

USTAR II™

Limb Salvage System



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System Description

The USTAR II System is designed for extensive reconstruction of the hip and knee joint. Components have been designed based on 20 years experience with the previous USTAR system. The information contained in this surgical technique guide outlines the intended use of the instruments and implants. Surgeons select and utilize the system based on the individual needs of each patient.

The modularity of USTAR II system is designed to allow flexibility to address a variety of difficult surgical situations including the following:

- Proximal Femoral Replacement
- Distal Femoral Replacement
- Proximal Tibial Replacement
- Total Femoral Replacement
- Hinge Knee



INDICATIONS

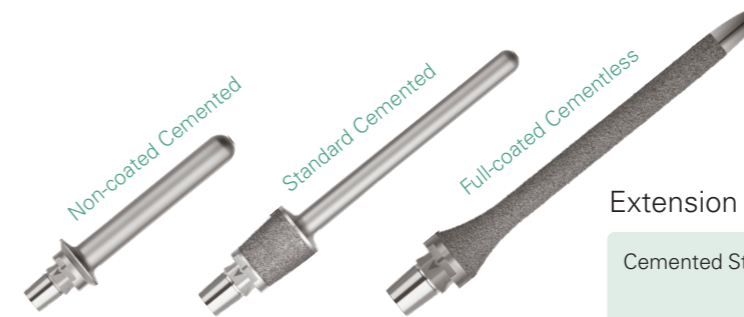
1. Metastatic tumor (i.e. osteosarcoma, chondrosarcoma, giant cell tumor or osteoma) where massive resection and transplantation are needed.
2. Severe hip or knee joint damage resulting from trauma where massive resection and transplantation are needed.
3. Non-inflammatory degenerative joint disease such as avascular necrosis, osteoarthritis, or traumatic arthritis.
4. Revision of previously failed total joint arthroplasty, osteotomy, or arthrodesis.
5. Joint instability resulting from excessive bone resection.

Please refer to the package inserts for important product information, including, but not limited to contraindications, warnings, precautions, and adverse effects.

Distal Femoral Replacement



Distal Femoral Assembly



Extension Stem

Cemented Stem Length : Straight 100 / 125 mm
 Curved 125 / 150 mm
 Diameter : 9 / 11 / 13 / 15 / 17 mm
 Full-coated Stem Length : 150 / 200 mm
 Diameter : 11 / 13 / 15 / 17 mm



Segment

Length : 25 / 30 to 220 mm in 10 mm Increments



Distal Femoral Component

Length : 55 mm
 Left and Right



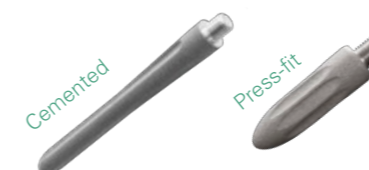
Tibial Insert

Size : S and M
 Thickness : 12 / 14 / 17 / 20 / 23 / 26 / 30 mm



Tibial Baseplate

6 Baseplate Sizes (#1 to #6)



Tibial Stem

Spirallock® Connection
 Cemented Stem Diameter : 9 mm
 Cemented Stem Length : 20 / 45 / 70 / 95 mm
 Press-fit Stem Diameter : 12.5 mm / 14 mm
 Press-fit Stem Length : 45 / 70 / 95 / 120 mm

A. Pre-operative Planning

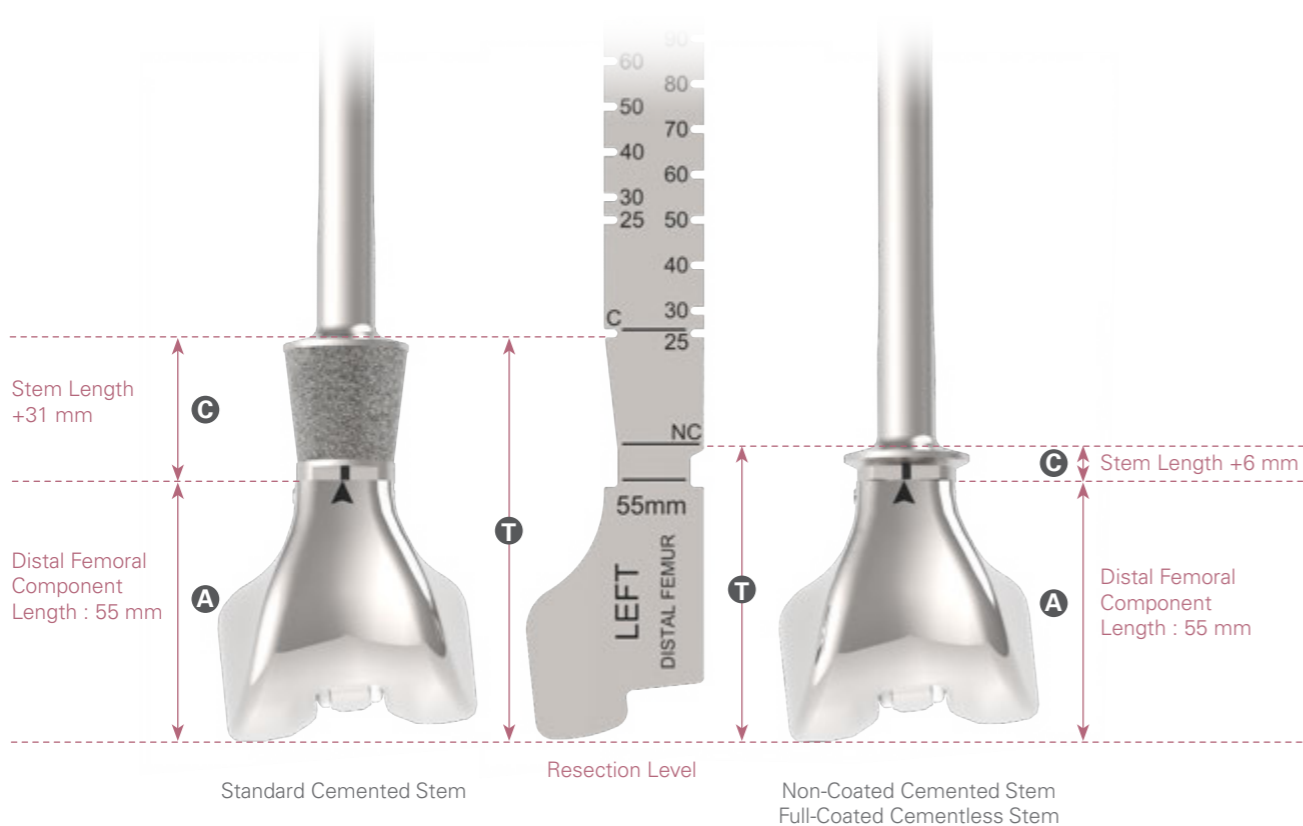
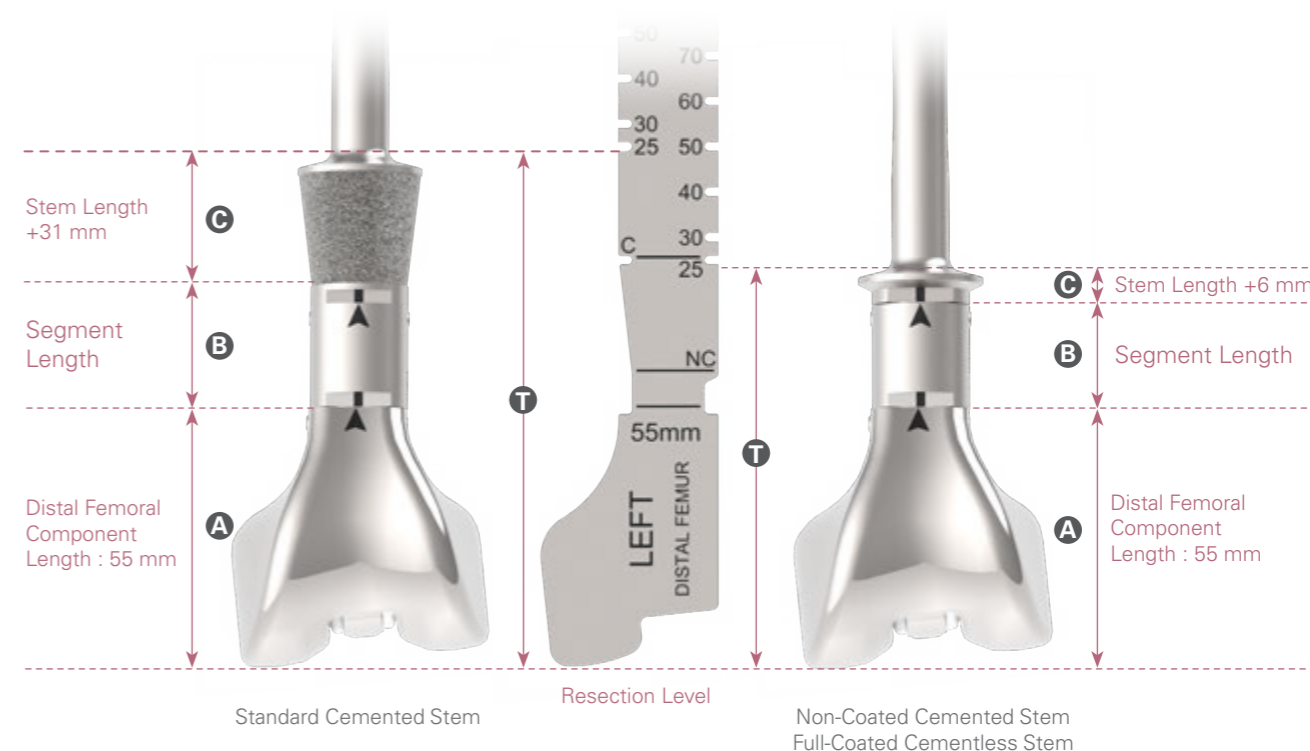
Plan the proper combination of components with the **Resection Template**.

Note the length for Standard Distal femoral components is 55 mm.

For the Standard Cemented Stem, use the medial side of the template with the etched marking 'C'. This includes the extra 31 mm titanium plasma spray coating section on the Standard Cemented Stem that adds to the extra-medullary total length. The rest of the cutouts indicate the additional segment length options.

For the Non-Coated Cemented Stem or Full-Coated Cementless stem, use the lateral side of the template with the etched marking 'NC'. This includes the extra 5 mm on the Non-Coated Cemented stem or the Full-Coated Cementless stem that add to the extra-medullary total length. The rest of the cutouts indicate the additional segment length options.

Please note the final combination of components may be different at the actual time of surgery.



| Reference Chart for Standard Cemented Stem | | | |
|--|---------------------------------|--------------|------------------------|
| T Resection Length | A Component | B Segment | C Stem |
| 86 mm | Distal Femoral Component Length | | Standard Cemented Stem |
| 111 mm | | 25 mm | |
| 116 mm | | 30 mm | |
| 126 mm | | 40 mm | |
| 136 mm | | 50 mm | |
| 146 mm | | 60 mm | |
| 156 mm | | 70 mm | |
| 166 mm | | 80 mm | |
| 176 mm | | 90 mm | |
| 186 mm | | 100 mm | |
| 196 mm | 55 mm | 110 mm | +31 mm |
| 206 mm | | 120 mm | |
| 216 mm | | 130 mm | |
| 226 mm | | 140 mm | |
| 236 mm | | 150 mm | |
| 246 mm | | 160 mm | |
| 256 mm | | 170 mm | |
| 266 mm | | 180 mm | |
| 276 mm | | 190 mm | |
| 286 mm | | 200 mm | |
| 296 mm | 210 mm | | |
| 306 mm | 220 mm | | |

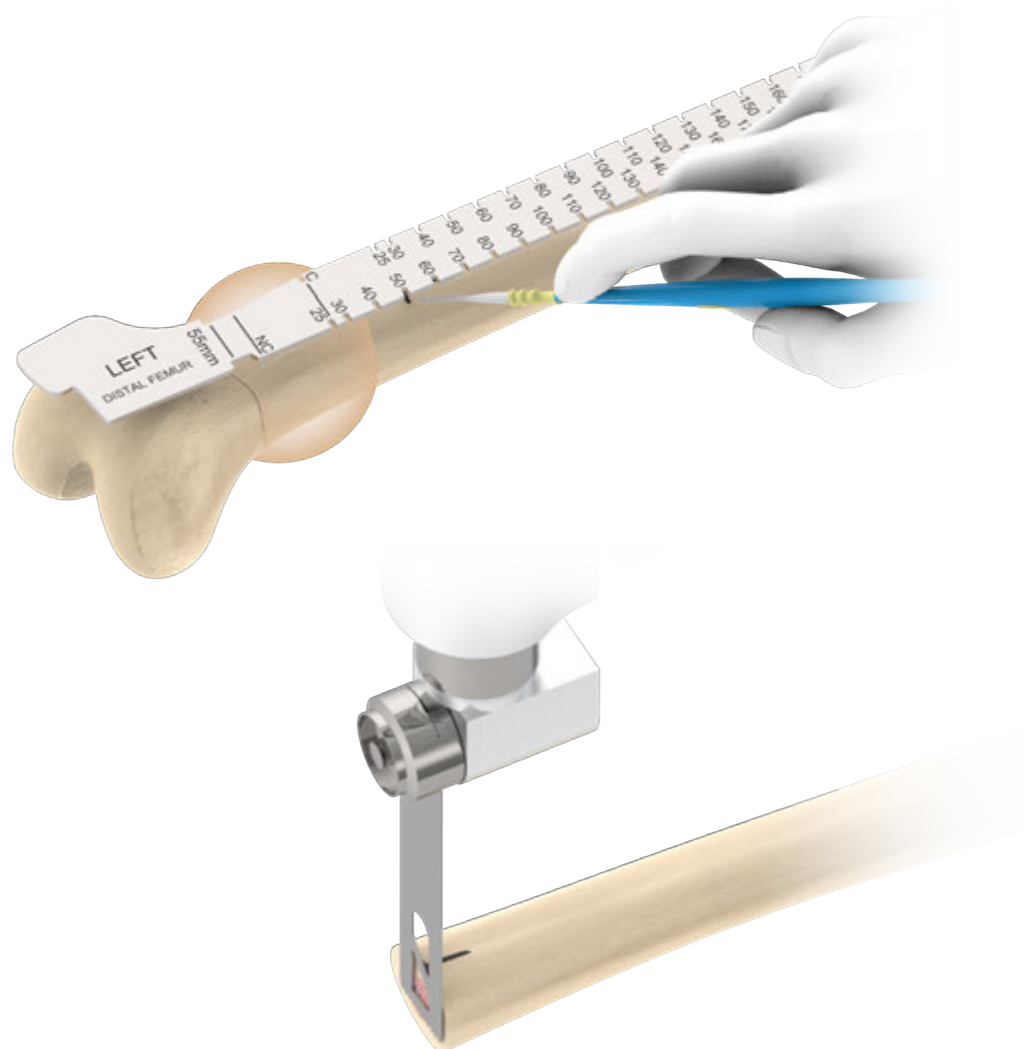
| Reference Chart for Non-Coated Cemented Stem and Full-Coated Cementless Stem | | | |
|--|---------------------------------|--------------|-----------------------------|
| T Resection Length | A Component | B Segment | C Stem |
| 61 mm | Distal Femoral Component Length | | Non-Coated Cemented Stem |
| 86 mm | | 25 mm | |
| 91 mm | | 30 mm | |
| 101 mm | | 40 mm | |
| 111 mm | | 50 mm | |
| 121 mm | | 60 mm | |
| 131 mm | | 70 mm | |
| 141 mm | | 80 mm | |
| 151 mm | | 90 mm | |
| 161 mm | | 100 mm | |
| 171 mm | 55 mm | 110 mm | Full-Coated Cementless Stem |
| 181 mm | | 120 mm | |
| 191 mm | | 130 mm | |
| 201 mm | | 140 mm | |
| 211 mm | | 150 mm | |
| 221 mm | | 160 mm | |
| 231 mm | | 170 mm | |
| 241 mm | | 180 mm | |
| 251 mm | | 190 mm | |
| 261 mm | | 200 mm | |
| 271 mm | 210 mm | | |
| 281 mm | 220 mm | | |

Note: the length of XS distal femoral component is 50 mm, 5 mm less than standard component. The XS articular surface fit only with XS Insert and XS Baseplate. Please refer to the appendix II for XS Tibial preparation.

B. Femoral Osteotomy

Measure the appropriate resection length by aligning the **Resection Template** to the level of the most distal medial condyle and mark a resection reference line. Create an anterior reference mark (L) to align with the indicator on the stem.

Perform the femoral osteotomy at the reference resection line perpendicular to the shaft.



Instruments



Resection Template

C. Canal Preparation

For the standard cemented stem and non-coated cemented stem, progressively ream the canal with the **Straight Stem Reamer** in 1 mm increments until the appropriate diameter and depth is achieved as indicated on the etched 'C' markings on the reamers. A stem diameter of 1~2 mm less than the final reamer is preferred for an adequate cement mantle.

For the full-coated cementless stem, progressively ream the canal with the **Straight Stem Reamers** that have 1 mm increments until the appropriate diameter and depth is achieved as indicated on the etched 'P' markings on the reamers. A stem diameter equal to the final reamer is recommended for an optimal press-fit. Optional reamer diameter of 11.5 / 13.5 / 15.5 / 17.5 mm are also included for the finer press-fit adjustment.

For a curved stem, there may need to be an additional difference in diameter between the final reamer and selected stem.



Example of reaming for standard cemented stem or non-coated cemented stem.

The etched marking C125 indicates an appropriate depth for a 125 mm cemented stem.

Example of reaming for full coated cementless stem.

The etched marking P150 indicates an appropriate depth for a 150 mm full coated cementless stem.

Instruments



Straight Stem Reamer
Diameter 8~21 mm

C.Canal Preparation

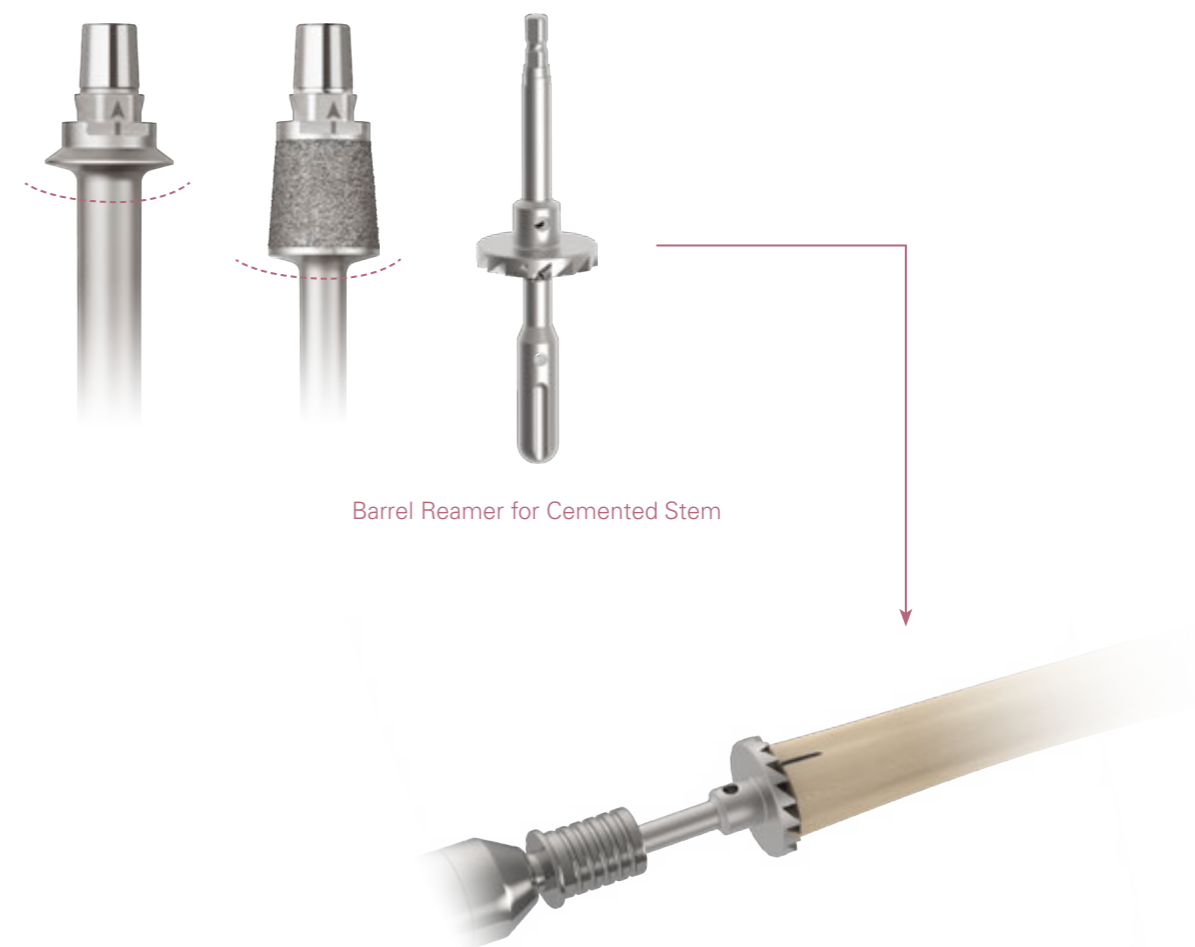
Stem Options Reference Chart

| | Straight Stem | Curved Stem |
|-----------------------------|--------------------------------|--------------------------------|
| Standard Cemented Stem | 9 mm diameter x 100 mm Length | 9 mm diameter x 125 mm Length |
| | 11 mm diameter x 100 mm Length | 11 mm diameter x 125 mm Length |
| | 13 mm diameter x 100 mm Length | 13 mm diameter x 125 mm Length |
| | 15 mm diameter x 100 mm Length | 15 mm diameter x 125 mm Length |
| | 17 mm diameter x 100 mm Length | 17 mm diameter x 125 mm Length |
| | 9 mm diameter x 125 mm Length | 9 mm diameter x 150 mm Length |
| | 11 mm diameter x 125 mm Length | 11 mm diameter x 150 mm Length |
| | 13 mm diameter x 125 mm Length | 13 mm diameter x 150 mm Length |
| | 15 mm diameter x 125 mm Length | 15 mm diameter x 150 mm Length |
| | 17 mm diameter x 125 mm Length | 17 mm diameter x 150 mm Length |
| Non-coated Cemented Stem | 9 mm diameter x 100 mm Length | 9 mm diameter x 125 mm Length |
| | 11 mm diameter x 100 mm Length | 11 mm diameter x 125 mm Length |
| | 13 mm diameter x 100 mm Length | 13 mm diameter x 125 mm Length |
| | 15 mm diameter x 100 mm Length | 15 mm diameter x 125 mm Length |
| | 17 mm diameter x 100 mm Length | 17 mm diameter x 125 mm Length |
| | 9 mm diameter x 125 mm Length | 9 mm diameter x 150 mm Length |
| | 11 mm diameter x 125 mm Length | 11 mm diameter x 150 mm Length |
| | 13 mm diameter x 125 mm Length | 13 mm diameter x 150 mm Length |
| | 15 mm diameter x 125 mm Length | 15 mm diameter x 150 mm Length |
| | 17 mm diameter x 125 mm Length | 17 mm diameter x 150 mm Length |
| Full Coated Cementless Stem | N/A | N/A |
| | 11 mm diameter x 150 mm Length | 11 mm diameter x 150 mm Length |
| | 13 mm diameter x 150 mm Length | 13 mm diameter x 150 mm Length |
| | 15 mm diameter x 150 mm Length | 15 mm diameter x 150 mm Length |
| | 17 mm diameter x 150 mm Length | 17 mm diameter x 150 mm Length |
| | N/A | N/A |
| | 11 mm diameter x 200 mm Length | 11 mm diameter x 200 mm Length |
| | 13 mm diameter x 200 mm Length | 13 mm diameter x 200 mm Length |
| | 15 mm diameter x 200 mm Length | 15 mm diameter x 200 mm Length |
| | 17 mm diameter x 200 mm Length | 17 mm diameter x 200 mm Length |



C.Canal Preparation

For the standard cemented stem and non-coated cemented stem, connect the **Cemented Stem Barrel Reamer** to the appropriate **Reamer Guide Rod** and advance into the canal to prepare the resected distal femur.



Barrel Reamer for Cemented Stem

Instruments



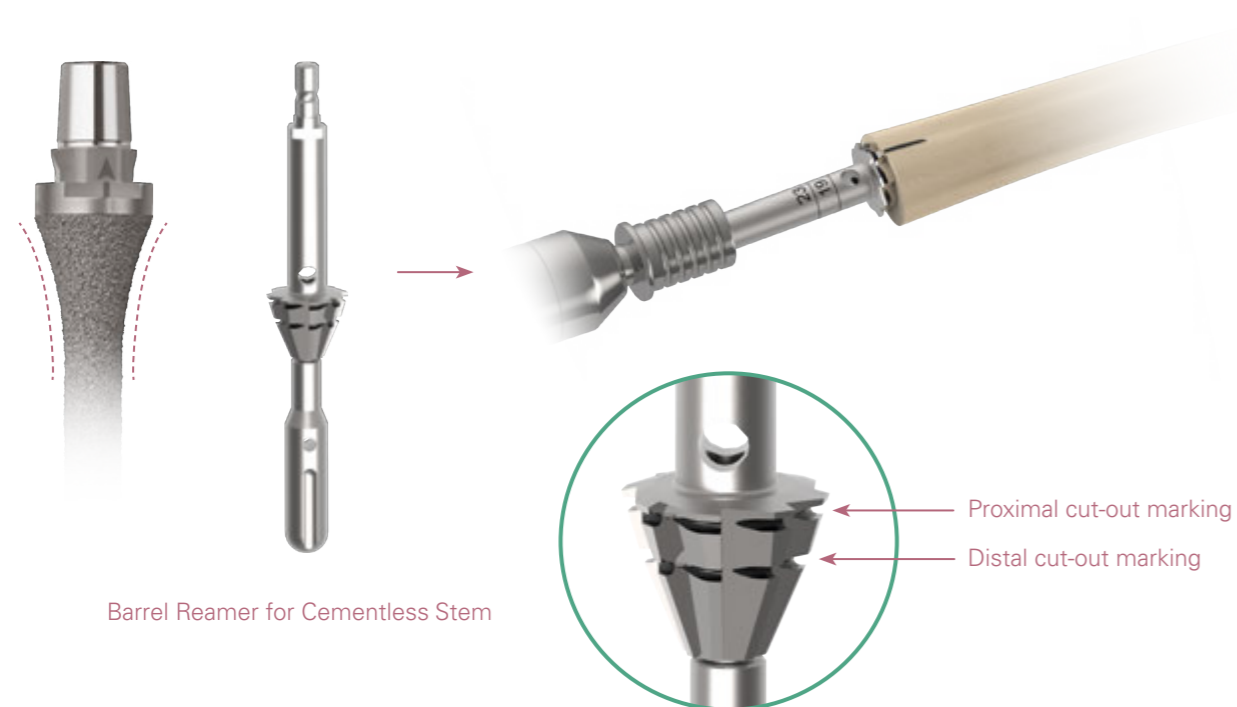
Cemented Stem Barrel Reamer Reamer Guide Rod

C. Canal Preparation

For the cementless stem, connect the **Cementless Stem Barrel Reamer** to the appropriate **Reamer Guide Rod** and advance into the canal to prepare the resected distal femur.

Ream to the distal cut-out marking on the barrel reamer. If less than 3 mm of cortical bone around the reamer is observed, stop reaming. The planned implant construct will be 8 mm longer than the original measured plan. The cementless stem will sit above the bone (proud) by 14 mm (8 mm coated and 6 mm non-coated area on the proximal end of stem). The length of the implant construct may be adjusted by selecting a shorter segment or making other adjustment.

If there is 3 mm or more of cortical bone around the barrel reamer after the initial reaming step, continue reaming to the proximal cut-out marking on the barrel reamer. The planned implant construct will match the original measured plan. The cementless stem will sit above the bone (proud) by 6mm (6mm non-coated area on the proximal end of the stem). This will be the non-coated area on the proximal end of the stem.



Instruments



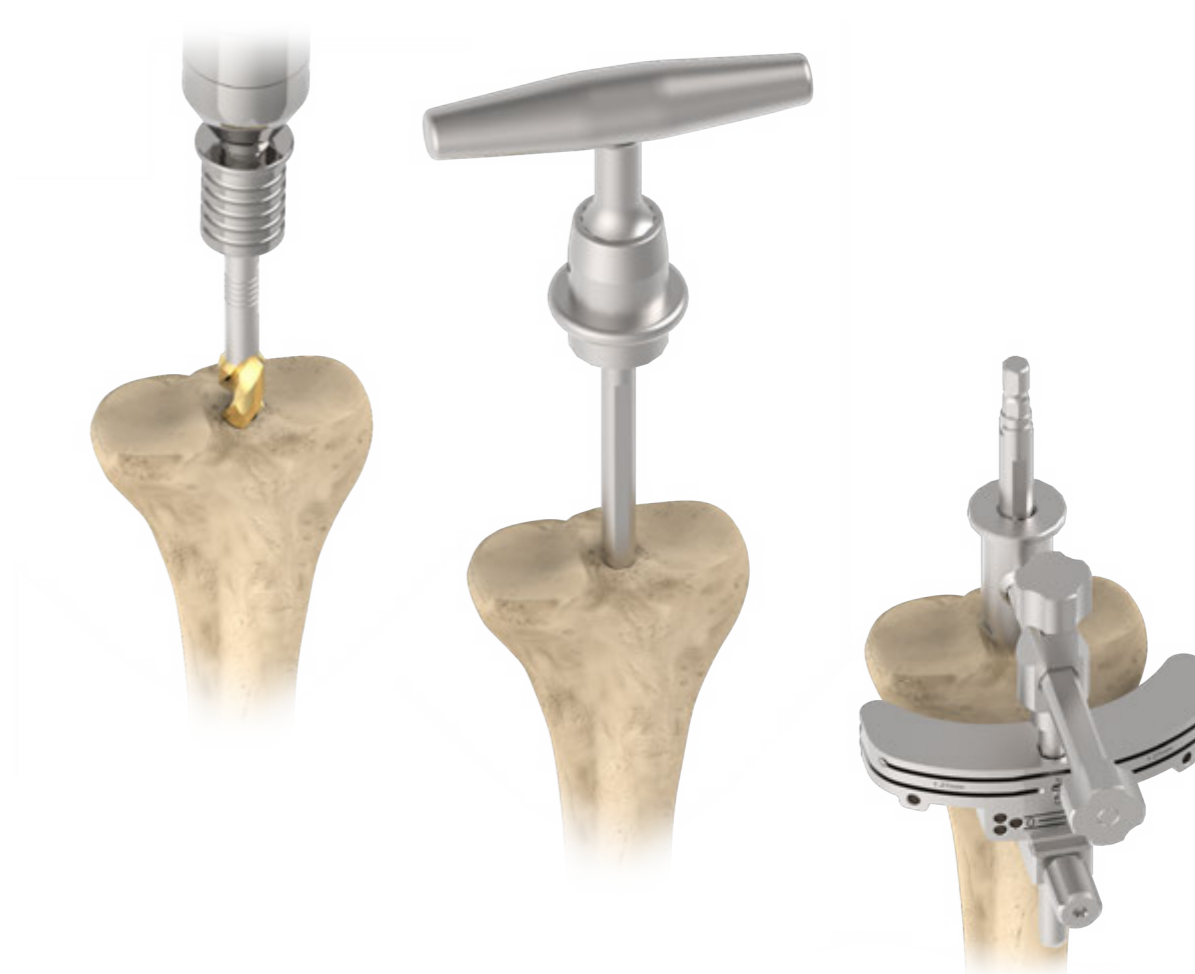
Cementless Stem Barrel Reamer Reamer Guide Rod

D. Establish Tibial Platform

Set the knee in flexion to fully expose the tibial plateau. Use the **Step Drill** to find the canal. The entry location shall be approximately 10 mm posterior to the origin of anterior cruciate ligament.

Using the **T-Handle**, advance the **Tibial IM Rod** into the canal. Then remove the **T-Handle**.

Assemble the **Tibial IM Alignment Guide** and the **Tibial Resection Guide** onto the **Tibial IM Rod**.



Instruments



Step Drill T-Handle Tibial IM Rod Tibial Resection Guide Tibial IM Alignment Guide

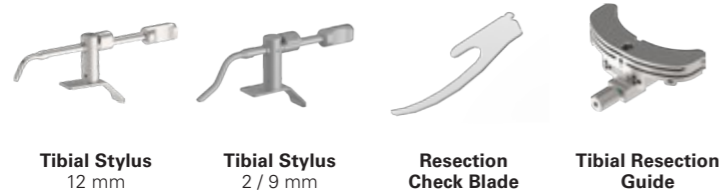
D. Establish Tibial Platform

Insert the 12 mm **Tibial Stylus** into the first slot which was labeled "N" on the **Tibial Resection Guide**. Position the tip of the **Tibial Stylus** on the appropriate reference point of the tibial plateau to evaluate the standard 12 mm tibial bone resection from the joint line. The **Resection Check Blade** may be inserted into the first slot labeled "N" on the **Tibial Resection Guide** to confirm positioning.

If a smaller resection is desired, an optional 2 mm / 9 mm **Tibial Stylus** is available.



Instruments

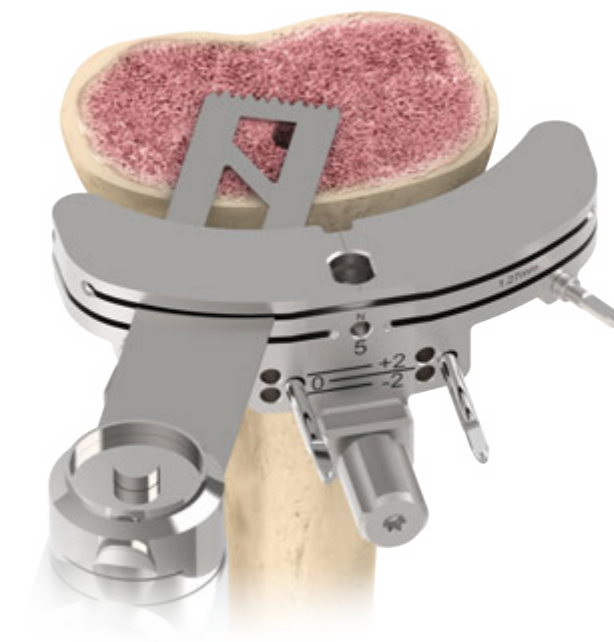


D. Establish Tibial Platform

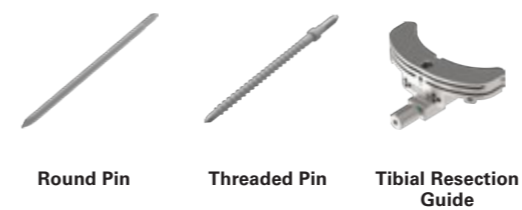
Secure the **Tibial Resection Guide** with two **Round Pins** through the holes labeled '0'.

Remove the intramedullary assembly, leaving the resection guide in place. If needed, additional **Threaded Pins** may be used to further secure the resection guide.

Perform the proximal tibial resection using a standard .050" (1.27 mm) saw blade inserted through the first slot labeled "N".



Instruments



E. Finish Tibial Preparation

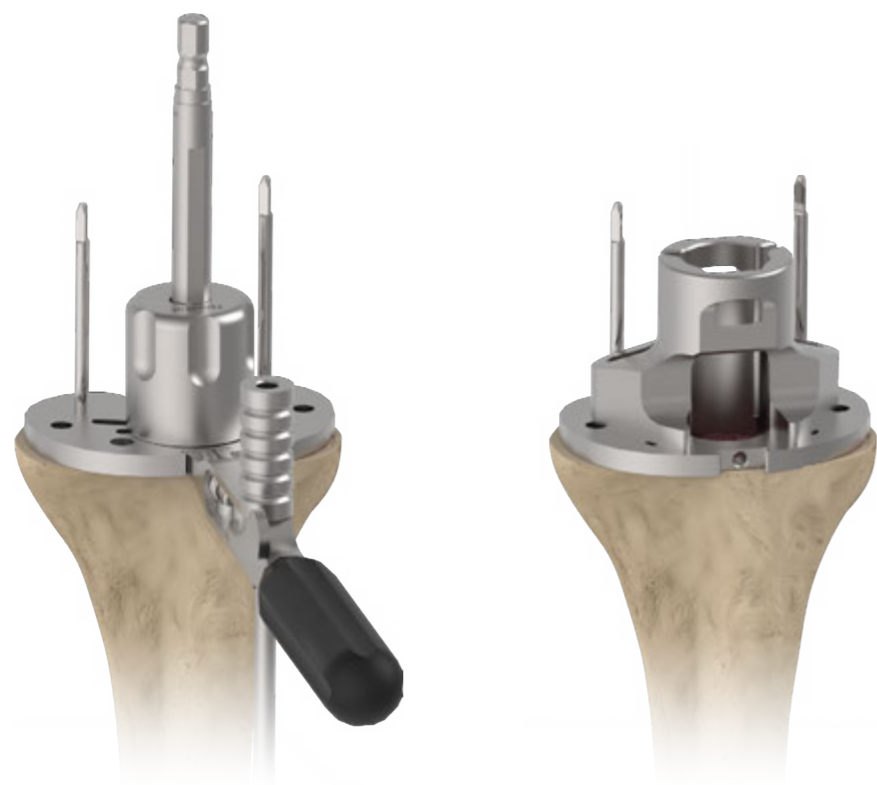
Select the **Tibial Sizing Template** that provides the desired tibial coverage and attach it to the **Tibial Sizing Template Handle**. Place onto the resected tibial surface, then insert the **Tibial IM Rod** into the tibial canal. Slide the **Tibial Neutral Bushing** over the the **Tibial IM Rod and** onto the **Tibial Sizing Template**.

Attach the **Alignment Rod** to the **Tibial Sizing Template Handle** to help confirm optimal position.

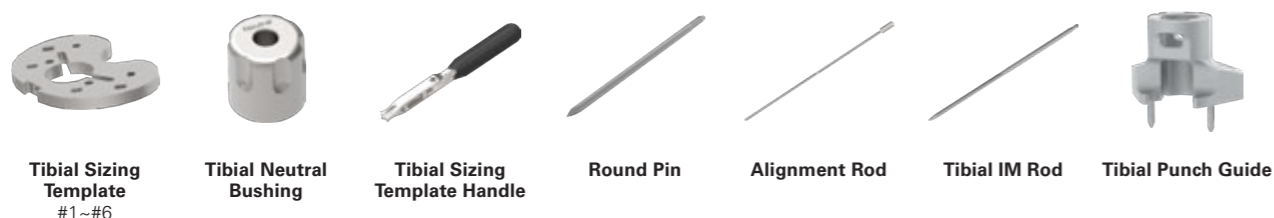
Align the **Tibial Sizing Template** with the desired rotational position on the resected tibial surface, maintaining orientation with the the **Tibial IM Rod/Tibial Neutral Bushing** assembly. Secure with two **Round Pins**.

Remove the **Tibial Neutral Bushing, Tibial IM Rod** and the **Alignment Rod**.

Attach the **Tibial Punch Guide** onto the sizing template.



Instruments

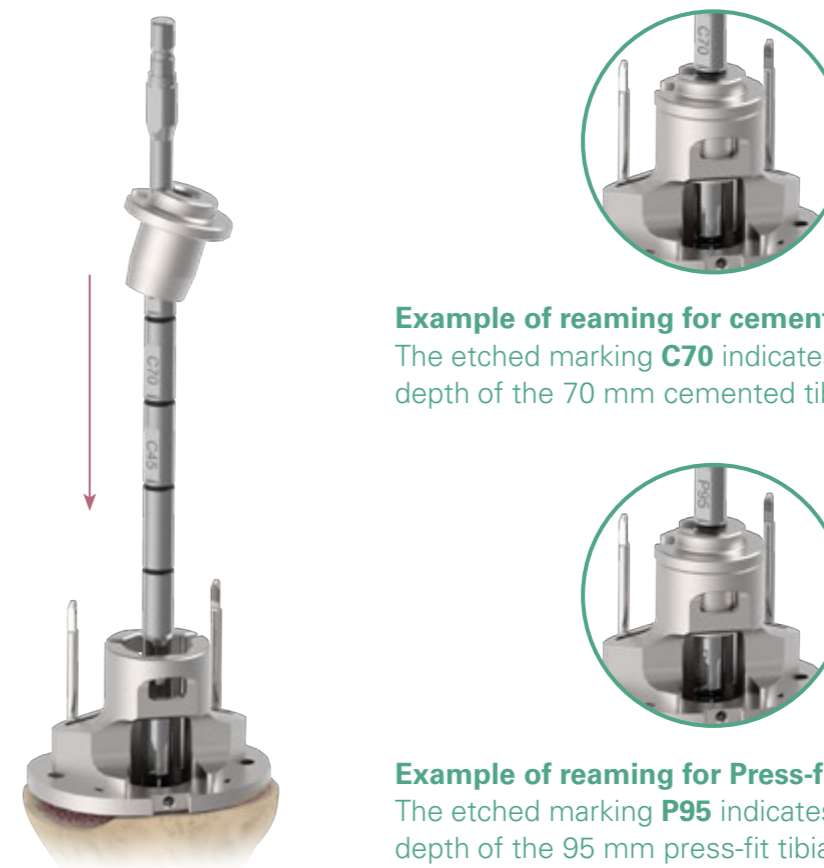


E. Finish Tibial Preparation

Insert the **Tibial Stem Drill** into the tibial canal. Place the **Tibial Stem Drill Sleeve** over the **Tibial Stem Drill**.

Different reamer diameters are available to obtain the desired stability. There are different reaming depths engraved on each reamer. Align the depth marking to the **Tibial Stem Drill Sleeve** in order to reach the appropriate depth of the desired stem length. Refer to the etched "C" depth marking for the 9 mm diameter cemented stem; and the etched "P" depth marking for the 12.5 mm and 14 mm diameter press-fit stem.

A 12.5 mm diameter reamer is recommended for an optimal press-fit of a 12.5 mm diameter press-fit tibial stem; while a 14 mm diameter reamer is recommended for an optimal press-fit of a 14 mm diameter press-fit tibial stem. If the desired stability is unable to achieve with the use of 12.5 mm and 14 mm reamers, the use of cemented stem is suggested.



Example of reaming for cemented tibial stem.
The etched marking **C70** indicates the appropriate depth of the 70 mm cemented tibial stem.

Example of reaming for Press-fit tibial stem.
The etched marking **P95** indicates the appropriate depth of the 95 mm press-fit tibial stem.

Instruments

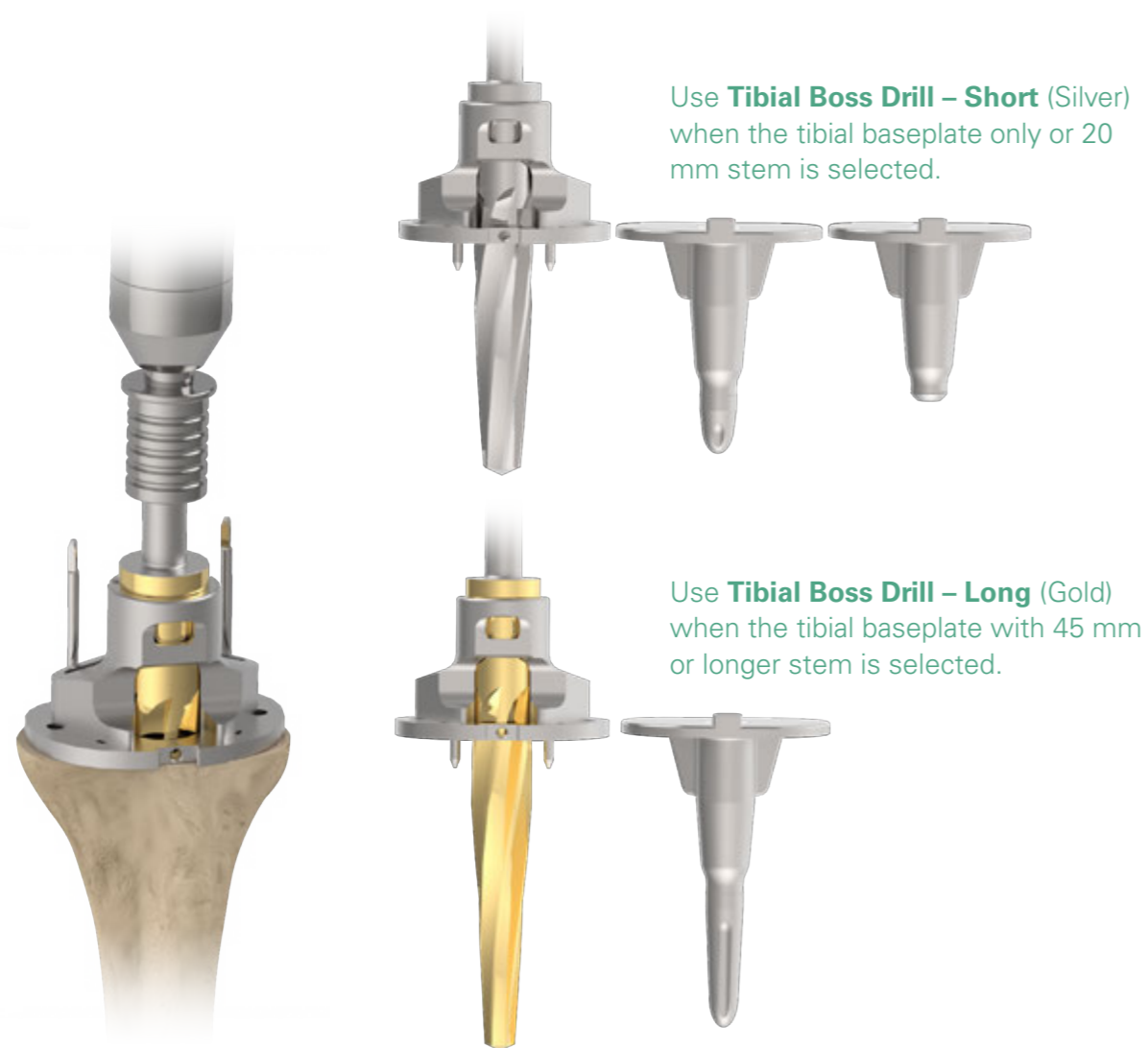


E. Finish Tibial Preparation

Select the correct **Tibial Boss Drill** for the selected tibial implant construct and advance through the **Tibial Punch Guide** until fully engaged.

For the tibial baseplate with no stem or a 20 mm stem, use the silver **Tibial Boss Drill - Short**.

For the tibial baseplate with a 45 mm stem or longer, use the gold **Tibial Boss Drill - Long**.



Instruments



E. Finish Tibial Preparation

Choose the **Tibial Punch** that corresponds to selected **Tibial Sizing Template** and attach it to the **Tibial Punch Handle**. The corresponding sizes are marked on the side of the **Tibial Punch**.

Advance the **Tibial Punch** through the **Tibial Punch Guide** until fully engaged.

Disengage the Tibial Punch assemblies with the **Slotted Hammer** and remove the **Tibial Sizing Template**.



Instruments



F.Trialing

If a tibial stem is selected, thread the corresponding **Tibial Stem Trial** into the bottom of the selected **Tibial Baseplate Trial**.

Attach the **Tibial Baseplate Trial Driver** to the **Modular Handle**.

Insert the tip of the **Tibial Baseplate Trial Driver** into the center hole of the tibial trial assembly and turn the driver ¼ turn in the clockwise direction to lock the driver into the tibial trial assembly.



Instruments



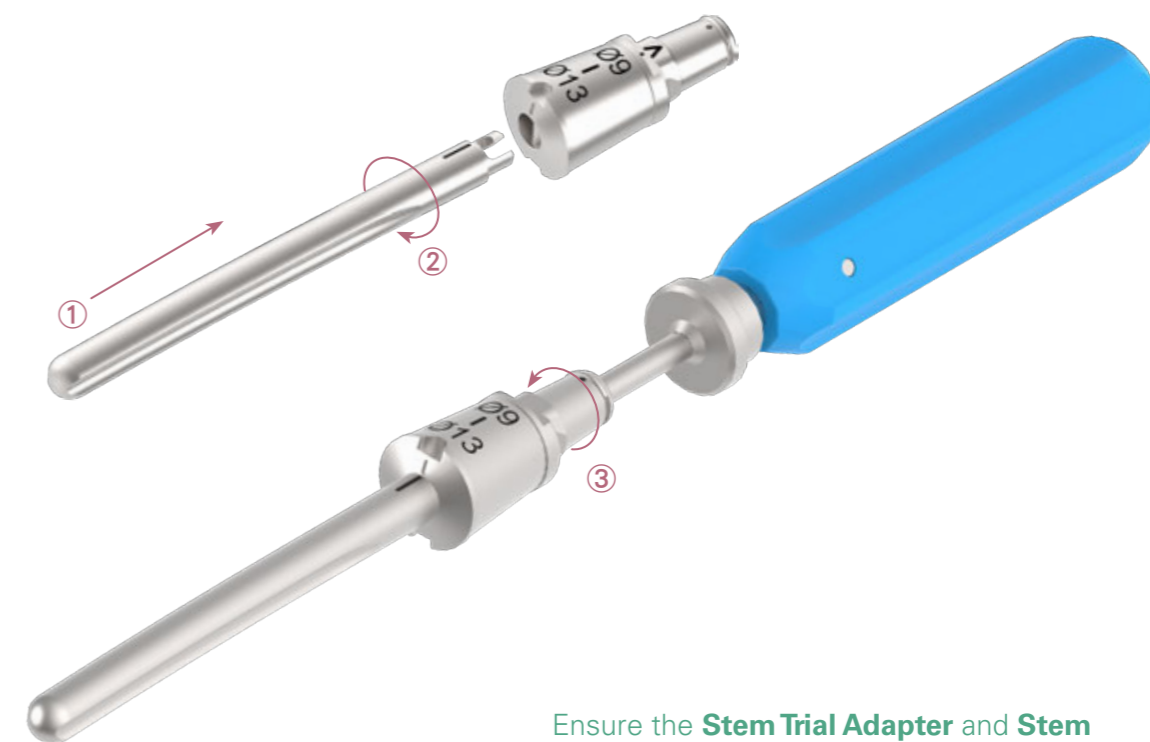
Tibial Baseplate Trial Tibial Stem Trial Modular Handle Tibial Baseplate Trial Driver

F.Trialing

Choose the **Stem Trial Body** and **Stem Trial Adapter** that corresponds to selected cemented or cementless stem size.

Attach the **Stem Trial Body** into the **Stem Trial Adapter** (see image part 1 and 2, the anterior indicators shall align together).

Insert the **Screwdriver Adapter T30** into the top of the **Stem Trial Adapter** and secure with the **Driver Handle** (see image part 3).



Ensure the **Stem Trial Adapter** and **Stem Trial Body** are fully attached and locked into position prior to trialing.

Instruments



Cemented Stem Trial Body Diameter 9~17 mm
 Cemented Stem Trial Adapter Diameter 9~13 mm
 Cementless Stem Trial Body Diameter 11~17 mm
 Cementless Stem Trial Adapter Diameter 11~17 mm
 Driver Handle
 Screwdriver Adapter, T30

F.Trialing

Identify the correct length **Segment Trial** to restore femoral length using the chart below. During trialing, multiple trial segments may be combined to represent the ideal monolithic component assembly length.

Attach the selected **Segment Trial(s)** to the selected **Distal Femoral Trial**. Attach the **Distal Femoral Trial/Segment Trial** assembly to the **Stem Trial Adapter/Stem Trial Body** assembly.

Segment Trial Reference Chart

| Segment (mm) | Segment Trial (mm) |
|--------------|--------------------|
| 25 | 25 |
| 30 | 30 |
| 40 | 40 |
| 50 | 50 |
| 60 | 60 |
| 70 | 70 |
| 80 | 30 + 50 |
| 90 | 40 + 50 |
| 100 | 40 + 60 |
| 110 | 110 |
| 120 | 50 + 70 |
| 130 | 60 + 70 |
| 140 | 30 + 110 |
| 150 | 150 |
| 160 | 50 + 110 |
| 170 | 60 + 110 |
| 180 | 70 + 110 |
| 190 | 40 + 150 |
| 200 | 50 + 150 |
| 210 | 60 + 150 |
| 220 | 70 + 150 |

Combining shorter Segment Trials to mimic longer length of segments



Always align the anterior marking when assembling the trial components or the implant assemblies

Instruments



Segment Trial
25-150 mm **Distal Femoral Trial**
Left/Right

F.Trialing

Place the femoral trial assembly onto the prepared femoral surface. Align the anterior reference mark on the bone with the anterior marking on the trial assemblies.

Place the tibial trial assembly onto the resected tibial surface and impact until fully seated into position. Retract the release lever to remove the **Tibial Baseplate Trial Driver**.



Instruments



Modular Handle **Tibial Baseplate Trial Driver**

F.Trialing

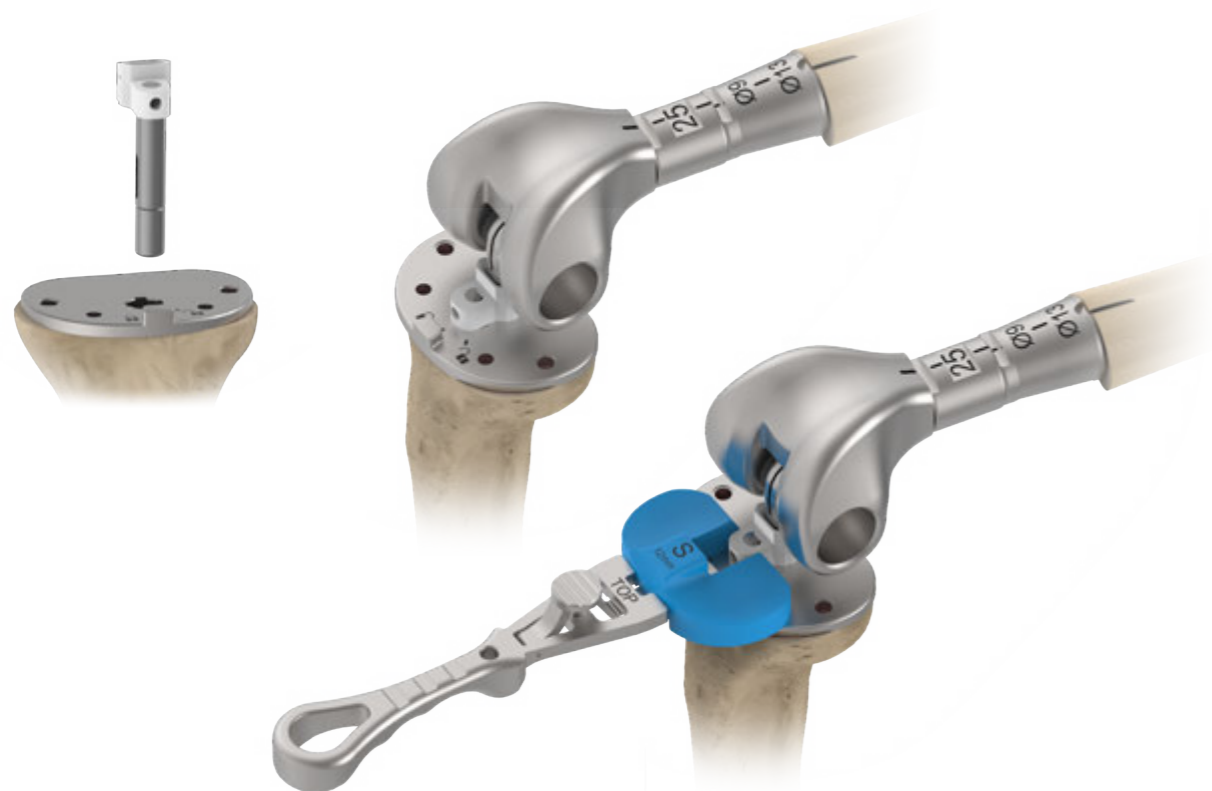
Identify the required **Tibial Insert Trial** and **Yoke Adapter** based on the selected **Tibial Baseplate Trial** size: The #1 to #3 tibial baseplate size corresponds with the size S Yoke Adapter, the #4 to #6 tibial baseplate size corresponds with the size M Yoke Adapter.

Insert the selected **Yoke Adapter** onto the the **Tibial Baseplate Trial**.

Connect the **Yoke Adapter** and the **Distal Femoral Trial**.

Attach the selected **Tibial Insert Trial** to the **Tibial Insert Trial Handle** and connect to the **Yoke Adapter** on the tibial assembly.

Evaluate joint stability using the selected trial components. Switch to different **Tibial Insert Trial** thicknesses as needed to obtain optimal stability.



Instruments



Distal Femoral Trial Left/Right

Yoke Adapter S, M

Cemented Tibial Baseplate Trial

Tibial Insert Trial

Tibial Insert Trial Handle

F.Trialing (Removal)

Position the **Taper Separator** at the junction between each trial component and separate by levering the trials.

If it is difficult to remove the stem trial assembly manually, remove the stem trial by connecting the **Stem Trial Remover** to the end of the trunnion. Utilize the **Slotted Hammer** remove the stem trial if needed.



Instruments



Taper Separator

Modular Handle

Stem Trial Remover

Slotted Hammer

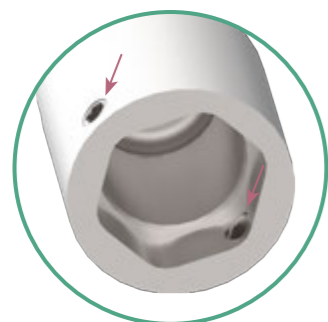
G. Implant Assembly

Assemble the implants starting with distal femoral component and the segment (if selected), then the selected stem.

Place the selected distal femoral component onto the **Distal Femur Impactor Base**. Verify the medial and lateral set screws are not obstructing the taper recess, loosening the set screws if needed.

Connect the distal femoral component with the correct segment component by aligning the anterior mark and tapping the prosthesis with the **Stem Impactor** in position.

Confirm the medial and lateral set screws on the segment is not obstructing the taper recess. Connect the selected stem component to the distal femoral component/segment assembly by aligning the anterior mark and tapping the prosthesis with the **Stem Impactor** in position.



Always verify the medial and lateral set screws are not obstructing the taper recess before tapping the assembly together. Obstruction of the set screws inside the taper recess may result in an unsuccessful connection. The **Set Screwdriver Adapter** can be used to retract the set screw.



Instruments

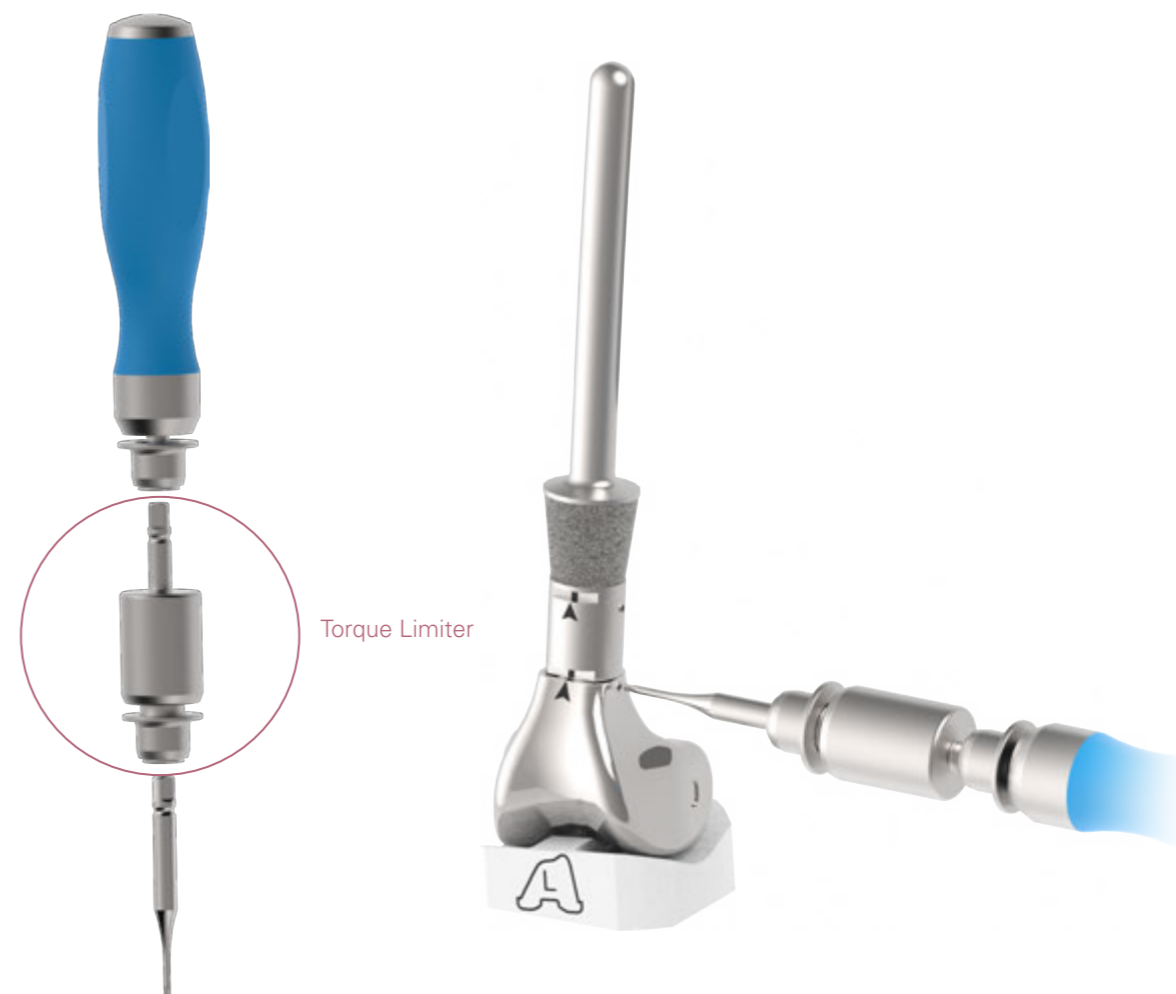


Impactor Base Distal Femur Stem Impactor Slotted Hammer Set Screw Driver Adapter

G. Implant Assembly

Connect the **Set Screw Torque Limiter** to the **Driver Handle** and tighten the medial and lateral set screws. The **Set Screw Torque Limiter** is used to ensure an appropriate amount of torque is applied to prevent over-tightening.

Note :
Do not use the **Torque Limiter** to loosen a set screw if this is required.



Instruments



Set Screw Driver Adapter Set Screw Torque Limiter Driver Handle

G. Implant Assembly

If a tibial stem is selected, assemble the tibial baseplate implant and tibial stem.

Remove the existing distal plug on the implant with the **Screwdriver Adapter T30**.

Place the selected tibial stem on the **Proximal Tibial Impactor Base**. Manually thread the selected tibial extension stem onto the baseplate.

Attach the **Torque Wrench 15 N-m** handle to the **Torque Wrench Adapter** that corresponds to the selected stem diameter.

Place the **Tibial Baseplate Wrench** over the baseplate. Complete tightening of the tibial implant assembly by applying 15 N-m of torque using the **Torque Wrench** assembly.



Instruments



Impactor Base Proximal Tibia



Driver Handle



Screwdriver Adapter, T30



Torque Wrench Adapter
9 / 12.5 / 14 mm



Torque Wrench 15 N-m



Tibial Baseplate Wrench

H. Implantation

If a cemented tibial stem is selected, Use the **Tibial Cement Restrictor Inserter** to introduce the selected cement restrictor to an adequate depth in the canal. Use the indicators on the shaft to set the depth.



The etched marking **C70** indicates the appropriate depth of the 70 mm cemented tibial stem

The diameter of cemented stem drill is 9 mm. Use cement restrictor size 8C to ensure smooth insertion

Instruments



Tibial Cement Restrictor Inserter

H. Implantation

Attach the **Tibial Baseplate Driver** to the **Modular Handle**.

Insert the tip of the **Tibial Baseplate Driver** into the center hole of the tibial baseplate implant, then lock the tibial implant assembly.

Apply bone cement to proximal tibial resection and the distal surface of the baseplate. If using a cemented tibial stem, add cement to the prepared tibial canal.

Place the tibial implant assembly onto the prepared tibial surface. Attach the **Tibial Baseplate Impactor** to the **Modular Handle** and impact the tibial implant assembly until fully seated and in proper contact with the bone.



Instruments



Modular Handle Tibial Baseplate Driver Tibial Baseplate Impactor

H. Implantation

If a cemented stem is selected for the femoral construct, use the **Cement Restrictor Inserter** to introduce the selected cement restrictor to an adequate depth in the canal. Use the indicators on the shaft to set the depth.

Fill the femoral canal and around the femoral implant assembly with cement, then advance the femoral prosthesis into the canal manually until fully seated onto the prepared bone surface. Use the **Femoral Impactor** if needed.

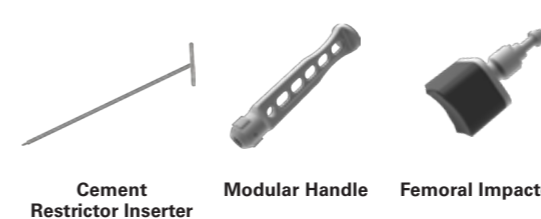


The etched marking **C125** indicates the appropriate depth of the 125 mm cemented stem.

Use the cement restrictor that is one size smaller than the diameter of the last reamer used to allow smooth insertion.

Align the rotational alignment mark on the femoral stem by referencing the rotational reference mark previously made on the anterior cortex of the femur.

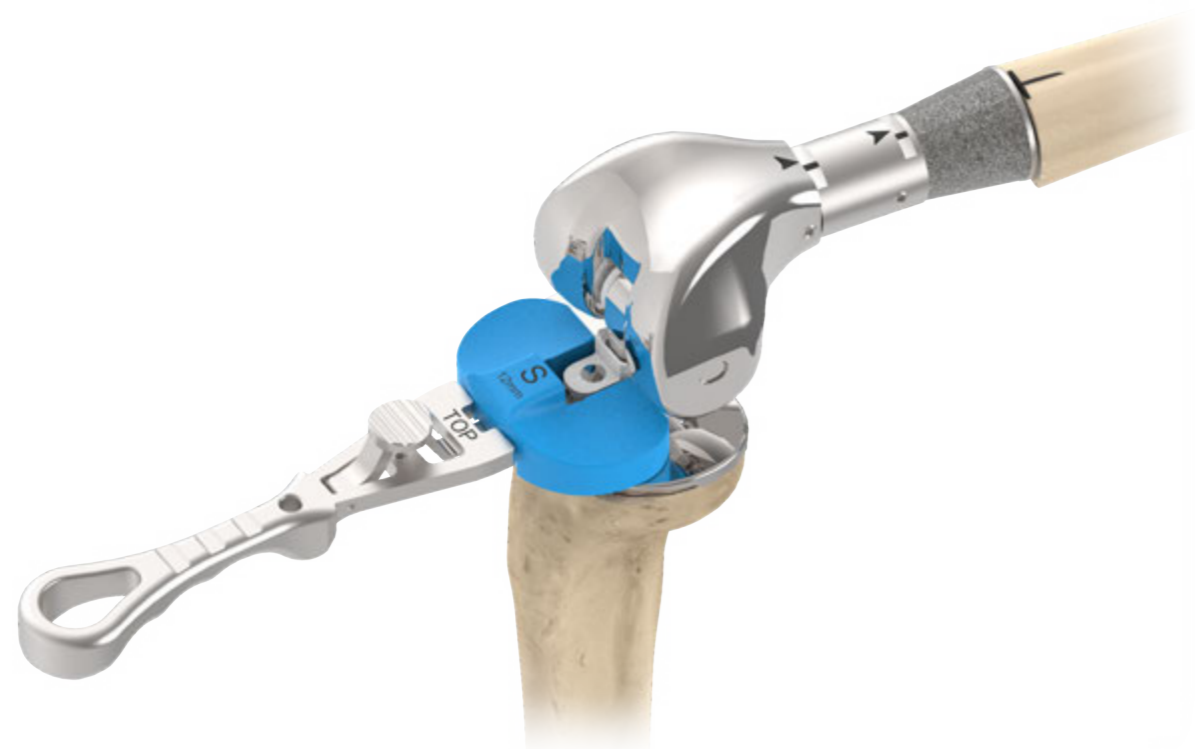
Instruments



Cement Restrictor Inserter Modular Handle Femoral Impactor

H. Implantation

Perform a final check to confirm the optimal tibial insert thickness with the last **Tibial Insert Trial**. Insert using the **Tibial Insert Handle** as described in previous steps.



Instruments



Tibial Insert Trial

Tibial Insert Trial Handle

H. Implantation

With the knee in flexion, place the selected tibial insert onto the implanted tibial baseplate assembly, making sure to maintain alignment with the hinge post of the distal femoral component.

With the knee in full extension, secure the tibial insert to the femoral prosthesis by tightening the built-in set screw inside the tibial insert with **Insert Set Screwdriver** to apply appropriate fixation torque.

Tighten the set screw until fully connected within the distal femoral component, confirming with the depth mark on the screwdriver.

Align the depth mark on the screwdriver according to the selected size of tibial insert. Align to the line marked S for size #S tibial insert; align the line marked M for size #M tibial insert.

If the depth mark is achieved but the torque limiter has not engaged, continue apply torque until engaged;

If the torque limiter is engaged before the depth mark is achieved, then the screw may not be correctly connected to the femoral component. Confirm the femoral assembly is fully seated in the tibial insert, then re-tighten the set screw.



Instruments



Insert Set Screwdriver

Proximal Femoral Replacement



Proximal Femoral Assembly

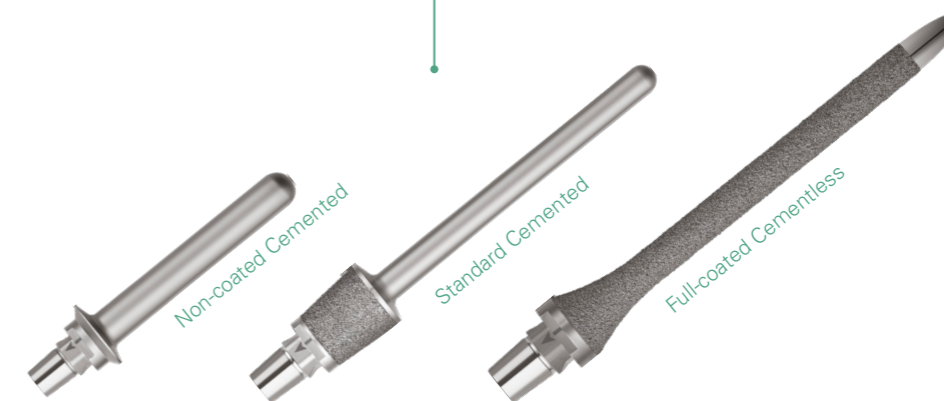


Proximal Femoral Component

Built-in 15° Anteversion
Length : 64 mm Left and Right

Segment

Length : 25 through 220 mm
(30-220 mm in 10 mm Increments)



Extension Stem

Cemented Stem Length : Straight 100 / 125 mm Curved 125 / 150 mm
Diameter : 9 / 11 / 13 / 15 / 17 mm
Full-coated Stem Length : 150 / 200 mm
Diameter : 11 / 13 / 15 / 17 mm

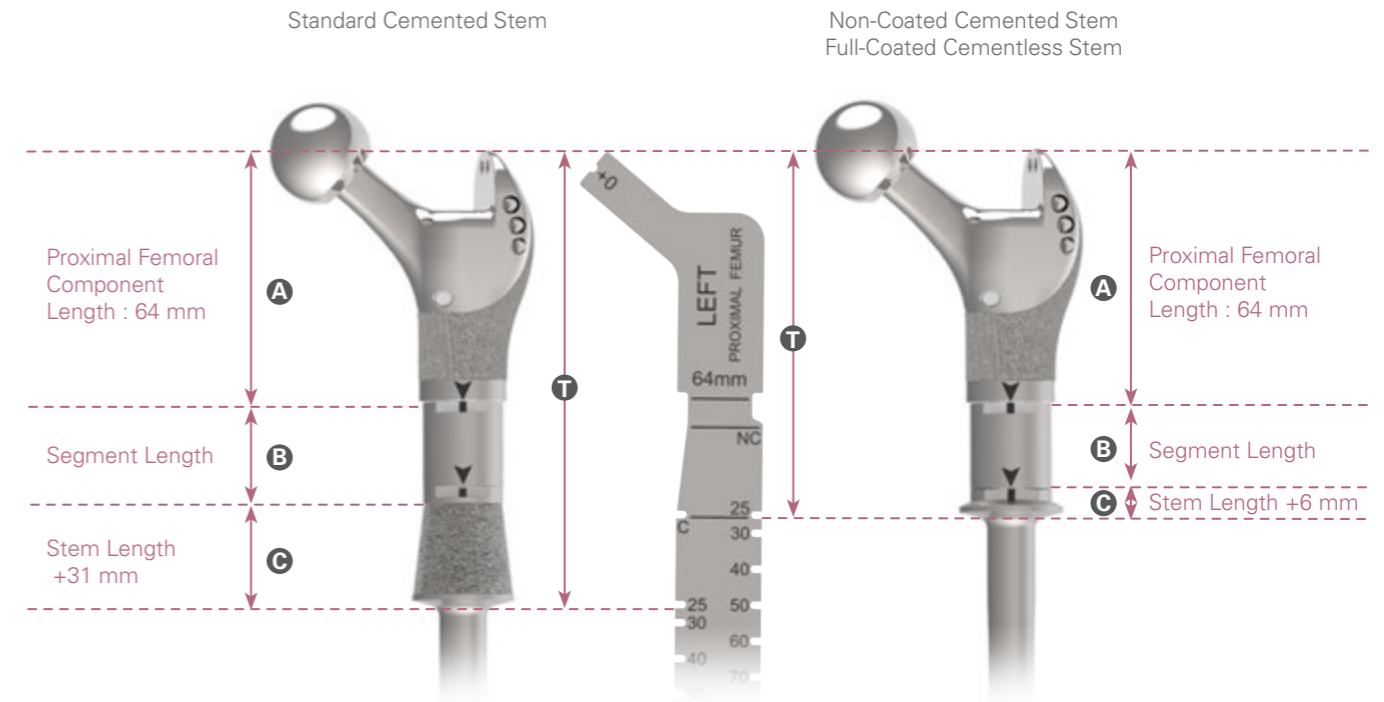
A. Pre-operative Planning

Plan the proper combination of implants with the **Resection Template**.

The length for standard proximal femoral components is 64 mm, the etched marking C on the medial side of the template indicates the extra-medullary 31 mm of titanium plasma spray coating section on the Standard Cemented Stem, while the rest of the cutouts indicate the additional segment length options.

The etched marking NC on the lateral side of the template indicates the extra-medullary 6mm on the Non-Coated Cemented stem or the Full-Coated Cementless stem, while the rest of the cutouts indicate the additional segment length options.

Please note the final combination of implants may be different at the actual time of surgery.



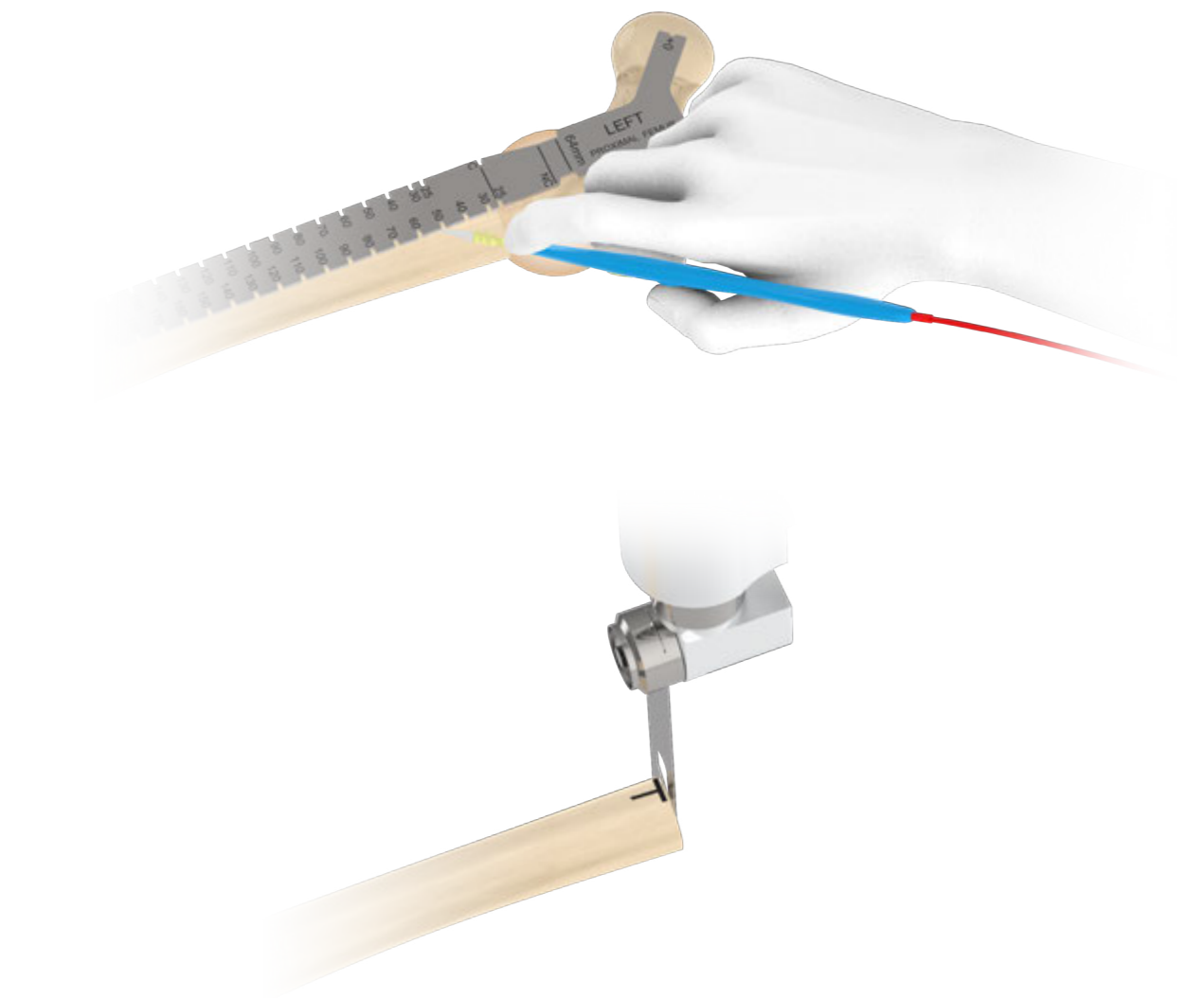
| Reference Chart for Standard Cemented Stem | | | |
|--|--|--------------|----------------------------------|
| T Resection Length | A Component | B Segment | C Stem |
| 95 mm | Proximal Femoral Component Length 64 mm | | Standard Cemented Stem +31 mm |
| 120 mm | | 25 mm | |
| 125 mm | | 30 mm | |
| 135 mm | | 40 mm | |
| 145 mm | | 50 mm | |
| 155 mm | | 60 mm | |
| 165 mm | | 70 mm | |
| 175 mm | | 80 mm | |
| 185 mm | | 90 mm | |
| 195 mm | | 100 mm | |
| 205 mm | | 110 mm | |
| 215 mm | | 120 mm | |
| 225 mm | | 130 mm | |
| 235 mm | | 140 mm | |
| 245 mm | | 150 mm | |
| 255 mm | | 160 mm | |
| 265 mm | | 170 mm | |
| 275 mm | | 180 mm | |
| 285 mm | | 190 mm | |
| 295 mm | | 200 mm | |
| 305 mm | 210 mm | | |
| 315 mm | 220 mm | | |

| Reference Chart for Non-Coated Cemented Stem and Full-Coated Cementless Stem | | | |
|--|--|--------------|--|
| T Resection Length | A Component | B Segment | C Stem |
| 70 mm | Proximal Femoral Component Length 64 mm | | Non-Coated Cemented Stem Or Full-Coated Cementless Stem +6 mm |
| 95 mm | | 25 mm | |
| 100 mm | | 30 mm | |
| 110 mm | | 40 mm | |
| 120 mm | | 50 mm | |
| 130 mm | | 60 mm | |
| 140 mm | | 70 mm | |
| 150 mm | | 80 mm | |
| 160 mm | | 90 mm | |
| 170 mm | | 100 mm | |
| 180 mm | | 110 mm | |
| 190 mm | | 120 mm | |
| 200 mm | | 130 mm | |
| 210 mm | | 140 mm | |
| 220 mm | | 150 mm | |
| 230 mm | | 160 mm | |
| 240 mm | | 170 mm | |
| 250 mm | | 180 mm | |
| 260 mm | | 190 mm | |
| 270 mm | | 200 mm | |
| 280 mm | 210 mm | | |
| 290 mm | 220 mm | | |

B. Femoral Osteotomy

Measure the appropriate resection length by aligning the **Resection Template** to the level of the most distal medial condyle and mark a resection reference line. Create an anterior reference mark(L) to align with the indicator on the stem trial and the implant.

Perform the femoral osteotomy at the reference resection line perpendicular to the shaft



Instruments



Resection Template

C. Canal Preparation

For the standard cemented stem and non-coated cemented stem, progressively ream the canal with the **Straight Stem Reamer** in 1 mm increments until the appropriate diameter and depth is achieved as indicated on the etched 'C' markings on the reamers. A stem diameter of 1~2 mm less than the final reamer is preferred for an adequate cement mantle.

For the full-coated cementless stem, progressively ream the canal with the **Straight Stem Reamers** that have 1 mm increments until the appropriate diameter and depth is achieved as indicated on the etched 'P' markings on the reamers. A stem diameter equal to the final reamer is recommended for an optimal press-fit. Optional reamer diameter of 11.5 / 13.5 / 15.5 / 17.5 mm are also included for the finer press-fit adjustment.

For a curved stem, there may need to be an additional difference in diameter between the final reamer and selected stem.



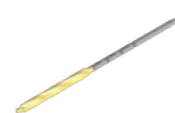
Example of reaming for standard cemented stem or non-coated cemented stem.

The etched marking C125 indicates an appropriate depth for a 125 mm cemented stem.

Example of reaming for full coated cementless stem.

The etched marking P150 indicates an appropriate depth for a 150 mm full coated cementless stem.

Instruments



Straight Stem Reamer
Diameter 8~21 mm

C.Canal Preparation

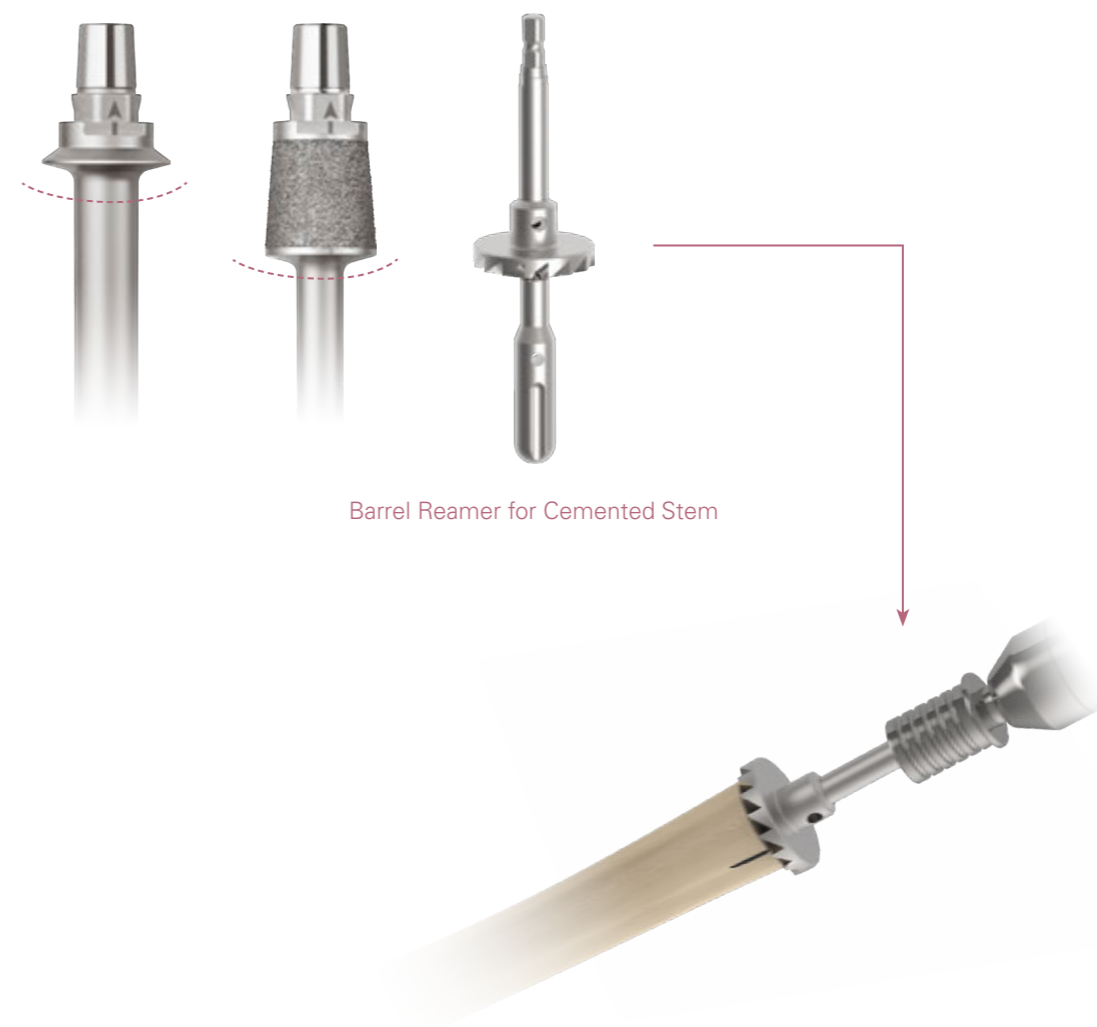
Stem Options Reference Chart

| | Straight Stem | Curved Stem |
|-----------------------------|--------------------------------|--------------------------------|
| Standard Cemented Stem | 9 mm diameter x 100 mm Length | 9 mm diameter x 125 mm Length |
| | 11 mm diameter x 100 mm Length | 11 mm diameter x 125 mm Length |
| | 13 mm diameter x 100 mm Length | 13 mm diameter x 125 mm Length |
| | 15 mm diameter x 100 mm Length | 15 mm diameter x 125 mm Length |
| | 17 mm diameter x 100 mm Length | 17 mm diameter x 125 mm Length |
| | 9 mm diameter x 125 mm Length | 9 mm diameter x 150 mm Length |
| | 11 mm diameter x 125 mm Length | 11 mm diameter x 150 mm Length |
| | 13 mm diameter x 125 mm Length | 13 mm diameter x 150 mm Length |
| | 15 mm diameter x 125 mm Length | 15 mm diameter x 150 mm Length |
| | 17 mm diameter x 125 mm Length | 17 mm diameter x 150 mm Length |
| Non-coated Cemented Stem | 9 mm diameter x 100 mm Length | 9 mm diameter x 125 mm Length |
| | 11 mm diameter x 100 mm Length | 11 mm diameter x 125 mm Length |
| | 13 mm diameter x 100 mm Length | 13 mm diameter x 125 mm Length |
| | 15 mm diameter x 100 mm Length | 15 mm diameter x 125 mm Length |
| | 17 mm diameter x 100 mm Length | 17 mm diameter x 125 mm Length |
| | 9 mm diameter x 125 mm Length | 9 mm diameter x 150 mm Length |
| | 11 mm diameter x 125 mm Length | 11 mm diameter x 150 mm Length |
| | 13 mm diameter x 125 mm Length | 13 mm diameter x 150 mm Length |
| | 15 mm diameter x 125 mm Length | 15 mm diameter x 150 mm Length |
| | 17 mm diameter x 125 mm Length | 17 mm diameter x 150 mm Length |
| Full Coated Cementless Stem | N/A | N/A |
| | 11 mm diameter x 150 mm Length | 11 mm diameter x 150 mm Length |
| | 13 mm diameter x 150 mm Length | 13 mm diameter x 150 mm Length |
| | 15 mm diameter x 150 mm Length | 15 mm diameter x 150 mm Length |
| | 17 mm diameter x 150 mm Length | 17 mm diameter x 150 mm Length |
| | N/A | N/A |
| | 11 mm diameter x 200 mm Length | 11 mm diameter x 200 mm Length |
| | 13 mm diameter x 200 mm Length | 13 mm diameter x 200 mm Length |
| | 15 mm diameter x 200 mm Length | 15 mm diameter x 200 mm Length |
| | 17 mm diameter x 200 mm Length | 17 mm diameter x 200 mm Length |



C.Canal Preparation

For the standard cemented stem and non-coated cemented stem, connect the **Cemented Stem Barrel Reamer** to the appropriate **Reamer Guide Rod** and advance into the canal to prepare the resected proximal femur.



Barrel Reamer for Cemented Stem

Instruments



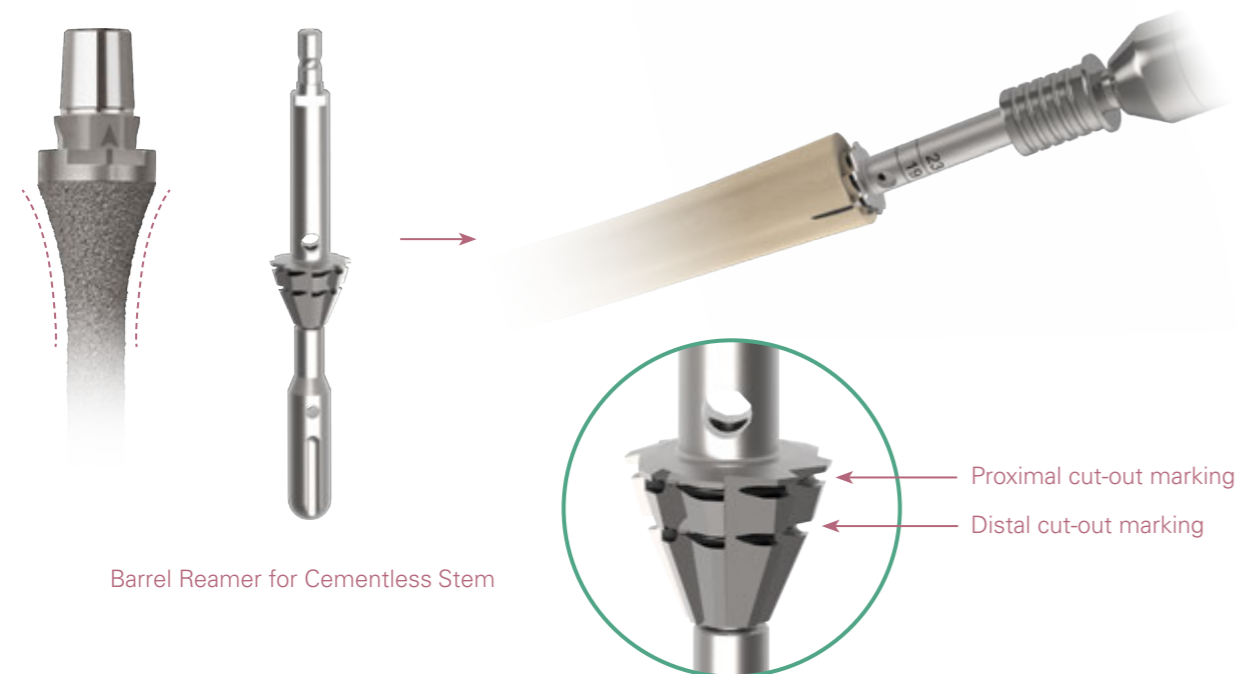
Cemented Stem Barrel Reamer Reamer Guide Rod Diameter 10-21 mm

C. Canal Preparation

For the cementless stem, connect the **Cementless Stem Barrel Reamer** to the appropriate **Reamer Guide Rod** and advance into the canal to prepare the resected proximal femur.

Ream to the distal cut-out marking on the barrel reamer. If less than 3 mm of cortical bone around the reamer is observed, stop reaming. The planned implant construct will be 8 mm longer than the original measured plan. The cementless stem will sit above the bone (proud) by 14 mm (8 mm coated and 6 mm non-coated area on the proximal end of stem). The length of the implant construct may be adjusted selecting a shorter segment or making other adjustment.

If there is 3 mm or more of cortical bone around the barrel reamer after the initial reaming step, continue reaming to the proximal cut-out marking on the barrel reamer. The planned implant construct will match the original measured plan. The cementless stem will sit above the bone (proud) by 6mm (6mm non-coated area on the proximal end of the stem). This will be the non-coated area on the proximal end of the stem.



Barrel Reamer for Cementless Stem

Instruments



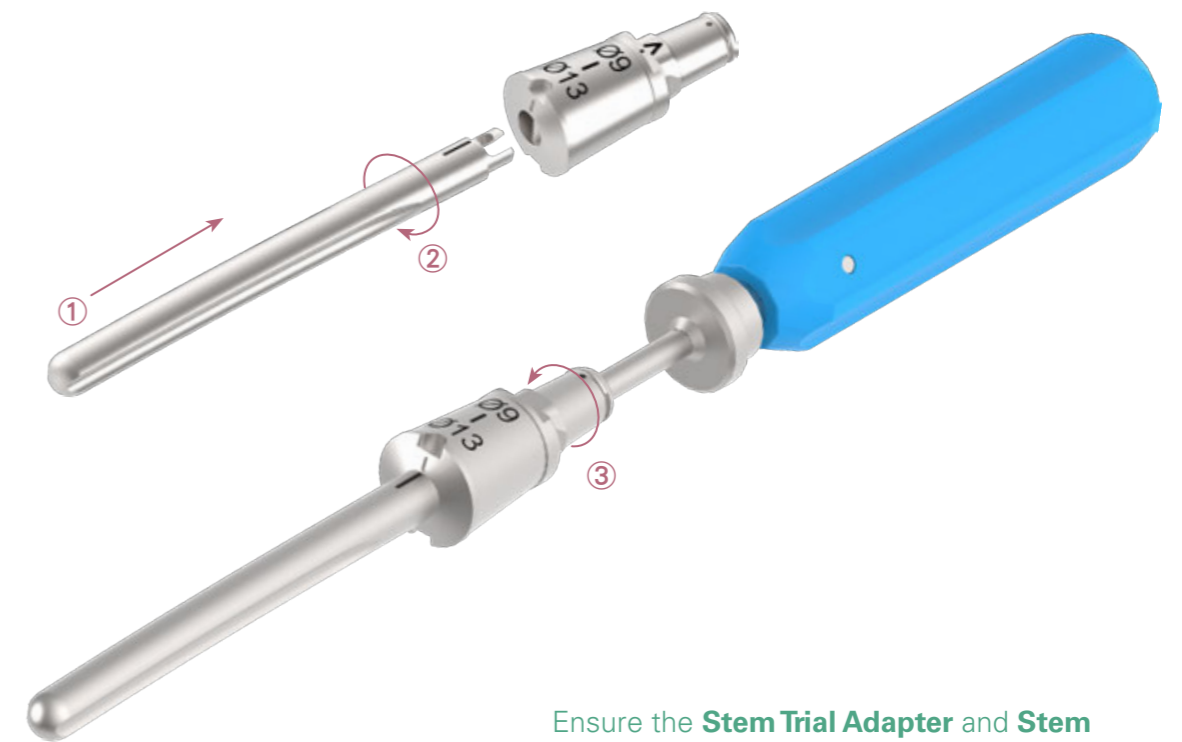
Cementless Stem Barrel Reamer
Reamer Guide Rod
Diameter 10~21 mm

D. Trialing

Choose the **Stem Trial Body** and **Stem Trial Adapter** that corresponds to selected cemented or cementless stem size.

Attach the **Stem Trial Body** into the **Stem Trial Adapter** (see image part 1 and 2, the anterior indicators shall align together).

Insert the **Screwdriver Adapter T30** into the top of the **Stem Trial Adapter** and secure with the **Driver Handle** (see image part 3).



Ensure the **Stem Trial Adapter** and **Stem Trial Body** are fully attached and locked into position prior to trialing.

Instruments



Cemented Stem Trial Body Diameter 9~17 mm
Cemented Stem Trial Adapter Diameter 9~13 mm
Cementless Stem Trial Body Diameter 11~17 mm
Cementless Stem Trial Adapter Diameter 11~17 mm
Driver Handle
Screwdriver Adapter, T30

D. Trialing

Identify the correct length **Segment Trial** to restore femoral length using the chart below. During trialing, multiple trial segments may be combined to represent the ideal monolithic implant assembly length.

Attach the selected **Segment Trial(s)** to the selected **Proximal Femoral Trial**. Attach the **Proximal Femoral Trial/Segment Trial** assembly to the **Stem Trial Adapter/Stem Trial Body** assembly.

Segment Trial Reference Chart

| Segment (mm) | Segment Trial (mm) |
|--------------|--------------------|
| 25 | 25 |
| 30 | 30 |
| 40 | 40 |
| 50 | 50 |
| 60 | 60 |
| 70 | 70 |
| 80 | 30 + 50 |
| 90 | 40 + 50 |
| 100 | 40 + 60 |
| 110 | 110 |
| 120 | 50 + 70 |
| 130 | 60 + 70 |
| 140 | 30 + 110 |
| 150 | 150 |
| 160 | 50 + 110 |
| 170 | 60 + 110 |
| 180 | 70 + 110 |
| 190 | 40 + 150 |
| 200 | 50 + 150 |
| 210 | 60 + 150 |
| 220 | 70 + 150 |

Combining shorter **Segment Trials** to mimic longer length of segments



Instruments



Segment Trial
25-150 mm
Trochanteric Proximal Femoral Trial
Left/Right
Low Profile Proximal Femoral Trial
Left/Right

D. Trialing

Place the femoral trial assembly onto the prepared femoral surface. Align the anterior reference mark on the bone with the anterior reference line on the **Stem Trial**.

Perform trial reduction by using the **Femoral Head Trial** and appropriate acetabular trial components to complete trialing.

Position the **Taper Separator** at the junction between each trial component and separate by levering the trials.

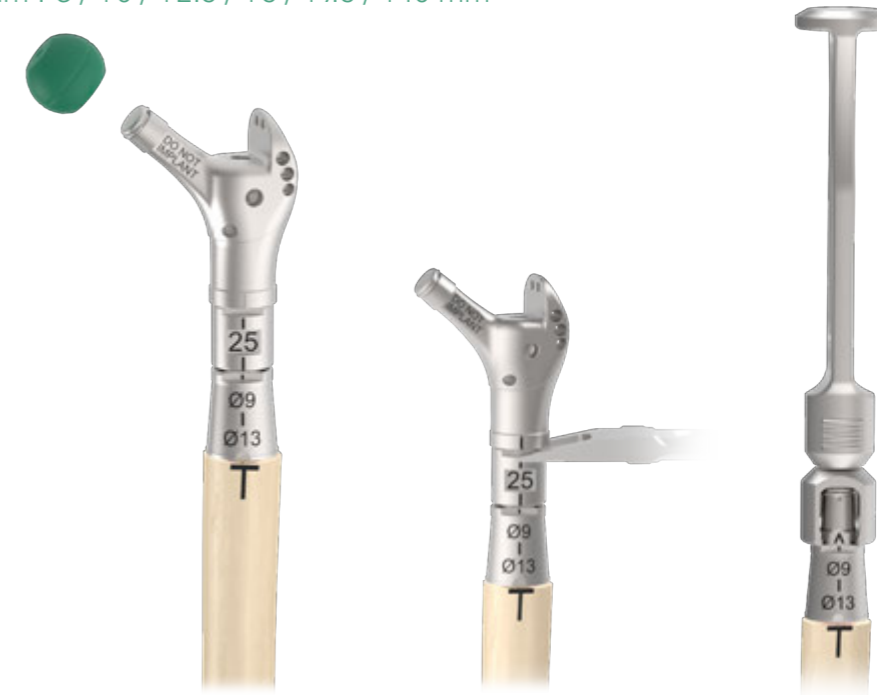
If it is difficult to remove the stem trial assembly manually, remove the stem trial by connecting the **Stem Trial Remover** to the end of the trunnion. Utilize the **Slotted Hammer** remove the stem trial if needed.

Metal Head

- Ø22 mm : +0 / +3 / +6 / +9 mm
- Ø26 mm : -2 / +0 / +3 / +6 / +9 mm
- Ø28 mm : -3 / +0 / +2.5 / +5 / +7.5 / +10 mm
- Ø32 mm : -3 / +0 / +2.5 / +5 / +7.5 / +10 mm
- Ø36 mm : -3 / +0 / +2.5 / +5 / +7.5 / +10 mm

Ceramic Head

- Ø28 mm : -2.5 / +1 / +4 mm
- Ø32 mm : -3 / +1 / +5 / +8 mm
- Ø36 mm : -3 / +1 / +5 / +9 mm
- Ø40 mm : -3 / +1 / +5 / +9 mm



Instruments



Femoral Head Trial **Taper Separator** **Modular Handle** **Stem Trial Remover** **Slotted Hammer**

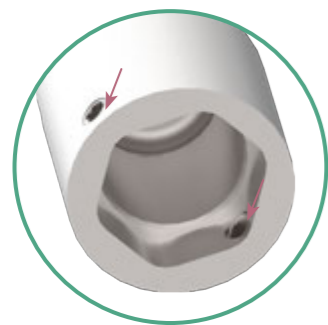
E. Implant Assembly

Assemble the implants starting with proximal femoral component and the segment (if selected), then the selected stem.

Place the selected proximal femoral component onto the **Proximal Femur Impactor Base**. Verify the medial and lateral set screws are not obstructing the taper recess, loosening the set screws if needed.

Connect the proximal femoral component with the correct segment component by aligning the anterior mark and tapping the prosthesis with the **Stem Impactor** in position.

Confirm the medial and lateral set screws on the segment is not obstructing the taper recess. Connect the selected stem component to the femoral component/segment assembly by aligning the anterior mark and tapping the prosthesis with the **Stem Impactor** in position.



Always verify the medial and lateral set screws are not obstructing the taper recess before tapping the assembly together. Obstruction of the set screws inside the taper recess may result in an unsuccessful connection. The **Set Screwdriver Adapter** can be used to retract the set screw.

Note :
All proximal femoral implant components have a built-in 15 degrees of anteversion.



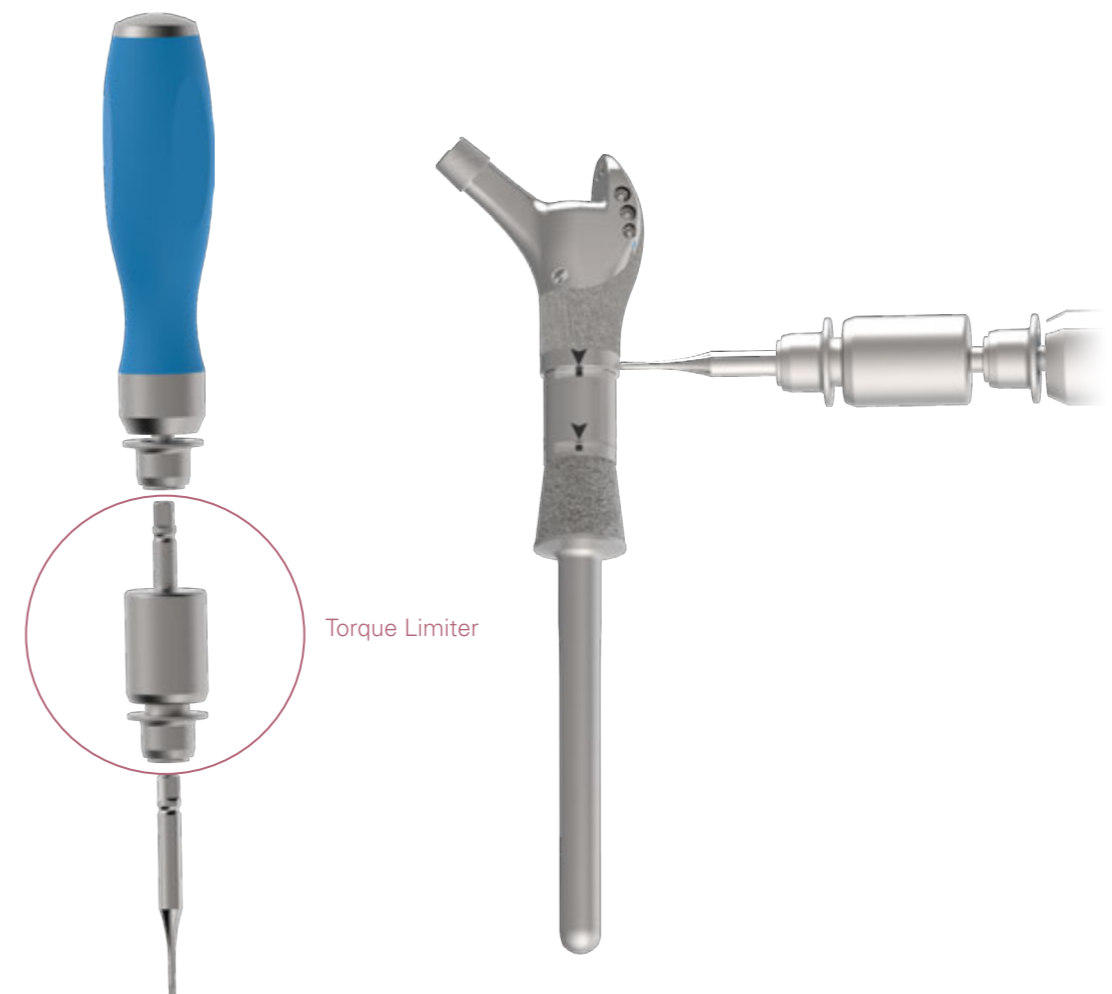
Instruments



E. Implant Assembly

Connect the **Set Screw Adapter**, and the **Set Screw Torque Limiter** to the **Driver Handle** and tighten the medial and lateral set screws. The **Set Screw Torque Limiter** is used to ensure an appropriate amount of torque is applied to prevent over-tightening.

Note :
Do not use the **Torque Limiter** to loosen a set screw if this is required.



Instruments



E. Implant Assembly

If a cemented stem is selected for the femoral construct, use the **Cement Restrictor Inserter** to introduce the selected cement restrictor to an adequate depth in the canal. Use the indicators on the shaft to set the depth.



The etched marking **C125** indicates the appropriate depth of the 125 mm cemented stem.

Use the cement restrictor that is one size smaller than the diameter of the last reamer used to allow smooth insertion.

Instruments

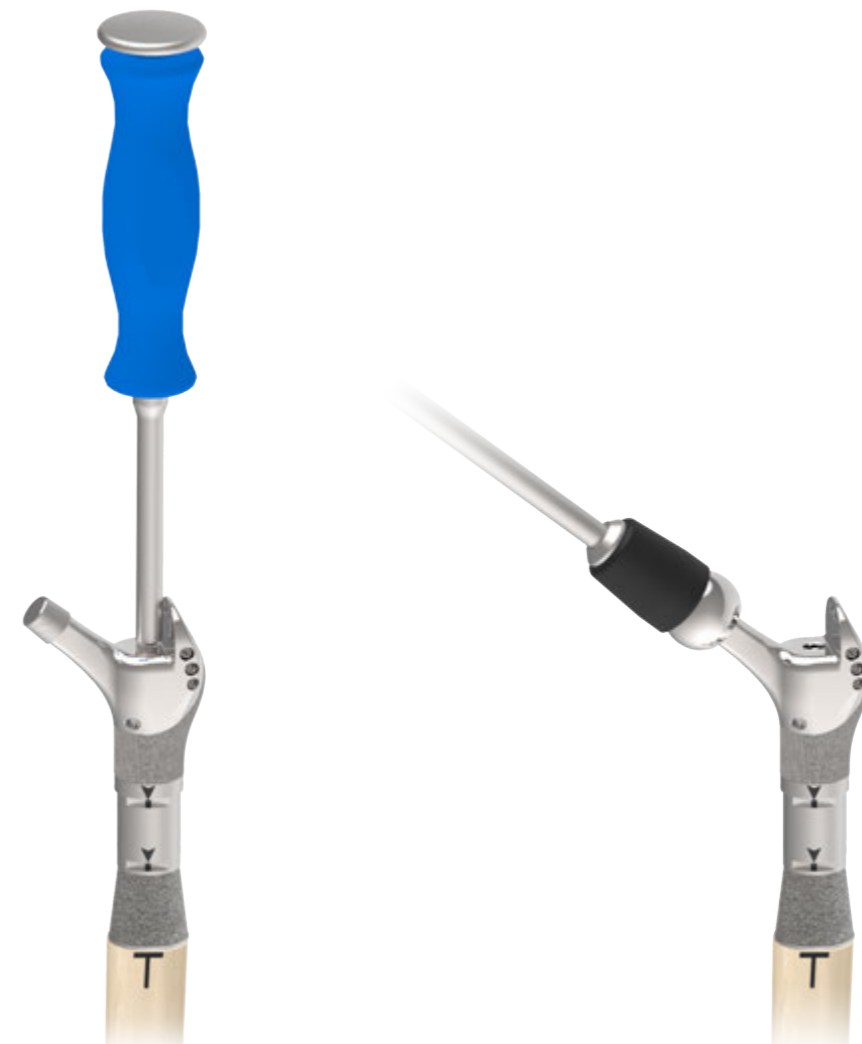


Cement Restrictor Inserter

F. Implantation

Advance the femoral prosthesis assembly into the canal by using the **Proximal Femoral Impactor** until the stem is seated properly with the bone. Rotational alignment may be set by referencing the mark previously made on the anterior cortex of the femur.

Perform a final trial reduction to confirm stability and leg length by using **Femoral Head Trials**. Connect the **Femoral Head Impactor** and **Universal Handle**. Impact the femoral head until it is firmly seated.



Instruments



Proximal Femoral Impactor

Femoral Head Trial

Femoral Head Impactor

Universal Handle

F. Implantation

The **Claw Holder** can be used to help position the selected trochanteric claw implant to further enhance soft tissue fixation.



Instruments

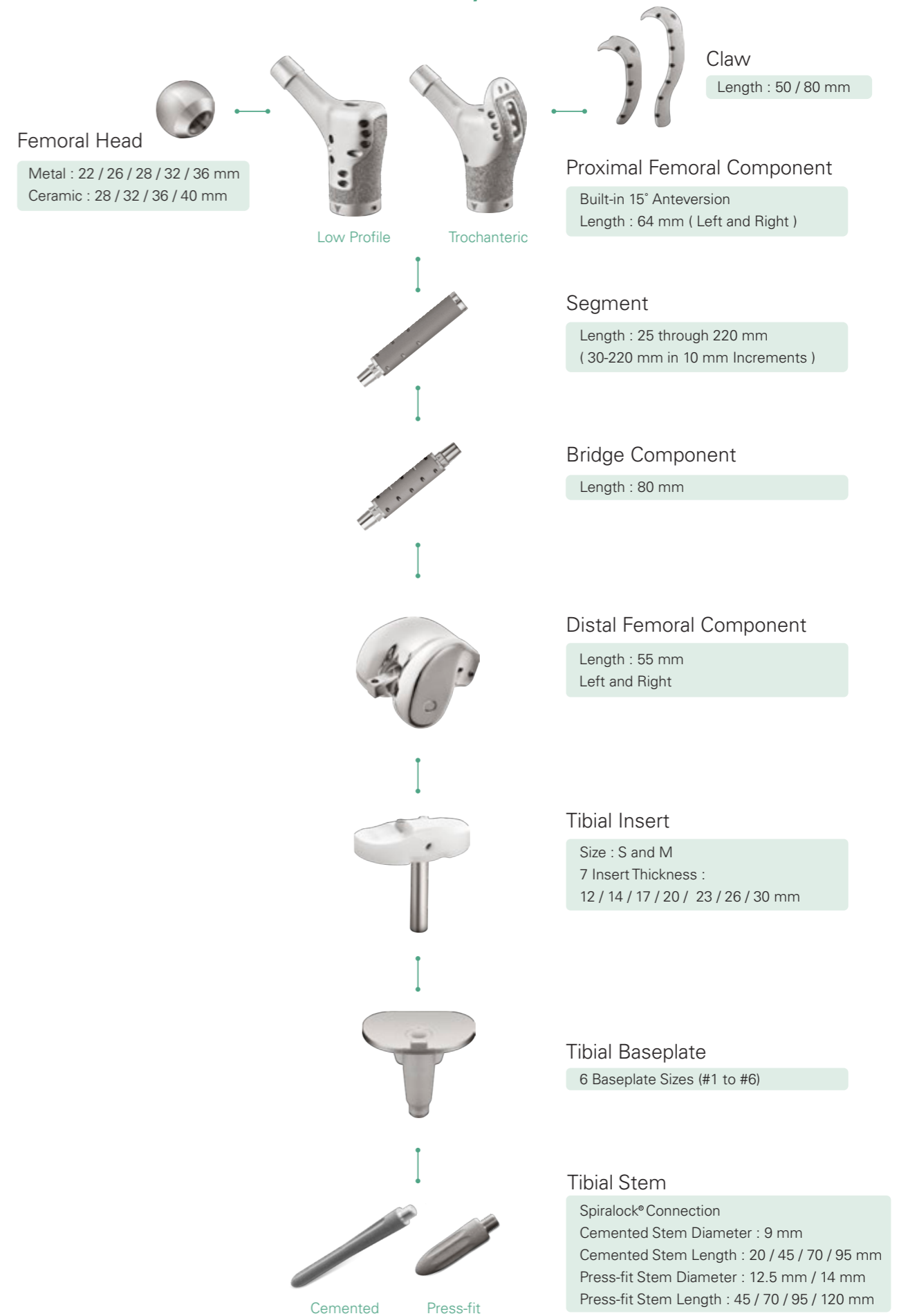


Claw Holder

Total Femoral Replacement



Total Femoral Assembly



A. Measure the Length of the Entire Femur

Plan the proper combination of components with the resection chart below.

The length for both the trochanteric and low-profile proximal femoral components is 64mm. The length for the distal femoral components is 55 mm. The length for the bridge component is 80 mm.

Please note the final combination of components may be different at the actual time of surgery.

| Reference Chart for the Resection of Total Femoral Replacement | | | | |
|--|-------------------------------------|---------------------------|---------|------------------------------------|
| Femur Length | Component | Bridge | Segment | Component |
| 199 mm | | | 0 | |
| 224 mm | | | 25 mm | |
| 229 mm | | | 30 mm | |
| 239 mm | | | 40 mm | |
| 249 mm | | | 50 mm | |
| 259 mm | | | 60 mm | |
| 269 mm | | | 70 mm | |
| 279 mm | | | 80 mm | |
| 289 mm | | | 90 mm | |
| 299 mm | Proximal Femoral Component 64 mm | Bridge Component 80 mm | 100 mm | Distal Femoral Components 55 mm |
| 309 mm | | | | |
| 319 mm | | | | |
| 329 mm | | | | |
| 339 mm | | | | |
| 349 mm | | | | |
| 359 mm | | | | |
| 369 mm | | | | |
| 379 mm | | | | |
| 389 mm | | | | |
| 399 mm | | | | |
| 409 mm | | | | |
| 419 mm | | | | |
| 429 mm | | | | |
| 439 mm | | | | |
| 449 mm | | | | |
| 459 mm | | | | |

Note: the length of XS distal femoral component is 50 mm, 5 mm less than standard component. The XS articular surface fit only with XS Insert and XS Baseplate. Please refer to the appendix for XS component preparation.

B. Trialing

Identify the correct length **Segment Trial** to restore femoral length using the chart below. During trialing, multiple trial segments may be combined to represent the ideal monolithic implant assembly length.

Assemble the **Proximal Femoral Component Trial**, **Segment Trial**, **Bridge Trial** and **Distal Femoral Component Trial** together as outlined in previous sections of this surgical technique guide.

| Femur Length (mm) | Segment (mm) | Segment Trial (mm) |
|-------------------|--------------|--------------------|
| 200 | 0 | — |
| 225 | 25 | 25 |
| 230 | 30 | 30 |
| 240 | 40 | 40 |
| 250 | 50 | 50 |
| 260 | 60 | 60 |
| 270 | 70 | 70 |
| 280 | 80 | 30 + 50 |
| 290 | 90 | 40 + 50 |
| 300 | 100 | 40 + 60 |
| 310 | 110 | 110 |
| 320 | 120 | 50 + 70 |
| 330 | 130 | 60 + 70 |
| 340 | 140 | 30 + 110 |
| 350 | 150 | 150 |
| 360 | 160 | 50 + 110 |
| 370 | 170 | 60 + 110 |
| 380 | 180 | 70 + 110 |
| 390 | 190 | 40 + 150 |
| 400 | 200 | 50 + 150 |
| 410 | 210 | 60 + 150 |
| 420 | 220 | 70 + 150 |

Combining shorter **Segment Trials** to mimic longer length of segments



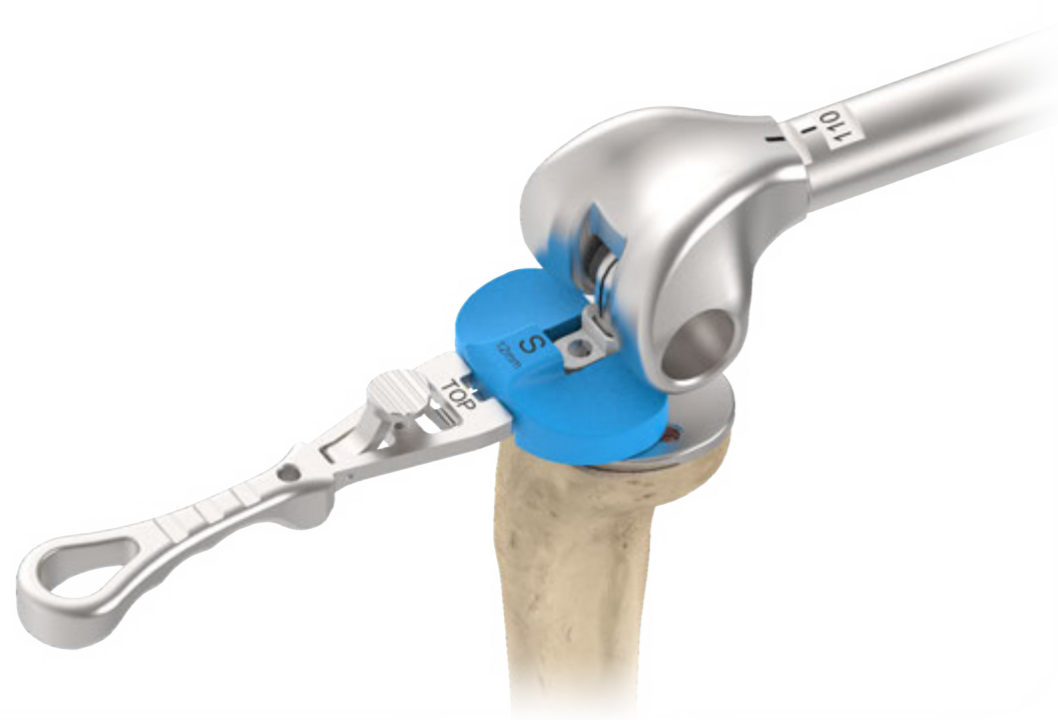
Instruments



B. Trialing

Prepare the tibia and **Tibial Assembly Trial** components as outlined in tibial preparation sections of this surgical technique guide.

Evaluate joint stability using the selected trial components. Switch to different thickness **Tibial Insert Trials** or other components as needed to obtain optimal stability and leg length.



Instruments



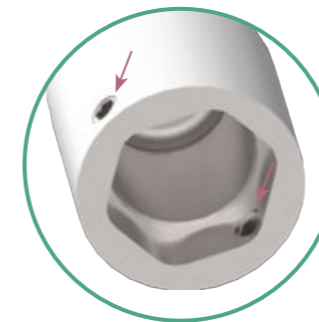
Tibial Insert Trial

Tibial Insert Trial Handle

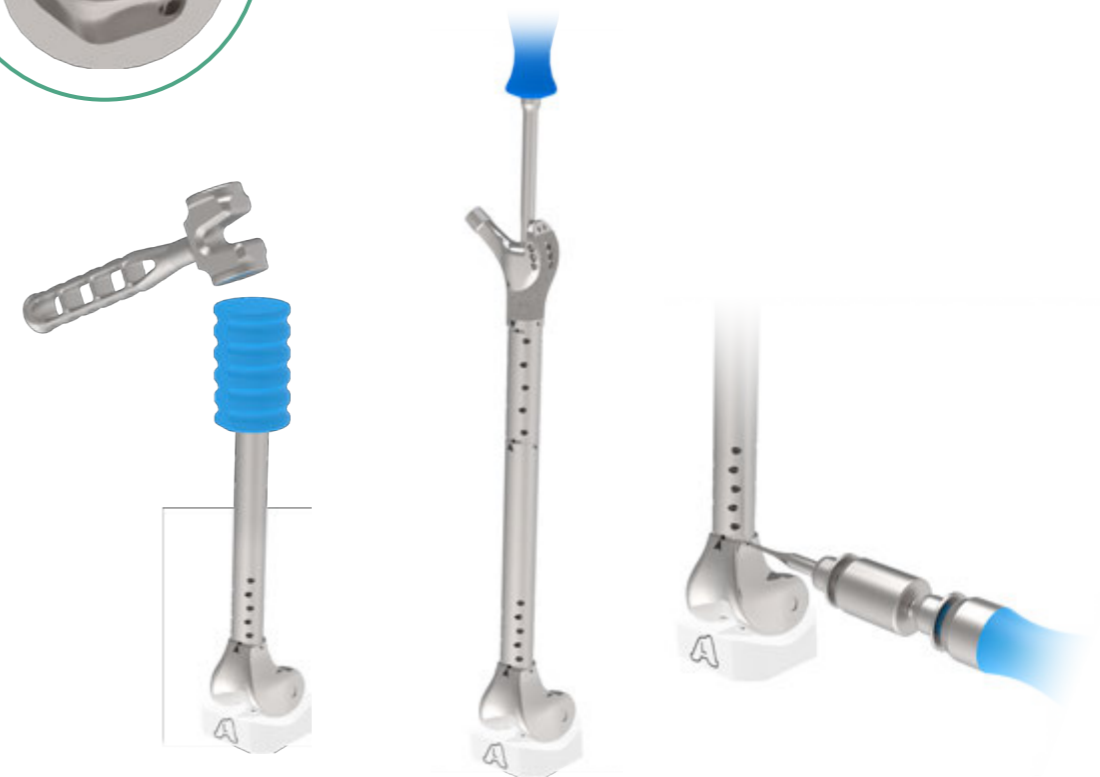
C. Implant Assembly

Assemble the femoral prosthesis; the distal femoral component, segment component, bridge component, and the proximal femoral component together by tapping the prosthesis with the **Stem Impactor** and **Proximal Femoral Impactor** as outlined in previous sections of this surgical technique guide. Start with the distal femoral component placed on the **Distal Femoral Impactor Base**.

Secure the set screws on both sides of the segment and proximal/ distal femoral component with the **Set Screwdriver Adapter**, **Set Screw Torque Limiter** and **Driver Handle** as outlined in previous sections of this surgical technique guide.



Always verify the medial and lateral set screws are not obstructing the taper recess before tapping the assembly together. Obstruction of the set screws inside the taper recess may result in an unsuccessful connection. The **Set Screwdriver Adapter** can be used to retract the set screw.



Instruments



Impactor Base Distal Femur

Stem Impactor

Proximal Femoral Impactor

Set Screw Driver Adapter

Set Screw Torque Limiter

Driver Handle

C. Implant Assembly

Perform a final trial reduction to confirm stability and leg length by using **Femoral Head Trials**. Connect the **Femoral Head Impactor** and **Universal Handle**. Impact the femoral head until it is firmly seated.

The **Claw Holder** can be used to help position the selected trochanteric claw implant to further enhance soft tissue fixation.



Instruments



Femoral Head Trial



Femoral Head Impactor



Universal Handle

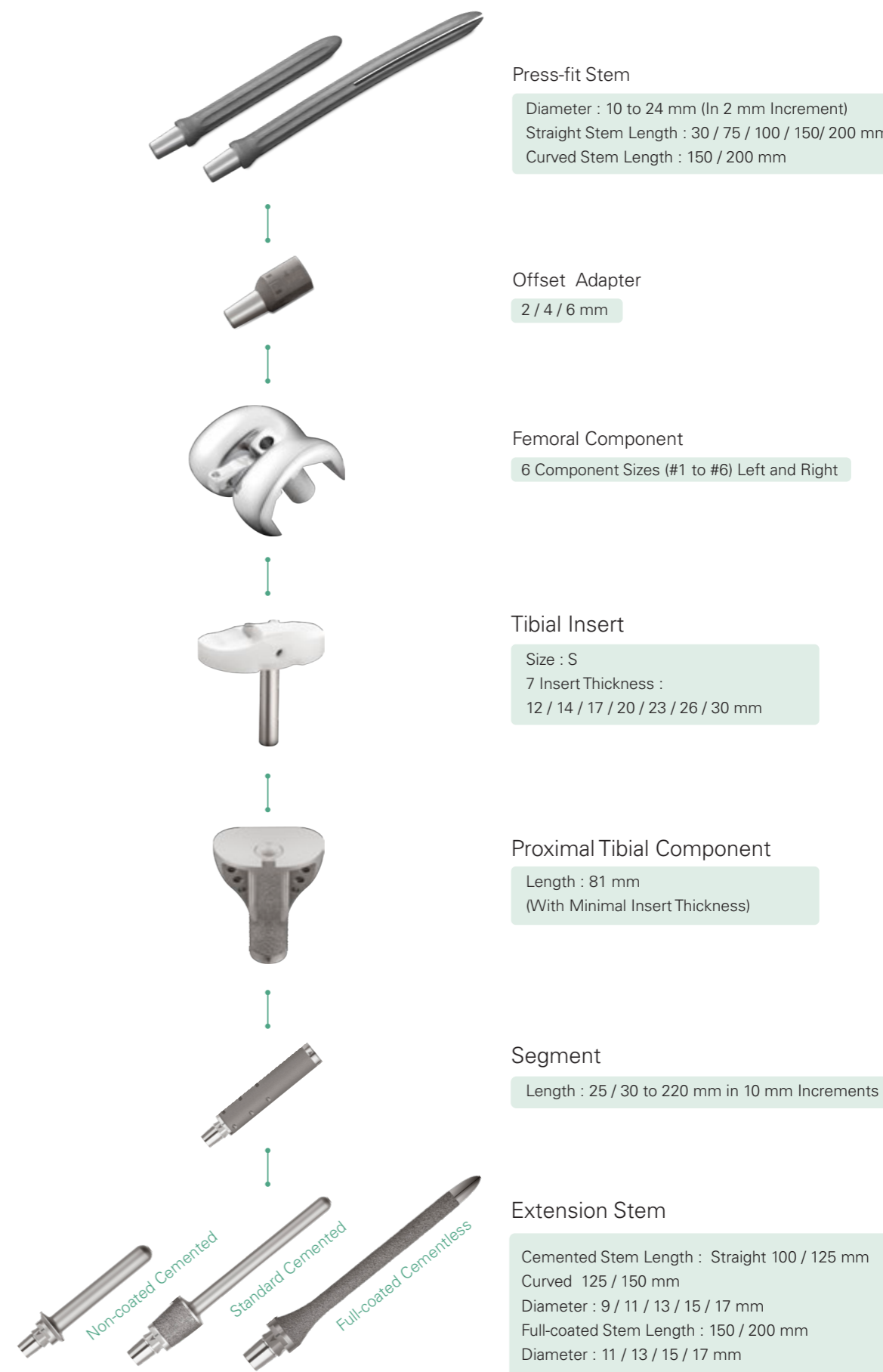


Claw Holder

Proximal Tibial Replacement



Proximal Tibial Assembly



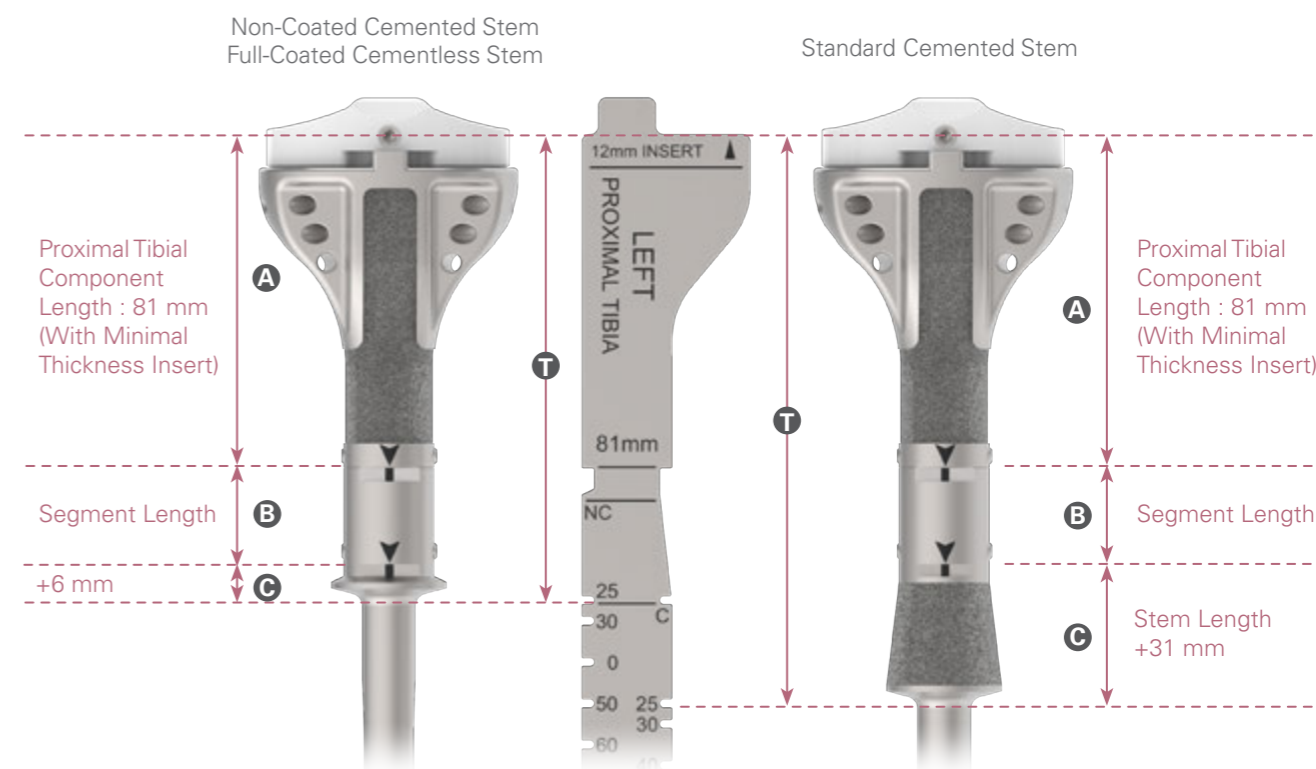
A. Pre-operative Planning

Plan the proper combination of components with the **Resection Template**.

The length for Standard proximal tibial components is 81mm, the etched marking **C** on the medial side indicates the extra-medullary 31mm of titanium plasma spray coating section on the Standard Cemented Stem, while the rest of the cutouts indicate the additional segment length options .

The etched marking **NC** on the lateral side indicates the extra-medullary 6 mm on the Non-Coated Cemented stem or the Full-Coated Cementless stem, while the rest of the cutouts indicate the additional segment length options.

Please note the final combination of components may be different at the actual time of surgery.



| Reference Chart for Non-Coated Cemented Stem and Full-Coated Cementless Stem | | | |
|--|--|--------------|--------------------------------------|
| T Resection Length | A Component | B Segment | C Stem |
| 87 mm | Proximal Tibial Component Length + 12mm Tibial Insert 81 mm | | Non-Coated Cemented Stem |
| 112 mm | | 25 mm | |
| 117 mm | | 30 mm | |
| 127 mm | | 40 mm | |
| 137 mm | | 50 mm | |
| 147 mm | | 60 mm | |
| 157 mm | | 70 mm | |
| 167 mm | | 80 mm | |
| 177 mm | | 90 mm | |
| 187 mm | | 100 mm | |
| 197 mm | | 110 mm | |
| 207 mm | | 120 mm | |
| 217 mm | | 130 mm | |
| 227 mm | | 140 mm | |
| 237 mm | | 150 mm | |
| 247 mm | | 160 mm | |
| 257 mm | | 170 mm | |
| 267 mm | | 180 mm | |
| 277 mm | | 190 mm | |
| 287 mm | | 200 mm | |
| 297 mm | | 210 mm | |
| 307 mm | | 220 mm | |
| | | | Full-Coated Cementless Stem +6 mm |

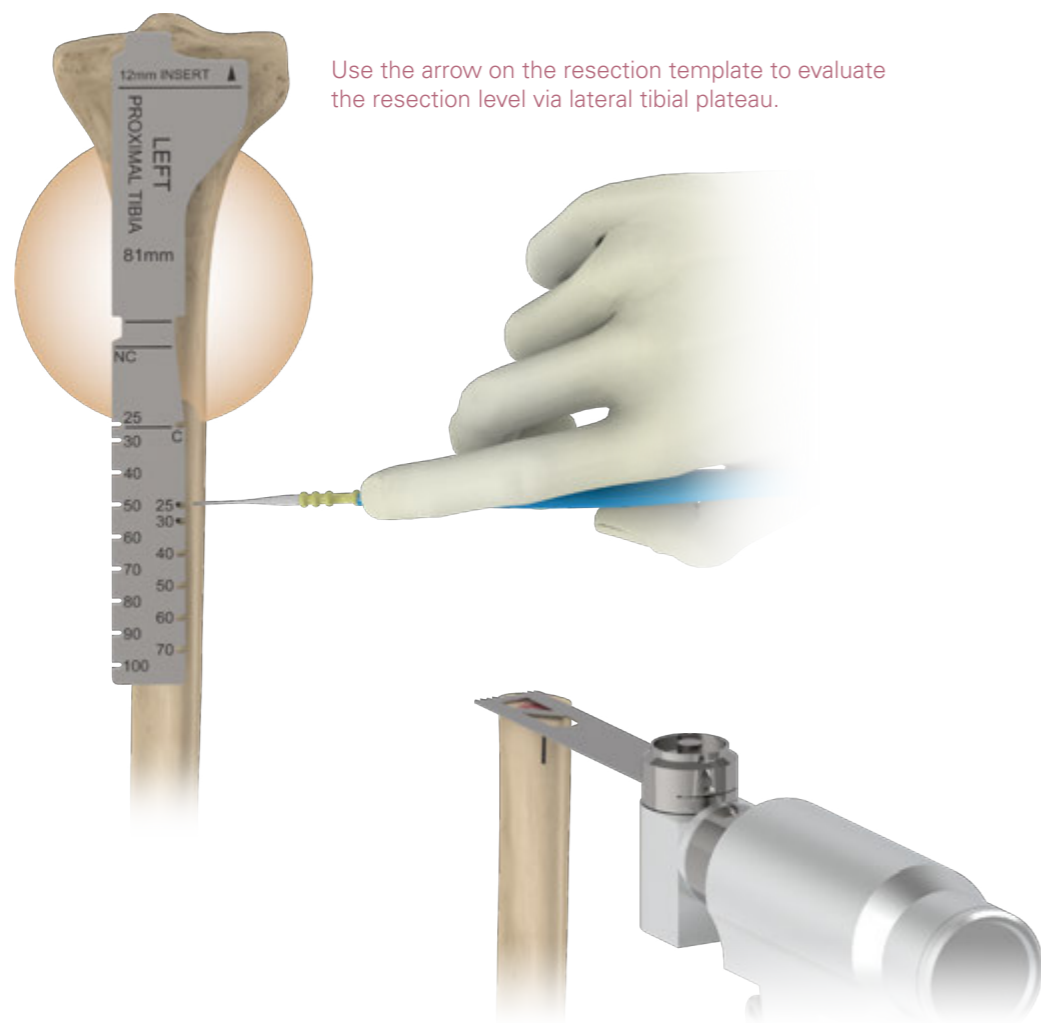
| Reference Chart for Standard Cemented Stem | | | |
|--|--|--------------|----------------------------------|
| T Resection Length | A Component | B Segment | C Stem |
| 112 mm | Proximal Tibial Component Length + 12mm Tibial Insert 81 mm | | Standard Cemented Stem +31 mm |
| 137 mm | | 25 mm | |
| 142 mm | | 30 mm | |
| 152 mm | | 40 mm | |
| 162 mm | | 50 mm | |
| 172 mm | | 60 mm | |
| 182 mm | | 70 mm | |
| 192 mm | | 80 mm | |
| 202 mm | | 90 mm | |
| 212 mm | | 100 mm | |
| 222 mm | | 110 mm | |
| 232 mm | | 120 mm | |
| 242 mm | | 130 mm | |
| 252 mm | | 140 mm | |
| 262 mm | | 150 mm | |
| 272 mm | | 160 mm | |
| 282 mm | | 170 mm | |
| 292 mm | | 180 mm | |
| 302 mm | | 190 mm | |
| 312 mm | | 200 mm | |
| 322 mm | | 210 mm | |
| 332 mm | | 220 mm | |

Note: the length of XS proximal tibial component and the XS tibial insert is 73 mm, 8 mm less than standard component. The XS rotating platform fit only with XS tibial insert and XS femoral component. Please refer to the appendix for XS component preparation.

B. Femoral Osteotomy

Measure the appropriate resection length by aligning the **Proximal Tibial Resection Template** to the appropriate reference point of the tibial plateau and mark a resection reference line. Create an anterior reference mark (L) to align with the indicator on the stem trial and the implant.

Perform the tibial osteotomy at the reference resection line perpendicular to the shaft.



Instruments

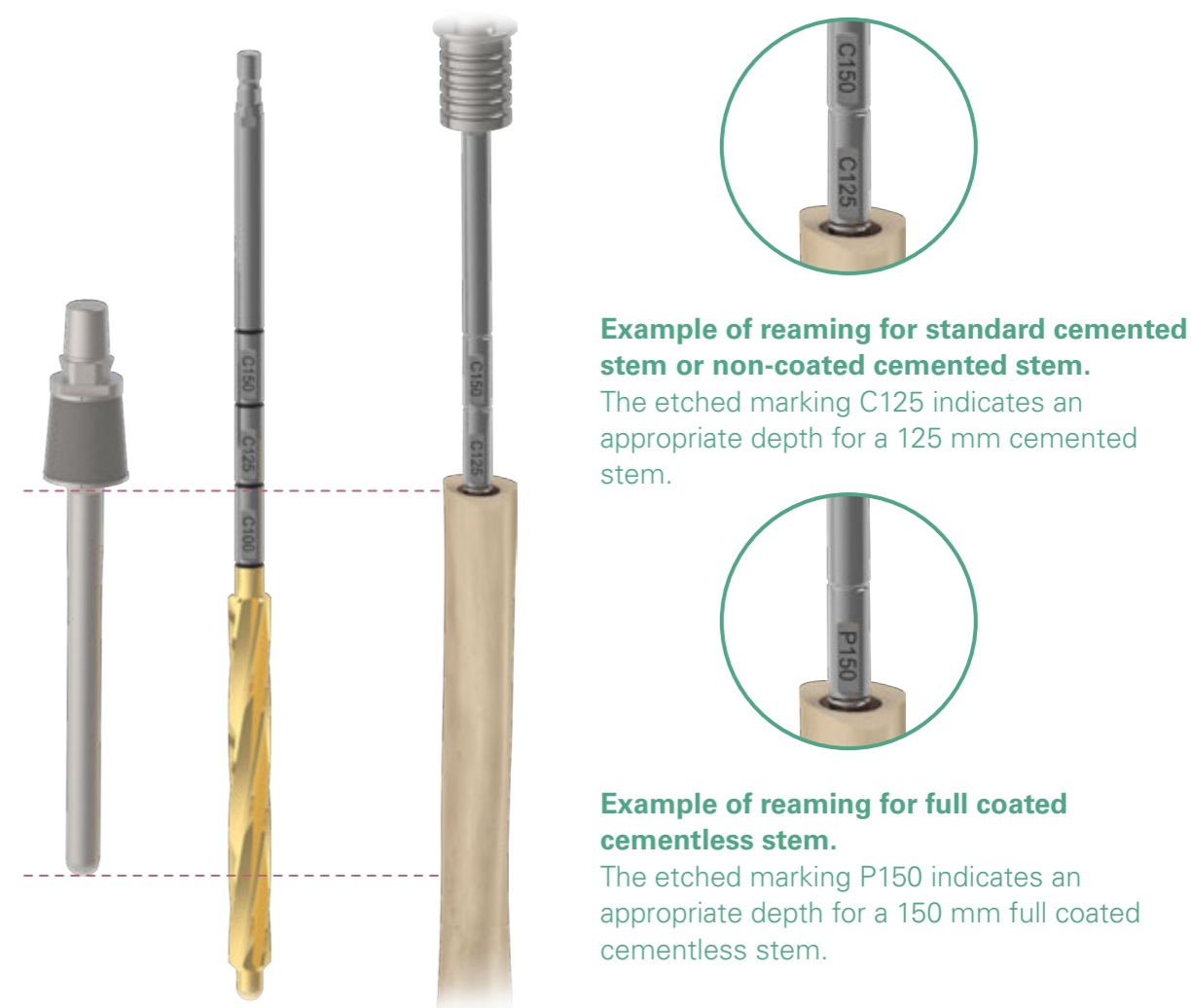


Proximal Tibial Resection Template

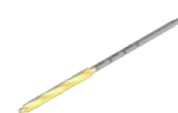
C. Canal Preparation

For the use of cemented stem, sequentially reaming the canal with the **Straight Stem Reamer** in 1 mm increment until the anticipated diameter and depth is achieved. A stem diameter 1~2 mm less than the final reamer is preferred for adequate cement mantle.

For the full-coated cementless stem, progressively ream the canal with the **Straight Stem Reamers** that have 1 mm increments until the appropriate diameter and depth is achieved as indicated on the etched 'P' markings on the reamers. A stem diameter equal to the final reamer is recommended for an optimal press-fit. Optional reamer diameter of 11.5 / 13.5 / 15.5 / 17.5 mm are also included for the finer press-fit adjustment.



Instruments



Straight Stem Reamer
Diameter 8~21 mm

C.Canal Preparation

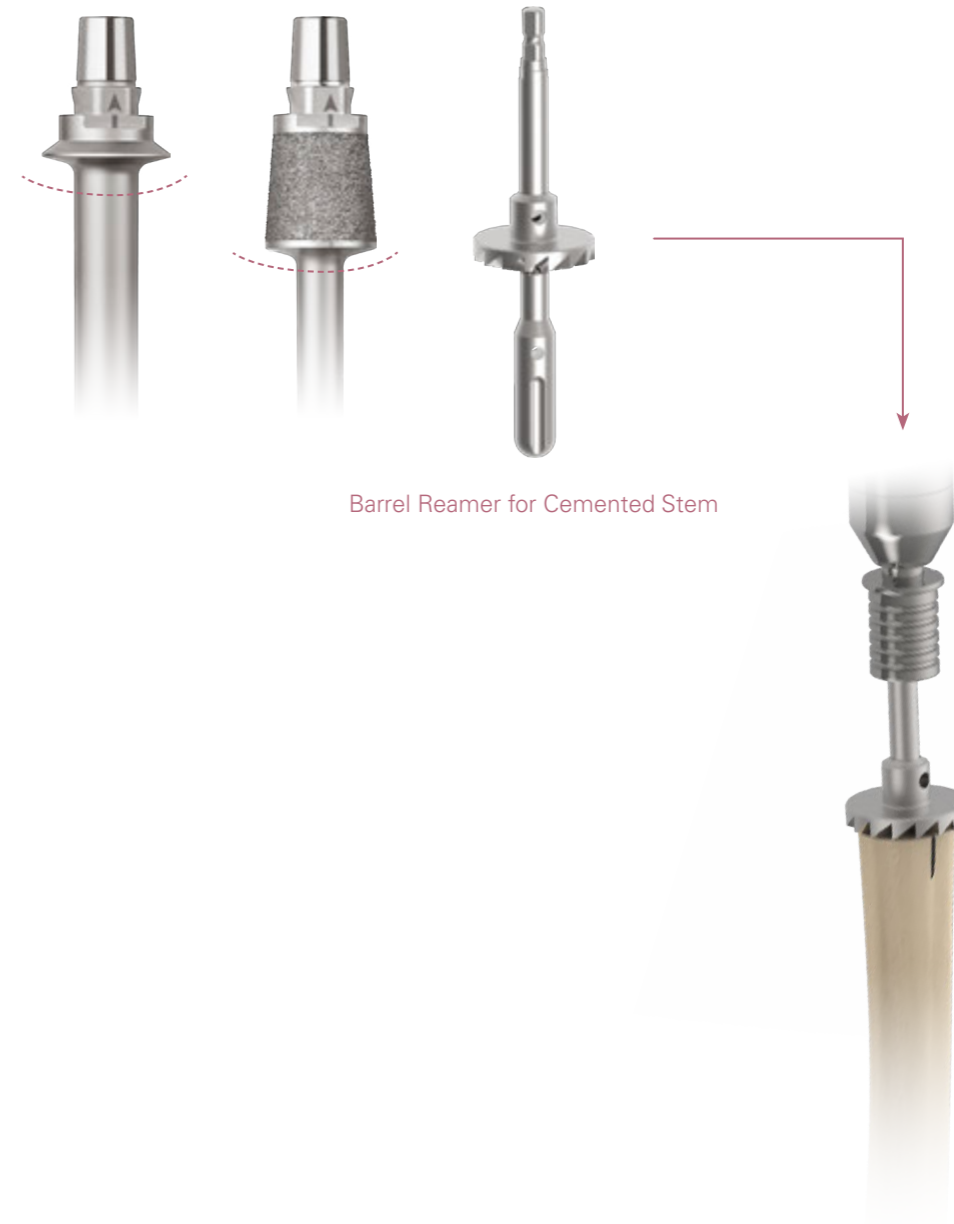
Stem Options Reference Chart

| | Straight Stem | Curved Stem |
|-----------------------------|--------------------------------|--------------------------------|
| Standard Cemented Stem | 9 mm diameter x 100 mm Length | 9 mm diameter x 125 mm Length |
| | 11 mm diameter x 100 mm Length | 11 mm diameter x 125 mm Length |
| | 13 mm diameter x 100 mm Length | 13 mm diameter x 125 mm Length |
| | 15 mm diameter x 100 mm Length | 15 mm diameter x 125 mm Length |
| | 17 mm diameter x 100 mm Length | 17 mm diameter x 125 mm Length |
| | 9 mm diameter x 125 mm Length | 9 mm diameter x 150 mm Length |
| | 11 mm diameter x 125 mm Length | 11 mm diameter x 150 mm Length |
| | 13 mm diameter x 125 mm Length | 13 mm diameter x 150 mm Length |
| | 15 mm diameter x 125 mm Length | 15 mm diameter x 150 mm Length |
| | 17 mm diameter x 125 mm Length | 17 mm diameter x 150 mm Length |
| Non-coated Cemented Stem | 9 mm diameter x 100 mm Length | 9 mm diameter x 125 mm Length |
| | 11 mm diameter x 100 mm Length | 11 mm diameter x 125 mm Length |
| | 13 mm diameter x 100 mm Length | 13 mm diameter x 125 mm Length |
| | 15 mm diameter x 100 mm Length | 15 mm diameter x 125 mm Length |
| | 17 mm diameter x 100 mm Length | 17 mm diameter x 125 mm Length |
| | 9 mm diameter x 125 mm Length | 9 mm diameter x 150 mm Length |
| | 11 mm diameter x 125 mm Length | 11 mm diameter x 150 mm Length |
| | 13 mm diameter x 125 mm Length | 13 mm diameter x 150 mm Length |
| Full-Coated Cementless Stem | N/A | N/A |
| | 11 mm diameter x 150 mm Length | 11 mm diameter x 150 mm Length |
| | 13 mm diameter x 150 mm Length | 13 mm diameter x 150 mm Length |
| | 15 mm diameter x 150 mm Length | 15 mm diameter x 150 mm Length |
| | 17 mm diameter x 150 mm Length | 17 mm diameter x 150 mm Length |
| | N/A | N/A |
| | 11 mm diameter x 200 mm Length | 11 mm diameter x 200 mm Length |
| | 13 mm diameter x 200 mm Length | 13 mm diameter x 200 mm Length |
| | 15 mm diameter x 200 mm Length | 15 mm diameter x 200 mm Length |
| | 17 mm diameter x 200 mm Length | 17 mm diameter x 200 mm Length |



C.Canal Preparation

For the standard cemented stem and non-coated cemented stem, connect the **Cemented Stem Barrel Reamer** to the appropriate **Reamer Guide Rod** and advance into the canal to prepare the resected proximal tibia.



Barrel Reamer for Cemented Stem

Instruments



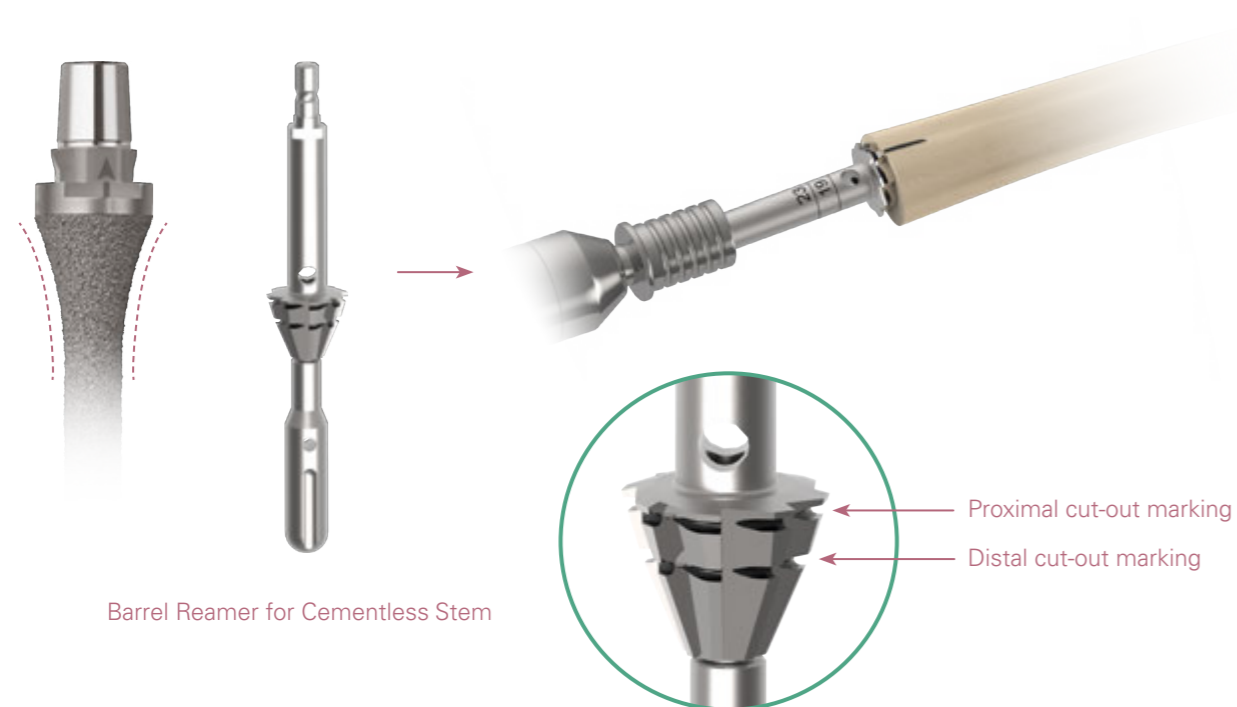
Cemented Stem Barrel Reamer Reamer Guide Rod Diameter 10-21 mm

C. Canal Preparation

For the cementless stem, connect the **Cementless Stem Barrel Reamer** to the appropriate **Reamer Guide Rod** and advance into the canal to prepare the resected proximal tibia.

Ream to the distal cut-out marking on the barrel reamer. If less than 3 mm of cortical bone around the reamer is observed, stop reaming. The planned implant construct will be 8 mm longer than the original measured plan. The cementless stem will sit above the bone (proud) by 14 mm (8 mm coated and 6 mm non-coated area on the proximal end of stem). The length of the implant construct may be adjusted selecting a shorter segment or making other adjustment.

If there is 3 mm or more of cortical bone around the barrel reamer after the initial reaming step, continue reaming to the proximal cut-out marking on the barrel reamer. The planned implant construct will match the original measured plan. The cementless stem will sit above the bone (proud) by 6mm (6mm non-coated area on the proximal end of the stem). This will be the non-coated area on the proximal end of the stem.



Instruments

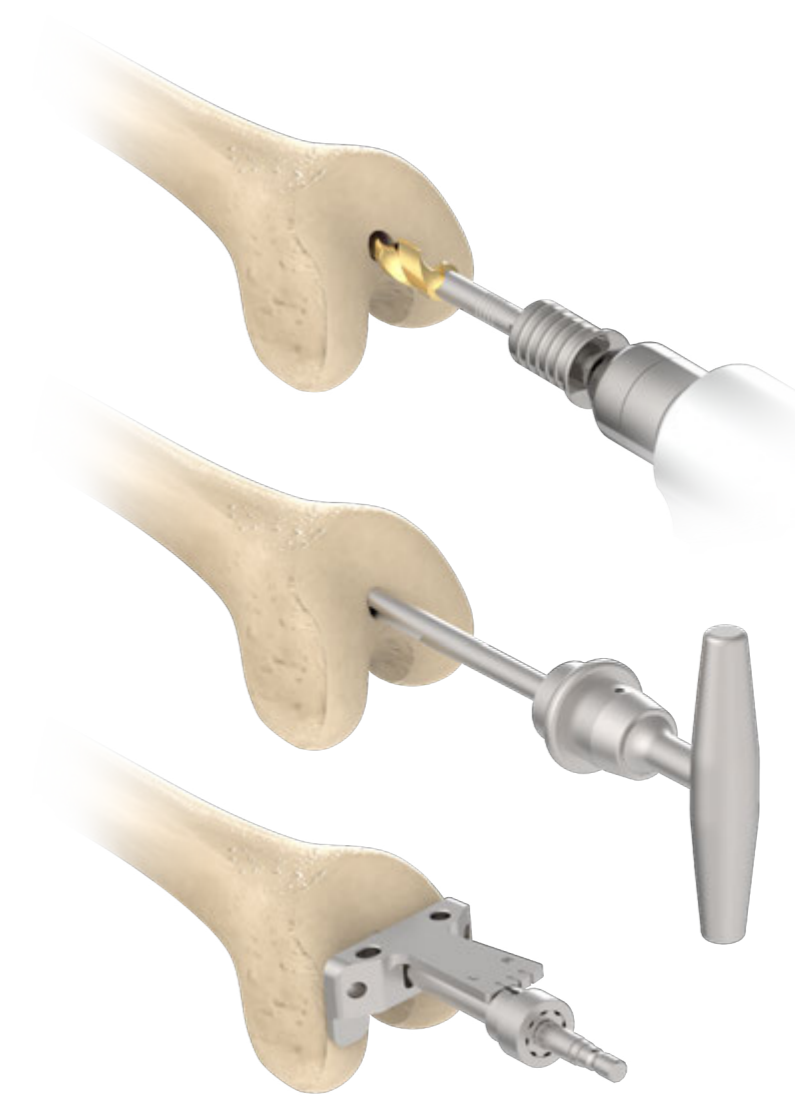


Cementless Stem Barrel Reamer
Reamer Guide Rod
Diameter 10-21 mm

D. Distal Femoral Resection

Use the **Step Drill** to create an opening into the femoral canal. The drill is inserted to a depth of approximately 100 mm into the femoral canal. This allows for depressurization of the canal when the **IM Rod** is inserted.

Set the **Femoral IM Alignment Guide** to the correct "R" or "L" for right or left knee. Slide the **Femoral IM Alignment Guide** through the **IM Rod** until it is seated against the distal femur. The alignment guide offers a fixed 6 degrees valgus angle.



Instruments



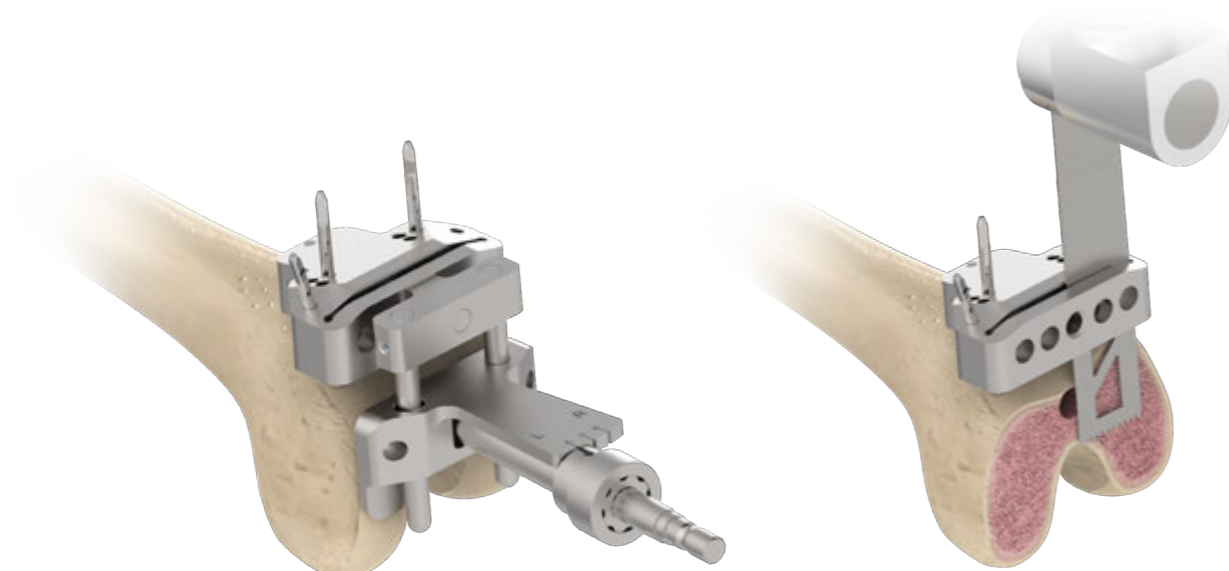
Step Drill
Femoral IM Rod
Femoral IM Alignment Guide
T-Handle

D. Distal Femoral Resection

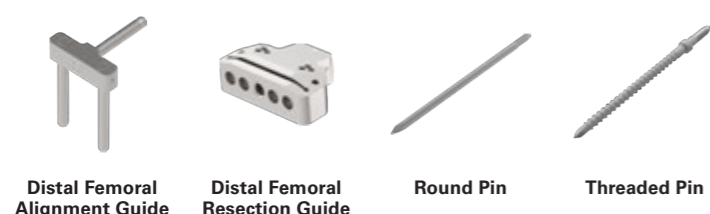
Attach the **Distal Femoral Alignment Guide** and the **Distal Femoral Resection Guide** to the **Femoral IM Alignment Guide**.

Drill pilot holes through the "0" pin holes on the resection guide with the **3.2 mm Drill**, and place a pair of the **Round Pins** to fix the resection guide. Additional **Threaded Pins** may be placed to further secure the resection guide.

Remove the alignment guide assembly, and perform distal femoral resection through the most distal slot on the **Distal Femoral Resection Guide**.



Instruments



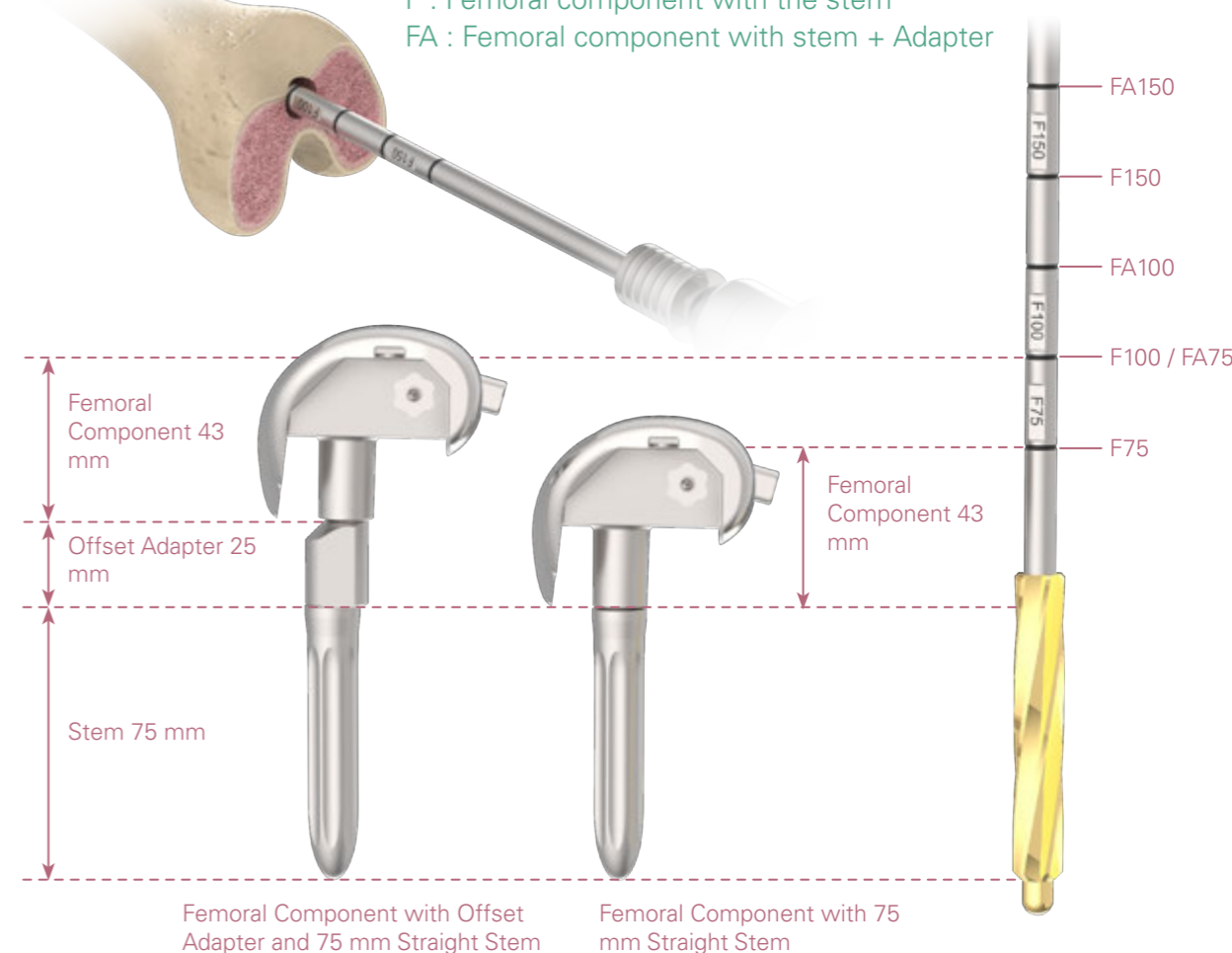
E. Femoral Canal Preparation

Ream the femoral canal starting with the 9 mm **Femoral Stem Reamer** and progressively increase the diameter until proper cortical contact is achieved at the desired depth. (Reamer options are available from 9mm to 24mm in 1mm increments).

Note the etched markings on the femoral stems, the 'F' indicates the appropriate depth for a femoral component with a stem only with no offset adapter. The 'FA' indicates the appropriate depth for a femoral component with an offset adapter and stem.

Note:

- F : Femoral component with the stem
- FA : Femoral component with stem + Adapter



Instruments



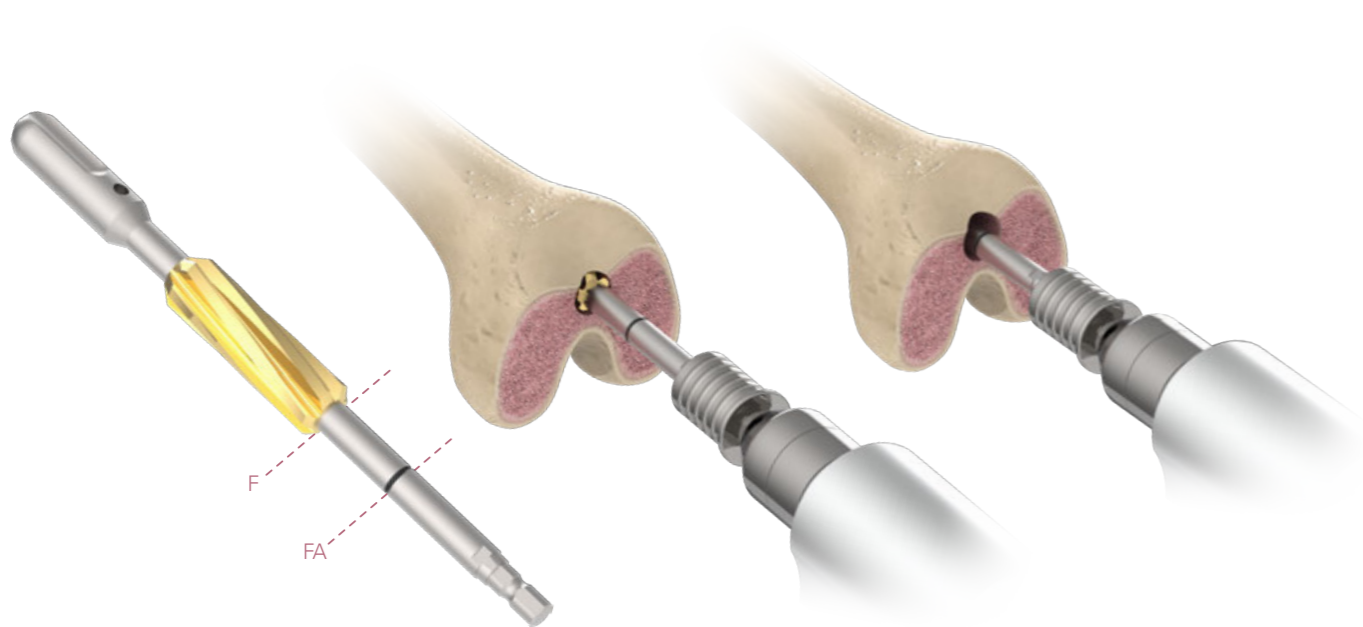
E. Femoral Canal Preparation

Choose the **Reamer Guide Rod** corresponding to the diameter of the last reamer used. Attach the **Reamer Guide Rod** to the **Boss Reamer**.

Ream the femoral canal to the depth until the indicator mark "F" on the **Boss Reamer** lines up with the entry hole. The boss reaming process will not be necessary if the last reamer used is larger than 16 mm.

(Optional) If offset is desired, ream to the indicator mark "FA".

As the reaming process is completed, place the last **Femoral Stem Reamer** in the femoral cavity.



Note:
 Ream to F for non-offset boss preparation
 Ream to FA if offset is desired after femoral sizing.

Instruments



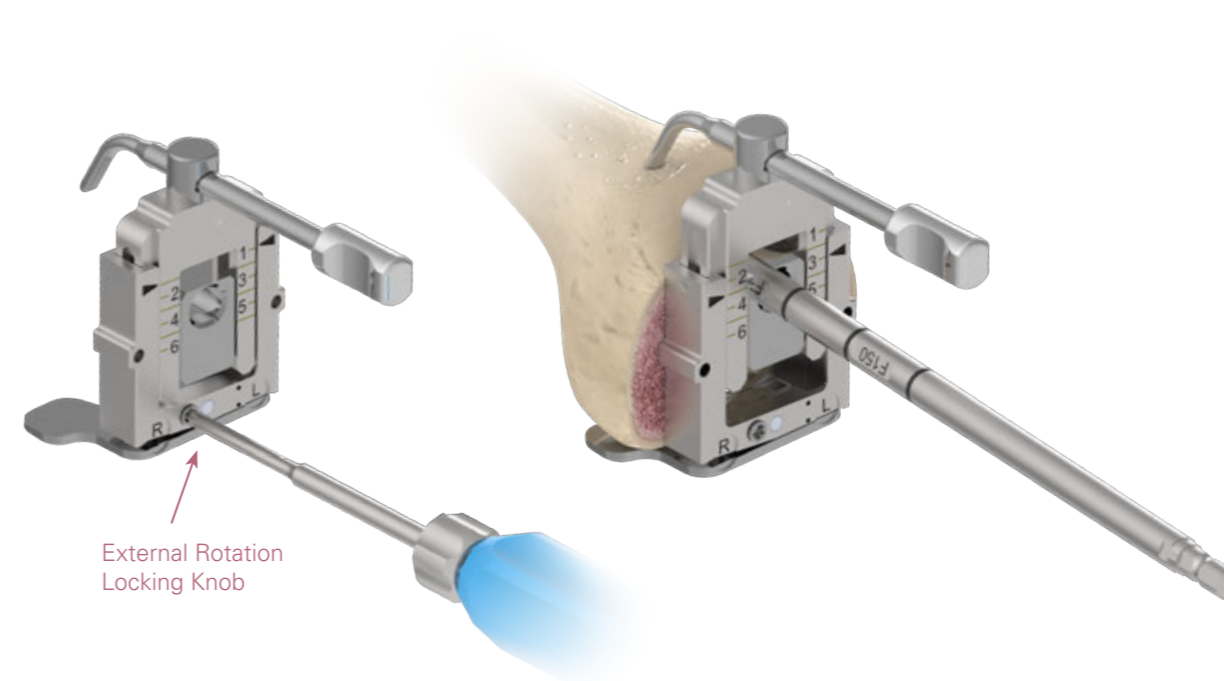
Reamer Guide Rod
10 / 12 / 14 mm **Boss Reamer**

F. Femoral Sizing and Placement

Set the **Femoral Sizer** to the correct "R" or "L" for the patient and lock the external rotation locking knob with the **Screwdriver T20**. This will provide a set 3 degree external rotation. Note. Additional external rotation adjustment can be made at a later technique step.

Place the **Femoral Sizer** through the reamer and onto the resected distal femur surface with the posterior feet of the Femoral Sizer seated on the posterior condyles.

Position the stylus tip to contact the lowest point of the anterior femoral cortex. Confirm the optimal femoral component size based on the sizing options from the main panel of the **Femoral Sizer**.



External Rotation Locking Knob

Instruments



Femoral Sizer **Driver Handle** **Screwdriver Adapter T20**

F.Femoral Sizing and Placement

F1. Optional A/P Offset Evaluation with Set 3 Degrees External Rotation

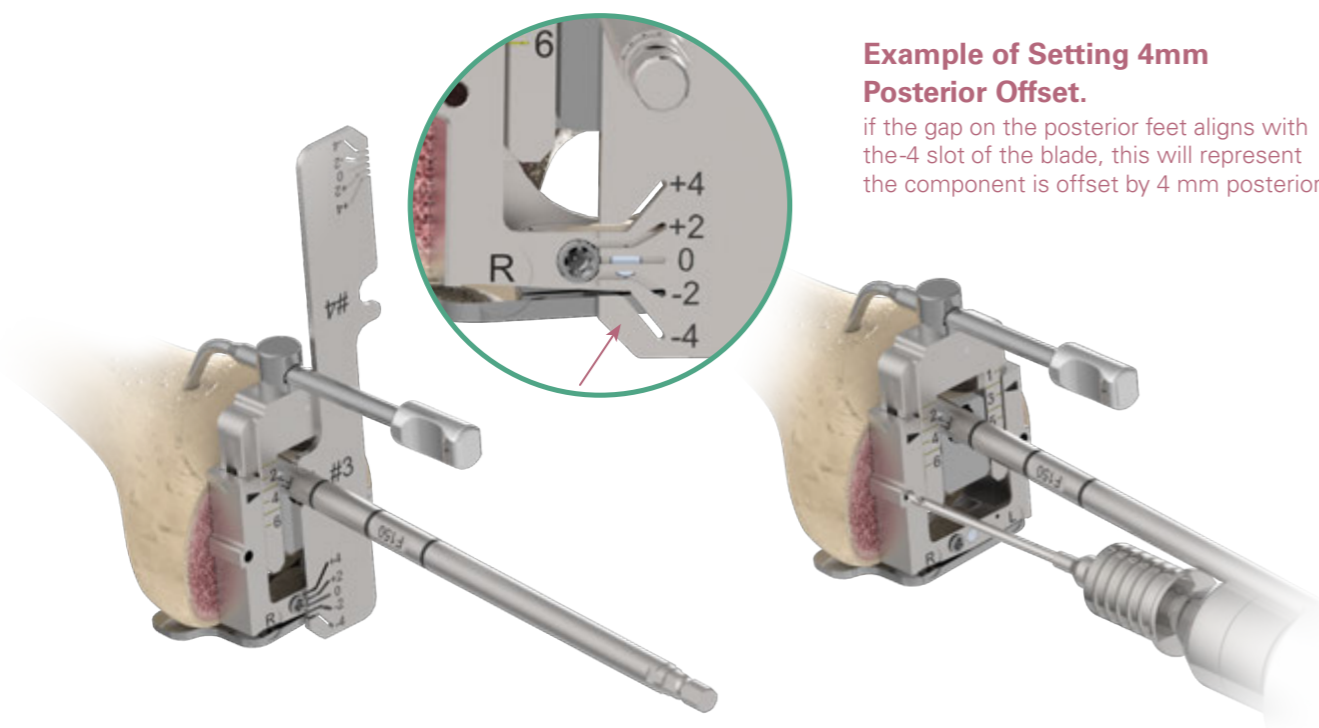
Determine preliminary A/P offset by attaching the **Femoral Offset Blade** that corresponds to the selected femoral size over the **Femoral Sizer** with the semi-circle cutout aligned with the reamer.

Note the offset marking adjacent to the gap between the posterior feet and the markings on the body of the **Femoral Sizer**. This will give a rough estimate of the A-P offset needed.

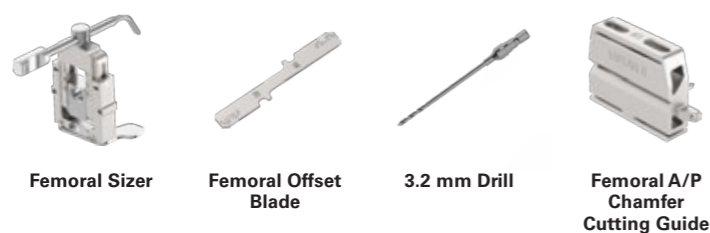
If no further M/L offset or external rotation adjustment is needed, make a pair of pilot holes through the pin holes on the **Femoral Sizer**. These pilot holes will be used to position the **Femoral A/P Chamfer Cutting Guide**.

Remove the sizer assembly.

Example of Setting 4mm Posterior Offset.
if the gap on the posterior feet aligns with the -4 slot of the blade, this will represent the component is offset by 4 mm posterior.



Instruments



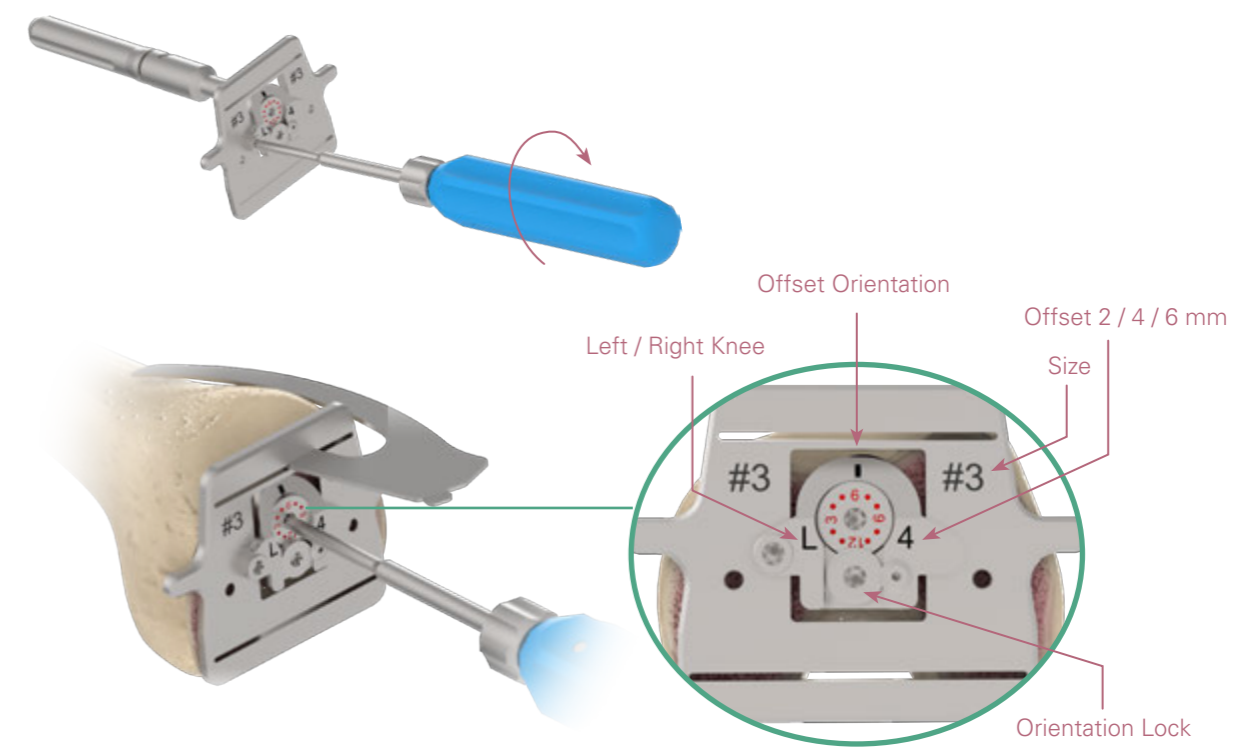
F.Femoral Sizing and Placement

F2. Optional Femoral Offset Evaluation and with Adjustable External Rotation

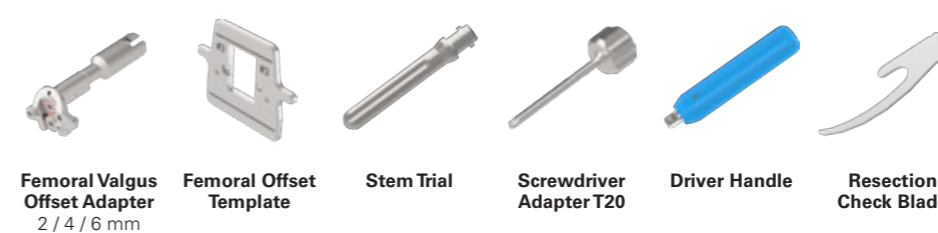
To further evaluate external rotation adjustment or offset adjustment, assemble the selected size **Femoral Offset Template**, the selected size **Femoral Valgus Offset Adapter** (2/4/6 mm, Left or Right), **Stem Trial** together with **Screwdriver T20**.

Position the **Femoral Offset Template** assembly on the resected distal femoral surface. Evaluate offset level, implant coverage and external rotation with the **Femoral Offset Template**. Adjust the Offset Orientation knob using the **Screwdriver T20**.

The projected A/P bone resection can be evaluated by inserting the **Resection Check Blade** into the resection slots.



Instruments



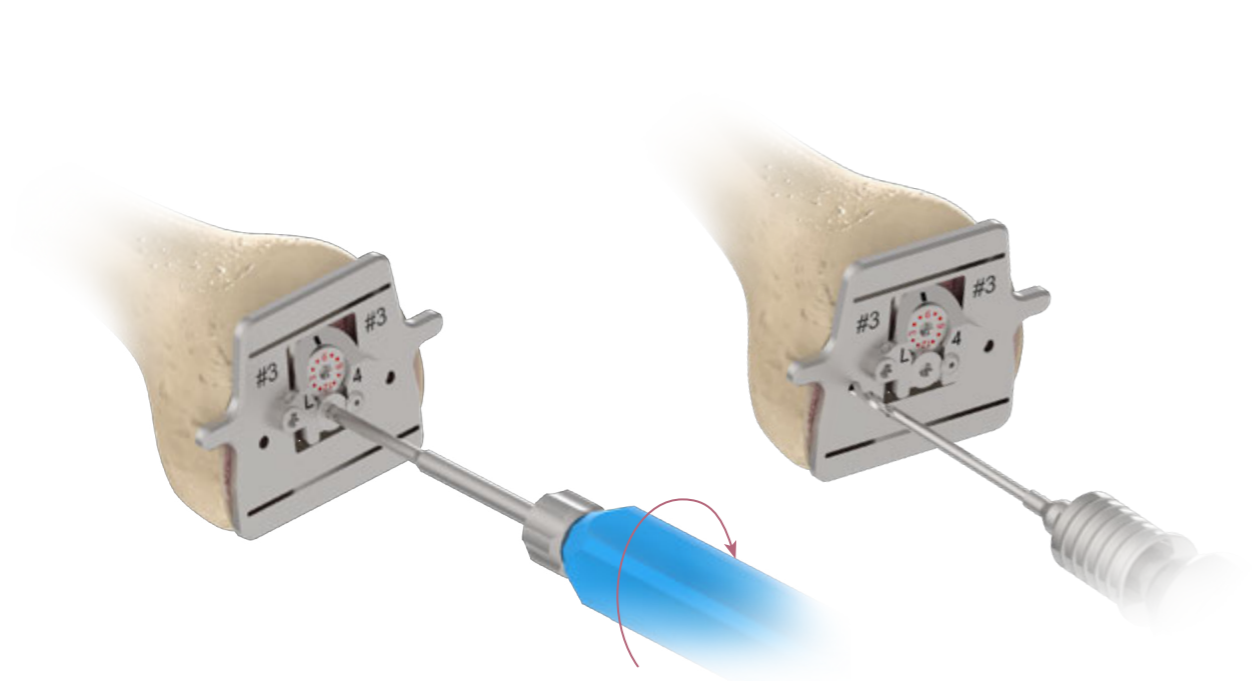
F.Femoral Sizing and Placement

F2. Optional Femoral Offset Evaluation and with Adjustable External Rotation

Once the ideal offset position is set, lock the offset knob with the **Screwdriver T20**.

Make a pair of pilot holes through the pin holes on the **Femoral Offset Template** with the **3.2 mm Drill**. These pilot holes will be used to position the **Femoral A/P Chamfer Cutting Guide**.

Remove the **Femoral Offset Template** assembly.



Instruments

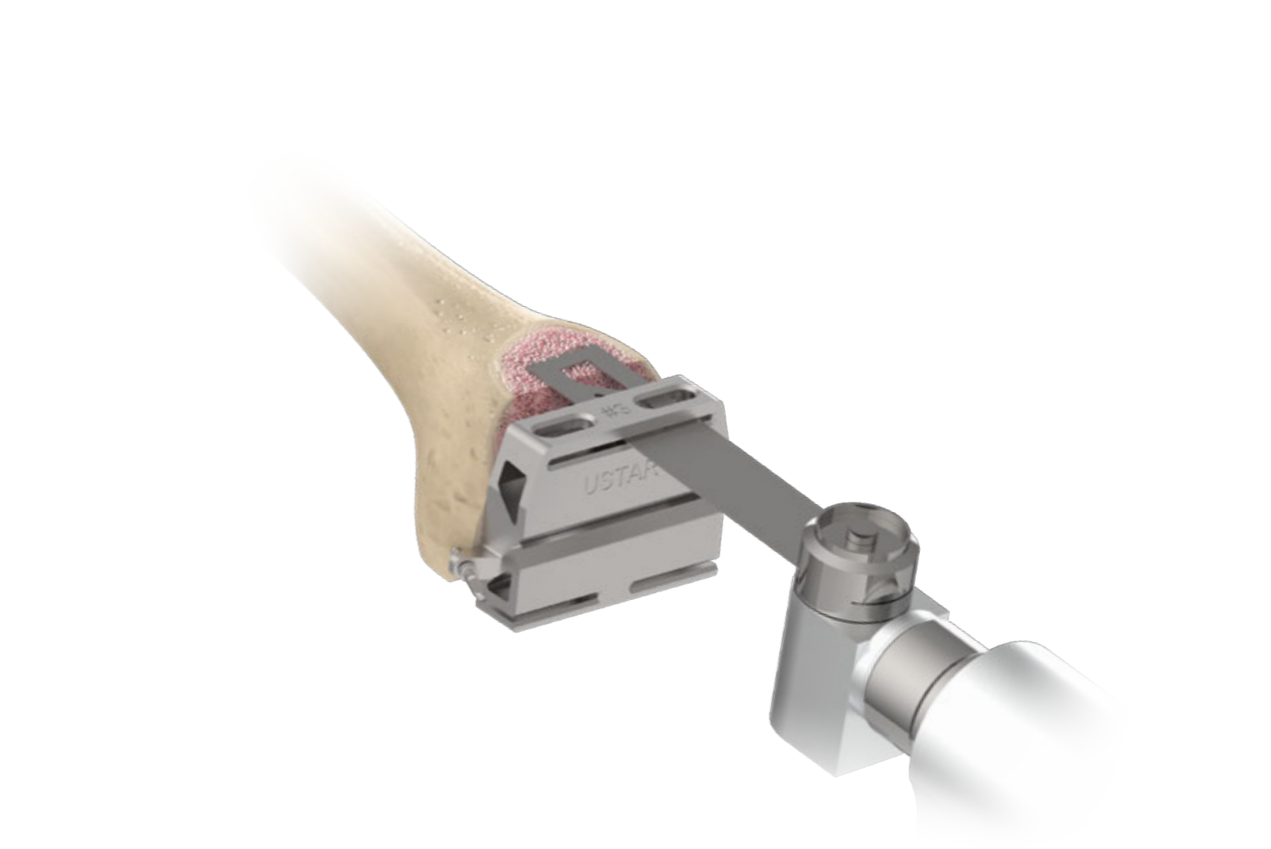


F.Femoral Sizing and Placement

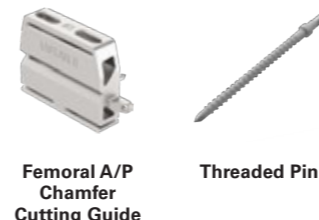
Place the **Femoral A/P Chamfer Cutting Guide** into the pre-drilled pin holes.

Secure the cutting guide with **Threaded Pins** and complete the A/P and chamfer resections.

Remove the **Femoral A/P Chamfer Cutting Guide**.



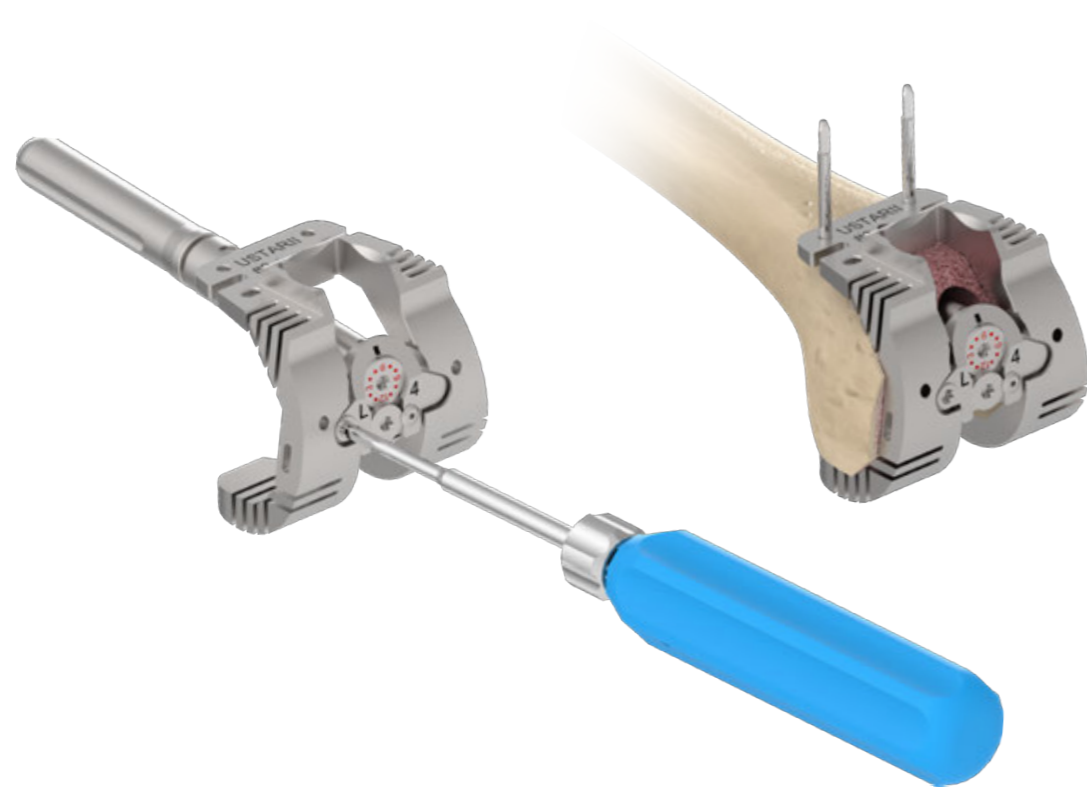
Instruments



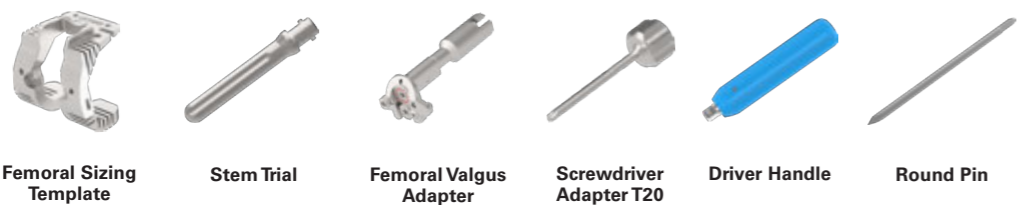
G.Femoral Box Preparation

Assemble the selected size of the **Femoral Sizing Template, Valgus offset Adapter, Stem Trial** together with **Screwdriver Adapter T20**.

Secure the **Femoral Sizing Template** assembly with **Round Pins** in the anterior holes.

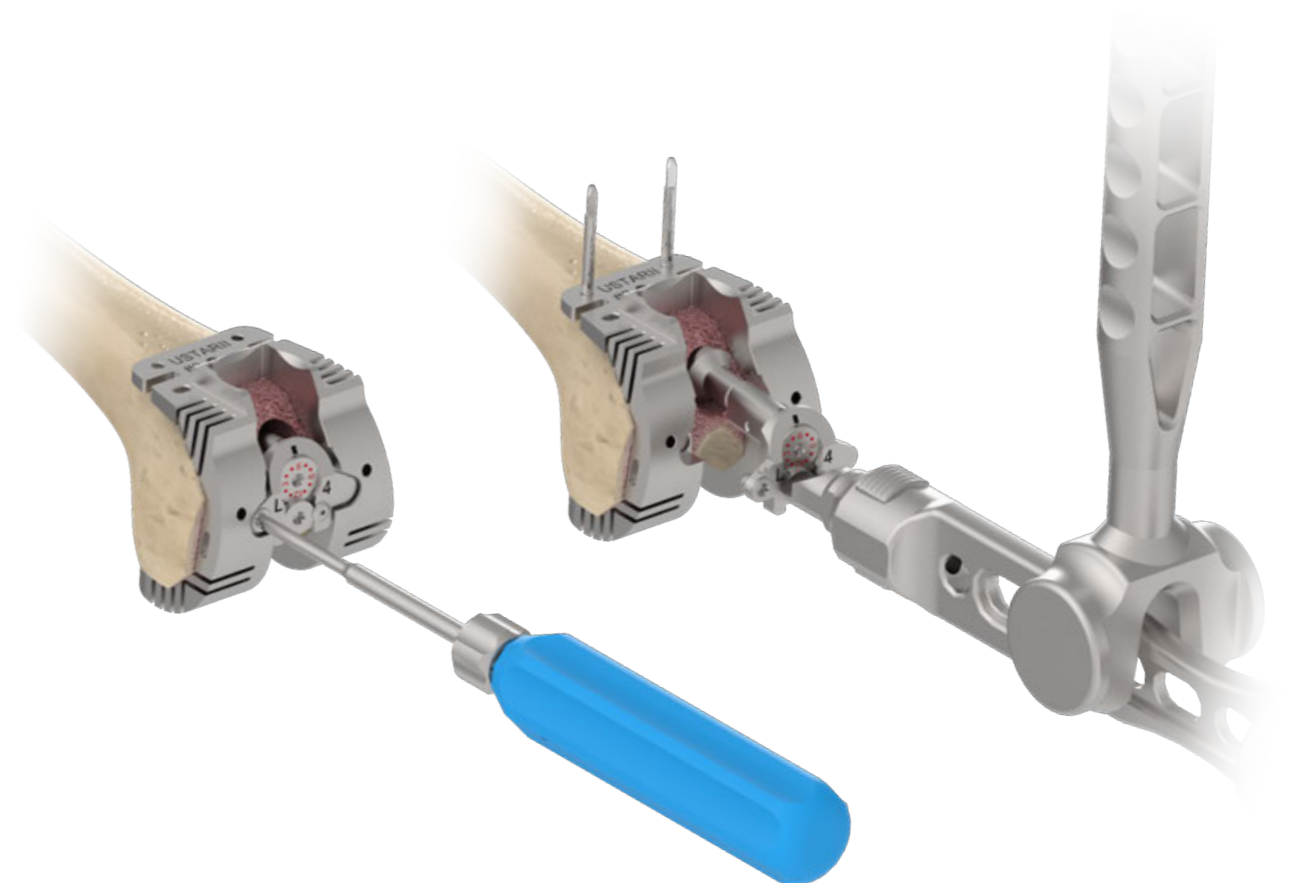


Instruments

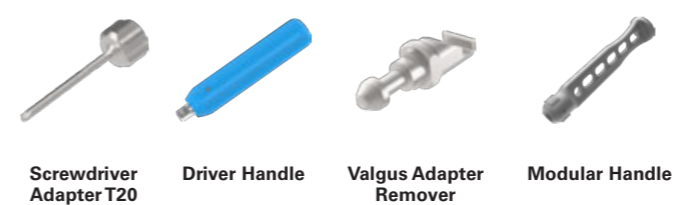


G.Femoral Box Preparation

Disassemble the **Femoral Valgus Adapter** and the **Femoral Sizing Template** with the screwdriver. Use the **Valgus Adapter Remover** to remove the **Femoral Valgus Adapter** and the **Stem Trial**.



Instruments

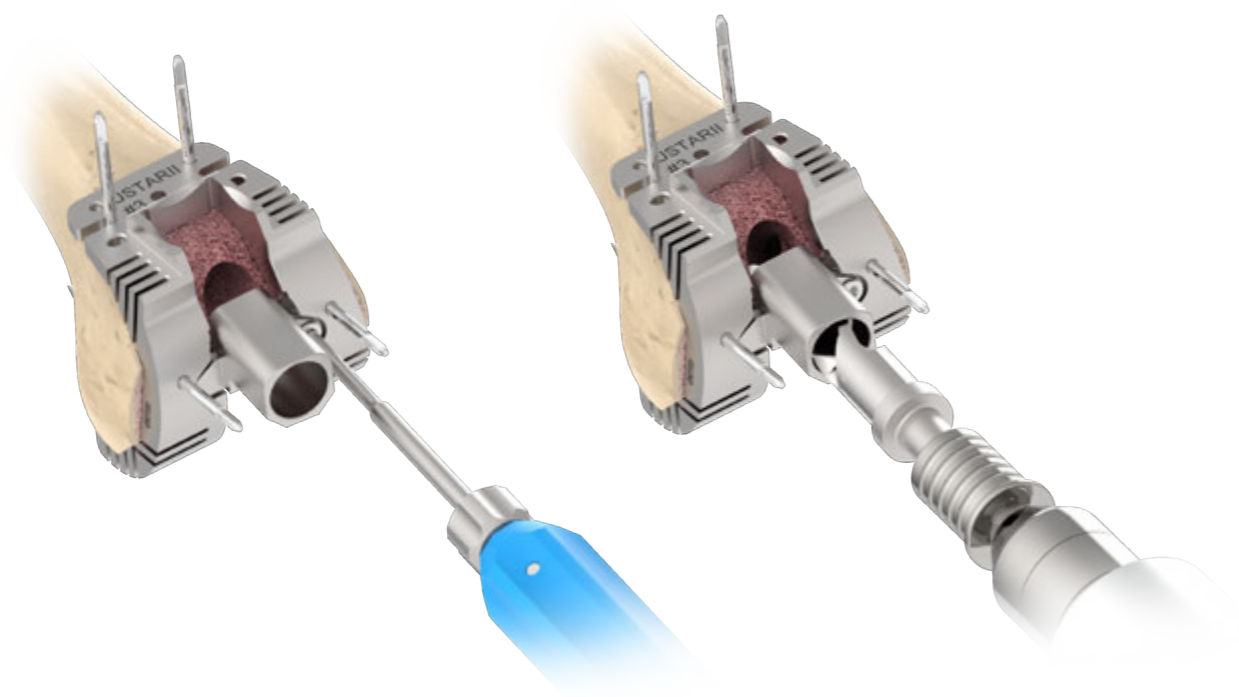


G.Femoral Box Preparation

If offset is desired, secure the **Femoral Sizing Template** with two **Round Pins** on resected distal femoral surface.

Assemble the **Femoral Offset Drill Guide** onto the **Femoral Sizing Template** with the **Screwdriver T20**.

Drill through the **Femoral Offset Drill Guide** with the **Femoral Offset Boss Drill** until fully engaged.



Instruments

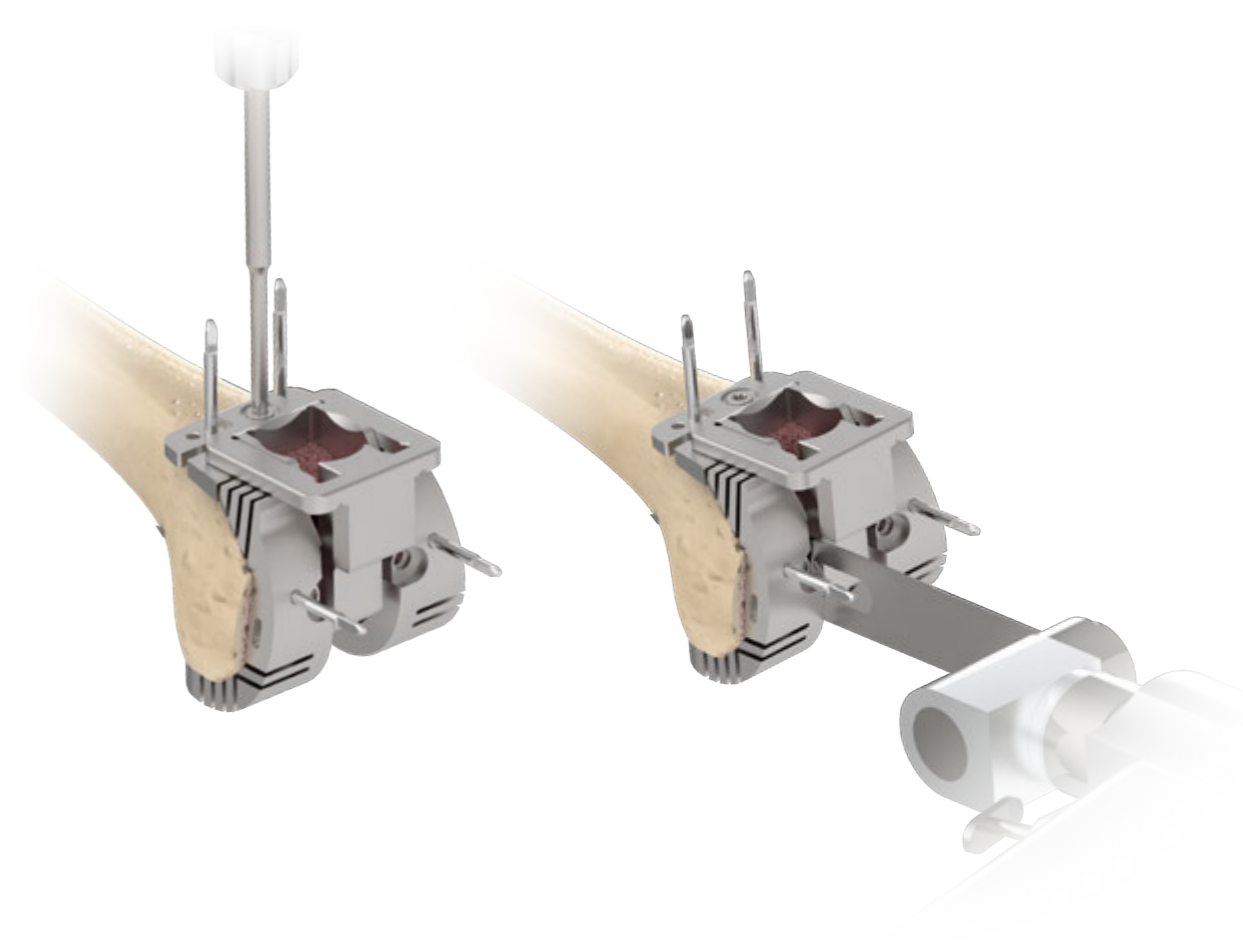


Femoral Offset Drill Guide Screwdriver Adapter T20 Driver Handle Femoral Offset Boss Drill Femoral Sizing Template

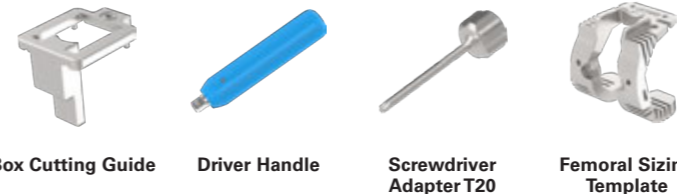
G.Femoral Box Preparation

Assemble the **Box Cutting Guide** to the **Femoral Sizing Template** with the **Screwdriver**.

Using a standard 1.27 mm saw blade, complete a parallel bone resection through the posterior cortex.



Instruments



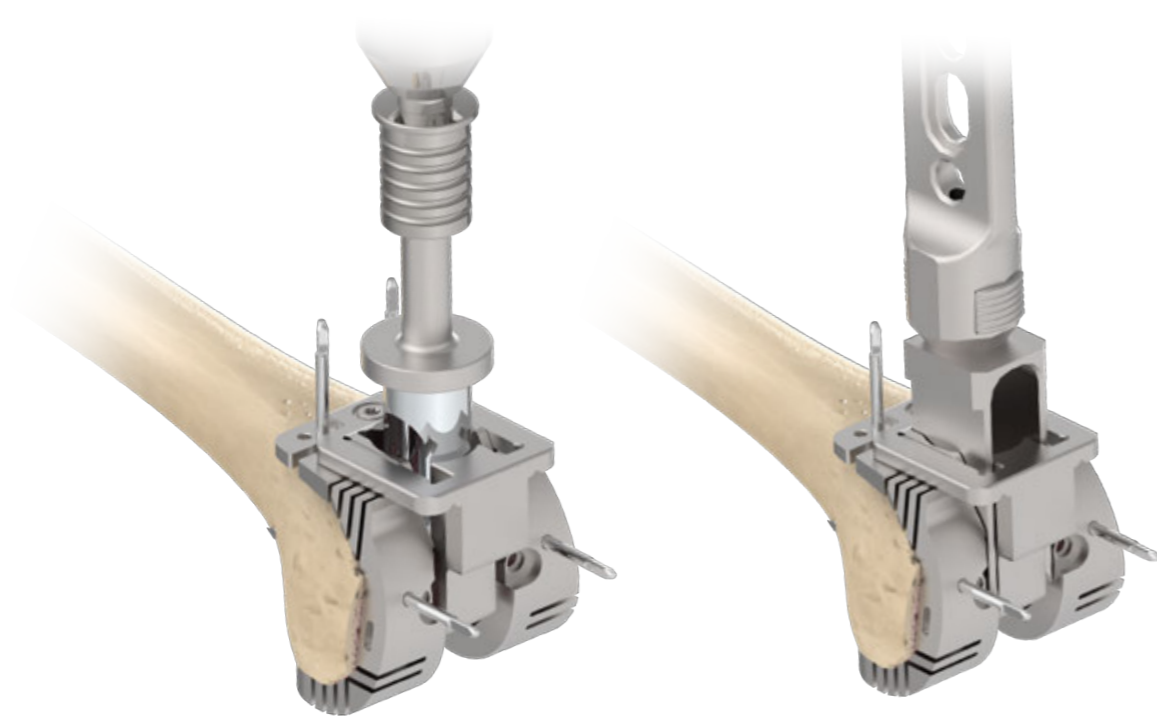
Box Cutting Guide Driver Handle Screwdriver Adapter T20 Femoral Sizing Template

G. Femoral Box Preparation

Using the **Box Reamer**, ream through **Box Cutting Guide** until the stop is fully engaged and in contact with the top surface of the guide.

Using the **Box Chisel**, impact through the **Box Cutting Guide** to ensure the corners of the box housing are 'square'.

Remove the **Femoral Sizing Template/Box Cutting Guide** assembly.



Instruments

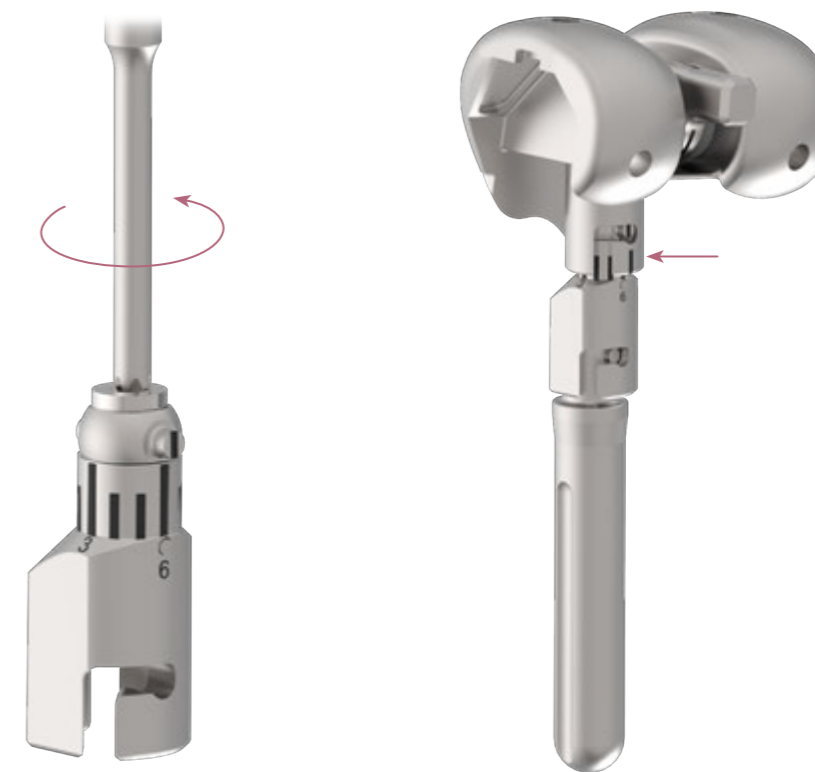


H. Trialing

Assemble the **Femoral Trial**, the **Offset Adapter Trial** if needed, and the **Stem Trial**.

If using the **Offset Adapter Trial**, use the **Screwdriver** to prepare the **Offset Adapter Trial** by unlock the knob on the top of the instrument.

Align the indicator on the **Offset Adapter Trial** to the predetermined offset number, then lock the knob.

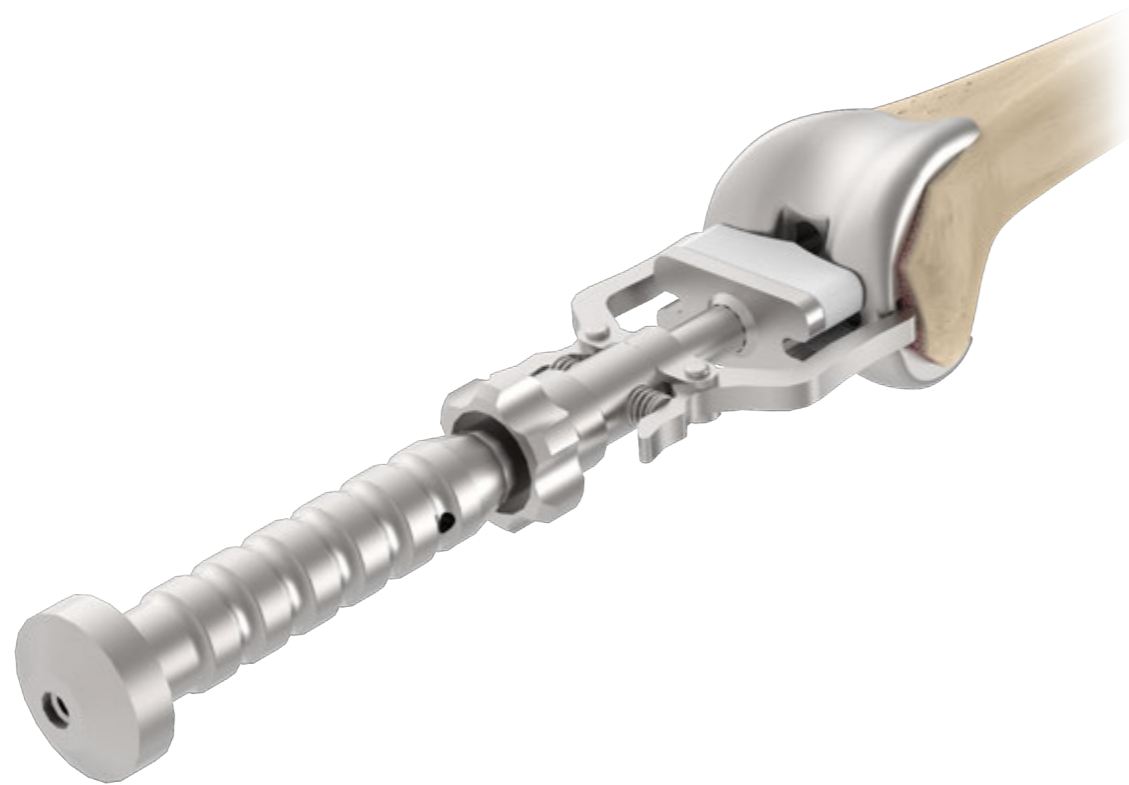


Instruments



H. Trialing

Place the femoral trial assembly onto the prepared femoral surface using the **Femoral Driver**.



Instruments



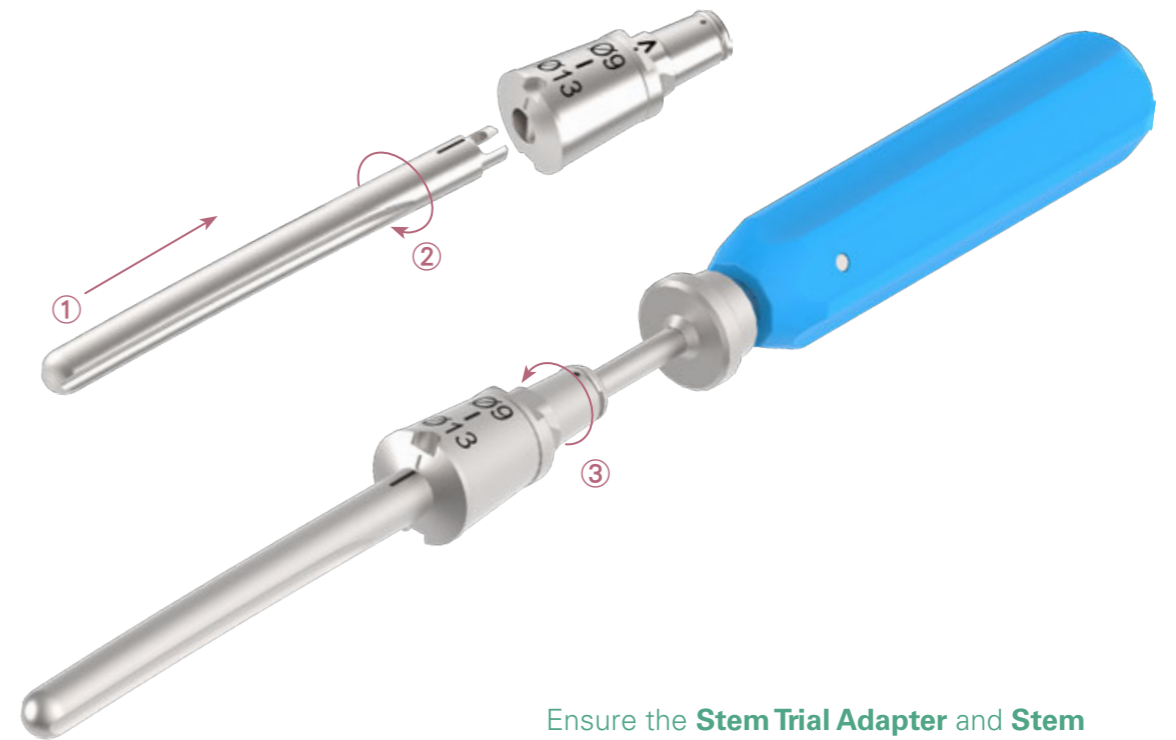
Femoral Driver

H. Trialing

Choose the **Stem Trial Body** and **Stem Trial Adapter** that corresponds to selected cemented or cementless stem size.

Attach the **Stem Trial Body** into the **Stem Trial Adapter** (see image part 1 and 2, the anterior indicators shall align together).

Insert the **Screwdriver Adapter T30** into the top of the **Stem Trial Adapter** and secure with the **Driver Handle** (see image part 3).



Ensure the **Stem Trial Adapter** and **Stem Trial Body** are fully attached and locked into position prior to trialing.

Instruments



Cemented Stem Trial Body
Diameter 9~17 mm
Cemented Stem Trial Adapter
Diameter 9~13 mm
Diameter 15~19 mm
Cementless Stem Trial Body
Diameter 11~17 mm
Cementless Stem Trial Adapter
Diameter 11~17 mm
Driver Handle
Screwdriver Adapter, T30

H. Trialing

Identify the correct length **Segment Trial** to restore tibial length using the chart below. During trialing, multiple trial segments may be combined to represent the ideal monolithic implant assembly length.

Attach the selected **Segment Trial** component(s) to the selected **Proximal Tibial Trial**. Attach the **Proximal Tibial Trial/Segment Trial** assembly to the **Stem Trial Adapter/Stem Trial Body** assembly.

Segment Trial Reference Chart

| Segment (mm) | Segment Trial (mm) |
|--------------|--------------------|
| 25 | 25 |
| 30 | 30 |
| 40 | 40 |
| 50 | 50 |
| 60 | 60 |
| 70 | 70 |
| 80 | 30 + 50 |
| 90 | 40 + 50 |
| 100 | 40 + 60 |
| 110 | 110 |
| 120 | 50 + 70 |
| 130 | 60 + 70 |
| 140 | 30 + 110 |
| 150 | 150 |
| 160 | 50 + 110 |
| 170 | 60 + 110 |
| 180 | 70 + 110 |
| 190 | 40 + 150 |
| 200 | 50 + 150 |
| 210 | 60 + 150 |
| 220 | 70 + 150 |

Combining shorter Segment Part Trials to mimic longer length of segments



H. Trialing

Insert the selected **Yoke Adapter S** onto the the **Proximal Tibial Trial**.

Connect the **Yoke Adapter** and the femoral assembly.

Attach the selected **Tibial Insert Trial** to the **Tibial Insert Trial Handle** and connect to the **Yoke Adapter** on the tibial assembly.

Evaluate joint stability using the selected trial components. Switch to different **Tibial Insert Trial** thicknesses as needed to obtain optimal stability.



Instruments



Segment Trial 25~150 mm
Proximal Tibial Trial Left/Right
Cemented Stem Trial Body Diameter 9~17 mm
Cemented Stem Trial Adapter Diameter 9~13 mm
Cementless Stem Trial Body Diameter 11~17 mm
Cementless Stem Trial Adapter Diameter 11~17 mm

Instruments



Tibial Insert Trial
Tibial Insert Trial Handle
Yoke Adapter S

H. Trialing (Removal)

Remove the femoral trial assembly with the **Femoral Driver**.

Position the **Taper Separator** to the junction between the trial components to separate apart by levering the trials.

If it is difficult to remove the stem trial assembly manually, remove the stem trial by connecting the **Stem Trial Remover** to the end of the trunnion. Utilize the **Slotted Hammer** remove the stem trial if needed.



Instruments



Femoral Driver Taper Separator Modular Handle Stem Trial Remover

I. Implant Assembly

Place the selected femoral component onto the **Distal Femur Impactor Base**.

If selected, connect the femoral component with the correct offset adapter by tapping the prosthesis with the **Stem Impactor** in position. To position the offset into proper orientation, seat the **Stop Tube** on the femoral component and place the **Femoral Offset Fixture** over the **Stop Tube**. Utilize the **Femoral Offset Wrench** to set the offset adapter match the direction of the trial assembly.



Instruments

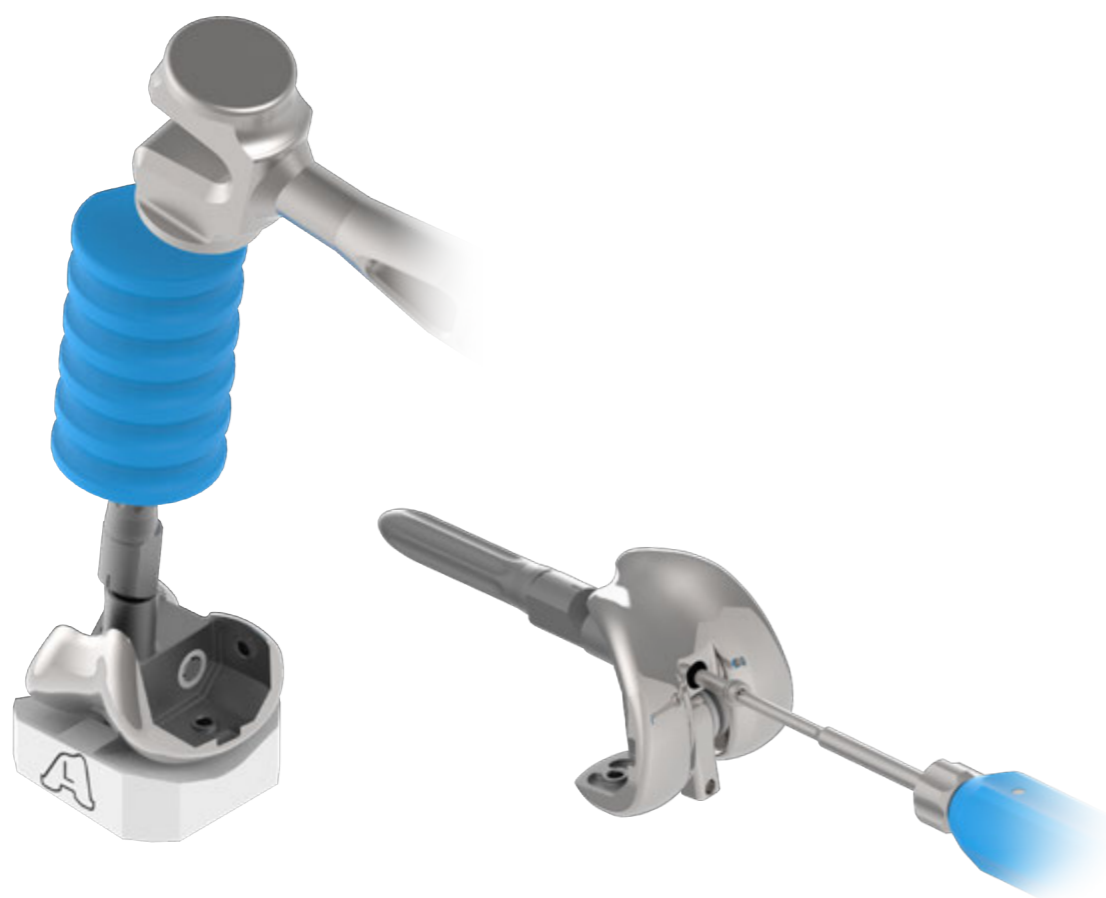


Distal Femur Impactor Base Stop Tube Femoral Offset Fixture Femoral Offset Wrench

I. Implant Assembly

Connect the selected extension stem to the femoral component assembly by tapping the stem with the **Stem Impactor** in position.

Thread the femoral screw into the intercondylar hole to secure the assembly.



Instruments



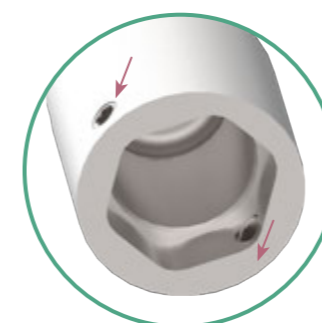
I. Implant Assembly

Assemble the implants starting with proximal tibial component and the segment (if selected), then the selected stem.

Place the selected proximal tibial component onto the **Proximal Tibial Impactor Base**. Verify the medial and lateral set screws are not obstructing the taper recess, loosening the set screws if needed.

Connect the proximal tibial component with the correct segment component by aligning the anterior mark and tapping the prosthesis with the **Stem Impactor** in position.

Confirm the medial and lateral set screws on the segment is not obstructing the taper recess. Connect the selected stem component to the tibial component/segment assembly by aligning the anterior mark and tapping the prosthesis with the **Stem Impactor** in position.



Always verify the medial and lateral set screws are not obstructing the taper recess before tapping the assembly together. Obstruction of the set screws inside the taper recess may result in an unsuccessful connection. The **Set Screw Driver Adapter** can be used to retract the set screw.



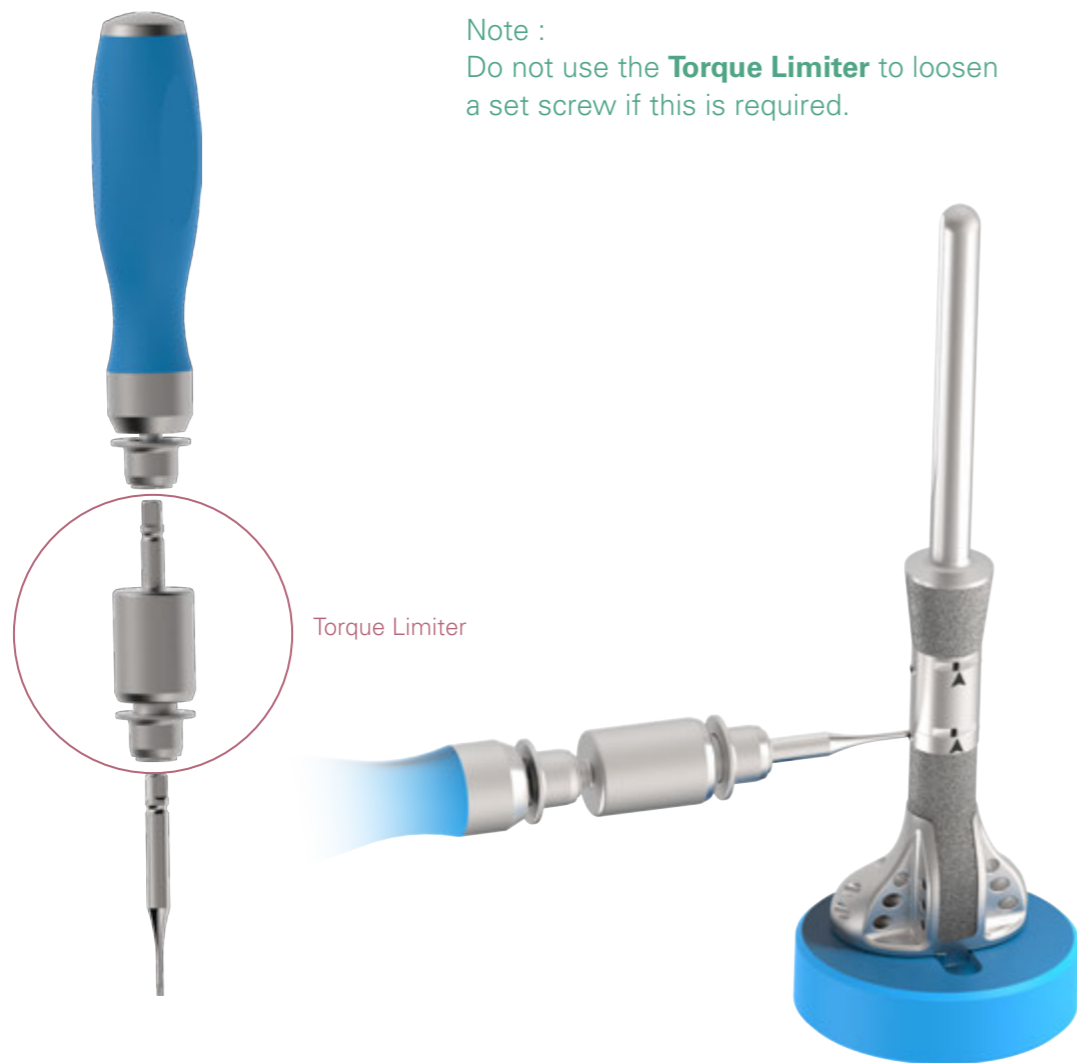
Instruments



I. Implant Assembly

Connect the **Set Screw Torque Limiter** to the **Driver Handle** and tighten the medial and lateral set screws. The **Set Screw Torque Limiter** is used to ensure an appropriate amount of torque is applied to prevent over-tightening.

Note :
Do not use the **Torque Limiter** to loosen a set screw if this is required.



Torque Limiter

Instruments



Set Screw Driver Adapter Set Screw Torque Limiter Driver Handle

J. Implantation

If a cemented stem is selected for the tibial construct, use the **Cement Restrictor Inserter** to introduce the selected cement restrictor to an adequate depth in the canal. Use the indicators on the shaft to set the depth.



The etched marking **C125** indicates the appropriate depth of the 125 mm cemented stem.

Use the cement restrictor that is one size smaller than the diameter of the last reamer used to allow smooth insertion.

Instruments



Cement Restrictor Inserter

J. Implantation

Fill the tibial canal and around the tibial implant assembly with cement.

Advance the tibial prosthesis assembly into the canal manually until fully seated onto the prepared bone surface. Attach the **Tibial Baseplate Impactor** to the **Modular Handle** and impact if needed.

Rotational alignment may be set by referencing the mark previously made on the anterior cortex of the tibia.



Instruments



Tibial Baseplate Impactor Modular Handle

J. Implantation

Apply bone cement to distal femoral resection and the proximal surface of the femoral component.

Place the implant assembly onto the prepared femoral surface with **Femoral Driver**. Attach the **Femoral Impactor** to the **Modular Handle** and impact the femoral component assembly until fully seated and in proper contact with the bone.

Remove the plastic protective cover on the femoral component after clean out the excessive cement.



Instruments



Femoral Driver Femoral Impactor Modular Handle

J. Implantation

Perform a final check to confirm the optimal tibial insert thickness with the last **Tibial Insert Trial**. Insert using the **Tibial Insert Handle** as described in previous steps.



Instruments



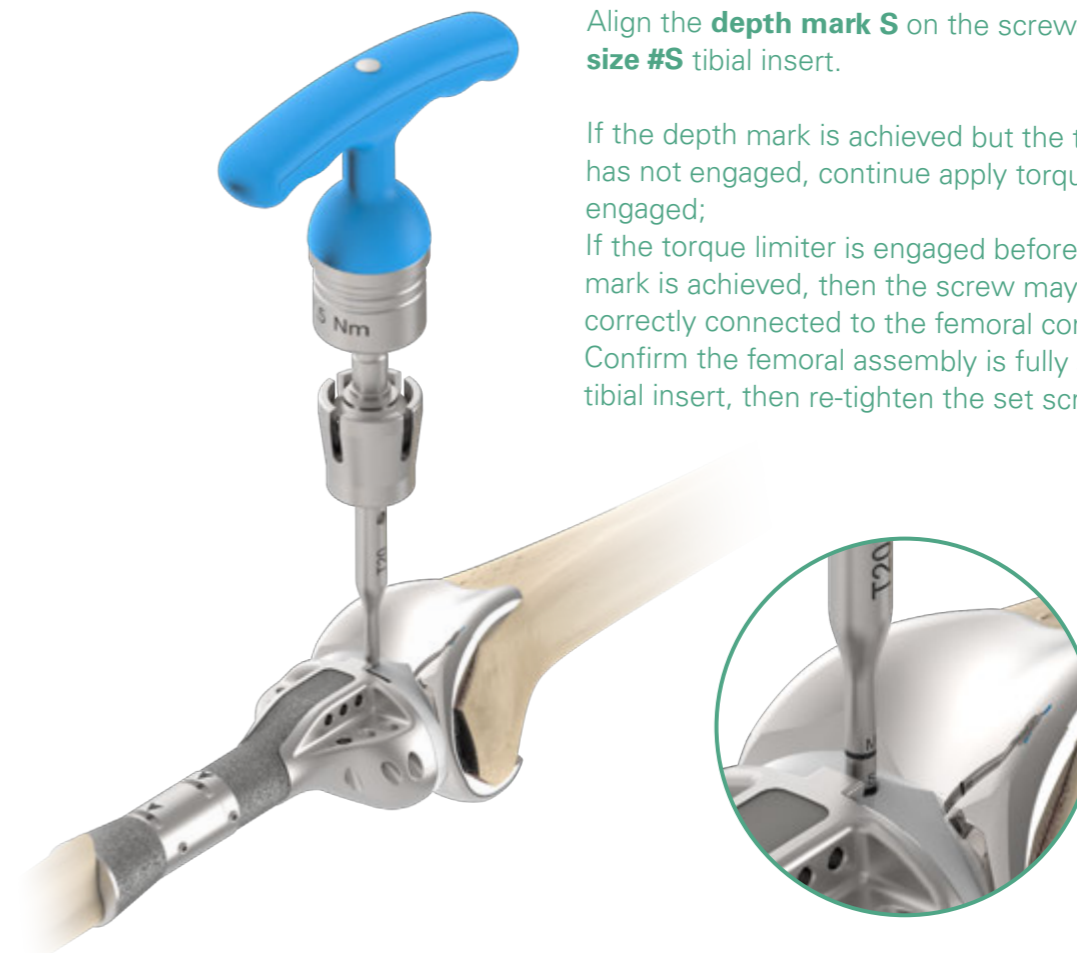
Tibial Insert Trial Tibial Insert Trial Handle

J. Implantation

With the knee in flexion, place the selected tibial insert onto the implanted tibial construct assembly, making sure to maintain alignment with the hinge post of the femoral component.

With the knee in full extension, secure the tibial insert to the femoral prosthesis by tightening the built-in set screw inside the tibial insert with **Insert Set Screwdriver** to apply appropriate fixation torque.

Tighten the set screw until fully connected within the femoral component, confirming with the depth mark on the screwdriver.



Align the **depth mark S** on the screwdriver for the **size #S** tibial insert.

If the depth mark is achieved but the torque limiter has not engaged, continue apply torque until engaged;
If the torque limiter is engaged before the depth mark is achieved, then the screw may not be correctly connected to the femoral component. Confirm the femoral assembly is fully seated in the tibial insert, then re-tighten the set screw.

Instruments



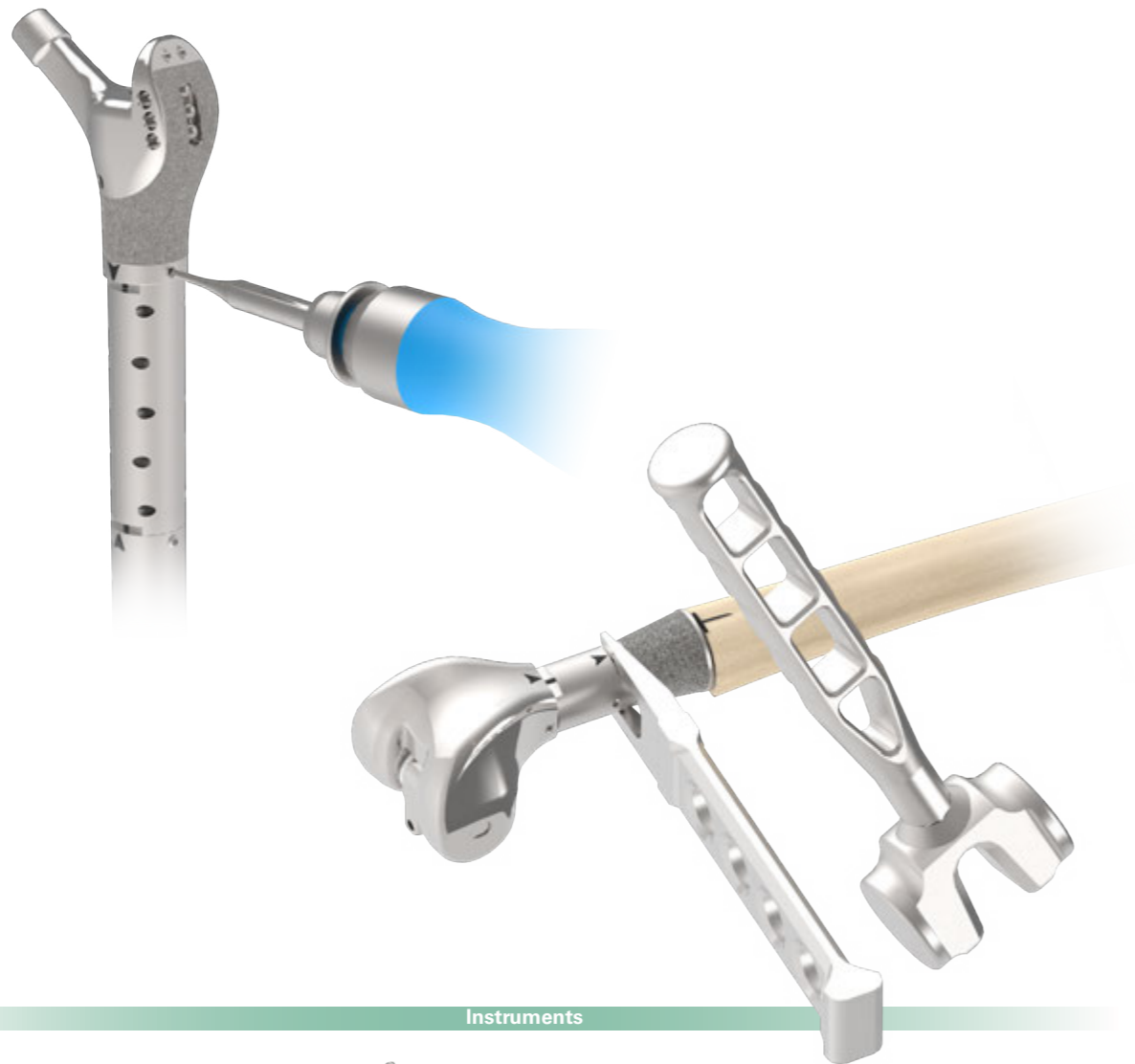
Insert Set Screwdriver

Appendix I:

Taper Disassembly

If there is a need to disassemble the taper junction for any reason, connect the **Driver Handle** to the **Set Screw Adapter** and release the set screws on both sides of the component or segment.

If needed, place the **Taper Separator** on the component and gently tap with a **Slotted Hammer** to separate the assembly.



Instruments



Set Screw
Driver Adapter

Driver Handle

Taper Separator

Slotted Hammer

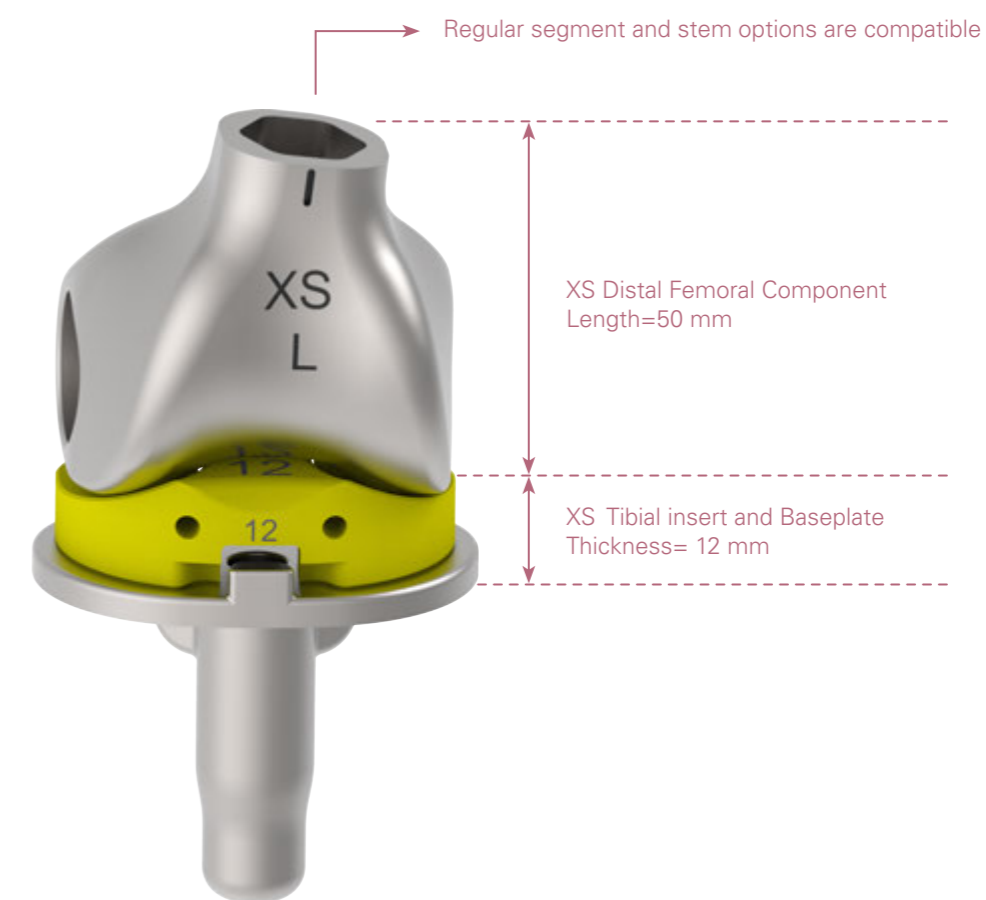
Appendix II. Distal Femoral Assembly XS



Appendix II :

The length for size XS Distal femoral components is 50 mm, 5 mm less than standard resection. XS components accept regular segment and stem options.

The thickness of the XS insert and baseplate is 12 mm. No extension stem and augment are allowed.

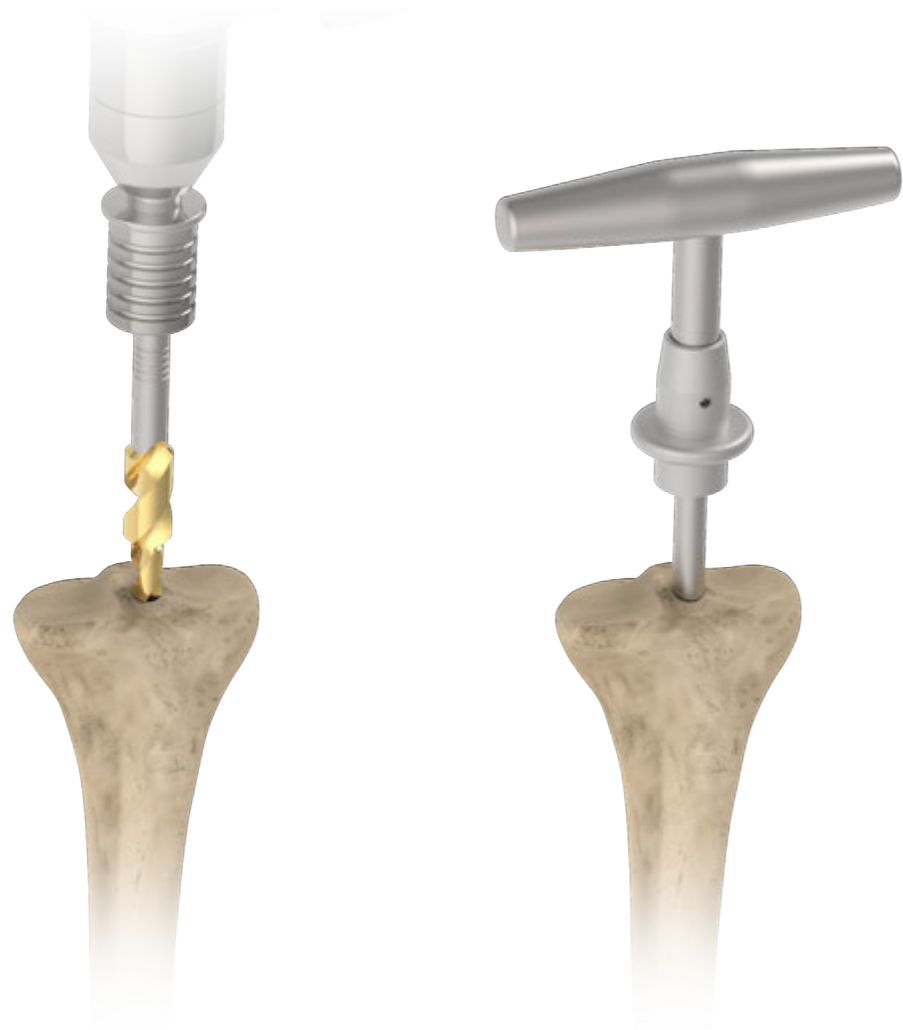


Appendix II :

Establish Tibial Platform for XS Baseplate

Set the knee in flexion to fully expose the tibial plateau. Use the **Step Drill** to find the canal. The entry location shall be approximately 10 mm posterior to the origin of anterior cruciate ligament.

Using the **T-Handle XS**, advance the **IM Rod XS** into the canal. Then remove the **T-Handle**.



Instruments



Step Drill T-Handle XS IM-Rod XS

Appendix II :

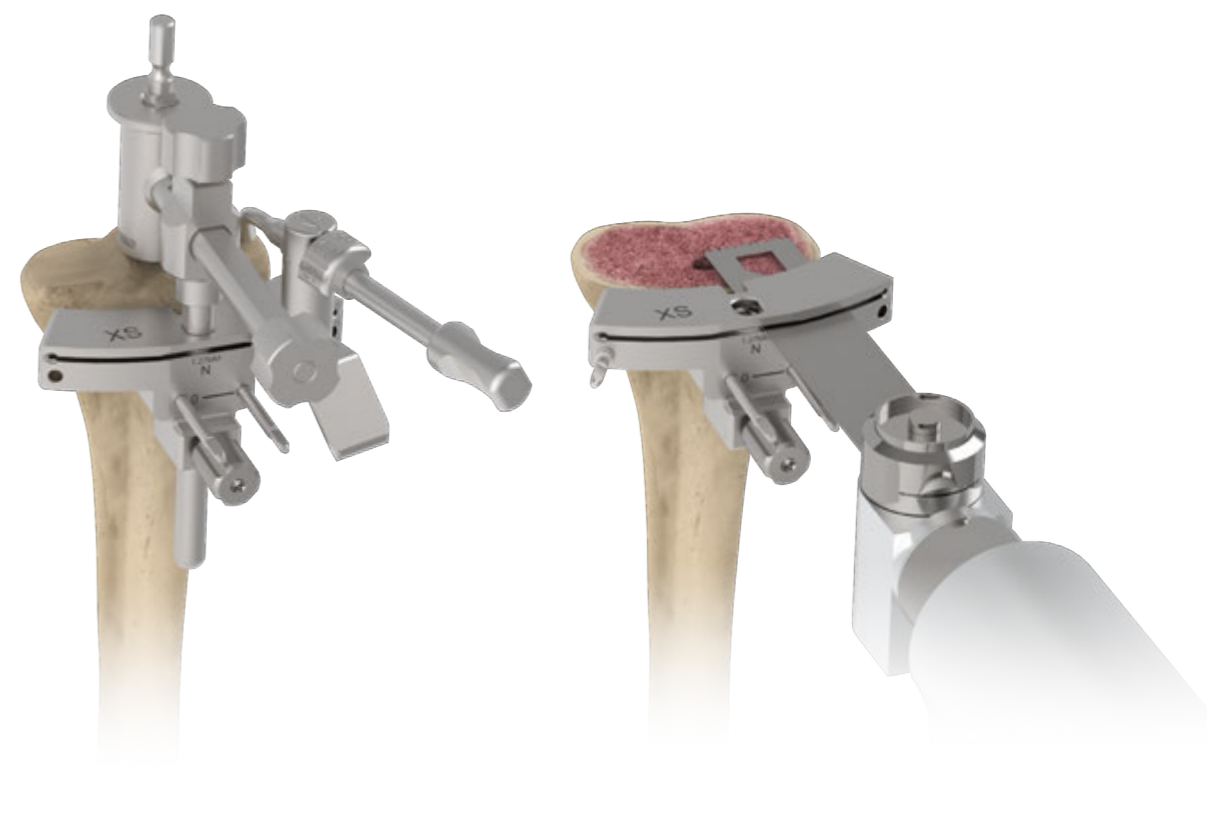
Establish Tibial Platform for XS Baseplate

Assemble the **Tibial IM Alignment Guide XS** and the **Tibial Resection Guide XS** onto the **IM Rod XS**.

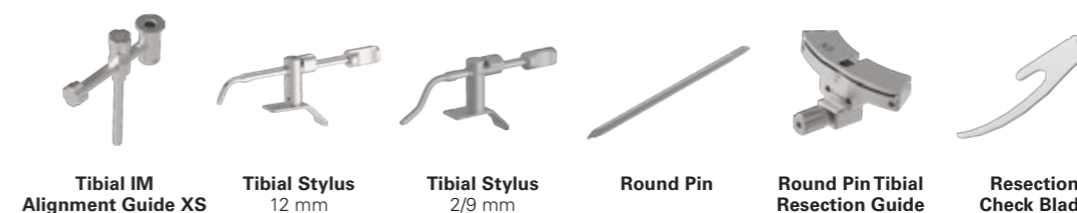
Insert the **Tibial Stylus** into the slot of the **Tibia Resection Guide XS**. Position the tip of the **Tibial Stylus** on the appropriate location on the tibial plateau. The **Resection Check Blade** may be used to confirm positioning.

Secure the **Tibial Resection Guide XS** with **Round Pins**. Remove the intramedullary assembly, leaving the resection guide in place. If needed, additional **Threaded Pins** may be used to further secure the resection guide.

Perform the proximal tibial resection using a standard .050" (1.27 mm) narrow saw blade inserted through the resection slot.



Instruments



Tibial IM Alignment Guide XS Tibial Stylus 12 mm Tibial Stylus 2/9 mm Round Pin Round Pin Tibial Resection Guide Resection Check Blade

Appendix II :

Finish Tibial Preparation for XS Baseplate

Attach the **Tibial Sizing Template XS** to the **Tibial Sizing Template Handle** and place onto the resected tibial surface.

Align the **Tibial Sizing Template XS** with the desired rotational position on the resected tibial surface, and secure with two **Round Pins**.

Attach the **Tibial Punch Guide XS** onto the sizing template.

Select the **Tibial Boss Drill XS** and advance through **Tibial Punch Guide XS** until fully engaged.

Continue with the regular trialing and implantation with the corresponding XS components as outlined in previous sections of this surgical technique guide.



Instruments



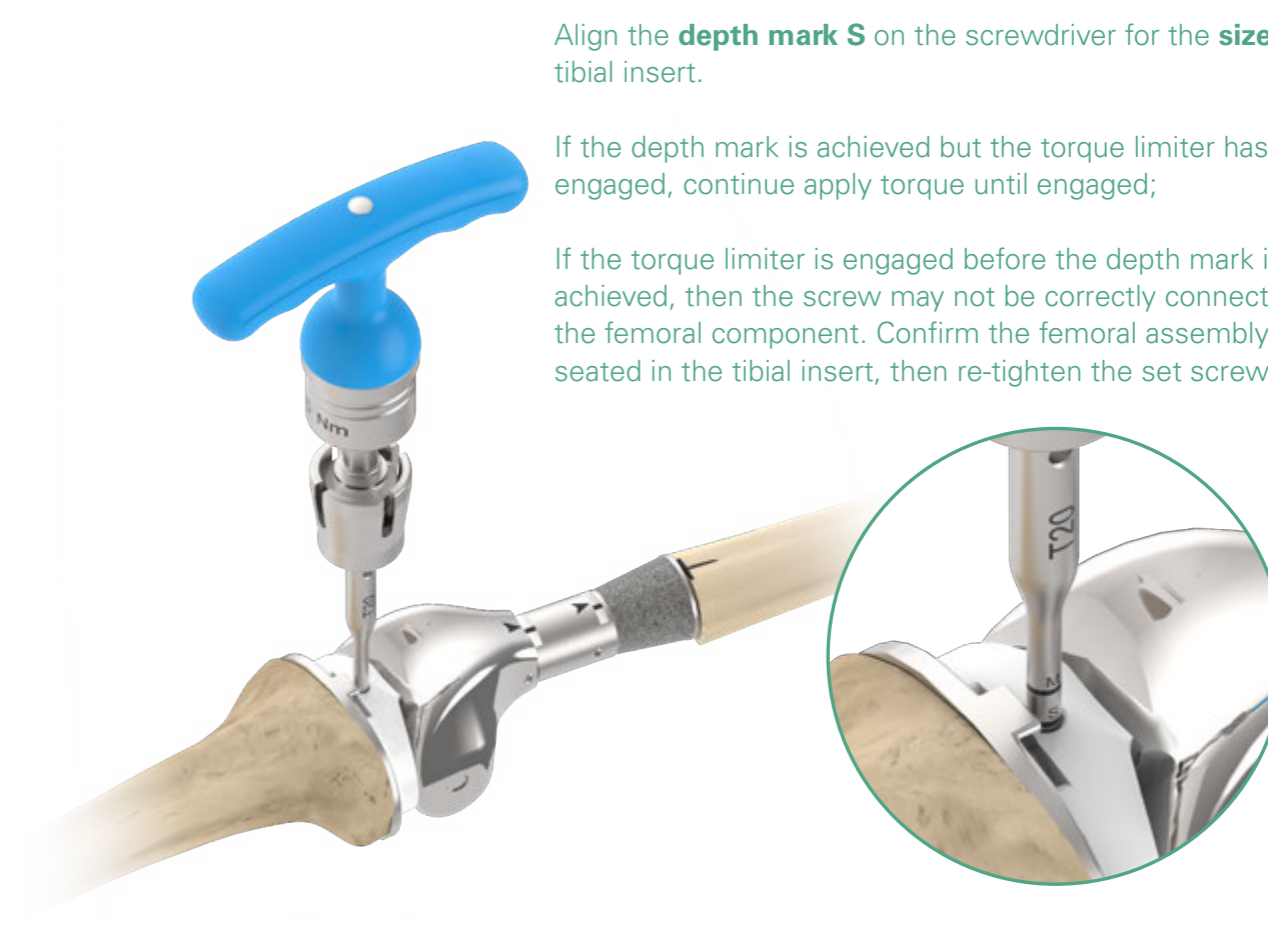
Appendix II :

Implantation

With the knee in flexion, place the selected tibial insert onto the implanted tibial baseplate assembly, making sure to maintain alignment with the hinge post of the distal femoral component.

With the knee in full extension, secure the tibial insert to the femoral prosthesis by tightening the built-in set screw inside the tibial insert with **Insert Set Screwdriver** to apply appropriate fixation torque.

Tighten the set screw until fully connected within the distal femoral component, confirming with the depth mark on the screwdriver.



Align the **depth mark S** on the screwdriver for the **size #XS** tibial insert.

If the depth mark is achieved but the torque limiter has not engaged, continue apply torque until engaged;

If the torque limiter is engaged before the depth mark is achieved, then the screw may not be correctly connected to the femoral component. Confirm the femoral assembly is fully seated in the tibial insert, then re-tighten the set screw.

Instruments



Appendix III. Proximal Tibial Assembly XS



Femoral Component XS

Built-in Stem Length : 85 mm from Distal Resection
No Extension Stem nor Augment Options



Tibial Insert XS

Thickness : 12 mm



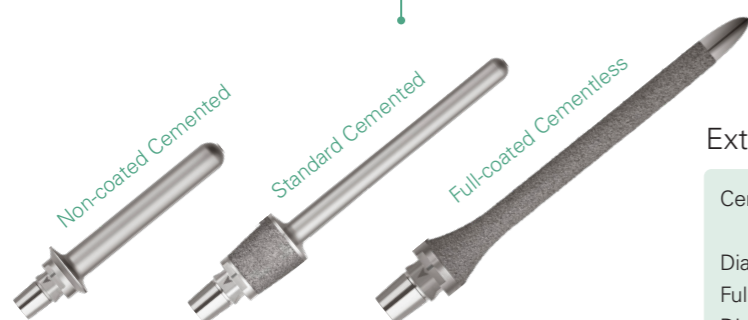
Proximal Tibial Component XS

Length : 73 mm
(With XS Insert)



Segment

Length : 25 / 30 to 220 mm in 10 mm Increments



Extension Stem

Cemented Stem Length : Straight 100 / 125 mm
Curved 125 / 150 mm
Diameter : 9 / 11 / 13 / 15 / 17 mm
Full-coated Stem Length : 150 / 200 mm
Diameter : 11 / 13 / 15 / 17 mm

Appendix III :

The overall length for size XS proximal tibial components and XS tibial insert is 73 mm, 8 mm less than standard resection. XS tibial component accept regular segment and stem options.

The distal/posterior femoral resection are 7 mm. No extension stem and augment are allowed.



Instruments



Femoral Component Trial, XS



Tibial Insert Trial, XS



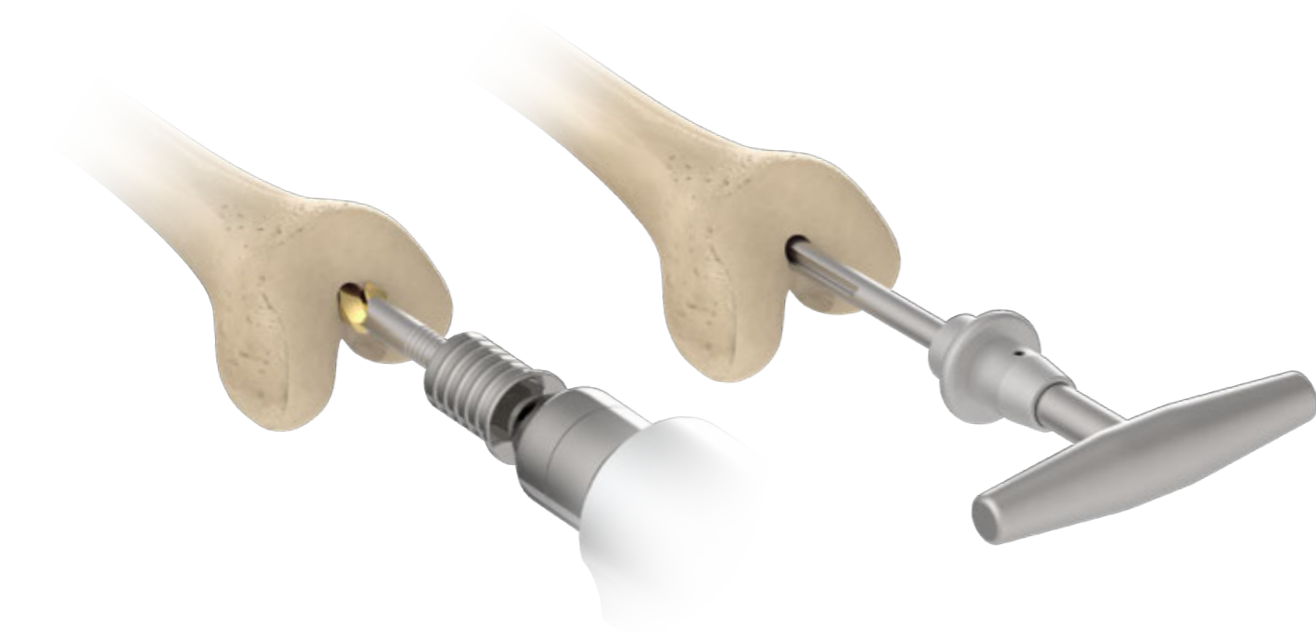
Proximal Tibial Component Trial, XS

Appendix III :

Distal Femoral Resection for XS Femoral Component

Use the **Step Drill** to create an opening into the femoral canal. The drill is inserted to a depth of approximately 100 mm into the femoral canal. This allows for depressurization of the canal when the **IM Rod XS** is inserted.

Using the **T-Handle XS**, advance the **IM Rod XS** into the canal. Then remove the **T-Handle**.



Instruments



Step Drill T-Handle XS IM-Rod XS

Appendix III:

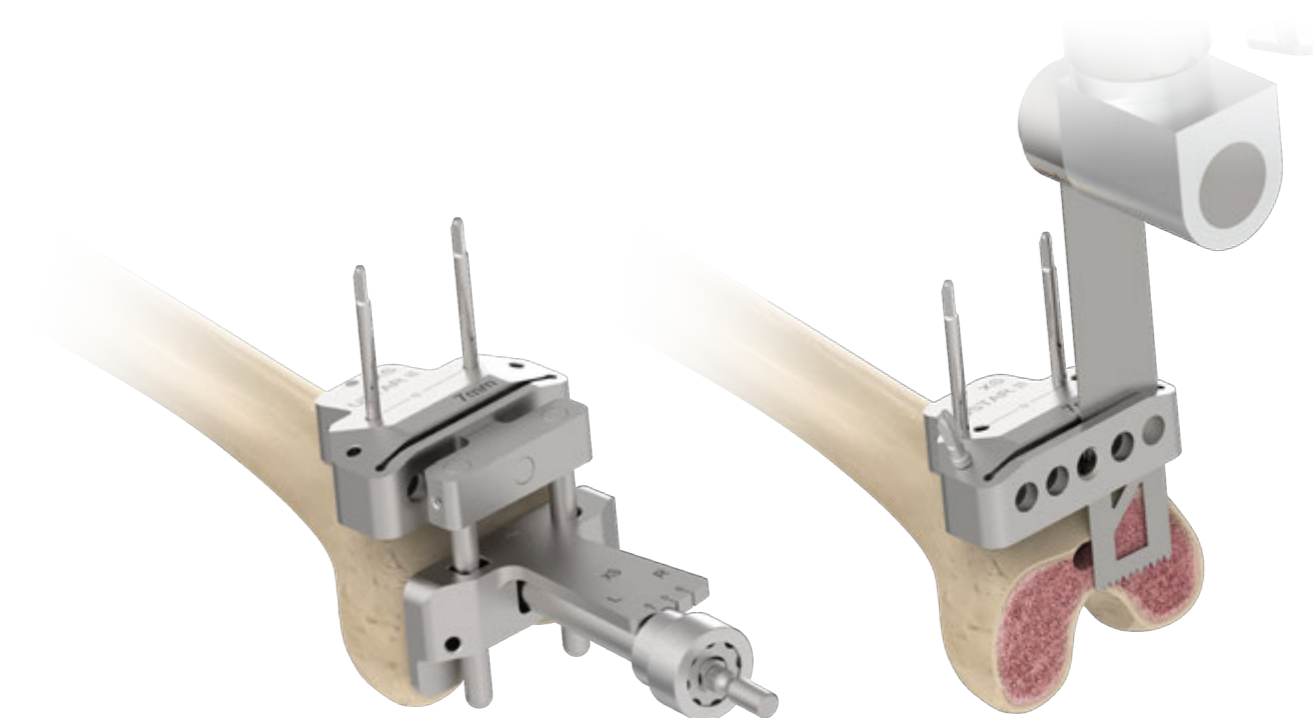
Distal Femoral Resection for XS Femoral Component

Slide the **Femoral IM Alignment Guide XS** through the **IM Rod XS** until set against the femur. The alignment guide offers a fixed 6 degrees valgus angle.

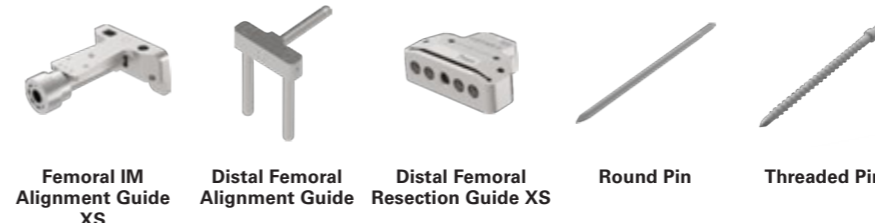
Attach the **Distal Femoral Alignment Guide XS** and the **Distal Femoral Resection Guide XS** to the **Femoral IM Alignment Guide XS**.

Secure the **Distal Femoral Resection Guide XS** with **Round Pins**. Additional **Threaded Pins** may be placed to further secure the resection guide.

Remove the alignment guide assembly, and perform distal femoral resection.



Instruments



Femoral IM Alignment Guide XS Distal Femoral Alignment Guide Distal Femoral Resection Guide XS Round Pin Threaded Pin

Appendix III :

A/P and Chamfer resection for XS Femoral Component

Re-position the **IM Rod XS** into the canal.

Set the 3 degree external rotation to the correct "R" or "L" on the **Femoral Sizer XS** and position it onto the resected distal femur surface, through the **IM Rod XS**, and with the posterior condyles seated on the posterior feet of the sizer.

Make a pair of pilot holes through the pin holes on the sizer to align the **A/P and Chamfer Cutting Guide XS**. Remove the sizer assembly.

Place the **Femoral A/P Chamfer Cutting Guide** into the pre-drilled pin holes. Secure the cutting guide with **Threaded Pins** and complete the A/P and chamfer bone cut

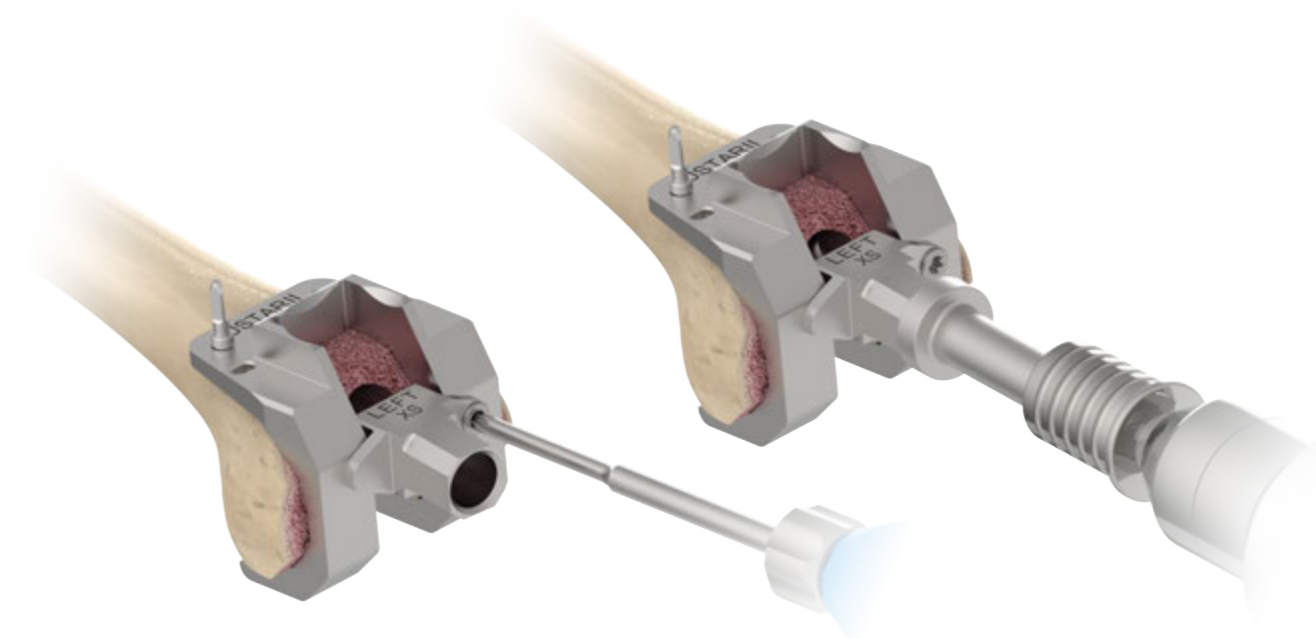
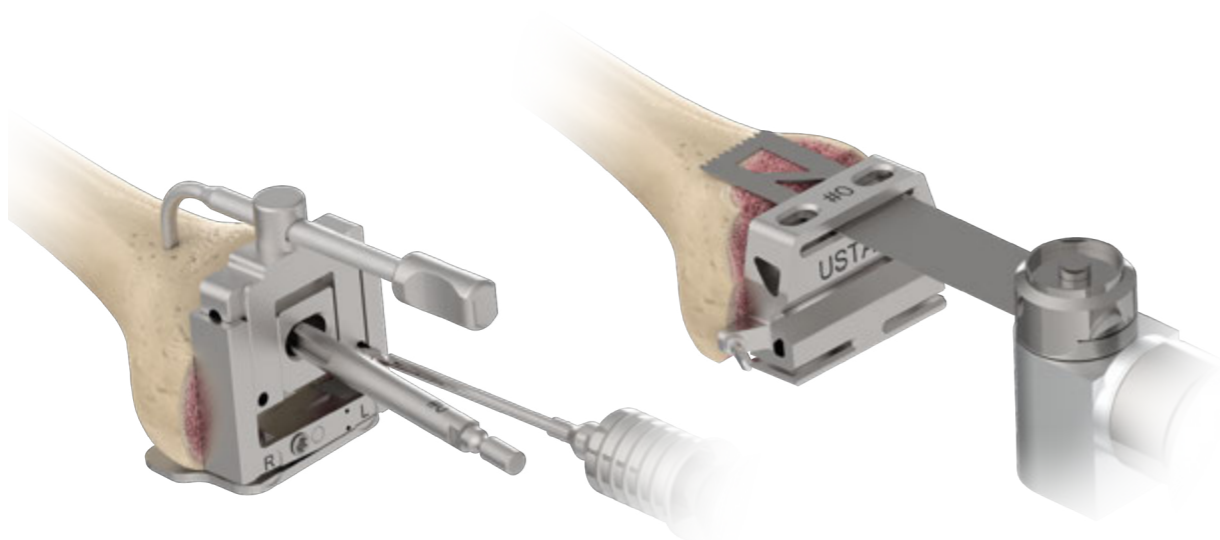
Appendix III:

Femoral Canal Preparation for XS Femoral Component

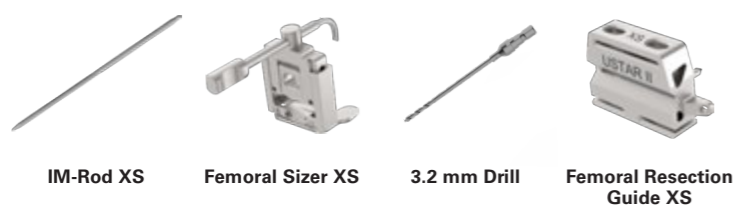
Position the **Femoral Sizing Template XS** onto the resected femur.

Assemble the **Femoral Drill Guide XS** onto the **Femoral Sizing Template XS** and secure with a **Threaded Pin**. Then drill with the **Femoral Stem Drill XS**.

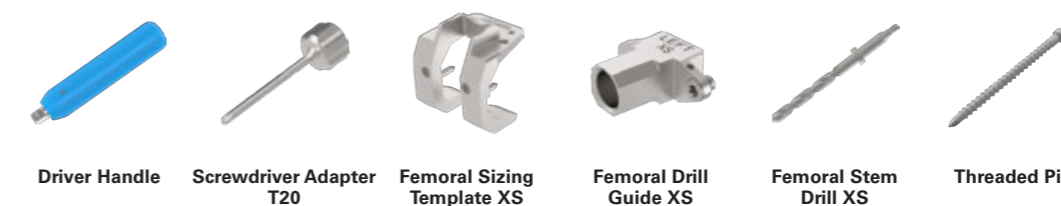
Remove the **Femoral Drill Guide XS**.



Instruments



Instruments

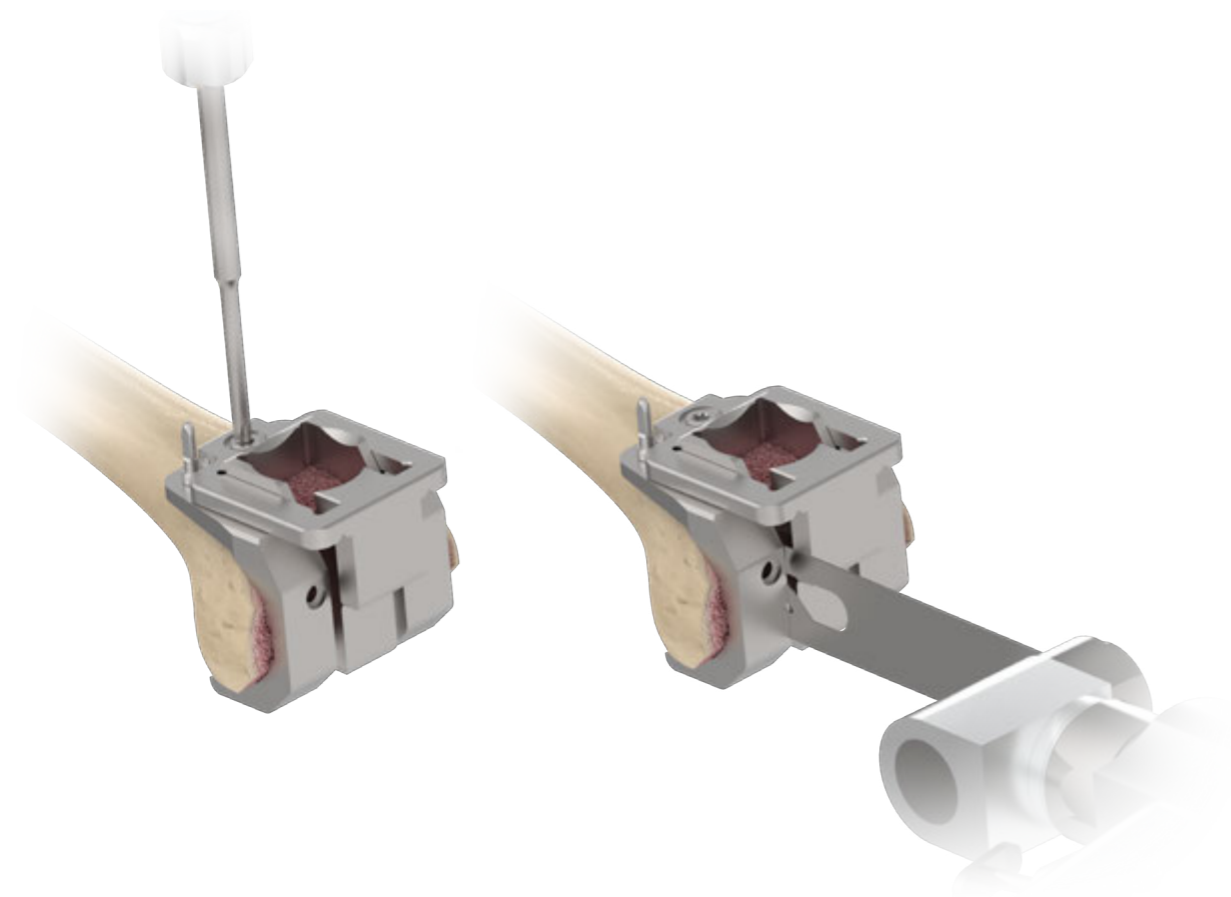


Appendix III :

Box Preparation for XS Femoral Component

Assemble the **Box Cutting Guide** to the **Femoral Sizing Template XS** with the **Screwdriver Adapter T20**.

Using a standard 1.27 mm saw blade, complete a parallel bone resection through the posterior cortex.



Instruments



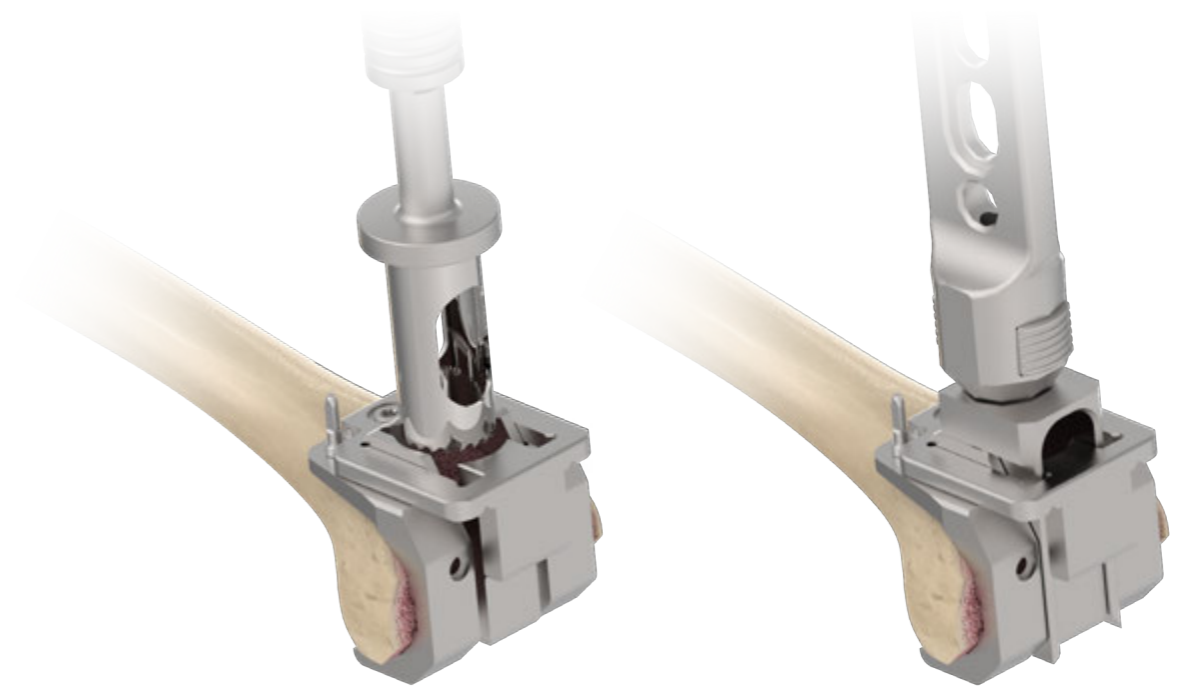
Appendix III:

Box Preparation for XS Femoral Component

Using the **Box Reamer XS**, ream through **Box cutting guide** until the stop is fully engaged, in contact with the guide.

Impact the **Box Chisel XS** through the **Box Cutting Guide** to ensure the corners of the box housing are 'square'.

Continue with the regular trialing and implantation with the corresponding size of components as outlined in previous sections of this surgical technique guide.



Instruments



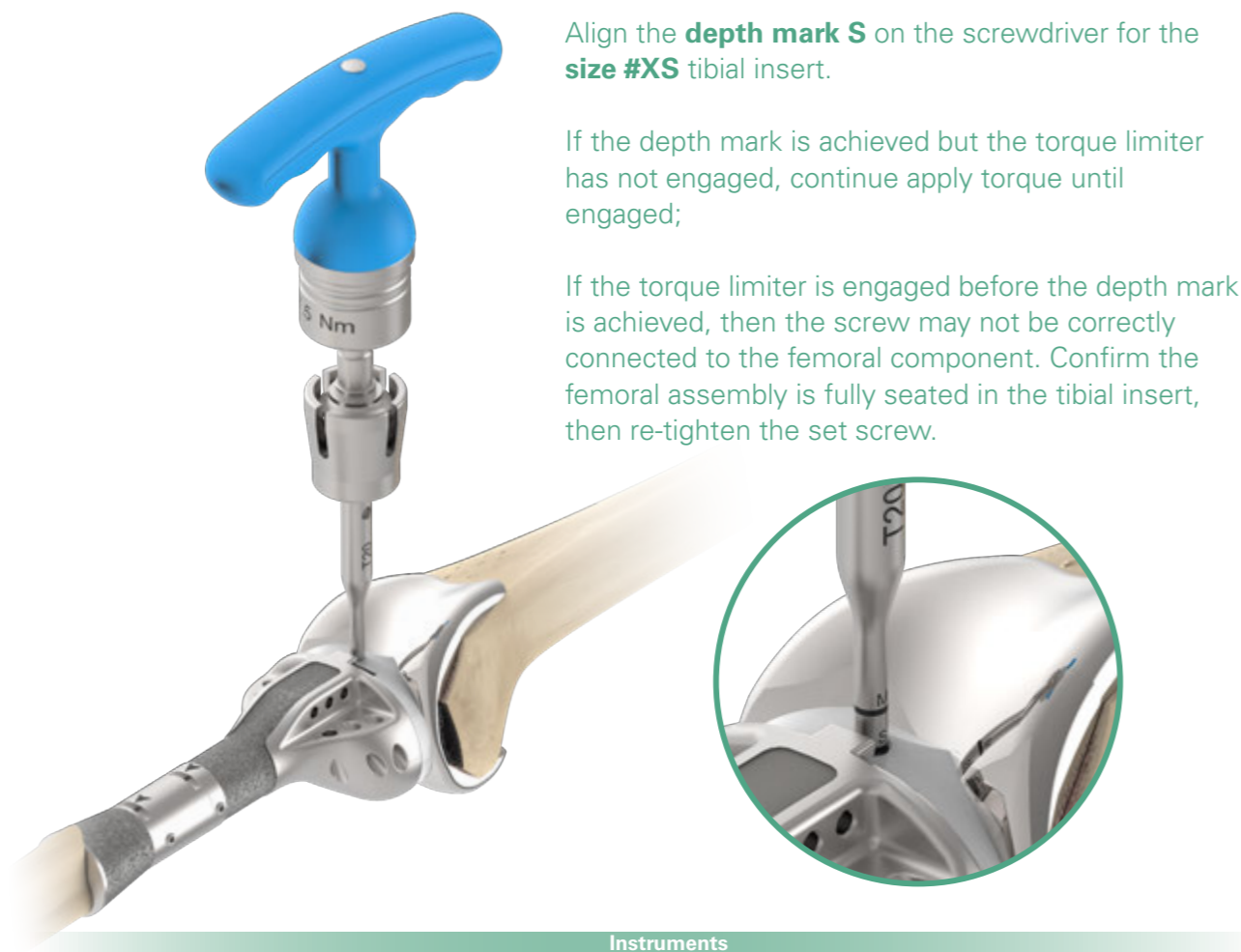
Appendix III :

Implantation

With the knee in flexion, place the selected tibial insert onto the implanted tibial construct assembly, making sure to maintain alignment with the hinge post of the femoral component.

With the knee in full extension, secure the tibial insert to the femoral prosthesis by tightening the built-in set screw inside the tibial insert with **Insert Set Screwdriver** to apply appropriate fixation torque.

Tighten the set screw until fully connected within the femoral component, confirming with the depth mark on the screwdriver.



Insert Set
Screwdriver

Order Information

Proximal Femoral Component



| Trochanteric | |
|--------------|-----------|
| Left | Right |
| 1115-9110 | 1115-9210 |



| Low Profile | |
|-------------|-----------|
| Left | Right |
| 1115-9120 | 1115-9220 |

* Low Profile type is not CE Marked

Femoral Component



| | Left | Right | AP X ML |
|----|-----------|-----------|---------|
| #1 | 2115-1310 | 2115-1410 | 52 x 56 |
| #2 | 2115-1320 | 2115-1420 | 56 x 60 |
| #3 | 2115-1330 | 2115-1430 | 60 x 64 |
| #4 | 2115-1340 | 2115-1440 | 64 x 68 |
| #5 | 2115-1350 | 2115-1450 | 68 x 72 |
| #6 | 2115-1360 | 2115-1460 | 72 x 76 |



Femoral Screw
2903-1014

Distal Femoral Component



| | Left | Right | AP X ML |
|---|-----------|-----------|---------|
| S | 2115-3310 | 2115-3410 | 52 x 56 |

Order Information

XPE Tibial Insert



| | 12 mm | 14 mm | 17 mm | 20 mm | 23 mm | 26 mm | 30 mm |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| S | 2315-3211 | 2315-3212 | 2315-3213 | 2315-3214 | 2315-3215 | 2315-3216 | 2315-3217 |
| M | 2315-3241 | 2315-3242 | 2315-3243 | 2315-3244 | 2315-3245 | 2315-3246 | 2315-3247 |

Tibial Baseplate



| | Cat. No. | AP X ML |
|----|-----------|---------|
| #1 | 2215-1410 | 42 x 63 |
| #2 | 2215-1420 | 45 x 66 |
| #3 | 2215-1430 | 47 x 69 |
| #4 | 2215-1440 | 50 x 72 |
| #5 | 2215-1450 | 53 x 76 |
| #6 | 2215-1460 | 56 x 80 |

Proximal Tibial Component



| | Cat. No. | AP X ML |
|---|-----------|---------|
| S | 2215-3410 | 42 x 63 |

Order Information

Segment Parts



| 25 mm | 30 mm | 40 mm | 50 mm | 60 mm | 70 mm | 80 mm |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 2915-1025 | 2915-1030 | 2915-1040 | 2915-1050 | 2915-1060 | 2915-1070 | 2915-1080 |
| 90 mm | 100 mm | 110 mm | 120 mm | 130 mm | 140 mm | 150 mm |
| 2915-1090 | 2915-1100 | 2915-1110 | 2915-1120 | 2915-1130 | 2915-1140 | 2915-1150 |
| 160 mm | 170 mm | 180 mm | 190 mm | 200 mm | 210 mm | 220 mm |
| 2915-1160 | 2915-1170 | 2915-1180 | 2915-1190 | 2915-1200 | 2915-1210 | 2915-1220 |

Bridge Component



| |
|-----------|
| 80 mm |
| 2915-3080 |

Order Information

Cemented Stem



| | Straight | | Curved | |
|-----|-----------|-----------|-----------|-----------|
| | 100 mm | 125 mm | 125 mm | 150 mm |
| Ø9 | 2715-1009 | 2715-1109 | 2515-1109 | 2515-1209 |
| Ø11 | 2715-1011 | 2715-1111 | 2515-1111 | 2515-1211 |
| Ø13 | 2715-1013 | 2715-1113 | 2515-1113 | 2515-1213 |
| Ø15 | 2715-1015 | 2715-1115 | 2515-1115 | 2515-1215 |
| Ø17 | 2715-1017 | 2715-1117 | 2515-1117 | 2515-1217 |

Non-Coated Cemented Stem



| | Straight | | Curved | |
|-----|-----------|-----------|-----------|-----------|
| | 100 mm | 125 mm | 125 mm | 150 mm |
| Ø9 | 2715-3009 | 2715-3109 | 2515-3109 | 2515-3209 |
| Ø11 | 2715-3011 | 2715-3111 | 2515-3111 | 2515-3211 |
| Ø13 | 2715-3013 | 2715-3113 | 2515-3113 | 2515-3213 |
| Ø15 | 2715-3015 | 2715-3115 | 2515-3115 | 2515-3215 |
| Ø17 | 2715-3017 | 2715-3117 | 2515-3117 | 2515-3217 |

Full-Coated Cementless Stem



| | Straight | | Curved | |
|-----|-----------|-----------|-----------|-----------|
| | 150 mm | 200 mm | 150 mm | 200 mm |
| Ø11 | 1115-3211 | 1115-3411 | 1115-1211 | 1115-1411 |
| Ø13 | 1115-3213 | 1115-3413 | 1115-1213 | 1115-1413 |
| Ø15 | 1115-3215 | 1115-3415 | 1115-1215 | 1115-1415 |
| Ø17 | 1115-3217 | 1115-3417 | 1115-1217 | 1115-1417 |

Order Information

Femoral Component Accessories



| | Distal Femoral Augment | | | | | |
|----|------------------------|--------------|--------------|--------------|-----------|-----------|
| | 4 mm LM / RL | 4 mm LL / RM | 8 mm LM / RL | 8 mm LL / RM | 12 mm | 16 mm |
| #1 | 2603-5111 | 2603-5211 | 2603-5112 | 2603-5212 | 2603-5313 | 2603-5314 |
| #2 | 2603-5121 | 2603-5221 | 2603-5122 | 2603-5222 | 2603-5323 | 2603-5324 |
| #3 | 2603-5131 | 2603-5231 | 2603-5132 | 2603-5232 | 2603-5333 | 2603-5334 |
| #4 | 2603-5141 | 2603-5241 | 2603-5142 | 2603-5242 | 2603-5343 | 2603-5344 |
| #5 | 2603-5151 | 2603-5251 | 2603-5152 | 2603-5252 | 2603-5353 | 2603-5354 |
| #6 | 2603-5161 | 2603-5261 | 2603-5162 | 2603-5262 | 2603-5363 | 2603-5364 |



| | Posterior Femoral Augment | |
|----|---------------------------|-----------|
| | 4 mm | 8 mm |
| #1 | 2603-5011 | 2603-5012 |
| #2 | 2603-5021 | 2603-5022 |
| #3 | 2603-5031 | 2603-5032 |
| #4 | 2603-5041 | 2603-5042 |
| #5 | 2603-5051 | 2603-5052 |
| #6 | 2603-5061 | 2603-5062 |



| Offset Adapter | | |
|----------------|-----------|-----------|
| 2 mm | 4 mm | 6 mm |
| 2903-1010 | 2903-1020 | 2903-1030 |



| | Straight Femoral Press-fit Stem | | | | |
|-----|---------------------------------|-----------|-----------|-----------|-----------|
| | 30 mm | 75 mm | 100 mm | 150 mm | 200 mm |
| Ø10 | NA | 2703-5011 | 2703-5021 | 2703-5051 | 2703-5061 |
| Ø12 | NA | 2703-5012 | 2703-5022 | 2703-5052 | 2703-5062 |
| Ø14 | 2703-5003 | 2703-5013 | 2703-5023 | 2703-5053 | 2703-5063 |
| Ø16 | NA | 2703-5014 | 2703-5024 | 2703-5054 | 2703-5064 |
| Ø18 | NA | 2703-5015 | 2703-5025 | 2703-5055 | 2703-5065 |
| Ø20 | NA | 2703-5016 | 2703-5026 | 2703-5056 | 2703-5066 |
| Ø22 | NA | 2703-5017 | 2703-5027 | 2703-5057 | 2703-5067 |
| Ø24 | NA | 2703-5018 | 2703-5028 | 2703-5058 | NA |



| | Curved Femoral Press-fit Stem | |
|-----|-------------------------------|-----------|
| | 150 mm | 200 mm |
| Ø10 | 2703-5031 | 2703-5041 |
| Ø12 | 2703-5032 | 2703-5042 |
| Ø14 | 2703-5033 | 2703-5043 |
| Ø16 | 2703-5034 | 2703-5044 |
| Ø18 | 2703-5035 | 2703-5045 |
| Ø20 | 2703-5036 | 2703-5046 |
| Ø22 | 2703-5037 | 2703-5047 |
| Ø24 | 2703-5038 | NA |

Order Information

Tibial Baseplate Accessories



| | Tibial Augment | | | |
|----|----------------|-----------|---------------|---------------|
| | 5 mm | 10 mm | 15 mm LM / RL | 15 mm LL / RM |
| #1 | 2815-1011 | 2815-1012 | 2815-1113 | 2815-1213 |
| #2 | 2815-1021 | 2815-1022 | 2815-1123 | 2815-1223 |
| #3 | 2815-1031 | 2815-1032 | 2815-1133 | 2815-1233 |
| #4 | 2815-1041 | 2815-1042 | 2815-1143 | 2815-1243 |
| #5 | 2815-1051 | 2815-1052 | 2815-1153 | 2815-1253 |
| #6 | 2815-1061 | 2815-1062 | 2815-1163 | 2815-1263 |



| | Cemented Tibial Stem | | | |
|----|----------------------|-----------|-----------|-----------|
| | 20 mm | 45 mm | 70 mm | 95 mm |
| Ø9 | 2715-5109 | 2715-5209 | 2715-5309 | 2715-5409 |



| | Press-Fit Tibial Stem | | | |
|-------|-----------------------|-----------|-----------|-----------|
| | 45 mm | 70 mm | 95 mm | 120 mm |
| Ø12.5 | 2715-7212 | 2715-7312 | 2715-7412 | 2715-7512 |
| Ø14 | 2715-7214 | 2715-7314 | 2715-7414 | 2715-7514 |



| Cement Restrictor | | |
|-------------------|-----------|--------------------------------|
| Size | Cat. No. | Flange Diameter (Up / Down) mm |
| 8 C | 1907-1008 | 12 / 9 |
| 10 C | 1907-1010 | 14 / 11 |
| 12 C | 1907-1012 | 16 / 13 |
| 14 C | 1907-1014 | 18 / 15 |
| 16 C | 1907-1016 | 20 / 17 |
| 18 C | 1907-1018 | 22 / 19 |

Order Information

Biolox® *delta* Ceramic Head



| | -3 mm | -2.5 mm | +1 mm | +4 mm | +5 mm | +8 mm | +9 mm |
|-----|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Ø28 | NA | 1203-5028 | 1203-5228 | 1203-5428 | NA | NA | NA |
| Ø32 | 1203-5032 | NA | 1203-5232 | NA | 1203-5432 | 1203-5632 | NA |
| Ø36 | 1203-5036 | NA | 1203-5236 | NA | 1203-5436 | NA | 1203-5636 |
| Ø40 | 1203-1036 | NA | 1203-1136 | NA | 1203-1236 | NA | 1203-1436 |

*BIOLOX® OPTION is the registry trademark of Ceramtec.

U2 Femoral Head



| | -3 mm | -2 mm | +0 mm | +2.5 mm | +3 mm | +5 mm | +6 mm | +7.5 mm | +9 mm | +10 mm |
|-----|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Ø22 | NA | NA | 1206-1122 | NA | 1206-1322 | NA | 1206-1522 | NA | 1206-1722 | NA |
| Ø26 | NA | 1206-1026 | 1206-1126 | NA | 1206-1326 | NA | 1206-1526 | NA | 1206-1726 | NA |
| Ø28 | 1206-1028 | NA | 1206-1128 | 1206-1228 | NA | 1206-1428 | NA | 1206-1628 | NA | 1206-1828 |
| Ø32 | 1206-1032 | NA | 1206-1132 | 1206-1232 | NA | 1206-1432 | NA | 1206-1632 | NA | 1206-1832 |
| Ø36 | 1206-1036 | NA | 1206-1136 | 1206-1236 | NA | 1206-1436 | NA | 1206-1636 | NA | 1206-1836 |

Trochanteric Claw



| Size | Cat. No. |
|-------|-----------|
| Small | 1915-1010 |
| Large | 1915-1020 |

* Trochanteric Claws are not CE Marked

Size #XS Implants

Femoral Component



| Left | Right | AP X ML |
|-----------|-----------|---------|
| 2115-1300 | 2115-1400 | 45 x 50 |

Distal Femoral Component



| Left | Right | AP X ML |
|-----------|-----------|---------|
| 2115-3300 | 2115-3400 | 45 x 50 |

XPE Tibial Insert



| |
|-----------|
| 12 mm |
| 2315-3201 |

Proximal Tibial Component



| Cat. No. | AP X ML |
|-----------|---------|
| 2215-3400 | 38 x 58 |

Tibial Baseplate



| Cat. No. | AP X ML |
|-----------|---------|
| 2215-1400 | 38 x 58 |

Please note that this Surgical Technique Guide has been authored in the English language. Any translations into other languages have not been reviewed or approved by United Orthopedic Corporation and their accuracy cannot be confirmed. Any translated guide should be reviewed carefully prior to use and questions regarding a Surgical Technique Guide should be directed to United Orthopedic Corporation at unitedorthopedic.com/contact

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