

# **Tornier Perform<sup>®</sup>**

## Humeral System – Fracture

### **Operative technique**



This publication sets forth detailed recommended procedures for using Stryker devices and instruments. It offers guidance that you should heed, but, as with any such technical guide, each surgeon must consider the particular needs of each patient and make appropriate adjustments when and as required.

### Important

- The patient should be advised that the device cannot and does not replicate a normal healthy bone, that the device can break or become damaged as a result of strenuous activity or trauma and that the device has a finite expected service life.
- Removal or revision of the device may be required sometime in the future.
- Cleaning and sterilization information is provided in the applicable instructions for use.
- Non-sterile devices, including implants and instruments, must be cleaned and sterilized prior to use, in accordance with validated methods.
- Devices that are able to be disassembled should be disassembled prior to point-of-use processing. Additionally, devices with movable components that do not facilitate disassembly should be manually articulated during the point-of-use processing step in order to evacuate additional soils.
- Please remember that the compatibility of different product systems has not been tested unless specified otherwise in the product labeling.
- Consult instructions for use (<https://ifu.stryker.com>) for a complete list of potential adverse effects and adverse events, contraindications, warnings and precautions.
- The surgeon must advise patients of surgical risks, and make them aware of adverse effects and alternative treatments.
- An implant whose packaging is open or damaged or whose expiration date has passed must not be used. Every precaution must be taken to ensure sterility when opening the packaging of the implant and during implantation.

# Tornier Perform Humeral System – Fracture

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# Indications for use

## In anatomic

The Tornier Perform Humeral System – Fracture combined with a humeral head may be used by themselves, as a hemiarthroplasty, if the natural glenoid provides a sufficient bearing surface, or in conjunction with a glenoid implant, as a total replacement.

The Tornier Perform Humeral System – Fracture is to be used only in patients with an intact or reconstructable rotator cuff, where it is intended to provide increased mobility, stability, and to relieve pain.

The Tornier Perform Humeral System – Fracture is indicated for use as a replacement of shoulder joints disabled by:

- Traumatic or pathologic conditions of the shoulder resulting in fracture of the glenohumeral joint, including humeral head fracture and displaced 3-or 4-part proximal humeral fractures
- Fracture sequelae
- Revisions where adequate fixation can be achieved and adequate bone stock remains after final reconstruction

Titanium humeral heads are intended for patients with suspected cobalt alloy material sensitivity. The wear properties of titanium and titanium alloys are inferior to that of cobalt alloy. A titanium humeral head is not recommended for patients without a suspected material sensitivity to cobalt alloy.

All components are single use. The fracture stems are intended for cemented or cementless use. In cementless use, the fracture stems are intended for use with or without cortical screws.

In a total shoulder arthroplasty, the Tornier Perform Humeral System – Fracture is intended to be used with cemented polyethylene glenoid components.

# Indications for use

## In reverse

The Tornier Perform Humeral System – Fracture combined with a reverse insert is indicated for use as a replacement of shoulder joints for patients with a functional deltoid muscle, grossly deficient rotator cuff, and pain disabled by:

- Traumatic or pathologic conditions of the shoulder resulting in fracture of the glenohumeral joint, including humeral head fracture and displaced 3-or 4-part proximal humeral fractures
- Proximal humerus bone defect
- Fracture sequelae
- Revisions where adequate fixation can be achieved and adequate bone stock remains after final reconstruction

The reversed insert is indicated for use for the conversion from an anatomic to reverse shoulder prosthesis without the removal of a well fixed fracture stem for patients with a functional deltoid muscle.

All components are single use. The fracture stems are intended for cemented or cementless use. In cementless use, the fracture stems are intended for use with or without cortical screws. The Tornier Perform Humeral System – Fracture is intended to be used with glenoid implants that are anchored to the bone with screws for non-cemented fixation.

# Contraindications for use

## In anatomic

### **Absolute contraindications for shoulder arthroplasty:**

- Non-proximal humeral fractures
- Active local or systemic infection, sepsis and osteomyelitis
- Inadequate bone stock in the proximal humerus or glenoid fossa for supporting the components
- Poor bone quality, where there could be considerable migration of the prosthesis and/or a chance of fracture of the humerus or glenoid
- Use of this implant is contraindicated in the presence of significant injury to the upper brachial plexus.
- Neuromuscular disease (e.g. joint neuropathy)
- Known or suspected allergy or material sensitivity to one of the materials
- Patient pregnancy
- Patient has not reached full skeletal maturity

### **Relative contraindications for shoulder arthroplasty:**

- Distant foci of infection from genitourinary, pulmonary, skin and other sites, dental focus infection which may cause hematogenous spread to the implant site. The foci of infection should be treated prior to, during and after implantation.
- Rapid joint destruction, marked bone loss or bone resorption apparent on radiograph
- Uncooperative patient or patient with neurologic disorders who are not capable of following directions
- Osteoporosis

## In reverse

### **Absolute contraindications for shoulder arthroplasty:**

- Non-proximal humeral fractures
- Active local or systemic infection, sepsis and osteomyelitis
- Poor quality and insufficient quantity of proximal humeral or glenoid bone stock
- Non-functional deltoid
- Use of this implant is contraindicated in the presence of significant injury to the upper brachial plexus.
- Paralysis of the axillary nerve
- Neuromuscular disease (e.g. joint neuropathy)
- Known or suspected allergy or material sensitivity to one of the materials
- Patient pregnancy
- Patient has not reached full skeletal maturity

# Contraindications for use

## **Relative contraindications for shoulder arthroplasty:**

- Distant foci of infection from genitourinary, pulmonary, skin and other sites, dental focus infection which may cause hematogenous spread to the implant site. The foci of infection should be treated prior to, during and after implantation.
- Rapid joint destruction, marked bone loss or bone resorption apparent on radiograph
- Uncooperative patient or patient with neurologic disorders who are not capable of following directions
- Osteoporosis

## **Relative contraindications for conversion from anatomic to reverse shoulder prosthesis:**

- Stability of the reversed components rely on secure fixation to a stable humeral component. If this is compromised by poor metaphyseal fixation, insufficient access or cleanliness to fully seat the reversed insert in the stem, or damage to the polyethylene locking mechanism, the entire humeral component must be removed and replaced with a new prosthesis in a reversed configuration.

## **Compatible systems**

The Perform Fracture prosthesis in the anatomic configuration must be used with a Tornier Perform Anatomic Glenoid, Tornier Perform Anatomic Augmented Glenoid in case of anatomic total shoulder arthroplasty.

The Perform Fracture prosthesis in the reversed configuration must be used with an Aequalis Reversed II, Tornier Perform Reversed Glenoid, Tornier Perform Reversed Augmented Glenoid or Shoulder iD Primary Reversed Glenoid.

All models are not available in all countries. Please contact your Stryker representative for information about availability.

\*In specific markets, Shoulder iD Primary Reversed Glenoid is branded as Tornier Perform Patient-Matched Primary Reversed Glenoid.

# Implant sizing

Tornier Perform Humeral System – Fracture is intended for use in anatomic, reverse, and hemiarthroplasty for proximal humerus fractures. The Tornier Perform Humeral System – Fracture offers a variety of implant options and can be implanted with cemented, cementless with screws, or cementless without screws fixation.

**Notice:** Cemented or cementless with screws are the recommended modes of fixation. A surgeon may choose cementless without screws as a mode of fixation when there is adequate bone stock and rotational stability to support the implant. In case of poor quality or insufficient quantity of proximal humeral bone stock, cemented use is mandatory.

## Implant sizing

Perform Fracture stem is available in 130mm and 170mm lengths with a stem diameter range of 7–17mm in 1mm increments. The Perform Fracture stems are compatible with Perform humeral heads and Perform Reversed inserts.

## Tornier Perform Fracture humeral stem sizing chart

Size	7S	8S	9S	9	10	11	12	13	14	15	16	17
Length	130mm*	130mm	130mm	130mm	130mm	130mm	130mm	130mm	130mm	130mm	130mm	130mm
		170mm	170mm	170mm	170mm	170mm	170mm	170mm	170mm	170mm		
Reversed insert size	1-2			3-4								
Glenosphere diameters	33/36/39			36/39/42								

\*7S 130mm stem not compatible with cementless with screws fixation.

\*\*The Perform humeral head couplers and Perform humeral spacers are not compatible with the Perform Fracture humeral stem.



Anterior/posterior (AP) screw hole

Proximal medial/lateral (M/L) screw hole

Distal medial/lateral (M/L) screw hole



# Implant sizing

Humeral heads are modular and allow for centered and offset (low 1.5mm) options utilizing a coupler.

## Tornier Perform Fracture humeral head coupler

Reference	Description
PFX00001	Fracture centered humeral head coupler Ti
PFX00002	Fracture low offset humeral head coupler Ti

\*The Perform Fracture coupler is not compatible with the Perform stem.



## Tornier Perform humeral heads

Reference	Description	Resection diameter	Height
*DWN3713	CoCr humeral head	37mm	13.5mm
DWN3914	CoCr humeral head	39mm	14mm
DWN4115	CoCr humeral head	41mm	15mm
DWN4314	CoCr humeral head	43mm	14mm
DWN4316	CoCr humeral head	43mm	16mm
DWN4615	CoCr humeral head	46mm	15mm
DWN4617	CoCr humeral head	46mm	17mm
DWN4619	CoCr humeral head	46mm	19mm
DWN4816	CoCr humeral head	48mm	16mm
DWN4818	CoCr humeral head	48mm	18mm
DWN4820	CoCr humeral head	48mm	20mm
DWN5016	CoCr humeral head	50mm	16mm
DWN5019	CoCr humeral head	50mm	19mm
DWN5022	CoCr humeral head	50mm	22mm
DWN5219	CoCr humeral head	52mm	19mm
DWN5223	CoCr humeral head	52mm	23mm
DWN5420	CoCr humeral head	54mm	20mm
DWN5424	CoCr humeral head	54mm	24 mm
*DWN5622	CoCr humeral head	56mm	22mm

\*Available by special request only.



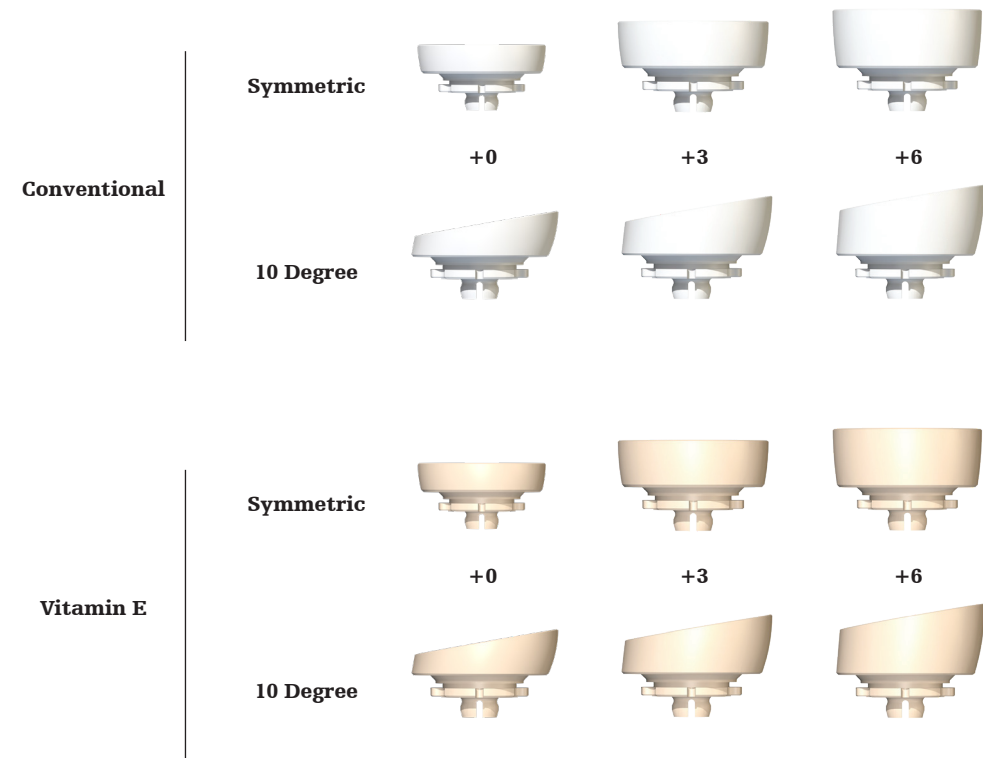
# Implant sizing

Reversed inserts are available in conventional and vitamin E UHMWPE.

Humeral spacers are available in size 1/2 and 3/4. The humeral spacer allows for an additional +9mm of thickness to the reverse construct.

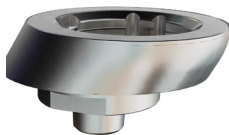
**Notice:** +9mm spacers cannot be stacked.

## Tornier Perform reversed inserts



## Tornier Perform Fracture humeral spacers

Reference	Description
PFX00011	Fracture humeral spacer Sz 1/2 TH9mm
PFX00012	Fracture humeral spacer Sz 3/4 TH9mm



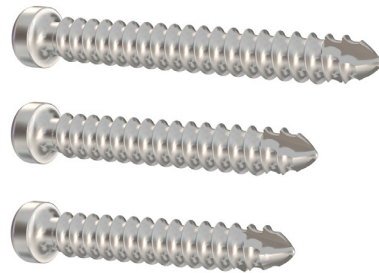
\*The Perform Fracture spacer is not compatible with the Perform Humeral stem.

## Implant sizing

Screws are available for the cementless with screws fixation technique with a 4.26mm diameter and lengths ranging from 20-36mm in 2mm increments.

### Tornier Perform Fracture screws

Reference	Description
PFX00120	Fracture stem screw l. 20mm
PFX00122	Fracture stem screw l. 22mm
PFX00124	Fracture stem screw l. 24mm
PFX00126	Fracture stem screw l. 26mm
PFX00128	Fracture stem screw l. 28mm
PFX00130	Fracture stem screw l. 30mm
PFX00132	Fracture stem screw l. 32mm
PFX00134	Fracture stem screw l. 34mm
PFX00136	Fracture stem screw l. 36mm



# Operative technique steps

## Glenoid preparation

The various surgical steps for exposure and implantation of the glenoid components are described in the following operative techniques:

- In anatomic configuration: Tornier Perform Anatomic Glenoid, Tornier Perform Anatomic Augmented Glenoid.
- In reversed configuration: Aequalis Reversed II, Tornier Perform Reversed Glenoid, Tornier Perform Reversed Augmented Glenoid, or Shoulder iD Primary Reversed Glenoid.\*

## Humeral preparation

**Notice:** The use of fluoroscopy is recommended in all cases.

The tuberosity clamp may be used to aid in fracture exposure by isolating the tuberosities in preparation for mobilization. | **Figure 1**

### Fracture exposure

Once the fracture fragments have been identified the rotator interval is released. The humeral head is removed. The long head of the biceps tendon may be tenotomized or tenodesed.

### Tuberosity preparation with NiceKnot Technique\*

The greater tuberosity is mobilized and two NiceLoop sutures are placed in the tendon-to-bone interface of the infraspinatus, and two NiceLoop sutures are placed in the tendon-to-bone interface of the teres minor. | **Figure 2**

**Notice:** For each tendon, the sutures are clipped with a Kelly clamp in order to ease their identification and manipulation.

Once the proximal humerus is exposed, reaming or rasping can be started.

\* Boileau P, Alami G, Rumian A, Schwartz DG, Trojani C, Seidl AJ. The Doubled-Suture NiceKnot. Orthopedics. 2017 Mar 1;40(2):e382-e386. doi: 10.3928/01477447-20161202-05. Epub 2016 Dec 15. PMID: 27942736.



Figure 1

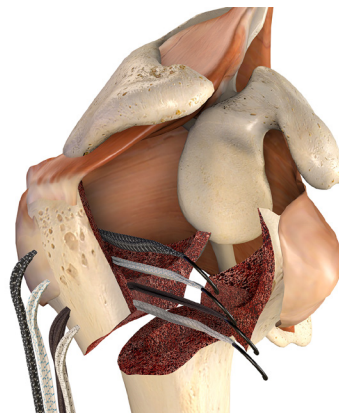


Figure 2

# Operative technique steps

## Humeral reaming (optional)

If choosing to ream, attach the T-handle to the size 7 reamer. Progressively ream the medullary canal of the humeral shaft with reamers of increasing diameter (up to 17mm) until the reamer contacts the cortical bone. Reaming should be done manually and not using power tools. Insert reamer to the corresponding groove associated with the stem length. | **Figure 3**

**Notice:** Avoid reaming cortical bone.

## Rasp positioning/sizing (cemented or cementless without screws)

**Notice:** The rasp will also be used as a trial stem.

**Notice:** The rasp cannot be used as a final implant.

**Notice:** Cemented or cementless with screws are the recommended modes of fixation. A surgeon may choose cementless without screws as a mode of fixation when there is adequate bone stock and rotational stability to support the implant.

Attach the inserter handle to the size 7S rasp. | **Figure 4 A, B.**



**Figure 3**



**Figure 4 A**



**Figure 4 B**

## Operative technique steps

Attach the horizontal retroversion rod to the inserter handle, then connect the vertical retroversion rod to the horizontal retroversion rod.

Insert the rasp into the humeral canal, and verify the desired version by resting the vertical retroversion rod on the patient's forearm | **Figure 5**.

**Notice:** Recommend 20° retroversion.

Progressively rasp, increasing the size of the rasps until achieving the desired stability and height.

- For cemented and cementless fixation, the final implant will be the same size as the last selected rasp.

Once the rasp is inserted to the desired height and version, the height gauge is connected to the inserter handle. Adjust the height gauge until the gauge contacts the most proximal humeral bone. The height gauge value will indicate the overall height or height from the bone reference, and will be reproduced when implanting the final stem. The marks on the rasp will also correspond with the height gauge value. | **Figure 6**



**Figure 5**

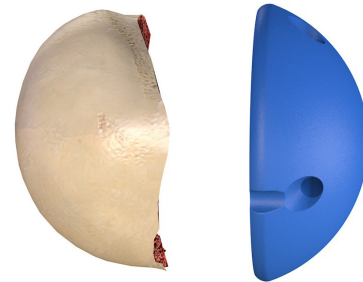


**Figure 6**

# Operative technique steps

## In anatomic

The humeral head trial's initial size can be determined by mirroring the removed humeral head, except in the case of a severe deformity. This can be accomplished by placing the removed humeral head against a humeral head trial and determining which size humeral head trial most closely represents the resected humeral head. | **Figure 7**



**Figure 7**

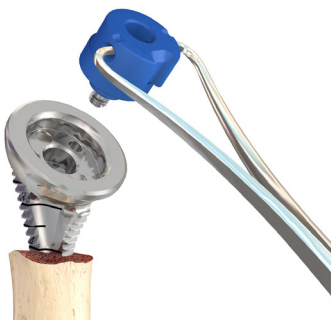
The humeral head trial attaches to the rasp utilizing a coupler trial. The coupler trials are offered in centered and 1.5mm low offset options. Select the coupler trial that best allows the humeral head trial to recreate the patient's native anatomy. | **Figure 8**



**Figure 8**

Place the tips of the trial clamp into the selected coupler trial and then place the coupler trial into the rasp. Use the 2.5mm hex drive to lightly engage a few threads of the coupler trial into the rasp. | **Figure 9 A, B**

Place the tips of the trial clamp into the holes of the humeral head trial and place the humeral head trial onto the coupler trial | **Figure 10 A, B**. If using an offset coupler, utilize the trial clamp and turn the Humeral head trial to locate the desired offset.



**Figure 9 A**



**Figure 10 A**



**Figure 9 B**



**Figure 10 B**

# Operative technique steps

Once the desired humeral head orientation is achieved, place the 2.5mm hex driver through the center of the humeral head trial and tighten the coupler screw.

**Figure 11**

Reduce the humeral head trial into the glenoid to check stability, range of motion, and impingement.

**Notice:** The coupler trial and humeral head trial cannot be used as a final implant.

Remove the humeral head trial.

If utilizing an offset coupler trial, take note of the orientation of the coupler trial relative to the clock face on the rasp. The coupler has a U-shaped cutout that serves as an alignment key to identifying the orientation of the final implant. Remove the coupler.

Attach the inserter handle to the rasp and remove the rasp from the humerus.

## In reversed

Reversed trials are available in three thicknesses (+0, +3, +6) and four glenosphere sizes (33mm, 36mm, 39mm, 42mm). The reversed insert trials are color-coded to correspond with the selected glenosphere size.

The 7S, 8S, and 9S rasps are compatible with glenosphere sizes 33 mm, 36 mm, and 39 mm and are compatible with the size 1-2 reversed insert trials and implants.



**Figure 11**



**Figure 12**

Size	7S	8S	9S	9	10	11	12	13	14	15	16	17
Length	130mm*	130mm	130mm	130mm	130mm	130mm	130mm	130mm	130mm	130mm	130mm	130mm
		170mm	170mm	170mm	170mm	170mm	170mm	170mm	170mm	170mm		
Reversed insert size	1-2			3-4								
Glenosphere diameters	33/36/39			36/39/42								

\*7S 130mm stem not compatible with cementless with screws fixation.



## Operative technique steps

The size 9-17 rasps are compatible with glenosphere sizes 36 mm, 39 mm, and 42 mm and share the size 3-4 reversed insert trials and implants.

With the rasp remaining in place, select the +0 reversed insert trial that matches the glenosphere size and rasp size.

### | Figure 13

- For example, the reversed insert trial for a size 9S rasp with a 36mm glenosphere and a +0 thickness would read SZ 1-2/36 +0.

Once the appropriate reversed insert trial is selected, insert the selected reversed insert trial into the rasp. Orient the notch in the reversed insert trial in a superolateral position assigned with the 12 o'clock position on the rasp.

### | Figure 14

Once the reversed insert trial and rasp are aligned, fully seat the reversed insert trial into the rasp until it is flush with the rasp's collar.

Reduce the reversed construct into the joint to check the deltoid tension, stability, range of motion, and impingement.

If the initial reduction is too loose, remove the reversed insert trial and replace it with the next greater reversed insert trial thickness.

**Notice:** The reversed insert trial cannot be used as a final implant.

To remove the reversed insert trial, insert the trial clamp's tips into the holes of the reversed insert trial. Then remove the reversed insert trial from the rasp and select the progressively thicker reversed insert trial.



**Figure 13**



**Figure 14**

# Operative technique steps

## Spacer for trialing

A spacer may be utilized if the +6 reversed insert trial is not thick enough to provide a stable reduction.

There are two spacers offered: size 1/2 and size 3/4. Both provide an additional +9 mm of thickness to the reverse construct.

- When using stem size 7s, 8s, 9s: use size 1/2 spacer
- When using stem size 9-17: use size 3/4 spacer

### | Figure 15

Select the appropriate size +9mm spacer trial. Make sure to align the etch mark of the spacer trial with the 12 o'clock position of the rasp. Insert the spacer trial into the rasp.

### | Figure 16

Place the desired reversed insert trial into the spacer and reduce the joint.

**Notice:** The spacer trial cannot be used as a final implant.

## Bone graft prep (optional)

Place the resected humeral head in the graft clamp with the fractured/resected surface facing away from the cup.

### | Figure 17

- Confirm the strike plate screw is backed out fully before striking the graft clamp.

Strike the strike plate screw until the cutting edge has been fully driven through the humeral head.

The strike plate screw has three lines corresponding with the final implant size. The top horizontal line (closest to the strike plate) corresponds with sizes 7S and 8S. The middle horizontal line corresponds with sizes 9S and 9. The bottom horizontal line (closest to the graft) corresponds with sizes 10-17. | Figure 18 A, B, C

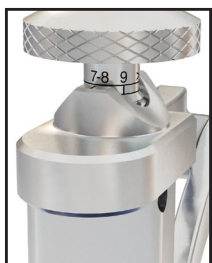


Figure 18 A

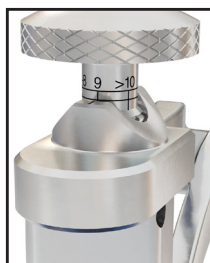


Figure 18 B



Figure 18 C

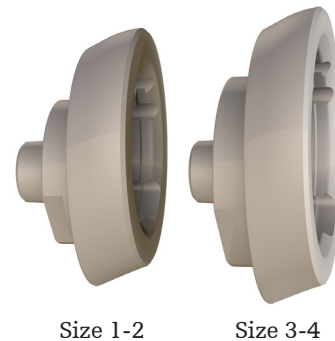


Figure 15



Figure 16

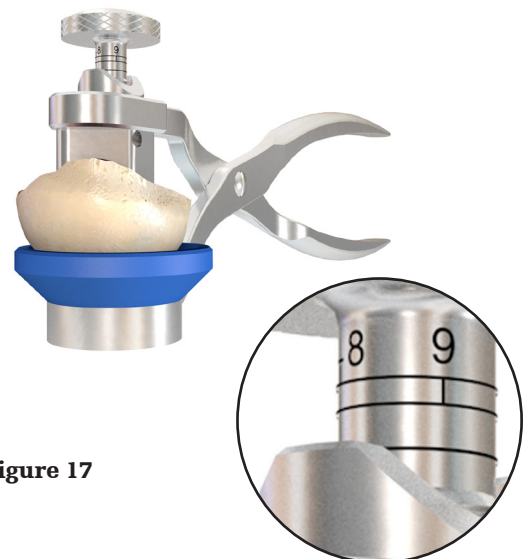


Figure 17

## Operative technique steps

Advance the strike plate screw so the vertical line corresponding to the final implant size is in line with the arrows on the graft clamp. Use the osteotome to resect the graft at the appropriate size. The bone remaining in the clamp will be used as the bone graft. | **Figure 19**

Advance the strike plate screw to extract the bone graft from the graft clamp. | **Figure 20**

Insert the graft into the bone graft window on the final implant. The graft impactor may be used to insert the graft fully. | **Figure 21**

### Final implant

The final implant can be assembled in-situ.

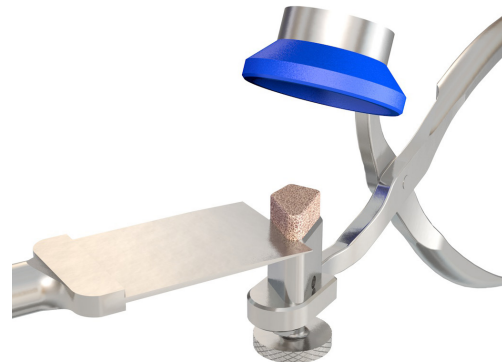
### Cemented

#### Bone plug prep

- Attach the bone plug cutter to the humeral impactor handle and impact the bone plug cutter in the remaining resected humeral head. Remove the bone plugs by inserting the horizontal retroversion rod through the humeral impactor handle's cannulated hole. | **Figure 22**



**Figure 19**



**Figure 20**



**Figure 21**



**Figure 22**

## Operative technique steps

- Insert the bone plugs into the two distal and one AP screw holes on the final implant. | **Figure 23**
- Connect the inserter handle to the final implant. Attach the height gauge and confirm the height gauge is positioned at the same value as the rasp. Attach the retroversion rods and verify the desired retroversion. | **Figure 24**



**Figure 23**

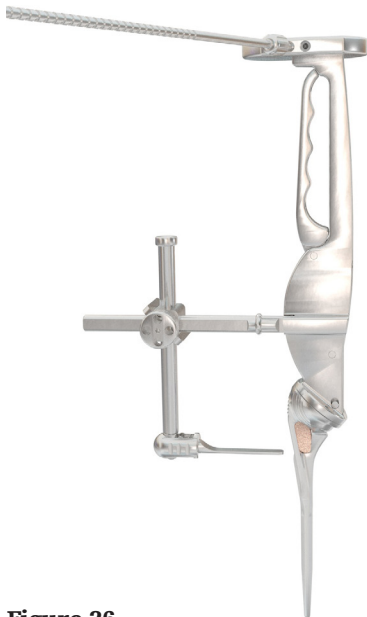
### Cementing the implant

- Introduce the cement into the humeral canal.
- The cement restrictor inserter may be used to insert a cement restrictor. | **Figure 25**
- Place the stem into the prepared proximal humerus. Impact the stem to the desired height. Confirm the height with the height gauge and retroversion with the retroversion rods. Detach the height gauge, retroversion rods, and inserter handle. | **Figure 26**

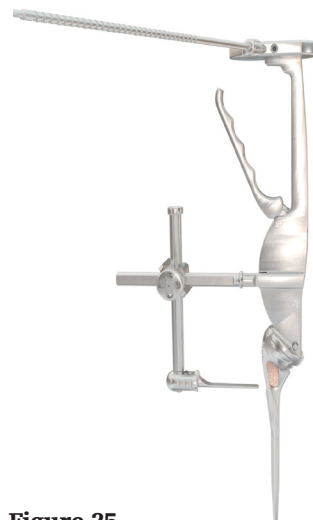
**Notice:** The final implant may be downsized one size from the trial stem to achieve the desired thickness of the cement mantle.



**Figure 24**



**Figure 26**



**Figure 25**

# Operative technique steps

## Cementless without screws

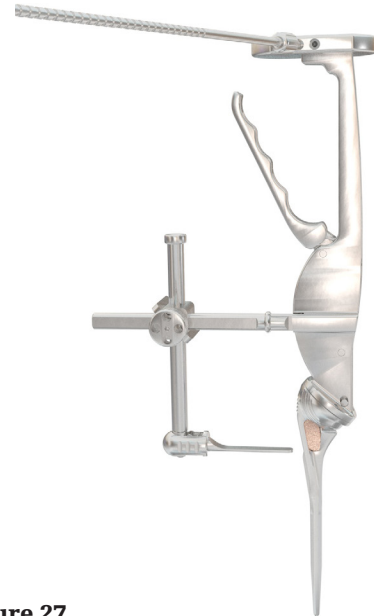
- Place the stem into the prepared proximal humerus. Impact the stem to the desired height. Confirm the height with the height gauge and retroversion with the retroversion rods. Detach the height gauge, retroversion rods, and inserter handle. | **Figure 27**

**Notice:** Confirm the stem has acceptable axial and rotational stability to be utilized without screws or cement.

In anatomic

- Impact the humeral head and coupler assembly to the stem 3 times or until fully seated utilizing the humeral impactor handle and the humeral head impactor tip. | **Figure 28 A, B**

**Notice:** The surgeon should inspect the implant tapers and articular surfaces for debris or blemishes before assembly. The tapers should be clean and dry for assembly. The humeral head or reversed insert should be assembled to the definitive stem with clean gloves.



**Figure 27**



**Figure 28 A**

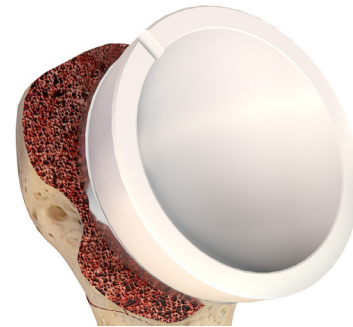


**Figure 28 B**

## Operative technique steps

### In reverse

- Select the final reversed insert that matches the previously selected reversed insert trial and place it into the final stem. Orient the final reversed insert in the superior position and align to the 12 o'clock marking on the stem. | **Figure 29**
- Once the reversed insert and stem are aligned superiorly, seat the final reversed insert into the stem until flush with the collar.
- Once the reversed insert is aligned and parallel to the collar of the stem, apply hand pressure to begin to engage the locking mechanism.



**Figure 29**



**Figure 30**



**Figure 31**

**Notice:** If the reversed insert is off axis, remove and realign.

- To fully seat the reversed insert into the stem, select the insert impactor tip and attach it to the humeral impactor handle. Place the assembly into the final reversed insert and impact 3 times or until flush with the collar of the stem. | **Figure 30**
- If a spacer is utilized, insert and impact the spacer into the bowl of the stem after the stem has been inserted into the prepared humerus. Impact 3 times or until the spacer is fully seated into the bowl. Be sure to align the etch mark of the spacer with the 12 o'clock position of the stem. Insert the reversed insert into the spacer. | **Figure 31**
- When reducing the tuberosities, use the reduction clamp to properly position the tuberosities prior to suture tightening. | **Figure 32**



**Figure 32**



# Operative technique steps

## Reduction

The “Lasso maneuver” is performed by placing the sutures around the prosthesis neck at the level of the polished area.

## Tuberosities fixation

Place horizontal cerclage sutures around the greater tuberosity.

## Fixation of the tuberosities begins with fixation of the greater tuberosity.

The arm is placed in neutral position. A clamp is used to pull the greater tuberosity anteriorly, reducing the greater tuberosity to the prosthesis. Using the NiceKnot technique,\* tie the two NiceLoop sutures without the needle around the greater tuberosity (one superior, one inferior), to secure the greater tuberosity to the prosthesis.

## Place horizontal cerclage around the lesser tuberosity

The next step is to reduce the lesser tuberosity.

The two remaining horizontal NiceLoop sutures with needles, which had initially been passed through the posterior rotator cuff tendon and around the prosthetic neck, are then passed through the subscapularis tendon (one superior and one inferior).

Both sutures are passed from inside to outside and are then tied using the NiceKnot technique. The sutures thereby give lateral stability to the tuberosities.

**Notice:** Tie the knot and position it to the point of fixation. The NiceKnot will be finally secured by performing three alternating half-hitches.

## Secure the greater and lesser tuberosities

Final tightening creates a vertical support from the diaphysis. The anterior suture is passed through the subscapularis and tied using the NiceKnot technique. The second posterior suture is placed into the infraspinatus and tied using the NiceKnot technique.

\* Boileau P, Alami G, Rumian A, Schwartz DG, Trojani C, Seidl AJ. The Doubled-Suture NiceKnot. Orthopedics. 2017 Mar 1;40(2):e382-e386. doi: 10.3928/01477447-20161202-05. Epub 2016 Dec 15. PMID: 27942736.

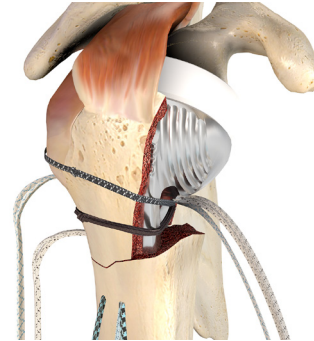


Figure 33

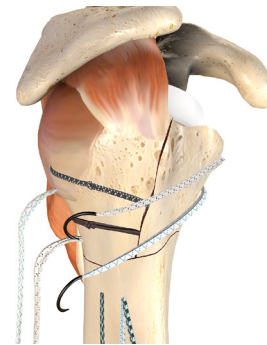


Figure 34

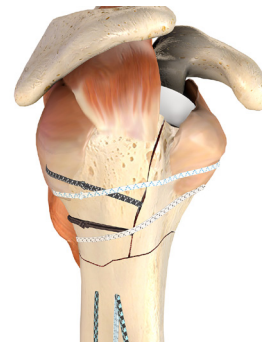


Figure 35

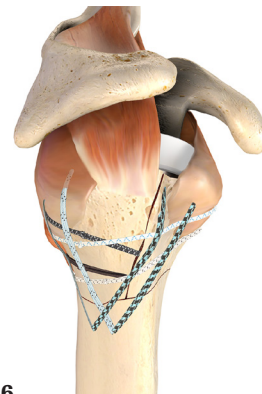


Figure 36

## Operative technique steps

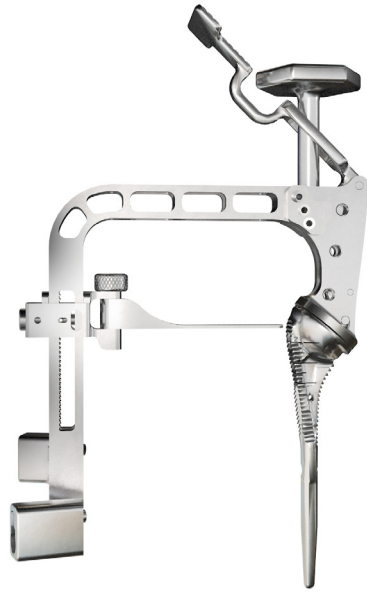
### Cementless with screws technique

**Notice:** The cementless with screws technique requires the use of three cortical screws : the A/P screw, the Proximal M/L screw, and the Distal M/L screw for 130mm and 170mm length stems.

Rasp positioning/sizing

**Notice:** The rasp will also be used as a trial stem.

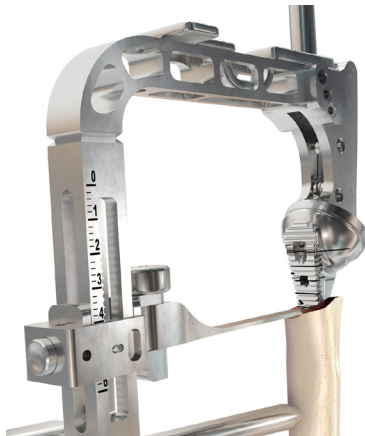
- Attach the targeting jig to the size 8S rasp. Ensure the bowl of the rasp is seated flush with the connection to the targeting jig. Thread the striking plate into the threaded hole on the top of the targeting jig. The striking plate may be left attached to the targeting jig for the final implant insertion. Insert the rasp into the humeral canal, and verify the desired version by resting the vertical retroversion rod on the patient's forearm. | **Figure 37 A, B**
- Progressively rasp, increasing the size of the rasps until achieving the desired stability.
  - For cementless with screws fixation, the final implant will be the same size as the selected rasp.
- Once the rasp is inserted to the desired height, adjust the height gauge until the gauge contacts the bone. The height gauge value will indicate the height of the stem and will be reproduced when implanting the final stem. The marks on the rasp will also correspond with the height gauge value. | **Figure 38**
- Follow the same trialing steps for anatomic and reverse as outlined for cementless and cemented fixation.
  - For stability while trialing, a 2.5mm K-wire may be utilized.



**Figure 37 A**



**Figure 37 B**



**Figure 38**

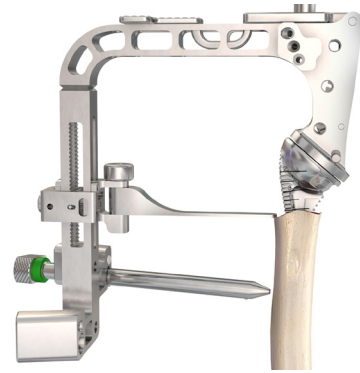


## Operative technique steps

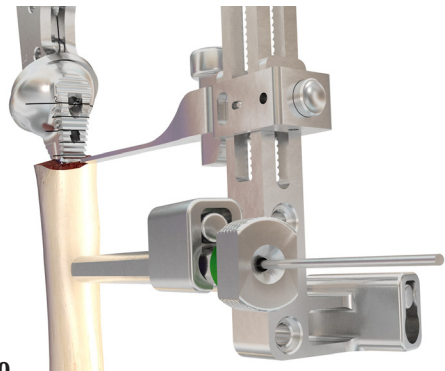
- To utilize K-wires, insert the guide wire drill sleeve into the proximal M/L slot of the targeting jig with the flat side facing up. Advance the guide wire drill sleeve until it contacts the bone. Rotate the drill sleeve one-quarter turn clockwise to lock the guide wire drill sleeve in place. | **Figure 39**

**Notice:** A small incision may be required prior to inserting the K-wire to avoid skin interference.

- Insert the 2.5mm k-wire bicortically through the guide wire drill sleeve. | **Figure 40**



**Figure 39**



**Figure 40**

## Operative technique steps

### Final implant

- The final implant can be assembled in-situ.
- Attach the targeting jig to the stem and insert it into the prepared proximal humerus. Impact the stem to the desired height. Confirm the height with the height gauge and retroversion with the retroversion rods. | **Figure 41**

### AP screw insertion

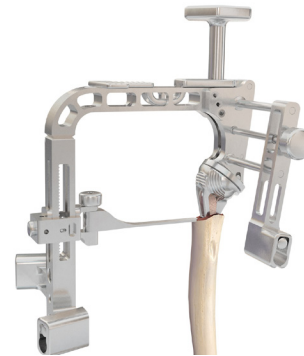
- Attach the AP screw targeting module to the anterior side of the targeting jig by aligning the proximal and distal tabs with the corresponding holes in the targeting jig and threading the middle rod into the corresponding hole. | **Figure 42**

**Notice:** Ensure the AP screw targeting module is connected to the anterior side of the targeting jig.

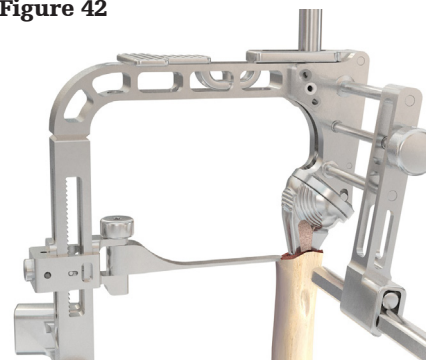
- Insert the drill sleeve and trocar assembly into the distal slot of the AP screw targeting module with the flat side facing up. Advance the drill sleeve until the trocar makes contact with the bone. Rotate the drill sleeve one-quarter turn clockwise to lock the drill sleeve in place. | **Figure 43**
- The trocar head will remain proud of the drill sleeve when the trocar contacts the bone. | **Figure 44**



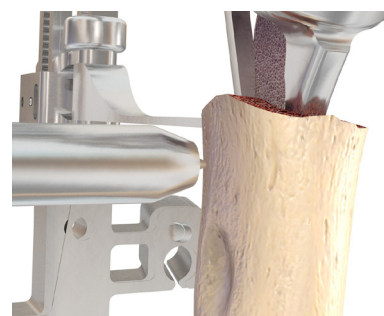
**Figure 41**



**Figure 42**



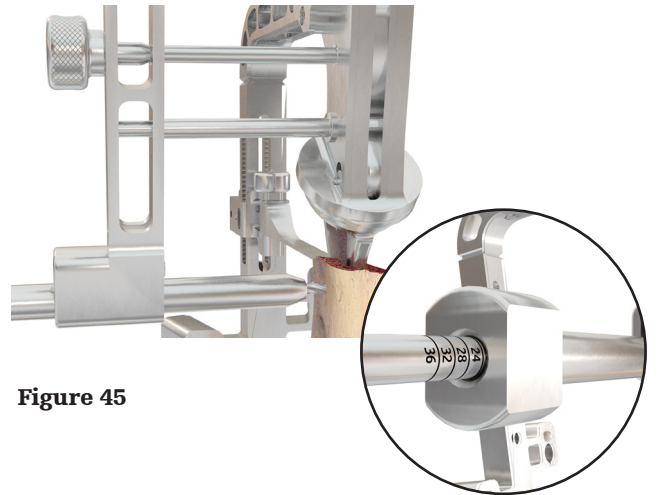
**Figure 43**



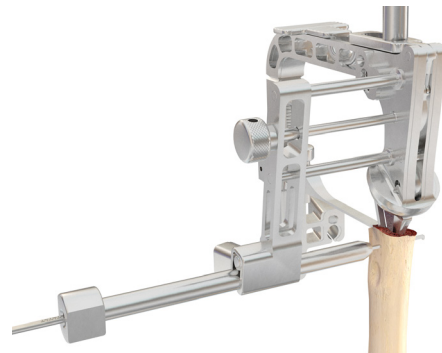
**Figure 44**

# Operative technique steps

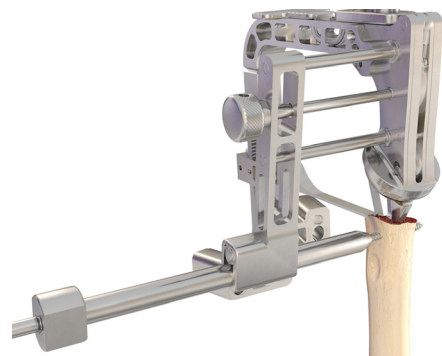
- Remove the trocar, and drill a bicortical hole with the 3.5mm drill bit.
- The 3.5mm drill bit can be used to measure screw length. Using the 4mm increment markings, screw length is determined by reading the marking on the drill bit at the junction with the drill sleeve. | **Figure 45**
- The depth gauge has 2mm increment markings and can also be used to determine screw length. When the hook of the depth gauge catches on the outer cortical wall, screw length is determined by reading the marking on the depth gauge at the junction with the drill sleeve. This measurement will result in the screw being flush with the outer cortical wall. | **Figure 46**
- Manually insert the correct-length screw utilizing the locking screwdriver until the screw is fully seated. | **Figure 47**
- Insert the screw until the groove on the locking screwdriver shaft aligns with the entrance of the drill sleeve.
- Do not insert the screws using power tools!
- Drill sleeve and AP screw targeting module can then be removed for M/L screw insertion.



**Figure 45**



**Figure 46**

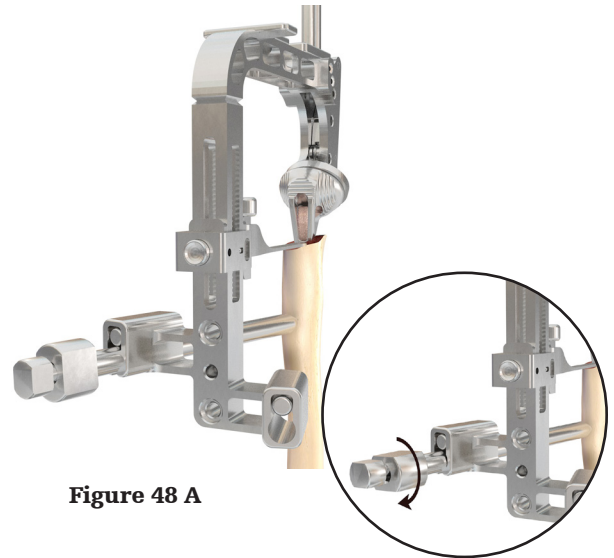


**Figure 47**

## Operative technique steps

### Proximal M/L screw insertion

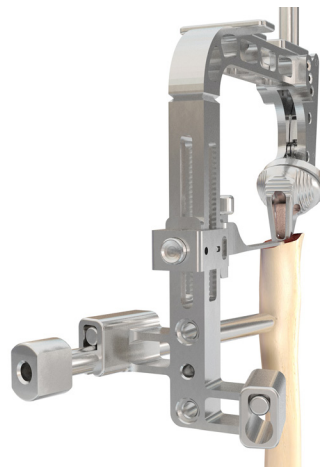
- Insert the drill sleeve and trocar assembly into the proximal M/L slot of the targeting jig with the flat side facing up. Advance the drill sleeve until the trocar makes contact with the bone. Rotate the drill sleeve one-quarter turn clockwise to lock the drill sleeve in place. | **Figure 48 A, B, C**
- Follow the same screw insertion steps as the AP screw section.
- Do not insert the screws using power tools!
- The locking screwdriver may be left attached to this locking screw to improve the overall stability of the jig as the last screw is drilled and inserted.



**Figure 48 A**



**Figure 48 B**



**Figure 48 C**

# Operative technique steps

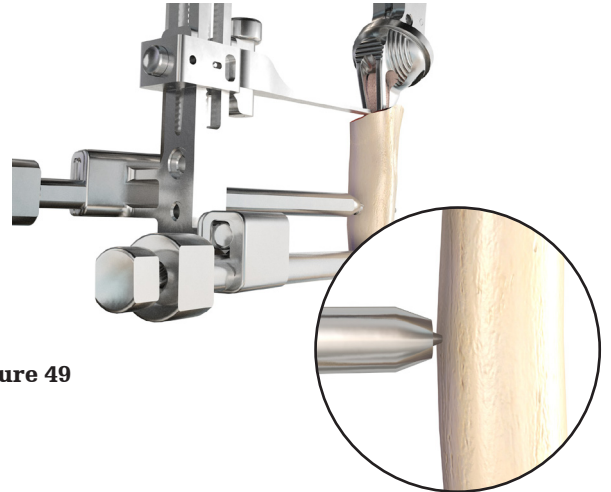
## Distal M/L screw insertion

- Insert a second drill sleeve and trocar assembly into the distal M/L slot of the targeting jig with the flat side facing up. Follow the same screw insertion steps as the AP screw section. Do not insert the screws using power tools! | **Figure 49**

## In anatomic

- Orient the selected size humeral head and coupler assembly to the previously determined rotation. Impact the humeral head and coupler assembly to the stem 3 times or until fully seated utilizing the humeral impactor handle and the humeral head impactor tip. | **Figure 50 A, B**

**Notice:** The surgeon should inspect the implant tapers and articular surfaces for debris or blemishes before assembly. The tapers should be clean and dry for assembly. The humeral head or reversed insert should be assembled to the definitive stem with clean gloves.



**Figure 49**



**Figure 50 A**

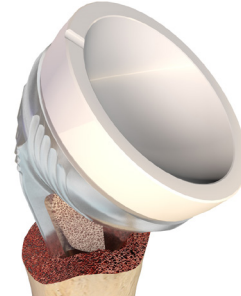


**Figure 50 B**

## Operative technique steps

In reverse

- Select the final reversed insert that matches the previously selected reversed insert trial and place it into the final stem. Orient the final reversed insert in the superior position and align to the 12 o'clock marking on the stem. | **Figure 51**
- Once the reversed insert and stem are aligned superiorly, seat the final reversed insert into the stem until flush with the collar.
- Once the reversed insert is aligned and parallel to the collar of the stem, apply hand pressure to begin to engage the locking mechanism.



**Figure 51**



**Figure 52**



**Figure 53**

- Notice:** If the reversed insert is off axis, remove and realign.
- To fully seat the reversed insert into the stem, select the insert impactor tip and attach it to the humeral impactor handle. Place the assembly into the final reversed insert and impact 3 times or until flush with the collar of the stem. | **Figure 52**
  - If a spacer is utilized, insert and impact the spacer into the bowl of the stem after the stem has been inserted into the prepared humerus. Impact 3 times or until the spacer is fully seated into the bowl. Be sure to align the etch mark of the spacer with the 12 o'clock position of the stem. Insert the reversed insert into the spacer. | **Figure 53**
  - When reducing the tuberosities, use the reduction clamp to properly position the tuberosities prior to suture tightening. | **Figure 54**



**Figure 54**



## Operative technique steps

### Conversion

Remove the humeral head and coupler by placing the tips of the distractor between the resection and bottom of the humeral head assembly and impact to free the morse taper. | **Figure 55**

If the coupler remains in the stem, utilize the coupler separator to remove the coupler from the stem. Thread the coupler separator clockwise into the threads of the coupler. Thread until the coupler disassociates from the stem. Assess the position, fixation, and taper of the stem. | **Figure 56**

Select the desired reversed insert trial and place it into the stem.

Reduce the reversed insert trial into the joint to check deltoid tension, stability, range of motion, and impingement.

Select the final reversed insert that matches the previously selected reversed insert trial and place it into the final stem. Orient the final reversed insert in the superior position and align to the 12 o'clock marking on the stem. | **Figure 57**

**Notice:** If the reversed insert is off axis, remove and realign.

Once the reversed insert and stem are aligned superiorly, seat the final reversed insert into the stem until flush with the collar.

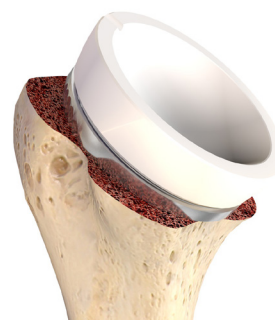
To fully seat the reversed insert into the stem, select the impactor tip and attach it to the impactor handle. Place the assembly into the final reversed insert and impact 3 times or until flush with the collar of the stem. | **Figure 58**



**Figure 55**



**Figure 56**



**Figure 57**



**Figure 58**

## Operative technique steps

### Reversed insert removal

To facilitate removing a final reversed insert, it is necessary to have a drill and bone screw.

Align the drill in the center of the reversed insert and advance until the drill bit hits the bottom of the stem bowl.

| **Figure 59**

Select a screw that is at least 30mm long and 4.26mm or greater, in diameter and advance into the prepared hole from the drill bit.

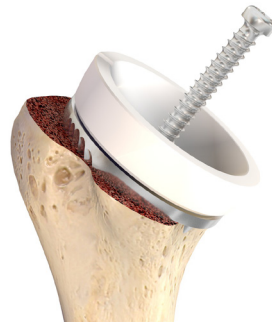
Insert the screw manually until the screw bottoms out on the stem bowl and pushes the reversed insert out of the stem. The reversed insert cannot be reinserted. | **Figure 60**

If the locking ring remains, remove the locking ring from the stem bowl with a clamp.

If a spacer was used, insert the tip of the distractor between the resection and the bottom of the spacer and impact to free the taper. | **Figure 61**



**Figure 59**



**Figure 60**



**Figure 61**



# Operative technique steps

## Stem removal

Once the humeral head assembly or reversed insert are removed, insert a curved osteotome into the interface between the implant and bone. Insert the osteotome around the complete circumference of the stem collar.

This will break the bond between the bone and proximal stem. | **Figure 62**

Attach the inserter handle to the stem to remove.

### | **Figure 63**

- If screws were used for primary fixation, remove all bone screws before attaching the inserter handle to remove the stem. | **Figure 64**
- If the inserter handle is not sufficient to remove the stem, the slaphammer may be connected to remove the stem.



**Figure 62**

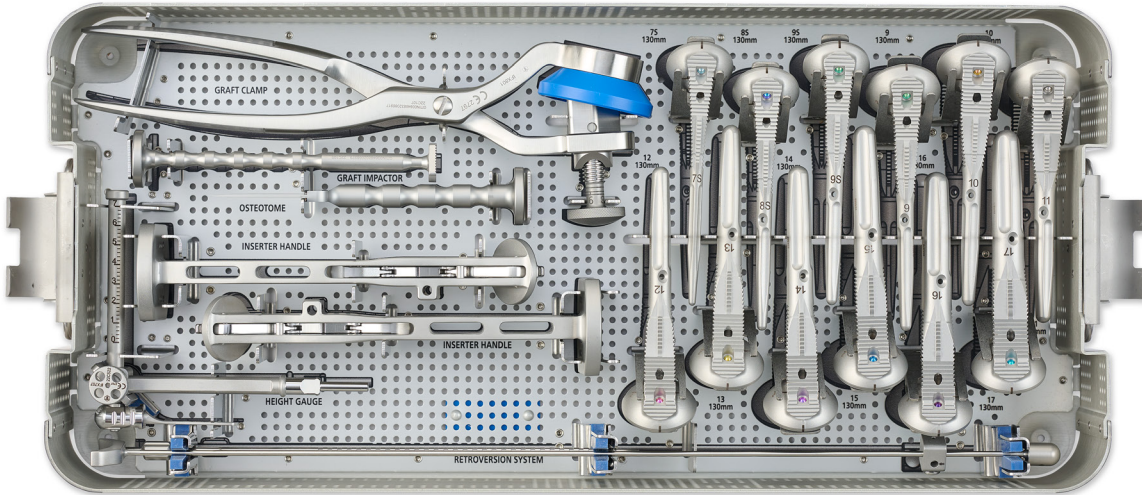


**Figure 63**



**Figure 64**

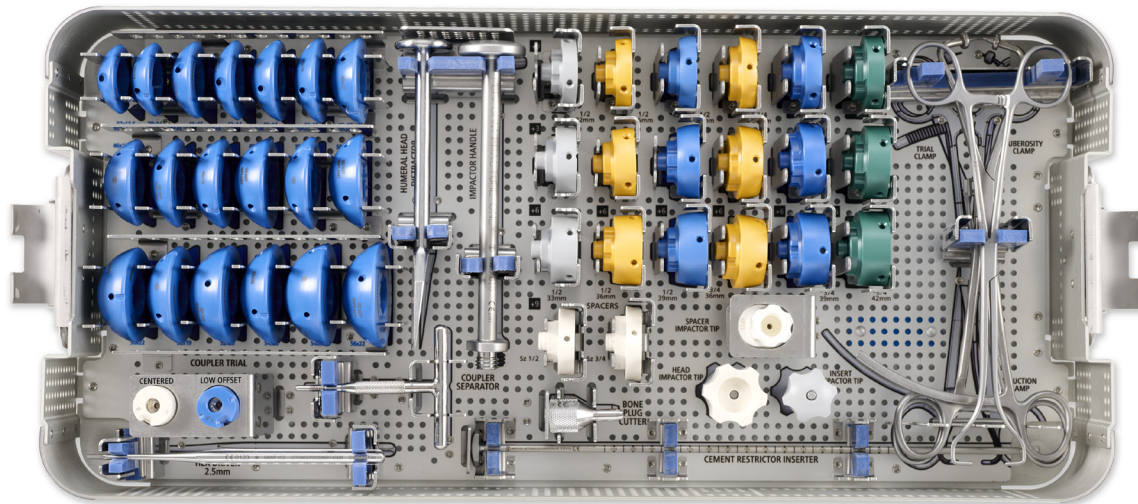
## Instrumentation



### YKAD10410

Reference	Description
IFX207S	Fracture rasp sz 7s 130mm
IFX208S	Fracture rasp sz 8s 130mm
IFX209	Fracture rasp sz 9 130mm
IFX209S	Fracture rasp sz 9s 130mm
IFX210	Fracture rasp sz 10 130mm
IFX211	Fracture rasp sz 11 130mm
IFX212	Fracture rasp sz 12 130mm
IFX213	Fracture rasp sz 13 130mm
IFX214	Fracture rasp sz 14 130mm
IFX215	Fracture rasp sz 15 130mm
IFX216	Fracture rasp sz 16 130mm
IFX217	Fracture rasp sz 17 130mm
IFX700	Fracture height gauge
IFX711	Fracture retroversion system: retroversion rod
IFX712	Fracture retroversion system: vertical rod
IFX800	Fracture inserter handle
IFX802	Fracture osteotome
IFX805	Fracture graft impactor
IFX801	Fracture graft clamp

# Instrumentation



## YKAD10420

Reference	Description
IFX601	Fracture XRO humeral head trials 37x13.5
IFX603	Fracture XRO humeral head trials 39x14
IFX606	Fracture XRO humeral head trials 41x15
IFX608	Fracture XRO humeral head trials 43x14
IFX609	Fracture XRO humeral head trials 43x16
IFX611	Fracture XRO humeral head trials 46x15
IFX612	Fracture XRO humeral head trials 46x17
IFX613	Fracture XRO humeral head trials 46x19
IFX614	Fracture XRO humeral head trials 48x16
IFX615	Fracture XRO humeral head trials 48x18
IFX616	Fracture XRO humeral head trials 48x20
IFX617	Fracture XRO humeral head trials 50x16
IFX618	Fracture XRO humeral head trials 50x19
IFX619	Fracture XRO humeral head trials 50x22
IFX620	Fracture XRO humeral head trials 52x19
IFX621	Fracture XRO humeral head trials 52x23
IFX623	Fracture XRO humeral head trials 54x20
IFX624	Fracture XRO humeral head trials 54x24
IFX626	Fracture XRO humeral head trials 56x22
MWN100	Perform centered coupler trial
MWN110	Perform low offset coupler trial

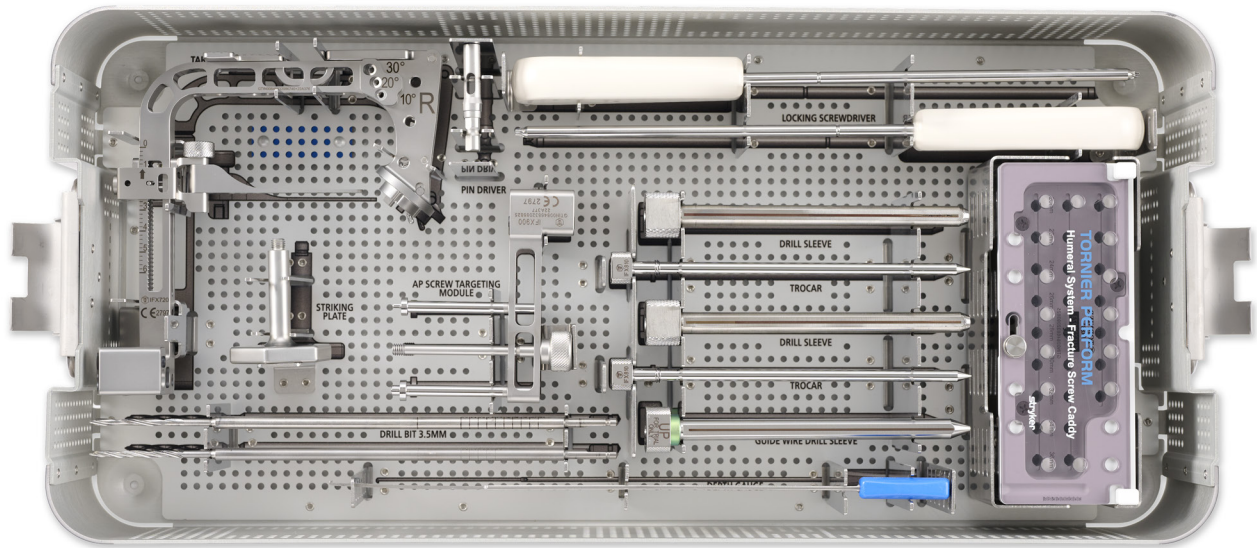
Reference	Description
MWP1330	Perform sz 1/2, 33mm dia, +0 insert trial
MWP1333	Perform sz 1/2, 33mm dia, +3 insert trial
MWP1336	Perform sz 1/2, 33mm dia, +6 insert trial
MWP1360	Perform sz 1/2, 36mm dia, +0 insert trial
MWP1363	Perform sz 1/2, 36mm dia, +3 insert trial
MWP1366	Perform sz 1/2, 36mm dia, +6 insert trial
MWP1390	Perform sz 1/2, 39mm dia, +0 insert trial
MWP1393	Perform sz 1/2, 39mm dia, +3 insert trial
MWP1396	Perform sz 1/2, 39mm dia, +6 insert trial
MWP2360	Perform sz 3/4, 36mm dia, +0 insert trial
MWP2363	Perform sz 3/4, 36mm dia, +3 insert trial
MWP2366	Perform sz 3/4, 36mm dia, +6 insert trial
MWP2390	Perform sz 3/4, 39mm dia, +0 insert trial
MWP2393	Perform sz 3/4, 39mm dia, +3 insert trial
MWP2396	Perform sz 3/4, 39mm dia, +6 insert trial
MWP2420	Perform sz 3/4, 42mm dia, +0 insert trial
MWP2423	Perform sz 3/4, 42mm dia, +3 insert trial
MWP2426	Perform sz 3/4, 42mm dia, +6 insert trial
IFX803	Fracture humeral +9mm spacer trial sz 3/4
IFX803S	Fracture humeral +9mm spacer trial sz 1/2

# Instrumentation

## YKAD10420 (continued)

Reference	Description
IFX804	Fracture spacer impactor tip
IFX806	Fracture tuberosity clamp
IFX807	Fracture reduction clamp
IFX817	Fracture coupler separator
IFX910	Fracture bone plug cutter
MWF102	Fracture hex driver 2.5mm
MWF124	Trial clamp
MB0101	Cement restrictor inserter
MWM054	Perform humeral head impactor tip
MWM330	Perform insert impactor tip
MWM068	Perform humeral head distractor
IFX818	Perform fracture impactor handle

# Instrumentation



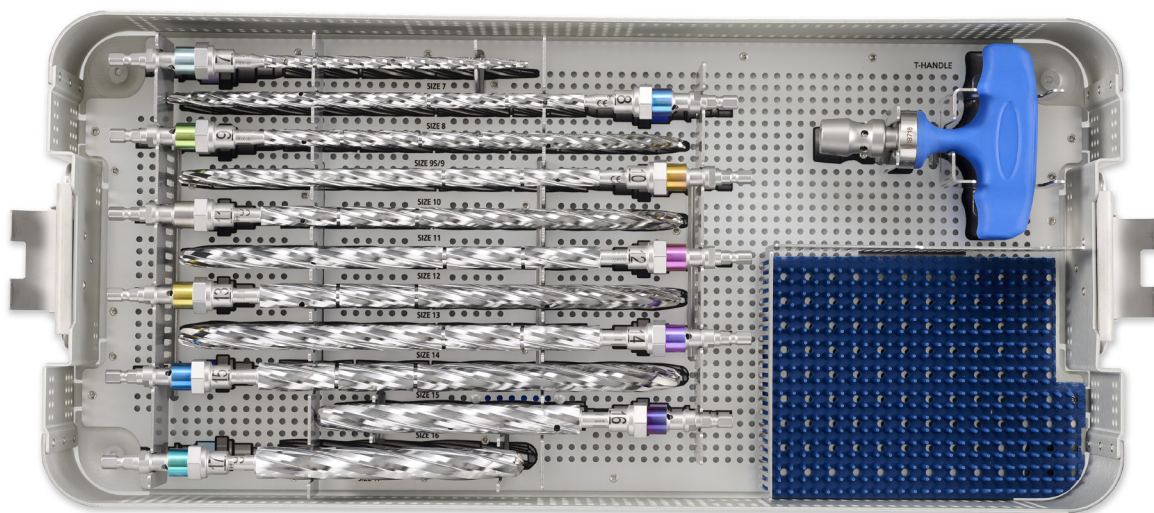
## YKAD10440

Reference	Description
IFX720	Fracture targeting jig
IFX721	Fracture striking plate
IFX809	Fracture drill sleeve
IFX810	Fracture trocar
IFX813	Fracture depth gauge
IFX814	Fracture locking screwdriver
IFX819	Fracture guide wire 2.5 X 220mm drill sleeve
IFX900	Fracture ap screw targeting module
IFX830	Fracture screw caddy base
IFX831	Fracture screw caddy lid
MWB253	Pin driver
IFX811	Fracture drill bit diameter 3.5mm

Reference	Description
PFX00120	Fracture stem screw l. 20mm
PFX00122	Fracture stem screw l. 22mm
PFX00124	Fracture stem screw l. 24mm
PFX00126	Fracture stem screw l. 26mm
PFX00128	Fracture stem screw l. 28mm
PFX00130	Fracture stem screw l. 30mm
PFX00132	Fracture stem screw l. 32mm
PFX00134	Fracture stem screw l. 34mm
PFX00136	Fracture stem screw l. 36mm



## Instrumentation



### YKAD10460

Reference	Description
IFX07	Fracture stem reamer sz 7
IFX08	Fracture stem reamer sz 8
IFX09	Fracture stem reamer sz 9s/9
IFX10	Fracture stem reamer sz 10
IFX11	Fracture stem reamer sz 11
IFX12	Fracture stem reamer sz 12
IFX13	Fracture stem reamer sz 13
IFX14	Fracture stem reamer sz 14
IFX15	Fracture stem reamer sz 15
IFX16	Fracture stem reamer sz 16
IFX17	Fracture stem reamer sz 17
MWB337	T-handle

# Implants

## Humeral stems

Reference	Description
PFX07130S	Fracture stem sz 7S L. 130mm
PFX08130S	Fracture stem sz 8S L. 130mm
PFX08170S	Fracture stem sz 8S L. 170mm
PFX09130	Fracture stem sz 9 L. 130mm
PFX09130S	Fracture stem sz 9S L. 130mm
PFX09170	Fracture stem sz 9 L. 170mm
PFX10130	Fracture stem sz 10 L. 130mm
PFX11130	Fracture stem sz 11 L. 130mm
PFX12130	Fracture stem sz 12 L. 130mm
PFX13130	Fracture stem sz 13 L. 130mm
PFX14130	Fracture stem sz 14 L. 130mm
PFX15130	Fracture stem sz 15 L. 130mm
PFX16130	Fracture stem sz 16 L. 130mm
PFX17130	Fracture stem sz 17 L. 130mm

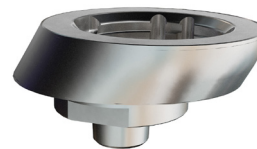


## Single-use items

Reference	Description
7020030	Guide wire 2.2 X 500 (sterile)
DWD017	Guide wire 2.5 x 220mm (sterile)

## Spacers

Reference	Description
PFX00011	Fracture humeral spacer sz 1/2 TH9mm
PFX00012	Fracture humeral spacer sz 3/4 TH9mm



# Implants

## Tornier Perform Fracture humeral head coupler

Reference	Description
PFX00001	Fracture centered humeral head coupler Ti
PFX00002	Fracture low offset humeral head coupler Ti



## Humeral heads (cobalt chrome)

Reference	Description	Diameter	Height
*DWN3713	CoCr humeral head	37mm	13.5mm
DWN3914	CoCr humeral head	39mm	14mm
DWN4115	CoCr humeral head	41mm	15mm
DWN4314	CoCr humeral head	43mm	14mm
DWN4316	CoCr humeral head	43mm	16mm
DWN4615	CoCr humeral head	46mm	15mm
DWN4617	CoCr humeral head	46mm	17mm
DWN4619	CoCr humeral head	46mm	19mm
DWN4816	CoCr humeral head	48mm	16mm
DWN4818	CoCr humeral head	48mm	18mm
DWN4820	CoCr humeral head	48mm	20mm
DWN5016	CoCr humeral head	50mm	16mm
DWN5019	CoCr humeral head	50mm	19mm
DWN5022	CoCr humeral head	50mm	22mm
DWN5219	CoCr humeral head	52mm	19mm
DWN5223	CoCr humeral head	52mm	23mm
DWN5420	CoCr humeral head	54mm	20mm
DWN5424	CoCr humeral head	54mm	24mm
*DWN5622	CoCr humeral head	56mm	22mm



## Humeral heads (titanium)

Reference	Description	Diameter	Height
*DWT3914	Ti humeral head	39mm	14mm
*DWT4115	Ti humeral head	41mm	15mm
*DWT4316	Ti humeral head	43mm	16mm
*DWT4617	Ti humeral head	46mm	17mm
*DWT4818	Ti humeral head	48mm	18mm
*DWT5016	Ti humeral head	50mm	16mm
*DWT5019	Ti humeral head	50mm	19mm
*DWT5219	Ti humeral head	52mm	19mm
*DWT5223	Ti humeral head	52mm	23mm
*DWT5420	Ti humeral head	54mm	20mm
*DWT5424	Ti humeral head	54mm	24mm

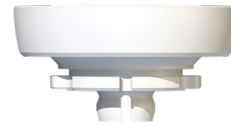
\*Available by special request only.



# Implants

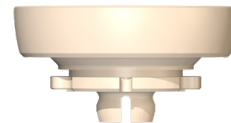
## Symmetric reversed inserts

Reference	Description	Size	Diameter	Thickness
DWP1330	Reversed insert	1/2	33mm	+0
DWP1333	Reversed insert	1/2	33mm	+3
DWP1336	Reversed insert	1/2	33mm	+6
DWP1360	Reversed insert	1/2	36mm	+0
DWP1363	Reversed insert	1/2	36mm	+3
DWP1366	Reversed insert	1/2	36mm	+6
DWP1390	Reversed insert	1/2	39mm	+0
DWP1393	Reversed insert	1/2	39mm	+3
DWP1396	Reversed insert	1/2	39mm	+6
DWP2360	Reversed insert	3/4	36mm	+0
DWP2363	Reversed insert	3/4	36mm	+3
DWP2366	Reversed insert	3/4	36mm	+6
DWP2390	Reversed insert	3/4	39mm	+0
DWP2393	Reversed insert	3/4	39mm	+3
DWP2396	Reversed insert	3/4	39mm	+6
DWP2420	Reversed insert	3/4	42mm	+0
DWP2423	Reversed insert	3/4	42mm	+3
DWP2426	Reversed insert	3/4	42mm	+6



## Symmetric reversed inserts vitamin E

Reference	Description	Size	Diameter	Thickness
DWS1330	Reversed insert VE	1/2	33mm	+0
DWS1333	Reversed insert VE	1/2	33mm	+3
DWS1336	Reversed insert VE	1/2	33mm	+6
DWS1360	Reversed insert VE	1/2	36mm	+0
DWS1363	Reversed insert VE	1/2	36mm	+3
DWS1366	Reversed insert VE	1/2	36mm	+6
DWS1390	Reversed insert VE	1/2	39mm	+0
DWS1393	Reversed insert VE	1/2	39mm	+3
DWS1396	Reversed insert VE	1/2	39mm	+6
DWS2360	Reversed insert VE	3/4	36mm	+0
DWS2363	Reversed insert VE	3/4	36mm	+3
DWS2366	Reversed insert VE	3/4	36mm	+6
DWS2390	Reversed insert VE	3/4	39mm	+0
DWS2393	Reversed insert VE	3/4	39mm	+3
DWS2396	Reversed insert VE	3/4	39mm	+6
DWS2420	Reversed insert VE	3/4	42mm	+0
DWS2423	Reversed insert VE	3/4	42mm	+3
DWS2426	Reversed insert VE	3/4	42mm	+6



# Implants

## 10° reversed inserts

Reference	Description	Size	Diameter	Thickness
DWR1330	10° reversed insert	1/2	33mm	+0
DWR1333	10° reversed insert	1/2	33mm	+3
DWR1336	10° reversed insert	1/2	33mm	+6
DWR1360	10° reversed insert	1/2	36mm	+0
DWR1363	10° reversed insert	1/2	36mm	+3
DWR1366	10° reversed insert	1/2	36mm	+6
DWR1390	10° reversed insert	1/2	39mm	+0
DWR1393	10° reversed insert	1/2	39mm	+3
DWR1396	10° reversed insert	1/2	39mm	+6
DWR2360	10° reversed insert	3/4	36mm	+0
DWR2363	10° reversed insert	3/4	36mm	+3
DWR2366	10° reversed insert	3/4	36mm	+6
DWR2390	10° reversed insert	3/4	39mm	+0
DWR2393	10° reversed insert	3/4	39mm	+3
DWR2396	10° reversed insert	3/4	39mm	+6
DWR2420	10° reversed insert	3/4	42mm	+0
DWR2423	10° reversed insert	3/4	42mm	+3
DWR2426	10° reversed insert	3/4	42mm	+6



## 10° reversed inserts vitamin E

Reference	Description	Size	Diameter	Thickness
DWT1330	10° reversed insert VE	1/2	33mm	+0
DWT1333	10° reversed insert VE	1/2	33mm	+3
DWT1336	10° reversed insert VE	1/2	33mm	+6
DWT1360	10° reversed insert VE	1/2	36mm	+0
DWT1363	10° reversed insert VE	1/2	36mm	+3
DWT1366	10° reversed insert VE	1/2	36mm	+6
DWT1390	10° reversed insert VE	1/2	39mm	+0
DWT1393	10° reversed insert VE	1/2	39mm	+3
DWT1396	10° reversed insert VE	1/2	39mm	+6
DWT2360	10° reversed insert VE	3/4	36mm	+0
DWT2363	10° reversed insert VE	3/4	36mm	+3
DWT2366	10° reversed insert VE	3/4	36mm	+6
DWT2390	10° reversed insert VE	3/4	39mm	+0
DWT2393	10° reversed insert VE	3/4	39mm	+3
DWT2396	10° reversed insert VE	3/4	39mm	+6
DWT2420	10° reversed insert VE	3/4	42mm	+0
DWT2423	10° reversed insert VE	3/4	42mm	+3
DWT2426	10° reversed insert VE	3/4	42mm	+6



# Implants

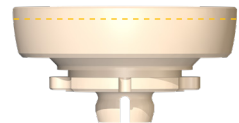
## \*Symmetric retentive reversed inserts

Reference	Description	Size	Diameter	Thickness
DWP3330	Symmetric retentive reversed insert	1/2	33mm	+0
DWP3333	Symmetric retentive reversed insert	1/2	33mm	+3
DWP3336	Symmetric retentive reversed insert	1/2	33mm	+6
DWP3360	Symmetric retentive reversed insert	1/2	36mm	+0
DWP3363	Symmetric retentive reversed insert	1/2	36 mm	+3
DWP3366	Symmetric retentive reversed insert	1/2	36mm	+6
DWP3390	Symmetric retentive reversed insert	1/2	39mm	+0
DWP3393	Symmetric retentive reversed insert	1/2	39mm	+3
DWP3396	Symmetric retentive reversed insert	1/2	39mm	+6
DWP4360	Symmetric retentive reversed insert	3/4	36mm	+0
DWP4363	Symmetric retentive reversed insert	3/4	36mm	+3
DWP4366	Symmetric retentive reversed insert	3/4	36mm	+6
DWP4390	Symmetric retentive reversed insert	3/4	39mm	+0
DWP4393	Symmetric retentive reversed insert	3/4	39mm	+3
DWP4396	Symmetric retentive reversed insert	3/4	39mm	+6
DWP4420	Symmetric retentive reversed insert	3/4	42mm	+0
DWP4423	Symmetric retentive reversed insert	3/4	42mm	+3
DWP4426	Symmetric retentive reversed insert	3/4	42mm	+6



## \*Symmetric retentive reversed inserts vitamin E

Reference	Description	Size	Diameter	Thickness
DWS3330	Symmetric retentive reversed insert VE	1/2	33mm	+0
DWS3333	Symmetric retentive reversed insert VE	1/2	33mm	+3
DWS3336	Symmetric retentive reversed insert VE	1/2	33mm	+6
DWS3360	Symmetric retentive reversed insert VE	1/2	36mm	+0
DWS3363	Symmetric retentive reversed insert VE	1/2	36mm	+3
DWS3366	Symmetric retentive reversed insert VE	1/2	36mm	+6
DWS3390	Symmetric retentive reversed insert VE	1/2	39mm	+0
DWS3393	Symmetric retentive reversed insert VE	1/2	39mm	+3
DWS3396	Symmetric retentive reversed insert VE	1/2	39mm	+6
DWS4360	Symmetric retentive reversed insert VE	3/4	36mm	+0
DWS4363	Symmetric retentive reversed insert VE	3/4	36mm	+3
DWS4366	Symmetric retentive reversed insert VE	3/4	36mm	+6
DWS4390	Symmetric retentive reversed insert VE	3/4	39mm	+0
DWS4393	Symmetric retentive reversed insert VE	3/4	39mm	+3
DWS4396	Symmetric retentive reversed insert VE	3/4	39mm	+6
DWS4420	Symmetric retentive reversed insert VE	3/4	42mm	+0
DWS4423	Symmetric retentive reversed insert VE	3/4	42mm	+3
DWS4426	Symmetric retentive reversed insert VE	3/4	42mm	+6

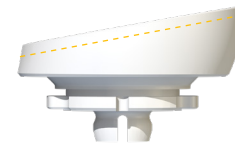


\*Retentive inserts have a 2mm greater wall height than standard inserts.

# Implants

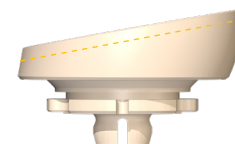
## \*10° retentive reversed inserts

Reference	Description	Size	Diameter	Thickness
DWR3330	10° retentive reversed insert	1/2	33mm	+0
DWR3333	10° retentive reversed insert	1/2	33mm	+3
DWR3336	10° retentive reversed insert	1/2	33mm	+6
DWR3360	10° retentive reversed insert	1/2	36mm	+0
DWR3363	10° retentive reversed insert	1/2	36mm	+3
DWR3366	10° retentive reversed insert	1/2	36mm	+6
DWR3390	10° retentive reversed insert	1/2	39mm	+0
DWR3393	10° retentive reversed insert	1/2	39mm	+3
DWR3396	10° retentive reversed insert	1/2	39mm	+6
DWR4360	10° retentive reversed insert	3/4	36mm	+0
DWR4363	10° retentive reversed insert	3/4	36mm	+3
DWR4366	10° retentive reversed insert	3/4	36mm	+6
DWR4390	10° retentive reversed insert	3/4	39mm	+0
DWR4393	10° retentive reversed insert	3/4	39mm	+3
DWR4396	10° retentive reversed insert	3/4	39mm	+6
DWR4420	10° retentive reversed insert	3/4	42mm	+0
DWR4423	10° retentive reversed insert	3/4	42mm	+3
DWR4426	10° retentive reversed insert	3/4	42mm	+6



## \*10° retentive reversed inserts vitamin E

Reference	Description	Size	Diameter	Thickness
DWT3330	10° retentive reversed insert VE	1/2	33mm	+0
DWT3333	10° retentive reversed insert VE	1/2	33mm	+3
DWT3336	10° retentive reversed insert VE	1/2	33mm	+6
DWT3360	10° retentive reversed insert VE	1/2	36mm	+0
DWT3363	10° retentive reversed insert VE	1/2	36mm	+3
DWT3366	10° retentive reversed insert VE	1/2	36mm	+6
DWT3390	10° retentive reversed insert VE	1/2	39mm	+0
DWT3393	10° retentive reversed insert VE	1/2	39mm	+3
DWT3396	10° retentive reversed insert VE	1/2	39mm	+6
DWT4360	10° retentive reversed insert VE	3/4	36mm	+0
DWT4363	10° retentive reversed insert VE	3/4	36mm	+3
DWT4366	10° retentive reversed insert VE	3/4	36mm	+6
DWT4390	10° retentive reversed insert VE	3/4	39mm	+0
DWT4393	10° retentive reversed insert VE	3/4	39mm	+3
DWT4396	10° retentive reversed insert VE	3/4	39mm	+6
DWT4420	10° retentive reversed insert VE	3/4	42mm	+0
DWT4423	10° retentive reversed insert VE	3/4	42mm	+3
DWT4426	10° retentive reversed insert VE	3/4	42mm	+6



\*Retentive inserts have a 2mm greater wall height than standard inserts.

# Mismatch charts

## Tornier Perform humeral heads with Tornier Perform Anatomic Glenoid, Tornier Perform Anatomic Augmented Glenoid – mismatch chart

Recommended combinations heads/glenoids

Diametrical mismatch in mm

Size	Heads	37x13.5	39x14	41x15	43x14	43x16	46x15	46x17	46x19	48x16	48x18	48x20	50x16	50x19	50x22	52x19	52x23	54x20	54x24	56x22
Glenoid	Diameter of curvature	39.67	41.91	43.68	48.20	45.64	51.12	48.60	47.08	52.93	50.59	49.14	56.13	52.58	50.64	55.23	52.61	57.06	54.58	58.10
Small	55.4	15.7	13.5	11.7	7.2	9.8	4.3	6.8	8.3	2.5	4.8	6.3	-0.7	2.8	4.8	0.2	2.8	-1.7	0.8	-2.7
Medium	59.6	19.9	17.7	15.9	11.4	14.0	8.5	11.0	12.5	6.7	9.0	10.5	3.5	7.0	9.0	4.4	7.0	2.5	5.0	1.5
Large	63.6	23.9	21.7	19.9	15.4	18.0	12.5	15.0	16.5	10.7	13.0	14.5	7.5	11.0	13.0	8.4	11.0	6.5	9.0	5.5
XL	67.8	28.1	25.9	24.1	19.6	22.2	16.7	19.2	20.7	14.9	17.2	18.7	11.7	15.2	17.2	12.6	15.2	10.7	13.2	9.7

\*The acceptable range for this combination is 1 to 24.8 mm

☐ Cleared mismatch range
 ☐ Non-cleared mismatch range

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Content ID: AP-015893D 03-Jun-2024  
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