

Persona[®] Revision Knee System

Large Defect Surgical Technique

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This surgical technique contains surgical steps for the Persona Revision Large Defect Tibial Perimeter Cones and Femoral Metaphyseal Cones only. Reference the Persona Revision Knee System Surgical Technique (1832.1-GLBL-en) for surgical steps.

Quick Reference: Abbreviated Surgical Technique

Tibial Perimeter Cone



Step 1:
Size Tibial Defect



Step 2:
Tibial Perimeter
Cone Preparation



Step 3:
Tibial Perimeter Cone
Provisional Assembly and
Insertion



Step 4:
Tibial Perimeter Cone
Implant Insertion



Step 5:
Tibial Perimeter Cone
Implant Pre-assembly (if required)

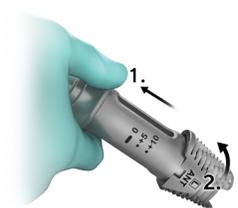
Femoral Metaphyseal Cone



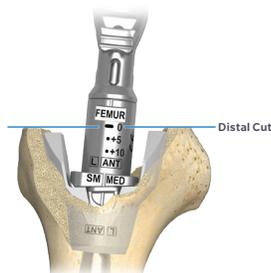
Step 1:
Cannulate Ream



Step 2:
Size Femoral Defect



Step 3:
Femoral Metaphyseal Cone
Preparation



Step 4:
Femoral Metaphyseal Cone
Provisional Assembly and
Insertion



Step 5:
Femoral Metaphyseal Cone
Implant Insertion



Step 6:
Femoral Metaphyseal Cone
Implant Preassembly
(if required)

Quick Reference:

Instrumentation

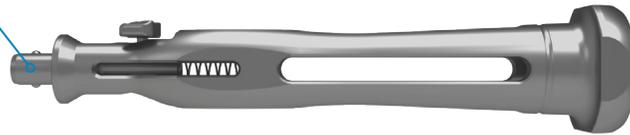
Note: Do not use implants and/or instruments from other knee systems unless expressly labeled for such use.

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

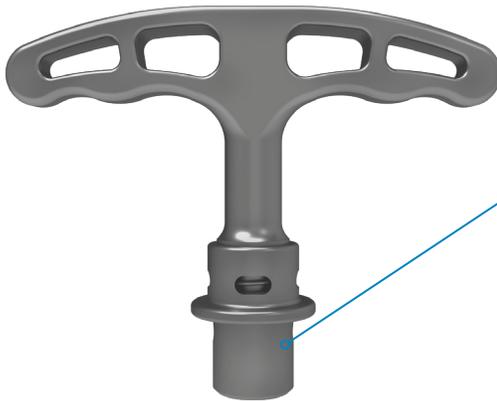
Quick Connect (QC) Handle

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



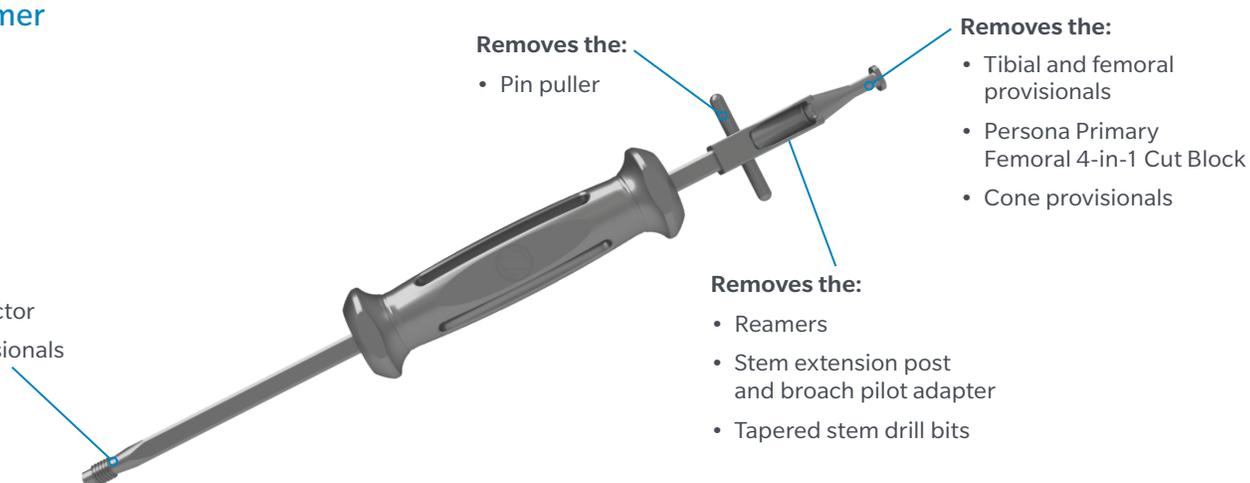
Attaches to:

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

Slap Hammer

Attaches to:

- Stem extractor
- Stem provisionals



Removes the:

- Pin puller

Removes the:

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

Removes the:

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

Quick Reference: Instrumentation (cont.)

5 mm Hex Driver

Removes the:

- Canal Reamers
- Stem extension post
- Broach pilot adapter
- Tapered stem drill bits

Attaches to:

- T-Handle

Loosens/Tightens the:

- Tibial boom knob
- Valgus alignment guide knob
- Tibial resection cut guide

Fastens the:

- Tibial and femoral provisional components to stem provisionals
- Tibial and femoral cone/sleeve 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

3.5 mm Hex Driver

Tightens or Loosens the:

- Stem provisionals (through cross hole)

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 canal reamers. The DR handle passes over the stem extension post or broach pilot adapter.

Attaches to:

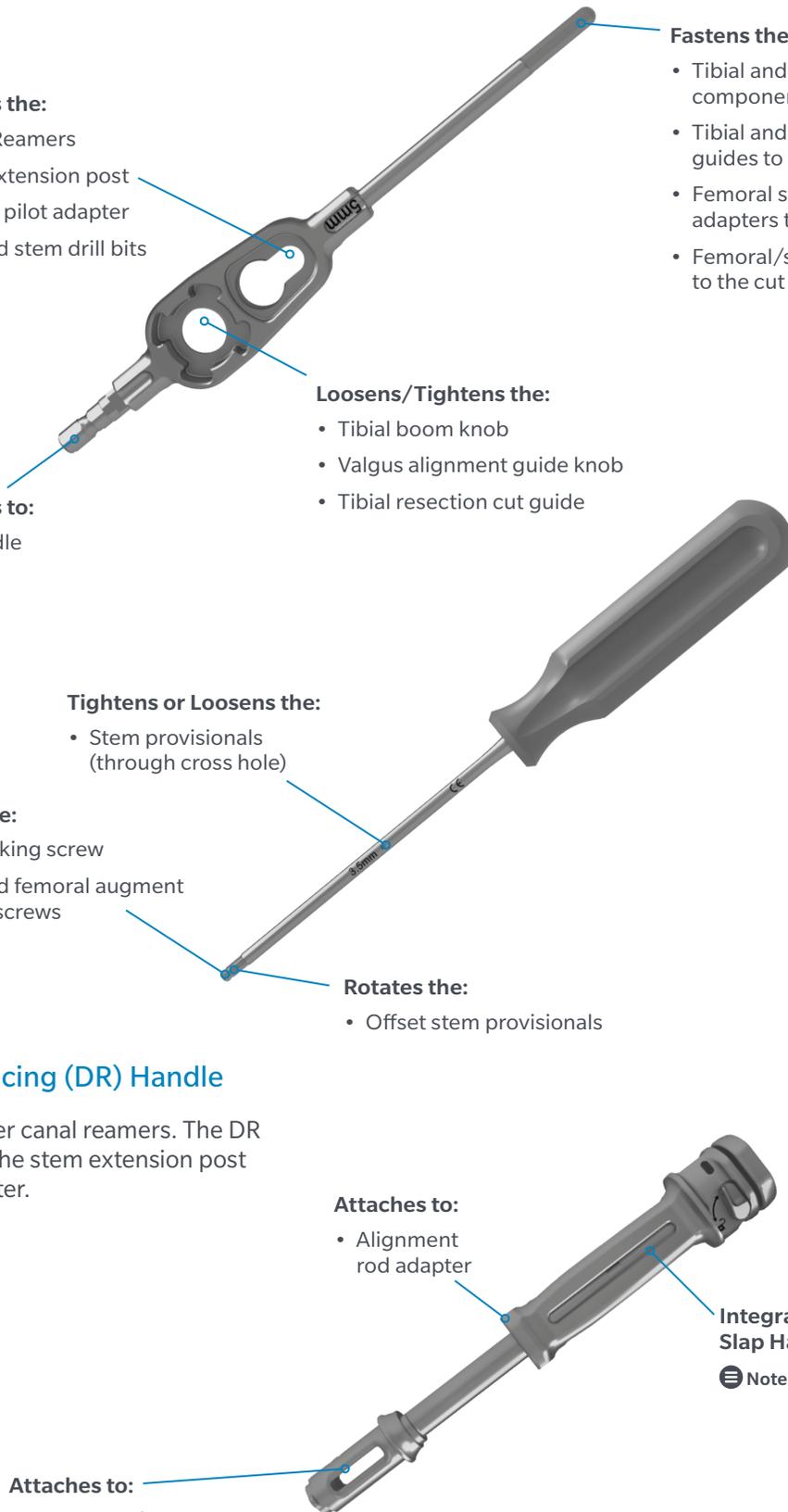
- Alignment rod adapter

Attaches to:

- Gold cone/sleeve broaches
- Silver cone broaches
- Tibial keel broaches

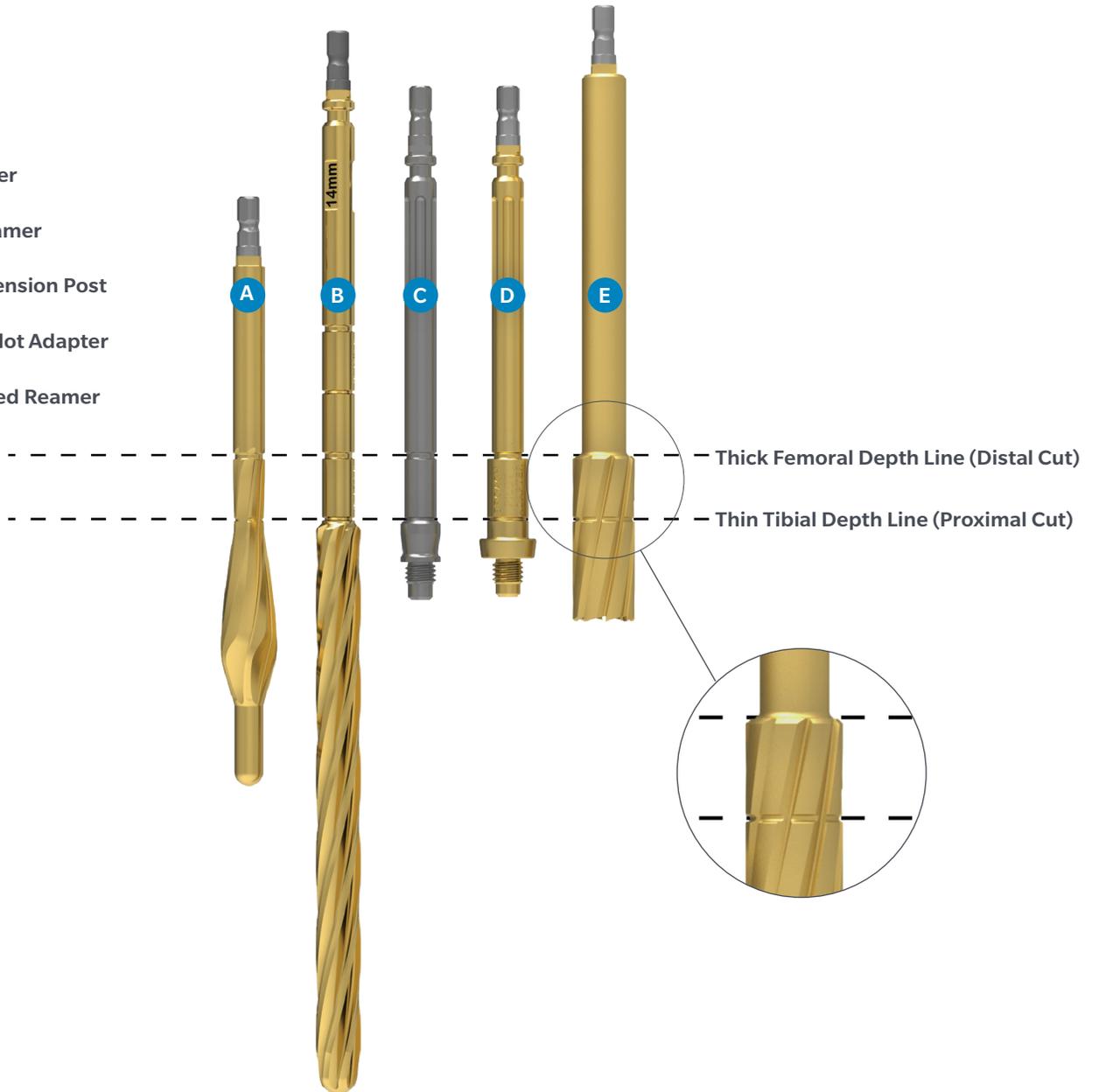
Integrated Slap Hammer

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



Femoral/Tibial Depths

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



Tibial Perimeter Cone Surgical Steps



Figure 1

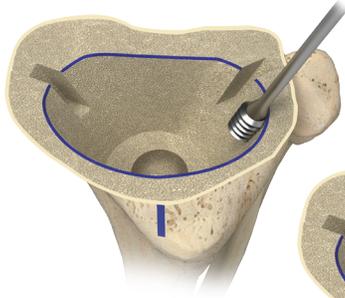


Figure 2a

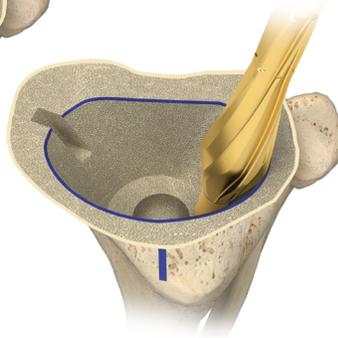


Figure 2b

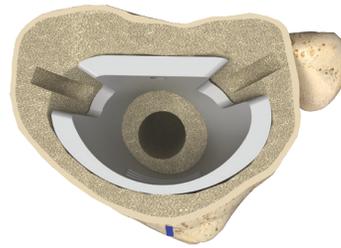


Figure 3

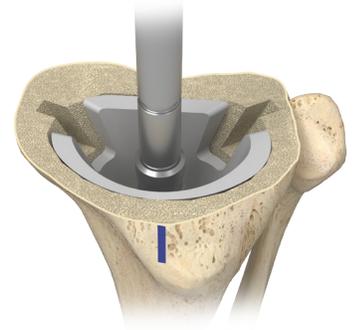


Figure 4

Tibial Perimeter Cone Preparation

Note: The following surgical steps only cover the Trabecular Metal Tibial Perimeter Cone preparation and implantation. To prepare the tibia, reference the Persona Revision Knee System Surgical Technique 1832.1-GLBL-en for surgical steps.

Size Tibial Defect

Insert the stem 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 proximal tibial bone. Ensure the stem extension post is stable in the canal. Tap into place, if necessary.

Invert the opposite side tibial perimeter cone provisional to simulate the size of the proximal void that the cone will accommodate. For example, if the defect is on a left tibial bone, use the “Right” tibial perimeter cone provisional and invert over the defect. This will help provide an estimate of the A/P and M/L position of the defect, relative to the center of the tibial IM canal. With methylene blue or bovie, trace around the outside of the provisional where bone remains to serve as a guide for bone removal (Figure 1).

Remove stem provisional and stem extension post. Using a high speed burr, remove enough bone in order to seat the tibial perimeter cone provisional in the defect (Figure 2a). Insert the appropriately sized tibial perimeter cone provisional by hand and assess the fit (Figure 3).

Note: Alternatively, the tilt reamer can be used to manually smooth or remove any obstructing bone if desired (Figure 2b).

Remove any obstructing bone with the burr in order for the tibial perimeter cone provisional to seat properly.

Insert the stem extension post and stem provisional construct into the tibial canal to check for size and position of the cone relative to the tibial IM canal. Confirm the cone orientation and verify that the fin cutouts are aligned to the previous placement of the tibial baseplate provisional (Figure 4).

Ensure the tibial perimeter cone provisional sits at or below the proximal tibial surface. If the cone provisional sits proud of the proximal tibial surface, it will cause the tibial baseplate to sit proud.

Note: A 1 mm cement mantle is recommended between the cone and tibial baseplate implant.

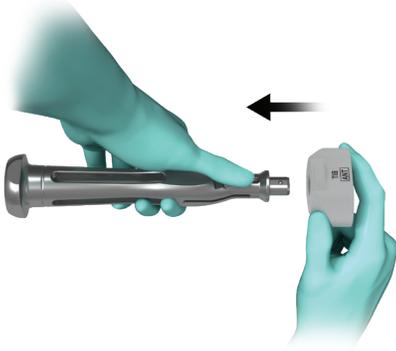


Figure 5



Figure 6



Figure 7



Figure 8

Tibial Perimeter Cone Preparation (cont.)

Tibial Perimeter Cone Insertion

Insert the tibial provisional construct (tibial baseplate, keel, and stem provisionals) into the tibial canal by hand. Assemble the tibial impactor pad to the QC handle and impact until fully seated (Figures 5–7).

Note: The stem compatibility charts are for both straight and offset stems, however for offset stems, it should be verified that the offset stem geometry can be passed through the provisional and into the prepared bone. See the compatibility charts at the end of this surgical technique for compatible sizes.

Note: If the provisional construct does not pass through the perimeter cone provisional, there are two options available:

Option 1: Preassemble the cone provisional to the tibial provisional construct prior to insertion.

Option 2: Convert to a smaller diameter Smooth Cemented Stem to eliminate pre-assembly requirements. See Smooth Stem Compatibility Chart at the end of the surgical technique.

If the large diameter or offset stem is required, this back table provisional step applies to the final implant construct assembly as well.

Ensure the provisional construct is stable and the desired cement mantle clearance between the tibial baseplate provisional and proximal tibia can be achieved. If the tibial baseplate provisional sits proud, use a high speed burr or tilt reamer to remove any additional bone to achieve desired placement of the cone.

Note: If the cone provisional is difficult to remove, use the non-threaded end of the slap hammer to hook under the cone provisional (Figure 8).

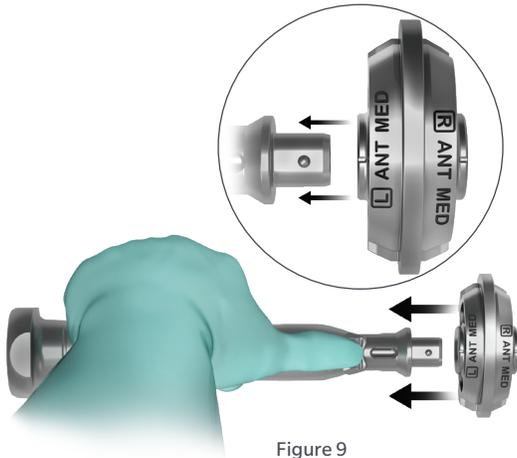


Figure 9



Figure 10



Figure 11



Figure 12

Tibial Perimeter 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 Tibial Perimeter Cone Implant.

If the stem implant does not pass through the Trabecular Metal Tibial Perimeter 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 9 for assembly instructions, if necessary.

Assemble the appropriate tibial perimeter cone impactor head to the QC handle by pulling back on the lever and attach.

Note: The tibial perimeter impactor head can be flipped to mate with either the “Left” or “Right” tibial perimeter cone implants (Figures 9 and 10).

Implant the Trabecular Metal Tibial Perimeter Cone Implant into the tibia using the QC handle and ensure proper rotation and location of the keel cut outs. Impact until fully seated in the tibial canal (Figures 11 and 12).

If excessive force is used to seat the cone implant, tibial fracture may occur. If necessary, consider removing additional bone to achieve desired placement of the cone.

The Trabecular Metal surface is intended to be in contact with the prepared bone. If gaps exist between the periphery of the cone and the endosteal surface, bone grafting material may be utilized with autogenous bone, allogenic bone, bone putty or cement to aid in fixation.

Note: Coat any exposed Trabecular Metal surface with bone cement or biological material if there is a concern of unwanted soft tissue attachment or to prevent soft tissue irritation.

Refer to the Persona Revision Knee System Surgical Technique 1832.1-GLBL-en for Tibial implant assembly and then proceed to the cementing section on page 10.

Perimeter Cone - Splined Stem Compatibility

		Stem Size			
		10-14 mm	15-16 mm	17 mm	18-24 mm
Perimeter Cone	FIXED TIB		*	*	*
	SML			*	*
	MED				*
	LRG				*

*Pre-assembly required

Compatible
Incompatible

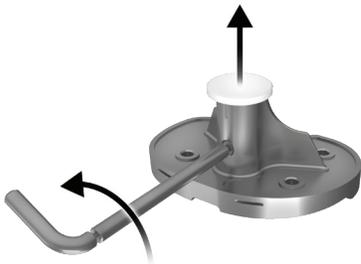


Figure 13



Figure 14

Tibial Perimeter Cone Implant Assembly (cont.)

Tibial Cone Assembly with an Offset or Large Diameter Stem (Pre-assembly)

The largest straight stems that can fit through the Trabecular Metal perimeter cones are contained in the charts above. If the stem implant does not pass through the Trabecular Metal Perimeter Cone Implant or it was found during trialing that pre-assembly was required, the Trabecular Metal Perimeter Cone Implant will need to be pre-assembled 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.

Note: The stem compatibility charts are for both straight and offset stems. However, for offset stems, the user should verify that the offset stem geometry can be passed through the provisional and into the prepared bone in-situ.

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 13).

Perimeter Cone - Smooth Stem Compatibility

		Stem Size			
		10-14 mm	16-18 mm	20 mm	22-24 mm
Perimeter Cone	FIXED TIB		*	*	*
	SML			*	*
	MED				*
	LRG				*

*Pre-assembly required

Compatible
Incompatible



Figure 15a



Figure 15b

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. Assemble the Trabecular Metal Tibial Perimeter Cone Implant over the tibial stem housing making sure to properly align the Trabecular Metal Tibial Perimeter Cone Implant with the fins of the keel (Figure 14). 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 15a).

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 (Figure 15b). Confirm stem alignment by referencing the provisional components.

Perimeter Cone - Tibial Augment Compatibility with Stems

		Stem Size	
		10–20 mm	22–24 mm
Perimeter Cone	FIXED TIB	5, 10, 15 mm	5, 10 mm 15 mm
	SML	5, 10, 15 mm	5, 10, 15 mm
	MED	5, 10, 15 mm	5, 10, 15 mm
	LRG	5, 10, 15 mm	5, 10, 15 mm

 Compatible
 Incompatible



Figure 16

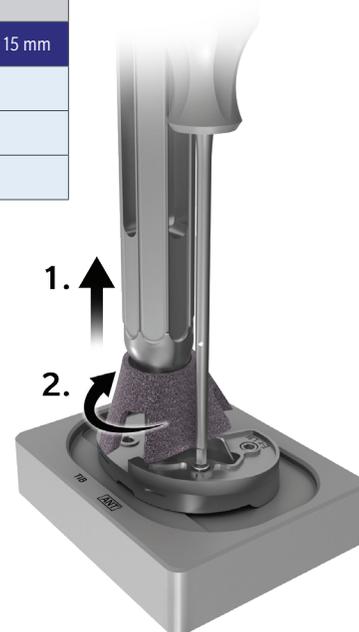


Figure 17

Tibial Perimeter Cone Implant Assembly (cont.)

While protecting the tip of the stem with a soft cloth, firmly impact the stem to engage the tapers. Lift the Trabecular Metal Tibial Perimeter Cone Implant and tighten the set screw with the 2 mm hex driver in a clockwise direction (Figure 16).

- ⓘ **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.

Optional Tibial Augment Assembly

- ⓘ **Note:** Tibial augments are compatible for use with perimeter cones, but depending on the cone and stem size, there may be limitations. Reference the compatibility chart above for tibial augment compatibility.

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 17).

- ⓘ **Note:** The cone may need to be lifted and rotated in order to gain access and tighten the augment 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.

Cementing

When cementing, it is important to ensure adequate cement is applied inside the preassembled tibial perimeter cone including around the stem housing junction and tibial keel.

Reference the Persona Revision Surgical Technique 1832.1-GLBL-en for the Two Stage Cementing Technique and Component Implantation surgical steps.

When implanting the preassembled construct, it is recommended that the cement is in the doughy phase to allow implant orientation adjustment during insertion.

Femoral Metaphyseal Cone Surgical Steps

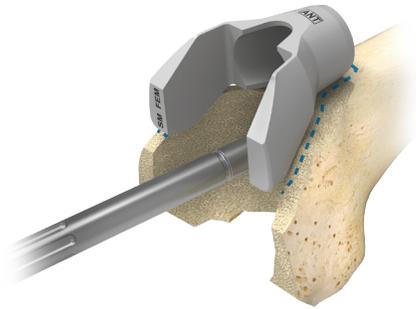


Figure 1

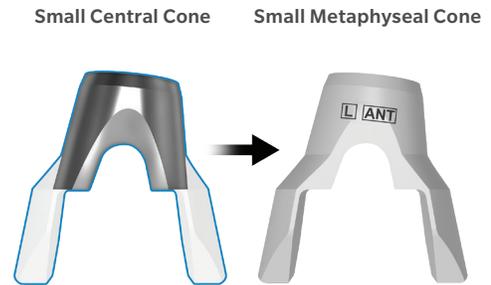


Figure 2

Femoral Metaphyseal Cone Preparation

Note: The following surgical steps only cover the Trabecular Metal Femoral Metaphyseal Cone preparation and implantation. To prepare the femur, reference the Persona Revision Knee System Surgical Technique 1832.1-GLBL-en for surgical steps.

Size Femoral Defect

Insert the stem 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 bone. Ensure the stem extension post is stable in the canal. Tap into place, if necessary.

Place the same side femoral metaphyseal cone provisional onto the anterior cortex aligning with the exposed extension post to simulate the size of the distal void that the cone will accommodate. For example, if the defect is on a left distal femur, use the “Left” femoral metaphyseal cone provisional. This will help provide an estimate of the A/P and M/L position of the defect, relative to the center of the femoral canal. With a methylene blue or bovie, trace around the outside of the provisional where the bone remains to serve as a guide for bone removal (Figure 1).

Alternatively a femoral metaphyseal cone provisional can be inserted into the defect for preliminary size selection.

This preliminary size selection will guide the size of the diaphyseal portion of the metaphyseal cone to be prepared using central cone broaches.

Note: The size, shape and position of the proximal portion of the femoral metaphyseal cone provisional is identical to that of the femoral central cone provisional, therefore this portion of the cone can be prepared using the femoral central cone instrumentation (Figure 2). For example, if you preliminary sized for a small Metaphyseal cone, prepare the diaphyseal portion of cone with the same sized central cone broach.

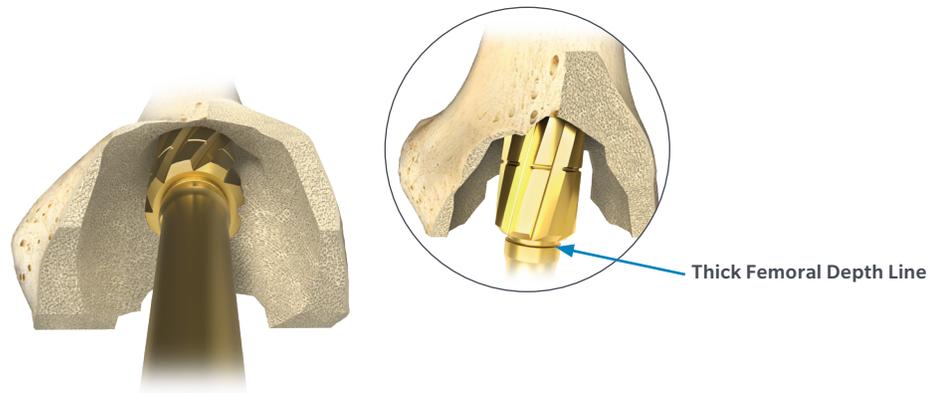


Figure 3

Femoral Metaphyseal Cone Preparation (cont.)

Cannulate Ream

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 the distal surface of the femur or the desired location of the distal surface of the metaphyseal cone (Figure 3).

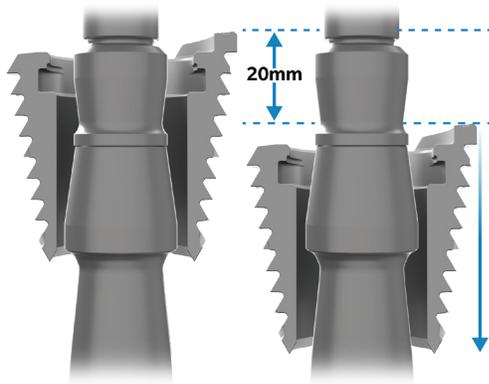


Figure 4a

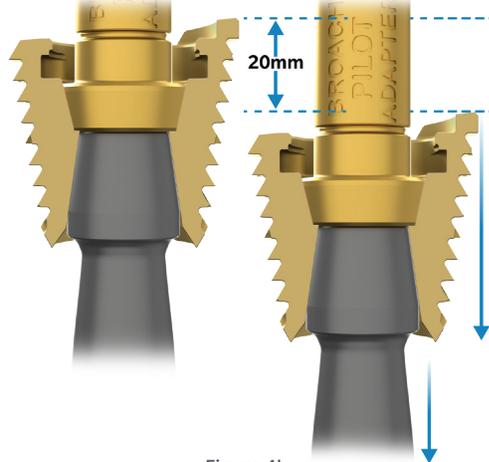


Figure 4b

Femoral Metaphyseal Cone Preparation (cont.)

Diaphyseal Preparation

Silver Broach

The silver broaches have a large through hole which allows for up to 20 mm of additional broaching depth without affecting the stem provisional placement (Figure 4a).

Gold Broach

The gold broaches can be coupled to the stem provisional and broach pilot adapter, if desired (Figure 4b).

ⓘ **Note:** Broaching deeper in the distal femur with gold broaches will drive the extension post/provisional stem deeper into the femoral canal which could lead to a femoral fracture.

If it is desired to seat the gold broach further, remove the stem extension post/stem provisional construct, disassemble gold extension post and stem provisional, and proceed with freehand broaching using the DR handle and the gold broaches.



Figure 5b

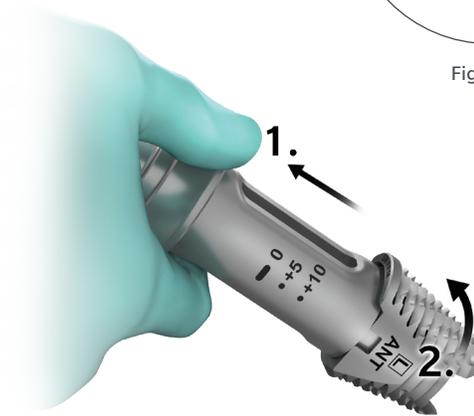


Figure 5a

Broach Preparation

ⓘ **Note:** Silver and gold broaches have identical bone preparation geometry and size.

Attach the smallest sized broach to the DR handle by pulling back on the collar and locking into place (Figure 5a).

ⓘ **Note:** The femoral cone broaches are used for both “Left” and “Right” components and must be oriented correctly to accurately represent the 6 degree valgus angle of the femoral stem housing. Orient the DR handle on the side with the depth markings with the correct side of the broach facing anterior (Figure 5b).

ⓘ **Note:** The extra small gold cone broach is intended for progressive broaching only. There is not a corresponding Trabecular Metal Metaphyseal Cone implant offered in this size.

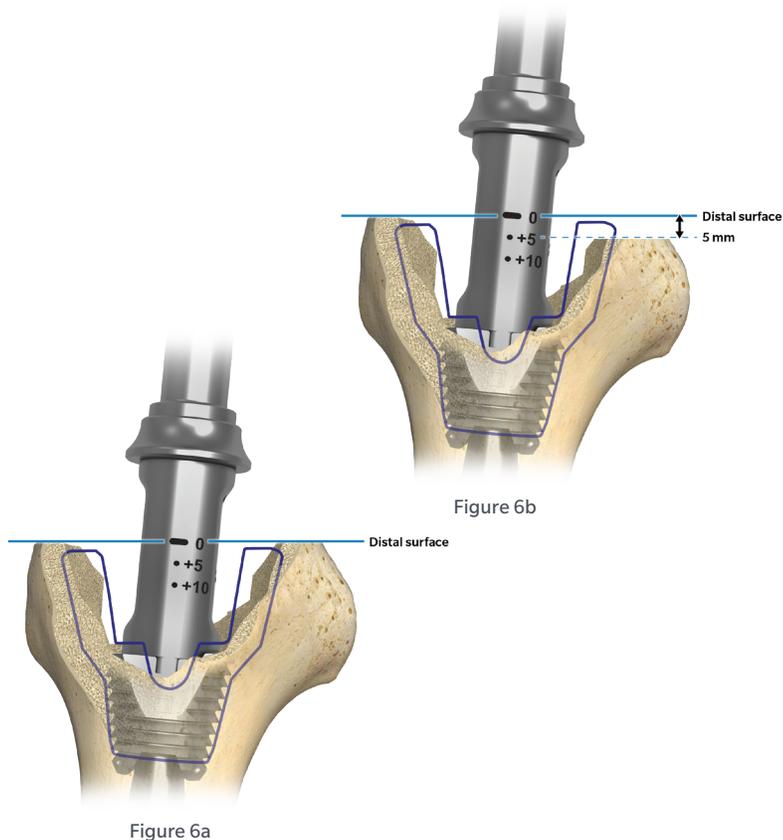


Figure 6a

Figure 6b

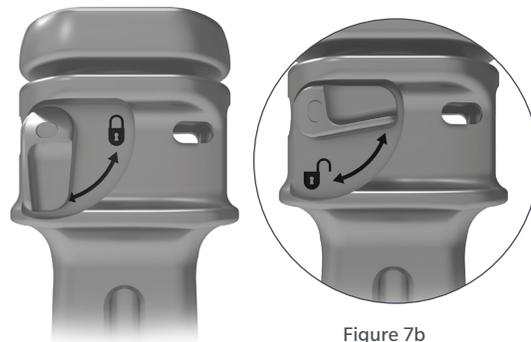


Figure 7a

Figure 7b

Femoral Metaphyseal Cone Preparation (cont.)

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 or the desired location of the distal surface of the metaphyseal cone (Figure 6a and 6b).

Progressively prepare the canal with the next size broach until the size that was preliminarily selected during the “Size Femoral Defect” step on page 11 has been prepared.

To remove the DR handle/broach, rotate the lever to the unlocked position and use the built-in slap hammer to remove the broach from the femur (Figure 7a and 7b).

Diaphyseal Fit Assessment

If the broach used to prepare the diaphyseal portion of the metaphyseal cone has been fully prepared to the proper depth, but not stable in the bone, then there are two options available:

Option 1: Advance the broach more proximal into the bone until stable and then utilize distal femoral augments to distalize the femoral component with respect to the metaphyseal cone. Reference the Metaphyseal Cone - Distal Augment Compatibility with Stems Chart at the end of this technique for compatible configurations.

Option 2: Use a larger metaphyseal cone which will have a larger diaphyseal portion. If this option is selected, ensure that a larger size cone is available and that it will fit medial-laterally within the metaphysis when sized up against the distal bone (Figure 1). Reference the Metaphyseal Cone - Femur Compatibility Chart at the end of this technique.

ⓘ **Note:** If the broach is not seated to the appropriate depth, it may cause the femoral component to sit in an undesired location.

ⓘ **Note:** Only certain distal augments can be used in conjunction with femoral metaphyseal cones. Reference the Metaphyseal Cone - Distal Augment Compatibility with Stems Chart at the end of this technique for compatible configurations.

ⓘ **Note:** The “0” marking on the DR handle corresponds to the distal end of the metaphyseal cone when fully seated in the prepared bone. If it is desired to have the metaphyseal cone positioned 5 or 10 mm distal to the femoral bone, then align the “+5” or “+10” markings to the remaining distal bone when broaching (Figure 6a and 6b). Positioning the metaphyseal cone distally does not require distal augmentation to be used on femur. The +5 and +10 markings on the DR handle correspond to central cone preparation only when distal augments are required.



Figure 8a



Figure 8b

Femoral Metaphyseal Cone Preparation (cont.)

Burring the Metaphyseal Bone

Remove stem provisional and stem extension post. Using a high speed burr, remove enough bone in order to seat the femoral metaphyseal cone provisional in the femoral defect to the previously planned location determined during diaphyseal broaching (Figure 8a).

ⓘ **Note:** Alternatively, the tilt reamer can be used to manually smooth or remove any obstructing bone if desired (Figure 8b).

Remove any obstructing bone with burr or tilt reamer in order to seat the femoral metaphyseal cone properly.

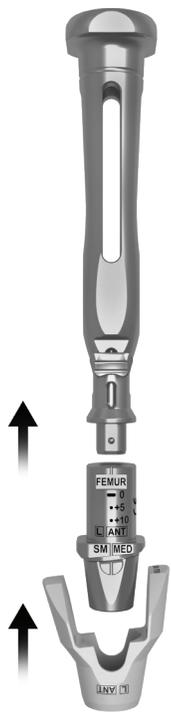


Figure 9a



Figure 9b

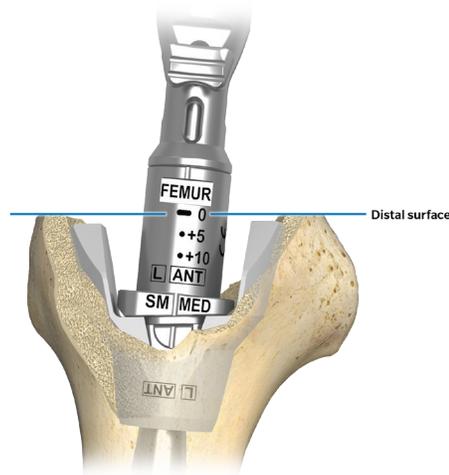


Figure 10a

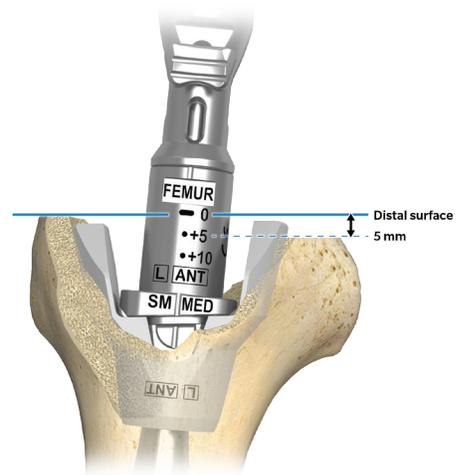


Figure 10b

Femoral Metaphyseal Cone Preparation (cont.)

Femoral Metaphyseal Cone Insertion

Attach the QC handle to the appropriate femoral cone impactor head (Figure 9a). Insert the femoral metaphyseal cone provisional that is the same size as the last broach used and position into the femur (Figure 10a). The “0” line will align to the distal surface of the metaphyseal cone or to the same depth as prepared during diaphyseal broaching (Figure 10a and 10b).

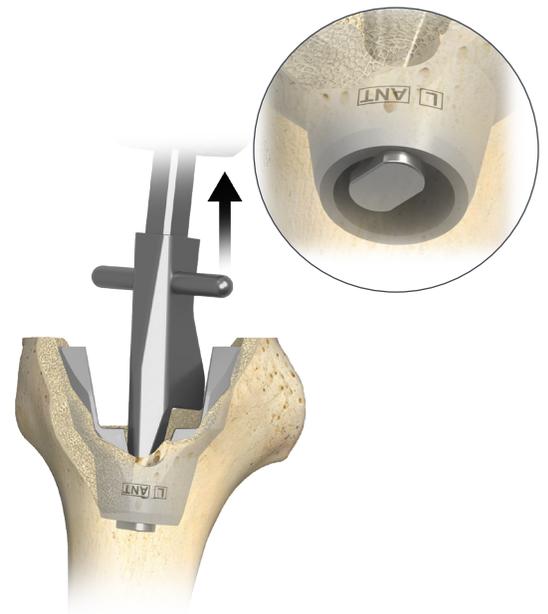


Figure 11

- ⓘ **Note:** Only certain distal augments can be used in conjunction with femoral metaphyseal cones. Reference the Metaphyseal Cone - Distal Augment Compatibility with Stems Chart at the end of this technique for compatible configurations.
- ⓘ **Note:** The femoral cone impactor heads are used for both “Left” and “Right” components and must be oriented correctly to accurately represent the 6 degree angle of the femoral stem housing. Orient the QC handle with the correct side facing anterior (Figure 9b).
- ⓘ **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).

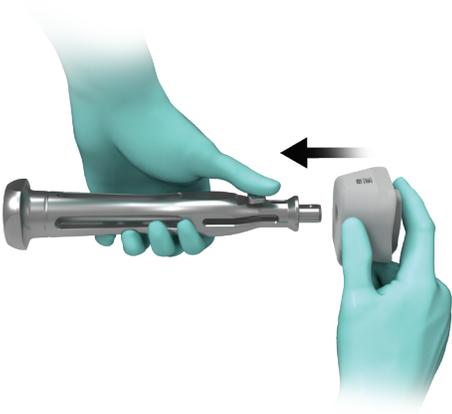


Figure 12

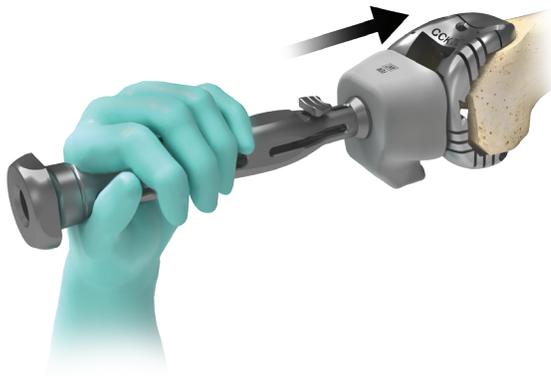


Figure 13

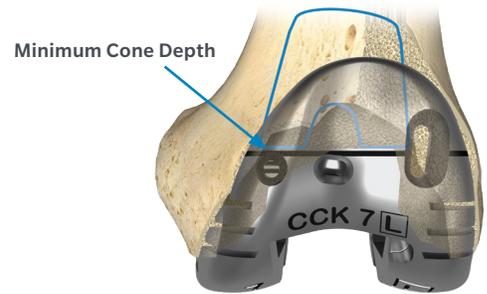


Figure 14

Femoral Metaphyseal Cone Preparation (cont.)

Insert the femoral provisional construct (femur and stem provisional) by hand. Assemble the QC handle and the femoral impactor pad and impact the femoral provisional construct into the femur (Figure 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:** The stem compatibility charts are for both straight and offset stems, however for offset stems, it should be verified that the offset stem geometry can be passed through the provisional and into the prepared bone. It should be noted that the stem provisionals are slightly undersized from the splined stem extension implants and slightly oversized for the smooth stem extension implants.

If the provisional construct does not pass through the metaphyseal cone provisional, there are two options available:

Option 1: Preassemble the metaphyseal cone provisional to the femoral provisional construct prior to insertion.

Option 2: Convert to a smaller diameter Smooth Cemented Stem to eliminate pre-assembly requirements. Reference the Metaphyseal Cone-Smooth Stem Compatibility chart at the end of the surgical technique.

If the large diameter or offset stem is required, this back table provisional step applies to the final implant construct assembly as well.

Reference the Metaphyseal Cone - Splined Stem and & Smooth Stem Compatibility Charts at the end of this technique for pre-assembly requirements.

Reference the Metaphyseal Cone - Distal Augment Compatibility with Stems Chart at the end of this technique for compatible configurations.

Proceed to the Persona Revision Knee System Surgical Technique 1832.1-GLBL-en for Trial Reduction and Optional Posterior Augment Preparation (see Metaphyseal Cone - Posterior Augment Compatibility with Femurs Chart at the end of this technique for compatible sizes).



Figure 15



Figure 16

Femoral Metaphyseal Cone Implant Assembly

Implanting Surgical Steps Overview (pre-assembly not required)

1. Implant Metaphyseal Cone
2. Assemble Distal/Posterior Augments(if any) on femur
3. Insert and impact stem implant. Tighten Set Screw
4. Apply cement to femoral construct (reference the Persona Revision Surgical Technique 1832.1-GLBL-en for complete directions) and insert, then impact femoral construct in place. Remove any residual cement.

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 Metaphyseal Femoral Cone Implant.

If the femoral provisional construct did not fit through the femoral metaphyseal cone provisional in-situ, pre-assembly of the femoral metaphyseal cone implant to the femoral component is required. Proceed to the Femoral Cone Assembly with an Offset or Large Diameter Stem section, on page 20 for assembly instructions.

Assemble the appropriate femoral cone impactor head to the QC handle by pulling back the lever on the handle and attaching (Figure 15). Implant the Trabecular Metal Femoral Metaphyseal Cone Implant (Figure 16). The “0” line will align to the distal surface of the metaphyseal cone or to the same depth as prepared during diaphyseal broaching. (Figure 17a and 17b).

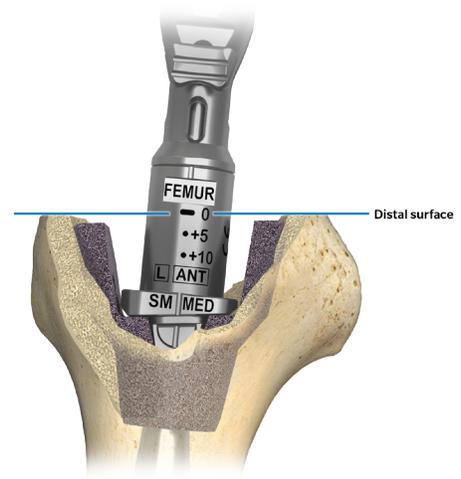


Figure 17a

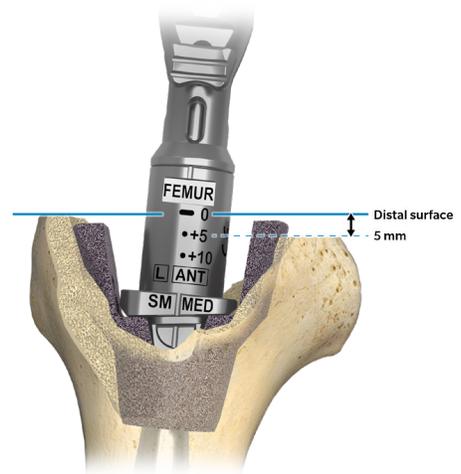


Figure 17b

ⓘ **Note:** Only certain distal augments can be used in conjunction with femoral metaphyseal cones. Reference the Metaphyseal Cone - Distal Augment Compatibility with Stems Chart at the end of this technique for compatible configurations.

ⓘ **Note:** The femoral cone impactor heads are used for both “Left” and “Right” components and must be oriented correctly to accurately represent the 6 degree angle of the femoral stem housing. Orient the QC handle with the correct side facing anterior.

If excessive force is required to seat the cone implant, femoral fracture may occur. If necessary, consider rebroaching the diaphysis and repairing the metaphysis.

The Trabecular Metal surface is intended to be in contact with the prepared bone. If gaps exist between the periphery of the cone and the endosteal surface, bone grafting material may be utilized with autogenous bone, allogenic bone, bone putty or cement to aid in fixation.

ⓘ **Note:** Coat any exposed Trabecular Metal surface with bone cement or biological material if there is a concern of unwanted soft tissue attachment or to prevent soft tissue irritation.

**Metaphyseal Cone - Distal Augment
Compatibility with Stems**

		Stem Size		
		10-17 mm	18-24 mm	
Metaphyseal Cone	SML	5, 10, 15 mm	5 mm	10, 15 mm
	MED	5, 10, 15 mm	5 mm	10, 15 mm
	LRG	5, 10, 15 mm	5 mm	10, 15 mm
	XLRG	5, 10, 15 mm	5 mm	10, 15 mm

Compatible
Incompatible

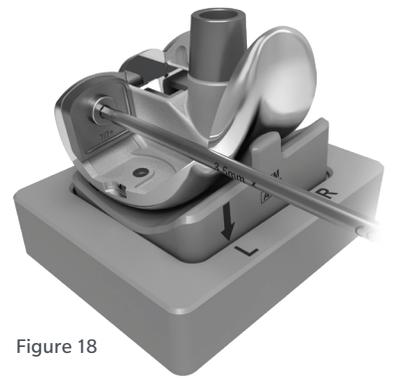


Figure 18

Metaphyseal Cone - Posterior Augment Compatibility with Femurs

		Femur Size												
		1/1+	3/3+		5/5+		7/7+		9/9+		11/11+		13	
Metaphyseal Cone	SML	5, 10, 15 mm	5 mm	10, 15 mm	5 mm	10, 15 mm	5, 10 mm	15 mm	5, 10 mm	15 mm	5, 10, 15 mm		5, 10, 15 mm	
	MED	*	*		5 mm	10, 15 mm	5 mm	10, 15 mm	5, 10 mm	15 mm	5, 10 mm	15 mm	5, 10, 15 mm	
	LRG	*	*	*			5 mm	10, 15 mm	5 mm	10, 15 mm	5, 10 mm	15 mm	5, 10 mm	15 mm
	XLRG	*	*	*			5, 10, 15 mm		5 mm	10, 15 mm	5 mm	10, 15 mm	5, 10 mm	15 mm

*Metaphyseal Cone is not compatible with Femur.

Compatible
Incompatible

Femoral Metaphyseal Cone Implant Assembly (cont.)

Optional Femoral Augment Assembly

Distal and posterior augments are compatible for use with metaphyseal cones, but depending on the cone, femur, or stem size, there may be limitations. Reference the compatibility charts above for distal and posterior augment compatibilities.

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 (Figure 18). If both distal and posterior augments are being utilized, assemble the distal augment onto the femoral implant first, then the posterior augment.

Proceed to the Persona Revision Knee System Surgical Technique 1832.1-GLBL-en for Femoral Implant Assembly and then proceed to the cementing section on page 22.

Metaphyseal Cone - Splined Stem Compatibility

		Stem Size		
		10-16 mm	17 mm	18-24 mm
Metaphyseal Cone	SML		*	*
	MED		*	*
	LRG			*
	XLRG			*

*Pre-assembly required

Compatible
Incompatible

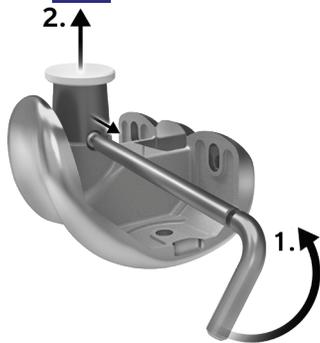


Figure 19

Metaphyseal Cone - Smooth Stem Compatibility

		Stem Size		
		10-16 mm	18 mm	20-24 mm
Metaphyseal Cone	SML		*	*
	MED		*	*
	LRG			*
	XLRG			*

*Pre-assembly required

Compatible
Incompatible



Figure 20



Figure 21

Femoral Metaphyseal Cone Implant Assembly (pre-assembly) (cont.)

Implanting Surgical Steps Overview (pre-assembly required)

1. Assemble Distal/Posterior Augments(if any) on femur
2. Assemble Metaphyseal Cone to femur
3. Assemble and impact stem implant. Tighten Set Screw through cone.
4. Apply cement to femoral construct and fill the interior portion of the cone with cement. Reference the Persona Revision Surgical Technique 1832.1-GLBL-en for complete directions.
5. Insert then impact femoral construct in place. Remove any residual cement.

Femoral Cone Assembly with an Offset or Large Diameter Stem

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

Note: The stem compatibility charts are for both straight and offset stems, however for offset stems, it should be verified that the offset stem geometry can be passed through the provisional and the prepared bone in-situ.

It is highly recommended that new gloves be applied prior to handling the femoral 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 femoral implant. Ensure the set screw in the stem housing is backed out in order for the stem to seat fully (Figure 19).

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 20). Place the femoral implant on the femoral impaction saddle (Figure 21).



Figure 22



Figure 23b



Figure 24b

Femoral Metaphyseal Cone Implant Assembly (cont.)

Place the Trabecular Metal Femoral Metaphyseal Cone Implant over the femoral stem housing (Figure 22). 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 straight 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 23a).

If using an offset splined stem, insert the stem into the femur and rotate the stem until the predetermined offset number lines up with the reference mark on the posterior of the stem housing (Figure 23b). Confirm stem alignment by referencing the provisional components.

While protecting the tip of the stem with a soft cloth, firmly impact the stem to engage the tapers. Adjust the position of the Trabecular Metal Metaphyseal Cone as needed in order to access the set screw. Tighten the set screw with the 2 mm hex driver in a clockwise direction through the slot in the Femoral Cone Implant (Figure 24a and 24b).

- ⓘ **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.

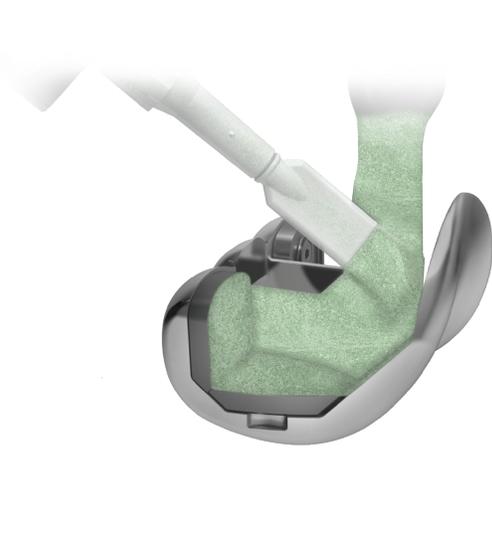


Figure 25



Figure 26



Figure 27

Femoral Metaphyseal Cone Implant Assembly (cont.)

Cementing (pre-assembly not required)

Apply a layer of bone cement on the interior surface of the femoral component including the intercondylar box region and stem transition (Figure 25). The amount of cement must be of sufficient quantity to fill the internal cavity of the cone.

ⓘ **Note:** The entire inside volume of the Trabecular Metal Metaphyseal Cone and hole must be filled with cement.

Implant the final assembled femoral component with stem extension through the cone and impact as described Persona Revision Surgical Technique 1832.1-GLBL-en.

Cementing (pre-assembly required)

When pre-assembly of the Femoral Metaphyseal Cone is required, follow this cementing technique once the stem has been seated and the set screw has been tightened.

Lift the metaphyseal cone from the Femoral Component and fill the interior portion of the cone with cement from the opening on the posterior side (Figure 26).

Apply cement on the distal surface of the cone that will contact the femoral component or distal augment once seated (Figure 27).

Seat the cone against the distal surface of the Femoral component or augment to pressurize the cement internally in the metaphyseal cone. Clear away any excessive cement from the external surfaces of the cone. Fill any visible internal gaps with additional cement posteriorly or near the stem junction at the proximal end of the cone.

When implanting the preassembled construct, it is recommended that the cement is in the doughy phase to allow implant orientation adjustment during insertion.

Perimeter Cone Compatibility Charts

Perimeter Cone - Tibia Compatibility

		Tibia Size								
		A	B	C	D	E	F	G	H	J
Perimeter Cone	FIX TIB									
	SML									
	MED									
	LRG									

 Compatible
 Incompatible

Perimeter Cone - Splined Stem Compatibility

		Stem Size			
		10-14 mm	15-16 mm	17 mm	18-24 mm
Perimeter Cone	FIX TIB		*	*	*
	SML			*	*
	MED				*
	LRG				*

*Pre-assembly required

 Compatible
 Incompatible

Perimeter Cone - Smooth Stem Compatibility

		Stem Size			
		10-14 mm	16-18 mm	20 mm	22-24 mm
Perimeter Cone	FIX TIB		*	*	*
	SML			*	*
	MED				*
	LRG				*

*Pre-assembly required

 Compatible
 Incompatible

Perimeter Cone - Tibial Augment Compatibility with Stems

		Stem Size		
		10-20 mm		22-24 mm
Perimeter Cone	FIX TIB	5, 10, 15 mm		5, 10 mm 
	SML	5, 10, 15 mm		5, 10, 15 mm
	MED	5, 10, 15 mm		5, 10, 15 mm
	LRG	5, 10, 15 mm		5, 10, 15 mm

 Compatible
 Incompatible

Metaphyseal Cone Compatibility Charts

Metaphyseal Cone - Femur Compatibility

		Femur Size						
		1/1+	3/3+	5/5+	7/7+	9/9+	11/11+	13
Metaphyseal Cone	SML							
	MED							
	LRG							
	XLRG							

Compatible
 Incompatible

Metaphyseal Cone - Distal Augment Compatibility with Stems

		Stem Size	
		10-17 mm	18-24 mm
Metaphyseal Cone	SML	5, 10, 15 mm	5 mm, 10, 15 mm
	MED	5, 10, 15 mm	5 mm, 10, 15 mm
	LRG	5, 10, 15 mm	5 mm, 10, 15 mm
	XLRG	5, 10, 15 mm	5 mm, 10, 15 mm

Compatible
 Incompatible

Metaphyseal Cone - Posterior Augment Compatibility with Femur

		Femur Size										
		1/1+	3/3+		5/5+		7/7+		9/9+		11/11+	
Metaphyseal Cone	SML	5, 10, 15 mm	5 mm	10, 15 mm	5 mm	10, 15 mm	5, 10 mm	15 mm	5, 10 mm	15 mm	5, 10, 15 mm	5, 10, 15 mm
	MED	*	*	5 mm	10, 15 mm	5 mm	10, 15 mm	5, 10 mm	15 mm	5, 10 mm	15 mm	5, 10, 15 mm
	LRG	*	*	*	5 mm	10, 15 mm	5 mm	10, 15 mm	5, 10 mm	15 mm	5, 10 mm	15 mm
	XLRG	*	*	*	5, 10, 15 mm	5 mm	10, 15 mm	5 mm	10, 15 mm	5 mm	10, 15 mm	5, 10 mm

*Metaphyseal Cone is not compatible with Femur.

Compatible
 Incompatible

Metaphyseal Cone - Splined Stem Compatibility

		Stem Size		
		10-16 mm	17 mm	18-24 mm
Metaphyseal Cone	SML		*	*
	MED		*	*
	LRG			*
	XLRG			*

*Pre-assembly required

Compatible
 Incompatible

Metaphyseal Cone - Smooth Stem Compatibility

		Stem Size		
		10-16 mm	18 mm	20-24 mm
Metaphyseal Cone	SML		*	*
	MED		*	*
	LRG			*
	XLRG			*

*Pre-assembly required

Compatible
 Incompatible

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