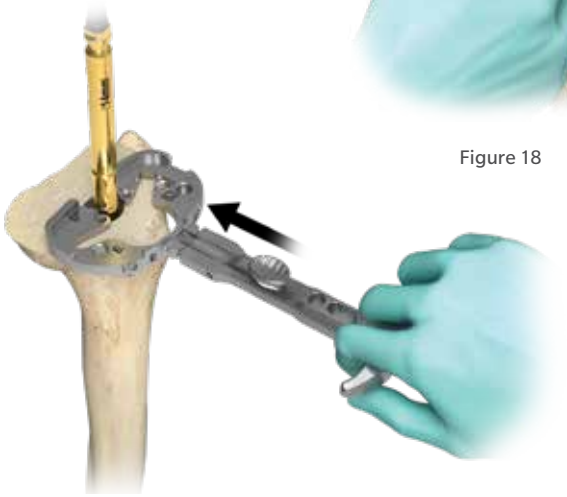


Figure 17

Figure 18

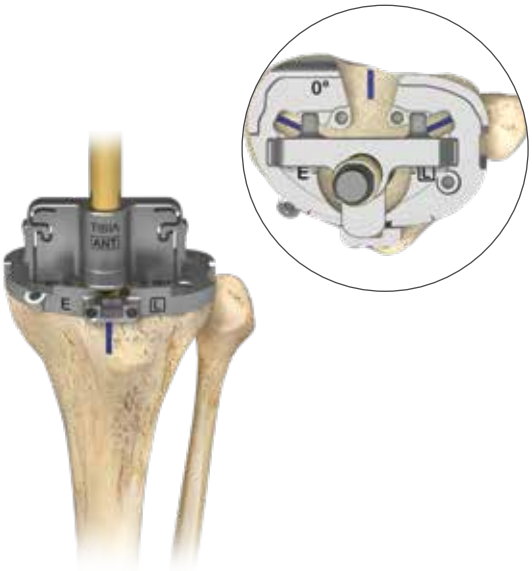


Figure 19

Tibial Sizing and Positioning

Reinsert the reamer, if necessary.

Straight Stem Preparation

Select the estimated "Left" or "Right" tibial sizing plate that provides the desired tibial coverage and rotation. Attach the tibial sizing plate to the TASP handle for easier handling and estimate size, rotation and coverage (Figure 17).

Once tibial size has been confirmed, attach the straight stem reamer adapter to the tibial sizing plate and slide over the reamer. Confirm that the "ANT" marking on the straight stem reamer adapter is facing anterior (Figure 18). If coverage and rotation using the straight stem reamer adapter are not adequate, choose another tibial size or the use of an offset stem may be required.

Note: If an offset stem is required, proceed to the Offset Stem Preparation section on page 14.

If an offset stem is not required, ensure optimal tibial coverage and rotation and remove the TASP handle. Mark tibial rotation and the keel fins. The medial 1/3rd of the tibial tubercle can be used as a reference for tibial rotational alignment (Figure 19).

Note: It is important to mark the fins to align for the keel. Tibial rotation cannot be adjusted after the keel has been prepared.

Remove the reamer using the slap hammer or T-handle, if necessary.

Proceed to the Tibial Stem Housing Preparation section on page 15.

Note: If the use of a tapered stem is necessary, proceed to Appendix A: Tapered Stem Preparation section on page 49.

Figure 20

Figure 21

Figure 22

Tibial Sizing and Positioning (cont.)

Offset Stem Preparation

Note: Offset stems are available in the splined configuration only.

The offset stem reamer adapter has two holes, one for 3 mm offset and one for 6 mm offset (Figure 20). Once the tibial size has been estimated, insert the offset stem reamer adapter to the tibial sizing plate and slide over the reamer. Confirm that the "ANT" marking on the offset stem reamer adapter is facing anterior (Figure 21).

Rotate the tibial offset stem reamer adapter until the preferred offset is achieved which provides the best tibial plateau coverage while maintaining rotational alignment (Figure 22). Resize the tibia, if necessary.

Note: The numbers on the tibial offset stem reamer adapter determine the selected offset direction of the tibia with respect to the stem.

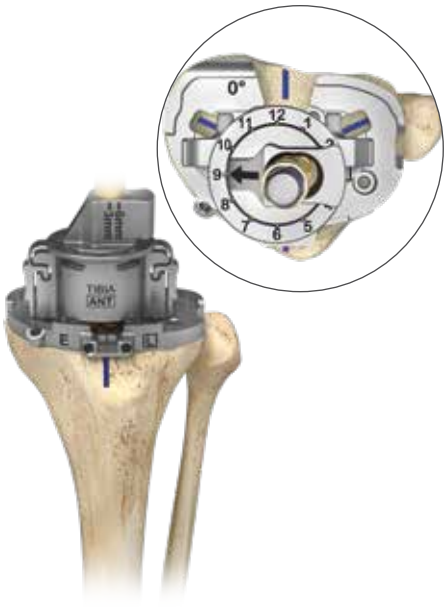


Figure 23

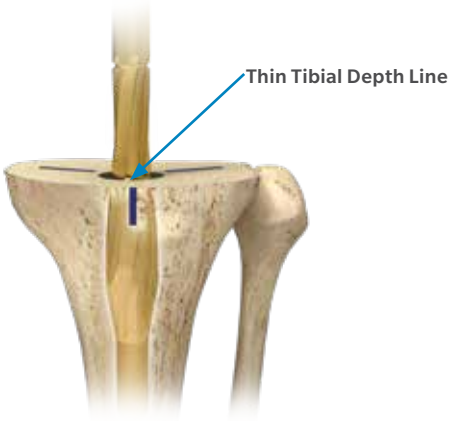


Figure 24

Tibial Sizing and Positioning (cont.)

Ensure optimal tibial coverage and rotation and remove the TASP handle. Mark tibial rotation and the keel fins. The medial 1/3rd of the tibial tubercle can be used as a reference for tibial rotational alignment (Figure 23).

Note: It is important to mark the fins to align for the keel. Tibial rotation cannot be adjusted after the keel has been prepared.

Remove the reamer using the slap hammer or T-handle, if necessary.

Tibial Stem Housing Preparation

Straight Stem Preparation Only

If the planned stem size has a diameter less than 16 mm, the bone must be cleared to accommodate the tibial stem provisional. The 16 mm tilt reamer can be used for this purpose. Drive the tilt reamer in the tibial canal until the thin tibial line is level with the most proximal tibial resection (Figure 24).

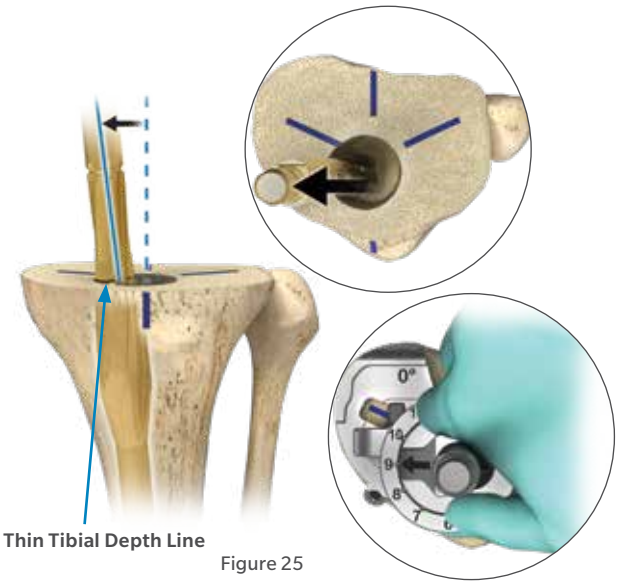
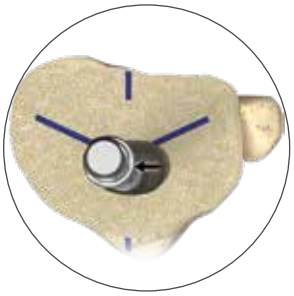


Figure 25

Figure 26

Figure 27

Figure 28



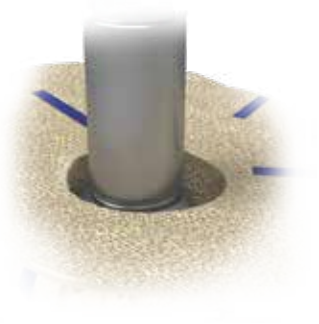


Figure 29

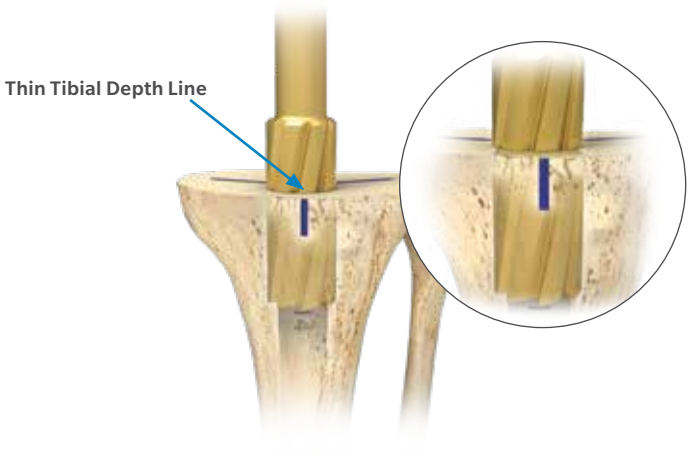


Figure 30

Tibial Stem Housing Preparation (cont.)

Offset Stem Preparation Only

Use a tilt reamer to clear out bone for the offset transition. Drive the tilt reamer in the tibial canal until the thin tibial line is level with the tibial plateau. Tilt the tilt reamer in the same direction as the arrow of the offset stem reamer adapter to remove the necessary amount of bone for a 3 mm or 6 mm offset stem (Figure 25).

Straight and Offset Stem Housing Preparation

Assemble the appropriate diameter, length, straight or offset stem provisional based on the last sized reamer used to the stem extension post and insert into the tibia by hand or with the T-handle (Figures 26 and 27).

Note: The stem provisionals are designed with a tight fit and may require being tapped into the canal until the tibial depth line of the stem extension post is level with the tibial plateau.

If an offset stem is utilized, make sure to align the line of the offset number previously determined anteriorly while inserting (Figure 28).

Verify that the tibial depth line on the stem extension post is level or distal to the highest point of the resected tibial plateau (Figure 29). Ensure the stem extension post is stable in the canal. Tap into place, if necessary. Ream for the tibial stem housing by placing the 19.5 mm cannulated reamer (22.5 mm cannulated reamer for tibial cone use) over the stem extension post. Start power prior to bone contact and ream until the thin tibial line on the reamer is aligned with the proximal tibial plane (Figure 30).

Note: If medial or lateral augments are being utilized, leave the extension post proud to the corresponding thickness.

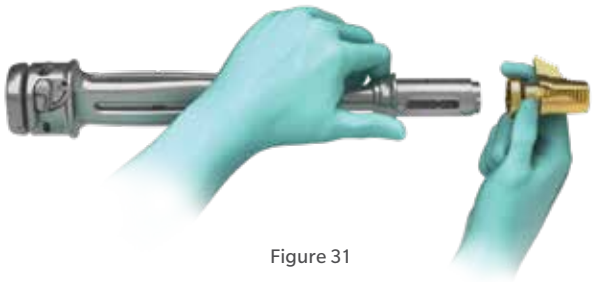


Figure 31

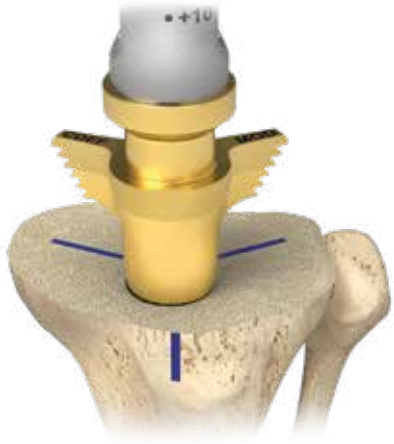


Figure 32

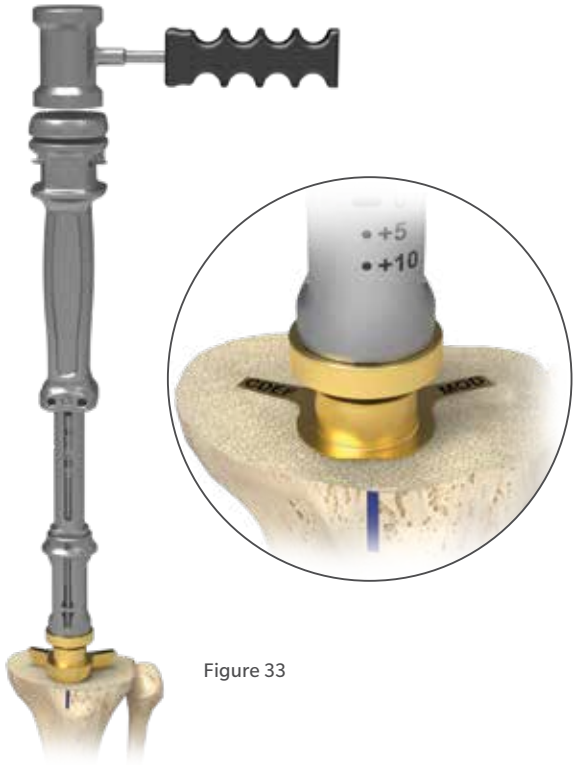


Figure 33

Keel Preparation

Attach the appropriately sized keel broach to the DR handle by pulling back the lever on the handle and rotating until locked (Figure 31).

Place the tibial keel broach over the stem extension post and align with the marks made on the tibial plateau previously for the keel fins (Figure 32). Impact the tibial keel broach using a mallet (Figure 33). The broach is fully seated when the top of the fins are level with the tibia plateau.

Note: Silver keel broaches are only used for fixed keel provisionals (not kitted).

Note: If two tibial augments are being utilized to build up the construct, the top of the broach should be level with where the anticipated tibial baseplate will sit.

Note: The 0, +5 and +10 marks on the DR handle are for femoral use only.

Note: If a Trabecular Metal Tibial Cone is required, proceed to Appendix B: Tibial Central Cone Preparation section on page 50. To prepare the tibia for a perimeter cone, reference the Persona Revision Large Defect Surgical Technique 2723.1-GLBL-en for surgical steps.

Remove all provisional components from the tibial canal. If the construct is difficult to remove or cannot be removed by hand, use the slap hammer to retrieve.

Figure 34

Figure 35

Figure 36

Figure 37

Tibial Baseplate Provisional Assembly and Insertion

Note: If planning to prepare for an augment while trialing, proceed with building the tibial provisional construct without the keel provisional.

Disassemble the stem provisional from the stem extension post and select the tibial baseplate provisional that matches the same size tibial sizing plate used. Select the tibial keel provisional that matches the tibial size. Place the keel provisional onto the tibial baseplate provisional aligning the fins with the tabs on the underside of the tibial baseplate provisional (Figure 34). Attach the stem provisional to the tibial baseplate provisional. Hold the baseplate screw in place with your index finger and rotate the stem provisional in a clockwise direction (Figure 35). Use the 5 mm hex driver for final tightening (Figure 36).

Note: The fixed keel provisional (not kitted) does not have a modular keel attachment. No keel assembly is required.

If an offset stem provisional is used, ensure the offset number determined previously is aligned with the anterior mark on the tibial keel provisional or the stem housing on the tibia provisional (Figure 37). Rotate to the planned offset, then lockdown using the 5 mm hex driver.

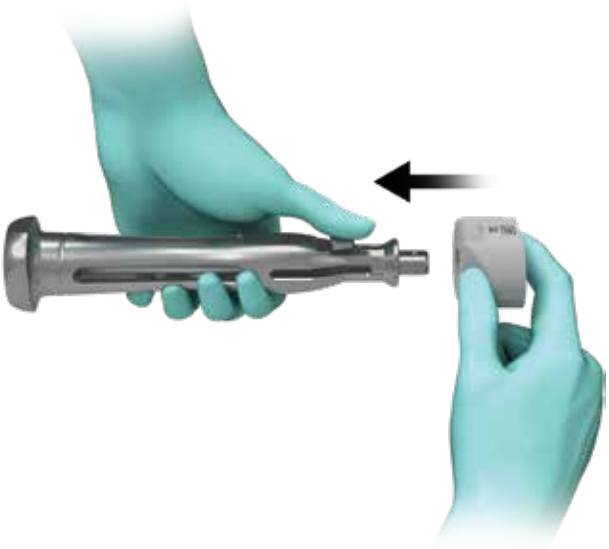


Figure 38

Figure 39

Figure 40

Tibial Baseplate Provisional Assembly and Insertion (cont.)

Assemble the tibial impactor pad to the QC handle (Figure 38). Insert the tibial construct in the tibial canal while ensuring proper rotation. Impact the construct until fully seated (Figures 39 and 40).

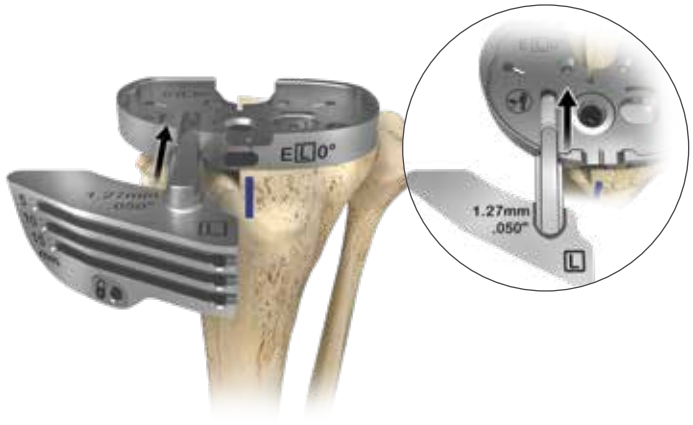


Figure 41

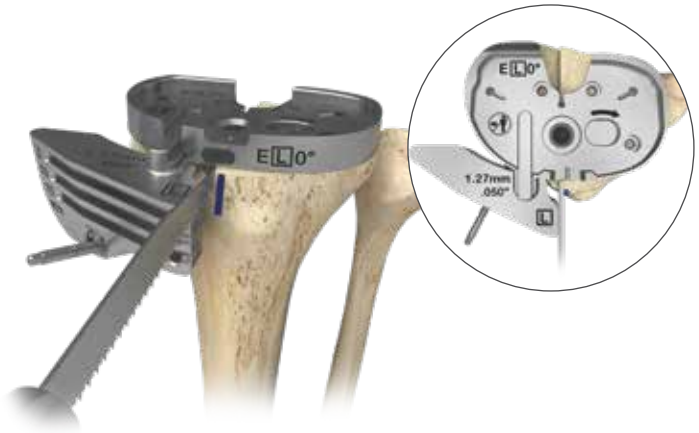


Figure 42

Figure 43

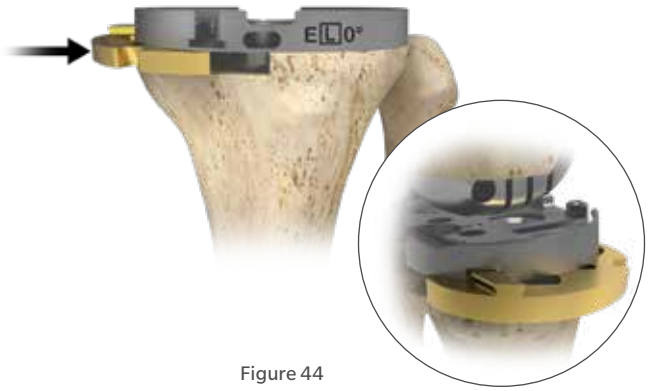


Figure 44

Optional Tibial Augment Resection

Note: The keel provisional should not be assembled at this time.

Tibial augments are available in medial and lateral sides and offered in 5, 10 and 15 mm thicknesses.

With the tibial provisional in the canal, insert the appropriate "Left" or "Right" tibial augment cut guide into the medial slot of the tibial baseplate provisional (Figure 41). If necessary, pin the cut guide to the tibia. The tibial augment cut guide has three slots which correspond to a 5, 10 and 15 mm augment cut. Cut through the appropriate augment slot and make a preliminarily transverse cut based on the desired augment thickness (Figure 42). Mark or score the sagittal cut plane along the lateral side of the guide and the posterior notch of the tibia provisional to finish the cut when the provisional is removed (Figure 43). Remove the tibial augment cut guide and all provisional components and complete the remaining bone cuts. Reassemble the tibial construct with the keel provisional and stem provisional.

Once assembled, insert the tibial augment provisional/s (Figure 44).

If a lateral augment needs to be prepared, select the opposite augment cut guide and insert it into the medial slot which will provide some level of guidance for the resection. The lateral augment cuts will need to be carefully completed with the tibial provisional removed.

Note: If two 10 mm or 15 mm tibial augments are being utilized, they will cover the fins of the keel reducing rotational resistance. Consider using a Trabecular Metal Cone to restore rotational resistance.

Note: If preparing the tibial bone to be used with a Trabecular Metal Augment, ensure the bone opposing surface of the Trabecular Metal Augment will make contact with the resected tibia.

Femoral Preparation

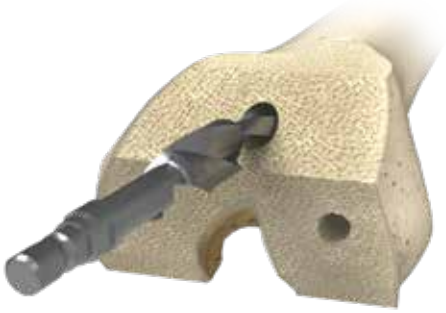


Figure 45

Figure 46

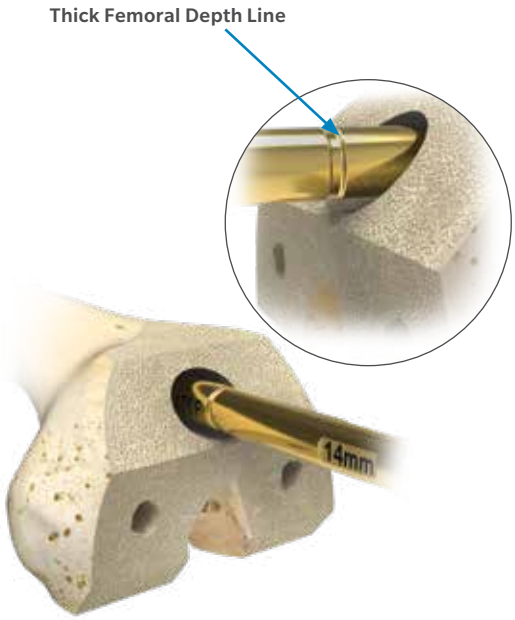


Figure 47

Femoral Intramedullary Canal Preparation

Stem Type	Stem Length (mm)	Diameters (mm)	Offset
Smooth	+135/+175	10– 24 Even Sizes Only	Straight Only
Splined	+135/+175	10–18, 20, 22, 24	Straight, 3 mm, 6 mm
Tapered	+30/+75	11, 14	N/A

Note: + in addition to stem housing

Note: For specific tapered stem preparation steps, proceed with the standard technique until the Femoral Stem Housing Preparation section on page 25. Then proceed to Appendix A for Tapered Stem Preparation steps on page 49.

Fully flex the knee and locate the canal position of the femur. Use a 8 mm stepped drill bit to create a medullary canal entry hole, if necessary (Figure 45).

Canal Preparation and Alignment

If desired, alignment may be checked while reaming. To assist with proper reamer alignment, attach the alignment rod with coupler to the reamer alignment guide and connect to the reamer post (Figure 46).

Note: The guide is designed with a slip fit in order for it to remain in place while reaming.

Point the reamer alignment rod with coupler along the anatomical axis of the femur. Using a T-handle or power, ream the femoral intramedullary canal to the appropriate depth, progressively increasing the reamer diameter size until cortical chatter is achieved. The Persona Revision Reamer shafts are marked with the minimum ream depth marks to prepare for a 135 mm and 175 mm stem extension implant for the tibia and femur respectively (Figure 47). A "T" indicates the line for the proximal tibial resection plane and a "F" indicates the distal femoral resection plane.

Leave the final reamer diameter used in the femoral canal for optional distal femoral resection.

Note: Take caution while reaming as the weight of a drill can push the reamer into flexion.

Record the diameter and the femoral stem length reamed.

Figure 48

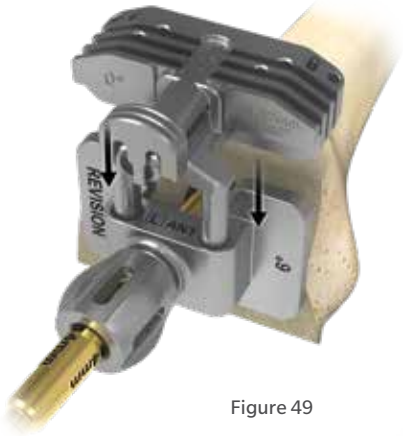


Figure 49

Figure 50

Figure 51

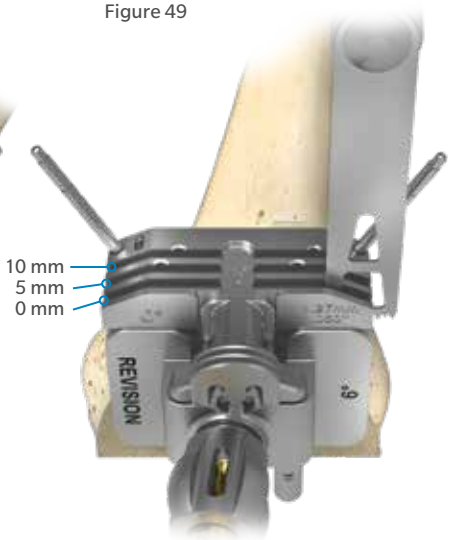


Figure 52

Optional Distal Femoral Resection

Depending on the available femoral bone stock and surgical approach, it may be necessary to correct the distal femoral resection.

With the reamer in the femoral canal, insert the 6 degree valgus alignment guide over the reamer and tighten against the distal femoral bone. Ensure the proper "Left" or "Right" engraving is facing anterior (Figure 48). Next, attach the resection tower to the distal cut guide and slide into the 6 degree valgus alignment guide (Figure 49). Prior to pinning the distal cut guide, confirm the location of the cut with the resection guide (angel wing) through the 0 mm cut slot (Figure 50). After the location has been confirmed, pin the distal cut guide and resect the minimum amount of femoral bone through the 0 mm cut slot (Figures 51 and 52).

Note: The 0 mm cut slot is designed to provide a clean up cut.

Remove all components leaving the reamer in place.

Optional Distal Femoral Augment Resection

The +5 and +10 mm cut slots are available for augment preparation. If preparing for an augment on one side, you must also cut through the 0 mm cut slot on the opposite side not receiving the augment (Figure 52).

Note: Distal augments can also be cut using a femoral provisional at a later stage in the surgical procedure.

Figure 53

Figure 54

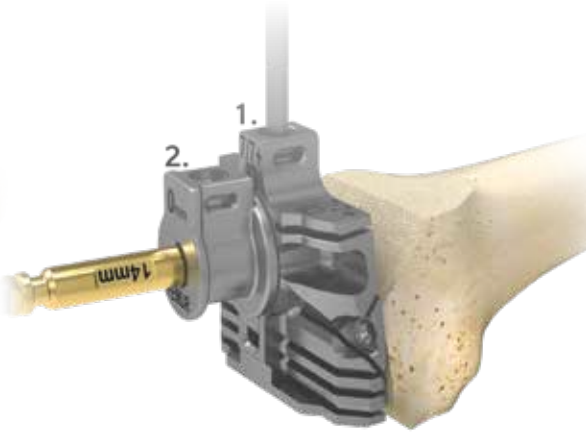


Figure 55

Optional Femoral Sizing and Positioning

Straight Stem Preparation

The femoral sizing/cut guide and straight stem reamer adapter may be used to determine femoral size, position and rotation. If bony resections are necessary, select the appropriate femoral sizing/cut guide that provides the desired A/P and M/L femoral coverage and rotation while avoiding femoral overhang. Attach the straight stem reamer adapter to the femoral sizing/cut guide (Figure 53).

Note: Use the 5 mm hex driver to ensure the set screws in the straight adapter and femoral sizing/cut guide are loose to assist with ease of assembly.

Once assembled, slide the construct over the reamer. The M/L width and shape of the sizing/cut guide matches the equivalent sized femoral implant. Check the coverage of the femoral sizing/cut guide and determine if an offset is required based on overhang and resection assessments.

Note: If an offset stem is required, proceed to the Offset Stem Preparation section on page 24.

The resection guide (angel wing) or epicondylar alignment guide may be utilized to determine femoral rotation adjustments or if cuts are required to accept the femoral provisional (Figure 54). If necessary, the set screws in the straight stem reamer adapter and in the sizing/cut guide can be rigidly locked down (Figure 55).

Note: The straight stem adapter and femoral sizing/cut guide construct has two screws. One locks the straight stem adapter to the sizing/cut guide and one locks the full assembly to the reamer.

Note: If the use of a tapered stem is necessary, proceed to Appendix A: Tapered Stem Preparation section on page 49.

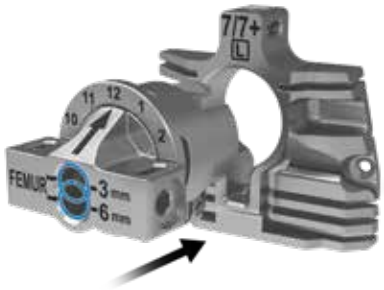


Figure 56

Figure 57

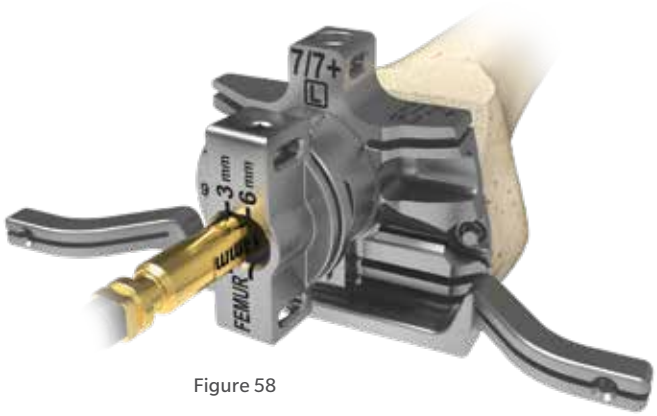


Figure 58

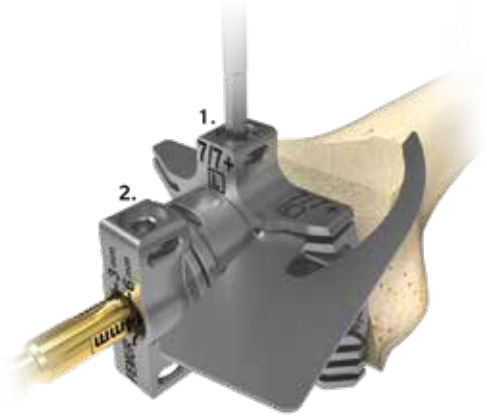


Figure 59

Optional Femoral Sizing and Positioning (cont.)

Offset Stem Preparation

Note: Offset stems are available in the splined configuration only.

The offset stem reamer adapter has two holes, one for 3 mm offset and one for 6 mm offset. Insert the offset stem reamer adapter in the femoral sizing/cut guide and slide over the reamer (Figure 56).

Note: Use the 5 mm hex driver to ensure the set screws in the offset adapter and femoral sizing/cut guide are loose to assist with ease of assembly.

Rotate the offset stem reamer adapter until the preferred offset is achieved which provides the best femoral coverage while maintaining rotational alignment. Resize the femur, if necessary.

Note: The numbers on the offset stem reamer adapter determine the selected offset direction of the femur with respect to the stem (Figure 57).

The resection guide (angel wing) or epicondylar alignment guide may be utilized to determine if femoral rotation needs to be adjusted or if cuts are required to accept the femoral provisional (Figure 58). If necessary, the set screws in the offset reamer adapter and in the sizing/cut guide can be rigidly locked down (Figure 59).

Note: The offset stem reamer adapter and femoral sizing/cut guide construct has two screws. One locks the offset stem adapter to the sizing/cut guide and one locks the full assembly to the reamer.

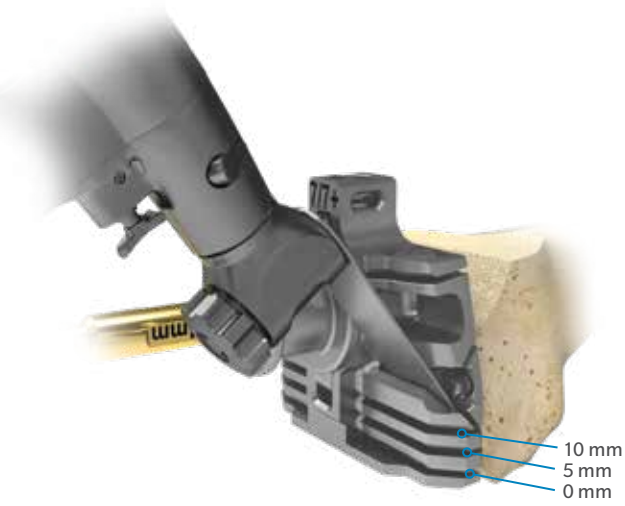


Figure 60

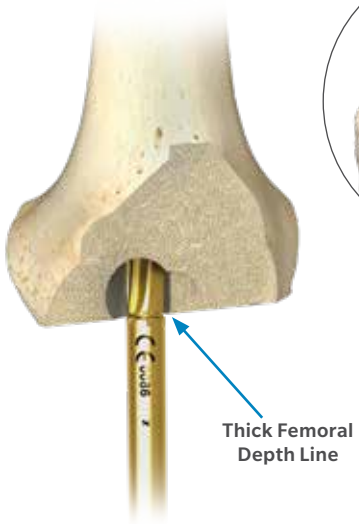


Figure 61

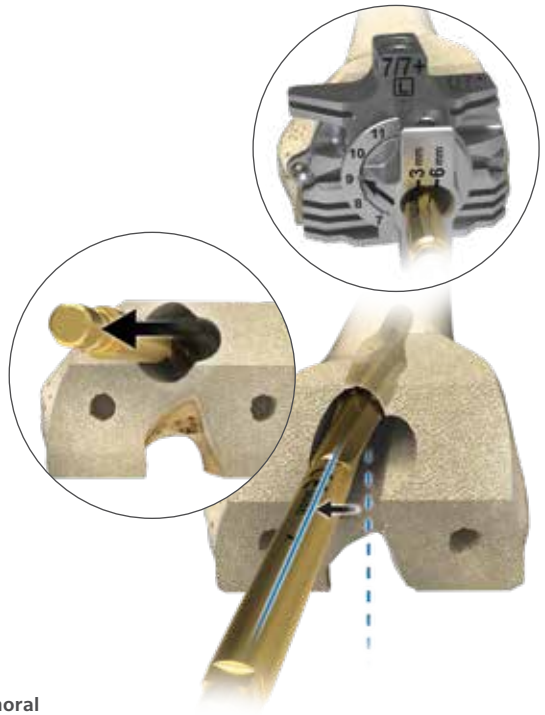


Figure 62

Optional Femoral Rotation or Size Adjustment (4-in-1 Cut Guide)

If the primary knee resections need to be adjusted, the femoral sizing/cut guide can be used to correct the resection.

Note: Assess bone loss to size the femur properly. Sizing to the existing bone may result in undersizing the femoral component. In this case, consider upsizing the femoral component.

While attached to the straight or offset adapter, use an oscillating saw to make the anterior, posterior, anterior chamfer and posterior chamfer cuts (Figure 60).

Note: A narrow neck oscillating blade will provide added clearance for the cuts.

Note: Distal spacers can be used to compensate for missing bone that would need to be replaced with augments.

Optional Posterior Augment Resection

The 5 and 10 mm posterior augment cut slots are available for augment preparation (Figure 60).

Note: Posterior augments can also be cut using a femoral provisional at a later stage in the surgical procedure.

Femoral Stem Housing Preparation

Straight Stem Preparation Only

If the planned stem size has a diameter less than 16 mm, the bone must be cleared to accommodate the femoral stem provisional. The 16 mm tilt reamer can be used for this purpose. Drive the tilt reamer in the femoral canal until the thick femoral line is level with the distal femur (Figure 61).

Offset Stem Preparation Only

Use a tilt reamer to clear out bone for the offset transition. Drive the tilt reamer in the femoral canal until the thick femoral line is level with the distal femur. Tilt the tilt reamer in the same direction as the arrow on the offset stem reamer adapter to remove the necessary amount of bone for a 3 mm or 6 mm offset stem (Figure 62).

Figure 63

Figure 64

Figure 65

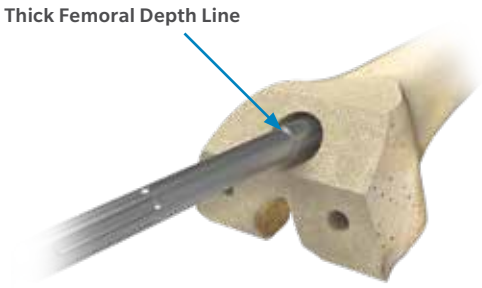


Figure 66

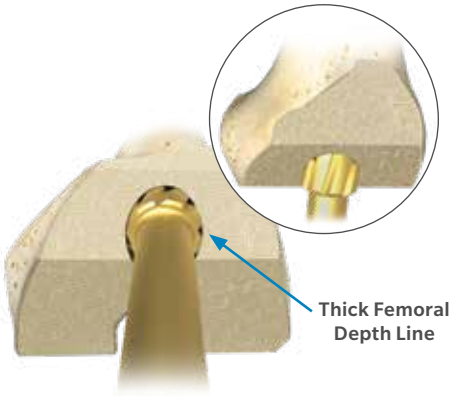


Figure 67

Femoral Stem Housing Preparation (cont.)

Straight and Offset Stem Housing Preparation

Assemble the appropriate diameter, length, straight or offset stem provisional based on the last size reamer used to the stem extension post and insert into the femur by hand or with the T-handle (Figures 63 and 64).

Note: The stem provisionals are designed with a tight fit and may require being tapped into the canal until the femoral depth line on the stem extension post is level with the distal femoral cut.

If an offset stem is utilized, make sure to align the line of the offset number determined previously posteriorly while inserting (Figure 65).

Note: If a Trabecular Metal Femoral Cone is required, proceed to Appendix C: Femoral Central Cone Preparation section on page 54. To prepare the femur for a metaphyseal cone, reference the Persona Revision Large Defect Surgical Technique 2723.1-GLBL-en for surgical steps.

Verify that the femoral depth line on the stem extension post is level or proximal to the distal cut (Figure 66). Ensure the stem extension post is stable in the canal. Tap into place, if necessary. Ream for the femoral stem housing by placing the 19.5 mm cannulated reamer (22.5 mm cannulated reamer for cone use) over the stem extension post. Start power prior to contact and ream until the thick femoral line is level with the distal surface of the femur (Figure 67).

Note: If distal augments are being utilized, leave the extension post proud to the corresponding thickness.

Remove all provisional components from the femoral canal. If the construct is difficult to remove or cannot be removed by hand, use the slap hammer to retrieve.

Figure 68

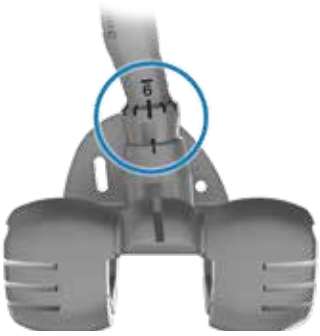


Figure 69

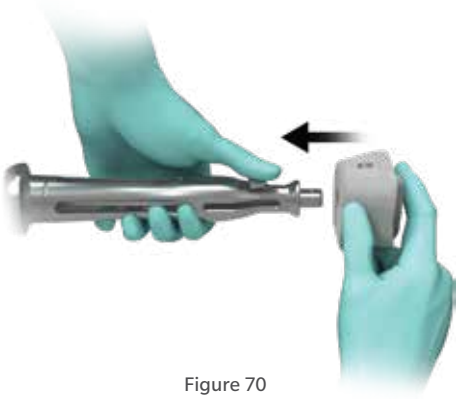


Figure 70

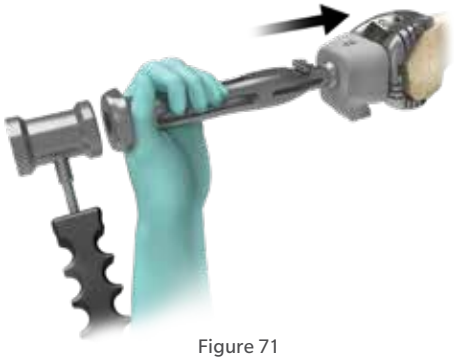


Figure 71

Figure 72

Femoral Provisional Assembly and Insertion

Remove the stem extension post and disassemble the stem provisional. Attach the stem provisional to the femoral provisional by inserting the 5 mm hex driver into the captured screw of the femoral provisional and tighten in a clockwise direction (Figure 68). If using an offset stem provisional, ensure to align the line of the offset number determined previously with the posterior line on the femoral provisional (Figure 69). Insert the femoral provisional construct into the femur by hand.

Note: If necessary, use a rongeur to remove anterior femoral bone between the femoral stem housing and the anterior flange to ensure the femoral provisional fully seats.

Assemble the QC handle and the femoral impactor pad and insert the femoral provisional construct into the femoral bone and impact until fully seated (Figures 70 and 71). Assess femoral rotation using the epicondylar alignment guide with respect to the transepicondylar axis (Figure 72).

Figure 73

Trial Reduction

Use the Posterior Stabilized (PS) Tibial Articular Surface Provisional (TASP) for initial trial reduction to determine flexion and extension gaps. Ensure there is clearance for the PS post in the box region. Excess bone may need to be removed for trialing to function properly. Do not trial with the Constrained Posterior Stabilized (CPS) TASP or Constrained Condylar Knee (CCK) TASP until flexion and extension gaps have been determined and the femoral box has been cut. The CPS and CCK TASPs require the femoral box to be cut which sets femoral rotation.

TASP Assembly

The TASP consists of three parts: the TASP bottom, top and shim. Select the TASP bottom that matches the tibial baseplate provisional. Select the TASP top that matches the same size tibial baseplate provisional and the femoral provisional.

The TASP top is marked to indicate constraint, compatible femurs and compatible tibias. In addition to the markings on the parts, the same colors are used for the mating TASP tops and bottoms. Align the post on the bottom with the pocket on the corresponding TASP top (Figure 73). Select the set of TASP shims that match the selected tibial provisional size.

There are three TASP bottom thicknesses. Reference the chart below for TASP bottom thicknesses and appropriate use of each size.

TASP Bottom Thickness	Tibial Constructs
+0 mm	10-14 mm
+6 mm	16-20 mm
+12 mm	22-26 mm

Note: The Persona Primary TASP System is not compatible with the Persona Revision TASP System.

Figure 74

Figure 75

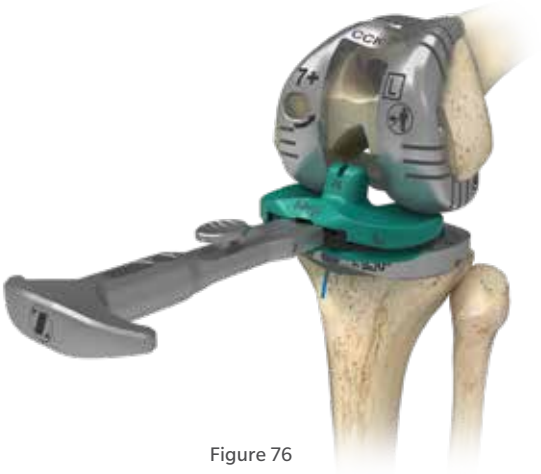


Figure 76

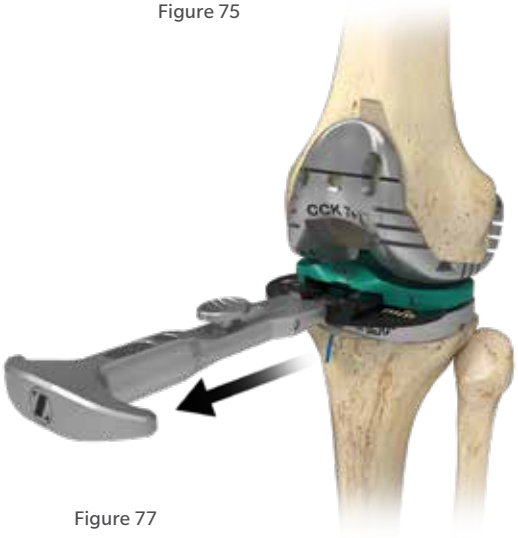


Figure 77

Trial Reduction (cont.)

Attach the tibial sizing plate handle to the appropriate shim (Figure 74). While holding the TASP top and bottom together with one hand, lock the TASP top and bottom together by inserting the appropriate shim with the tibial sizing plate handle (Figure 75). The shim will create a TASP construct which matches the thickness of the tibial bearing implant. See the example below to calculate bearing thickness.

Shim +	Bottom TASP	= Implant Bearing Thickness
12 mm	6 mm	18 mm

It is recommended that the thinnest TASP construct (10 mm) be inserted into the joint space with the knee in greater than 30 degrees of flexion to perform an initial range of motion assessment. Apply gentle manual pressure while inserting without impacting the TASP construct with either a mallet or hand.

TASP Shim Exchange

If a thicker construct is needed to appropriately fill and balance the joint space, place the knee in approximately 5-15 degrees of flexion to facilitate in-vivo removal and insertion of the shim using the tibial sizing plate handle (Figure 76).

Attach the tibial sizing plate handle to the shim and pull anteriorly to remove the shim (Figure 77). Insert a new shim by aligning with the TASP top and bottom and push in posteriorly. If significant resistance is experienced during insertion, realign and reinsert.

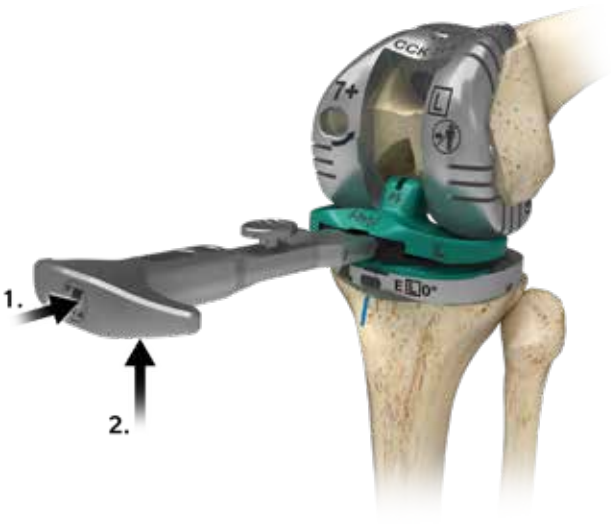


Figure 78

Figure 79

Trial Reduction (cont.)

TASP Removal

The entire TASP construct must be removed to exchange the bottom in the TASP construct. To remove or exchange the bottom, flex the knee greater than 30 degrees, push in the TASP posteriorly to disengage anteriorly (1) and lift (2) the tibial sizing plate handle while attached to the TASP construct (Figure 78). Once the anterior lip of the TASP bottom is above the anterior rail of the tibial baseplate provisional, rotate the TASP out of the joint space medially or laterally (PS TASP Top only) (Figure 79). This will aid in preventing unwanted shim disassembly during TASP removal.

Note: Varus/Valgus forces may make it difficult to remove the TASP construct. To aid in the removal of the TASP and prevent breakage, ensure the joint is in a neutral position when removing the TASP construct.

Flexion and Extension Decision Matrix

	Tight in Extension	Stable in Extension	Loose in Extension
Tight in Flexion	Decrease tibial bearing thickness	Downsize femur	Use distal femoral augments and thinner tibial bearing
	Resect more tibia	Use distal femoral augments and thinner tibial bearing	Downsize the femur and use thicker tibial bearing
		Offset the femur anteriorly and use thinner tibial bearing	Offset the femur anteriorly and use thicker tibial bearing
Stable in Flexion	Resect additional distal femur	Gaps balanced	Use distal femoral augments
			Downsize femur and use thicker tibial bearing
Loose in Flexion	Resect distal femur and use plus femur	Use a plus femur	Increase tibial bearing thickness
			Add/increase tibial augments
	Resect distal femur and use thicker tibial bearing		Use distal femoral augments and plus femur

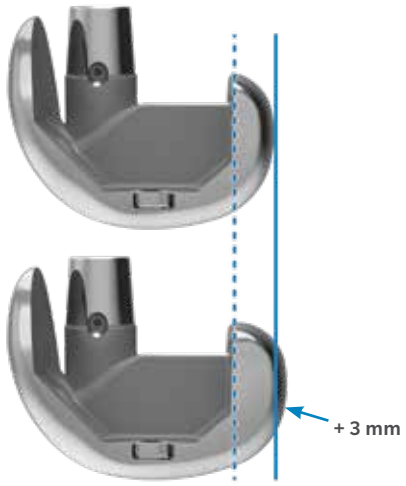


Figure 80

Trial Reduction (cont.)

Flexion and Extension Gap Analysis

With all provisional components in place, check ligament stability in extension, in 30, 60, 90 and 120 degrees of flexion with the patella reduced. Check for posterior osteophytes. Attempt to distract the joint in flexion. Reference the Flexion and Extension Decision Matrix above to help recreate a stable joint. Perform a range of motion to check component positioning and joint stability.

If a plus femur is required to fill the flexion space, remove the TASP and the femoral provisional construct, disassemble the femoral provisional from the stem extension provisional and replace with the same size plus femoral provisional. The plus femoral components provide an additional +3 mm of flexion fill compared to the corresponding standard femoral components (Figure 80). No new cuts need to be made for like-sized components. Insert the plus femoral provisional construct into the femoral canal and repeat the range of motion checks.

Figure 81

Figure 82

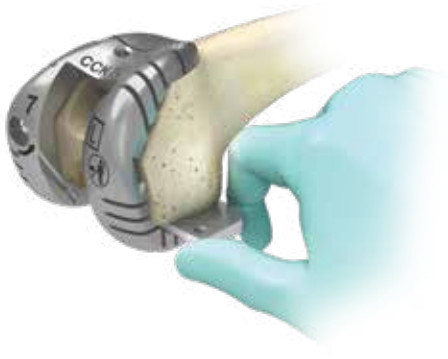


Figure 83

Optional Femoral Augment Preparation

Femoral augments are available in distal and posterior options and offered in 5, 10 and 15 mm thicknesses (Figure 81). 15 mm augments are not offered for size 1 and 3 femurs.

Remove the TASP assembly if inserted in the joint. Secure the femoral provisional using the anterior pin and/or slot. Make the appropriate distal and/or posterior augment cuts using a reciprocating saw (Figure 82). With the knee in 90 degrees of flexion, slide in the posterior and/or distal augment provisional/s into the femoral provisional (Figure 83). If an augment provisional is difficult to insert, pull the femoral provisional out of the femoral canal slightly, and insert the augment provisional into position.

Note: Alternatively, the femoral sizing/cut guide can be used to resect the 5 and 10 mm posterior augments and the distal cut guide can be used to resect the 5 and 10 mm distal augments.

Take appropriate care protecting the collateral ligaments when resecting through the distal and/or posterior augment slots.

Note: Posterior and distal augments are the same for left/right and medial/lateral uses.

Note: If preparing the femoral bone to be used with a Trabecular Metal Augment, ensure the bone opposing of the Trabecular Metal Augment will make contact with the resected femur.

Figure 84

Figure 85

Figure 86

Femoral Box Cut Preparation

Remove the TASP assembly if inserted in the joint. Prior to making a femoral box cut, flex the knee to allow for adequate visualization of the posterior capsule to avoid unintended neurovascular damage. With the femoral provisional in place and the desired position set, resect along each interior edge of the femoral provisional with a reciprocating saw. Make the wall cuts first, then proceed with the proximal box cut along the ramp surface of the femoral provisional until the intercondylar bone is resected (Figures 84 and 85). Once the bone has been removed, insert the femoral box provisional that matches the same size and side as the femoral provisional until fully seated (Figure 86). Recut the femoral box if unable to insert the box provisional. It is likely that bone is obstructing assembly.

Note: The femoral box provisionals are size and side specific and are compatible with both the standard and plus femoral provisionals.

Note: For femoral cone preassembly, with an offset or large diameter stem, ensure the provisional is not obstructing the box cut plane. If necessary, seat the provisional more proximal until the cone clears the box cut plane.

Note: Consider using the Persona Revision Femoral Retractor while in flexion to elevate the femur and protect the posterior structures while making the resection.

Patella Resurfacing

If it is necessary to resurface the patella, reference the Persona Primary Surgical Technique 97-5026-001-00 for surgical steps.

Figure 87

Figure 88

Figure 89

Final Trialing

Shim Thickness (mm)	Bottom Thickness (mm)	Screw Length (mm)	Tibial Construct Thickness (mm)
10 12 14	+0	10–14	10–14
10 12 14	+6	16–20	16–20
10 12 14	+12	22–26	22–26

With the final provisional components in place, reinsert the TASP assembly into the joint. Check ligament stability in extension, in 30, 60, 90 and 120 degrees of flexion and check for posterior osteophytes. Attempt to distract the joint in flexion (Figure 87). Perform a range of motion to check patellar tracking. Ensure the spine clears all bone in the femoral box.

The CPS and CCK TASP may be assessed if further stability is needed. The CPS and CCK TASPs provide an increase in constraint.

CPS and CCK Bearing TASP Assembly

Select the TASP bottom that matches the tibial baseplate provisional. Select the CPS or CCK TASP top that mates with the femoral provisional.

The provisional lockdown screws should be used with the tibial provisional during range of motion assessment to give the CPS and CCK TASP constructs the necessary rigidity to assess varus/valgus and internal/external constraint. The provisional lockdown screws are specific to the TASP bottom thickness being used. See the chart for appropriate screw length use.

Use the 3.5 mm hex driver to tighten the TASP construct to the tibial baseplate provisional (Figures 88 and 89). Do not overtorque the provisional lockdown screw.

Note: The provisional lockdown screw is not compatible with the tibial baseplate implant.

Figure 90

Final Trialing (cont.)

TASP Shim Exchange

If a thicker TASP construct is needed to appropriately fill and balance the joint space, begin by loosening the provisional lockdown screw fully with the 3.5 mm hex driver by rotating counterclockwise (it is not necessary to remove the provisional lockdown screw if the TASP bottom is not being exchanged).

Place the knee in approximately 5–15 degrees of flexion to facilitate in-vivo removal and insertion of the shim with the tibial sizing plate handle (Figure 90).

Attach the tibial sizing plate handle to the shim and pull anteriorly to remove. Insert a new shim by aligning with the TASP top and bottom and pushing posteriorly. If significant resistance is experienced during insertion, realign and reinsert.

Lightly tighten the provisional lockdown screw with the 3.5 mm hex driver until the head of the provisional lockdown screw has fully seated in the counterbore in the TASP top.

Ensure the spine clears all bone proximal of the femoral box. If the patella was resurfaced, insert the patellar provisional onto the resected patellar surface. Perform a range of motion to check patellar tracking. Check ligament stability in extension, in 30, 60 and 90 degrees flexion. Attempt to distract the joint in flexion. Flex the knee to peak flexion and verify adequate flexion is achieved.

When component position, range of motion and joint stability have been confirmed, remove the TASP.

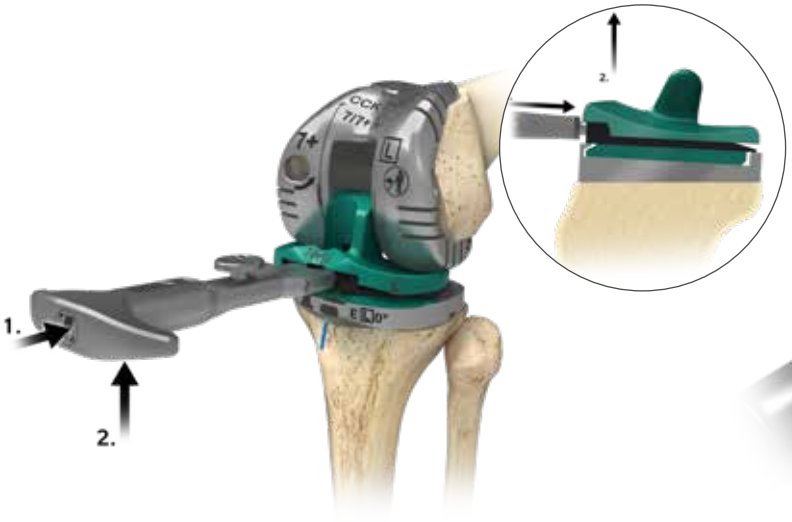


Figure 91

Figure 92a

Figure 92b

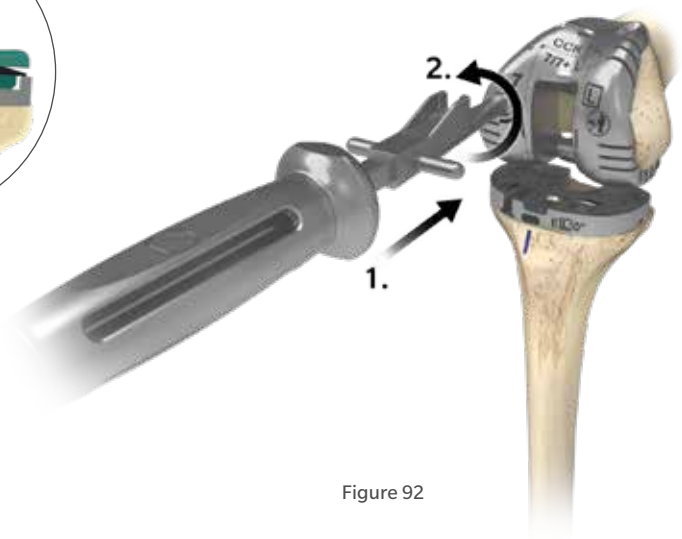


Figure 92

Final Trialing (cont.)

TASP Removal

The entire TASP construct must be removed to exchange the bottom in the TASP construct. To remove or exchange the bottom, disengage the provisional lockdown screw by rotating the 3.5 mm hex driver in a counterclockwise direction. Remove the provisional lockdown screw from the joint. Flex the knee greater than 30 degrees, push in the TASP posteriorly to disengage anteriorly (1) and lift (2) the tibial sizing plate handle while attached to the TASP construct (Figure 91).

Note: Varus/valgus forces may make it difficult to remove the TASP construct. To aid in the removal of the TASP and prevent breakage, ensure that the joint is in a neutral position when removing the TASP construct.

Note: Use only the tibial sizing plate handle to remove the TASP construct. The use of other instruments may damage or break the TASP.

Note: Do not implant the TASP components.

All other provisional components can be removed by inserting and locking the non-threaded end of the slap hammer into place of the femoral and/or tibial provisional (Figures 92, 92a and 92b).

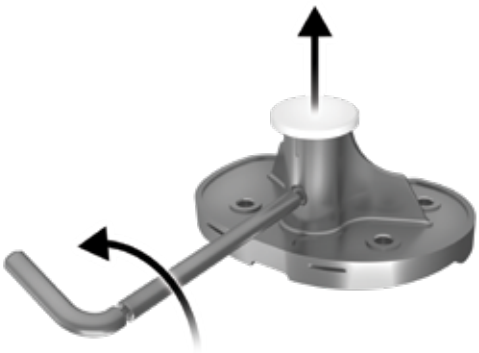


Figure 93

Figure 94

Figure 95

Figure 95a

Implant Assembly

Note: A stem extension implant must be utilized with the tibial and femoral components.

The steps below are for assembling tibial and femoral implant constructs for use with or without an augment.

Note: If Trabecular Metal Tibial and/or Femoral Cones are required, proceed to Appendix D: Tibial Central Cone Implant Assembly on page 57 and/or Appendix E: Femoral Central Cone Implant Assembly on page 60 for assembly instructions.

Tibial Implant Assembly

Prior to assembly of the final construct, use the 2 mm hex driver to loosen the set screw to remove the taper cap from the tibial implant. Ensure the set screw in the stem housing is backed out in order for the stem to seat fully (Figure 93). The tibial impaction base may be used to aid in assembling the stem implant to the tibial baseplate implant. Place the tibial baseplate implant on the tibial impaction base (Figure 94). Place the stem in the tibial baseplate implant. If using a straight splined stem, align the slots of the stem so that one slot runs directly A/P and the other runs directly M/L (Figure 95).

If using an offset splined stem, insert the stem into the tibial baseplate implant and rotate the stem until the predetermined offset number aligns with the reference mark on the anterior of the stem housing. Confirm stem alignment by referencing the provisional components (Figure 95a).

While protecting the tip of the stem with a soft cloth, firmly impact the stem to engage the tapers. Tighten the set screw with the 2 mm hex driver in a clockwise direction (Figure 96).

Figure 96

Figure 97

Note: The 2 mm hex driver has an over-torque limiter built into the design of the handle so it will break to prevent over-torquing.

Optional Tibial Augment Assembly

If an augment is being utilized, position the augment on the underside of the tibial baseplate implant and align the screws with the thread holes. Use the 3.5 mm hex driver to start and align both augment screws in a clockwise direction. Once both screws have been started, align the augment with the perimeter of the tibial baseplate implant as desired. Tighten the screws until the augment is rigidly attached to the tibial baseplate implant (Figure 97).

Note: Augments must be attached after the stem has been assembled. The 10 and 15 mm augment thicknesses will block access to the 2 mm set screw anteriorly.

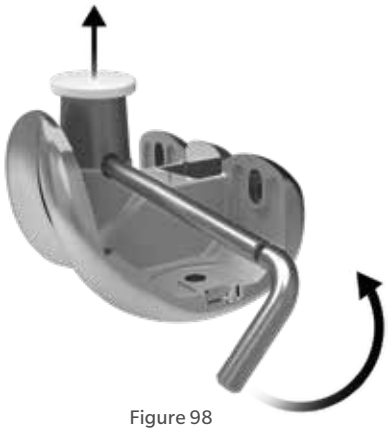


Figure 98

Figure 99

Figure 100

Figure 101

Implant Assembly (cont.)

Femoral Implant Assembly

Prior to assembly of the final construct, place the femoral implant on a rigid table protected by a soft surface. Use the 2 mm hex driver to loosen the set screw to remove the taper cap from the femoral implant. Ensure the set screw in the stem housing is backed out in order for the stem to seat fully (Figure 98). The femoral impaction saddle may be used to aid in assembling femoral augments and the stem to the femoral implant. Assemble the femoral impaction saddle with the appropriate "Left" or "Right" designation into the underside of the impaction base. The arrow on the femoral impaction saddle will align with "L" or "R" on the impaction base depending on if a left or right knee is being used (Figure 99). Place the femoral implant on the femoral impaction saddle (Figure 100).

Optional Femoral Augment Assembly

If a distal or posterior augment is being utilized, position the augment on the femoral component and align the screw with the threaded hole. If both distal and posterior augments are being utilized, assemble the distal augment onto the femoral implant first, then the posterior augment. Use the 3.5 mm hex driver to start and align the screw in a clockwise direction. Align the augment with the perimeter of the femur as desired. Tighten the screw until the augment is rigidly attached to the femoral component (Figure 101).

Figure 102a

Figure 102

Figure 103

Implant Assembly (cont.)

Place the stem in the femur. If using a straight splined stem, align the slots of the stem so that one slot runs directly A/P and the other runs directly M/L (Figure 102).

If using an offset splined stem, insert the stem into the femoral component until the predetermined offset number on the stem lines up with the posterior reference mark on the posterior of the stem housing. Confirm stem alignment by referencing the provisional components (Figure 102a).

While protecting the tip of the stem with a soft cloth, firmly impact the stem to engage the tapers. Tighten the set screw with the 2 mm hex driver in a clockwise direction (Figure 103).

Note: The 2 mm hex driver has an over-torque limiter built into the design of the handle so it will break to prevent over-torquing.

Figure 104

Figure 105

Two Stage Cementing Technique

Proceed with preparing the tibial bone with cement after the final implants have been assembled. Due to space constraints, the tibial component should be implanted first.

Tibial Component

To prepare the tibia for cementing, flex the knee and externally rotate the tibia. If a tourniquet is being used, ensure it is inflated throughout preparation of bone for cementation, as well as mixing, application and hardening of bone cement. If the tibial bone is dense or sclerotic, it may be necessary to perforate the tibia by drilling with the 3.2 mm drill 3-4 mm deep, spaced 5 to 8 mm apart to improve cement penetration (Figure 104).

Cleanse all cement-receiving bone surfaces thoroughly using pulse lavage and dry with a clean, dry lap sponge (Figure 105). Next, mix a single 40g unit of cement. Additional cement may be necessary due to the size of the tibia and components being utilized. Use of a vacuum mixing cartridge is recommended as well as application of new gloves.

Figure 106

Figure 107

Figure 108

Figure 109

Figure 110

Two Stage Cementing Technique (cont.)

As soon as cement properties permit, apply a thick layer of cement over the entire underside of the tibial baseplate implant including the keel, stem/tibial baseplate junction and the stem transition (Figures 106 and 107). Avoid contamination of the component-cement interface.

If necessary, coat any exposed Trabecular Metal Material that may come in contact with soft tissues with cement or biological material to prevent soft tissue irritation or attachment.

Note: The 30 mm and 75 mm stems are intended for full cemented use. If a tapered stem (30 mm or 75 mm) is being utilized, coat the entire stem with a layer of cement.

Note: If cone preassembly is required, the cone will need to be lifted in order to cement the underside of the tibial baseplate including the keel and stem/tibial housing junction and the stem transition (Figures 108 and 109).

Set the cone back down lightly on the cement mantle of the tibial baseplate implant. Fill the inside of the Trabecular Metal Cone with cement.

Optional Cementing Tibial Augments

In the event that a tibial augment implant needs to be cemented to the tibial baseplate implant, begin by removing and discarding the preassembled attachment screws. Place a thin layer of cement between the augment and where the augment will be placed on the tibial baseplate implant. Ensure the augment does not overhang the tibia. Hold until the cement is cured (Figure 110).

Figure 111

Figure 112

Figure 113

Two Stage Cementing Technique (cont.)

If cementing the tibial canal, a bone plug or cement restrictor should be used to plug the tibial canal.

Apply cement on the top surface of the tibia and in the tibial canal and pressurize the cement, striving for penetration of 3–4 mm (Figure 111).

Use of a cement gun/cartridge equipped with a pressurizing nozzle is recommended.

Note: If using a straight splined stem, take care when applying cement in or around the tibial canal to avoid getting cement on the splines of the stem.

Note: If a tapered stem (30 mm and 75 mm) is being utilized, fill the entire tibial canal and tibial plateau with cement and pressurize prior to inserting the tibial construct.

Note: If preparing the tibial bone for a Trabecular Metal Augment, ensure the distal surface of the Trabecular Metal Augment will have bony contact with the resected tibia.

Insert the tibial component into the prepared tibial canal by hand while retrograde filling the canal with cement. Flex the knee and externally rotate the tibia. Press down on the posterior portion of the tibial baseplate implant first to force excess cement anteriorly. Then press down on the anterior portion of the component. Once inserted by hand, seat the tibial component using the QC handle and tibial impactor pad (Figure 112).

Note: If using a splined stem, once the splines have engaged the bone, you cannot adjust rotation.

Remove any excess cement in a routine manner (Figure 113). The curved tonsile/hemostat can also be used to remove excess cement.

Ensure the cement is fully cured before proceeding with cementing the femoral implant.

Figure 114

Figure 115

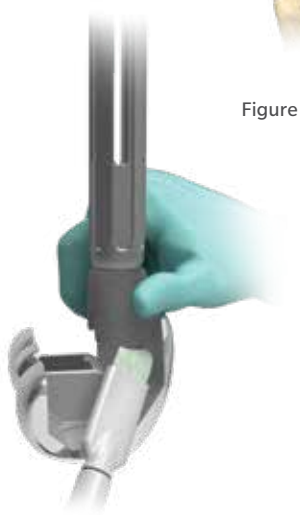


Figure 116

Figure 117

Figure 118

Two Stage Cementing Technique (cont.)

Femoral Component

If the femoral bone is dense or sclerotic, it may be necessary to perforate the femur by drilling with the 3.2 mm drill 3–4 mm deep, spaced 5 to 8 mm apart to improve cement penetration.

Cleanse all cement-receiving bone surfaces thoroughly using pulse lavage and dry with a clean, dry lap sponge (Figure 114). Next, mix a single 40g unit of cement. Additional cement may be necessary due to the size of the femur and components being utilized. Use of a vacuum mixing cartridge is recommended as well as application of new gloves.

As soon as cement properties permit, apply a thick layer of cement over the entire underside of the femoral implant including the stem/femoral housing junction and the stem transition (Figure 115). Avoid contamination of the component-cement interface.

Note: If preparing the femoral bone for a Trabecular Metal Augment, ensure the surface of the Trabecular Metal Augment will have bony contact with the resected femur.

Note: The 30 and 75 mm stems are intended for full cemented use. If a tapered stem (30 mm or 75 mm) is being utilized, coat the entire stem with a layer of cement.

If cone preassembly is required, the cone will need to be lifted in order to cement the surface of the femoral component and stem/femoral housing junction (Figures 116 and 117). Set the cone back down lightly on the cement mantle of the femoral implant. Fill the inside of the Trabecular Metal Cone with cement.

Optional Cementing Femoral Augments

In the event that the distal and/or posterior augment needs to be cemented to the femoral implant, begin by removing and discarding the preassembled attachment screws. Place a thin layer of cement between the augment and where the augment will be placed on the femoral implant. Ensure the augment does not overhang the femoral component. Hold until the cement is cured (Figure 118).

Figure 119

Figure 120

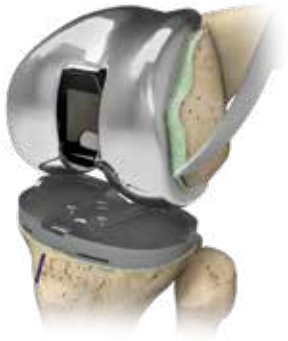


Figure 121

Two Stage Cementing Technique (cont.)

If cementing the femoral canal, a bone plug or cement restrictor should be used to plug the femoral canal.

Apply cement on the surface of the distal femur and pressurize the cement, striving for penetration of 3–4 mm (Figure 119).

Use of a cement gun/cartridge equipped with a pressurizing nozzle is recommended.

- **Note:** If using a straight splined stem, take care when applying cement in or around the femoral canal to avoid getting cement on the splines of the stem.
- **Note:** If a tapered stem (30 mm and 75 mm) is being utilized, fill the entire tibial canal and tibial plateau with cement and pressurize prior to inserting the femoral construct.
- **Note:** Coat any exposed Trabecular Metal Material that may come in contact with soft tissues with cement or biological material to prevent soft tissue irritation or attachment.

With the knee in deep flexion, insert the femoral component into the femoral canal by hand while retrograde filling the canal with cement. Once inserted by hand, seat the femoral component using the QC handle and femoral impactor pad (Figure 120). Remove any excess cement in a routine manner (Figure 121). The curved tonsile/hemostat can also be used to remove excess cement. Check for excess cement above and in the femoral box and remove to ensure adequate clearance of the bearing spine.

- **Note:** The hook feature of the femoral impactor pad can be used to impact the femur in the intercondylar notch area.
- **Note:** If using a splined stem, once the splines have engaged the bone, you cannot adjust rotation.

Patella Cementing

If necessary, reference the Persona Primary Surgical Technique 97-5026-001-00 for cement steps.

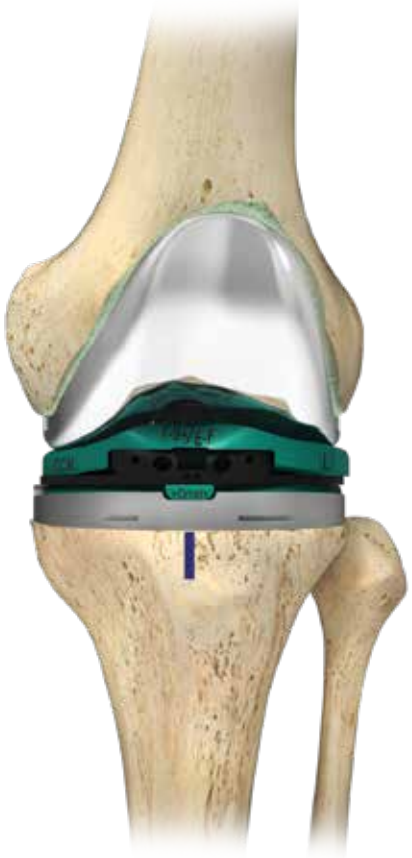


Figure 122

Two Stage Cementing Technique (cont.)

The knee should be placed in extension for the cement to cure. A TASP can be used to assist with compression on the cement. Insert a TASP 2 mm thicker than the final bearing in order to increase the pressure on the cement (Figure 122). If the knee cannot be straightened out at the time of cementing the femur, constant pressure should be exerted in order to obtain the best possible compression on the cement.

Note: Any remaining cement will prevent proper insertion of the TASP assembly.

Once the cement has cured, remove any excess cement before final bearing assembly. Confirm that all cement has been removed from the proximal surface of the tibial baseplate implant especially posterior near the locking mechanism.

Figure 123

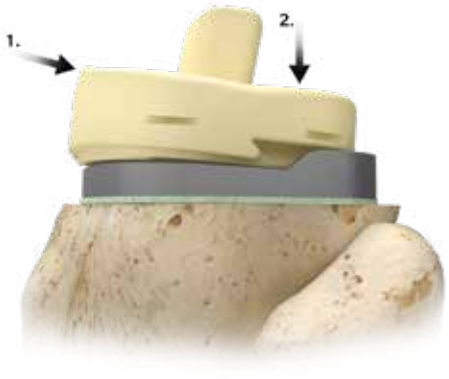


Figure 124

Bearing Assembly and Insertion

The TASP construct can be used to check for final range of motion with the tibial and femoral implants and to confirm the required bearing thickness. Ensure the cement is fully cured.

Note: The TASP construct cannot be locked down to the final implants.

Choose the correct tibial bearing based on femoral size, tibial size, side, constraint and thickness determined during trial range of motion. Prior to assembly, ensure soft tissue and cement debris are removed from the locking mechanism.

CCK Bearing Insert Assembly

Begin by pressing the insert packaged with the bearing into the slot on the CCK bearing (Figure 123). Once the insert has been assembled, set the CCK bearing on the tibial baseplate.

PS, CPS and CCK Bearing Assembly

Note: To avoid post impingement with the femoral component, place the knee in mid-flexion prior to inserting the bearing.

Place the bearing onto the tibial baseplate. Apply finger pressure anterior to posterior to properly engage the tibial baseplate and bearing. This is necessary to allow the inserter to properly engage the tibial baseplate and tibial bearing for final seating (Figure 124). Steady the surface of the tibial baseplate with one hand by applying downward pressure near the posterior cruciate cutout.

Note: Insert a bearing only once. Never reinsert the same bearing onto a tibial baseplate.

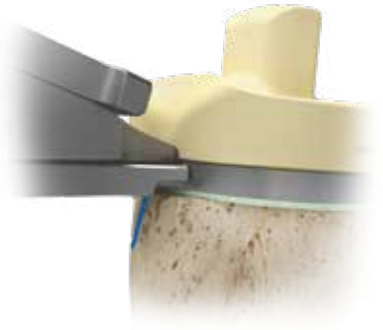


Figure 125

Figure 126

Bearing Assembly and Insertion (cont.)

Note: The articular surface inserter applies both downward and rearward forces to aid in the insertion of the bearing onto the tibial baseplate.

Engage the hook on the articular surface inserter with the mating slot on the front of the tibial baseplate and close the lever with your index finger. This locks the inserter to the tibial baseplate (Figure 125). Squeeze the handle of the articular surface inserter to fully seat the bearing (Figure 126). Open the lever and remove from the bearing.

Note: Do NOT impact or lever the articular surface inserter when attached to the tibial baseplate. This may disrupt the fixation of the tibial baseplate to the bone and/or cause damage to the implant or instrument. Do not impact the bearing.

Figure 127

Figure 128

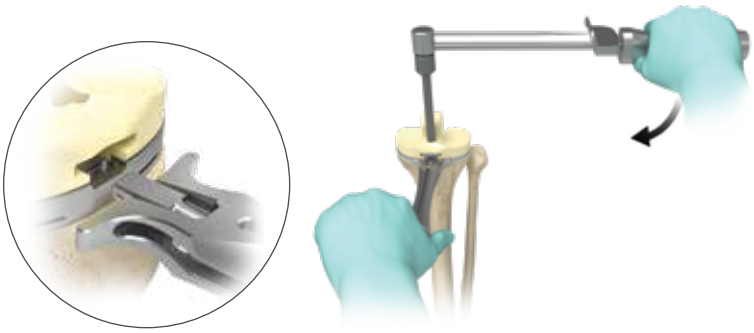


Figure 129

Figure 130

Bearing Assembly and Insertion (cont.)

CCK Bearing Lockdown Screw Assembly

Insert the screw packaged with the bearing through the hole in the bearing and into the tibial baseplate (Figure 127). Hand tighten the screw using the 4.5 mm hex driver (Figure 128). Attach the counter torque wrench to the anterior slot of the tibial baseplate and tighten the knob.

While holding the counter torque wrench, use the deflection beam torque wrench to tighten the screw in a clockwise direction to 95 in-lbs (Figure 129). Reduce the joint and move the knee through flexion and extension. It is recommended that the torque wrench is tightened two times to the target 95 in-lbs.

Close Incision

Freely irrigate the wound to ensure unwanted debris is removed from the joint space prior to closure. Implant assembly is now complete (Figure 130). A drain may be placed intracapsulary. Close the wound with sutures and apply a bandage.

Note: Take care that the retractors do not inadvertently dislodge the tibial baseplate, particularly on the posterolateral corner. Verify that the femoral component is fully seated before closing the wound. Confirm that no portion of the quadriceps mechanism have been pinned beneath the femoral component before closing the wound.

Appendices

Figure 1

Figure 2

Figure 3

Figure 4

Appendix A: Tapered Stem Preparation

30 mm and 75 mm tapered stems are available for cemented use and are only available in straight stem configurations. If using a 75 mm stem, reaming is required prior to stem preparation. If at any time it is determined a tapered stem is necessary, follow these steps in addition to the main technique.

Tibial Tapered Stem Preparation

The tibial sizing plate and straight stem reamer adapter may be used to confirm appropriate stem alignment while providing the desired tibial coverage and rotation. To confirm appropriate stem alignment, attach the straight stem reamer adapter to the tibial sizing plate that provides the desired tibial coverage and rotation. Secure the tibial sizing plate to the bone using the 3.5 mm hex headed screws. Remove the reamer or the stem extension post if still in the canal. Place the tibial drill guide on the tibial sizing plate aligning the two pegs to the mating holes of the sizing plate (Figure 1). Ensure the "ANT" mark on the tibial drill guide is facing anterior. The tibial drill guide should sit flush against the tibial sizing plate.

Using the appropriate 30 mm or 75 mm tapered stem drill bit, start power prior to contact and drill through the drill guide until the hard stop (Figure 2).

Remove the tibial drill guide from the tibial sizing plate and return to the Keel Preparation section on page 17.

Note: Cannulated reaming is not necessary for tapered stem preparation.

Femoral Tapered Stem Preparation

The femoral sizing/cut guide and femoral drill guide must be used to prepare for a 30 mm and 75 mm stem in cases where less than a 16 mm reamer has been utilized. Remove the reamer if still in the canal. Attach the femoral drill guide to the femoral sizing/cut guide (Figure 3). Firmly hold the drill guide in place prior to drilling. Using the appropriate 30 mm or 75 mm tapered stem drill bit, start power prior to contact and drill through the drill guide until the hard stop (Figure 4). Remove the femoral drill guide and the femoral sizing/cut guide.

Proceed to the Femoral Provisional Assembly and Insertion section on page 27.

Figure 1

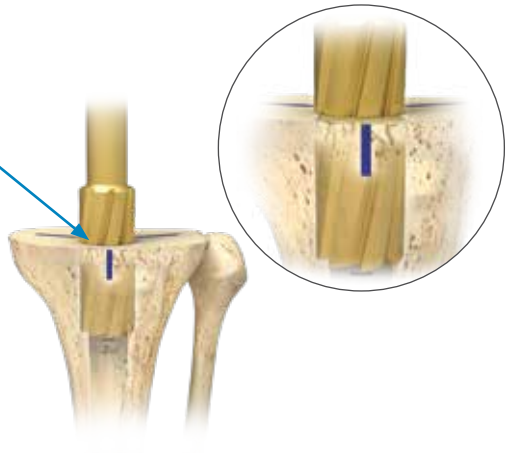


Figure 2

Figure 3

Figure 4

Figure 5

Appendix B: Tibial Central Cone Preparation

Fixed Tibial Cone

The fixed tibial cone does not require preparation of the bone using the cannulated reamer. Proceed directly to the Silver/Gold Broach Preparation section on page 51.

Cannulate Ream (Extra-Small, Small, Medium, Large Tibial Central Cone Preparation Only)

Insert the extension post and stem provisional into the canal and verify that the thin tibial depth line on the stem extension post is level or distal to the highest point of the resected tibial plateau (Figure 1). Ensure the stem extension post is stable in the canal. Tap into place, if necessary. Ream by placing the 22.5 mm cannulated reamer over the stem extension post. Start power prior to contact and ream until the thin line on the reamer is aligned in the tibial canal or slightly below the tibial reamer line (Figure 2).

Optional Tibial Defect Sizing

Select the tibial central cone provisional that approximates the size and depth of the defect.

Invert the cone provisional to simulate the size of distal void that the cone will accommodate and insert it over the stem extension post.

Optional Drill Guide (Medium, Large Tibial Central Cone Preparation Only)

Note: The intent of the drill guide is to remove bone prior to broaching. It does not fully prepare the cavity for a central cone.

Insert the desired drill guide over the stem extension post aligning anteriorly (Figure 3). Position the drill guide against the proximal surface of the tibia. If needed, trocar pins or 3.5 mm hex headed screws can be inserted into the side pinning holes in order to increase rotational stability while drilling. Using the 5 mm hex driver, tighten the captured set screw on the drill guide to secure to the stem extension post (Figure 4). Drill through each hole with the drill bit to remove desired bone (Figure 5). Remove the drill guide and any remaining bone prior to broaching.

Note: Alternatively, a tilt reamer can be used to manually remove bone if desired.

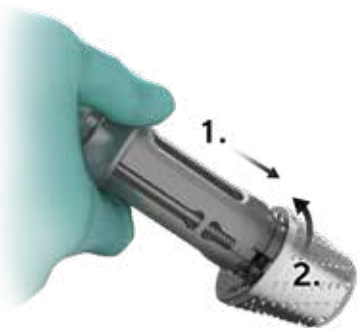


Figure 6

Figure 7

Figure 8

Figure 9

Appendix B: Tibial Central Cone Preparation (cont.)

Silver/Gold Broach Preparation

Attach the smallest sized broach that best fits the size of the tibial defect to the DR handle by pulling back the lever and locking into place (Figure 6).

Note: The 0, +5 and +10 marks on the DR handle are for femoral use only.

Slide the broach over the extension post and align anteriorly to the tibia. Fully seat the broach. Sequentially broach until the desired fit or stability is achieved (Figures 7 and 8). To remove the DR handle/broach, rotate the lever to the unlocked position and use the slap hammer to remove the broach from the tibia (Figure 9).

Ensure the broach sits at or below the proximal surface of the tibia. Check for rotational stability of the broach. If the broach is unstable or the defect is unfilled, repeat with sequentially larger broaches until the desired fit is achieved.

Note: If the broach was not prepared at or distal to the proximal surface of the tibia, it will cause the tibial baseplate to sit proud.

Note: The silver broaches are designed to be broached up to 20 mm below the proximal surface of the tibia.

Gold Broaches

The gold cone broach is a coupled device. Broaching deeper in the proximal tibia will drive the provisional stem deeper into the tibial canal.

If the gold broach needs to sit more distal, remove the stem extension post/stem provisional construct and proceed with freehand broaching using the DR handle and the gold cone broaches. The stem extension post/stem provisional construct must be removed. Broaching will drive the provisional stem deeper into the tibial canal which could potentially cause the tibia to fracture.

Note: If a cut was made for a tibial augment, the cone broach must be impacted until the top of the broach is level with or slightly below the augment cut.

Remove all instruments from the tibia.

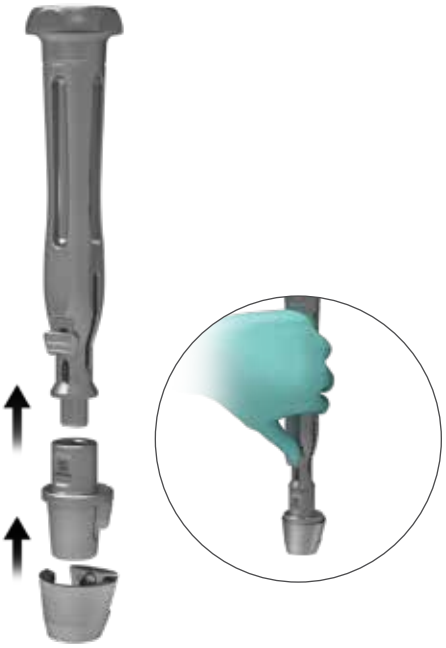


Figure 10

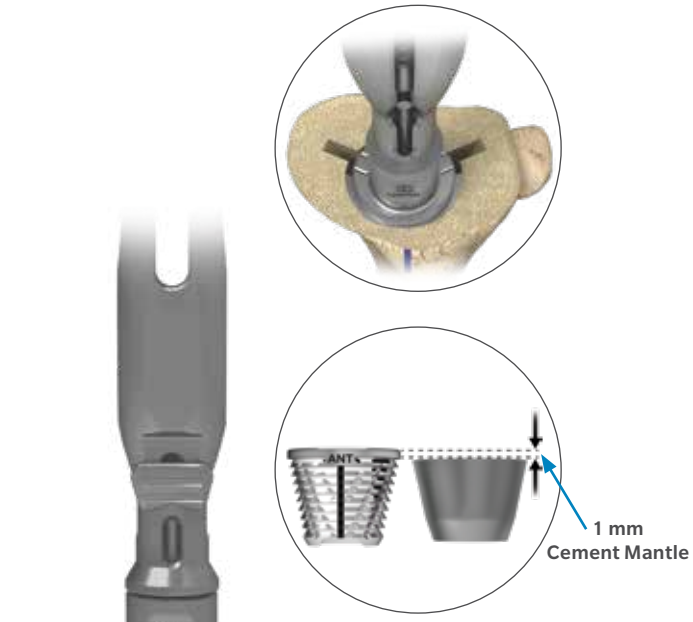


Figure 11a

Figure 11

Appendix B: Tibial Central Cone Preparation (cont.)

Tibial Central Cone Insertion

Attach the QC handle to the appropriate tibial central cone impactor. Insert the tibial central cone provisional that is the same size as the last broach used and position into the tibia (Figures 10 and 11). Verify that the cut-outs on the tibial cone provisional match up with the marks for the keel locations. If necessary, lightly tap into the tibia.

Note: The broaches are designed to clear out an additional 1 mm of proximal bone in order to leave room for a cement mantle between the cone and tibial baseplate implant (Figure 11a).

Note: If the cone provisional is difficult to remove, use the non-threaded end of the slap hammer to hook under the cone (Figure 12).

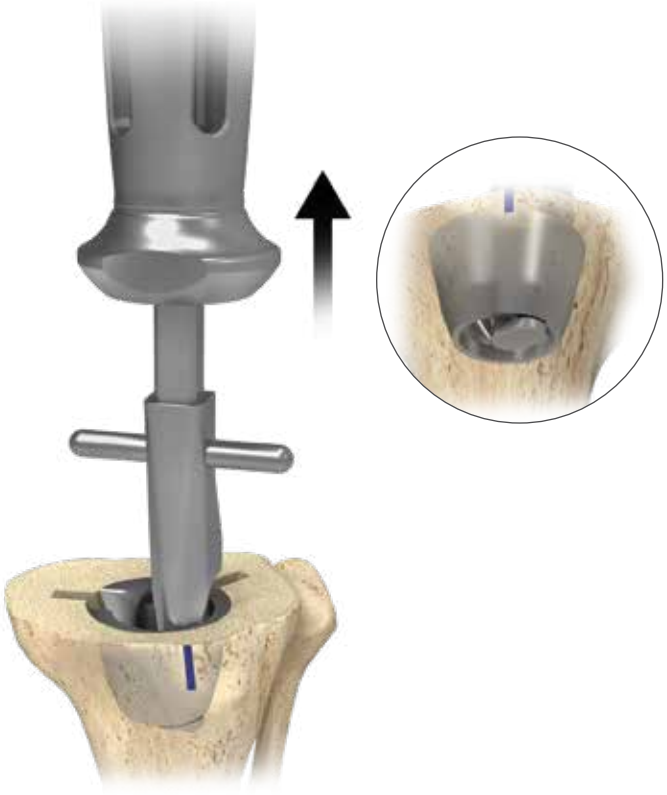


Figure 12

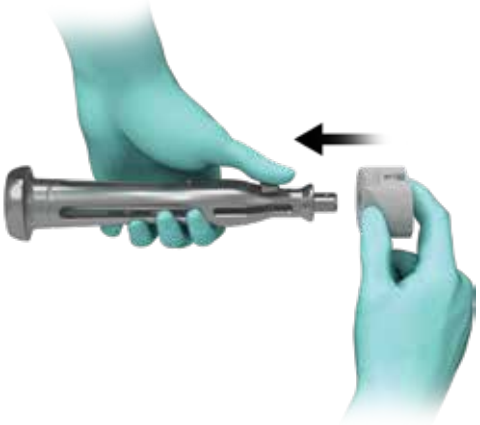


Figure 12

Figure 13

Figure 14

Appendix B: Tibial Central Cone Preparation (cont.)

Insert the tibial provisional construct into the tibial canal by hand. Assemble the QC handle and the tibial impactor pad and impact until fully seated (Figures 12–14).

Note: If the tibial provisional construct does not fit through the cone provisional, preassembly of the cone provisional on the tibial baseplate provisional is required. This assembly step applies to the final implant assembly as well.

Ensure the provisional construct is stable and the desired cement mantle clearance between the tibial baseplate and cone provisional can be achieved. If the tibial baseplate provisional sits proud, repeat the last broaching step to achieve appropriate distal placement of the cone.

Proceed to the Femoral Intramedullary Canal Preparation section on page 21.

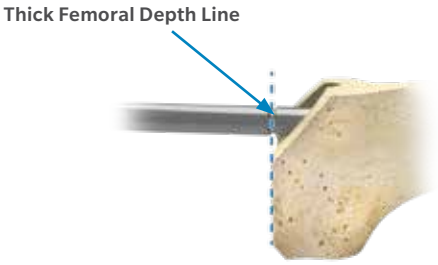


Figure 1

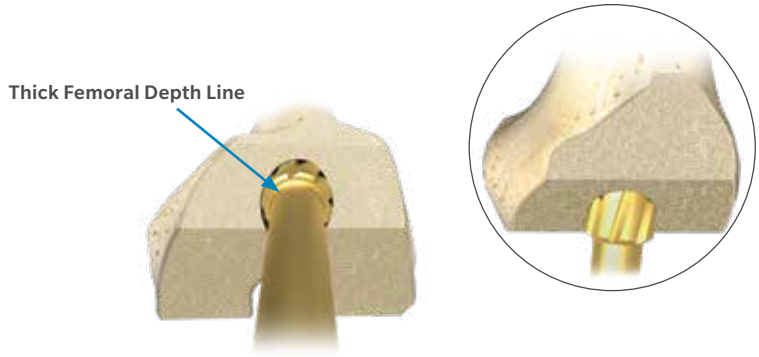


Figure 2

Figure 3

Figure 4

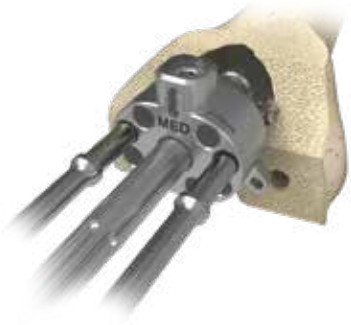


Figure 5

Appendix C: Femoral Central Cone Preparation

Cannulate Ream (Small, Medium, Large, Extra-Large Femoral Central Cone Preparation Only)

Insert the extension post and stem provisional into the canal and verify that the thick femoral depth line on the stem extension post is level or proximal to the distal cut. Ensure the stem extension post is stable in the canal. Tap into place, if necessary (Figure 1).

Ream by placing the 22.5 mm cannulated reamer over the stem extension post. Start power prior to contact and ream until the thick line on the reamer is aligned with the distal surface of the femur (Figure 2).

Optional Femoral Defect Sizing

Select the femoral central cone provisional that approximates the size and depth of the defect. Invert the cone provisional to simulate the size of distal void that the cone will accommodate and insert it over the stem extension post.

Optional Drill Guide (Medium, Large, Extra-Large Femoral Central Cone Preparation Only)

Note: The intent of the drill guide is to clear away bone from the distal condyles. It does not prepare the bone for the cone, only access to the diaphysis.

Insert the desired drill guide over the stem extension post, taking care to ensure the anterior mark on the broach aligns with the anterior femur (Figure 3). Position the drill guide against the distal surface of the femur. If needed, trocar pins or 3.5 mm hex headed screws can be inserted into the side pinning holes in order to increase rotational stability while drilling. Using the 5 mm hex driver, tighten the captured set screw on the drill guide to secure to the stem extension post (Figure 4).

Drill through each hole with the drill bit to remove desired bone (Figure 5). Remove the drill guide and any remaining bone prior to broaching.

Note: Alternatively, a tilt reamer can be used to manually remove bone if desired.

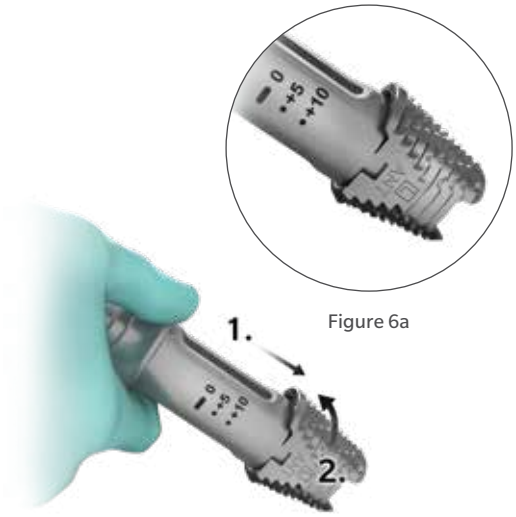


Figure 6a

Figure 6

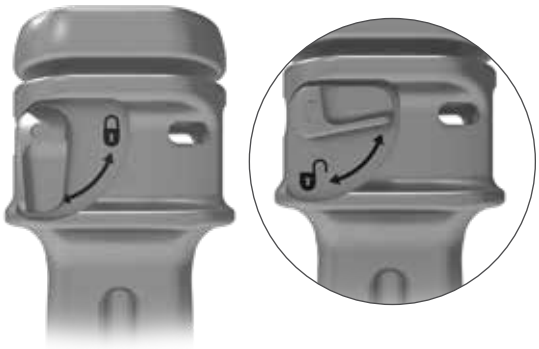


Figure 8

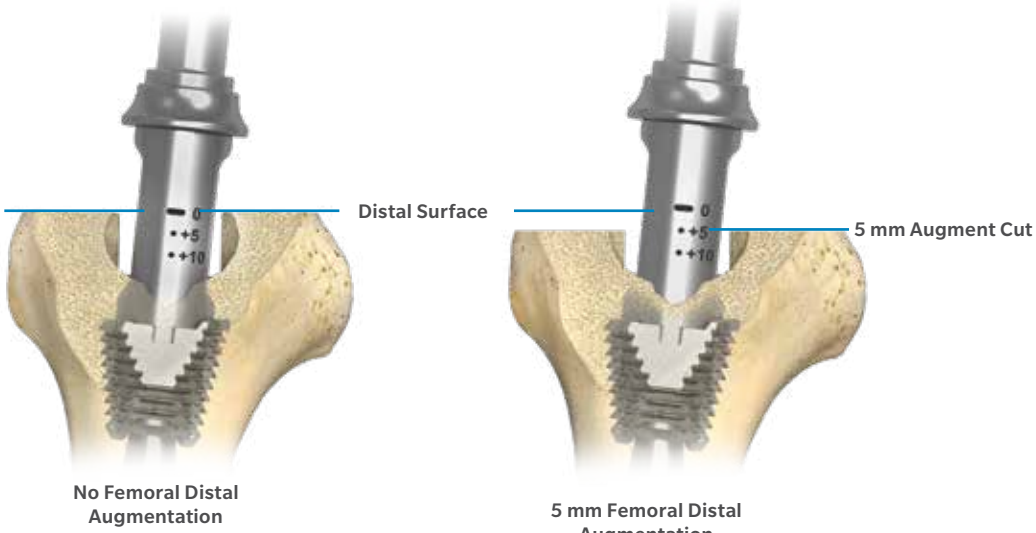


Figure 7

Appendix C: Femoral Central Cone Preparation (cont.)

Silver/Gold Broach Preparation

Attach the smallest sized broach that best fits the size of the femoral defect to the DR handle by pulling back the lever and locking into place (Figure 6).

Note: The central femoral cone provisionals and broaches are used for both "Left" and "Right" components and must be flipped in the correct orientation to accurately represent the 6 degree angle of the femoral stem housing (Figure 6a).

Slide the assembly over the extension post and align the anterior surface of the broach parallel to the anterior cut of the femur. To broach to the appropriate depth, the "0" line should align at or proximal to the distal surface of the femur. If distal augments are required, the +5 and +10 markings on the DR handle represent the appropriate depth for broaching. If the broach is unstable or the defect is unfilled, repeat with sequentially larger broaches until the desired fit is achieved (Figure 7).

To remove the DR handle/broach, rotate the lever to the unlocked position and use the slap hammer to remove the broach from the femur (Figure 8).

Note: If the broach is not proximal enough in the femur, it may cause the femoral component to sit proud.

Note: The silver broaches are designed to be broached up to 20 mm proximal of the femoral box.

Gold Broaches

The gold cone broach is a coupled device. Broaching deeper in the proximal tibia will drive the provisional stem deeper into the tibial canal.

If the gold broach needs to sit more proximal in the femur, remove the stem extension post/stem provisional construct and proceed with freehand broaching using the DR handle and the gold femoral cone broaches. The stem extension post/stem provisional construct must be removed. Broaching will drive the provisional stem deeper in the femoral canal which could potentially cause the femur to fracture.

Note: The extra small silver cone broach and gold cone broach are meant for progressive broaching only. There is not a corresponding Trabecular Metal Cone implant offered in this size.

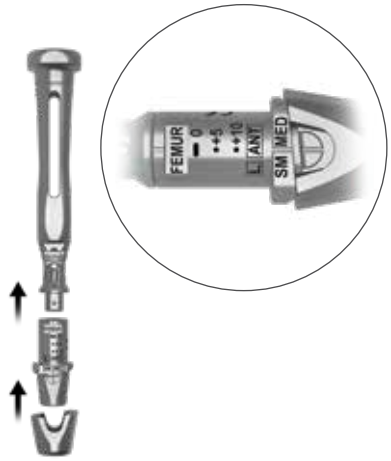


Figure 9

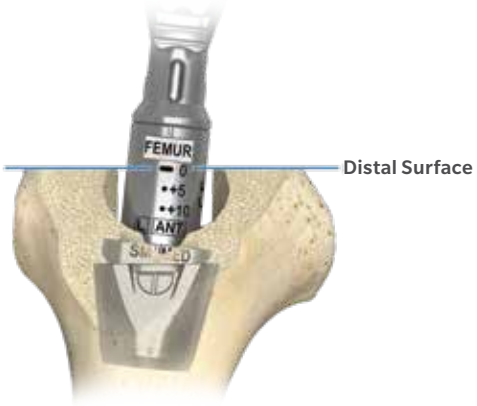


Figure 10

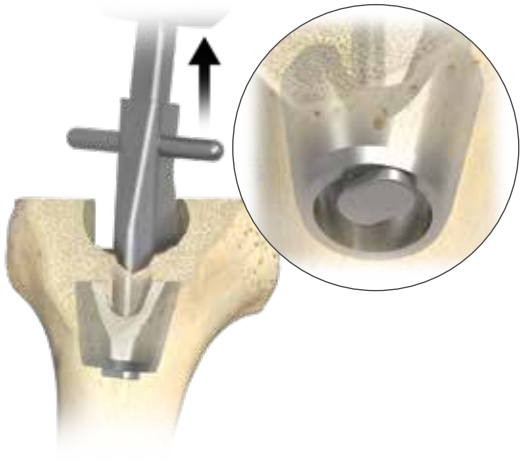


Figure 11

Figure 12

Figure 13

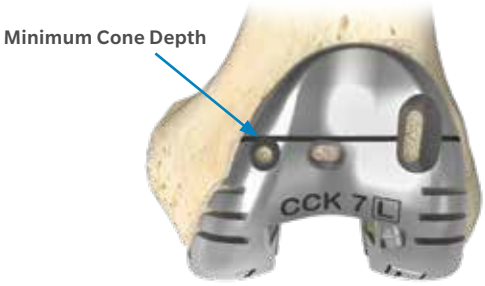


Figure 14

Appendix C: Femoral Central Cone Preparation (cont.)

Femoral Central Cone Insertion

Remove the instruments from the femoral canal and attach the QC handle to the appropriate femoral cone impactor head (Figure 9). Insert the femoral cone provisional that is the same size as the last broach used and position into the femur (Figure 10). The "0" line should align to the distal surface of the femur. If distal augments are required, the +5 and +10 markings on the femoral cone impactor head represent the appropriate depth for insertion.

- **Note:** The cone impactors are used for both left and right components, and must be rotated in the correct orientation to accurately represent the 6 degree angle of the femoral stem housing.
- **Note:** If the cone provisional is difficult to remove, use the non-threaded end of the slap hammer to hook under the cone (Figure 11).

Insert the femoral provisional construct into the femur by hand. Assemble the QC handle and the femoral impactor pad and impact the femoral provisional construct into the femur (Figures 12 and 13).

- **Note:** The line across the anterior flange of the femoral provisional shows the minimum depth the broach must be prepared into the bone and can be used as a reference (Figure 14).
- **Note:** If the femoral provisional construct does not fit through the cone provisional, preassembly of the cone provisional on the femoral provisional is required. This assembly step applies to the final construct assembly as well.

Proceed to the Trial Reduction section on page 28.

Figure 1

Figure 2

Figure 3

Figure 4

Appendix D: Tibial Central Cone Implant Assembly

Cone Insertion

On the back table, use the provisional constructs as a guide for building the final implants. Verify that the stem implant will pass through the Trabecular Metal Central Tibial Cone Implant.

If the stem implant does not pass through the Trabecular Metal Central Tibial Cone Implant, you will need to preassemble the Trabecular Metal Tibial Cone Implant to the tibial baseplate implant prior to implanting the construct. Proceed to the Tibial Cone Assembly with an Offset or Large Diameter Stem section, on page 58 for assembly instructions, if necessary.

Assemble the appropriate tibial central cone impactor head to the QC handle by pulling back on the lever and attach (Figure 1).

Implant the Trabecular Metal Central Tibial Cone Implant into the tibia using the QC handle and ensure proper rotation and location of the keel cut outs (Figures 2 and 3). Impact until fully seated in the tibial canal (Figure 4).

If excessive force is required to seat the cone implant, tibial fracture may occur. If necessary, consider re-broaching the cavity.

If gaps exist between the periphery of the cone and the endosteal surface, bone grafting material may be utilized with autogenous bone, allogenic bone or bone putty.

Proceed to the Tibial Implant Assembly section on page 37.

Tibial Central Cones	Stem Extensions: Straight (Splined)	Stem Extensions: Cemented (Smooth)
Fixed	16 mm	16 mm
XSML	18 mm	18 mm
SML	18 mm	18 mm
MED	18 mm	18 mm
LRG	18 mm	18 mm

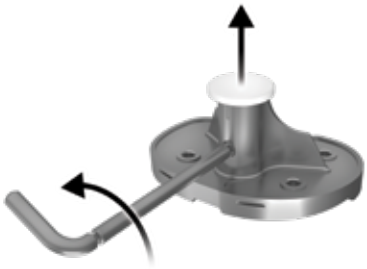


Figure 5

Figure 6

Figure 7

Figure 8

Figure 8a

Figure 9

Appendix D: Tibial Central Cone Implant Assembly (cont.)

Tibial Cone Assembly with an Offset or Large Diameter Stem

The largest straight stems that can fit through the Trabecular Metal Tibial Central Cones are contained in the charts above. If the stem implant does not pass through the Trabecular Metal Central Cone Implant or it was found during trialing, the Trabecular Metal Cone Implant will need to be preassembled to the tibial baseplate implant prior to implanting the construct.

It is highly recommended that new gloves be applied prior to handling the tibial implant.

Prior to assembly of the final construct, use the 2 mm hex driver to loosen the set screw to remove the taper cap from the tibial implant. Ensure the set screw in the stem housing is backed out in order for the stem to seat fully (Figure 5).

The tibial impaction base may be used to aid in assembling the stem implant to the tibial baseplate implant. Place the tibial baseplate implant on the tibial impaction base (Figure 6).

Assemble the Trabecular Metal Tibial Central Cone Implant over the tibial stem housing making sure to properly align the Trabecular Metal Tibial Central Cone Implant with the fins of the keel (Figure 7). If using a straight splined stem, align the slots of the stem so that one slot runs directly A/P and the other runs directly M/L (Figure 8).

If using an offset splined stem, insert the stem into the tibial baseplate implant and rotate the stem until the predetermined number lines up with the reference mark on the anterior of the stem housing. Confirm stem alignment by referencing the provisional components (Figure 8a).

While protecting the tip of the stem with a soft cloth, firmly impact the stem to engage the tapers. Lift the Trabecular Metal Tibial Central Cone Implant and tighten the set screw with the 2 mm hex driver in a clockwise direction (Figure 9).

Note: The 2 mm hex driver has an over-torque limiter built into the design of the handle so it will break to prevent over-torquing.

Note: Do not cement the cone prior to tightening the set screw.

Figure 10

Appendix D: Tibial Central Cone Implant Assembly (cont.)

Optional Tibial Augment Assembly

If an augment is being utilized, position the augment on the underside of the tibial baseplate implant and align the screws with the thread holes. Use the 3.5 mm hex driver to start both augment screws in a clockwise direction. Once both screws have been started, align the augment with the perimeter of the tibial baseplate implant as desired. Tighten the screws until the augment is rigidly attached to the tibial baseplate implant (Figure 10).

- **Note:** The tibial central cone may need to be lifted and rotated in order to gain access and tighten the augments screws.
- **Note:** Augments must be attached after the stem has been assembled. The 10 and 15 mm augment thicknesses will block access to the 2 mm set screw anteriorly.

Proceed to the Two Stage Cementing Technique section on page 40.

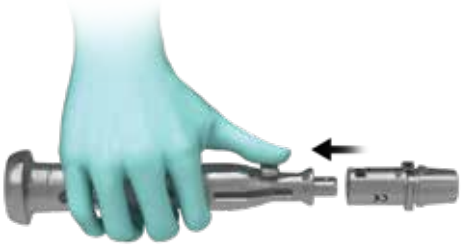


Figure 1

Figure 2

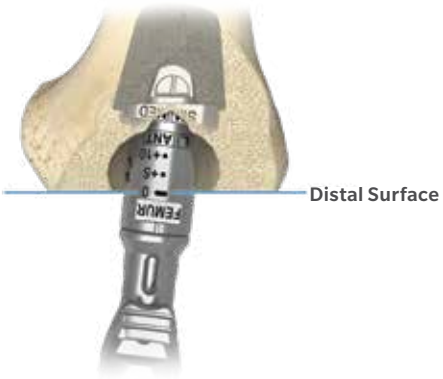


Figure 3

Appendix E: Femoral Central Cone Implant Assembly

Cone Insertion

On the back table, use the provisional constructs as a guide for building the final implants. Verify that the stem implant will pass through the Trabecular Metal Central Femoral Cone Implant.

If the stem implant does not pass through the Trabecular Metal Central Femoral Cone Implant, you will need to preassemble the Trabecular Metal Femoral Cone Implant to the femoral implant prior to implanting the construct. Proceed to the Femoral Cone Assembly with an Offset or Large Diameter Stem section, on page 61 for assembly instructions, if necessary.

The femoral cone impactors are reversible for "Left" and "Right" anatomy. Orient the cone impactor with the correct side facing anterior.

Assemble the appropriate femoral cone impactor head to the QC handle by pulling back the lever on the handle and attaching (Figure 1). Implant the Trabecular Metal Femoral Central Cone Implant (Figures 2 and 3). The "0" line should align to the distal surface of the femur. If distal augments are required, the +5 and +10 markings on the femoral cone impactor head represent the appropriate depth for insertion.

If excessive force is required to seat the cone implant, femoral fracture may occur. If necessary, consider re-broaching the cavity.

If gaps exist between the periphery of the cone and the endosteal surface, bone grafting material may be utilized with autogenous bone, allogenic bone or bone putty.

Proceed to the Femoral Implant Assembly section on page 38.

Femoral Central Cones	Stem Extensions	
	Straight (Splined)	Cemented (Smooth)
SML	16 mm	16 mm
MED	16 mm	16 mm
LRG	17 mm	18 mm
XLRG	17 mm	18 mm

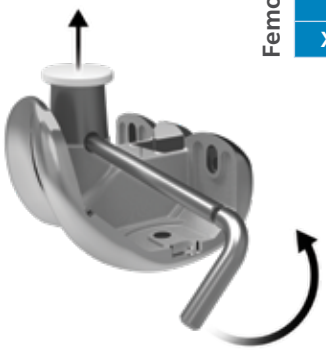


Figure 4

Figure 5

Figure 6

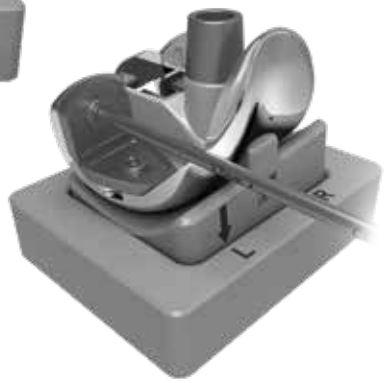


Figure 7

Appendix E: Femoral Central Cone Implant Assembly (cont.)

Femoral Cone Assembly with an Offset or Large Diameter Stem

The largest straight stems that can fit through the Trabecular Metal Femoral Central Cones are contained in the charts above. If the stem implant does not pass through the Trabecular Metal Central Cone Implant or it was found during trialing, the Trabecular Metal Cone Implant will need to be preassembled to the femoral implant prior to implanting the construct.

It is recommended that new gloves be applied prior to handling the femoral implants.

Prior to assembly of the final construct, place the femoral implant on a rigid table protected by a soft surface. Use the 2 mm hex driver to loosen the set screw to remove the taper cap from the femoral implant. Ensure the set screw in the stem housing is backed out in order for the stem to seat fully (Figure 4).

The femoral impaction saddle may be used to aid in assembling the femoral augments and stem to the femoral implant. Assemble the femoral impaction saddle with the appropriate "Left" or "Right" designation into the tibial impaction base. The arrow on the femoral impaction saddle will align with the "L" or "R" on the impactor base depending on if a left or right knee is being used (Figure 5). Place the femoral implant on the femoral impaction saddle (Figure 6).

Optional Femoral Augment Assembly

If a distal or posterior augment is being utilized, position the augment on the femoral component and align the screw with the thread hole. Use the 3.5 mm hex driver to start and align the screw in a clockwise direction. Align the augment with the perimeter of the femoral component as allowed. Tighten the screw until the augment is rigidly attached to the femoral component (Figure 7). If both distal and posterior augments are being utilized, assemble the distal augment onto the femoral implant first, then the posterior augment.

Figure 8

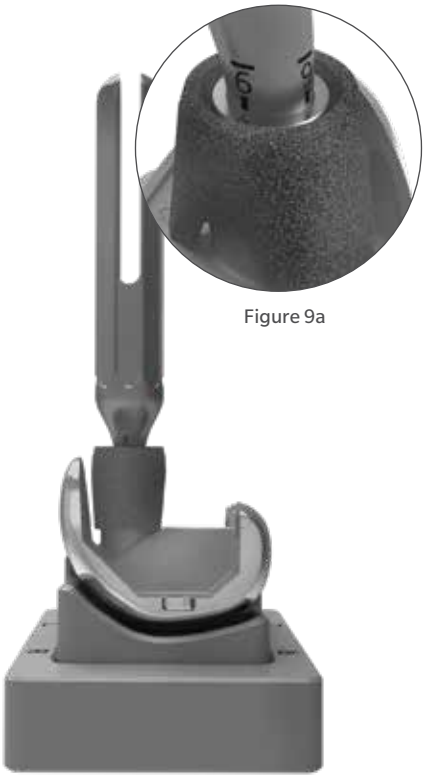


Figure 9a

Figure 9

Figure 10

Appendix E: Femoral Central Cone Implant Assembly (cont.)

Femoral Cone Assembly with an Offset or Large Diameter Stem (cont.)

Place the Trabecular Metal Femoral Central Cone Implant over the femoral stem housing (Figure 8). Ensure the set screw in the stem housing is backed out in order for the stem to seat fully. Place the stem in the femur. If using a press-fit stem, align the slots of the stem so that one slot runs directly A/P and the other runs directly M/L (Figure 9).

If using an offset splined stem, insert the stem into the femur and rotate the stem until the predetermined number lines up with the reference mark on the posterior of the stem housing (Figure 9a).

While protecting the tip of the stem with a soft cloth, firmly impact the stem to engage the tapers. Lift the Trabecular Metal Central Femoral Cone Implant and tighten the set screw with the 2 mm hex driver in a clockwise direction (Figure 10).

Note: The 2 mm hex driver has an over-torque limiter built into the design of the handle so it will break to prevent over-torquing.

Note: Do not cement the cone prior to tightening the set screw.

Proceed to the Two Stage Cementing Technique section on page 40.

Figure 1

Figure 2

Appendix F: Component Removal

PS, CPS and CCK Bearing Removal

In the event that the bearing needs to be removed from the tibial baseplate implant, begin by removing the screw, if equipped (Figure 1). Next, engage the hook on the bearing extractor instrument with the mating slot on the front of the tibial baseplate and squeeze the handle to disengage the bearing from the tibial baseplate implant (Figure 2).

Note: The bearing extractor instrument should not be used for provisional or TASP removal.

Tibial Baseplate Removal

In the event that the tibial baseplate needs to be removed, disrupt the bone cement interface using a flexible osteotome or thin saw blade with an oscillating saw. Once the prosthetic bone interface is loosened, consider using a punch or stacking osteotomes between the prosthesis and bone interface to lift the component out of the tibia.

Figure 3

Figure 4

Figure 5

Appendix F: Component Removal (cont.)

Femoral Component Removal

In the event that the femoral implant needs to be removed, Disrupt the femoral implant/bone interface with flexible osteotomes or thin saw blades with an oscillating saw. Once the prosthetic bone interface is loosened, a femoral extraction tool may be used to aid in removal of the femoral component from the bone. Persona Revision Femurs have medial and lateral notches to help facilitate removal of the femoral component (Figure 3).

Stem Removal

In the event that a Persona Stem needs to be removed from the tibial or femoral canals, the stem extractor may be used to assist in removal. Remove any residual cement around the stem junction. Thread the stem extractor around the end of the stem in the canal and lock into place (Figure 4). Assemble the slap hammer to the end of the extractor in a clockwise direction. Slap hammer out the stem (Figure 5).

Product Compatibility Charts

Persona Revision Femoral Component Used on Persona Revision CCK, Persona CPS or Persona PS Bearing

Persona Tibial Plates	Persona Revision Femoral Components												
	1	1+	3	3+	5	5+	7	7+	9	9+	11	11+	13
A	1-1+/AB		3-5+/AB										
B													
C	1-1+/CD		3-5+/CD				7-9+/CD						
D													
E			3-5+/EF				7-9+/EF				11-11+/EF		
F													
G							7-9+/GH				11-13/GH		
H													
J											11-13/J		

Persona Revision Femoral Component Used with Persona Patellae

		Persona Revision Femoral Component												
		1	1+	3	3+	5	5+	7	7+	9	9+	11	11+	13
Persona All-Poly (UHMWPE) Patellar Component (42-5400-000-XX) Vivacit-E® Patellar Component (42-5402-000-XX) (mm sizes)	26	i	i	i	i	i	i	i	i	i	i	i	i	i
	29											i	i	i
	32											i	i	i
	35													
	38													
	41													

i: INSET patella with Persona Revision Femoral Component

Compatible

Incompatible

Persona Revision Femoral Component Used with NexGen® Patellae

		Persona Revision Femoral Component												
		1	1+	3	3+	5	5+	7	7+	9	9+	11	11+	13
NexGen All-Poly Patellar Component (00-5972-065-XX) Prolong® Patellar Component (00-5972-066-XX) (mm sizes)	26	i	i	i	i	i	i	i	i	i	i	i	i	i
	29											i	i	i
	32											i	i	i
	35													
	38													
	41													

i: INSET patella with Persona Revision Femoral Component

Compatible

Incompatible

Persona Revision Femoral Component Used with NexGen Patellae (cont.)

		Persona Revision Femoral Component												
		1	1+	3	3+	5	5+	7	7+	9	9+	11	11+	13
NexGen Primary Porous Patellar Component (00-5878-065-XX) (mm sizes)	32											i	i	i
	35													
	38													
	41													

i: INSET patella with Persona Revision Femoral Component

Compatible

Incompatible

Persona Revision Femoral Component Used with Persona Revision Femoral Central Cone

		Persona Revision Femoral Components												
		1	1+	3	3+	5	5+	7	7+	9	9+	11	11+	13
Persona Revision Femoral Central Cones	SML													
	MED													
	LRG													
	XLRG													

Compatible

Incompatible

Notes

Notes

Zimmer Biomet does not practice medicine. This technique was developed in conjunction with health care professionals. This document is intended for surgeons and is not intended for laypersons. Each surgeon should exercise his or her own independent judgment in the diagnosis and treatment of an individual patient, and this information does not purport to replace the comprehensive training surgeons have received. As with all surgical procedures, the technique used in each case will depend on the surgeon's medical judgment as the best treatment for each patient. Results will vary based on health, weight, activity and other variables. Not all patients are candidates for this product and /or procedure.

This material is intended for health care professionals. Distribution to any other recipient is prohibited.

For indications, contraindications, warnings, precautions, potential adverse effects and patient counseling information, see the package insert or contact your local representative; visit www.zimmerbiomet.com for additional product information.

Caution: Federal (USA) law restricts this device to sale by or on the order of a surgeon. Rx only.

Check for country product clearance and reference product specific instructions for use.

Not for distribution in France.

EC REP **Authorized Representative**
Zimmer GmbH
Sulzerallee 8
8404 Winterthur
Switzerland

Authorized Representative
Zimmer U.K. Ltd.
The Courtyard
9 Lancaster Place
South Marston Park
Swindon, Wiltshire SN3 4FP
United Kingdom

Legal Manufacturer
Zimmer, Inc.
1800 W. Center Street
Warsaw, Indiana 46580
USA

ZIMMER BIOMET
Your progress. Our promise.®

1832.1-GLBL-en-REV0819 MC218585

zimmerbiomet.com

CE 2797

CE 0086

CE mark on a surgical technique is not valid unless there is a CE mark on the product label.