OSS™ Orthopedic Salvage System

Segmental Distal Femoral Replacement

Surgical Technique

ZIMMER BIOMET

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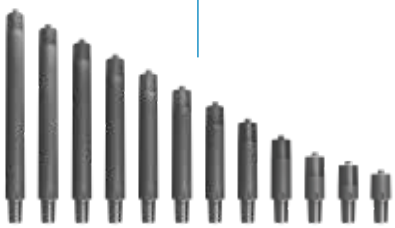
Table of Contents

This brochure is presented to demonstrate the surgical technique utilized by John A. Abraham, MD; Prof. Lee M. Jeys; Michael D. Miller, MD; Jeffrey R. Kneisl, MD; Robert J. Tait, MD and Edward J. McPherson, MD.

Stems

OsseoTi Augments



Tapered Diaphyseal Segments

Standard 7 cm & 8.5 cm Distal Femurs

RS 7 cm & 8.5 cm Distal Femurs

Standard Auxiliary Parts

Universal Auxiliary Parts

RS Auxiliary Parts

Standard Tibial Baseplates

RS Tibial Baseplates

Indications for Use

Indications and Contraindications

Effective as of January 1, 2016

INDICATIONS

1. Painful and disabled joint resulting from avascular necrosis, osteoarthritis, rheumatoid arthritis, or traumatic arthritis.
2. Correction of varus, valgus, or posttraumatic deformity.
3. Correction of revision of unsuccessful osteotomy, arthrodesis or previous joint replacement.
4. Ligament deficiencies.
5. Tumor resections.
6. Treatment of non-unions, femoral neck fracture, and trochanteric fractures of the proximal femur with head involvement, unmanageable using other techniques.*
7. Revision of previously failed total joint arthroplasty.
8. Trauma.

These devices are to be used with bone cement unless composed of OsseoTi® titanium alloy (not licensed in Canada) or a proximal femur is indicated for use (USA).

Legacy Biomet OSS Reduced size (RS) components offers a variety of component options for treatment in small adults and adolescents (12-21 years) that require proximal femoral, distal femoral, total femur, or proximal tibial replacement as well as, resurfacing components for the proximal tibia and distal femur (USA).

*Not applicable to Regenerex® Ultra Porous Construct titanium knee augment usage (not licensed in Canada), or any other knee component.

COMPRESS INDICATIONS

The Compress® Segmental Femoral Replacement System is indicated for:

1. Correction of revision of unsuccessful osteotomy, arthrodesis, or previous joint replacement.
2. Tumor resections.
3. Revision of previously failed total joint arthroplasty.
4. Trauma.

The Compress Segmental Femoral Replacement System components are intended for uncemented use.

When components of the Orthopaedic Salvage System are used with legacy Biomet's Compress Segmental Femoral Replacement System, the user should refer to the package insert contained with the Compress components for full prescription information.

CONTRAINDICATIONS

Absolute contraindications include: infection, sepsis, and osteomyelitis. Relative contraindications include: 1) uncooperative patient or patient with neurologic disorders who are incapable of following directions, 2) osteoporosis, 3) metabolic disorders which may impair bone formation, 4) osteomalacia, 5) distant foci of infections which may spread to the implant site, 6) rapid joint destruction, marked bone loss or bone resorption apparent on roentgenogram, 7) vascular insufficiency, muscular atrophy, or neuromuscular disease.

Distal Femoral Preparation

Pre-operative Planning

When planning for a segmental distal femoral replacement utilizing the Orthopedic Salvage System, carefully review the indication and contraindications for use referenced within the package insert located on pages 5 and 6 of this surgical technique.

To determine the correct implant components and size, utilize the Segmental Distal Femoral Resection Chart on the next page. Final determination frequently cannot be made until the actual time of surgery, however with appropriate planning a consistent operative plan with alternatives can be formulated.

Chart 1: Segmental Distal Femoral Resection

Total Construct Length	Distal Femoral Components (cm)	Segments												Segmental Adapter
	Standard or RS	3 cm	4 cm	5 cm	7 cm	9 cm	11 cm	13 cm	15 cm	17 cm	19 cm	21 cm	23 cm	1 cm
30	7												23	
29.5	8.5											21		
29	7						(11+11)							
28.5	8.5					9	11							
28	7											21		
27.5	8.5										19			
27	7					9	11							
26.5	8.5					(9+9)								
26	7										19			
25.5	8.5									17				
25	7					(9+9)								
24.5	8.5				7	9								
24	7									17				
23.5	8.5								15					
23	7				7	9								
22.5	8.5				(7+7)									
22	7								15					
21.5	8.5							13						
21	7				(7+7)									
20.5	8.5			5	7									
20	7							13						
19.5	8.5						11							
19	7			5	7									
18.5	8.5			(5+5)										
18	7						11							
17.5	8.5					9								
17	7			(5+5)										
16.5	8.5		(4+4)											
16	7					9								
15.5	8.5				7									
15	7		(4+4)											
14.5	8.5	(3+3)												
14	7				7									
13.5	8.5			5										
13	7	(3+3)												
12.5	8.5		4											
12	7			5										
11.5	8.5	3												
11	7		4											
10	7	3												
9.5	8.5													1 or collared/ splined stem
8.5	8.5 Elliptical													
8	7													1 or collared/ splined stem
7	7 Elliptical													

Additional options not presented exist if using collared stems or segmental adapters.

Note: Collared stems add 1 cm extramedullary. Segmental adapters add either 1 cm or 1.5 cm extramedullary and adds 30 mm intramedullary.

Figure 1

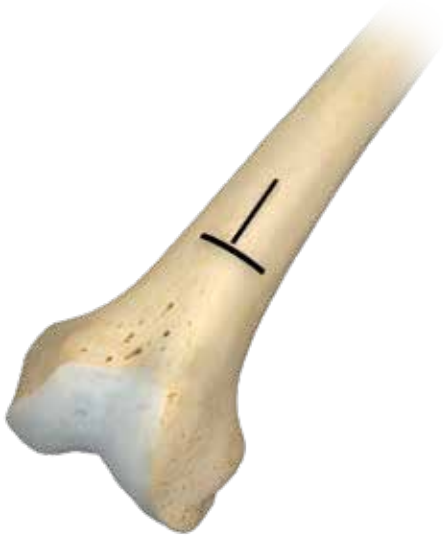


Figure 2

Measuring Resection Length

Place the distal femoral resection template on the bone and identify a resection length based on corresponding engravings (Figure 1).

Mark the resection point on the femur and make a longitudinal anterior mark (Figure 2). The reference corresponds with the markings on the trials and implant constructs.

Distal Femoral Resection Template 110018799
Femoral Bone Prep Tray 1

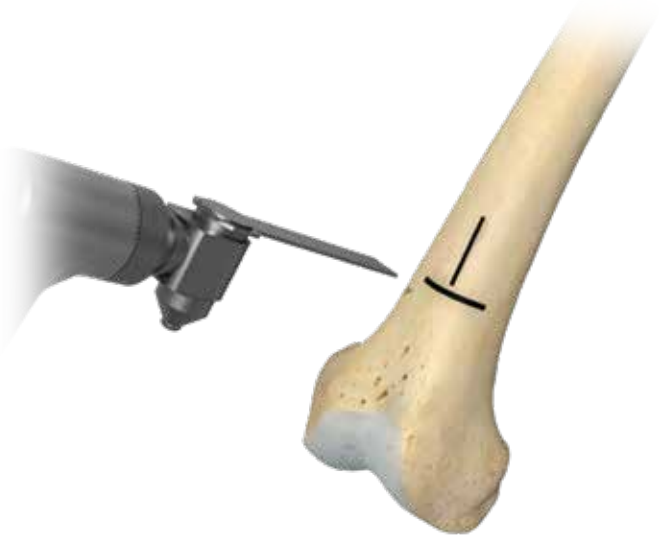


Figure 3

Figure 4

Femoral Osteotomy

Resect the distal femur at the reference resection mark (Figure 3 and Figure 4).

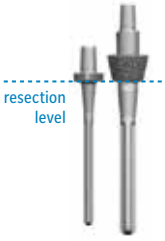
	Collared Stem or Diaphyseal Segment with Extramedullary Augment and Non-Collared Stem	Segmental Adapter with Non-Collared Stem	Diaphyseal Segment with Intramedullary Augment and Non-Collared Stem	Collared Splined Stem
				
Flexible Ream Depth	Stem Length	Stem Length + 30 mm	Stem Length + Augment Depth	Stem Length
Flare Ream Depth	Flare to Etch	Flare to Flat	Flare to Flat	n/a
Plane the Resection	Planer	Planer	Planer and Augment Reamer	Splined Reamer

Chart 2: Segmental Distal Femoral Canal Preparation Options

Canal Preparation

There are four options for preparing the distal femoral canal for a segmental replacement 7 cm or greater. Before flexible reaming, reference Chart 2 Segmental Distal Femoral Canal Preparation Options to determine the appropriate option for preparing the femoral canal.

Figure 5

Figure 6

Flexible Reaming

Start at full power prior to contact and progressively ream using the flexible reamers to the appropriate laser-etched markings until cortical chatter is obtained (Figure 5 and Figure 6).

Note: For bowed stems, final flexible reamer shaft diameter may need to be larger than definitive trial and implant diameter (Reamer/Trial/Stem Diameter Example).

Note: Reaming over a guide is recommended. The Arcos Flexible Reamers that are designed to prepare for a bowed stem are cannulated to accommodate a guide wire.

If preparing the canal for a collared splined stem proceed to page 17.

Reamer / Trial / Stem Diameter Example	
Flexible Reamer	13 mm
Trial Stem	13 mm
Splined Stem (implant)	13 mm
Cemented Stem (implant)	11 mm

Arcos® Flexible Reamer
Arcos Modular Femoral Revision System
Flexible Reamers Instrument Case

Figure 7

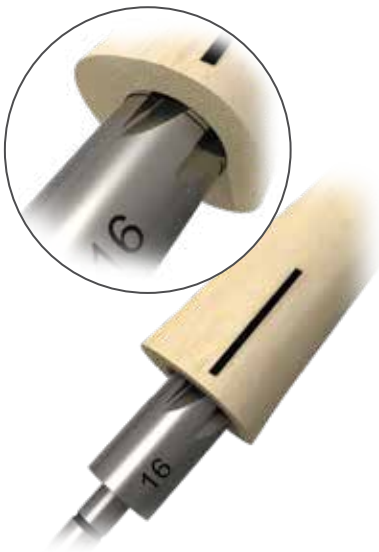


Figure 8a

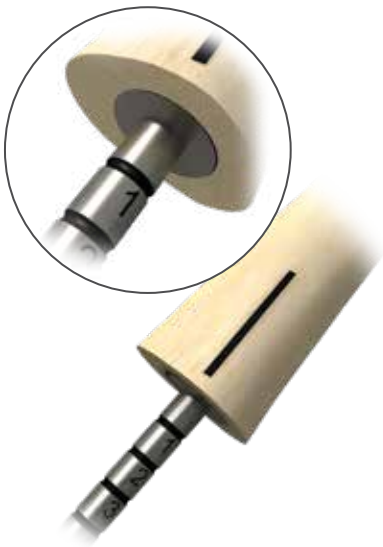


Figure 8b

Flare Reaming

Based on the diameter of the final flexible reamer, select the flare reamer of equivalent size and ream the canal opening (Figure 7).

To prepare the canal for a collared stem or a diaphyseal segment with an EM augment and a non-collared stem, start at full power prior to contact and ream to the etch mark on the flutes (Figure 8a). To prepare the canal for a segmental adapter with a stem or a diaphyseal segment with an IM augment and a stem, start at full power prior to contact and ream the flare to the flat of the flute (Figure 8b).

Note: When trialing, select the stem trial corresponding to the last flare reamer used.

Flare Reamer
Reamers Tray 3

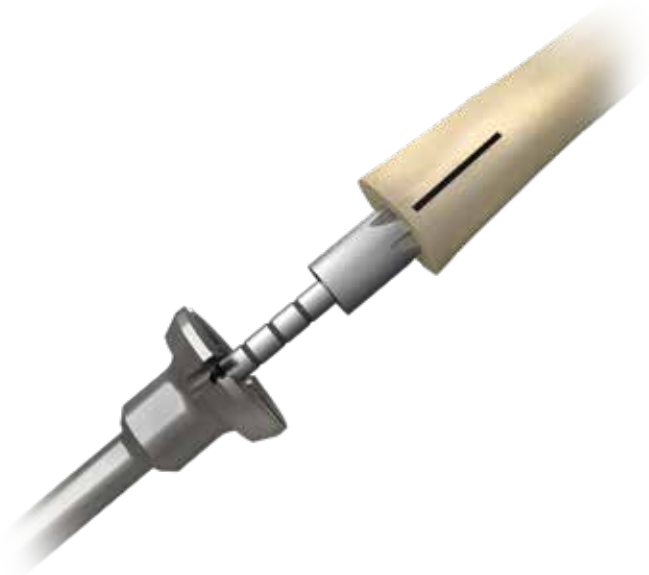


Figure 9

Figure 10

Planing the Resection

Place the resection planer over the shaft of the flare reamer (Figure 9). Start at full power prior to contact and plane the resected distal femur (Figure 10).

Resection Planer 110018812
Reamers Tray 3

Figure 11

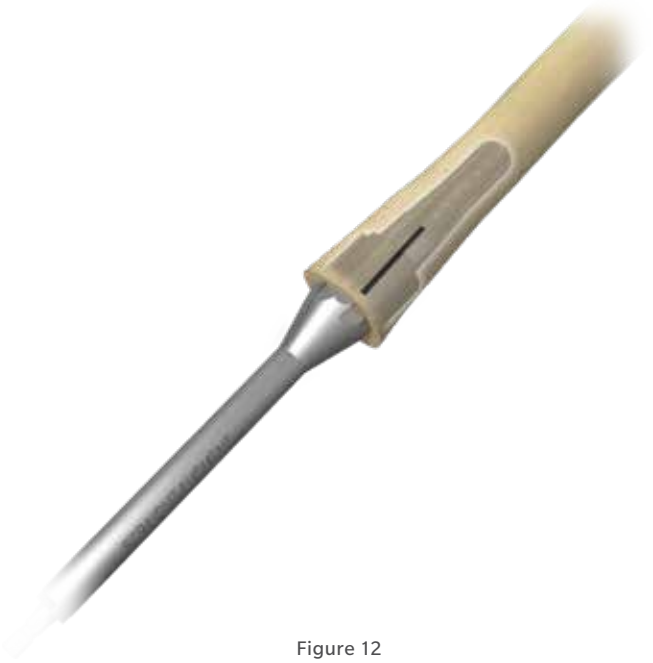


Figure 12

IM Diaphyseal Augment Preparation (optional)

Diaphyseal augments may be placed intra or extramedullary at the level of the osteotomy. To prepare for intramedullary placement, select augment size and type, based on defect or bone void (Figure 11).

Select the corresponding sized augment reamer. Insert the augment reamer over the flare reamer. Start power and run at full speed prior to the augment reamer contacting the bone. Ream to mechanical stop (Figure 12).

Warning #1: Do not utilize more than one diaphyseal augment per individual diaphyseal segment.

Warning #2: Diaphyseal augments can only be utilized with the following segments which have a corresponding external taper (151836, 151837, 151838, 151839, 151840, 151841, 150842, 151843, 151844, 151845, 151846, and 151847).

Augment Trials
STND Segmental Provisionals Tray 5

Augment Reamers
Femoral Bone Prep Tray 1
STND Segmental Provisionals Tray 5

Figure 13

Figure 14

Collared Splined Stem Bone Preparation

Select the collared splined stem reamer with integrated planer that corresponds to the final flexible reamer diameter (Figure 13).

Start at full power prior to contacting bone. Ream to full circumferential contact (Figure 14).

Splined Stem Planer
Reamers Tray 3

Tibial Preparation

Figure 15

Figure 16

Note: If using a modular tibial component with a stem for a revision, reference page 28.

This technique is utilized for a tibial replacement of 20 mm or less. If resecting more than 20 mm, reference the Proximal Tibial Replacement Surgical Technique.

Note: If an extramedullary guide is preferred, the OSS Tibial Resection Guide and stylus can be used in conjunction with the Vanguard XP® (32-700365), Vanguard Premier™ (32-487551, 32-487550), and Vanguard Microplasty® Elite (32-484550, 32-487550) extramedullary guides.

Reaming

Fully flex the knee and locate the center of the tibial plateau. Center the drill and start at full power prior to contact to create an entry hole with the .375" intramedullary (IM) drill (Figure 15), followed by the IM reamer (Figure 16). Replace with the IM rod.

Intramedullary (IM) Drill 32-467600
Femoral Bone Prep Tray 1

IM Reamer 32-467602
Tibial Bone Prep Tray 2

IM Rod 32-467603
Tibial Bone Prep Tray 2

Figure 17

Figure 18

Proximal Tibial Resection

Screw in the tibial resection guide to the tibial vertical guide then connect to the tibial horizontal guide (Figure 17).

Slide the tibial resection guide assembly over the IM rod (Figure 18).

Tibial Resection Guide Universal 110030077
Tibial Bone Prep Tray 2

IM Tibial Vertical Guide 110030078
Tibial Bone Prep Tray 2

IM Tibial Horizontal Guide 110030079
Tibial Bone Prep Tray 2

Tibial Stylus 2/12mm 110030075
Tibial Bone Prep Tray 2

IM Rod 32-467603
Tibial Bone Prep Tray 2

Figure 19

Figure 20

Proximal Tibial Resection (cont.)

Insert the stylus into the cut slot of the tibial resection guide (Figure 19). When referencing the deepest point of the least affected condyle, use the 12 mm stylus foot (primary). Use the 2 mm stylus foot when referencing the deepest point of the most affected condyle (revision).

Once the desired resection depth has been achieved, pin the resection guide in the most distal holes with 1/8" drills or threaded drill pins using the pin driver (Figure 20). This will allow additional resection of +2 mm or +4 mm of the proximal tibial plateau if needed. Pin the resection guide using the diverging holes to secure the guide in place.

Drill Pin 32-467619 or
Threaded Drill PIn 32-700379
Femoral Bone Prep Tray 1

Pin Driver 32-486261
Femoral Bone Prep Tray 1

Figure 21

Figure 22

Proximal Tibial Resection (cont.)

Remove the tibial guide assembly and IM rod leaving the tibial resection guide in place (Figure 21).

Note: If necessary, use the 3.5mm hex screw driver to remove the tibial assembly guide from the tibial resection guide.

Use a standard .054" saw blade and cut through the slot (Figure 22). Remove the cutting guide.

Note: To prepare the tibia for a Regenerex® tibial cone augment, reference pages 4–6 of the Regenerex Tibial Cone Augment Surgical Technique Addendum to the Vanguard® SSK Revision System. Recommended sizing of x-small or small.

3.5 mm Short Driver CP460366
General Instruments Tray 13

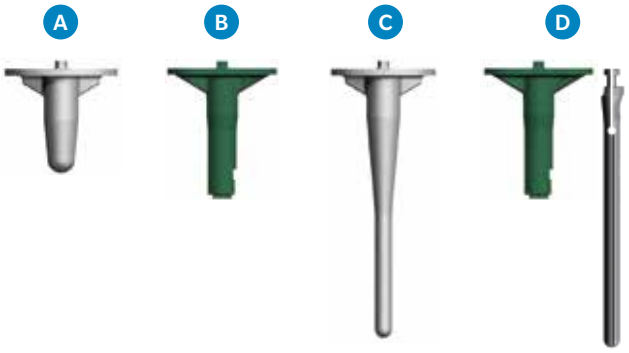


Figure 23
Short Non-Modular or Modular Tibia without a Stem

There are four distinct tibial options:

A – Short Non-Modular Tibial Component
B – Modular without a Stem
C – Long Non-Modular Tibial Component
D – Modular with a Stem

Note: The distal diameter of the modular tibial base plate is larger than the non-modular tibial base plate to accommodate the taper of a stem.

Canal Preparation

For preparation of (A) or (B), select and center a tibial sled sized to provide the best tibial plateau coverage without overhang, making sure to establish appropriate external rotation. Attach with long head bone nails (Figure 23).

Tibial Sled
Tibial Bone Prep Tray 2

Tibial Sled Alignment Handle 32-360299
Tibial Bone Prep Tray 2

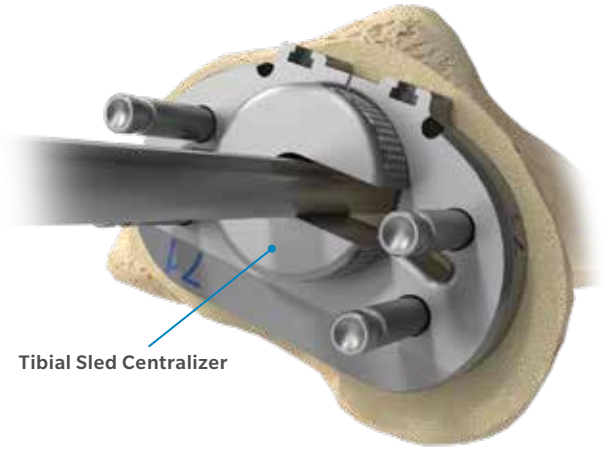


Figure 24
Preparation for Long Non-Modular or Modular Tibia with a Stem

Canal Preparation (cont.)

For preparation of (C) or (D), reinsert the IM Rod. Position the tibial sled over the tibial plateau using the tibial sled centralizer in order to centrally locate the distal end of a long non-modular or modular tibia with a stem. Use the tibial sled with the best coverage and no overhang, making sure to establish appropriate external rotation (Figure 24).

The tibial sled may have to be downsized. Attach tibial sled with long head bone nails. Remove the tibial centralizer and IM rod.

Note: The tibial sled alignment handle can be used in conjunction with the alignment rod to centrally locate the distal end of a long non-modular or modular tibia with a stem.

IM Rod 32-467603
Tibial Bone Prep Tray 2

Tibial Sled Centralizer 110024531
Tibial Bone Prep Tray 2

Long Head Bone Nail 32-422623
Tibial Bone Prep Tray 2

Alignment Rod 32-466616
Tibial Bone Prep Tray 2

Figure 25

Figure 26

Canal Preparation (cont.)

Insert the tibial sled guide post to the tibial sled. Attach by rotating clockwise (Figure 25).

Use the tibial starter reamer to provide an entry hole into the tibia. Start at full power prior to contacting the tibia (Figure 26).

Tibial Sled Guide Post 110018785
Tibial Bone Prep Tray 2

Tibial Starter Reamer 32-468410
Tibial Bone Prep Tray 2

Short Non-Modular Tibial Reamer (Standard or RS)

Long Non-Modular Tibial Reamer (Standard or RS)

Modular Tibial Reamer

Figure 27

Figure 28

Canal Preparation (cont.)

Select the appropriate reamer that corresponds to the Standard or RS short non-modular, Standard or RS long non-modular or modular tibial component.

Start at full power prior to contact and ream to the mechanical stop (Figure 27).

Note: There are several tibial reamers in the OSS set. It is important to select the correct reamer that corresponds to the type of Standard or RS replacement (long non-modular, short non-modular or modular reamer).

Keel Prep

If using a standard sized tibia, select the keel punch and impact through the sled until fully seated. Remove (Figure 28).

Note: The keel punch is not used when preparing for a RS tibial component.

If preparing for a modular tibia with a stem, continue to the next page.

Continue to page 33 for Trialing.

Tibial Reamers
STND Tibial Provisionals Tray 9
STND Tibial Provisionals Tray 10
RS Tibial Provisionals Tray 11

Keel Punch 110018808
Tibial Bone Prep Tray 2

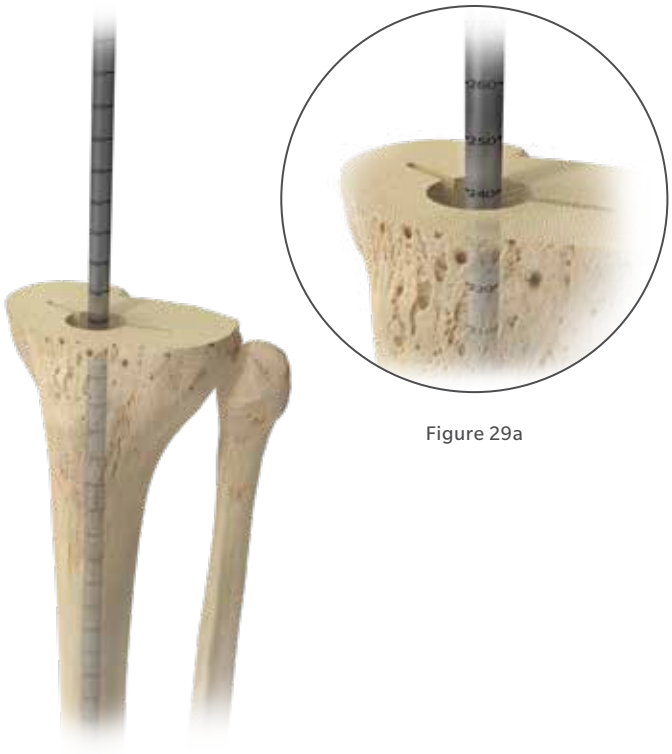


Figure 29a

Figure 29

Modular Tibial Component with Stem

Begin with the smallest diameter flexible reamer. Start power prior to contact and sequentially ream in .5 mm increments until light cortical chatter is achieved (Figure 29). See charts below for reamer to stem diameter and reamer depth.

		Stem Length (mm)	
		90	150
Primary	Modular Tibia + Poly (90 mm)	180	240
Revision	Modular Tibia (80 mm)	170	230

Reamer/Trial/Stem Diameter Example	
Flexible Reamer	13 mm
Trial Stem	13 mm
Porous Stem (implant)	13.5 mm
Cemented Stem (implant)	11 mm

Arcos Flexible Reamer
Arcos Modular Femoral Revision System
Flexible Reamers Instrument Case

Flare Reamer
Reamers Tray 3

12.5- Flare Reamer CP460477
13+ Flare Reamer CP460476
Reamers Tray 3

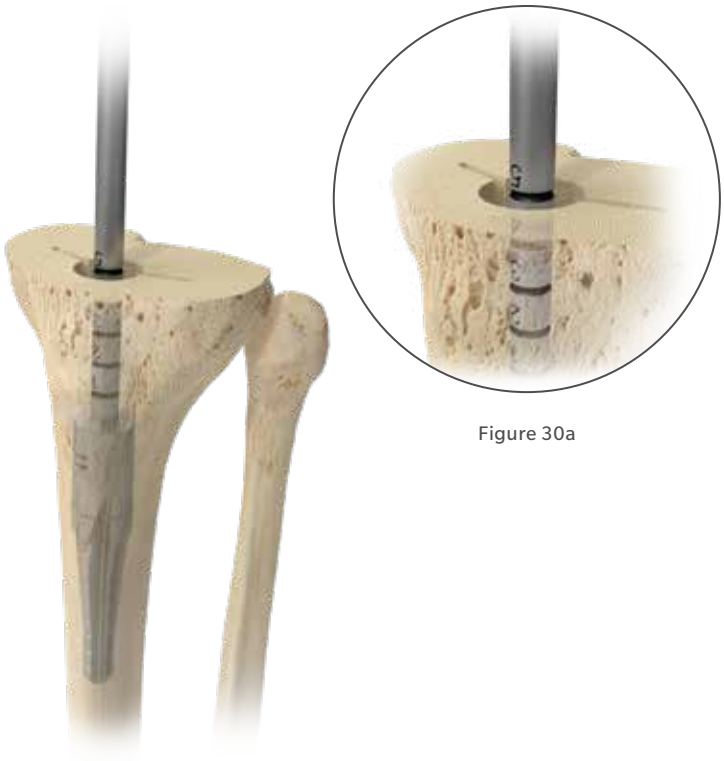


Figure 30a

Figure 30

Modular Tibial Component with Stem (cont.)

Based on the diameter of the final flexible reamer, select the flare reamer of equivalent size. Start power prior to contact and ream the canal opening to the groove marked "5" on the reamer shaft to prepare the canal for the modular tibial component and the flared stem (Figure 30).

For a 90 mm stem, select the following:

12.5- flare reamer =
8 mm through 12.5 mm flexible reamers

13+ flare reamer =
13 mm through 24 mm flexible reamers

For a 150, 225 or 300 mm stem select the corresponding flare reamer, based on the final diameter of the flexible reamer to prepare for the flared portion of the stem.

Note: If using a modular tibial component with a stem for a revision, refer back to page 21 to continue bone preparation. To achieve adequate stability when making the tibial resection, the flare reamer can be used in place of the IM rod.

12.5- Flare Reamer CP460477
13+ Flare Reamer CP460476
Reamers Tray 3

Figure 31

Figure 32

Tibial Block Augment Resection

Magnetically attach the augment resection block to the alignment handle and connect to the tibial sled (Figure 31). Medial or lateral specific options are available in 10 mm or 20 mm sizes.

Secure the augment block to the tibia with 1/8" drill pins or threaded drill pins using the pin driver (Figure 32). Remove the alignment handle and sled.

Tibial Sled
Tibial Bone Prep Tray 2

Long Head Bone Nails 32-422623
Tibial Bone Prep Tray 2

Tibial Sled Alignment Handle 32-360299
Tibial Bone Prep Tray 2

Tibial Augment Resection Block
Tibial Bone Prep Tray 2

Drill Pins 32-467619 or Threaded Drill Pins 32-700379
Femoral Bone Prep Tray 1

Pin Driver 32-486261
Femoral Bone Prep Tray 1

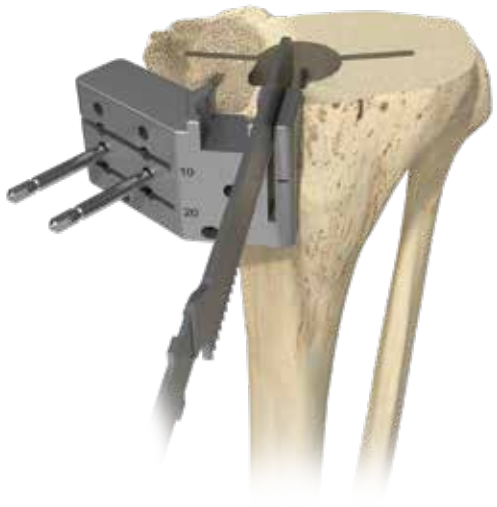


Figure 33

Figure 34

Tibial Block Augment Resection (cont.)

Make the vertical augment resection through the cut block utilizing a reciprocating saw, being careful to only cut down to the appropriate augment depth (Figure 33).

Note: Augment depths are denoted with engraved markings.

Resect the tibia through the appropriate slot (10 mm or 20 mm thick augments) using a .054" saw blade (Figure 34).

Tibial Augment Resection Block
110026622/623
Tibial Bone Prep Tray 2

Drill Pins 32-467619 or
Threaded Drill Pins 32-700379
Femoral Bone Prep Tray 1

Trialing

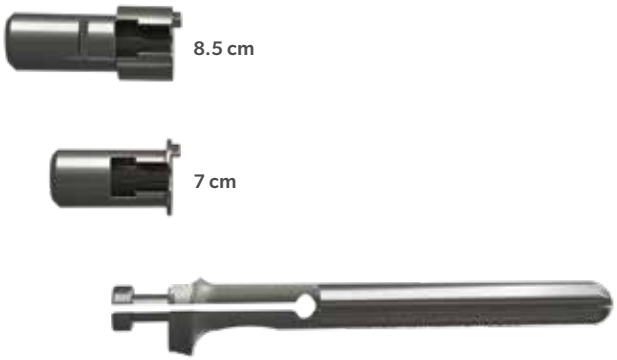


Figure 35

Figure 36

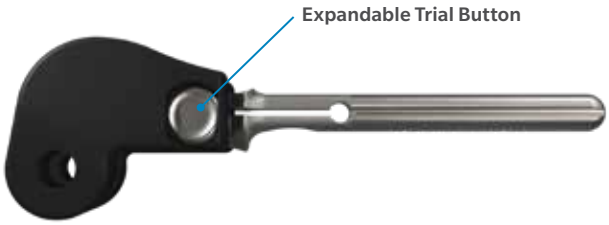


Figure 37

7 cm to 8.5 cm Elliptical Segmental Distal Femoral Replacement

Connect the stem trial into the 7 cm (Left or Right specific) or 8.5 cm trial sleeve (Figure 35 and Figure 36) and insert into the 7 cm expandable femoral trial by pressing the expandable trial button (Figure 37). Insert trial construct into the resected femur.

To prepare for tibial trialing, continue to page 37.

Stem Trials
Short Provisional Stems Tray 7
Long Provisional Stems Tray 8

Expandable Trial Sleeve
STND Segmental Provisionals Tray 5

Expandable Femoral Trial
STND Segmental Provisionals Tray 5
RS Femoral Provisionals Tray 6

Expandable Trial Button 110018632
STND Segmental Provisionals Tray 5

Figure 38

Figure 39

Figure 39a

Over 8.5 cm Segmental Distal Femoral Replacement

Based on the resection length of the distal femur, select the diaphyseal trial to be used with the 7 cm expandable distal femoral trial (Figure 38).

There are four expandable segment trials marked to match the resection length of the distal femur. If the bone was prepared for an 8.5 cm femoral implant, use the 7 cm expandable femoral trial with the 8.5 cm trial sleeve and quick connect segment.

Note: See Segmental Distal Femoral Resection Chart 1 on page 9 for available construct lengths.

Connect the stem trial into the selected expandable diaphyseal trial (Figure 39).

If a non-collared stem is chosen, attach the diaphyseal augment trial to the expandable segment trial and connect to the stem trial (Figure 39a).

Once everything is connected, rotate the diaphyseal augment trial to capture the stem trial.

Stem Trials
Short Provisional Stems Tray 7
Long Provisional Stems Tray 8

Expandable Diaphyseal Trial
STND Segmental Provisionals Tray 5

Augment Trial
STND Segmental Provisionals Tray 5

Figure 40

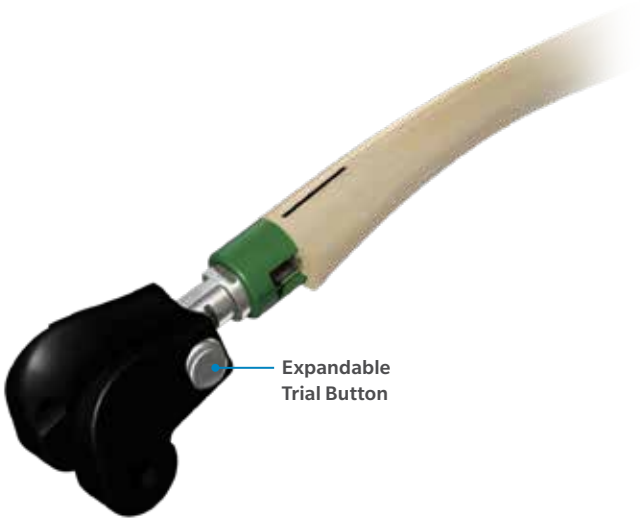


Figure 41

Over 8.5 cm Segmental Distal Femoral Replacement (cont.)

Insert into the expandable femoral trial by pressing the expandable trial button (Figure 40).

Expand the trial to the corresponding resection length (Figure 41).

Note: Markings on expandable segments indicate total resection length.

Expandable Femoral Trial
STND Segmental Provisionals Tray 5
RS Femoral Provisionals Tray 6

Expandable Trial Button 110018632
STND Segmental Provisionals Tray 5

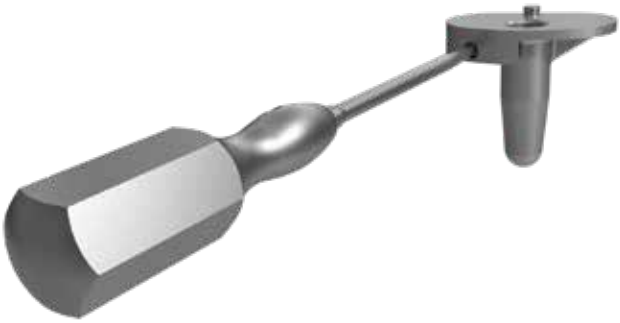


Figure 42

Figure 43

Tibial Augment Trial Assembly

Attach the augment trial utilizing the 3.5 mm driver (Figure 42).

Place the augment trial/baseplate trial assembly into the prepared tibia (Figure 43).

Tibial Trials
STND Tibial Provisionals Tray 9
STND Tibial Provisionals Tray 10
RS Tibial Provisionals Tray 11

Tibial Block Augment Trials
STND Tibial Provisionals Tray 10
RS Tibial Provisionals Tray 11

3.5 mm Short Driver CP460366
General Instruments Tray 13

Figure 44

Figure 45

Tibial Trial Assembly

In flexion, insert the assembled trial tibial baseplate into the prepared tibial canal (Figure 44).

Insert the 12 mm tibial bearing trial into the tibial baseplate (Figure 45).

Tibial Trials
STND Tibial Provisionals Tray 9
STND Tibial Provisionals Tray 10
RS Tibial Provisionals Tray 11

Tibial Bearings
STND Femoral Provisionals Tray 4
RS Femoral Provisionals Tray 6

Figure 46

Figure 47

Tibial Trial Assembly (cont.)

Reduce the bearing/baseplate assembly into the trial femoral component. Insert the trial axle through the condyles so that the entire construct is fully captured (Figure 46 and Figure 47).

Note: Ensure the corresponding trial axle is utilized for a Standard or RS femoral replacement.

Select the tibial bearing that allows for full extension, but not more than 8 mm of joint distraction with longitudinal traction in full extension. Upon confirming fit and interaction of all components, the trials are removed.

Note: The patella is prepared using a legacy Biomet patella of choice. It is not recommended to use a patella smaller than 31 mm.

Trial Axle
STND Femoral Provisionals Tray 4
RS Femoral Provisionals Tray 6

Figure 48

Figure 49

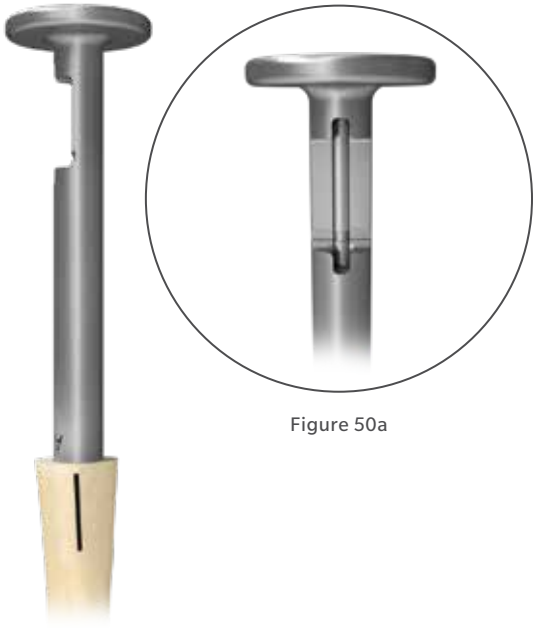


Figure 50

Figure 50a

Trial Extraction

If the expandable trial construct is difficult to remove by hand, begin by separating the expandable femoral/segment trial from the stem trial. Insert the stem trial extractor onto the stem trial (Figure 48).

Align the anterior witness marks and turn clockwise. Insert the stem trial extractor rod to prevent the stem trial from separating from the stem trial extractor (Figures 49, 50 and 50a).

Thread the slide hammer into the stem trial extractor to remove.

Stem Trial Extractor 110024532
General Instruments Tray 14

Slide Hammer 31-473621
General Instruments Tray 14

Implant Assembly

	Small Head / Small Thread Locking Screw	Large Head / Small Thread Locking Screw	Large Head / Large Thread Locking Screw	Stacking Adapter
				
Packaged with	Segments	Stems	Segments	Packaged Separately

Chart 3: Locking Screw Chart

Implant Assembly
Screw Packaging Information

Before assembling the implants together, it is important to note which screws are used and how they are packaged. Depending on the type of construct assembled, some screws may or may not be utilized.

Diaphyseal segments are packaged with both a small head/small thread locking screw and a large head/ large thread locking screw.

Stems are packaged with a large head/small thread locking screw.

The stacking adapter is packaged separately.

Implant Assembly without Augments and Segments

To impact the distal femoral component with a stem, assemble the impactor onto the impaction base (A). Vigorously impact using the impactor handle.

After impaction, secure the construct with the large head/small thread locking screw packaged with the stem through the distal femoral component (B) with a 3.5 mm driver (Figure 51).

Figure 51

Cementing the Segmental Femur

Insert a cement plug then retrograde fill the canal and pressurize. Carefully clean out any excess cement using a curette or similar instrument.

Continue to page 48.

Femoral/Tibial Impactor Handle 110030073
General Instruments Tray 13

Impaction Base
General Instruments Tray 12

3.5 mm Driver (Long or Short)
General Instruments Tray 13

Femoral/Tibial Impactor 110030072
General Instruments Tray 12

Implant Assembly with Augments and Segments

Step 1: Augment Assembly

To impact the diaphyseal segment with an augment, insert the taper sleeve into the diaphyseal impactor and thread onto the impaction base (B). Thread the augment impactor onto the impaction handle (A). Vigorously impact using the impaction handle (Figure 52).

Warning #1: Do not utilize more than one diaphyseal augment per individual diaphyseal segment.

Warning #2: Diaphyseal augments can only be utilized with the following segments which have a corresponding external taper (151836, 151837, 151838, 151839, 151840, 151841, 150842, 151843, 151844, 151845, 151846, and 151847).

Figure 52

Taper Sleeve
General Instruments Tray 12

Diaphyseal Impactor
General Instruments Tray 12

Impaction Handle
General Instruments Tray 12

Augment Impactor
General Instruments Tray 12

Impaction Base
General Instruments Tray 12

Implant Assembly with Augments and Segments (cont.)

Step 2: Stem Assembly

To impact the diaphyseal segment with a stem, use the assembled impaction base (B). Vigorously impact using the impaction handle (A).

Make certain to locate and discard the large head/small thread locking screw packaged with the stem as it will not be used.

After impaction, secure the construct with the small head/small thread locking screw packaged with the segment through the diaphyseal segment (C) with the 3.5 mm driver (Figure 53).

Do not discard the large head/large thread locking screw packaged with the segment if directly impacting the segment/stem construct to a distal femoral component as it is needed to secure the final construct.

Discard the large head/large thread locking screw packaged with the segment if stacking a second diaphyseal segment to the segment/stem construct (Step 3).

Figure 53

Taper Sleeve
General Instruments Tray 12

Diaphyseal Impactor
General Instruments Tray 12

Femoral/Tibial Impactor Handle
110030073
General Instruments Tray 13

Impaction Base
General Instruments Tray 12

3.5 mm Short Driver
CP460366
General Instruments Tray 13

Implant Assembly with Augments and Segments (cont.)

Step 3: Stacking a Second Segment

If not utilizing a second diaphyseal segment, proceed to Step 4: Distal Femoral Assembly.

BEFORE impacting a second diaphyseal segment, thread the stacking adapter into the male taper of the diaphyseal segment/stem construct with the axle driver (A). The stacking adapter is packaged separately.

To impact the diaphyseal segment with the diaphyseal segment/stem construct, use the assembled impaction base (B). Vigorously impact using the impaction handle (C).

After the second diaphyseal segment is impacted with the diaphyseal segment/stem construct, secure with the small head/small thread locking screw through the diaphyseal segment (D) with a 3.5 mm driver. Screw is packaged with the second diaphyseal segment (Figure 54).

Figure 54

Axle Driver CP461009
General Instruments Tray 13

Femoral/Tibial Impactor Handle 110030073
General Instruments Tray 13

Taper Sleeve
General Instruments Tray 12

Diaphyseal Impactor
General Instruments Tray 12

Impaction Base
General Instruments Tray 12

3.5 mm Driver (Long or Short)
General Instruments Tray 13

Implant Assembly with Augments and Segments (cont.)

Step 4: Distal Femoral Assembly

To impact the distal femoral component with a stem construct, assemble the impactor onto the impaction base (A). Vigorously impact using the impactor handle (B).

Secure the construct with a large head/large thread locking screw packaged with the segment (C) (Figure 55).

Figure 55

Cementing the Segmental Femur

Insert a cement plug, then retrograde fill the canal and pressurize. Carefully clean out any excess cement using a curette or similar instrument.

Femoral/Tibial Impactor Handle 110030073
General Instruments Tray 13

Femoral/Tibial Impactor 110030072
General Instruments Tray 12

Impaction Base
General Instruments Tray 12

3.5 mm Short Driver CP460366
General Instruments Tray 13

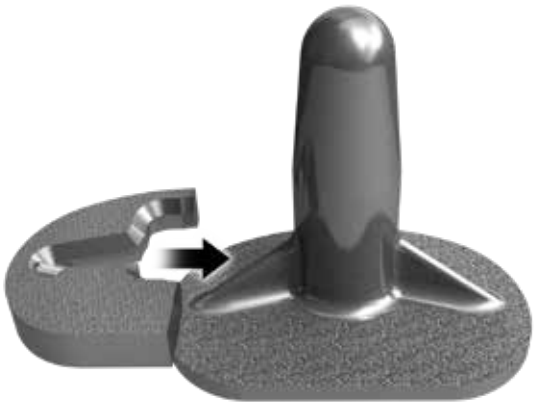


Figure 56

Figure 57

Tibial Augment Implant Assembly

The tibial augment is attached to the interior surface of the tibial baseplate with bone cement. Hold the augment(s) securely to the baseplate until the cement cures (Figure 56 and Figure 57).

Cementing the Tibial Construct

Digitally pressurize cement into the proximal tibia and apply cement under the tibial tray and insert the tibial assembly onto the tibia. Impact the implant with the femoral/tibial impactor being careful to match the patient's correct rotational alignment.

Note: It is imperative that the augment is cemented to the tibial baseplate prior to implantation.

Femoral/Tibial Impactor Handle 110030073
General Instruments Tray 13

Femoral/Tibial Impactor 110030072
General Instruments Tray 13

Figure 58

Figure 59

Figure 60

Implant Assembly

The trial bearing may be used with the definitive distal femoral and tibial implants to confirm the correct tibial bearing thickness.

Position the trial bearing onto the tibial baseplate (Figure 58).

Reduce the bearing/baseplate assembly into the femoral component. Insert the bushing/axle trial through the medial condyle to fully capture the femoral component (Figure 59 and Figure 60).

Once the tibial bearing thickness has been finalized, and the trial components removed, two options are available to assemble the remaining implants.

Tibial Trial Bearing
STND Femoral Provisionals Tray 4
RS Femoral Provisionals Tray 6

Femoral Bushing/Axle Trial
STND Femoral Provisionals Tray 4
RS Femoral Provisionals Tray 6

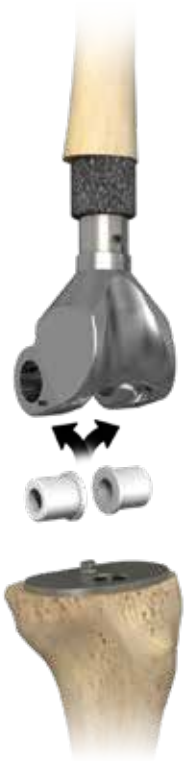


Figure 61

Figure 62

Implant Assembly (cont.)

Insert the two polyethylene femoral bushings into the femoral condyle openings from within the intercondylar notch (i.e. inside out) (Figure 61).

Insert the polyethylene tibial bushing into the tibial baseplate (small end first) (Figure 62).

Figure 63

Figure 64

Figure 65

Option One

Push the yoke through the underside of the polyethylene tibial bearing and place up between the femoral condyles (Figures 63, 64, and 65).

Figure 66

Figure 67

Figure 68

Option One (cont.)

The axle is inserted (non-slotted end first) into the medial side of the femoral component and through the yoke (Figure 66) until the slotted end of the axle is flush with the polyethylene femoral bushing (Figure 67).

Using the axle screwdriver, rotate the axle until the lock pin notch in the axle is aligned with the hole located on the anterior face of the yoke (Figure 68).

Axle Driver CP461009
General Instruments Tray 13

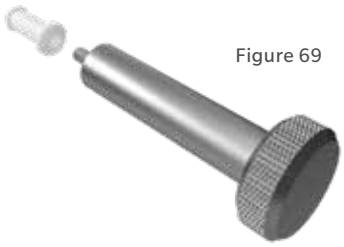


Figure 69

Figure 70

Figure 71

Figure 72

Option One (cont.)

Upon correct alignment the polyethylene lock pin is placed onto the lock pin inserter (Figure 69).

Insert the lock pin through the yoke opening and ensure that it is fully engaged (Figure 70 and Figure 71).

Note: If the lock pin is difficult to insert, tap lightly on the lock pin inserter to engage.

Remove the lock pin inserter (Figure 72).

Lock Pin Inserter 32-472106
General Instruments Tray 13

Figure 73

Figure 74

Option One (cont.)

To articulate the tibial and femoral components, hyperflex the knee with the patella everted and insert the yoke down into the tibial baseplate (Figure 73 and Figure 74).

Place the knee in extension and evaluate the soft tissue tension.

Closure is accomplished in the standard fashion.

Figure 75

Figure 76

Figure 77

Figure 78

Option Two

Push the yoke through the underside of the polyethylene tibial bearing (Figure 75 and Figure 76) and, while holding the proximal portion of the yoke, insert the assembly into the opening of the tibial baseplate (Figure 77 and Figure 78).

Figure 79

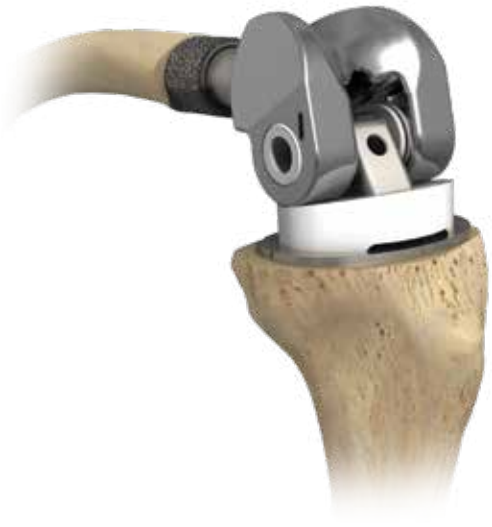


Figure 80

Option Two (cont.)

Slide the distal femur onto the tibial component with the proximal portion of the yoke resting between the condyles (Figure 79 and Figure 80).

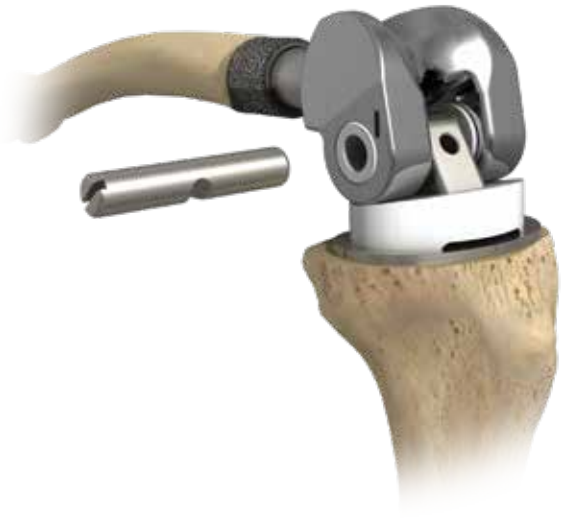


Figure 81

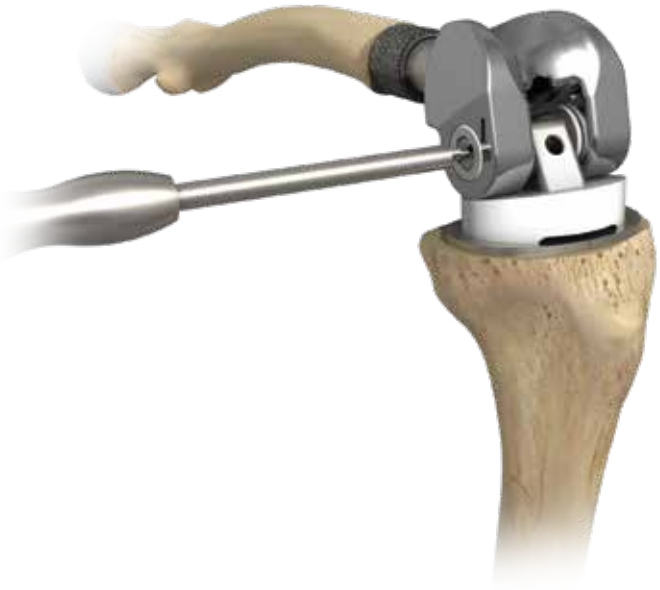


Figure 82

Option Two (cont.)

The axle is inserted (non-slotted end first) into the medial side of the femoral component and through the yoke until the slotted end of the axle is flush with the polyethylene femoral bushing (Figure 81).

Note: The yoke may need to be slightly "lifted" in order for the axle to pass through the medial side of the femoral component.

Using the axle screwdriver, rotate the axle until the lock pin notch in the axle is aligned with the hole located on the anterior face of the yoke (Figure 82).

Axle Driver CP461009
General Instruments Tray 13

Figure 83

Figure 84

Figure 85

Option Two (cont.)

Upon correct alignment, the polyethylene lock pin is placed onto the lock pin inserter (Figure 83).

Insert the lock pin through the yoke opening and ensure that it is fully engaged (Figure 84 and Figure 85).

Note: If lock pin is difficult to insert, tap lightly on the lock pin inserter to engage.

Lock Pin Inserter 32-472106
General Instruments Tray 13

Figure 86

Option Two (cont.)

Remove the lock pin inserter (Figure 86).

Place the knee in extension and evaluate the soft tissue tension.

Closure is accomplished in the standard fashion.

Notes

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