# Integra®

Titan™ Modular Shoulder System, 2.5
Featuring Fin-Lock™ Surgical Technique

SURGICAL TECHNIQUE


INTEGRA®
LIMIT UNCERTAINTY

# Table of Contents

## Introduction



## Surgical Technique

## Indications

Total Shoulder Arthroplasty or Hemiarthroplasty is indicated for:
- Severely painful and/or disabled joint resulting from osteoarthritis, traumatic arthritis or rheumatoid arthritis.
- Fracture-dislocations of the proximal humerus where the articular surface is severely comminuted, separated from its blood supply or where the surgeon's experience indicates that alternative methods of treatment are unsatisfactory.
- Other difficult clinical problems where shoulder arthrodesis or resection arthroplasty are not acceptable (e.g. revision of a failed primary component).

Shoulder Hemiarthroplasty is also indicated for:
- Ununited humeral head fractures
- Avascular necrosis of the humeral head
- Rotator cuff arthropathy
- Deformity and/or limited motion

The humeral component is intended for cemented or uncemented use. The glenoid component is intended for cemented use only.

## Contraindications

The following conditions are contraindications for total shoulder arthroplasty and hemiarthroplasty:
- Active local or systemic infection
- Inadequate bone stock in the proximal humerus or glenoid fossa for supporting the components
- Poor bone quality, such as osteoporosis, where there could be considerable migration of the prosthesis and/or a chance of fracture of the humerus or glenoid
- Absent, irreparable or nonfunctional rotator cuff or other essential muscles
- Pregnancy
- Muscular, neurologic, or vascular deficiencies that compromise the affected extremity
- Known metal allergies

The following conditions are contraindications for total shoulder arthroplasty and hemiarthroplasty:
- Absent, irreparable or nonfunctional rotator cuff or other essential muscles

## Warnings

The use of a glenoid prosthesis in patients with cuff tear arthropathy could increase the risk of glenoid component loosening due to non-anatomic loading conditions. The following conditions tend to adversely affect shoulder replacement implants:

- Excessive patient weight
- High levels of patient activity
- Likelihood of falls
- Poor bone stock
- Metabolic disorders
- Disabilities of other joints

## Precautions

- Do not reuse this device. Reuse of this product may result in infection or other systemic complication that may affect the patient's overall health. Additionally, the reuse of this product could adversely affect function of the device. Any implant that has been damaged, mishandled, or removed from the sterile field may have surface damage that could result in implant fracture and/or particulate and should be discarded.
- The Titan™ Modular Shoulder System has not been evaluated for safety and compatibility in the MR environment. It has not been tested for heating, migration, or image artifact in the MR environment. The safety of the Titan Modular Shoulder System in the MR environment is unknown. Scanning a patient who has this device may result in patient injury.

## Sterility

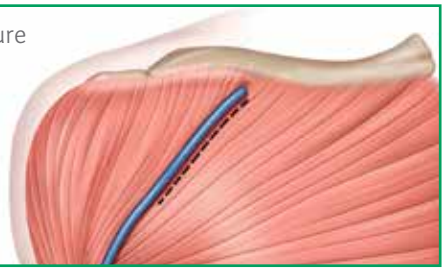
The Fin-Lock™ Glenoid implant has been sterilized by Ethylene Oxide (EO) and is sterile in the unopened, undamaged package. If either the implant or the package appears to be damaged or has been opened, or if sterility is questioned for any reason, the implant should not be used. Do not resterilize this product. All other Titan™ System Implants have been sterilized by gamma radiation and are sterile in the unopened, undamaged package. If either the implant or the package appears damaged or has been opened, or if sterility is questioned for any reason, the implant should not be used. Do not resterilize this product.

## Adverse Events

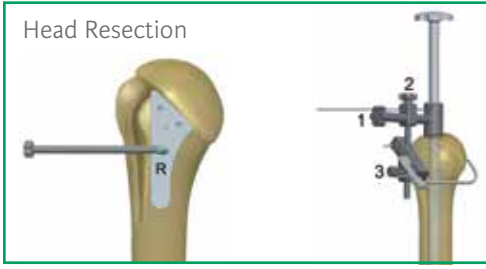
- Potential adverse events include early or late postoperative infection, allergic reaction, intraoperative or postoperative bone fracture and/or postoperative pain.
- Intraoperative bone perforation or fracture may occur, particularly in the presence of poor bone stock caused by osteoporosis, bone defects from previous surgery, bone resorption, or while inserting the device.
- Loosening or migration of the implants can occur due to loss of fixation, trauma, malalignment, bone resorption, and/or excessive activity.
- Surgical intervention may be required to treat adverse effects.
- MDR Reporting Reminder: Medical device manufacturers and users are required by law and regulation to report serious injuries and death.

## Surgical Technique – Visual Step By Step with Fin-Lock™ Glenoid

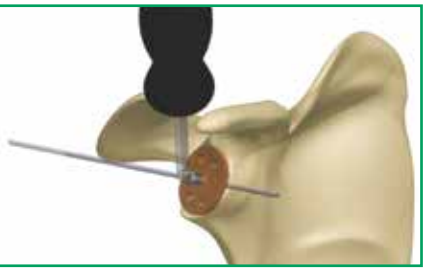
Exposure



Head Resection



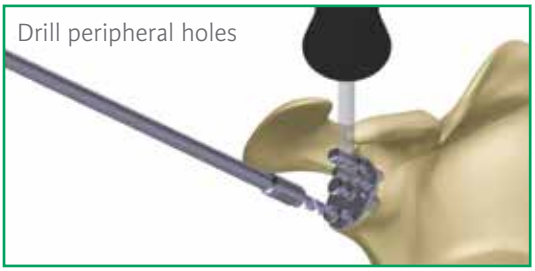

Size and place wire



Ream

Drill center holes

Drill peripheral holes



Punch

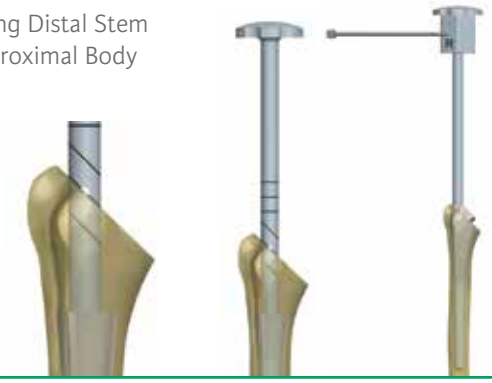
Trial

Implant

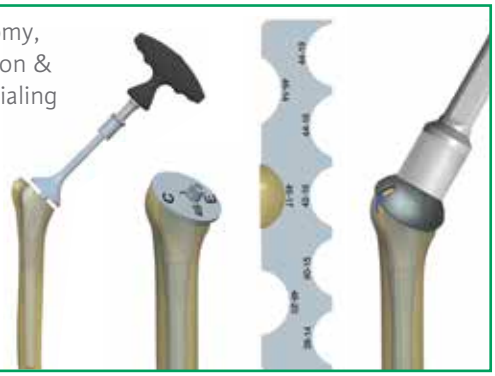
## Surgical Technique – Visual Step By Step with Fin-Lock™ Glenoid (continued)

Final Glenoid Implantation

Trialing Distal Stem and Proximal Body



Osteotomy, Evaluation & Head Trialing



Implant Assembly


Head Assembly

Final Humeral Implantation

# Design Rationale

## Redefining Modularity

- 26 Humeral Head options based on published anthropomorphic data of over 300 human humeri to provide anatomic fit by respecting the varying radius of curvature which allows for simplified sizing and soft tissue balancing. [1,2]
- Interchangeable proximal bodies and distal stems to accommodate varying patient anatomy.

## Platform Convertibility

- Well-fixed press-fit stem options provide an intraoperative building platform and a pathway for revision.
- Modularity allows for convertibility from Total Shoulder Arthroplasty to Reverse Shoulder Arthroplasty with version adjustment.

## Enhanced Instrumentation

- Compaction technique to impact and preserve bone.
- Consistent instrumentation is utilized for primary, fracture and revision procedures aiding in familiarity and more efficient use of space.


### Fin-Lock™ Glenoid

- Center peg features fins to aid in stability
- Highly crosslinked polyethylene for improved wear resistance

1. Iannotti JP, Gabriel JP, Schneck SL, et al: The normal glenohumeral relationships. An anatomical study of one hundred and forty shoulders. J Bone Joint Surg (Am), 1992; 74:491-500.
2. Hertel R, Knothe U and Ballmer F: Geometry of the proximal humerus and implications for prosthetic design. J Shoulder Elbow Surg. Vol. 11, No 4, 2002; 331-338.

## Surgical Technique

**The Titan Modular Shoulder System was developed in conjunction with Joseph Abboud, MD; Phillip Duke, MB.BS, FRACS, FA(ORTH)A; William Geissler, MD; Sanford Kunkel, MD; Anand Murthi, MD; Matthew Ramsey, MD; Mark Ross, MB.BS, FRACS, FA(ORTH)A**

**As the manufacturer of this device, Integra does not practice medicine and does not recommend this or any other surgical technique for use on a specific patient. The surgeon who performs any implant procedure is responsible for determining and using the appropriate techniques for implanting the device in each patient.**

**Caution: Federal law restricts this device to sale by or on the order of a physician or practitioner.**

## Step 1 • Preoperative Templating and Patient Positioning

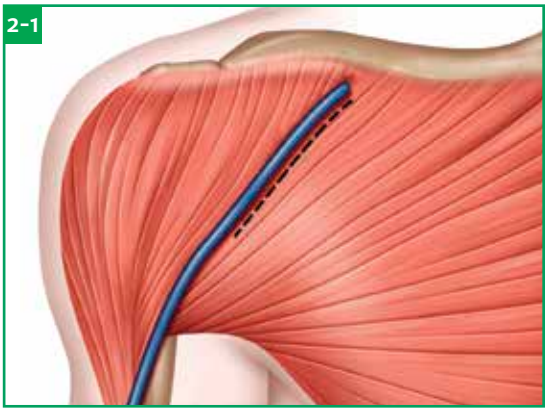
**1-1** Preoperative evaluation of the humerus using the Titan Modular Shoulder System X-ray Templates helps determine the size of the prosthesis and level of the humeral head resection. The goal is to remove the humeral head at the anatomic neck using the patient's own neck shaft angle, generally between 130-135°, and humeral version indicated by the patient's natural version.

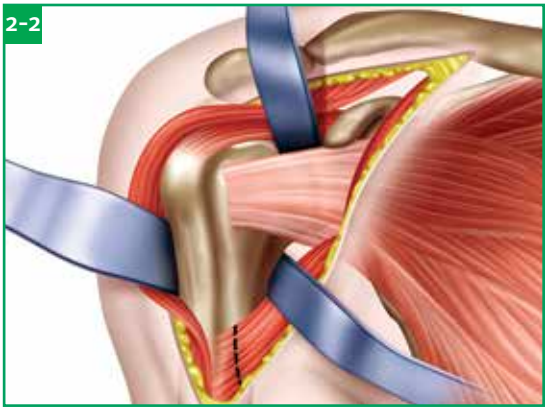
Hemi and Total Shoulder Arthroplasty can be performed using general anesthesia, regional anesthesia (i.e., interscalene block), or a combination. Place the patient in beach chair position. This position would have the patient supine with the hips flexed approximately 30°, knees bent approximately 30° and back elevated approximately 30°. Specialized headrests, such as the MAYFIELD® or the McConnell, arm mounts or operating tables with breakaway side panels can facilitate further access to the top and back of shoulder.


## Step 2 • Exposure

**2-1** A deltopectoral approach is used to provide exposure to the anterior aspect of the glenohumeral joint, the upper humeral shaft and the humeral head. The initial incision line runs from the mid-clavicle, over the top of the coracoid and extends in a straight line down the anterior aspect of the arm. It should follow the path of the cephalic vein along the interval between the deltoid and the pectoralis major. The length of the initial incision along this line can vary, depending on the exposure needed to provide adequate access and visualization of the joint, and is determined by patient body habitus.

Once the initial incision is made, expose, incise and release the fascia. Locate the cephalic vein at the deltopectoral interval. Separate the deltoid and pectoralis major muscles so that the deltoid muscle is completely free from its origin to its insertion, especially along its deep surface. Abduct and externally rotate the arm. Gently retract the cephalic vein medially or laterally along with the deltoid and pectoralis muscle.



## Step 2 • Exposure (continued)

2-2 Incise the clavipectoral fascia lateral to the conjoined tendon. If needed, release the upper 25% of the pectoralis major tendon from its insertion on the humerus, using an electrocautery cutting blade. Place a Hohmann retractor over the top of the humeral head, pulling the upper part of the deltoid posteriorly.

Check that rotator cuff tendons are intact. Introduce self-retaining Weitlander and Kobel retractors underneath conjoined tendon and underneath the middle deltoid. It is important to always save or preserve the coracoacromial ligament.

However, a small triangle can be removed from the coracoacromial ligament which will allow visualization of the subscapularis and supraspinatus interval.

Release the biceps tendon from the bicipital groove and along the rotator interval down to its glenoid attachment. Resect the long head of the biceps at the origin of the superior glenoid. Open the rotator interval along the line of the biceps to define the superior margin of the subscapularis.

Isolate, clamp and ligate or coagulate the anterior humeral circumflex vessels lying across the anterior/inferior third of the subscapularis tendon.

It is important to be aware of the musculocutaneous nerve, which penetrates the coracobrachialis muscle 2.54cm-5.08cm distally from the coracoid. The nerve may not be palpable within the surgical field, but remember its proximity to the conjoined tendon. Digitally locate the axillary nerve. Introduce a Hohmann retractor and carefully retract the nerve along with the latissimus dorsi tendon. This is especially important as it will protect the axillary nerve, define and expose the inferior capsule.

## Step 3 • Subscapularis Tendon Management

### Lesser Tuberosity Osteotomy

3-1 Locate the insertion of the subscapularis tendon onto the lesser tuberosity. Place the saw blade or osteotome just lateral to the subscapularis insertion point and osteotomize approximately 4-5mm of the lesser tuberosity.

### Subscapularis Tenotomy

3-2 Alternatively the tendon can be removed from its insertion with sharp dissection about 1cm medial to the lesser tuberosity. This will allow for tendon to tendon reattachment of the subscapularis.


## Step 4 • Capsule Release and Humeral Head Dislocation

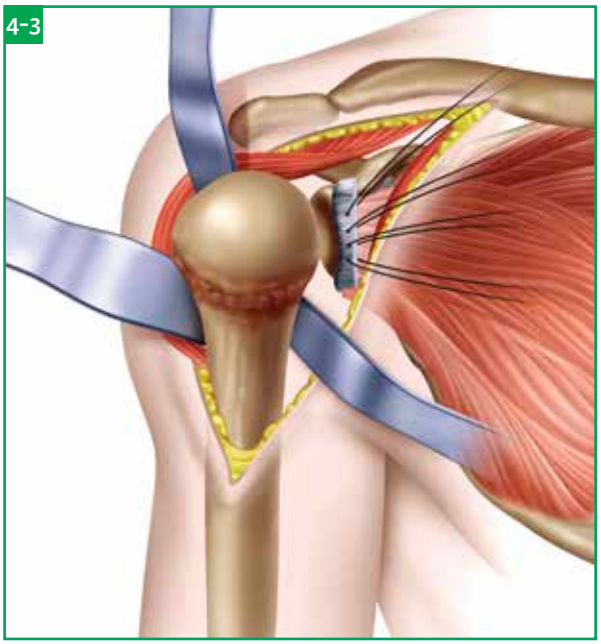
**4-1** Using blunt dissection, separate the capsule from the subscapularis, inferiorly and medially. Release the rest of the anterior capsule from the subscapularis to the glenoid rim. Release the coracohumeral ligament from the base of the coracoid. Place traction sutures in the subscapularis tendon to control and mobilize it from the anterior glenoid neck. The subscapularis traction sutures will be utilized as a "shoe horn" to control the humeral head dislocation and relocation.


**4-2** The 'subscapularis tendon-capsule complex' is dissected and elevated as one unit from the humerus at the medial aspect of the bicipital groove. If this complex is contracted, a superior 180° release of the subscapularis must be performed to mobilize the tendon to gain eventual external rotation.


Further humeral neck joint capsule release may be performed medially, anteriorly or inferiorly as needed. The posterior capsule is maintained to facilitate centralization and prevent posterior subluxation. Take care to protect the axillary nerve as it passes inferior to the subscapularis and capsule. The location of the axillary nerve should be kept in mind at all times during capsular release.

**Note**
If the capsule is tented over large inferior osteophytes, it may be safer to remove the osteophytes with an osteotome, moving away from the articular surface in an inferior direction. Once the osteophyte has been separated from the bone, it may be peeled off the capsule, and the capsular release can then be completed adjacent to the capsular attachment to the humerus. This decreases the risk of inadvertently damaging the axillary nerve when attempting to mobilize the capsule out from beneath large inferior osteophytes.

**4-3** Place a large Darrach retractor underneath the upper part of the humeral head and dislocate the humerus. Put a medium size retractor on the inferior part of the humeral head and continue to bring the arm into full external rotation. The entire humeral head should now be in vision, with all capsular tissues removed from around the neck to provide excellent exposure.Release of the anterior, inferior and posterior glenohumeral ligaments is vital to properly and concentrically centralize the humeral head as noted above. At this point, the humeral head should freely rotate into maximum external rotation, slight abduction and significant extension allowing the head to dislocate anteriorly for preparation of the humeral head. Proper anterior and inferior capsular releases are needed for ease of dislocation and proper humeral head preparation as well as re-establishing concentricity of the glenohumeral joint. Releasing the inferior capsule off the humerus past the 6 o'clock position is essential in gaining exposure. Bone preparation is initiated by debridement of sufficient amount of anterior inferior osteophytes to properly identify the anatomic neck.



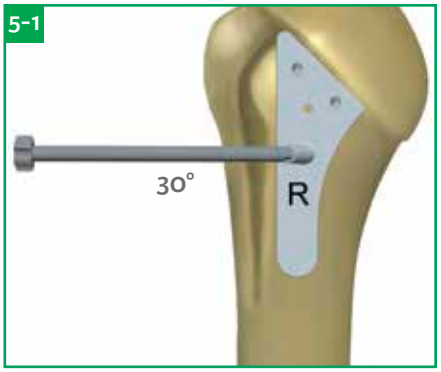
## Step 5 • Humeral Head Preparation and Resection

Assess the humeral head and remove any unwanted osteophytes to return the proximal humerus to near native anatomy.

5-1 **Freehand Head Resection Technique**

Place the Head Cutting Template along the anterior aspect of the arm parallel to the shaft of the humerus, and mark the angle at which the humeral head will be resected with an oscillating power saw or mallet and large osteotome. There are two proximal holes on the Head Cutting Template for 3.2mm Fixation Pin placement, if preferred. A 30° threaded version hole for the Head Cutting Template Handle / Version Rod is also available to assess retroversion.

The saw or osteotome should enter the anterior surface of the humerus along the line of the anatomic neck and exit 2-3mm proximal to the posterior cuff attachment. Once complete, the resection should be at the level of the articular surface of the supraspinatus insertion site.



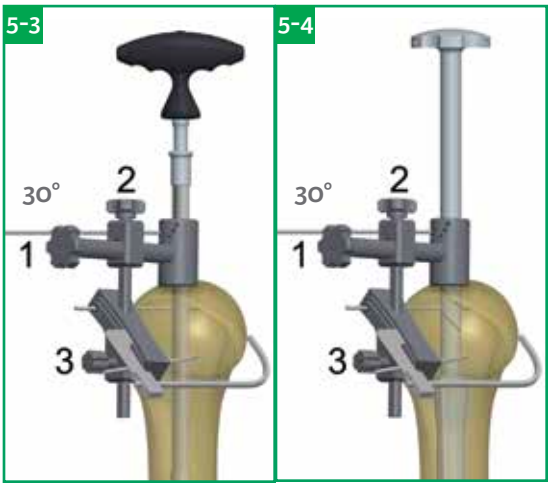

5-2 **Head Resection with an Intramedullary Cutting Guide**

Attach the T-Handle to the Starter Awl and create a pilot hole at the top of the humerus, in line with the long axis of the humerus just lateral to the articular surface of the head of the humerus and medial to the attachment of the rotator cuff.

**Note**
This surgical step should not be performed with power reamers or drills.

Leave the Starter Awl in place and clamp the Head Cutting Guide around the awl by tightening knob 1. The Version Rod is then passed through the holes in the cutting guide and is rotated into the desired retroversion. The holes denote 20°, 30°, and 40° of retroversion, in reference to the forearm axis. If more or less retroversion is required, use the orientation holes on the cutting guide collar and rotate the forearm to desired angle accordingly. Slide the cutting plate against the humerus and tighten knob 2. Then adjust the resection level by sliding the cutting plate up or down and tightening knob 3.


5-3 The Head Cutting Depth Gauge can be used to assess the cutting plane. The gauge should enter the anterior surface of the humerus along the line of the anatomic neck and exit 2-3mm proximal to the posterior cuff attachment. Before the oscillating saw blade (33 x 0.8mm) is placed along the flat surface of the cutting plate, drill two 3.2mm Fixation Pins through the cutting plate and into the underlying bone which will stabilize the guide. Remove the Cutting Guide-Starter Awl assembly by loosening knob 3 on the cutting plate and removing the Starter Awl out of the humerus. Use an oscillating saw through the capture to remove the humeral head. If additional head resection is needed, lower the blade to the next slot. This will remove 3mm of additional bone. After removing the humeral head, extract the Fixation Pins using the Pin Puller.



## Step 5 • Humeral Head Preparation and Resection (continued)

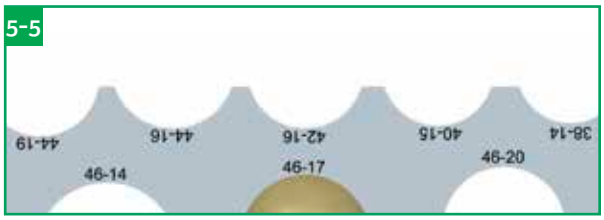
**Note**
For larger canals, it may be preferable to start impacting up, using the Stem Trials, until a solid fit is achieved in the canal. The cutting guide can then be attached to the Stem Trial Handle in the same manner as above.

5-5

### Head Sizing

Use the Head Sizing Gauge to measure the resected head diameter and thickness. Be sure to remove all osteophytes for accurate sizing. After measuring and selecting the humeral head size, place the humeral head on the back table to remove the cancellous bone. Use the cancellous graft later in the procedure if impaction bone grafting is needed for the metaphyseal body and humeral distal stem.

5-5




**Note**
The Humeral Osteotomy Covers provided in the instrument tray can be used to protect the proximal humeral preparation area.

## Step 6 • Glenoid System Preparation and Implantation

### 6a: Fin-Lock Glenoid

### 6b: Pegged Glenoid

### 6c: Keeled Glenoid

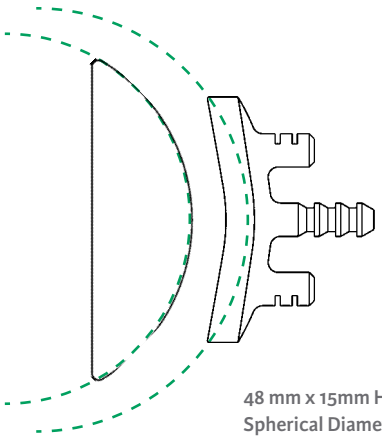
**Exposure**

Place a Fukuda retractor in the joint to retract the humerus posteriorly. Identify the axillary nerve by digital palpation and place a blunt Hohmann retractor between the axillary nerve and the subscapularis. Dissect the inferior capsule from the inferior border of the subscapularis. Release the capsule above the blunt Hohmann retractor to the glenoid margin. Release the rotator interval to the base of the corocoid to complete the superior and inferior release of the subscapularis. Release the capsule between the labrum and the subscapularis, leaving the labrum attached to the glenoid. With the subscapularis circumferentially released, the remnant capsule on the undersurface of the subscapularis can either be resected or retained to bolster the bulk of the subscapularis. Place the subscapularis with its attached tuberosity fragment behind a retractor. Grasp the remaining biceps tendon and excise the posterosuperior labrum from within the joint to the inferior labrum. Similarly, excise the anterosuperior labrum to the inferior labrum. This leaves a small fragment of inferior labrum with attached capsule that needs to be released. Protect the axillary nerve with an index finger and release the inferior capsule from the labrum. After release of the inferior capsule, exposure to glenoid is improved. Glenoid exposure is complete once the inferior capsule is released and the remnant labrum is excised.



## Step 6 • Glenoid System Preparation and Implantation (continued)

**Note**
When sizing the glenoid, care should be taken to create the recommended 4.0 - 8.5mm radial mismatch of the Humeral Head and Glenoid components. See chart below.



**48 mm x 15mm Head:**
**Spherical Diameter = 56mm**

**Medium Glenoid:**
**Spherical Diameter = 64mm**

**Diametrical Mismatch = 8mm**
**Radial Mismatch = 4mm**

| Head Size (mm) | Spherical Ø | Radial Mismatch with ExtraSmall Glenoid (54 Ø) | Radial Mismatch with Small Glenoid (59 Ø) | Radial Mismatch with Medium Glenoid (64 Ø) | Radial Mismatch with Large Glenoid (66 Ø) |
|---|---|---|---|---|---|
| 38x14* | 41 | 6.5mm | 9.0mm | 11.5mm | 12.5mm |
| 40x15* | 43 | 5.5mm | 8.0mm | 10.5mm | 11.5mm |
| 42x16 | 45 | 4.5mm | 7.0mm | 9.5mm | 10.5mm |
| 44x16 | 48 | 3.0mm | 5.5mm | 8.0mm | 9.0mm |
| 44x19 | 45 | 4.5mm | 7.0mm | 9.5mm | 10.5mm |
| 46x14 | 54 | 0.0mm | 2.5mm | 5.0mm | 6.0mm |
| 46x17 | 49 | 2.5mm | 5.0mm | 7.5mm | 8.5mm |
| 46x20 | 47 | 3.5mm | 6.0mm | 8.5mm | 9.5mm |
| 48x15 | 56 | -1.0mm | 1.5mm | 4.0mm | 5.0mm |
| 48x18 | 51 | 1.5mm | 4.0mm | 6.5mm | 7.5mm |
| 48x21 | 49 | 2.5mm | 5.0mm | 7.5mm | 8.5mm |
| 50x19 | 53 | 0.5mm | 3.0mm | 5.5mm | 6.5mm |
| 50x22 | 51 | 1.5mm | 4.0mm | 6.5mm | 7.5mm |
| 52x20 | 55 | -0.5mm | 2.0mm | 4.5mm | 5.5mm |

***38mm and 40mm Offset/Eccentric Head option only.**

***Green boxes represent the ideal glenohumeral sizing options as it relates to the Humeral Head and Glenoid implant sizes.**

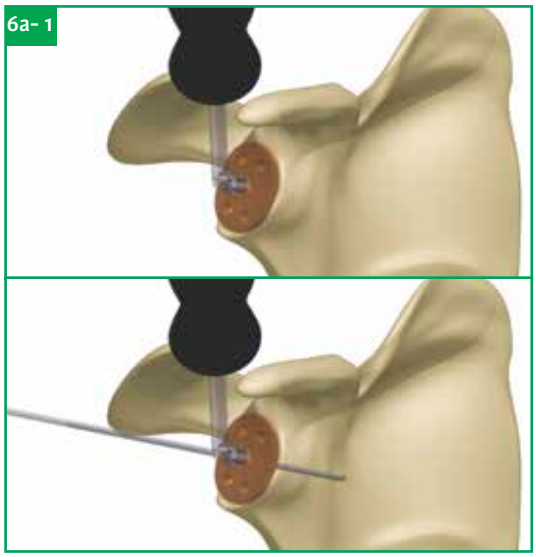
## 6a: Fin-Lock Glenoid System

### Cannulated Glenoid Preparation

#### Size Selection and Guide-Wire Placement

6a- 1

Select a Fin-Lock Sizer and attach the Angled Handle to the center post of the Sizer. The handle can be adjusted to an anterior superior angle. Select the size that covers as much of the glenoid surface as possible, without overhanging the periphery of the bone.




**Note**
Optional version-correction Sizers are included in the tray. Assess posterior wear on the glenoid and if version correction is necessary, select the appropriate 5 or 10 degree Sizer to accommodate off centered reaming and retroversion correction. The amount of version correction is typically established on preoperative CT scan. If more than 10° to 15° of version correction is required, asymmetric reaming of the glenoid will not adequately correct the version without compromising glenoid implantation.

| Version Correction | Step Height |
|---|---|
| None | +0 mm |
| 5° | +3 mm |
| 10° | +5 mm |

Insert the 2.8mm Guide Wire through the selected Sizer. Advance the Guide Wire until adequate purchase is achieved in the glenoid. Remove the Angled Handle and slide the Sizer anteriorly to remove, leaving the guide wire in the bone. The Glenoid Holder can be used to remove the sizer. Do not grasp the Sizer at the hex to prevent damaging the connection with the handle.

## 6a: Fin-Lock Glenoid System (continued)

### Cannulated Glenoid Reaming

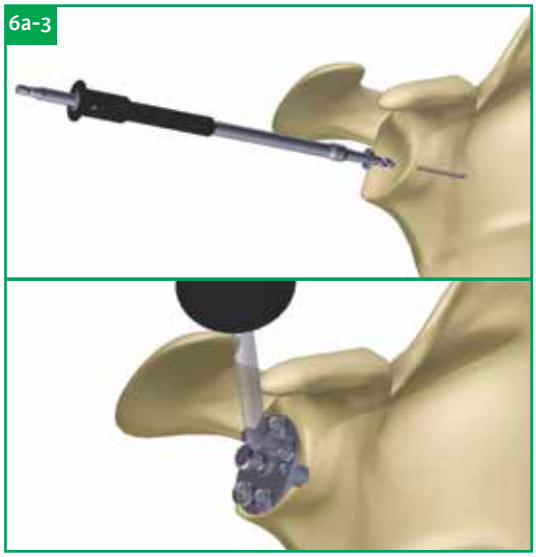
**6a-2** Select the appropriate sized Cannulated Reamer and attach the reamer to the 2.8mm Drill Shaft. Start the reamer prior to contacting the glenoid surface. Ream accordingly until proper concavity has been achieved and cartilage has been removed. Remove the reamer, leaving the Guide Wire in the bone. It is important to remember that over-reaming will both decrease the surface area of the glenoid face and reduce the depth of the glenoid vault. Excessive glenoid reaming should be avoided (See recommendations, in section 6a-1, on the limits of asymmetric glenoid reaming)

If manual reaming is preferred, attach the 2.8mm Drill Shaft to the T-Handle located in the Fin-Lock instrument tray.


### Cannulated Center Peg Preparation

**6a-3** Select the appropriate Cannulated Central Peg Drill: 15mm for XS/S and 18mm for M/L. Attach the Cannulated Central Peg Drill to the 2.8mm Drill Shaft. Slide the drill over the Guide Wire and drill to the stop. Remove the Guide Wire. Attach the Angled Handle to the Drill Guide and align the Drill Guide over the central hole. Place a Central Anti-Rotation Peg to stabilize the Drill Guide.

**Continue to step 6a-7**




## Non-Cannulated Glenoid Preparation

### Size selection

**6a-4** Select a Fin-Lock Sizer and attach the Angled Handle to the center post of the Sizer. The handle can be adjusted to an anterior superior angle. Select the size that covers as much of the glenoid surface as possible, without overhanging the periphery of the bone.

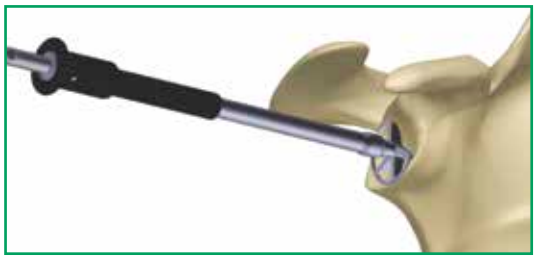
## 6a: Fin-Lock Glenoid System (continued)

### Glenoid Reaming

6a-5 Attach the Starter Drill to the 2.8mm Drill Shaft. Select the appropriate Starter Drill Guide and align the guide centrally on the glenoid. Drill through the center hole until the drill stops to create a hole for the non-cannulated reamer post.

Select the appropriate Non-Cannulated reamer and attach it to the 2.8 mm Drill Shaft. Start the Reamer prior to contacting the glenoid surface. Ream accordingly until proper concavity has been achieved and cartilage has been removed. It is important to remember that over-reaming will both decrease the surface area of the glenoid face and reduce the depth of the glenoid vault. Excessive glenoid reaming should be avoided.

If manual reaming is preferred, attach the 2.8mm Drill Shaft to the T-Handle located in the Fin-Lock instrument tray.

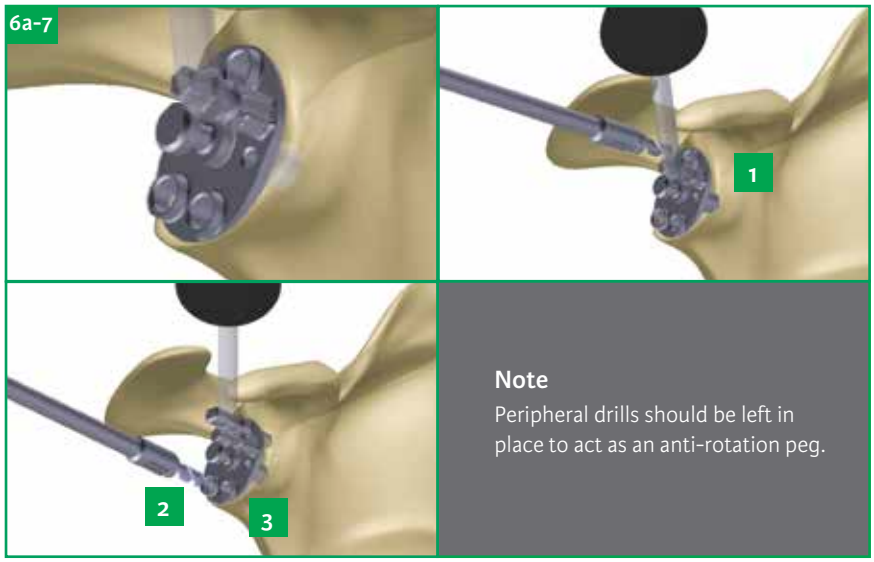
### Center Peg Preparation

6a-6 Attach the Angled Handle to the 2.8mm Drill Guide. Select the appropriate Central Peg Drill: 15mm for XS/S and 18mm for M/L. Attach the Central Peg Drill to the 2.8mm Drill Shaft. Align the Drill Guide with the center hole and drill until the collar of the drill bit contacts the guide. Place a Central Anti-rotation Peg in the hole.

Option: An alternative to holding the Drill Guide in place is to insert the 2.8mm Guide Pin through one of two holes in the Drill Guide directly and securely into the glenoid fossa. This alleviates the need to hold the Drill Guide in place by hand, and allows for better visibility and maneuverability in the joint space.


### Peripheral Peg preparation

6a-7 Attach a Peripheral Drill to the Self-retaining Drill Adaptor. Ensure the Drill Guide is aligned so that the two adjacent holes are inferior. Drill the superior hole (1) until the collar of the drill bit contacts the guide. Pull the Self-retaining Drill Adaptor gently and the drill will remain in the hole and act as an anti-rotation peg. Select another Peripheral Drill and drill the posterior inferior (2), hole. Leave the drill in as an anti-rotation peg. Select another Peripheral Drill and drill the anterior inferior hole (3). Remove the Drill Guide, Central Anti-rotation Peg and Peripheral Drills.




**Note**
Peripheral drills should be left in place to act as an anti-rotation peg.

## 6a: Fin-Lock Glenoid System (continued)

### Punch

6a-8 A Punch is available to check hole positioning/depth in addition to being used as a cement pressurizer. Check each peripheral hole to determine whether it penetrates the scapula at its base. If penetration is detected consider bone grafting the hole with cancelleous bone harvested from the resected humeral head. The Punch can be utilized to impact the graft.


### Trial

6a-9 Select the appropriate Fin-Lock Trial and impact the trial onto the glenoid using the Glenoid Impactor. The trial matches the drill diameter and will give you a secure trial fit. Visually verify that the trial component sits flush with the prepared glenoid surface through the slots in the trial. Remove the trial and irrigate the glenoid using pulsative lavage to remove blood and tissue debris from the drill holes.


### Cement and Implant

6a-10 While cement is being prepared, obtain hemostasis by packing each of the peg holes with thrombin and surgical gauze or gel foam. Mix cement using manual or syringe application. Place the cement into a 60 cc Catheter/Toomey syringe. Insert the tip and pressurize the cement into each of the peg holes. Further pressurize the cement using the Punch, remove the Punch and refill the drill holes with cement. This will allow for cement pressurization as well as removal of any excess cement on the glenoid surface.

Attach the appropriately sized Combo Inserter/Extractor to the corresponding Fin-Lock implant and screw on the Glenoid Impactor Handle. Apply cement to cover the entire backside of the Fin-Lock implant and impact the implant construct with a mallet until there is complete contact between the back side of the implant and the prepared glenoid surface. It may be necessary to use the oval Glenoid Impactor to fully seat the component. Maintain pressure directly on the glenoid component until the cement has hardened.

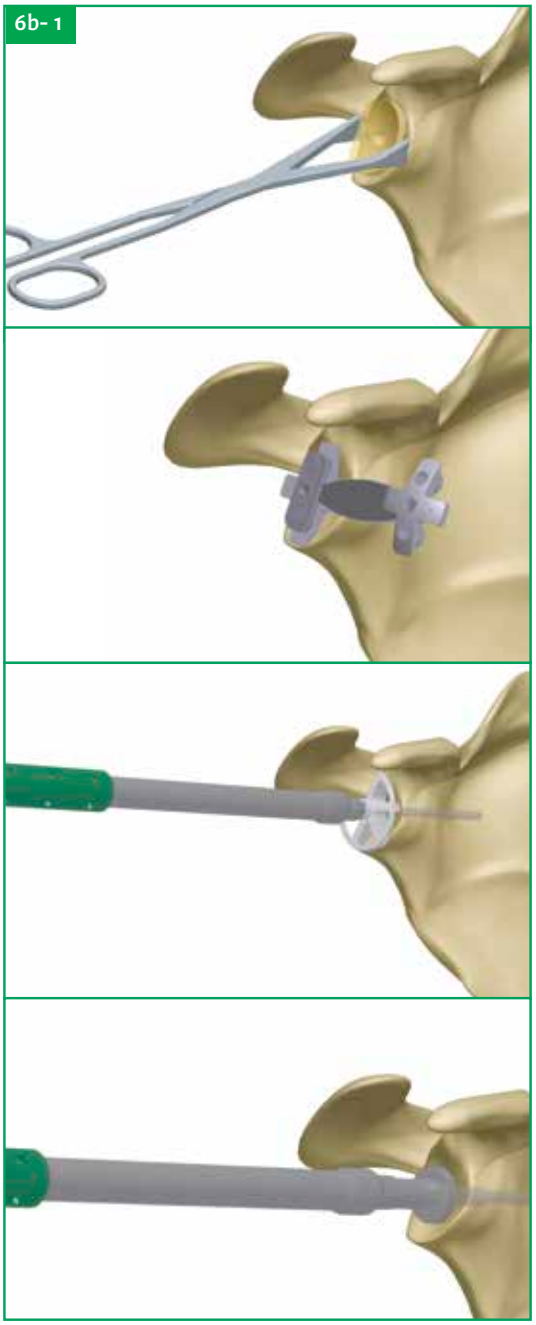
## Step 6b • Pegged Glenoid Preparation and Implantation

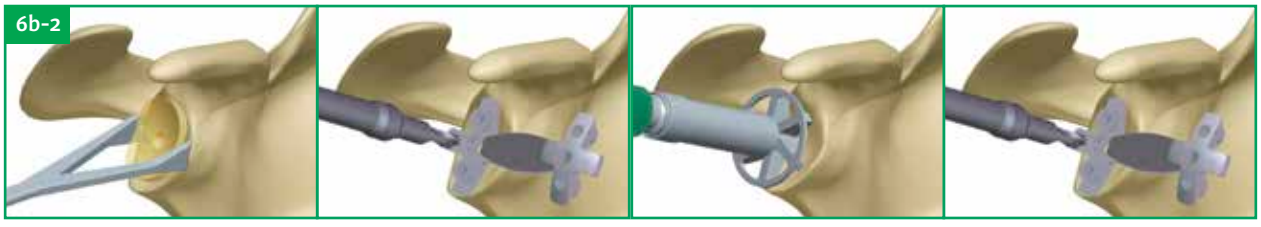
### Cannulated Drill/Cannulated Reaming

**6b- 1** When exposure is deemed adequate, use the Glenoid Sizers and Glenoid Holder to size the glenoid. Mark the center of the glenoid using the hole in the Glenoid Sizer with a skin marker. Attach the appropriately sized Pin Bushing onto the selected size Glenoid Drill Guide. Align with the center mark, and using the included 2.0mm Guide Pin, drive through the Pin Bushing until adequate purchase is achieved into the glenoid. If increased retroversion is noted on preoperative imaging studies, then orient the Glenoid Drill Guide to correct this retroversion by placing the drill guide in a plane that is anteverted from the native glenoid plane prior to Guide Pin insertion. Remove the Drill Guide/Pin Bushing. Attach the appropriately sized 5-fluted Glenoid Reamer to the Straight Drill Shaft. Slide over the Guide Pin, start the reamer before making contact with the bone and ream accordingly until proper concavity has been achieved and cartilage has been removed. It is important to remember that over-reaming will both decrease the surface area of the glenoid face and reduce the depth of the glenoid vault. Excessive glenoid reaming should be avoided. Leaving the Guide Wire secure in the bone, use the Cannulated Peg Drill to create the center hole. Remove the Guide Wire.

### Alternative Non-Cannulated Drill/Reaming

**6b- 2** When exposure is deemed adequate, use the Glenoid Sizers and Glenoid Holder to size the glenoid. Also, mark the center of the glenoid using the hole in the Glenoid Sizer with a skin marker. Attach the Glenoid Solid Peg Drill onto the Straight Drill Shaft and use the center hole in the appropriately sized Glenoid Drill Guide. Drill the central hole. Attach the appropriately sized Glenoid Reamer to the Straight Drill Shaft.
Insert the nub of the reamer into the central hole. Start the Reamer before making contact with the bone and ream accordingly until proper concavity has been achieved and cartilage has been removed. It is important to remember that over-reaming will both decrease the surface area of the glenoid face and reduce the depth of the glenoid vault. Excessive glenoid reaming should be avoided. Align the Glenoid Drill Guide with the current center hole and drill using the Peg Drill.



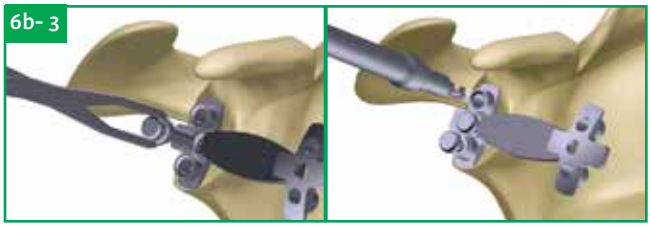



## Step 6b • Pegged Glenoid Preparation and Implantation (continued)

### Peripheral Peg Drilling

6b- 3

Place an Anti-rotation Peg in the center hole using the Anti-rotation Peg Holder. This will help stabilize the drill guide during the drilling of the peripheral peg holes. Rotate the drill guide to desired orientation and drill the peripheral peg holes.

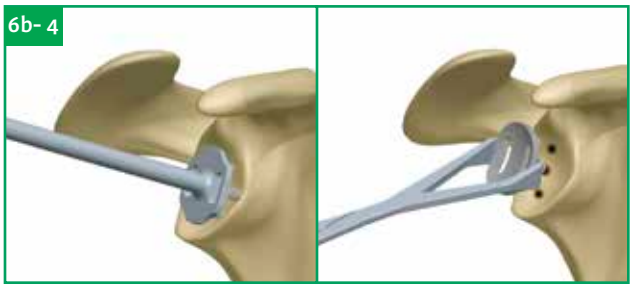


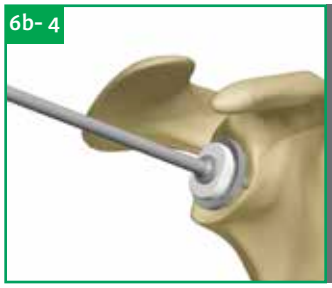

After each peripheral peg hole is drilled, insert an Anti-rotation Peg to maintain alignment of the drill guide. The preferred scenario is drilling so as not to penetrate the scapula which will allow you to pressurize the cement mantle. Check the quality of the glenoid bone preparation by determining if the component is directly supported by precisely contoured bone, which should prevent the component from rocking, even when an eccentric load is applied to the rim of the implant.

### Punch/Trial

6b- 4

A Glenoid Peg Punch is available to check hole positioning/depth. Check each peripheral hole to determine whether it penetrates the scapula at its base. If penetration is detected consider bone grafting the hole. The Glenoid Peg Punch can be utilized to impact the graft. Select the appropriate Glenoid Peg Trial and impact the trial onto the glenoid using the Glenoid Impactor. The trial matches the drill diameter and will give you a secure trial fit. Visualize that the trial component sits flush with the prepared glenoid surface through the slots in the trial. Remove the trial and irrigate the glenoid using pulsative lavage to remove blood and tissue debris from the three drill holes.




**Note**

The Peg Punch is the same dimension as the final implant. Additional cement must be placed in the holes after pressurization or the implant will not be adequately cemented.

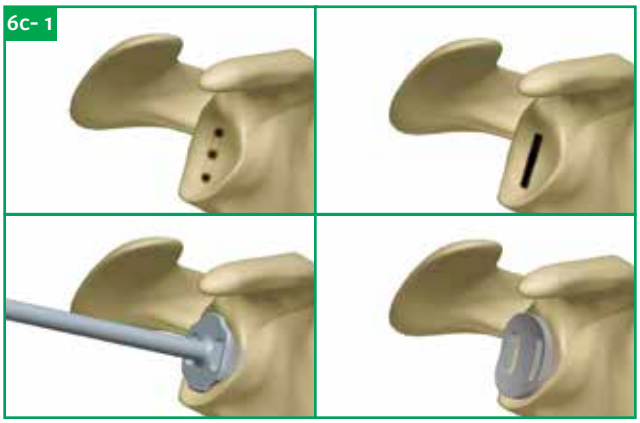
6b- 5

Open the appropriately sized pegged glenoid implant. While cement is being prepared, obtain hemostasis by using the Cement Pressurizer and attaching it to the T-Handle. Hemostasis may also be achieved by packing each of the peg holes with thrombin and surgical gauze or gel foam. Mix cement using manual or syringe application. The cement is placed into a 60cc Catheter/Toomey syringe. The end of the syringe is cut with scissors. The tip is inserted, and the cement pressurized into each of the peg holes. Further pressurize the cement and refill the drill holes with cement. This will allow for cement pressurization as well as removal of any excess cement on the glenoid surface.

Apply cement to cover the entire backside of the pegged glenoid component, insert the implant, and use the Glenoid Impactor to seat the component until there is complete contact with the perimeter of the glenoid. Maintain pressure directly on the glenoid component until the cement has hardened.

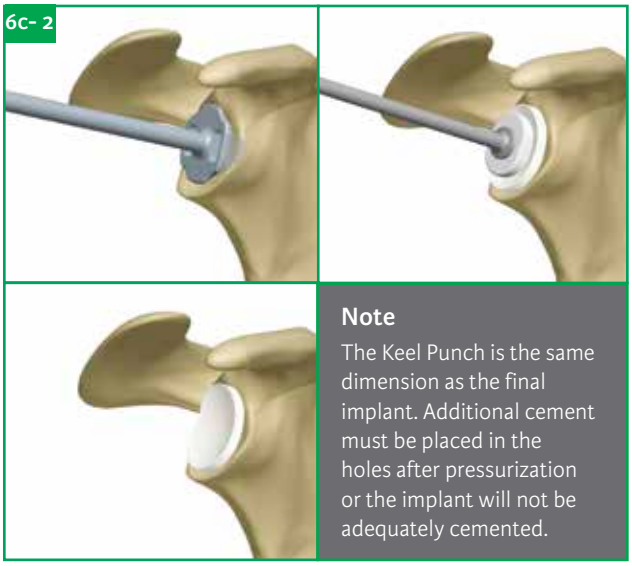
## Step 6c • Keeled Glenoid Preparation and Implantation

**6c- 1** If using the Keeled Glenoid implant, prepare the glenoid as previously described. As mentioned in Step 6b-1 and 6b-2, size, then drill the central hole and ream the glenoid. Proceed with drilling the peripheral peg holes. Use a burr, rongeur or curette to connect the peg holes for the keel of the prosthesis. Excavate the bone in the base of the coracoid and down the lateral border of the scapula to help lock the keeled prosthesis with cement. Use the Glenoid Keel Punch to impact the bone in the glenoid fossa for proper fit of the Glenoid Keel Trial. The Glenoid Keel Trials have slots in them to visualize that the back of the prosthesis will sit flush on the bone of the glenoid fossa. Commence with trialing.




**6c-2** Open the appropriately sized keeled glenoid implant. While cement is being prepared, obtain hemostasis by packing the keel hole with thrombin and surgical gauze or gel foam. Mix cement using manual or syringe application. The cement is placed into a 60cc Catheter/ Toomey syringe. The end of the syringe is cut with scissors. The tip is inserted, and the cement pressurized into the keel hole. Further pressurize the cement using the Glenoid Keel Punch, remove the punch and refill the keel hole with cement. This will allow for cement pressurization as well as removal of any excess cement on the glenoid surface.

Apply cement to cover the entire backside of the keeled glenoid component, insert the implant, and use the Glenoid Impactor to seat the component until there is complete contact with the perimeter of the glenoid. Maintain pressure directly on the glenoid component until the cement has hardened.




**Note**

The Keel Punch is the same dimension as the final implant. Additional cement must be placed in the holes after pressurization or the implant will not be adequately cemented.

## Step 7 • Humeral Canal Preparation

**7-1** Side the Depth Stop onto the Stem Trial Handle prior to attaching it to the 6mm Humeral Stem Trial. Place the tip of the stem trial at the most superior point on the resected humerus just behind the long head of the biceps groove, so that it is aligned with and ready to pass directly down the intramedullary canal. Using the Stem Trial, create a pilot hole and then sequentially trial/impact the medullary canal in line with its long axis. If the extramedullary cutting guide was used the Starter Awl can be used to create the pilot hole. Continue sequential trialing/impacting, following the path created through the intramedullary canal, increasing the Stem Trial diameter in 1mm increments until a solid fit is achieved in the humerus.

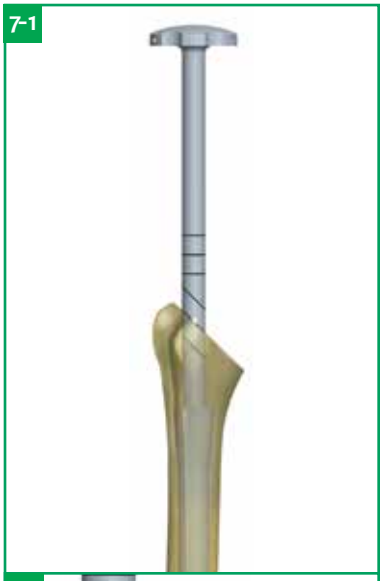
### Note

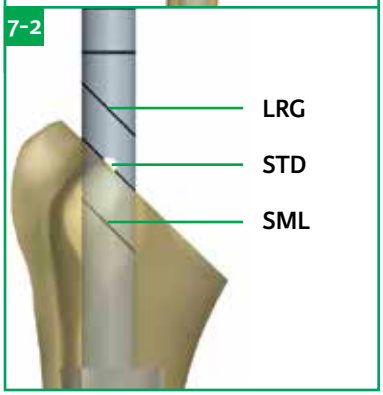
The diagonal laser markings and hole on the inserter handle correspond to the depth required for the Small, Standard, and Large Proximal Bodies. If a depth stop is not available, for the Standard Body, place a 3.2mm Fixation Pin through the hole and drive the trial down until the pin sits flush on the osteotomy. Remove the pin and ensure the trial does not advance further. If trial advances, additional sequential trialing/impacting to a larger diameter is needed, be sure to stop when resistance within the canal is felt.

**7-2** The laser etching below the hole is for the Small Proximal Body and the etching above the hole is for the Large Proximal Body. If using a Small or Large body height, impact until the appropriate laser etching is parallel with the osteotomy.

### Tip

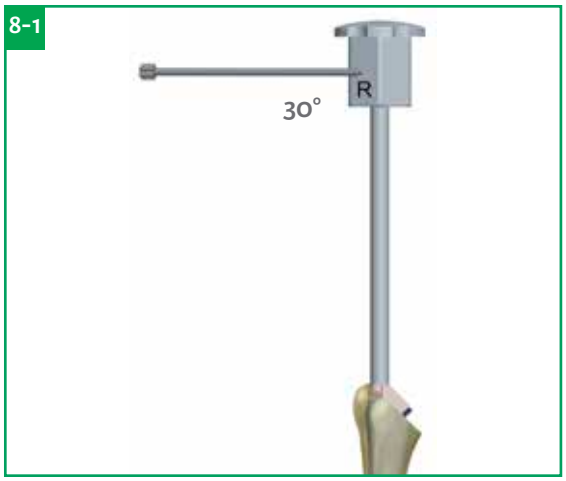
With the Stem Trial Handle attached to the stem trial,note the final Stem Trial diameter. This will determine the size of the final distal stem implant. When trialling to determining the appropriate body and stem size, trialling to the Small Body line will allow you up-size during a conversion to a Reverse.



## Step 8 • Body And Stem Trial Insertion

**8-1** Remove the Stem Trial and attach it to the closest corresponding Body Trial. Proximal Bodies are interchangeable and can be used with all stem sizes. If the Trial Stem is between Proximal Body sizes, it is suggested to start with the smaller diameter Body Trial and go up to the larger diameter Body Trial if needed. Attach the Body/Stem Trial construct to the Humeral Trial Inserter/Extractor inserting the D feature in the taper hole for alignment, then tightening the top of the Humeral Trial Inserter/Extractor until the Body/Stem Trial is secure.

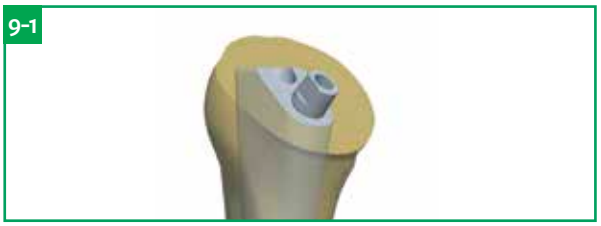



Using the Cutting Template Handle for a threaded version rod on the Humeral Trial Inserter/Extractor (which is set at 30° of retroversion), impact the stem in the correct retroversion, which corresponds to the version set during the humeral head osteotomy. Seat the Body/Stem Trial until the Humeral Trial Inserter/Extractor sits on the resected surface. At this point, the Body Trial is seated flush to the resection. Remove the Humeral Trial Inserter/Extractor.

## Step 9 • Humeral Head Trial

### Osteotomy Evaluation/Calcar Reaming

**9-1** Place the Taper Adaptor onto the Body Trial. Attach the Trial Calcar Planar onto the ratcheting T-Handle to remove any excess bone on the surface of the osteotomy




**9-2** The angle of the Trial Calcar Planar when fixed onto the Taper Adaptor will be parallel to the standard neckshaft angle at 135°. Assess its relationship to the resected plane. If the angle diverges by only a few degrees then the Calcar Planar can be used to finalize the plane.


> **Note**
> Ensure all boney protrusions are clear before moving on to head trialing.

### Osteotomy Sizing Template

**9-3** Select the Head Sizing Plate that most closely covers the cut surface of the humeral osteotomy.
After determining the diameter of the measured humeral head, use the Head Sizing Plate to determine if a concentric or eccentric head is necessary.
Select the appropriately sized Humeral Head Trial.

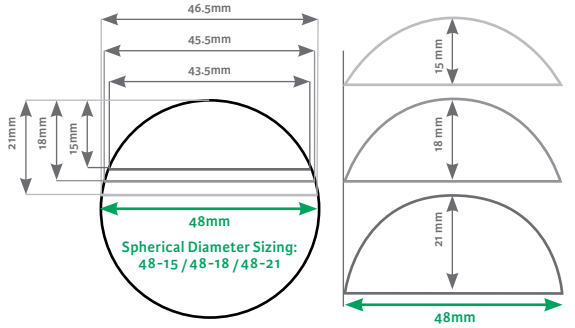
## Step 8 • Body And Stem Trial Insertion

### Head Trialing

9-4

This system measures its humeral heads using a base width x height measurement. A 46x17 head is 46mm wide x 17mm tall. This makes different spherical radii in one base width as height changes. Some systems use a spherical diameter measurement which keeps a constant spherical radii, yet this causes the base width to change as height changes. With this system, you choose the diameter that best fits your osteotomy, then choose the head height that best matches the glenoid component while allowing for adequate soft tissue balancing.

9-4




### Concentric Head Trialing

9-4a

Once trial is selected, place the Concentric Head Trial onto the Taper Adapter on the Body Trial. Check that the head trial achieves appropriate coverage of cortical bone, with 5-8mm height above the greater tuberosity. Proper head thickness can be determined during trial reduction. If necessary, increase or decrease selected head size/type and reassess in place. A final decision will be made during trial reduction, with the glenoid component in place.

### Eccentric Head Trialing

9-4b

If the Stem Trial is off-center in relation to the humeral osteotomy, the Eccentric Head Trial will allow the head to be rotated into the head position that allows maximum coverage of the proximal humerus.

Place the Eccentric Head Trial onto the Taper Adaptor on the Body Trial and rotate the head trial to the desired position. Once the Eccentric Head Trial position is selected, lock the Head Trial position with the Head Impactor. Mark the final position of the Eccentric Head Trial peripheral notch on the humeral surface for later reference with the final implant.

Ensure the taper adapter remains in the head for proper eccentricity assessment if using the back table assembly technique.

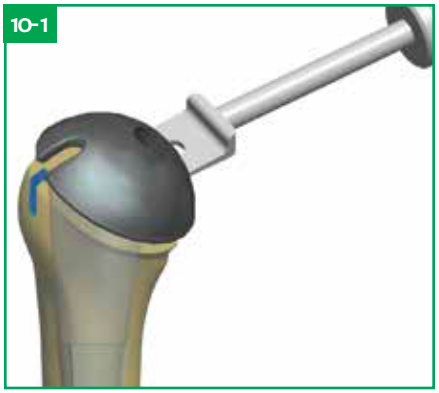
9-4b

**Note**

If the Humeral Head Trial does not lock onto the Taper Adaptor, it may be necessary to Calcar plane further to clear any boney impingement.

## Step 10 • Soft Tissue Balancing and Trial Removal

**10-1** With the Body/Stem Trial and Humeral Head Trial in place, use a burr or a rongeur to remove any residual osteophytes extending beyond the periphery of the humeral head. It is important to balance soft tissue tension with the appropriate trial humeral head in place. It should be possible to fully internally rotate the arm across the chest so that the hand of the involved shoulder easily rests on top of the opposite shoulder, without elevating the involved shoulder off the table. It should also be possible to externally rotate the arm 30-40° and still re-approximate the subscapularis tendons to the cut surface of the neck of the humerus. With the arm in neutral rotation, the humeral head should posteriorly sublux 50% or more but should spontaneously reduce when the posterior force is released. Remove the Head Trial/Taper Adapter construct by hand. If difficult to remove use the Head Extractor tool under the trial head.




### Stem Trial Removal

**10-2** Mark the osteotomy in line with the laser etching on the back of the Body Trial. This will be used as a reference for matching rotation with the final implant. Extract Body/Stem Trial construct from the humeral canal using the Threaded T-Handle or Humeral Trial Inserter/Extractor and Slotted Mallet.


## Step 11 • Preparation for Repair of Subscapularis Tendon

**11-1** If the subscapularis tendon was removed with a small portion of lesser tuberosity, two permanent sutures are passed through two sets of holes for later tension band suturing of the lesser tuberosity fragment to its native bed. In this circumstance, we recommend placing the sutures through the suture holes and/or around the stem of the prosthesis and pulling the slack out of the sutures just before the prosthesis is placed into its final seated position within the humeral canal.

If the subscapularis tendon was cut using sharp dissection a tendon to tendon repair can be performed after final prosthesis has been implanted.

## Step 12 • Body and Stem Implant Assembly

### Proximal Body and Distal Stem Assembly

**12-1** Select and remove from their packaging the final Humeral Body and Humeral Stem sizes that correspond to the trials. Seat and secure the Humeral Body implant onto the Stem Impaction Stand. Place the Humeral Stem implant onto the Humeral Body with finger pressure. Place the Stem Impactor over the tip of the humeral stem and engage the tapers with a few mallet strikes.

## Step 12 • Body and Stem Implant Assembly (continued)

**12-2** Remove the Humeral Body Screw from its packaging and insert into the Humeral Body with the Driver Handle, Torque Limiter and 1/8 Hex Driver. Tighten the screw until the torque limiter clicks.

**Note**
The implant stand can be used to hold the implant while tightening the Humeral Body Screw. The torque limiter is designed to tighten the screw to 2 Nm.

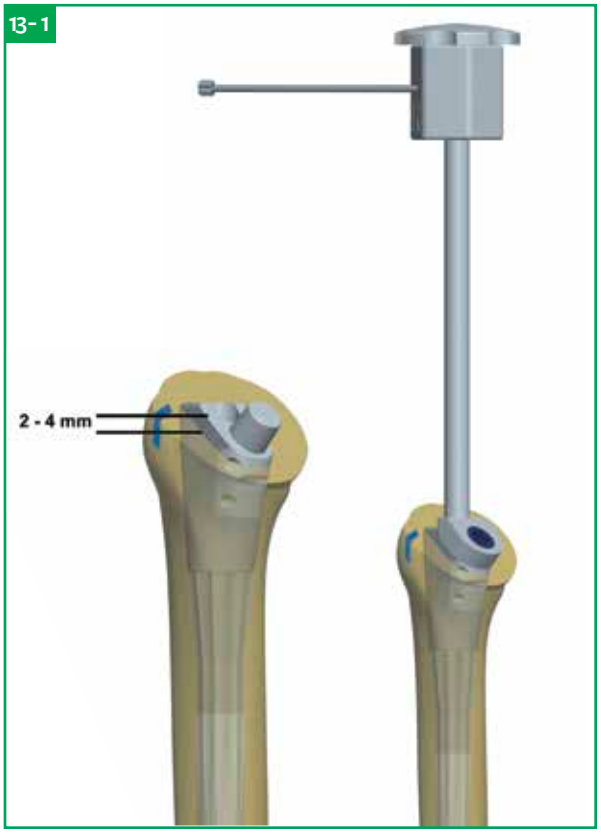

## Step 13 • Stem/Body Implantation and In-Situ Head Assembly

This system is designed as a press-fit prosthesis, in which the press-fit is achieved via the tapering and splines of the distal stem. The use of cement is not necessary or recommended. Cemented stems are available for cases in which a press-fit stem would not be appropriate.

### Stem Insertion

**13-1** Insert the assembled Body/Stem implant into the prepared humerus using the Humeral Implant Inserter/ Extractor. Use the Head Cutting Template Handle / Version Rod on the Humeral Implant Inserter/Extractor to set the stem in the correct anatomic retroversion, which should match the version set at the time of the humeral osteotomy and trialing. The body has a laser mark that can be lined up with the previous mark placed on the osteotomy. Slowly impact the implant and stop once the stem is firmly seated and the top of the body is approximately 2-4mm above the osteotomy. This will ensure Morse taper assembly with Humeral Head.
If desired, use the gold Implant Calcar Planar to remove any excess bone at the osteotomy.

**Note**
Thoroughly clean and dry both tapers to ensure proper fit.



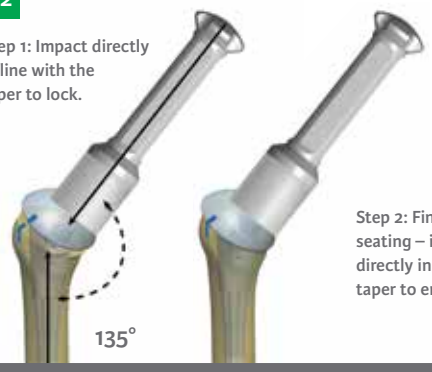
## Step 13 • Stem/Body Implantation and In-Situ Head Assembly (continued)

### Humeral Head Assembly
### In–Situ

13-2 Place the selected Humeral Head onto the clean and dry Morse taper. If using an Eccentric Humeral Head you can place a mark on the articular surface of the Humeral Head reflecting the eccentric etching on the bottom of the Humeral Head. This will allow you to line up the mark on the head with the previously recorded position on the osteotomy. Once Humeral Head position is satisfactory, impact the head in line with the taper using the Head Impactor.

**Note**
The implant must be seated by impacting the head in line with the taper.

13-2




**Note**
Once secured, check the humeral head by hand to confirm taper lock.

Remove any further osteophytes. The Humeral Head should be about 5mm above the top of the greater tuberosity. If a lesser tuberosity osteotomy was performed, there is often a portion of the anterior part of the humeral prosthesis that overhangs the bone. This is where the lesser tuberosity is going to fit. Now perform the final checks for range of motion, correct version and stability.

## 13-3 Back Table Assembly Option

### Seating the Standard/Concentric Humeral Head

With the Humeral Body/Stem prosthesis in the stand, the proximal plane of the proximal body will be parallel to the table top and allow the final humeral head to be driven down perpendicular to the table top, ensuring proper seating of the Morse taper. With the final head in place, impact it into the Humeral Body using the rubber tipped Head Impactor and the Slotted Mallet. Impact the head 3-4 times to ensure proper seating and Morse taper.

### Seating the Eccentric Humeral Head

There is an etching on the nonarticular surface of the final Eccentric Humeral Head that corresponds to the peripheral slot on the Eccentric Head Trial. Line the etching up to the referenced position previously marked on the Head Impaction Stand. It may be helpful to use a skin marker to place a mark on the articular surface near the etching. This technique ensures that the final prosthesis will have the same orientation as the Trial construct. Firmly impact the head by placing the rubber tipped Head Impactor on the Humeral Head and striking the impactor three to four times with the Slotted Mallet.

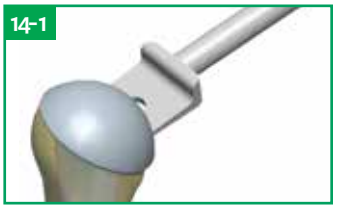
### Insertion of Final Humeral Head, Body and Stem Assembly

Place the final assembled Humeral Head/Body/Stem down the humeral canal checking rotation as it is seated. Use the Head Impactor to insert the assembly to the final seated position. The Humeral Head should sit flush on the osteotomy.

Remove any further osteophytes. The Humeral Head should be about 5 mm above the top of the greater tuberosity. If a lesser tuberosity osteotomy was performed there is often a portion of the anterior part of the humeral prosthesis that overhangs the bone. This is where the lesser tuberosity is going to fit. Now perform the final checks for range of motion, correct version and stability.

## Step 14 • Revision Procedure

Removal of the humeral head and/or proximal humeral body during revision surgery can be achieved without disturbing a well-fixed distal stem.





### Removing the Humeral Head

**14-1** The Humeral Head can be removed using the Humeral Head Extractor. Place the two prongs of the extractor between the humeral head and the osteotomy surface so that the prongs will advance in each side of the linking component. Lift the head off the proximal humeral body taper by impacting the end of the extractor with the slotted mallet.

### Removing only the Proximal Humeral Body

**14-2** The Humeral Body can be removed using the T-Handle and the final Implant Inserter/ Extractor. First disengage the Humeral Body Screw and remove using the 1/8 Hex Driver. Unthread the inner rod from the Implant Inserter/Extractor and replace with the T-Handle. Place the Inserter/Extractor over the taper, and thread the T-Handle into the Humeral Body until resistance is felt. Grip the Inserter/ Extractor firmly to control rotation of implant and continue to tighten the T-Handle to disengage the Morse taper between the Humeral Body and distal stem. Remove the Humeral Body, which will be threaded onto the T-Handle.

### Removing the Stem

**14-3** The stem is designed to remain in the humeral canal in a revision or conversion to reverse. If removing the Stem is necessary, leave the Humeral Body on and the Body Screw fully inserted. Insert the Implant Inserter/Extractor over the taper and use the slotted mallet against the strike plate until the stem and body are removed from the bone intact.  It is recommended to also have the Titan Modular Shoulder System Long Stem tray available and use the stem adapter with the slap hammer.

## Long Stem Option and Implantation

The surgical technique for implanting a Titan Modular Shoulder System Long Stem differs slightly from the standard stem process.

**Note**
Long stems are intended for cemented use only
The Long Stem Reamers, within the Long Stem instrument set, are a special order item and do not come with the standard TSS and RSS instrumentation set

### Long Stem Trialing

Attach the T-Handle to the Starter Awl and create a 6mm pilot hole in the humerus. Continue progressively reaming using cylindrical reamers of increasing diameter to 8, 10, or 12mm in either the 125mm or 165mm stem length options. The canal is reamed until cortical chatter is present and inserted to the depth of the laser mark associated with the desired height of humeral body.

It is important to prepare the medullary canal over its total length. The final reamer used will correlate to the proper Trial Long Stem selected. The reamer, trial, and implant are line to line; minimizing cement to the stem flutes and within the surrounding trabecular bone.

## Long Stem Option and Implantation (continued)

If a greater cement mantle is desired, choose a Long Stem Implant diameter smaller than the reamer and Trial Long Stem diameter used for preparation.

### Humeral Body Trial

**Note**
The Primary Body Trials from the Total Shoulder System Humeral Tray 1 can be used with the Trial Long Stems to determine proper prosthesis height prior to cementing.

Attach the selected Body Trial/Long Stem Trial construct to the Humeral Trial Inserter/Extractor by inserting the D feature in the taper hole for alignment. Tighten the top of the Humeral Trial Inserter/Extractor knob until the selected Body Trial/Long Stem Trial construct is secure.

Affix the Cutting Template Handle / Version Rod to the Humeral Trial Inserter/Extractor to ensure proper version. The Cutting Template Handle / Version Rod is aligned parallel with the patient's forearm and initially sets the trial construct in 30° of retroversion. Using the Slotted Mallet, carefully drive the Body Trial/Long Stem Trial into the proximal humerus so that it is in line with the long axis. Seat the Body Trial/ Long Stem Trial until the desired fit is achieved.

The Body Trial/Long Stem Trial should be positioned at the correct height to preserve the anatomic reconstruction. If the desired Body Trial size is between the available options after the appropriate Long Stem Trial has been determined, its suggested to start with the smaller height/diameter Body Trial and go up to the larger height/diameter Body Trial if needed.

**Note**
For further instructions, please refer to:
Step 9 – Humeral Head Trialing
Step 10 – Soft Tissue Balancing

### Humeral Body and Long Stem Implant Assembly

Remove the final Humeral Body and Long Stem implants that correspond to the trials from their packaging. Seat and secure the selected Body Implant onto the Stem Impaction Stand. Place the Long Stem Implant onto the Humeral Body with finger pressure. Place the Stem Impactor over the tip of the humeral stem and engage the tapers with a few mallet strikes. Then insert the body screw using the 1/8 Hex Driver, attached to the Torque Limiter. Once the Body/Stem construct is secure, place the selected Humeral Head implant onto the clean and dry Morse taper. Impact the head in line with the taper using the Head Impactor with a few strikes of a mallet.

### Cementing the Stem

Thoroughly irrigate the medullary canal to remove debris. Use either a small piece of cancellous bone or utilize a cement restrictor and place 1-2 cm below distal stem to prevent cement from extruding to the elbow. Use either medium or high viscosity cement, place cement down the humeral canal using finger pressure. Now insert the full implant construct.

## Step 15 • Wound Closure

Once final implant is in place, the subscapularis tendon repair can be completed with the previously placed sutures.

When necessary, perform a biceps tenodesis prior to wound closure.

Thoroughly irrigate the wound with antibiotic solution. If a regional anesthetic is not used then infiltrate the soft tissue with a local anesthetic that will last 6-8 hours. A wound drainage system is recommended to prevent formations of postoperative hematoma.

The wound may be closed according to surgeon preference. Careful attention to wound closure will result in a cosmetically acceptable incision. After the dressing and shoulder immobilizer are in place, the use of a cold wrap is recommended. This prefrozen wrap can be placed on the shoulder in the operating room and replaced with another unit every three hours. The combination of regional anesthetic or local anesthetic and the immediate cooling seems to decrease the amount of postoperative pain.

## Postoperative Therapy Protocol

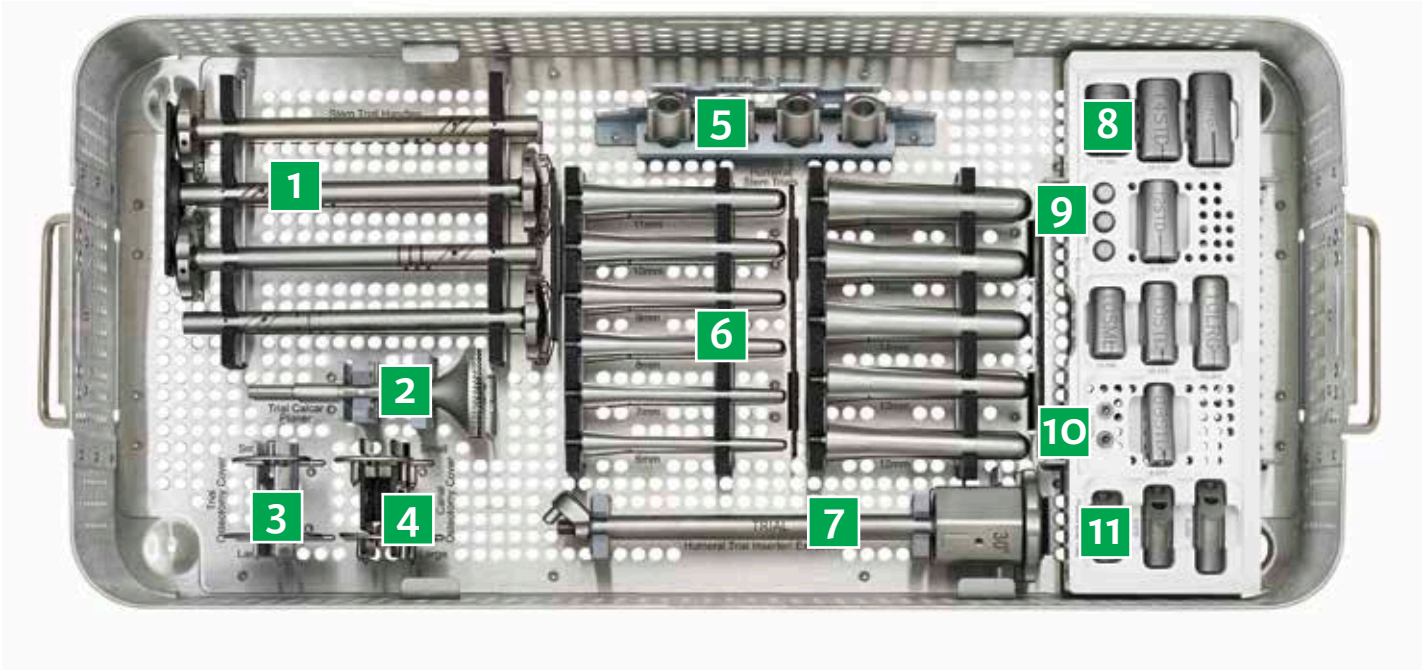
The patient is placed in a comfortable immobilizer with arm at their side and regional block analgesia as preferred. Active pendulum exercises are not encouraged in order to prevent stretch of the anterior repair. However, supine passive range of motion within 24-72 hours of surgery is of the utmost importance. The limits to the extent of passive range of motion performed should not exceed the safe zone of rotation observed at surgery after subscapularis closure.

Supervised physical therapy program is recommended after 24-48 hours. Supervised active assisted and passive range of motion mobilization is suggested for the first 72 hours. Active assisted and passive assistance is recommended for 6 weeks after which terminal stretching and active range of motion is initiated. Home pulley system is initiated at 72 hours.

The sling immobilizer may be abandoned at approximately 6 weeks to protect the subscapularis repair. Most patients are able to perform all their exercises at home in a physician supervised therapy program. Supervision of all post-operative therapy is recommended. Therapy should be individualized and based on the status of the repaired tissues and muscle strength. Most importantly, protection of the subscapularis repair and/or rotator cuff repair will dictate the amount of stretching or resistance as well as the duration of immobilization. Progressive resistance for the rotator cuff including the subscapularis is initiated at 10-12 weeks depending on the quality of rotator cuff tissue and of the repair.

Guarded loading of the shoulder should be observed for the first 4-6 months post-operatively. Complete recovery from surgery generally occurs at 9-12 months.

## Humeral Tray 1: Base

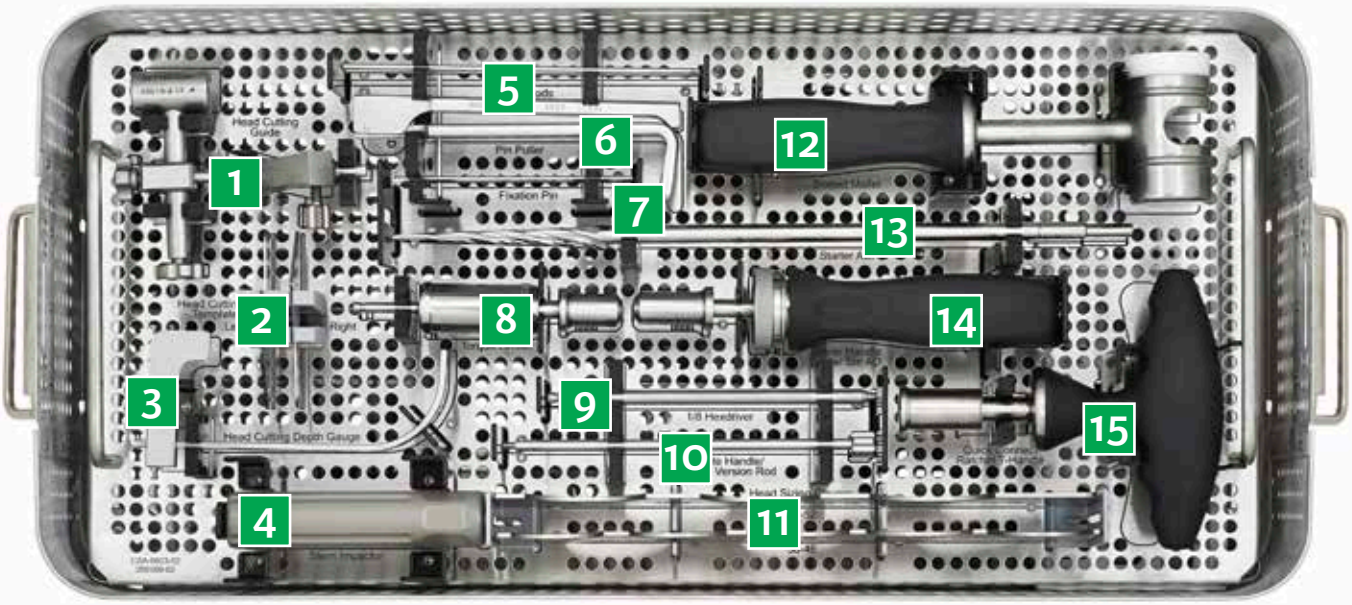



1. Stem Trial Handles
2. Trial Calcar Planer
3. Trial Osteotomy Cover
4. Canal Osteotomy Cover
5. Total Shoulder Depth Stops
6. Humeral Stem Trials
7. Humeral Trial Inserter/Extractor
8. Humeral Body Trials
9. Taper Adaptors
10. Locking Body Screws
11. Fracture Body Trials

| No. | Reference | Description | QTY |
|---|---|---|---|
| | CSA-000-14 | Generic Case Lid – Full DIN | 1 |
| 1 | HDL-0920-043-001 | Stem Trial Handle | 4 |
| 2 | RMR-0923-050-002 | TSS Trial Calcar Planer, 2.5 | 1 |
| 3 | CVR-0920-076L | Trial Osteotomy Cover, Large | 1 |
| 3 | CVR-0920-076S | Trial Osteotomy Cover, Small | 1 |
| 4 | CVR-0920-077L | Canal Osteotomy Cover, Large | 1 |
| 4 | CVR-0920-077S | Canal Osteotomy Cover, Small | 1 |
| 5 | HDS-0920-069-001 | Depth Stop | 4 |
| 6 | TRL-0920-025-06 | Humeral Stem Trial, 6mm | 1 |
| 6 | TRL-0920-025-07 | Humeral Stem Trial, 7mm | 1 |
| 6 | TRL-0920-025-08 | Humeral Stem Trial, 8mm | 1 |
| 6 | TRL-0920-025-09 | Humeral Stem Trial, 9mm | 1 |
| 6 | TRL-0920-025-10 | Humeral Stem Trial, 10mm | 1 |
| 6 | TRL-0920-025-11 | Humeral Stem Trial, 11mm | 1 |
| 6 | TRL-0920-025-12 | Humeral Stem Trial, 12mm | 1 |
| 6 | TRL-0920-025-13 | Humeral Stem Trial, 13mm | 1 |
| 6 | TRL-0920-025-14 | Humeral Stem Trial, 14mm | 1 |
| 6 | TRL-0920-025-15 | Humeral Stem Trial, 15mm | 1 |
| 6 | TRL-0920-025-16 | Humeral Stem Trial, 16mm | 1 |

| No. | Reference | Description | QTY |
|---|---|---|---|
| 7 | INS-0923-046-001 | TSS Trial Inserter/Extractor, 2.5 | 4 |
| 8 | TRL-0920-020-08STD | Body Trial, 8 Standard | 1 |
| 8 | TRL-0920-020-10LRG | Body Trial, 10 Large | 1 |
| 8 | TRL-0920-020-10SML | Body Trial, 10 Smal | 1 |
| 8 | TRL-0920-020-10STD | Body Trial, 10 Standard | 1 |
| 8 | TRL-0920-020-12STD | Body Trial, 12 Standard | 1 |
| 8 | TRL-0920-020-14LRG | Body Trial, 14 Large | 4 |
| 8 | TRL-0920-020-14SML | Body Trial, 14 Small | 1 |
| 8 | TRL-0920-020-14STD | Body Trial, 14 Standard | 1 |
| 9 | ADT-0923-065-001 | TSS Taper Adapter, 2.5 | 1 |
| 10 | BSW-0920-01NS | Locking Body Screw | 1 |
| 11 | TRL-0923-021-08LRG | TSS Fracture Body Trial Lrg, 2.5 | 1 |
| 11 | TRL-0923-021-08SML | TSS Fracture Body Trial Sml, 2.5 | 1 |
| 11 | TRL-0923-021-08STD | TSS Fracture Body Trial Std, 2.5 | 1 |

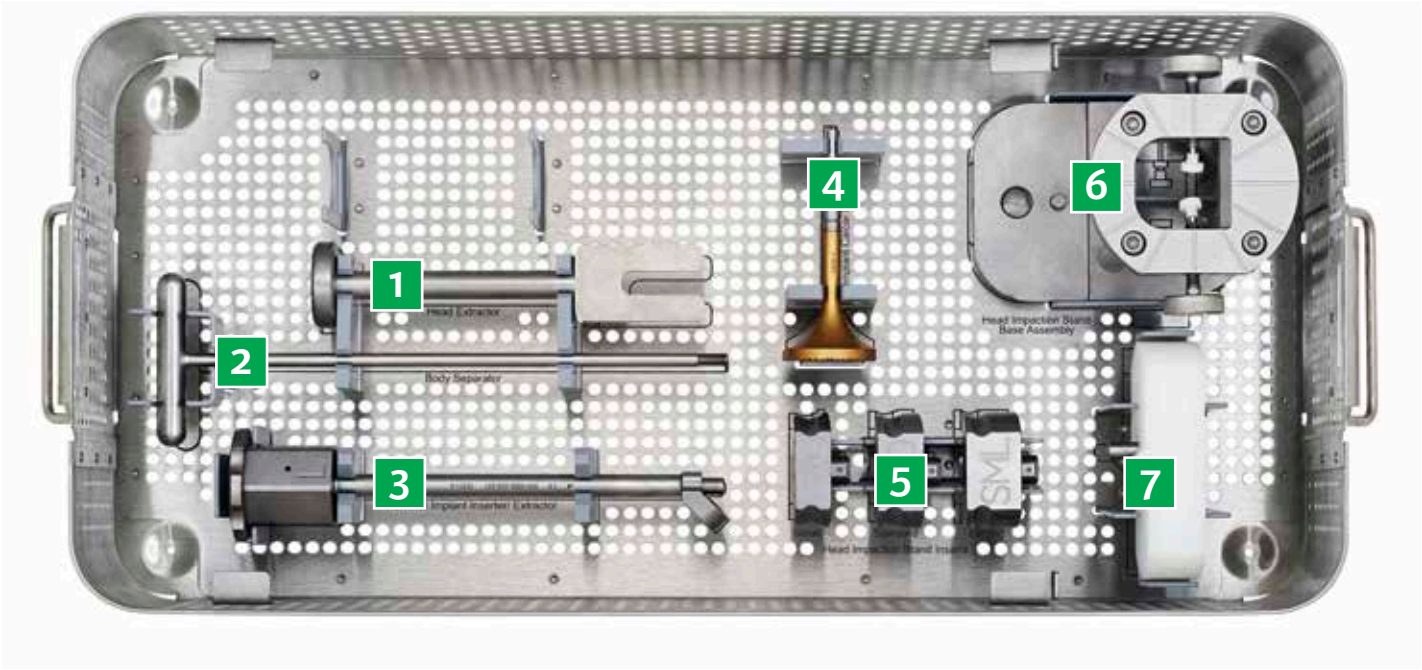
## Humeral Tray 1: Insert




1. Head Resection Guide
2. Head Cutting Templates
3. Head Cutting Depth Gauge
4. Body/Stem Impactor
5. Version Rods
6. Pin Puller
7. Fixation Pin
8. Torque Limiter
9. Hex Driver
10. Cutting Template Handle
11. Head Sizing Templates
12. Slotted Mallot
13. Starter Awl
14. Driver Handle
15. Quick Connect Ratchet Handle

| No. | Reference | Description | QTY |
|---|---|---|---|
| 1 | SET189-A001 | Head Cutting Guide | 1 |
| 2 | TMP-0920-040-001L | Head Cutting Template, Left | 1 |
| 2 | TMP-0920-040-001R | Head Cutting Template, Right | 1 |
| 3 | GAU-0920-058-001 | Head Cutting Depth Gauge | 1 |
| 4 | IMP-0920-055-001 | Stem Impactor | 1 |
| 5 | SET189-D007 | Version Rod | 1 |
| 6 | PUL-0920-087-01 | Pin Puller | 1 |
| 7 | PIN-0920-051-001 | Fixation Pin | 2 |
| 8 | TRQ-0920-086-01 | Torque Limiter | 1 |
| 9 | SCR-0920-060-001 | 1/8 Hexdriver | 1 |
| 10 | ROD-0923-040-001 | TSS Head Cutting Template Rod, 2.5 | 1 |
| 11 | MAL-0920-085-01 | Slotted Mallet | 1 |
| 11 | AWL-0920-042-001 | Starter Awl | 1 |
| 12 | G107992_B | Driver Handle w/ Sm AO | 1 |
| 13 | HSG-0920-041-001 | Head Sizing Gauge 38-46 | 1 |
| 14 | HSG-0920-041-002 | Head Sizing Gauge 48-52 | 1 |
| 15 | NR135004-J-004 | T-Handle w/ Lg AO or Quick Connect Ratchet T-Handle | 1 |

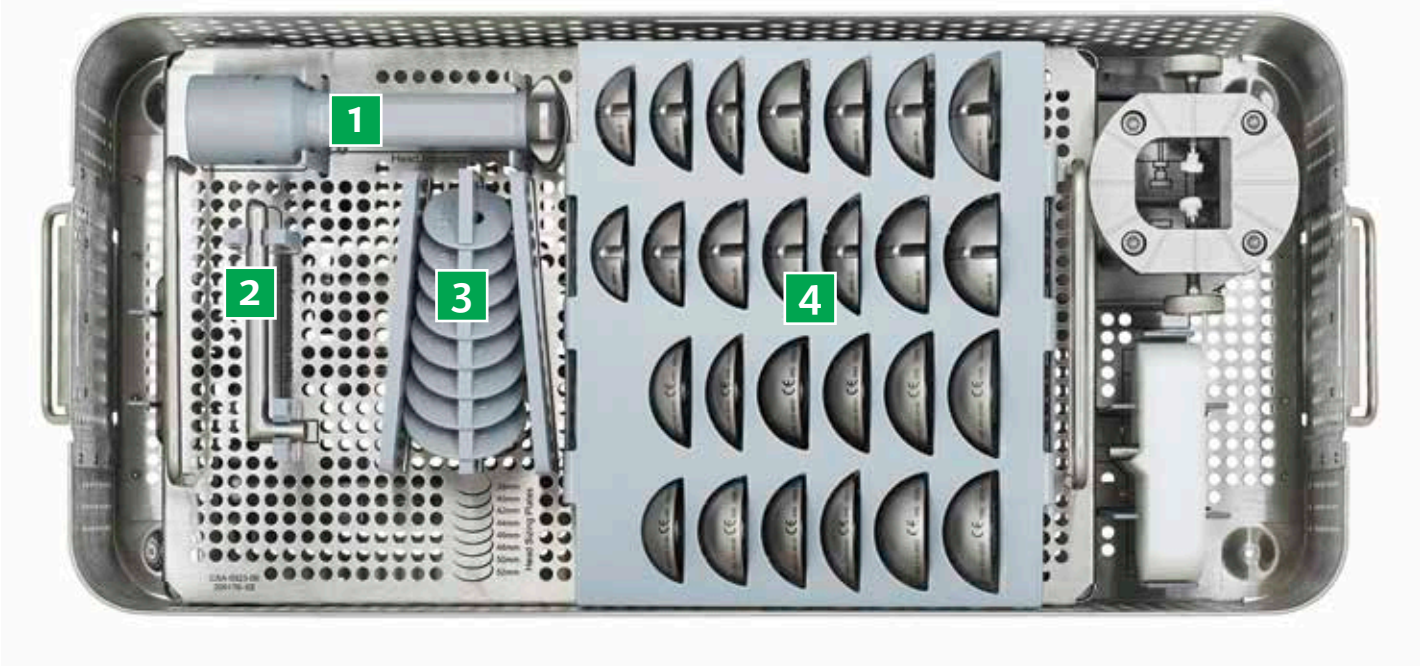
## Humeral Tray 2: Base




1. Head Extractor
2. Body Separator
3. Humeral Implant Inserter/Extractor
4. Implant Calcar Planer
5. Head Impaction Stand Inserts
6. Head Impaction Stand Base Assembly
7. Stem Impaction Stand

| No. | Reference | Description | QTY |
|---|---|---|---|
| 1 | SET188-A001 | Head Extractor | 1 |
| 2 | SEP-0920-068-001 | Body Separator | 1 |
| 3 | INS-0923-045-001 | TSS Implant Inserter/Extractor, 2.5 | 1 |
| 4 | RMR-0923-050-001 | TSS Implant Calcar Planer, 2.5 | 1 |
| 5 | INS-0920-071-LRG | Head Impaction Stand Insert, Large | 1 |
| 5 | INS-0920-071-SML | Head Impaction Stand Insert, Small | 1 |
| 5 | INS-0920-071-STD | Head Impaction Stand Insert, Std. | 1 |
| 6 | STD-0920-071-001 | Head Impaction Stand, Base Assembly | 1 |
| 7 | SIS-0920-054-001 | Stem Impaction Stand | 1 |

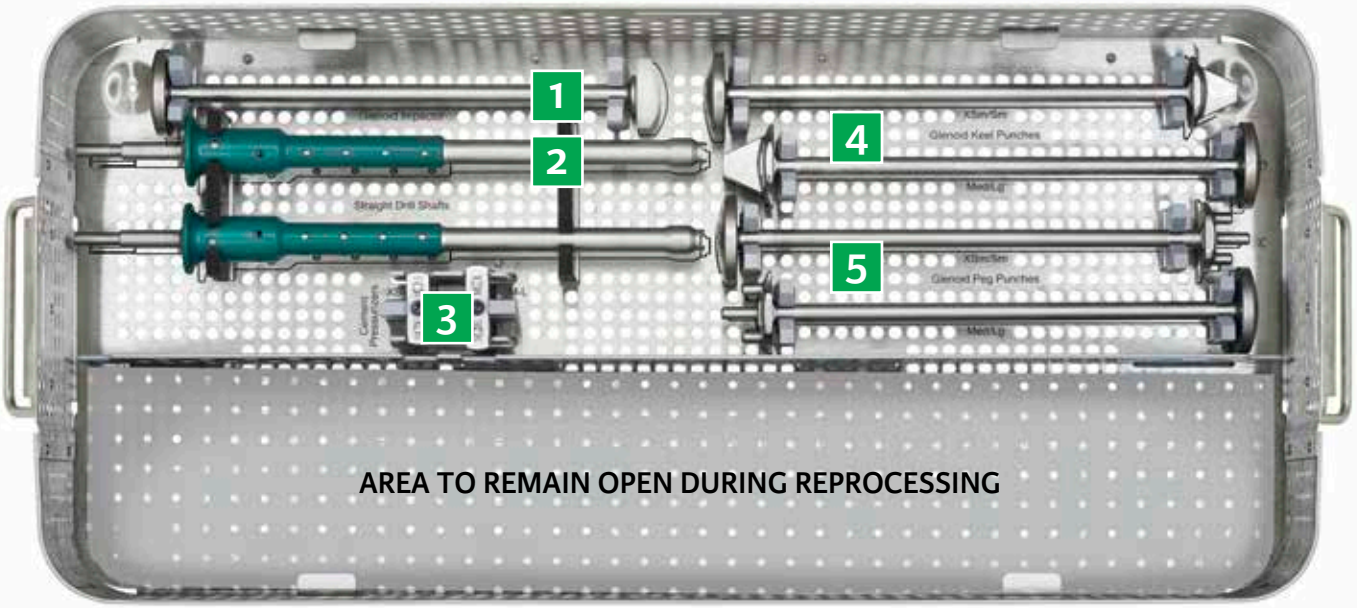
## Humeral Tray 2: Insert




1. Head Impactor
2. Taper Disassembly Tool
3. Humeral Head Sizing Plate
4. Humeral Head Trails

| No. | Reference | Description | QTY |
|---|---|---|---|
| 1 | IMP-0920-079-501 | TSS Head Impactor | 1 |
| 2 | TDT-0920-044-001 | Taper Disassembly Tool | 1 |
| 3 | HSP-0923-070-001E | TSS Head Sizing Plates 38-40, 2.5 - 38E | 1 |
| 3 | HSP-0923-070-002E | TSS Head Sizing Plates 38-40, 2.5 - 40E | 1 |
| 3 | HSP-0923-070-003 | TSS Head Sizing Plates 42-52, 2.5 - 42 | 1 |
| 3 | HSP-0923-070-004 | TSS Head Sizing Plates 42-52, 2.5 - 44 | 1 |
| 3 | HSP-0923-070-005 | TSS Head Sizing Plates 42-52, 2.5 - 46 | 1 |
| 3 | HSP-0923-070-006 | TSS Head Sizing Plates 42-52, 2.5 - 48 | 1 |
| 3 | HSP-0923-070-007 | TSS Head Sizing Plates 42-52, 2.5 - 50 | 1 |
| 3 | HSP-0923-070-008 | TSS Head Sizing Plates 42-52, 2.5 - 52 | 1 |
| 4 | TRL-0923-010-3814E | TSS Head Trial Eccentric, 2.5 38x14mm | 1 |
| 4 | TRL-0923-010-4015E | TSS Head Trial Eccentric, 2.5 40x15mm | 1 |
| 4 | TRL-0923-010-4216C | TSS Head Trial Concentric, 2.5 42x16mm | 1 |
| 4 | TRL-0923-010-4216E | TSS Head Trial Eccentric, 2.5 42x16mm | 1 |
| 4 | TRL-0923-010-4416C | TSS Head Trial Concentric, 2.5 44x16mm | 1 |
| 4 | TRL-0923-010-4416E | TSS Head Trial Eccentric, 2.5 44x16mm | 1 |
| 4 | TRL-0923-010-4419C | TSS Head Trial Concentric, 2.5 44x19mm | 1 |
| 4 | TRL-0923-010-4419E | TSS Head Trial Eccentric, 2.5 44x19mm | 1 |
| 4 | TRL-0923-010-4614C | TSS Head Trial Concentric, 2.5 46x14mm | 1 |
| 4 | TRL-0923-010-4614E | TSS Head Trial Eccentric, 2.5 46x14mm | 1 |
| 4 | TRL-0923-010-4617C | TSS Head Trial Concentric, 2.5 46x17mm | 1 |
| 4 | TRL-0923-010-4617E | TSS Head Trial Eccentric, 2.5 46x17mm | 1 |
| 4 | TRL-0923-010-4620C | TSS Head Trial Concentric, 2.5 46x20mm | 1 |
| 4 | TRL-0923-010-4620E | TSS Head Trial Eccentric, 2.5 46x20mm | 1 |
| 4 | TRL-0923-010-4815C | TSS Head Trial Concentric, 2.5 48x15mm | 1 |
| 4 | TRL-0923-010-4815E | TSS Head Trial Eccentric, 2.5 48x15mm | 1 |
| 4 | TRL-0923-010-4818C | TSS Head Trial Concentric, 2.5 48x18mm | 1 |
| 4 | TRL-0923-010-4818E | TSS Head Trial Eccentric, 2.5 48x18mm | 1 |
| 4 | TRL-0923-010-4821C | TSS Head Trial Concentric, 2.5 48x21mm | 1 |
| 4 | TRL-0923-010-4821E | TSS Head Trial Eccentric, 2.5 48x21mm | 1 |
| 4 | TRL-0923-010-5019C | TSS Head Trial Concentric, 2.5 50x19mm | 1 |
| 4 | TRL-0923-010-5019E | TSS Head Trial Eccentric, 2.5 50x19mm | 1 |
| 4 | TRL-0923-010-5022C | TSS Head Trial Concentric, 2.5 50x22mm | 1 |
| 4 | TRL-0923-010-5022E | TSS Head Trial Eccentric, 2.5 50x22mm | 1 |
| 4 | TRL-0923-010-5220C | TSS Head Trial Concentric, 2.5 52x20mm | 1 |
| 4 | TRL-0923-010-5220E | TSS Head Trial Eccentric, 2.5 52x20mm | 1 |

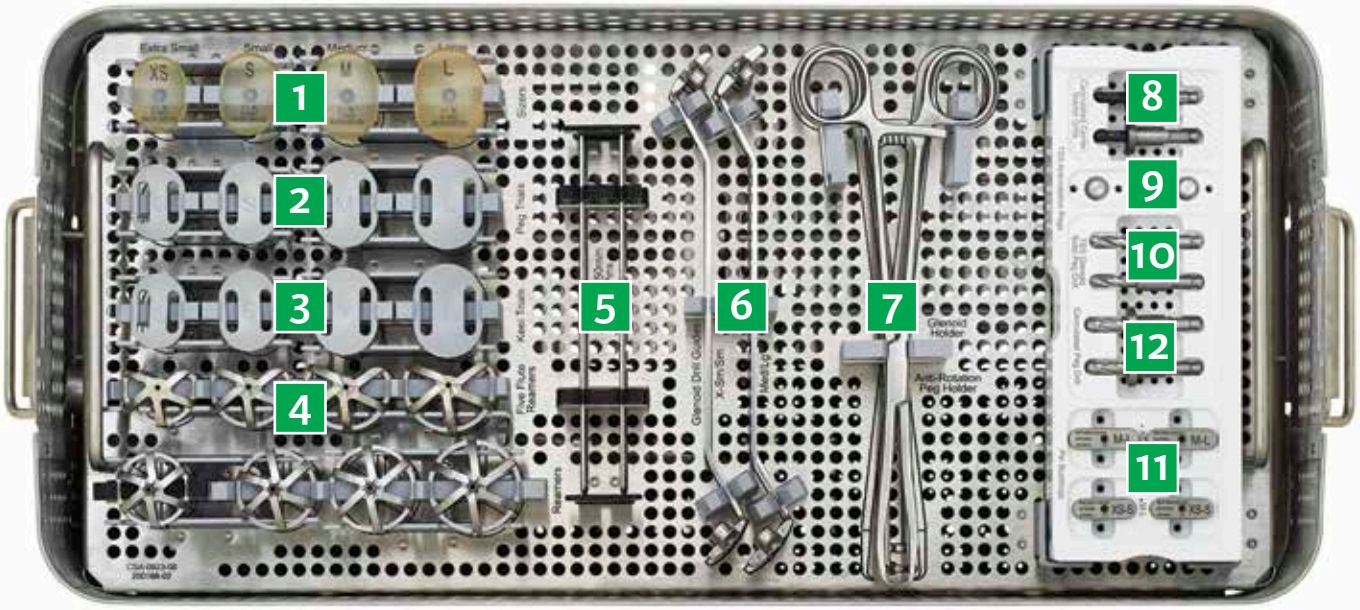
## Pegged/Keeled Glenoid Tray: Base




1. Glenoid Impactor
2. Straight Drill Shaft
3. Cement Pressurizer
4. Glenoid Keeled Punches
5. Glenoid Peg Punches

| No. | Reference | Description | QTY |
|---|---|---|---|
| 1 | IMP-0920-064-001 | Glenoid Impactor | 1 |
| 2 | HDL-0922-082-01 | Glenoid Drill Shaft | 2 |
| 3 | PRS-0923-073-001 | Pressurizer xsm/s | 1 |
| 3 | PRS-0923-073-002 | Pressurizer m/l | 1 |
| 4 | PUN-0920-062-001 | Glenoid Keel Punch, XSm/Sm | 1 |
| 4 | PUN-0920-062-002 | Glenoid Keel Punch, Med/Lg | 1 |
| 5 | PUN-0920-072-001 | Glenoid Peg Punch, XSm/Sm | 1 |
| 5 | PUN-0920-072-002 | Glenoid Peg Punch, Med/Lg | 1 |

## Glenoid Tray: Insert

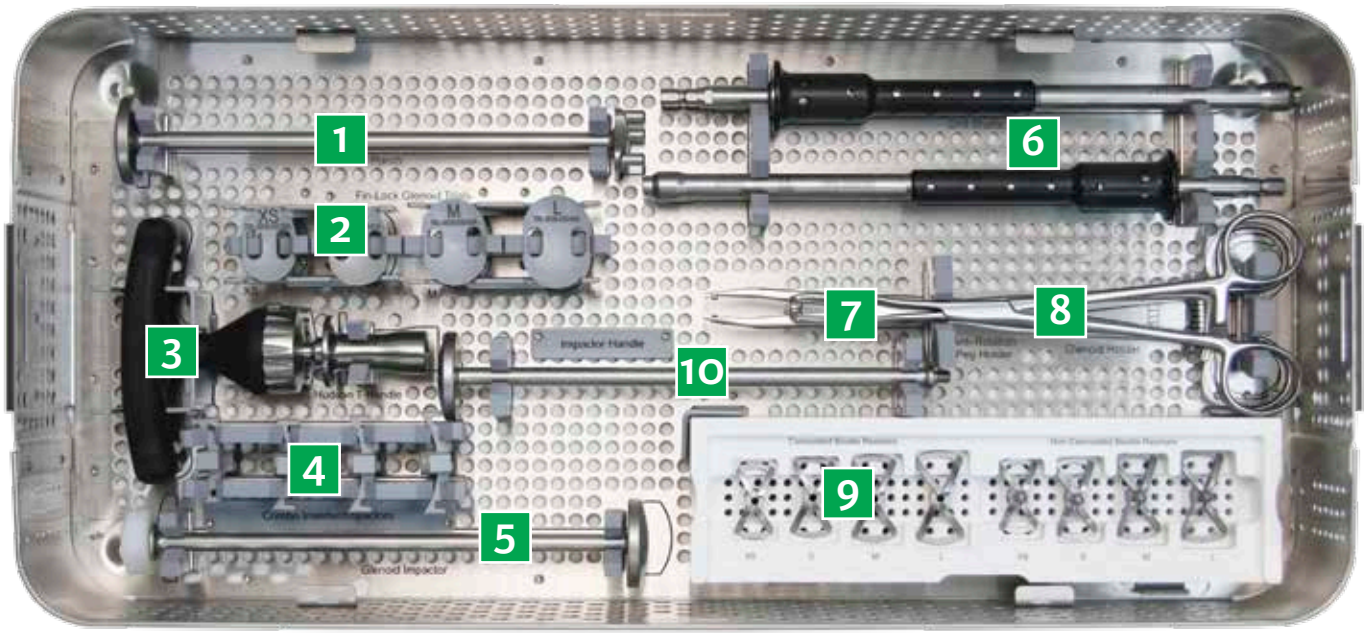



1. Glenoid Sizers
2. Glenoid Peg Trials
3. Glenoid Keeled Trials
4. Glenoid Reamers
5. Guide Pins
6. Glenoid Drill Guides
7. Glenoid Trial Holder / Anti-Rotation Peg Holder
8. Cannulated Center Starter Drill
9. Anti-Rotation Pegs
10. TSS Glenoid Solid Peg Drill
11. Pin Bushings
12. Cannulated Peg Drills

| No. | Reference | Description | QTY |
|---|---|---|---|
| 1 | SZR-0920-052-000 | Glenoid Sizer, Extra Small | 1 |
| 1 | SZR-0920-052-001 | Glenoid Sizer, Small | 1 |
| 1 | SZR-0920-052-002 | Glenoid Sizer, Medium | 1 |
| 1 | SZR-0920-052-003 | Glenoid Sizer, Large | 1 |
| 2 | TRL-0920-030-00P | Glenoid, Peg Trial, Extra Small | 1 |
| 2 | TRL-0920-030-01P | Glenoid, Peg Trial, Small | 1 |
| 2 | TRL-0920-030-02P | Glenoid, Peg Trial, Medium | 1 |
| 2 | TRL-0920-030-03P | Glenoid, Peg Trial, Large | 1 |
| 3 | TRL-0920-030-00K | Glenoid, Keel Trial, Extra Small | 1 |
| 3 | TRL-0920-030-01K | Glenoid, Keel Trial, Small | 1 |
| 3 | TRL-0920-030-02K | Glenoid, Keel Trial, Medium | 1 |
| 3 | TRL-0920-030-03K | Glenoid, Keel Trial, Large | 1 |
| 4 | RMR-0920-057-000 | Glenoid Reamer, Extra Small | 1 |
| 4 | RMR-0920-057-001 | Glenoid Reamer, Small | 1 |
| 4 | RMR-0920-057-002 | Glenoid Reamer, Medium | 1 |
| 4 | RMR-0920-057-003 | Glenoid Reamer, Large | 1 |
| 4 | RMR-0920-059-000 | Glenoid Five Flute Reamer, XS | 1 |
| 4 | RMR-0920-059-001 | Glenoid Five Flute Reamer, S | 1 |
| 4 | RMR-0920-059-002 | Glenoid Five Flute Reamer, M | 1 |
| 4 | RMR-0920-059-003 | Glenoid Five Flute Reamer, L | 1 |
| 5 | GDW-0920-061-501 | 2.0mm x 150mm Guide Pin | 4 |

| No. | Reference | Description | QTY |
|---|---|---|---|
| 6 | DRG-0922-067-01 | Glenoid Drill Guide, X-Sm/Sm | 1 |
| 6 | DRG-0922-067-02 | Glenoid Drill Guide, Med/Lg | 1 |
| 7 | HDL-0920-075-001 | Anti-rotation Peg Holder | 1 |
| 7 | HDR-0920-063-001 | Glenoid Holder | 1 |
| 8 | DRL-0920-047-001 | Cannulated Center Starter Drill | 2 |
| 9 | PEG-0922-074-02 | TSS Anti-rotation Peg | 3 |
| 10 | DRL-0922-080-01 | TSS Glenoid Solid Peg Drill | 2 |
| 11 | BSH-0923-048-001 | Pin Bushing XS/S | 2 |
| 11 | BSH-0923-048-002 | Pin Bushing M/L | 2 |
| 12 | DRL-0923-047-001 | Cannulated Peg Drill | 2 |

## Fin-Lock Glenoid Tray: Base

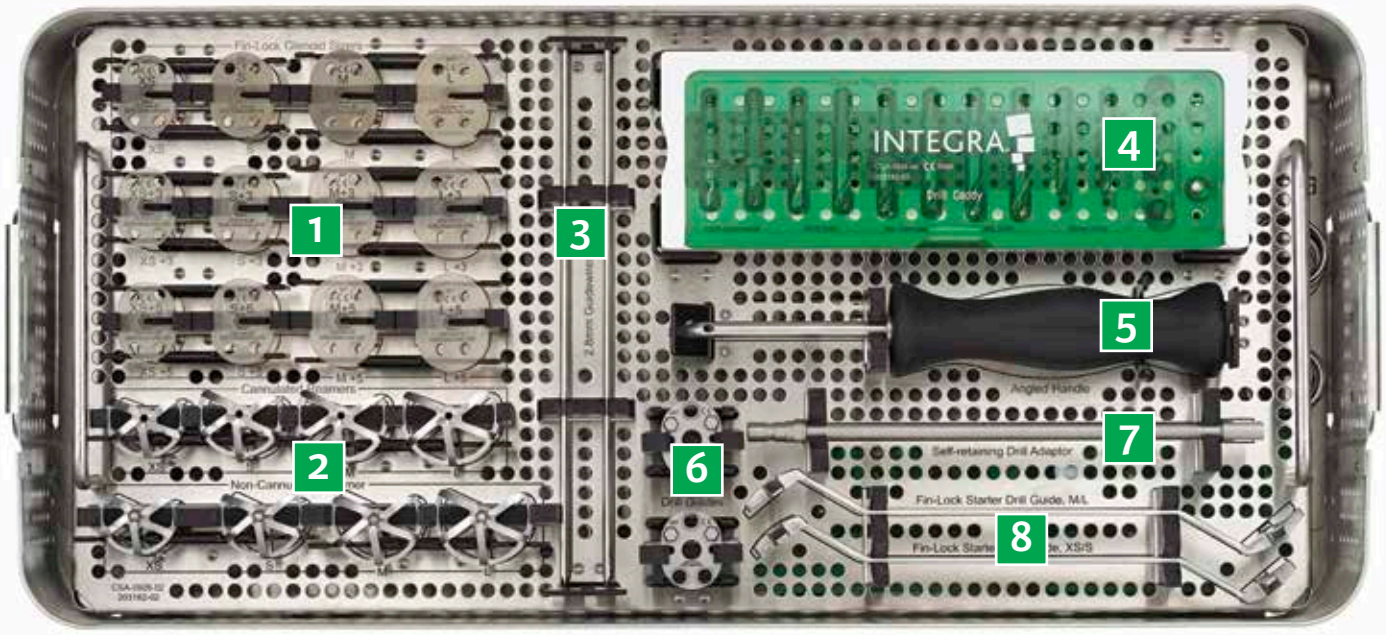



1. Glenoid Punch
2. Fin-Lock Trials
3. Hudson T-Handle
4. Combo Inserter/Impactors
5. Glenoid Impactor
6. 2.8mm Drill Shaft
7. Anti-Rotation Peg Holder
8. Glenoid Holder
9. Bowtie Reamer Caddy (ordered separately)
10. Glenoid Handle

| No. | Reference | Description | QTY |
|---|---|---|---|
| 1 | PN-0926-001 | Punch | 1 |
| 2 | TRL-0926-030-00A | Trial, Fin-Lock Glenoid, XS | 1 |
| 2 | TRL-0926-030-01A | Trial, Fin-Lock Glenoid, S | 1 |
| 2 | TRL-0926-030-02A | Trial, Fin-Lock Glenoid, M | 1 |
| 2 | TRL-0926-030-03A | Trial, Fin-Lock Glenoid, L | 1 |
| 3 | HDL-0926-002 | Hudson T-Handle | 1 |
| 4 | IMP-0926-030-00A | Combo Inserter/Impactor, XS | 1 |
| 4 | IMP-0926-030-01A | Combo Inserter/Impactor, S | 1 |
| 4 | IMP-0926-030-02A | Combo Inserter/Impactor, M | 1 |
| 4 | IMP-0926-030-03A | Combo Inserter/Impactor, L | 1 |
| 5 | IMP-0920-064-001 | Glenoid Impactor | 1 |
| 6 | DRS-0926-001 | 2.8mm Drill Shaft | 2 |
| 7 | HDL-0920-075-001 | Anti-Rotation Peg Holder | 1 |
| 8 | HDR-0940-048-001 | Glenoid Holder | 1 |
| 9 | RMR-0926-00BC | Cannulated Bowtie Reamer, XS | 1 |
| 9 | RMR-0926-01BC | Cannulated Bowtie Reamer, S | 1 |
| 9 | RMR-0926-02BC | Cannulated Bowtie Reamer, M | 1 |
| 9 | RMR-0926-03BC | Cannulated Bowtie Reamer, L | 1 |

| No. | Reference | Description | QTY |
|---|---|---|---|
| 9 | RMR-0926-00BN | Noncannulated Bowtie Reamer, XS | 1 |
| 9 | RMR-0926-01BN | Noncannulated Bowtie Reamer, S | 1 |
| 9 | RMR-0926-02BN | Noncannulated Bowtie Reamer, M | 1 |
| 9 | RMR-0926-03BN | Noncannulated Bowtie Reamer, L | 1 |
| 10 | IMH-0926-000 | Glenoid Impactor Handle | 1 |

## Fin-Lock Glenoid Tray: Insert

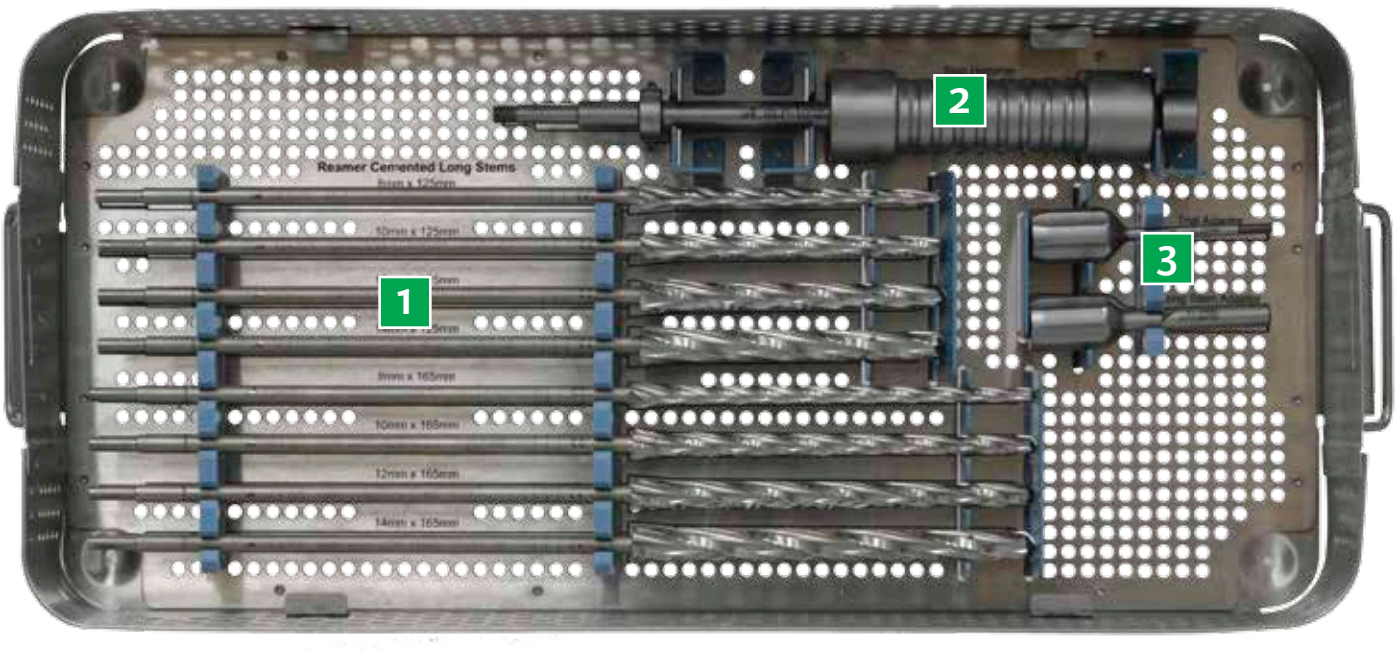



1. Fin-Lock Sizers
2. Five Fluted Glenoid Reamers
3. 2.8mm Guide Wire
4. Glenoid Drill Caddy
5. Angled Handle
6. Fin-Lock Modular Drill Guide
7. Self-Retaining Drill Adaptor
8. Fin-Lock Starter Drill Guides

| No. | Reference | Description | QTY |
|---|---|---|---|
| 1 | SZR-0926-030-000 | Sizer, Fin-Lock Glenoid, XS | 1 |
| 1 | SZR-0926-030-010 | Sizer, Fin-Lock Glenoid, S | 1 |
| 1 | SZR-0926-030-020 | Sizer, Fin-Lock Glenoid, M | 1 |
| 1 | SZR-0926-030-030 | Sizer, Fin-Lock Glenoid, L | 1 |
| 1 | SZR-0926-030-003 | Sizer, Fin-Lock Glenoid, XS, +3 | 1 |
| 1 | SZR-0926-030-013 | Sizer, Fin-Lock Glenoid, S, +3 | 1 |
| 1 | SZR-0926-030-023 | Sizer, Fin-Lock Glenoid, M, +3 | 1 |
| 1 | SZR-0926-030-033 | Sizer, Fin-Lock Glenoid, L, +3 | 1 |
| 1 | SZR-0926-030-005 | Sizer, Fin-Lock Glenoid, XS, +5 | 1 |
| 1 | SZR-0926-030-015 | Sizer, Fin-Lock Glenoid, S, +5 | 1 |
| 1 | SZR-0926-030-025 | Sizer, Fin-Lock Glenoid, M, +5 | 1 |
| 1 | SZR-0926-030-035 | Sizer, Fin-Lock Glenoid, L, +5 | 1 |
| 2 | RMR-0926-00C | Cannulated Reamer, XS | 1 |
| 2 | RMR-0926-01C | Cannulated Reamer, S | 1 |
| 2 | RMR-0926-02C | Cannulated Reamer, M | 1 |
| 2 | RMR-0926-03C | Cannulated Reamer, L | 1 |
| 2 | RMR-0926-00N | Non-Cannulated Reamer, XS | 1 |
| 2 | RMR-0926-01N | Non-Cannulated Reamer, S | 1 |
| 2 | RMR-0926-02N | Non-Cannulated Reamer, M | 1 |
| 2 | RMR-0926-03N | Non-Cannulated Reamer, L | 1 |

| No. | Reference | Description | QTY |
|---|---|---|---|
| 3 | GDW-0926-001 | 2.8mm Guidewire | 4 |
| 4 | DRL-0926-015-S | Drill, Central Peg, 15mm, Solid | 2 |
| 4 | DRL-0926-018-S | Drill, Central Peg, 18mm, Solid | 2 |
| 4 | DRL-0926-015-C | Drill, Central Peg, 15mm, Cannulated | 2 |
| 4 | DRL-0926-018-C | Drill, Central Peg, 18mm, Cannulated | 2 |
| 4 | DRL-0926-001 | Starter Drill | 2 |
| 4 | DRL-0926-002 | Peripheral Drill | 4 |
| 4 | PEG-0926-000 | Central Anti-rotation Peg | 2 |
| 5 | HDL-0926-001 | Angled Handle | 1 |
| 6 | DRG-0926-001 | Fin-Lock Drill Guide | 1 |
| 7 | ADP-0980-105-00 | Self-retaining Drill Adaptor | 1 |
| 8 | DRG-0926-002 | Starter Drill Guide, XS/S | 1 |
| 8 | DRG-0926-003 | Starter Drill Guide, M/L | 1 |

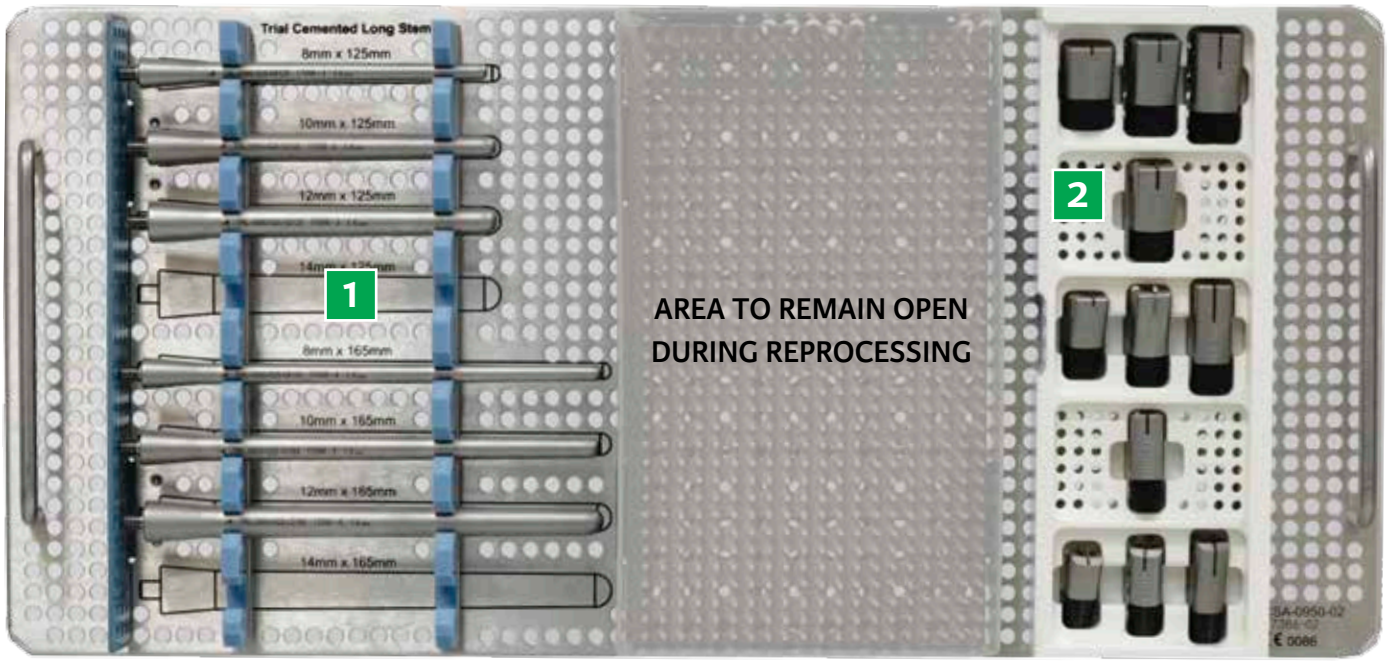
## Cemented Long Stem Base




1 Reamers
2 Slap Hammer
3 Adapters

| No. | Catalog No. | Description | QTY |
|---|---|---|---|
| 1 | RMR-0950-025-08125 | Reamer Cemented Long Stem, 8mm x 125mm | 1 |
| 1 | RMR-0950-025-10125 | Reamer Cemented Long Stem, 10mm x 125mm | 1 |
| 1 | RMR-0950-025-12125 | Reamer Cemented Long Stem, 12mm x 125mm | 1 |
| 1 | RMR-0950-025-08165 | Reamer Cemented Long Stem, 8mm x 165mm | 1 |
| 1 | RMR-0950-025-10165 | Reamer Cemented Long Stem, 10mm x 165mm | 1 |
| 1 | RMR-0950-025-12165 | Reamer Cemented Long Stem, 12mm x 165mm | 1 |
| 2 | SLP-1002-519 | Slap Adaptor | 1 |
| 3 | ADA-0950-040-501 | Trial Adaptor | 1 |
| 3 | ADA-0950-040-502 | Stem Adaptor | 1 |

## Cemented Long Stem Insert



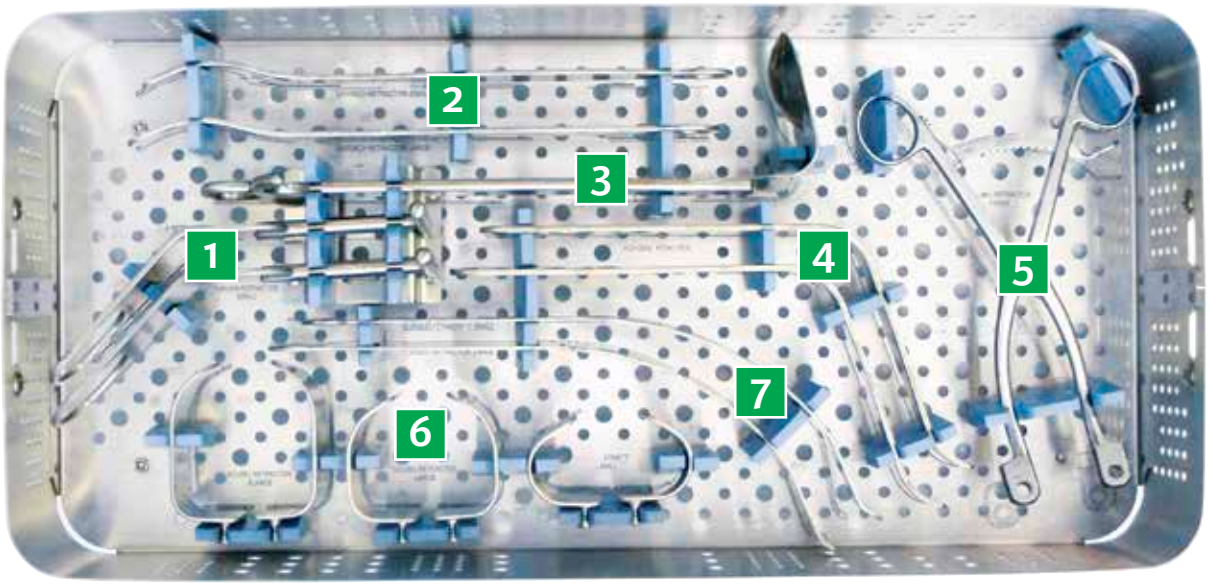

1 Trial Cemented Long Stems

2 Definitive Stem Primary Body Trials

| No. | Catalog No. | Description | QTY |
|---|---|---|---|
| 1 | TRL-0950-025-08125 | Trial Cemented Long Stem, 8mm x 125mm | 1 |
| 1 | TRL-0950-025-10125 | Trial Cemented Long Stem, 10mm x 125mm | 1 |
| 1 | TRL-0950-025-12125 | Trial Cemented Long Stem, 12mm x 125mm | 1 |
| 1 | TRL-0950-025-18165 | Trial Cemented Long Stem, 8mm x 165mm | 1 |
| 1 | TRL-0950-025-10165 | Trial Cemented Long Stem, 10mm x 165mm | 1 |
| 1 | TRL-0950-025-12165 | Trial Cemented Long Stem, 12mm x 165mm | 1 |
| 2 | TRL-0920-120-08STD | Definitive Stem Primary Body Trial - 08 Std | 1 |
| 2 | TRL-0920-120-10SML | Definitive Stem Primary Body Trial - 10 Sml | 1 |
| 2 | TRL-0920-120-10STD | Definitive Stem Primary Body Trial - 10 Std | 1 |
| 2 | TRL-0920-120-10LRG | Definitive Stem Primary Body Trial - 10 Lrg | 1 |
| 2 | TRL-0920-120-12STD | Definitive Stem Primary Body Trial - 12 Std | 1 |
| 2 | TRL-0920-120-14SML | Definitive Stem Primary Body Trial - 14 Sml | 1 |
| 2 | TRL-0920-120-14STD | Definitive Stem Primary Body Trial - 14 Std | 1 |
| 2 | TRL-0920-120-14LRG | Definitive Stem Primary Body Trial - 14 Lrg | 1 |
| 2 | TRL-0923-121-08SML | Definitive Stem Fracture Body Trial - 2.5 Sml | 1 |
| 2 | TRL-0923-121-08STD | Definitive Stem Fracture Body Trial - 2.5 Std | 1 |
| 2 | TRL-0923-121-08LRG | Definitive Stem Fracture Body Trial - 2.5 Lrg | 1 |

# Titan Modular Shoulder Instrumentation

## Retractor Tray

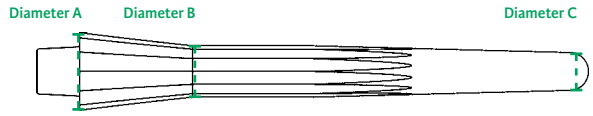



1. Fukuda Retractors
2. Darrach Retractors
3. Deltoid Retractor
4. Curved Hohmann Retractors
5. Kolbel Retractor Frame
6. Kolbel Retractor Blades – Small, Large, Extra Large
7. Spiked Glenoid Retractors

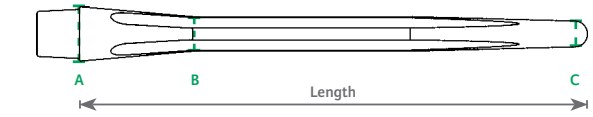
| No. | Catalog No. | Description | QTY |
|---|---|---|---|
| 1 | RET-920-50S | Fukuda Retractor-Small | 1 |
| 1 | RET-920-50L | Fukuda Retractor-Large | 1 |
| 2 | RET-920-11 | Darrach Retractor-Small | 1 |
| 2 | SRET-920-11L | Darrach Retractor-Large | 1 |
| 3 | RET-920-20 | Deltoid Retractor-Large | 1 |
| 4 | RET-920-31 | Hohman Retractor | 2 |
| 5 | RET-920-60 | Kolbel Retractor Frame | 1 |
| 6 | RET-920-61S | Kolbel Retractor-Small | 2 |
| 6 | RET-920-61L | Kolbel Retractor-Large | 2 |
| 6 | RET-920-61XL | Kolbel Retractor-XLarge | 2 |
| 7 | RET-920-41S | Glenoid Retractor-Small | 1 |
| 7 | RET-920-41L | Glenoid Retractor-Large | 1 |

# Ordering Information and Implant Dimensions

### Press-Fit Stem Dimensions (mm), Ti




### Cemented Stem Dimensions (mm), CoCr



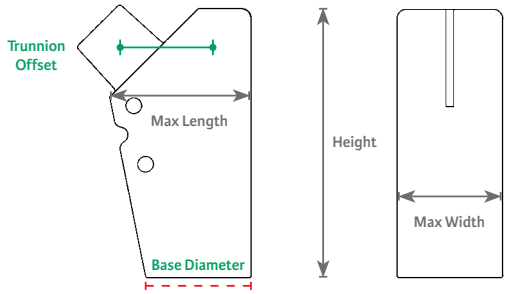

| Press-fit Stem Catalog Number | Length | Diameter A | Diameter B | Diameter C | Spline Depth | No. of Splines |
|---|---|---|---|---|---|---|
| STEM-0920-025-06 | 90.4 | 11.6 | 6.8 | 4.6 | 1 | 12 |
| STEM-0920-025-07 | 90.4 | 12.4 | 7.6 | 5.3 | 1 | 12 |
| STEM-0920-025-08 | 90.4 | 13.7 | 9.0 | 6.6 | 1 | 12 |
| STEM-0920-025-09 | 90.4 | 14.4 | 9.9 | 7.4 | 1 | 12 |
| STEM-0920-025-10 | 90.4 | 15.4 | 10.9 | 8.5 | 1 | 12 |
| STEM-0920-025-11 | 90.4 | 16.5 | 12.1 | 9.5 | 1 | 12 |
| STEM-0920-025-12 | 90.4 | 17.5 | 13.2 | 10.6 | 1 | 12 |
| STEM-0920-025-13 | 90.4 | 18.5 | 14.2 | 11.6 | 1 | 12 |
| STEM-0920-025-14 | 90.4 | 19.5 | 15.3 | 12.6 | 1 | 12 |
| STEM-0920-025-15 | 90.4 | 20.5 | 16.4 | 13.5 | 1 | 12 |
| STEM-0920-025-16 | 90.4 | 21.5 | 17.4 | 14.7 | 1 | 12 |

| Cemented Stem Catalog Number | Length | Diameter A | Diameter B | Diameter C | No. of Flutes |
|---|---|---|---|---|---|
| STEM-0950-025-06 | 90.4 | 9.6 | 6.1 | 4.6 | 4 |
| STEM-0950-025-08 | 90.4 | 11.6 | 8.1 | 6.7 | 4 |
| STEM-0950-025-10 | 90.4 | 13.4 | 9.9 | 8.5 | 4 |
| STEM-0950-025-12 | 90.4 | 15.4 | 11.9 | 10.6 | 4 |
| STEM-0950-025-14 | 90.4 | 17.5 | 14.0 | 12.6 | 4 |

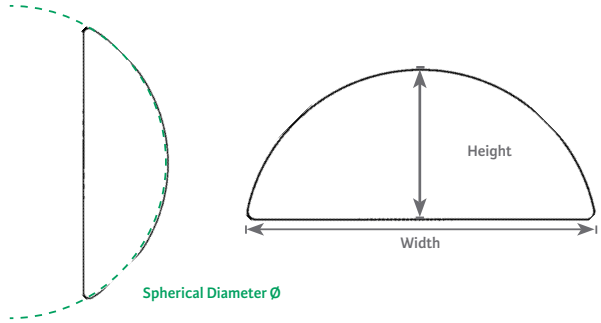
| Primary Body Catalog Number | Height | Max Length | Max Width | Base Diameter | Trunnion Offset |
|---|---|---|---|---|---|
| BOD-0923-020-08STD | 35 | 16.9 | 11.6 | 11.6 | 8 |
| BOD-0923-020-10SML | 30 | 17.8 | 13.7 | 13.7 | 8 |
| BOD-0923-020-10STD | 35 | 18.1 | 13.7 | 13.7 | 8 |
| BOD-0923-020-10LRG | 40 | 18.3 | 13.7 | 13.7 | 8 |
| BOD-0923-020-12STD | 35 | 19.2 | 15.4 | 15.4 | 8 |
| BOD-0923-020-14SML | 30 | 20.4 | 17.5 | 17.5 | 8 |
| BOD-0923-020-14STD | 35 | 20.6 | 17.5 | 17.5 | 8 |
| BOD-0923-020-14LRG | 40 | 20.7 | 17.5 | 17.5 | 8 |

BSW-0920-021-01 Body Screw

### Primary Body Dimensions (mm), Ti



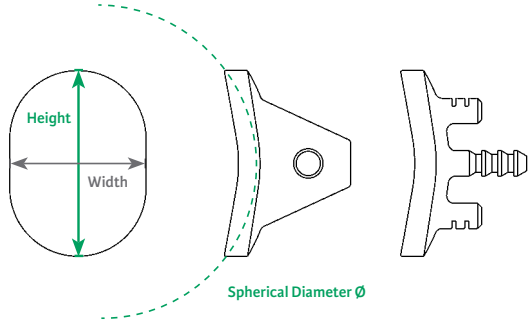

### Humeral Head Dimensions (mm), CoCr




| Humeral Head Catalog Number | Height | Width | Spherical Diameter Ø | Offset (Eccentric) | Concentric |
|---|---|---|---|---|---|
| MHH-0923-010-3814X | 14 | 38 | 41 | 2.5 | No Option |
| MHH-0923-010-4015X | 15 | 40 | 43 | 2.5 | No Option |
| MHH-0923-010-4216X | 16 | 42 | 45 | 4 | C |
| MHH-0923-010-4416X | 16 | 44 | 48 | 4 | C |
| MHH-0923-010-4419X | 19 | 44 | 45 | 4 | C |
| MHH-0923-010-4614X | 14 | 46 | 54 | 4 | C |
| MHH-0923-010-4617X | 17 | 46 | 49 | 4 | C |
| MHH-0923-010-4620X | 20 | 46 | 47 | 4 | C |
| MHH-0923-010-4815X | 15 | 48 | 56 | 4 | C |
| MHH-0923-010-4818X | 18 | 48 | 51 | 4 | C |
| MHH-0923-010-4821X | 21 | 48 | 49 | 4 | C |
| MHH-0923-010-5019X | 19 | 50 | 53 | 4 | C |
| MHH-0923-010-5022X | 22 | 50 | 51 | 4 | C |
| MHH-0923-010-5220X | 20 | 52 | 55 | 4 | C |

# Ordering Information and Implant Dimensions (continued)

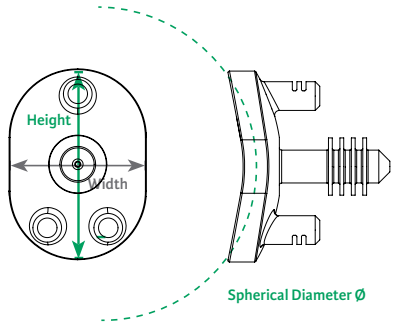
**Pegged and Keeled Glenoid Dimensions (mm), UHMWPE**




| Keeled Glenoid Catalog Number | Size | H | W | Ø | Keel L | Keel H | Keel W |
|---|---|---|---|---|---|---|---|
| GLN-0920-030-00K | X-Small | 31.8 | 22.9 | 54 | 14.0 | 22.9 | 4.1 |
| GLN-0920-030-01K | Small | 34.3 | 24.9 | 59 | 14.0 | 22.9 | 4.1 |
| GLN-0920-030-02K | Medium | 36.8 | 26.9 | 64 | 15.2 | 25.4 | 5.1 |
| GLN-0920-030-03K | Large | 39.4 | 28.9 | 66 | 15.2 | 25.4 | 5.1 |

| Pegged Glenoid Catalog Number | Size | H | W | Ø | Peg L Center | Peg L Peripheral | Peg D |
|---|---|---|---|---|---|---|---|
| GLN-0920-030-00P | X-Small | 31.8 | 22.9 | 54 | 14.0 | 6.4 | 5.0 |
| GLN-0920-030-01P | Small | 34.3 | 24.9 | 59 | 14.0 | 6.4 | 5.0 |
| GLN-0920-030-02P | Medium | 36.8 | 26.9 | 64 | 15.2 | 6.4 | 5.0 |
| GLN-0920-030-03P | Large | 39.4 | 28.9 | 66 | 15.2 | 6.4 | 5.0 |

**Fin-Lock™ Glenoid Dimensions (mm), HXLPE**




| | | | | | Peripheral | | Center | | |
|---|---|---|---|---|---|---|---|---|---|
| Fin-Lock Glenoid Catalog Number | Size | H | W | Ø | Peg D | Peg L | Peg Outer D | Peg Inner D | Peg L |
| GLN-0926-030-00A | X-Small | 31.8 | 22.9 | 54 | 5.0 | 6.4 | 9.5 | 5.5 | 15.0 |
| GLN-0926-030-01A | Small | 34.3 | 24.9 | 59 | 5.0 | 6.4 | 9.5 | 5.5 | 15.0 |
| GLN-0926-030-02A | Medium | 36.8 | 26.9 | 64 | 5.0 | 6.4 | 9.5 | 5.5 | 18.0 |
| GLN-0926-030-03A | Large | 39.4 | 28.9 | 66 | 5.0 | 6.4 | 9.5 | 5.5 | 18.0 |

**Availability of these products might vary from a given country or region to another, as a result of specific local regulatory approval or clearance requirements for sale in such country or region.**

- Always refer to the appropriate instructions for use for complete clinical instructions.
- Non contractual document. The manufacturer reserves the right, without prior notice, to modify the products in order to improve their quality.
- Warning: Applicable laws restrict these products to sale by or on the order of a physician.

## For more information or to place an order, please contact:

**United States, Canada, Asia, Pacific, Latin America**

USA 800-654-2873 ▪ 888-980-7742 fax
International +1 609-936-5400 ▪ +1 609-750-4259 fax
**integralife.com/contact**

**Europe, Middle-East, Africa**

International +33 (0)4 37 47 59 50 ▪ +33 (0)4 37 47 59 25 fax
Benelux +32 (0)2 257 4130 ▪ +32 (0)2 253 2466 fax
France +33 (0)4 37 47 59 10 ▪ +33 (0)4 37 47 59 29 fax
Switzerland +41 (0)22 721 23 00 ▪ +41 (0)22 721 23 99 fax
United Kingdom +44 (0)1 264 345 781 ▪ +44 (0)1 264 363 782 fax
**integralife.eu/contact**

Manufacturer:

Ascension Orthopedics, Inc.
8700 Cameron Road, Suite 100
Austin, Texas 78754
USA

EC REP Integra LifeSciences Services (France)
Immeuble Séquoia 2, 97 allée Alexandre Borodine
Parc technologique de la Porte des Alpes
69800 Saint Priest ▪ France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