enovis™

# AltiVate Reverse

SURGICAL TECHNIQUE

AltiVate Reverse

**NOTE:** *The AltiVate® Reverse Shoulder Humeral Stem Implant is designed for use with AltiVate Reverse Humeral Instrumentation and is not compatible with the RSP® Humeral Site Preparation Instruments. The AltiVate Reverse Humeral Stem Implant is compatible with the RSP Glenoid Implants and Instrumentation and with RSP humeral liner insert trials and implants*

# Table of Contents

# Indications

*Reverse Total Shoulder Indications:*

The AltiVate® Reverse Shoulder Prosthesis Stem is as a reverse shoulder replacement for patients with a functional deltoid muscle and a grossly deficient rotator cuff joint suffering from pain and dysfunction due to:

- Severe arthropathy with a grossly deficient rotator cuff;
- Previously failed joint replacement with a grossly deficient rotator cuff;
- Fracture of glenohumeral joint from trauma or pathologic conditions of the shoulder including humeral head fracture, displaced 3- or 4-part fractures of proximal humerus, or reconstruction after tumor resection;
- Bone defect in proximal humerus;
- Non-inflammatory degenerative disease including osteoarthritis and avascular necrosis of the natural humeral head and/or glenoid;
- Inflammatory arthritis including rheumatoid arthritis;
- Correction of functional deformity

The glenoid baseplate is intended for cementless application with addition of screws for fixation. This device may also be indicated in the salvage of previously failed surgical attempts for anatomic and hemi procedures.

**NOTE:** *All humeral stems are intended for cemented or cementless use.*

# Contraindications

Total joint replacement is contraindicated where there is:

- Infection or Sepsis;
- Insufficient bone quality which may affect the stability of the implant;
- Muscular, neurological, or vascular deficiencies, which compromise the affected extremity;
- Alcoholism or other addictions;
- Materials (metals, etc.) sensitivity;
- Loss of ligamentous structures;
- High levels of physical activity (e.g. competitive sports, heavy physical labor);
- Non-functional deltoid muscle;
- Intraoperative conversion from a reverse to an anatomic shoulder

# Surgical Snapshot – AltiVate® Reverse Humeral Preparation – Metaphyseal Approach


1 Perform osteotomy.


2 Drill guide hole.

3 Ream humeral socket.

4 Ream humeral canal.

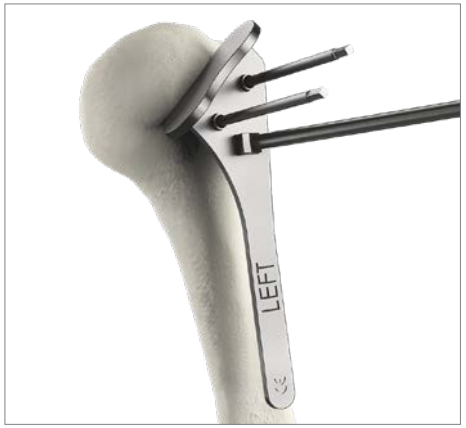
5 Assemble trial shell and broach.


6 Insert trial assembly and reduce with socket trial.

7 Insert AltiVate Reverse stem.

8 Impact humeral socket insert.

# Surgical Snapshot – AltiVate® Reverse Humeral Preparation – Diaphyseal Approach




1 Perform osteotomy.

2 Ream humeral canal.

3 broach humeral canal.

4 Plane humeral socket.

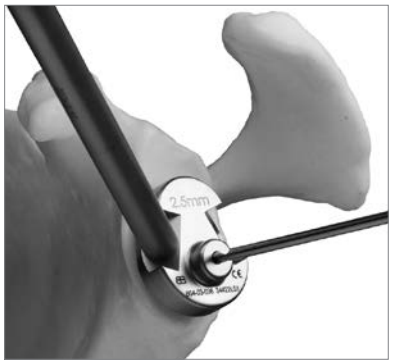
5 Ream humeral socket.


6 Reduce with shell and socket trials.

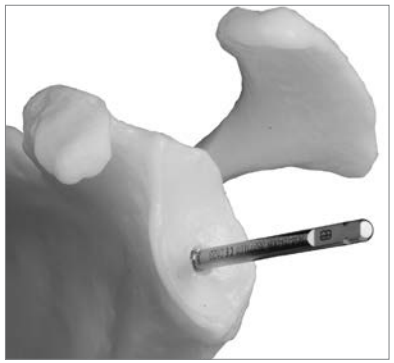
7 Insert AltiVate Reverse stem.

8 Impact humeral socket insert.

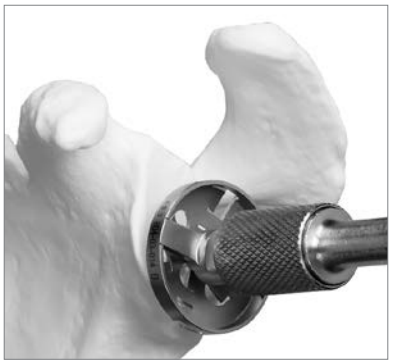
# Surgical Snapshot – AltiVate® Reverse Glenoid Preparation



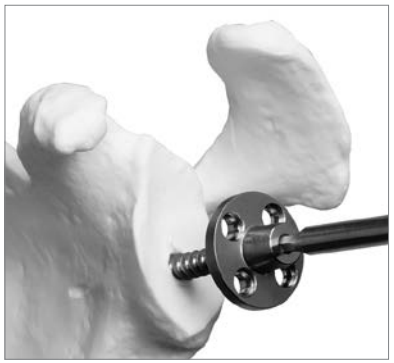

1 Drill guide hole.



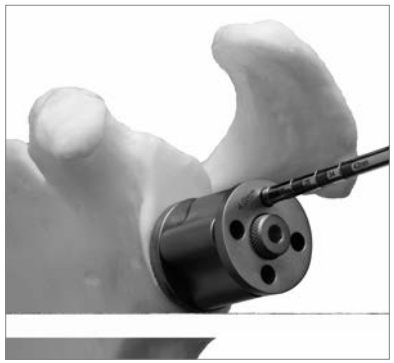
2 Insert guide tap.



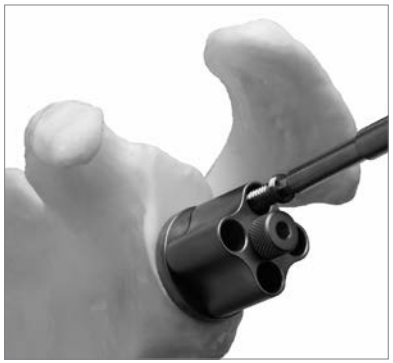
3 Ream glenoid.



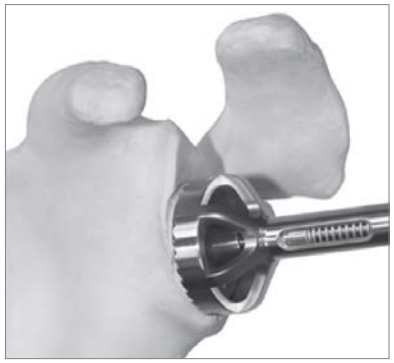
4 Insert baseplate.



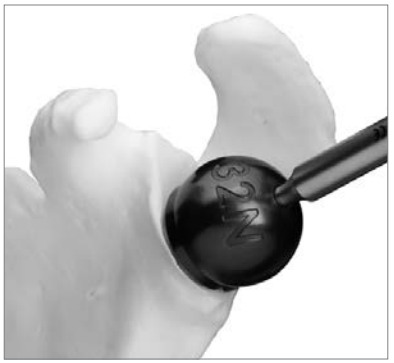
5 Drill peripheral holes.



6 Insert peripheral screws.

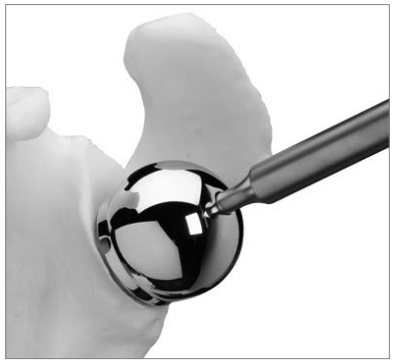


7 Plane around baseplate rim.



8 Reduce with glenosphere trial.

9 Insert glenosphere implant.



10 Insert glenosphere retaining screw.

# Patient Preparation

FIGURE 1

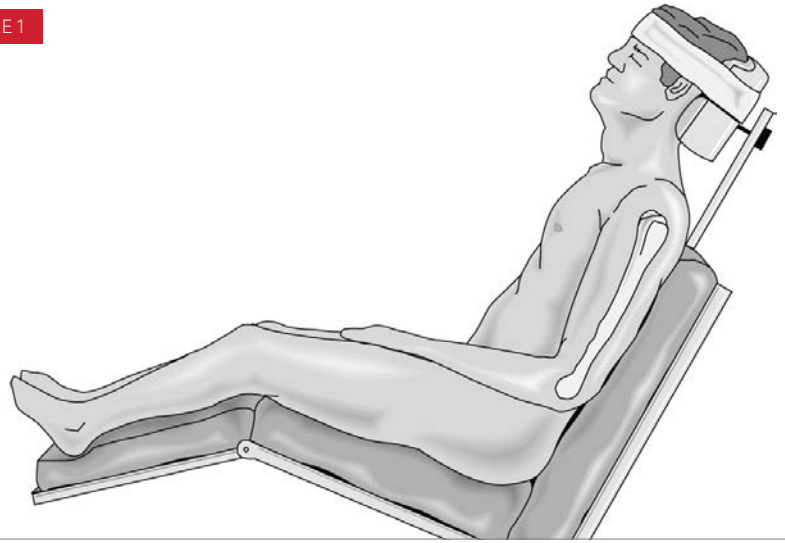
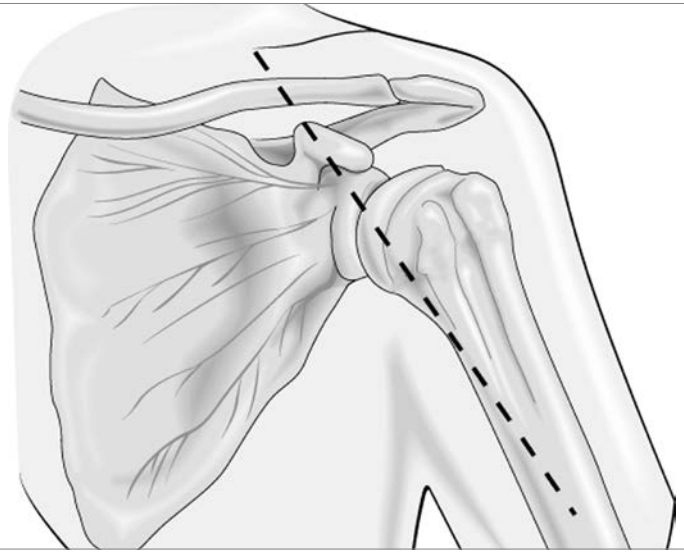


FIGURE 2



## PATIENT PREPARATION AND POSITIONING

General endotracheal anesthesia combined with an interscalene nerve block is preferable prior to positioning.

Place the patient in an upright beach chair position with the head firmly secured with the arm draped free (**FIGURE 1**).

The operative arm must be sufficiently off to the side of the bed to allow for unobstructed movement of the shoulder in adduction and hyperextension.

## DELTOPECTORAL SURGICAL APPROACH

An extended deltopectoral approach is used (**FIGURE 2**). In a primary case, prepare the incision 5 cm medial to the acromioclavicular joint and extend it down the anterior arm, distal and lateral to the axillary fold. Identify and preserve the cephalic vein. Free the deltoid muscle from the cephalic vein, ligating the lateral tributaries and leaving the vein medial with the pectoralis major muscle. Release a portion of the pectoralis major tendon insertion. Care should be taken to not damage the long head of the biceps tendon underneath.

# Humeral Exposure

FIGURE 3

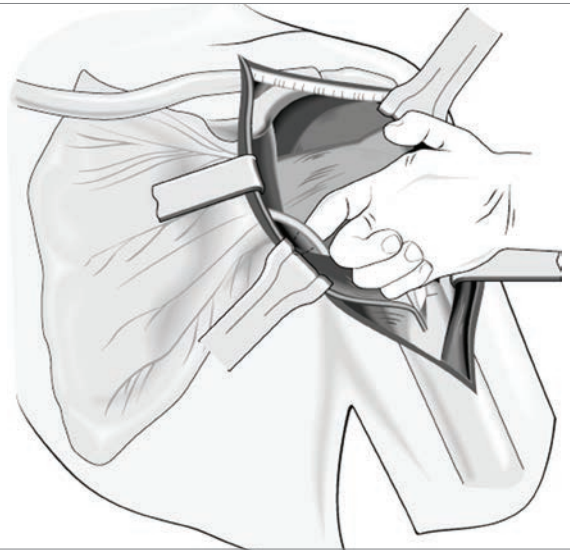
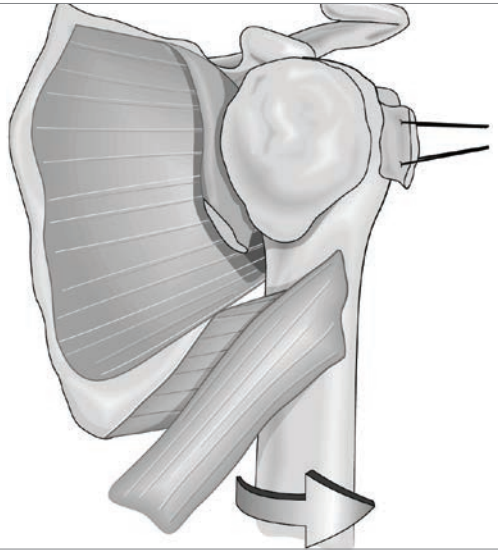


FIGURE 4



Expose the subdeltoid, subacromial, and subcoracoid spaces. Open the subdeltoid space using blunt and electrocautery dissection. Excise the subacromial bursa to allow placement of a deltoid retractor. Any remaining posterior rotator cuff insertion can be appreciated. Palpate the tip of the coracoid and identify the conjoined tendon. Incise the clavipectoral fascia superficially with electrocautery on the lateral border of the conjoined tendon. Avoid medial retractors on the conjoined tendon to prevent a musculocutaneous nerve traction injury.

Palpate the axillary nerve proximally between the conjoined tendon and the lower subscapularis muscle and distally on the undersurface of the lateral deltoid muscle. Confirm its location by performing the tug test (**FIGURE 3**).

Expose the long head of the biceps tendon and completely open the rotator interval to the superior rim of the glenoid. Ligate the anterior humeral circumflex vessels at the lower portion of the subscapularis. Release the remnant subscapularis tendon from the lesser tuberosity and proximal humerus. Externally rotating the arm will place tension on the muscle and facilitate its release from bone. Atraumatically dislocate the shoulder anteriorly using gentle external rotation and extension (**FIGURE 4**). The humerus is often osteopenic and can be fractured if overzealous force is used to dislocate the shoulder.

# › Humeral Osteotomy

FIGURE 5

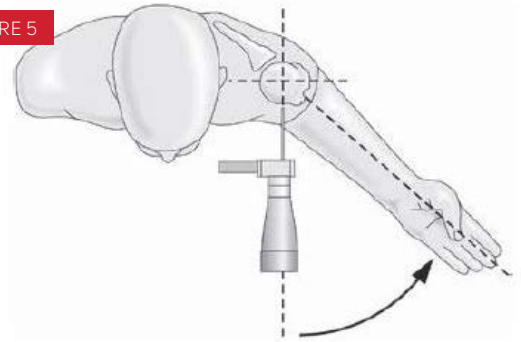


FIGURE 6

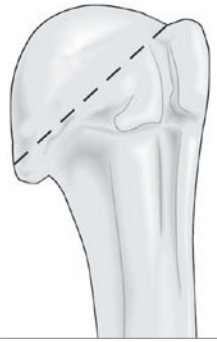


FIGURE 7


## HUMERAL PREPARATION - OSTEOTOMY

Measure the level of the humeral head resection intraoperatively by reviewing the preoperative plan. Trim any osteophytes from the proximal humerus as needed using a straight rongeur to improve visualization of the anatomic neck of the humerus. Position the Extramedullary Osteotomy Guide onto the anterior humeral shaft to determine the varus-valgus angle of the humeral head osteotomy. For a right shoulder, the Right label should be facing outward and for a left shoulder, the Left label should be facing outward. Humeral retroversion is determined by using the forearm as a reference point to the flexed elbow. Externally rotate the forearm, and align the Retroversion Alignment Rod parallel to the forearm to recreate a preferred humeral neck resection in 30 degrees of humeral retroversion. (**FIGURE 5**) Note that the height of the osteotomy should be at the anatomic neck. (**FIGURE 6**) Drill 2 holes through the Osteotomy Guide using a 3.2mm drill bit. Tap the bone pins into the prepared drill holes to secure the Osteotomy Guide to the anterior humeral shaft. (**FIGURE 7**) A Pin Driver can be used to for pin placement instead of first drilling with a 3.2mm drill bit. Begin the humeral head resection by cutting parallel to the top of the Osteotomy Guide until the humeral head is completely resected. Pull out the bone pins using the Bone Pin Puller/ Extractor and remove the Osteotomy Guide.

# › Humeral Protection

FIGURE 8

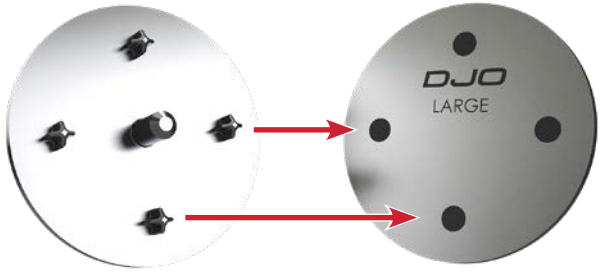



FIGURE 9


FIGURE 10


## HUMERAL PROTECTION (OPTIONAL)

Humeral Protectors (available in Small and Large) can be placed on the cut humeral surface as long as socket shell reaming has not been done. The Protectors have a central post and 4 "feet" to provide fixation to the resection surface. (**FIGURE 8**)

Use the Humeral Socket Sizer/Drill Guide to center the position of the implant shell on the osteotomy. Gently impact the Sizer/Drill Guide with a surgical mallet to firmly seat it on the osteotomy. Assemble Humeral Socket Reamer Guide Drill to power and insert into Drill Guide through-hole. (**FIGURE 9**) Drill to physical stop and remove the Guide Drill and Sizer/Drill Guide. A pilot hole is now positioned at the center of the osteotomy.

**NOTE:** *Prior to using the Guide Drill, inspect the cutting edges of the instruments to ensure that the surfaces are not damaged.*

Insert the central post of the Protector into the pilot hole and gently impact the Protector with a surgical mallet to firmly seat it on the osteotomy. (**FIGURE 10**) Markings correlating to the location of the 4 feet are on the top surface of the Protector and can aid in Protector positioning.

If the Protector is assembled after broaching, use the markings to position the Protector to maximize fixation on the osteotomy as the pilot hole is no longer relevant. The Protector cannot be used after socket shell reaming.

# Humeral Preparation and Trialing - Metaphyseal-Based Approach

FIGURE 11

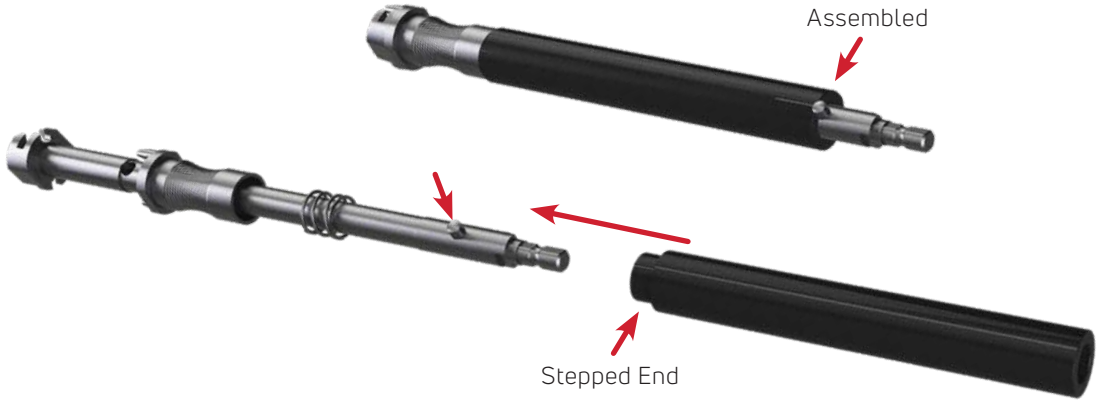

## PILOT HOLE CREATION

Use the Humeral Socket Sizer/Drill Guide to center the position of the implant shell on the osteotomy. Gently impact the Sizer/Drill Guide with a surgical mallet to firmly seat it on the osteotomy. Assemble Humeral Socket Reamer Guide Drill to power and insert into Drill Guide through-hole. (**FIGURE 11**) Drill to physical stop and remove the Guide Drill and Sizer/Drill Guide. A pilot hole is now positioned at the center of the osteotomy.

**Tip for implant position:** *In patients with smaller metaphyses, positioning the Humeral Socket Sizer/Drill Guide more laterally can minimize medialization of the implant.*

**NOTE:** *Prior to using the Guide Drill, inspect the cutting edges of the instruments to ensure that the surfaces are not damaged.*

FIGURE 12




## HUMERAL REAMER/PLANER DRIVER ASSEMBLY

The Humeral Socket Reamer/Planer Driver and Humeral Socket Reamer/Planer Driver Sleeve must be pre-assembled prior to use with the Socket Reamers and Planers. (**FIGURE 12**) Note that the spring must be present on the shaft of the Driver, and the stepped end of the Sleeve must go on the Humeral Socket Reamer/Planer Driver first. Depress the release button and slide the Sleeve over it. Assess the fit of the Driver Assembly to ensure there is not a lot of excess space between the Sleeve and the release button.

# Humeral Preparation and Trialing - Metaphyseal-Based Approach

FIGURE 13

FIGURE 14

FIGURE 15

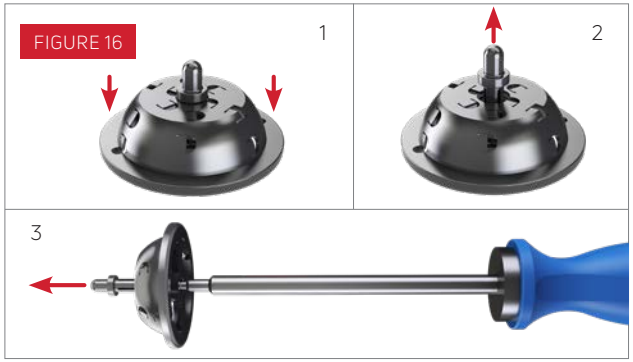
## PROXIMAL HUMERAL PREPARATION

Humeral Socket Reamers are available in 4 sizes. The Small Shell Press-Fit (SM PF) and Small Shell Cemented (SM CM) sizes can be used as starter reamers if required. The Standard Shell Press-Fit (STD PF) size should be used in a cementless application, while the Standard Shell Cemented (STD CM) size should be used in a cemented application. Assemble the Humeral Socket Reamer Removable Guide Pin to the selected Socket Shell Reamer. (**FIGURE 13**) Next, assemble the Socket Shell Reamer and the Humeral Socket Reamer/Planer Handle Assembly. (**FIGURE 14**) Insert the Guide Pin into the pilot hole in the osteotomy and ream to the physical stop. (**FIGURE 15**)

**NOTE:** *Prior to using the Socket Shell Reamers, inspect the cutting edges of the instruments to ensure that the surfaces are not damaged.*

**NOTE:** *The bone graft collected by the Socket Shell Reamer can be used in press-fitting the stem.*

FIGURE 16




**NOTE:** *To disengage the guide pin from the socket reamer, set the assembly on a flat surface and push down on the reamer's physical stop. A drill bit or hex driver can aid in disassembly. (**FIGURE 16**)*

# Humeral Preparation and Trialing - Metaphyseal-Based Approach

FIGURE 17

FIGURE 18

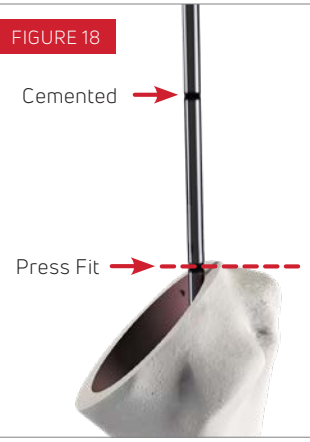



FIGURE 19

FIGURE 20


FIGURE 21

## HUMERAL CANAL REAMING

The Humeral Reamers are cylindrical and self-centering, with blunt tips, proportionally sized in 6mm-20mm diameters, in 2mm increments. The Starter Reamer is the Size 5mm Canal Reamer with a starter tip. It is recommended to always manually hand-ream the intramedullary humeral canal.

Extend and adduct the humerus to allow access to the medullary canal. Remove a small amount of lateral cortical bone to allow straight access down the humeral shaft and prevent varus reaming. Enter the intramedullary canal where the supraspinatus tendon normally would attach to the greater tuberosity lateral to the humeral head cut surface. Attach the 5mm Starter Reamer to the detachable T-handle and begin reaming. (**FIGURE 17**)

Orient the Humeral Reamer laterally against the cortical bone to ensure proper alignment of the reamer along the long axis of the humeral shaft for correct component positioning. Use the proximal lateral level of the humeral osteotomy as the point of reference. Reamers indicate three depths which correspond to reaming depths appropriate for three stem lengths: Standard (108mm), Long 1 (175mm) and Long 2 (220mm). Each stem length has two lines. The thicker line is the reaming depth appropriate for a press-fit application, and the thinner line is the reaming depth appropriate for a cemented application and accounts for the largest cement restrictor length. (**FIGURE 18**) Sequentially ream the intramedullary canal to the size templated in the preoperative plan or until cortical bone chatter resistance is encountered.

## HUMERAL STEM TRIALING

The Humeral Broaches and Socket Shell Trial can be assembled to create a "Trial Assembly" (**FIGURE 19**) for the Implant. Assemble the Trialing Guide Pin to the lateral (top) hole of the Humeral Broach. Slide the Socket Shell Trial over the Trialing Guide Pin so that the screw lines up with the medial hole of the Humeral Broach. Assemble the Socket Shell Trial to the Humeral Broach using the 3.5mm Hex Driver, then remove the Trialing Guide Pin. (**FIGURE 20**) . If the final Humeral Canal Reamer size is 10mm or smaller, start with the Size 6mm Humeral Broach and assemble with the Socket Shell Trial using the 3.5mm Hex Driver. If the final Humeral Canal Reamer size is 12mm or larger, start with a broach size that is 2 sizes smaller than the final Humeral Canal Reamer size.

Assemble Retroversion Alignment Rod to the Trial/Implant Inserter and the Trial/Implant Inserter to the Trial Assembly. Insert Trial Assembly into humerus and impact the strike plate to seat the Trial Assembly. (**FIGURE 21**) Continue to sequentially insert Trial Assemblies, increasing in Broach size, until a firm and stable fit is achieved. The final broach size obtained is generally equivalent to, or is one size smaller than, the last Humeral Reamer size used.

**NOTE:** *The Shell Trial should be firmly attached to the broach before impacting with the Trial/Implant Inserter. If using a* ***size 14 or larger*** *broach and/or if the patient has hard bone, the Broach Handle should be used with the Humeral Broach to avoid excess force on the Shell Trial.*

# Humeral Preparation and Trialing - Diaphyseal–Based Approach

FIGURE 22


FIGURE 23

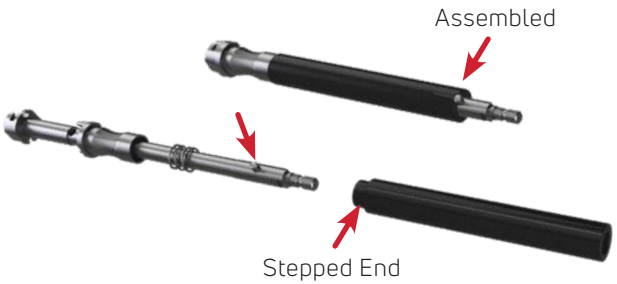



FIGURE 24

## OPTIONAL HUMERAL PREPARATION STEP - STARTER REAMING

**NOTE:** *This section describes the optional use of starter metaphyseal reaming. This starter ream can help with optimal broach positioning and sizing. Once the starter reaming is done, the humeral protectors cannot be used.*

## PILOT HOLE CREATION

Use the Humeral Socket Sizer/Drill Guide to center the position of the implant shell on the osteotomy. Gently impact the Sizer/Drill Guide with a surgical mallet to firmly seat it on the osteotomy. Assemble Humeral Socket Reamer Guide Drill to power and insert into Drill Guide through-hole. (**FIGURE 22**) Drill to physical stop and remove the Guide Drill and Sizer/Drill Guide. A pilot hole is now positioned at the center of the osteotomy.

**NOTE:** *Prior to using the Guide Drill and the Socket Shell Reamers, inspect the cutting edges of the instruments to ensure that the surfaces are not damaged.*

## HUMERAL REAMER/PLANER DRIVER ASSEMBLY

The Humeral Socket Reamer/Planer Driver and Humeral Socket Reamer/Planer Driver Sleeve must be pre-assembled prior to use with the Socket Reamers and Planers. Note that the spring must be present on the shaft of the Driver, and the stepped end of the Sleeve must go on the Humeral Socket Reamer/Planer Driver first. Depress the release button and slide the Sleeve over it. Assess the fit of the Driver Assembly to ensure there is not a lot of excess space between the Sleeve and the release button. (**FIGURE 23**)

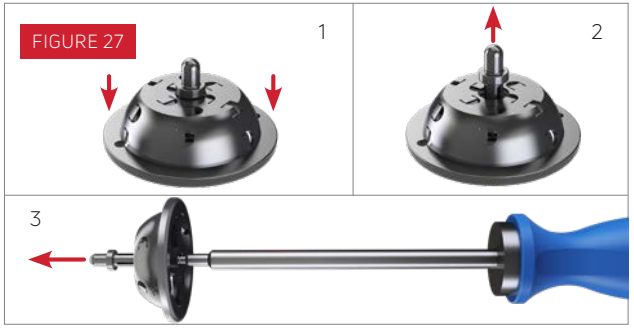
## PROXIMAL HUMERAL STARTER REAMING

Assemble the Humeral Socket Reamer Removable Guide Pin to the Small Shell Press-Fit (SM PF) Socket Shell Reamer. (**FIGURE 24**) Next, assemble the Socket Shell Reamer and the Humeral Socket Reamer/Planer Handle Assembly. (**FIGURE 25**) Insert the Guide Pin into the pilot hole in the osteotomy and ream to the physical stop. (**FIGURE 26**)

FIGURE 25

FIGURE 26

FIGURE 27




**NOTE:** *To disengage the guide pin from the socket reamer, set the assembly on a flat surface and push down on the reamer's physical stop. A drill bit or hex driver can aid in disassembly.(**FIGURE 27**)*

# Humeral Preparation and Trialing - Diaphyseal–Based Approach

FIGURE 28

FIGURE 29


## HUMERAL CANAL REAMING

The Humeral Reamers are cylindrical and self-centering, with blunt tips, proportionally sized in 6mm-20mm diameters, in 2mm increments. The Starter Reamer is the Size 5mm Canal Reamer with a starter tip. It is recommended to always manually hand-ream the intramedullary humeral canal.

Extend and adduct the humerus to allow access to the medullary canal. Remove a small amount of lateral cortical bone to allow straight access down the humeral shaft and prevent varus reaming. Enter the intramedullary canal where the supraspinatus tendon normally would attach to the greater tuberosity lateral to the humeral head cut surface. Attach the 5mm Starter Reamer to the detachable T-handle and begin reaming. (**FIGURE 28**)

Orient the Humeral Reamer laterally against the cortical bone to ensure proper alignment of the reamer along the long axis of the humeral shaft for correct component positioning. Use the proximal lateral level of the humeral osteotomy as the point of reference. Reamers indicate three depths which correspond to reaming depths appropriate for three stem lengths: Standard (108mm), Long 1 (175mm) and Long 2 (220mm). Each stem length has two lines. The thicker line is the reaming depth appropriate for a press-fit application, and the thinner line is the reaming depth appropriate for a cemented application and accounts for the largest cement restrictor length. (**FIGURE 29**) Sequentially ream the intramedullary canal to the size templated in the preoperative plan or until cortical bone chatter resistance is encountered.

# Humeral Preparation and Trialing - Diaphyseal–Based Approach

FIGURE 30

FIGURE 31


FIGURE 32

FIGURE 33

FIGURE 34


## HUMERAL CANAL BROACHING

Humeral Broaches are designed to be consistent in shape and size with the sub-shell portion of the implant. If cementing, to allow for adequate cement mantle, a stem smaller than the final broach size should be selected. If using a cementless technique, a stem equal in size to the final broach size should be selected.

If the final Humeral Canal Reamer size is 10mm or smaller, start with the Size 6mm Humeral Broach. If the final Humeral Canal Reamer size is 12mm or larger, start with a broach size that is 2 sizes smaller than the final Humeral Canal Reamer size. Attach the Humeral Broach to the Humeral Broach Handle. (**FIGURE 30**)

As a guide for proper alignment and retroversion, attach the Retroversion Alignment Rod to the right or left hole in the Humeral Broach Handle. Externally rotate the forearm, and align the Retroversion Alignment Rod parallel to the patient's forearm to maintain the preferred amount of retroversion.

Gently impact the Humeral Broach Handle using a mallet until the depth indicator line of the Humeral Broach Handle lines up with the lateral aspect of the osteotomy (**FIGURE 31**) to ensure that the Humeral Broach has been countersunk into the metaphysis of the proximal humerus. (**FIGURE 32**)

Continue to sequentially broach, increasing in size, until a firm and stable fit is achieved. The final broach size obtained is generally equivalent to, or is one size smaller than, the last Humeral Reamer size used.

Remove the Humeral Broach Handle, and leave the final countersunk Humeral Broach in the humerus. (**FIGURE 33**) If humeral canal preparation has been done prior to the glenoid preparation, Humeral Protectors (available in Small and Large) can be placed on the cut humeral surface. (**FIGURE 34**)

# Humeral Preparation and Trialing - Diaphyseal–Based Approach

FIGURE 35


FIGURE 36


FIGURE 37

FIGURE 38

FIGURE 39

## HUMERAL REAMER/PLANER DRIVER ASSEMBLY

The Humeral Socket Reamer/Planer Driver and Humeral Socket Reamer/Planer Driver Sleeve must be pre-assembled prior to use with the Socket Reamers and Planers. Note that the spring must be present on the shaft of the Driver, and the stepped end of the Sleeve must go on the Humeral Socket Reamer/Planer Driver first. Depress the release button and slide the Sleeve over it. Assess the fit of the Driver Assembly to ensure there is not a lot of excess space between the Sleeve and the release button. (**FIGURE 35**)

## HUMERAL PLANING

Humeral Planers are available in Small and Large sizes. Assemble the Humeral Socket Reamer/Planer Guide Pin with the most lateral hole of the Humeral Broach in the humeral metaphysis. (**FIGURE 36**) Assemble the Humeral Planer and the Humeral Reamer/Planer Driver Assembly and ream the outer remaining surface of the osteotomy using power. (**FIGURE 37**) Plane to the physical stop. Leave the Reamer/Planer Guide Pin assembled to the broach for subsequent reaming.

**NOTE:** *Ensure debris is removed from the broach face (threaded holes) prior to assembly of Guide Pin*

## PROXIMAL HUMERAL PREPARATION

Humeral Socket Reamers are available in 4 sizes. The Small Shell Press-Fit (SM PF) and Small Shell Cemented (SM CM) sizes can be used as starter reamers if required. The Standard Shell Press-Fit (STD PF) size should be used in a cementless application, while the Standard Shell Cemented (STD CM) size should be used in a cemented application. Assemble the Socket Shell Reamer and the Humeral Socket Reamer/Planer Handle Assembly. (**FIGURE 38**) Place the Socket Reamer over the Guide Pin and ream the humeral metaphysis using power. (**FIGURE 39**) Ream to the physical stop and remove the Socket Reamer. Disassemble the Guide Pin from the Humeral Broach.

**NOTE:** *The bone graft collected by the Socket Shell Reamer can be used in press-fitting the stem.*

# Humeral Trialing

There are two options for trialing. Trialing can be done with a Trial Assembly (Humeral Broach and Socket Shell Trial) or with the final Humeral Stem Implant.

## OPTION 1: Using Trial Assembly and Socket Insert Trials

With the Metaphyseal-Based Approach, the Trial Assembly is already present in the humerus.

With the Diaphyseal-Based Approach, screw the Trialing Guide Pin into the lateral (top) hole of the Humeral Broach. Slide the Socket Shell Trial over the Trialing Guide Pin so that the screw lines up with the medial hole of the Humeral Broach. Assemble the Socket Shell Trial to the Humeral Broach using the 3.5mm Hex Driver, then remove the Trialing Guide Pin. (**FIGURE 40**)

FIGURE 40


**NOTE:** *Ensure debris is removed from the broach face (threaded holes) prior to assembly of the Socket Shell Trial.*

## OPTION 2: Using the Humeral Stem Implant and Socket Insert Trials

In a shoulder arthroplasty case it is recommended that trial reduction first be performed using the Trial Assembly. In certain cases, however, it may be desirable to cement or press-fit the Humeral Stem implant prior to performing the initial trial reduction.

Refer to the Humeral Stem Cementation section of this surgical technique for instructions on cementing the implant into the humerus. If using a cementless technique, the bone graft window in the implant should be filled with bone graft.

Attach the Humeral Stem to the Trial/Implant Inserter and insert the stem into the humeral canal. (**FIGURE 41**) A few taps on the end of the Trial/Implant Inserter is recommended.

FIGURE 41

# Glenoid Preparation

FIGURE 42

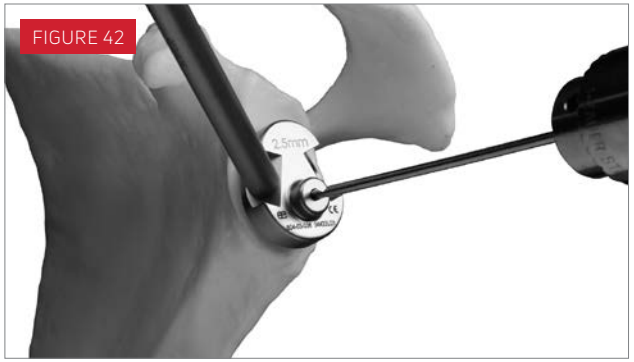


FIGURE 43

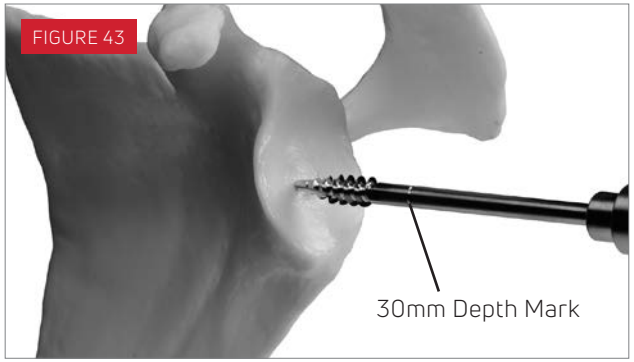



FIGURE 44

## GLENOID EXPOSURE

Abduct the arm on a free-standing Mayo stand or arm holder to relax the deltoid, and allow the humerus to retract posteriorly. Extensive soft tissue releases may be necessary to gain optimal visualization and access to the glenoid.

Place a glenoid retractor on the posterior-inferior rim of the glenoid to displace the humerus posteriorly. Release the coracohumeral ligament from the lateral coracoid to free the subscapularis and visualize the lateral coracoid base.

Release the glenohumeral ligaments, capsule, and labrum, and excise them from the glenoid beginning at the 12 o'clock position and ending between the 6 and 7 o'clock positions (for the right side shoulder). Excise the inferior capsule to ensure excellent visualization of inferior glenoid. Note that the axillary nerve is at risk for injury near the posterior-inferior resection of the capsule. When using electrocautery, care must be taken to remain on the bone of the glenoid neck while performing these releases to help minimize this risk.

Place a Meyerding or blunt Hohmann retractor on the anterior glenoid neck to retract the subscapularis and facilitate releases around the glenoid to minimize traction on the anterior structures to avoid brachial plexus traction injuries.

## GLENOID DRILL GUIDE PLACEMENT

Assemble the Central Drill Guide Handle to the Central Drill Guide such that the handle will be held anteriorly when the drill guide is placed on the glenoid. The Central Drill Guide has a built-in 10 degree inferior tilt to ensure accurate placement of the baseplate.

Preoperative planning helps to anticipate the tilt of the glenoid baseplate. As is common in cases of cuff tear arthropathy, superior wear of the glenoid may be present. In those cases, the 10 degree built-in inferior tilt of the drill guide may not be sufficient in ensuring the appropriate tilt of the baseplate.

Drill the hole and exit the anterior scapula using the 2.5mm drill bit. (**FIGURE 42**) Measure the depth of the drill hole using the Depth Gauge to ensure that the depth of the drill hole is approximately 30mm.

It is important to note that the length of the central screw on the baseplate is 30mm. Therefore, the length of the drilled hole should be of the appropriate length to achieve bicortical fixation after the face of the glenoid has been reamed.

Seat the 6.5mm Guide Tap in the same direction and angle as that used for the 2.5mm drill hole until it engages the anterior cortex of the scapula. The 6.5mm Guide Tap has a 30mm depth mark to provide guidance for achieving the appropriate depth. (**FIGURE 43**) Manual placement of the 6.5mm Guide Tap is achieved by connecting the manual Tap Driver Adaptor to the Ratchet Handle. Power placement of the 6.5mm Guide Tap is achieved by using the Power Tap Driver Adaptor. Significant resistance should be felt when the anterior cortex is engaged.

Leave the 6.5 mm Guide Tap in the glenoid. (**FIGURE 44**)

# Glenoid Preparation and Baseplate Implantation

FIGURE 45

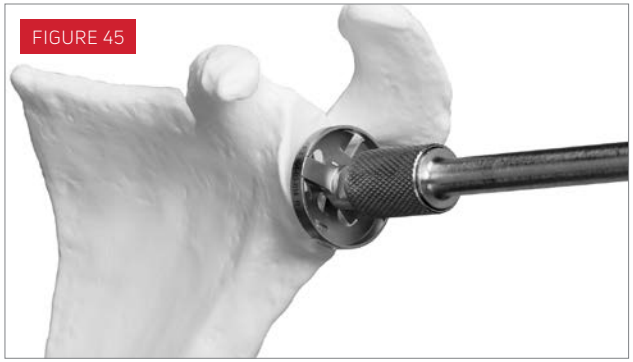


FIGURE 46

## GLENOID REAMING

Glenoid Reamers are cannulated and designed to create a concave glenoid surface that is congruent with the Glenoid Baseplate. They are designed for power use and are available in 4 sizes: starter, small, medium, and large.

Connect the smallest-sized Starter Glenoid Reamer to the Glenoid Reamer Driver for power use. Place the hole of the cannulated Starter Glenoid Reamer onto the 6.5mm Guide Tap and begin to ream the glenoid surface using power. (**FIGURE 45**) Ream the glenoid surface using the Small Glenoid Reamer. Medium and Large Glenoid Reamers are available based on surgeon preference. A 36mm glenosphere requires a ream up to the medium size and a 40mm glenosphere requires a ream up to the large size.

Ream to expose subchondral bone. Continue reaming to violate the subchondral bone on the inferior 50% of the prepared glenoid until bleeding bone is exposed. Remove the 6.5mm Guide Tap upon completion. Manual removal of the 6.5mm Guide Tap is achieved either by connecting the Quick-Coupling T-handle directly to the 6.5mm Guide Tap or by connecting the Manual Tap Driver Adaptor to the Ratchet Handle.

## GLENOID BASEPLATE IMPLANT

The Glenoid Baseplate implant is designed with a 6.5mm centralized bone screw that is 30mm long and 4 peripheral holes for bone screws. The baseplate is manufactured using a titanium alloy substrate and porous coating on the backside of the baseplate to promote biological fixation.

## GLENOID BASEPLATE INSERTION

Implant the Glenoid Baseplate into the prepared glenoid by purchasing the tip of the 6.5mm central bone screw into the pre-drilled hole on the anterior cortex of the scapula for secure fixation. (**FIGURE 46**) Manual placement of the Glenoid Baseplate is achieved by connecting the Ratchet Handle to the 3.5mm Hex Driver, which mates with a hex feature on the Morse taper of the Glenoid Baseplate.

When fully seated, the Glenoid Baseplate should sit flush with the glenoid, and the scapula should rotate slightly when attempting to tighten it down onto the glenoid surface. The purchase of the central screw when the baseplate is fully seated must be very secure so that the attempted further advancement of the screw will cause the entire scapula to rotate.

## PERIPHERAL BONE SCREW IMPLANTS

Four peripherally mounted bone screws are used to provide additional fixation of the Glenoid Baseplate to the glenoid surface. For perpendicular placement, 5.0mm locking bone screw implants are indicated. For angled placement in any direction up to 12 degrees, 3.5mm non-locking bone screw implants are indicated. Selection of bone screws is at the discretion of the surgeon, however, it is preferable to use 5.0mm locking screws. A variable angle 3.5mm non-locking screw should only be used in the event that a perpendicular 5.0mm locking screw is unable to achieve adequate bone purchase

# Glenoid Preparation and Baseplate Implantation

FIGURE 47

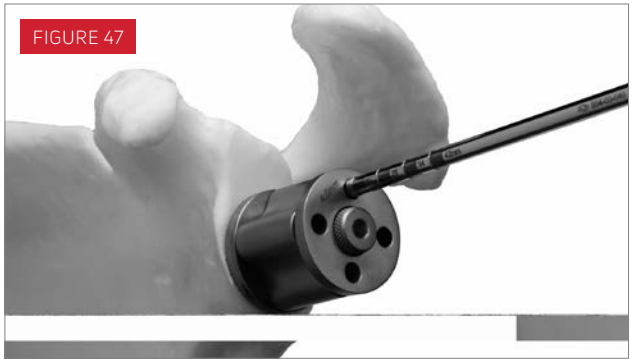


FIGURE 48

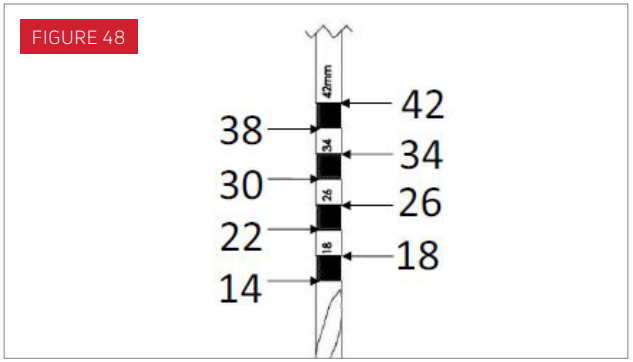



FIGURE 49

## PERIPHERAL BONE SCREW INSERTION

For placement of the 5.0mm locking bone screws, attach the Two-Piece Drill Guide onto the Glenoid Baseplate. Using the 4.0mm drill bit, drill all 4 screw holes through the assembled Two-Piece Drill Guide. (**FIGURE 47**) When the rear cortex is penetrated by the drill bit, the depth line on the drill bit should be noted to determine the appropriate screw length. The 4.0mm drill bit is calibrated in 4mm increments, starting at 14mm up to 42mm. (**FIGURE 48**)

To measure the depth of each pre-drilled screw hole using the Depth Gauge, subtract 25mm (i.e., the assembled height of the drill guide) from the Depth Gauge reading to obtain screw length. Remove the inner drill guide tube section, leaving the outer screw guide. The outer screw guide provides guidance for the locking screws. Implant the appropriate 5.0mm locking bone screw into the Glenoid Baseplate. (**FIGURE 49**)

Manual placement of the 5.0mm locking bone screw is achieved using the 3.5mm Hex Driver connected to the Ratchet Handle. Power placement of the 5.0mm locking bone screw is achieved by connecting the Power Tap Driver Adaptor to the 3.5mm Power Hex Driver.

Care should be taken when using power for insertion of the 5.0mm locking screws with the screw guide. A low/slow setting must be applied when drilling. Do not engage the head of the screw to the baseplate under power.

Obtain final seating of the bone screws manually using the 3.5mm Hex Screwdriver. Screw heads should be tightened completely to prevent impingement with the Glenoid Head.

# Glenoid Preparation and Baseplate Implantation

FIGURE 50

## PERIPHERAL BONE SCREW INSERTION/ NON-LOCKING SCREWS

Occasionally, there may be an inadequate amount of bone stock and/or too poor quality of bone for perpendicular placement of the 5.0mm locking bone screws. Under these circumstances, the 3.5mm non-locking bone screws can be used to angle the bone screw placement using the 2.5mm drill bit and the 2.5mm/3.2mm angled drill guide for improved bone purchase. (**FIGURE 50**) Measure the depth of each pre-drilled screw hole using the Depth Gauge.

Tap the pre-drilled 2.5mm screw holes using the 3.5mm Bone Screw Tap. Manual placement of the 3.5mm non-locking bone screw is achieved using the small 2.5mm Hex Screwdriver. Power placement of the 3.5mm locking bone screw is achieved by connecting the Power Tap Driver Adaptor to the 2.5mm Power Hex Driver.

Obtain final seating of the bone screws using the 2.5mm Hex Screwdriver. Screw heads should be tightened completely to prevent impingement with the Glenoid Head.

FIGURE 51

## GLENOID BASEPLATE RIM PLANING

Position the Baseplate Rim Planer over the Glenoid Baseplate. Manually ream around the rim of the Glenoid Baseplate to remove any bone or soft tissue. (**FIGURE 51**) This will help to prevent impingement when implanting the Glenoid Head onto the Glenoid Baseplate.

## ALTERNATIVE GLENOID PLANING TECHNIQUE UTILIZING A BURR INSTEAD OF GLENOID RIM PLANER

Remove any observed soft tissue or bony prominence around the baseplate that might prevent the head from seating fully using rongeurs or a burr, being careful to avoid damaging the rim of the baseplate. If the trial glenoid head is seated fully and the taper is engaged, then sufficient bone was removed. If a glenosphere larger than a size 32mm neutral is used, additional bone and soft tissue will need to be removed for preparation for a larger glenosphere rim. In the case of 36 -4mm offset, 40mm neutral and 40mm -4mm offset, preparation for the associated hood will also need to be made.

FIGURE 52

## GLENOID HEAD SELECTION

Glenoid Head Trials are available in seven sizes: 32mm blue (neutral and -4mm offset), 36mm yellow (neutral and -4mm offset), 40mm green (neutral and -4mm offset), and 44mm gray (+8mm offset).

Select the appropriate Glenoid Head Trial with the correct offset. Assemble the Glenoid Head Trial to the Glenoid Head Inserter by placing the Glenoid Head Inserter into the outer central hole of the Trial and rotating clockwise until tight. Position the Glenoid Head Trial onto a clean, dry Morse taper of the Glenoid Baseplate using the Glenoid Head Inserter. (**FIGURE 52**) Using the Glenoid Head Impactor, impact the Glenoid Head Trial onto the Glenoid Baseplate using three to four taps. As the 36mm -4mm offset, 40mm neutral, and 40mm -4mm offset glenoid heads are hooded on the inferior portion, excess bone from the medial, inferior margin of the glenoid should be removed using a high speed burr or curved rongeur to ensure that the hooded glenoid head sits flush on the prepared glenoid without impingement.

Pull the proximal humerus laterally while extending and externally rotating the arm to deliver the proximal humerus anteriorly.

# Shoulder Trial Reduction

Socket Insert Trials are available in sixteen sizes that are defined according to diameter, constraint level, and thickness. If a +8mm buildup is needed, the 8mm Spacer Trial can be used. The 8mm Spacer trial is compatible with any Humeral Socket Insert Trial.

The Socket Insert Trials assemble to the Socket Shell Trial and Humeral Stem Implant by lining up the tabs of the Insert Trial with the scallops of the Shell Trial or Implant. A clockwise turn of the Insert Trial will lock it into the Shell Trial or Implant.

## SHOULDER REDUCTION

Reduce the Shoulder by pulling laterally on the Humeral Socket Trial or Implant and proximal humerus to clear it from the Glenoid Head Trial, while flexing and internally rotating the arm until a gental but appreciable "clunk" occurs. If the shoulder reduces too easily, soft tissue tension is inadequate and may be addressed by incorporating greater humeral buildup and/or using a different Glenoid Head.

The 8mm Spacer Trial can also be used to further increase tensioning in the shoulder joint as required. It assembles to the Humeral Socket Trial or Humeral Stem Implant by aligning the 8mm Spacer Trial tabs to the mating scallops on the Shell Trial or Implant, followed by a clockwise turn of the 8mm Spacer Trial.

# Removal of Trial Components

FIGURE 53

Once shoulder mobility and joint stability are sufficient, dislocate the shoulder to remove all trial components. Rotate the Socket Insert Trial counter-clockwise, and remove it from the Socket Shell Trial.

**There are two options for removal of the Socket Shell Trial and the Broach.**

OPTION 1: Disassemble the Socket Shell Trial from the Broach using the 3.5mm Hex Driver. Then, use the Broach Handle to remove the Broach from the humeral canal.

OPTION 2: Assemble the Stem Inserter to the Shell Trial. Use the Stem Inserter to remove the Trial Assembly (Socket Shell Trial and Broach).

The Glenoid Head Distractor is also used to remove the Glenoid Head Trial. Position the Glenoid Head Distractor into the central hole of the Glenoid Head Trial and rotate clockwise until the Glenoid Head Trial disengages from the Glenoid Baseplate. (**FIGURE 53**) After the trial components and the broach have been removed, clear any remaining debris from the humeral canal.

## GLENOID HEAD IMPLANT

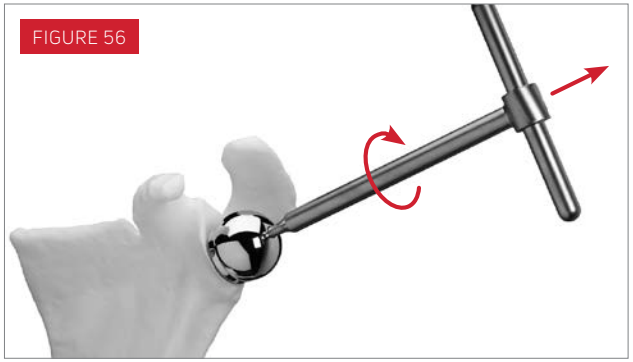
Glenoid Head Implants are manufactured with a wrought cobalt chrome articulating glenoid head surface and reverse Morse taper for fixation to the Glenoid Baseplate. Glenoid Heads are available in diameters of 32mm, 36mm, and 40mm, in either a neutral or -4mm offset. A 44mm Glenoid Head with a +8mm offset is also available. The 36mm -4mm offset, 40mm neutral, and 40mm -4mm offset Glenoid Heads are hooded on the inferior portion. All Glenoid Heads have a 5.4mm diameter hole in the center of the glenosphere to accept a Retaining Screw that is 16mm long. Although the Glenoid Head is attached to the Glenoid Baseplate via a Morse taper connection, the Retaining Screw is designed to be tightened into the central part of the Glenoid Baseplate to provide an additional measure of security.

# Implantation

FIGURE 54

FIGURE 55

FIGURE 56



## GLENOID HEAD INSERTION

Clear any soft tissue around the circumference of the Glenoid Baseplate. Irrigate the Glenoid Baseplate surface including the Morse taper and dry thoroughly. As the 36mm -4mm offset, 40mm neutral, and 40mm -4mm offset Glenoid Heads are hooded on the inferior portion, excess bone from the medial, inferior margin of the glenoid should be removed using a high speed burr or curved rongeur to ensure that the hooded Glenoid Head sits flush within the prepared glenoid without impingement.

Select the appropriate cobalt-chrome Glenoid Head implant with the correct offset. Assemble the Glenoid Head to the Glenoid Head Inserter by placing the Glenoid Head Inserter into the outer central hole of the Glenoid Head and rotate clockwise until tight. Position the Glenoid Head onto a clean, dry Morse taper of the Glenoid Baseplate using the Glenoid Head Inserter. (**FIGURE 54**) Remove the Glenoid Head Inserter and, using the Glenoid Head Impactor, impact the cobalt-chrome Glenoid Head implant onto the Glenoid Baseplate implant using three to four firm taps. (**FIGURE 55**)

Thread the Glenoid Head Inserter onto the Glenoid Head implant and pull on the Glenoid Head Inserter to ensure the Glenoid Head is fully seated onto the Morse taper of the Glenoid Baseplate. Also attempt to twist the Glenoid Head Inserter to ensure that the Glenoid Head is fully seated. (**FIGURE 56**) A fully seated Glenoid Head implant will not move. If the Glenoid Head implant is not fully seated. soft tissue impingement may be present. Insert the Retaining Screw into the outer central hole of the Glenoid Head. Tighten the Retaining Screw using the Torque limiting Driver.

# Humeral Stem Cementless Implantation

FIGURE 57

Select the appropriately sized Humeral Stem. If using a cemented technique, note that the Humeral Stem Implant should be smaller than the final Humeral Broach size used to allow for an adequate cement mantle.

The bone graft window in the implant should be filled with bone graft, whether doing a cemented or cementless technique.

FIGURE 58

Assemble Retroversion Alignment Rod to the Trial/Implant Inserter and the Trial/Implant Inserter to the Implant. (**FIGURE 57**) Insert Implant into humerus and impact the strike plate to seat the Implant. (**FIGURE 58**) Disassemble the Inserter from the implant. Select the appropriately sized Humeral Socket Insert based upon the last trial reduction performed. Carefully align the Humeral Socket Insert into

FIGURE 59

the opening of the humeral socket of the Humeral Stem Implant. Lightly impact the Humeral Socket Insert into the Humeral Stem using three to four firm taps on the Humeral Socket Impactor. (**FIGURE 59**) Ensure that the Socket Insert is fully seated around the entire circumference of the Socket Shell portion of the Humeral Stem.

# Humeral Stem Implant Cementation

Insert the appropriately sized cement restrictor into the humeral canal, approximately 1.5 cm below the distal tip of the Humeral Stem implant. Brush, irrigate, and dry the humeral canal before bone cement is pressurized into the humeral canal. Mix the bone cement according to the manufacturer's instructions. Extrude the bone cement into the humeral canal by filling the humeral canal, distal to proximal, using a retrograde technique. This technique is critical to avoid embolization of the intramedullary humeral canal with debris such as air and bone marrow. Pressurize the bone cement using a pressurizing nozzle or a digit.

**NOTE:** *Ensure that the bone graft window is filled with bone graft prior to insertion into cement-filled canal.*

Assemble and thread the Trial/Implant Inserter into the Humeral Stem Implant. A Retroversion Alignment Rod should then be threaded into the appropriate version hole (according to the desired amount of retroversion) of the Trial/Implant Inserter. When the bone cement has reached a dough-like consistency, the assembled Retroversion Alignment Rod should be used to orient the Humeral Stem into the humeral canal, and the Trial/Implant Inserter should be gently tapped with a surgical mallet to seat the implant. Disassemble the threaded knob of the Trial/Implant Inserter from the implant.

**NOTE:** *Remove any excess bone cement, focusing on the internal shell of the Stem Implant where the osteotome slots and poly snap feature are.*

FIGURE 60

**Tip for Implant Seating:** Use the Glenosphere Impactor to further seat the implant in the humerus prior to liner assembly. (**FIGURE 60**)

## 8mm Spacer Implantation

FIGURE 61

Follow the instructions of the Humeral Stem Implant – Socket Insert Assembly section

If the Humeral Stem is implanted into the humeral canal prior to assembly of the Socket Insert implant, confirm the initial choice of humeral build-up by trialing the Socket Insert Trial and 8mm Spacer Trial with the implanted Humeral Stem.

FIGURE 62

If the 8mm Spacer is determined to be needed, insert the Spacer implant into the socket of the Humeral Stem implant, ensuring that the alignment features are appropriately aligned with the mating pockets on the socket shell. (**FIGURE 61**) Insert and tighten the retaining screw using the 45 in-lb Torque Limiting Driver Handle and 5/16" Hex Socket Driver (**FIGURE 62**). Assemble the appropriately sized Socket Insert into the Humeral Stem socket or the 8mm Spacer by gently impacting the Socket Insert with the appropriately sized Humeral Socket Impactor.

## Final Reduction and Closure

With the patient relaxed, reduce the humeral prosthesis onto the glenoid head prosthesis. If the prosthesis cannot be reduced, soft tissue impingement may be present.

Gently examine the shoulder while the bone cement is still curing to confirm the previously established motion and joint stability. Examine the axillary nerve again using the "tug" test.

# Fracture Treatment

The Humeral Stem implant can be used as a hemi arthroplasty or reverse arthroplasty prosthesis for fracture treatment. The Humeral Stem Implant has suture holes placed within the rim of the stem, through the fins and also has a cerclage hole. Any of these can be used for sutures to assist in properly fixating tuberosities.

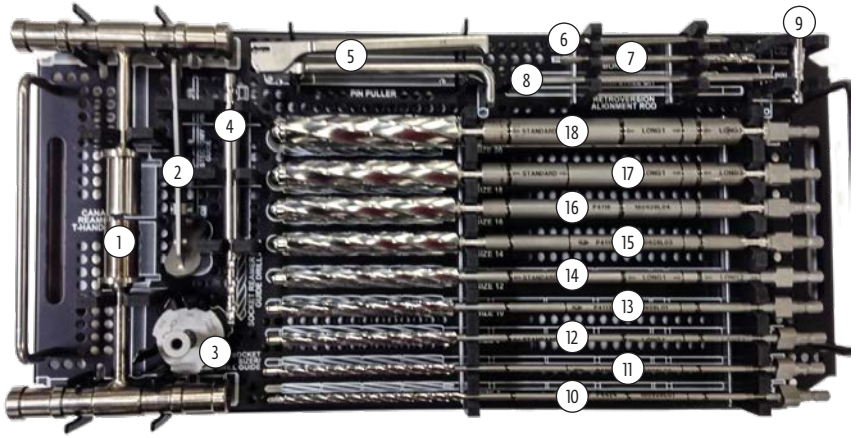
**NOTE:** *If cementing, make sure the suture holes on the implant shell are cleared of cement.*

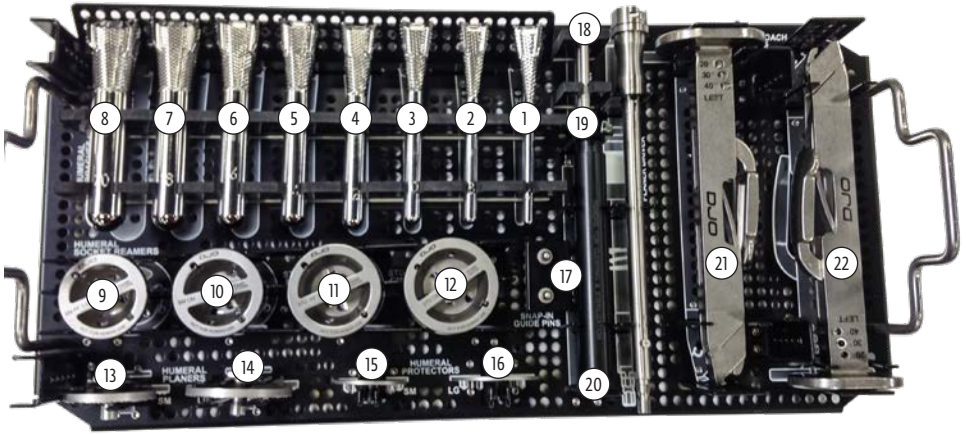

1. DATA ON FILE AT DJO®. LABORATORY TESTING DOES NOT NECESSARILY INDICATE CLINICAL PERFORMANCE.

2. BECK ET AL.BONE RESPONSE TO LOAD BEARING PERCUTANEOUS OSSEOINTEGRATED IMPLANTS FOR AMPUTEES: A SHEEP AMPUTATION MODEL.POSTER 2085 AT THE 57TH ANNUAL MEETING OF THE ORTHOPAEDIC RESEARCH SOCIETY. 2011.

# Reference Guide

## INSTRUMENT GUIDE




### AltiVate® Reverse Humeral Preparation – Top Tray: 61.34.0301A

| | Part No. | Description |
|---|---|---|
| 1 | 803-05-257 | Detachable T-Handle (x2) |
| 2 | 804-06-033 | Extramedullary Osteotomy Guide |
| 3 | 804-06-061 | Socket Sizer/Drill Guide |
| 4 | 804-06-062 | Socket Reamer Guide Drill |
| 5 | 800-01-035 | Pin Extractor |
| 6 | 800-01-338 | Quick Release Bone Pin (x2) |
| 7 | 801-01-020 | 3.2mm Drill Bit (x2) |
| 8 | 803-01-057 | Retroversion Alignment Rod (x2) |
| 9 | 800-01-339 | Pin Driver |

| | Part No. | Description |
|---|---|---|
| 10 | 804-06-015 | Humeral Canal Reamer 5mm |
| 11 | 804-06-016 | Humeral Canal Reamer 6mm |
| 12 | 804-06-018 | Humeral Canal Reamer 8mm |
| 13 | 804-06-020 | Humeral Canal Reamer 10mm |
| 14 | 804-06-022 | Humeral Canal Reamer 12mm |
| 15 | 804-06-024 | Humeral Canal Reamer 14mm |
| 16 | 804-06-026 | Humeral Canal Reamer 16mm |
| 17 | 804-06-028 | Humeral Canal Reamer 18mm |
| 18 | 804-06-030 | Humeral Canal Reamer 20mm |

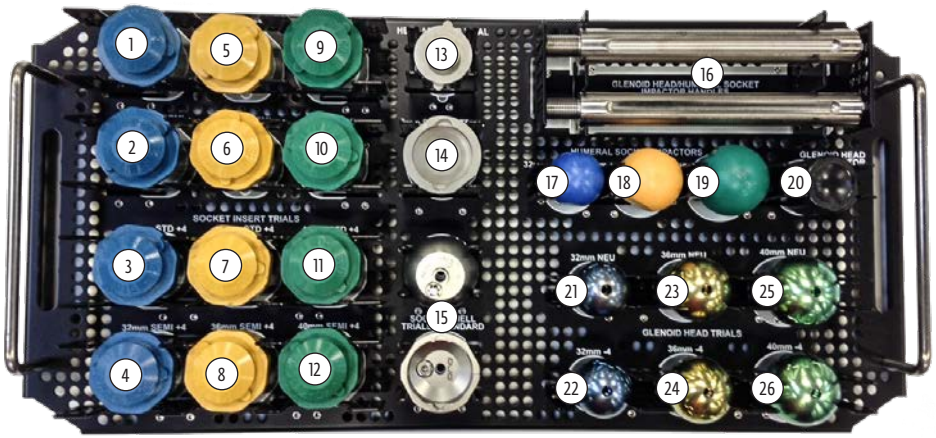
### AltiVate® Reverse Humeral Preparation – Bottom Tray: 61.34.0301A

| | Part No. | Description |
|---|---|---|
| 1 | 804-06-036 | Humeral Broach 6mm |
| 2 | 804-06-038 | Humeral Broach 8mm |
| 3 | 804-06-040 | Humeral Broach 10mm |
| 4 | 804-06-042 | Humeral Broach 12mm |
| 5 | 804-06-044 | Humeral Broach 14mm |
| 6 | 804-06-046 | Humeral Broach 16mm |
| 7 | 804-06-048 | Humeral Broach 18mm |
| 8 | 804-06-050 | Humeral Broach 20mm |
| 9 | 804-06-005 | Socket Reamer Small PF (Press-Fit) |
| 10 | 804-06-006 | Socket Reamer Small CM (Cemented) |
| 11 | 804-06-007 | Socket Reamer Standard PF (Press-Fit) |

| | Part No. | Description |
|---|---|---|
| 12 | 804-06-008 | Socket Reamer Standard CM (Cemented) |
| 13 | 804-06-053 | Humeral Planer Small |
| 14 | 804-06-054 | Humeral Planer Large |
| 15 | 804-06-063 | Humeral Protector Small |
| 16 | 804-06-064 | Humeral Protector Large |
| 17 | 804-06-060 | Humeral Socket Reamer Removable Guide Pin (x2) |
| 18 | 804-06-059 | Socket Reamer/Planer Guide Pin |
| 19 | 804-06-095 | Trialing Guide Pin |
| 20 | 804-06-002 | Socket Reamer/Planer Driver Sleeve |
| 21 | 804-06-001 | Socket Reamer/Planer Driver |
| 22 | 804-06-034 | Broach Handle (x2) |

# Reference Guide

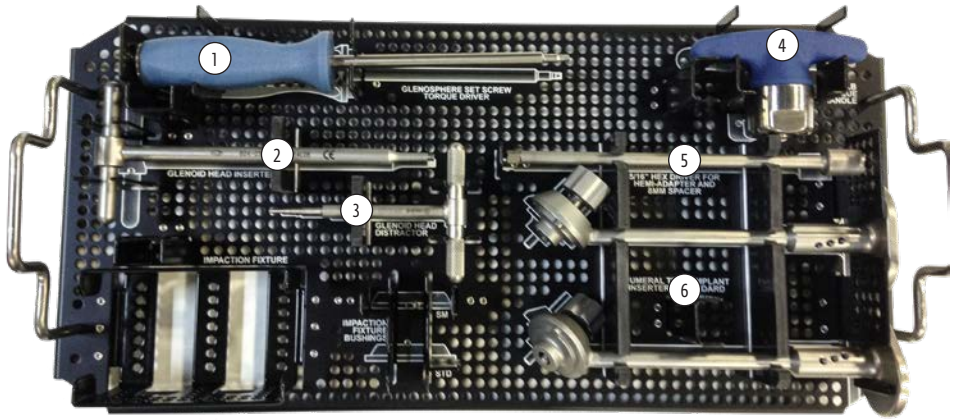
## INSTRUMENT GUIDE




### AltiVate® Reverse Humeral Trialing – Top Tray: 61.34.0303A

| | Part No. | Description |
|---|---|---|
| 1 | 804-02-468 | Socket Insert Trial 32mm Standard |
| 2 | 804-02-471 | Socket Insert Trial 32mm Semiconstrained |
| 3 | 804-02-460 | Socket Insert Trial 32mm Standard +4 |
| 4 | 804-02-461 | Socket Insert Trial 32mm Semiconstrained +4 |
| 5 | 804-02-469 | Socket Insert Trial 36mm Standard |
| 6 | 804-02-472 | Socket Insert Trial 36mm Semiconstrained |
| 7 | 804-02-462 | Socket Insert Trial 36mm Standard +4 |
| 8 | 804-02-463 | Socket Insert Trial 36mm Semiconstrained +4 |
| 9 | 804-02-470 | Socket Insert Trial 40mm Standard |
| 10 | 804-02-473 | Socket Insert Trial 40mm Semiconstrained |
| 11 | 804-02-464 | Socket Insert Trial 40mm Standard +4 |
| 12 | 804-02-465 | Socket Insert Trial 40mm Semiconstrained +4 |
| 13 | 804-02-072 | Hemi Adapter Trial (USA/NZ use only) |

| | Part No. | Description |
|---|---|---|
| 14 | 804-02-071 | 8mm Spacer Trial |
| 15 | 804-06-252 | Socket Shell Trial Standard (x2) |
| 16 | 800-01-018 | Glenoid Head/Humeral Socket Impactor Handle (x2) |
| 17 | 804-02-002 | Humeral Socket Impactor 32mm |
| 18 | 804-02-036 | Humeral Socket Impactor 36mm |
| 19 | 804-02-037 | Humeral Socket Impactor 40mm |
| 20 | 804-03-001 | Glenoid Head Impactor |
| 21 | 804-03-042 | Glenoid Head Trial 32mm Neutral |
| 22 | 804-03-043 | Glenoid Head Trial 32mm -4 |
| 23 | 804-03-044 | Glenoid Head Trial 36mm Neutral |
| 24 | 804-03-045 | Glenoid Head Trial 36mm -4 |
| 25 | 804-03-046 | Glenoid Head Trial 40mm Neutral |
| 26 | 804-03-047 | Glenoid Head Trial 40mm -4 |



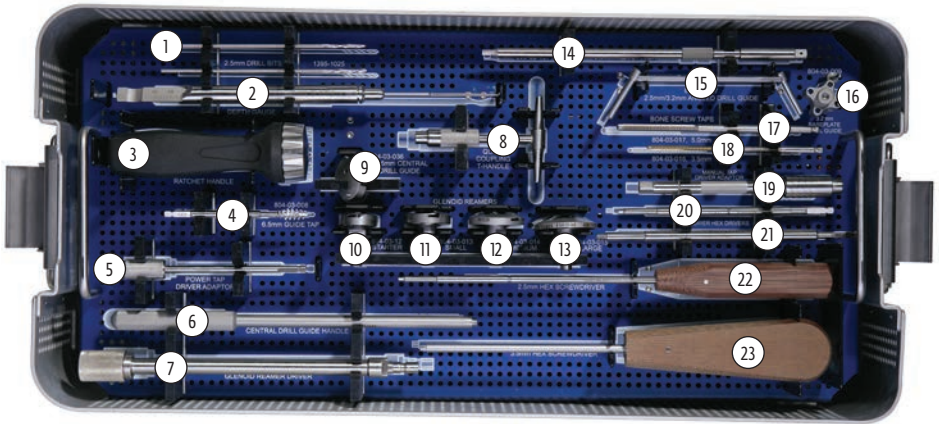

### AltiVate® Reverse Humeral Trialing – Bottom Tray: 61.34.0303A

| | Part No. | Description |
|---|---|---|
| 1 | 804-03-038 | Torque Driver for Glenosphere Set Screw |
| 2 | 804-03-051 | Glenoid Head Inserter/Impactor |
| 3 | 804-03-055 | Glenoid Head Distractor |

| | Part No. | Description |
|---|---|---|
| 4 | 801-01-662 | Torque Limiting T Handle |
| 5 | 804-02-075 | 5/16" Hex Socket Driver for Hemi Adapter and 8mm spacer |
| 6 | 804-06-056 | Humeral Trial/Implant Inserter Standard |

# Reference Guide

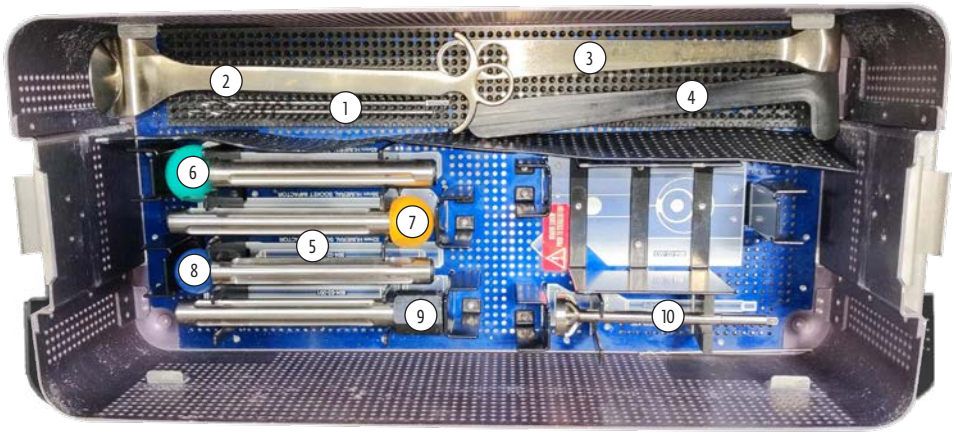
## INSTRUMENT GUIDE




### RSP™ Glenoid – Top Tray: 61.34.0302A

| | Part No. | Description |
|---|---|---|
| 1 | 1395-1025 | 2.5mm Drill Bit (x2) |
| 2 | 804-03-003 | Depth Gauge |
| 3 | 803-05-163 | Black Ratchet Handle |
| 4 | 804-03-008 | RSP 6.5mm Guide Tap |
| 5 | 804-03-020 | Power Driver Adaptor |
| 6 | 804-03-037 | Central Drill Guide Handle |
| 7 | 804-03-011 | Glenoid Reamer Driver |
| 8 | 804-03-019 | Quick-Coupling T-Handle |
| 9 | 804-03-036 | 2.5mm Central Drill Guide |
| 10 | 804-03-012 | Glenoid Reamer, Starter |
| 11 | 804-03-013 | Glenoid Reamer, Small |
| 12 | 804-03-014 | Glenoid Reamer, Medium |

| | Part No. | Description |
|---|---|---|
| 13 | 804-03-015 | Glenoid Reamer, Large |
| 14 | 803-05-167 | 3.5mm Hex Driver |
| 15 | 804-03-007 | 2.5mm / 3.2mm Angled Drill Guide |
| 16 | 804-03-048 | Two Piece Drill Guide |
| 17 | 804-03-017 | 5.0mm Bone Screw Tap |
| 18 | 804-03-018 | 3.5mm Bone Screw Tap |
| 19 | 804-03-016 | Manual Tap Driver Adaptor |
| 20 | 804-03-021 | 2.5mm Power Hex Driver |
| 21 | 804-03-022 | 3.5mm Power Hex Driver |
| 22 | 1395-1030 | Small 2.5mm Hex Screwdriver |
| 23 | 801-01-042 | Large 3.5mm Hex Screwdriver |



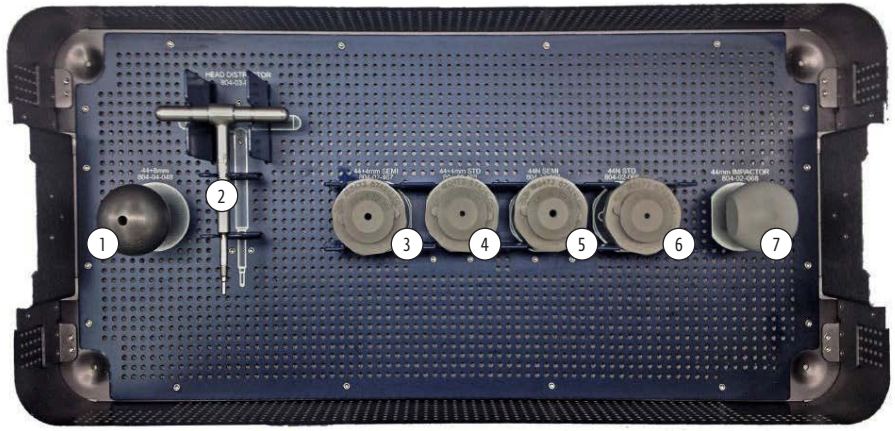

### RSP™ Glenoid – Bottom Tray: 61.34.0302A

| | Part No. | Description |
|---|---|---|
| 1 | 804-03-049 | 4.0mm Drill Bit (x2) |
| 2 | 804-00-098 | Deltoid Retractor |
| 3 | 804-00-099 | Humeral Retractor |
| 4 | 804-00-097 | Glenoid Retractor |
| 5 | 800-01-018 | Impactor Handle (x4) |
| 6 | 804-02-037 | 40mm Humeral Socket Impactor |

| | Part No. | Description |
|---|---|---|
| 7 | 804-02-036 | 36mm Humeral Socket Impactor |
| 8 | 804-02-002 | 32mm Humeral Socket Impactor |
| 9 | 804-03-001 | Glenoid Head Impactor |
| 10 | 804-03-056 | 32mm Baseplate Rim Planer |

# Reference Guide

## INSTRUMENT GUIDE




### RSP™ 44mm Tray: 61.34.0306A

| | Part No. | Description |
|---|---|---|
| 1 | 804-04-048 | Glenoid Head Trial, 44 +8 |
| 2 | 804-03-055 | Glenoid Head Distractor |
| 3 | 804-02-467 | Humeral Socket Shell Insert Trial, 44 +4 Semiconstrained |
| 4 | 804-02-466 | Humeral Socket Shell Insert Trial, 44 +4 Standard |

| | Part No. | Description |
|---|---|---|
| 5 | 804-02-067 | Humeral Socket Shell Insert Trial, 44 N Semiconstrained |
| 6 | 804-02-066 | Humeral Socket Shell Insert Trial, 44 N Standard |
| 7 | 804-02-068 | 44mm Humeral Socket Impactor |

# Reference Guide

## IMPLANT PART NUMBERS

### AltiVate® Reverse Humeral Stem, Standard

| Part No. | Size | Length |
|---|---|---|
| 530-06-108 | 6 | 108mm |
| 530-08-108 | 8 | 108mm |
| 530-10-108 | 10 | 108mm |
| 530-12-108 | 12 | 108mm |
| 530-14-108 | 14 | 108mm |
| 530-16-108 | 16 | 108mm |
| 530-18-108 | 18 | 108mm |

### AltiVate® Reverse Humeral Stem, Revision

| Part No. | Size | Length |
|---|---|---|
| 530-06-175 | 6 | 175mm |
| 530-08-175 | 8 | 175mm |
| 530-10-175 | 10 | 175mm |
| 530-12-175 | 12 | 175mm |
| 530-14-175 | 14 | 175mm |
| 530-16-175 | 16 | 175mm |
| 530-06-220 | 6 | 220mm |
| 530-08-220 | 8 | 220mm |
| 530-10-220 | 10 | 220mm |

### Socket Inserts, e+ Poly

| Part No. | Size | Thickness | Constraint |
|---|---|---|---|
| 509-00-032 | 32 | Standard | |
| 509-00-036 | 36 | Standard | |
| 509-00-040 | 40 | Standard | |
| 509-00-044 | 44 | Standard | |
| 509-00-432 | 32 | +4 | |
| 509-00-436 | 36 | +4 | |
| 509-00-440 | 40 | +4 | |
| 509-00-444 | 44 | +4 | |
| 509-01-032 | 32 | Standard | Semi |
| 509-01-036 | 36 | Standard | Semi |
| 509-01-040 | 40 | Standard | Semi |
| 509-01-044 | 44 | Standard | Semi |
| 509-01-432 | 32 | +4 | Semi |
| 509-01-436 | 36 | +4 | Semi |
| 509-01-440 | 40 | +4 | Semi |
| 509-01-444 | 44 | +4 | Semi |

### Glenospheres with Retaining Screw

| Part No. | Size | Offset |
|---|---|---|
| 508-32-101 | 32 | N |
| 508-32-103 | 32 | -4 |
| 508-36-101 | 36 | N |
| 508-36-103 | 36 | -4 |
| 508-40-101 | 40 | N |
| 508-40-103 | 40 | -4 |
| 508-44-101 | 44 | N |
| 508-00-001 | | Screw |

# Reference Guide

## IMPLANT PART NUMBERS

### Glenoid Baseplate

| Part No. | Coating |
|---|---|
| 508-32-104 | HA/3D MATRIX |

### Glenoid Baseplate Locking Bone Screws

| Part No. | Size | Length |
|---|---|---|
| 506-03-114 | 5mm | 14mm |
| 506-03-118 | 5mm | 18mm |
| 506-03-122 | 5mm | 22mm |
| 506-03-126 | 5mm | 26mm |
| 506-03-130 | 5mm | 30mm |
| 506-03-134 | 5mm | 34mm |
| 506-03-138 | 5mm | 38mm |

### Glenoid Baseplate Nonlocking Bone Screws

| Part No. | Size | Length |
|---|---|---|
| 506-02-114 | 3.5mm | 14mm |
| 506-02-116 | 3.5mm | 16mm |
| 506-02-118 | 3.5mm | 18mm |
| 506-02-120 | 3.5mm | 20mm |
| 506-02-122 | 3.5mm | 22mm |
| 506-02-124 | 3.5mm | 24mm |
| 506-02-126 | 3.5mm | 26mm |
| 506-02-128 | 3.5mm | 28mm |
| 506-02-130 | 3.5mm | 30mm |
| 506-02-132 | 3.5mm | 32mm |
| 506-02-134 | 3.5mm | 34mm |
| 506-02-136 | 3.5mm | 36mm |
| 506-02-138 | 3.5mm | 38mm |

### +8mm Spacer

| Part No. | Description |
|---|---|
| 510-08-000 | +8mm Spacer & Screw |
| 510-08-001 | Screw |

# NOTES

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# AltiVate Extremity Solutions

**Manufactured by**
DJO
9800 Metric Blvd.
Austin, TX 78758
U.S.A.
DJOGlobal.com/surgical

**EC Rep**.
MDSS GmbH
Schiffgraben 41
30175 Hannover
Germany

**Distributed by**
Mathys Ltd Bettlach
Robert Mathys Str. 5
P.O. Box
2544 Bettlach
Switzerland
www.mathysmedical.com


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