stryker

Tornier Perform®
Reversed Augmented Glenoid

Operative technique

Disclaimer

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 (www.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

Reversed Augmented Glenoid

Contents

Tornier Perform Reversed Augmented Glenoid

Overview

The Tornier Perform Reversed Glenoid and Tornier Perform Reversed Augmented Glenoid must be used in association with a Stryker humeral component*:

- humeral implants Tornier Flex Shoulder System in reverse configuration.
- or humeral implants Aequalis Reversed, Aequalis Reversed Fracture or Aequalis Adjustable Reversed Shoulder System.
- or humeral implants Reversed.

The Tornier shoulder prostheses are intended for replacement of the shoulder joint to reduce pain and improve shoulder mobility for patients with designated indication.

Walch classification	Sirveaux classification	Tornier Perform Reversed Augmented Glenoid Baseplate
B2	E2	Half wedge baseplates
C	E3	Full wedge baseplates

*Not all glenoid and humeral components are available in all geographies.

Indications and contraindications

Indications for use

The Tornier Perform Reversed & Tornier Perform Reversed Augmented Glenoid are indicated for use as a replacement of shoulder joints for patients with a functional deltoid muscle and with massive and non-repairable rotator cuff-tear with pain disabled by:

- Rheumatoid arthritis.
- Non-inflammatory degenerative joint disease (i.e. osteoarthritis and avascular necrosis).
- Correction of functional deformity.
- Fractures of the humeral head.
- Traumatic arthritis.
- Revision of the devices if sufficient bone stock remains.

Notes:

- All components are single use.
- The glenoid sphere implant is anchored to the bone with screws and is for non-cemented fixation.

Contra-indications:

Absolute contraindications for shoulder arthroplasty:

- Poor quality and insufficient quantity of glenoid bone stock.
- Pre or Per-operative glenoid fracture.
- Acromion fracture.
- Non-functional deltoid.
- Active local or systemic infection, sepsis and osteomyelitis.
- Elevation of sedimentation rate unexplained by other disease, elevation of WBC count, or marked shift in WBC differential count.
- 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 allergy to one of the materials.
- Patient pregnancy.

Relative contraindications for shoulder arthroplasty:

- Uncooperative patient or patient with neurologic disorders who are not capable of following directions.
- Osteoporosis.
- Metabolic disorders which may impair bone formation.
- Osteomalacia.
- 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 roentgenogram.

Operative technique

Pre-operative planning

Pre-operative planning is performed utilizing X-rays including a true anterior/posterior view of the glenohumeral joint or axillary views. The use of a CT scan or MRI is recommended to better determine the orientation of the glenoid, the quality of glenoid bone stock and to evaluate the integrity of the rotator cuff.

A careful analysis of X-rays and CT scan views is recommended before surgery to evaluate the following parameters: osteophytes, anterior, superior, posterior, and inferior wear of the glenoid, as well as the location, orientation and depth of the glenoid vault and presence of subcortical cysts.

Glenoid exposure

Exposure of the glenoid is one of the more technically difficult aspects of shoulder arthroplasty. The size of the patient, soft tissue contractures, bony morphology, and the sequelae of previous surgeries are some of the potential challenges to adequate exposure.

A thorough understanding of the neuroanatomy and techniques for protecting the axillary nerve, in particular, are routinely used to achieve successful exposure. In brief, a standard deltopectoral approach is typically used, with retraction of the deltoid laterally and pectoralis and conjoined tendon medially. A superior approach may also be utilized. Humeral exposure is performed per surgeon preference with appropriate subscapularis techniques and humeral head resection.

The proximal humerus is then retracted posteriorly and access to the glenoid is gained. Residual labral tissue is excised, biceps tendon is released, and the capsule is released from the glenoid anterior, inferiorly, and posteriorly. Special attention is given for protection of the axillary nerve inferiorly. Appropriate glenoid retractors are then inserted and additional exposure techniques can then be used as needed. Please reference the Tornier Tornier Approach Shoulder Arthroplasy Program for additional details.

Operative technique

Tornier Perform Reversed Augmented Glenoid surgical steps

Tornier Perform Reversed Augmented Glenoid instrumentation allows for use of different operative techniques to better suit the clinical situation and surgeon preference.

The instruments have been designed to increase the safety of the procedure and to assist the surgeon in obtaining accurate and reproducible results. The instrumentation only allows for a cannulated preparation referencing a guide pin positioned at a chosen orientation.

To minimize bone loss during an augmented procedure the surgeon can utilize the augmented trials prior to reaming to determine what type of augment will be most appropriate for the patient. The augment option that preserves the most native glenoid bone should be utilized.

NOTICE

These devices should not be used in cases of significant bone loss where poor quality or insufficient quantity of glenoid bone stock exists.

Half wedge augment

Sizing the glenoid and pin placement

Two types of pin guides are available (circular or anatomic). (fig. 1) The circular guide has the same outer diameter as the glenoid baseplate in a 25mm or 29mm diameters. The anatomical pin guides come in four sizes (S=Small, M=Medium, L=Large, and XL=Extra-Large) that correspond to the varying patient anatomies. The anatomical pin guides have an inferior offset built in, which positions the pin 12 mm from the bottom of the guide.1 Two pin guide handles are offered in the instrument set, a 0° or 10° inferior tilt handle. The 0° pin guide handle can be used to prepare the baseplate perpendicular to the glenoid. The 10° pin guide handle can be used to place a 10° inferior tilt to the baseplate. The guides are assembled by rotating the distal end of the pin guide handle into the pin guide clockwise until it is fully seated (fig. 2).

According to surgeon preference, exposure, and surgical approach, the offset pin guide handle can be attached to the straight pin guide handles by sliding the offset handle down the shaft of the straight handle until it snaps in place (fig. 3). Use of the offset handle can provide better visualization as the guide pin is placed.

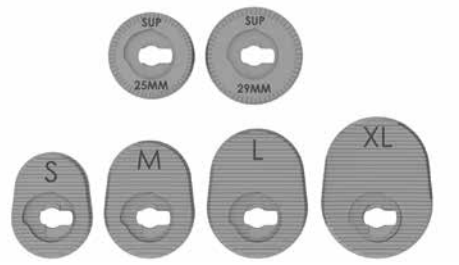


Fig. 1

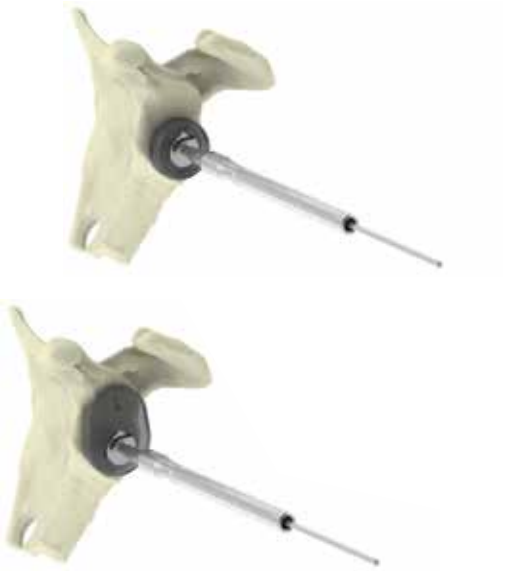


Fig. 2

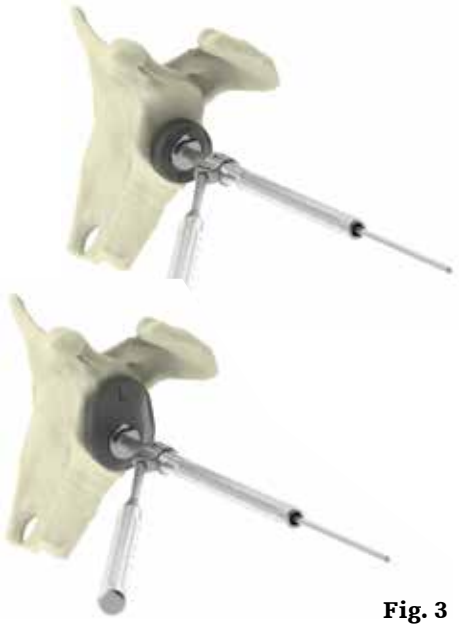


Fig. 3

Operative technique

While referencing the face of the glenoid and appropriately seating the assembled pin guide on the inferior edge of the glenoid to reduce the risk of impingement, drill the 2.5mm guide pin through the guide pin handle until bicortical fixation is achieved. Care should be taken when placing the pin on a glenoid with abnormal erosion (fig. 4).

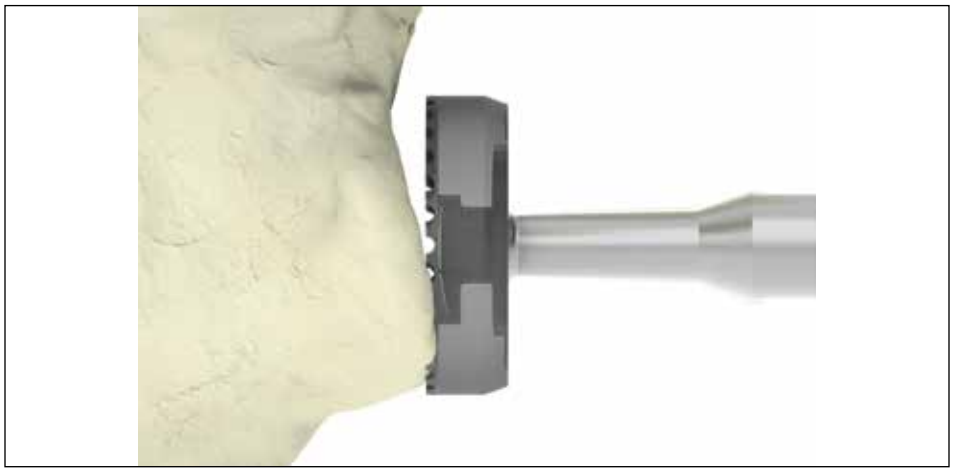


Fig. 4

Once the 2.5mm guide pin is fixed in the glenoid with bicortical fixation, remove the drill and the pin guide assembly. Finally, before reaming, check to ensure the guide pin is accurately placed on the glenoid and no adjustments are needed. It is important to check the guide pin condition after every step of the glenoid preparation. If the guide pin is damaged or bent, a new guide pin should be inserted.

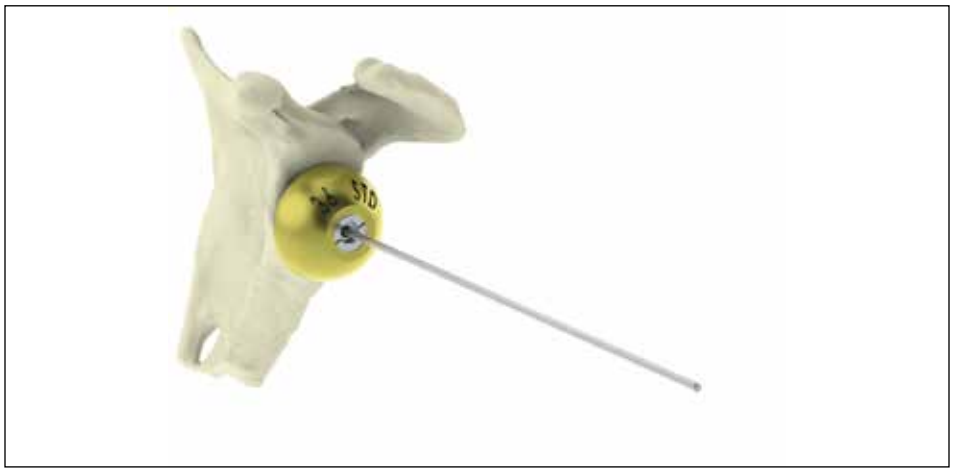


Fig. 5

NOTICE

An optional trialing step to estimate glenoid position can be performed at this point using the guide pin and the glenosphere trials (fig. 5).

Operative technique

Resurfacing the glenoid

To obtain complete seating and secure fixation of the glenoid baseplate, it is important to create a flat glenoid surface using the cannulated baseplate reamer of the same diameter of the baseplate that will be used. Half-moon reamers are provided standard in the Tornier Perform Reversed Standard instrument set. If preferred, full-moon reamers are available upon request.

Connect the appropriate reamer to power and select the reaming option on the drill. Slide the assembly onto the guide pin and ream.

Only the paleo glenoid, or surface that reassembles the natural glenoid shape, should be reamed flat to best fit the implant. Care should be taken to not completely ream the entire glenoid surface. It is recommended to start the reamer before contacting the glenoid surface and ream until the paleo glenoid surface is flat (fig. 6).

If insertion of reamer is difficult, remove or reposition retractors for greater exposure. A T-handle is provided in all Tornier humeral instrument sets if manual reaming is desired. Preserve as much bone as possible to support good primary fixation.

Overly aggressive reaming should be avoided to minimize the risk of glenoid fracture.

Augment reaming - neo reaming

After the paleo surface of the glenoid has been adequately prepared, ream the defected bone or the neo portion of the glenoid. When assembling the augment reamer (see instructions in the Appendix) make sure the angle indicator is positioned at the 35° angle before starting to ream. Choose the appropriately sized neo reamer and neo reamer depth stop size based on whether a 25mm or 29mm sized baseplate will be used. The arrow on the depth stop indicates the position that is 180° opposite of the deepest point of the wedge. This arrow corresponds to marking on several other instruments that will follow. An anatomical mark on the rim of the glenoid made with a bovie can also be created to keep the location identified through the duration of the surgery.

Fig. 6

Operative technique

Begin by placing the neo reamer assembly over the guide pin and slide the assembly down to the face of the glenoid. Make sure that the appropriate size neo reamer depth stop is aligned with the paleo reamed surface (fig. 7a-7b).

NOTICE

It is imperative to maintain alignment with the guide pin and rotational position while neo reaming.

The neo reamer is intended to be power driven only. Begin reamer rotation prior to contacting the glenoid surface then apply light pressure. This will help reduce the risk of fracture. Take extra care to keep the neo reamer axially aligned with the guide pin so that the depth stop sits flush on the paleo surface when reaming is complete. Depending on the defect, you will need to progressively ream until the depth stop is seated on the paleo surface. This will be determined in the next step with the augment trials. Care should be taken to keep the reamer steady to maintain alignment if progressive reaming is necessary. The goal of neo reaming is to obtain a bony surface that matches the backside of the glenoid component while removing as little bone as possible. Over aggressive reaming should be avoided to prevent possible glenoid fracture and improper fit of the implant. Once neo reaming is complete, remove the neo reamer assembly from the guide pin and out of the joint (fig. 8).

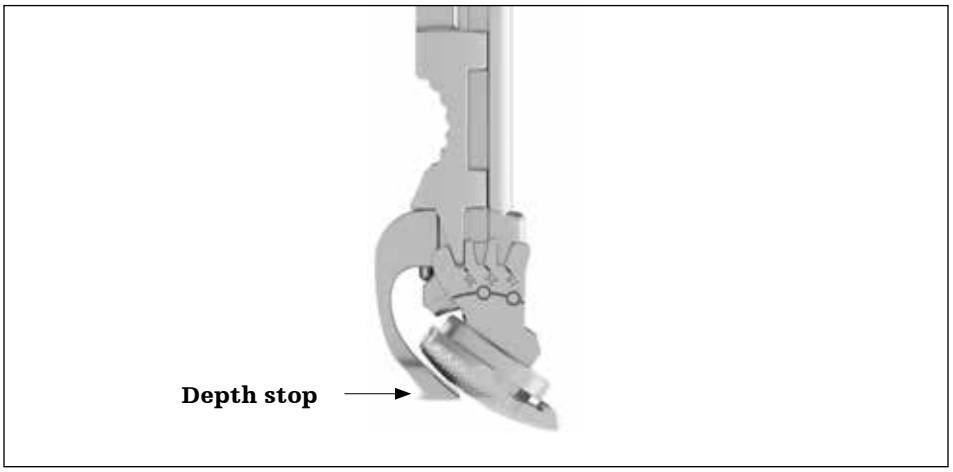


Fig. 7a

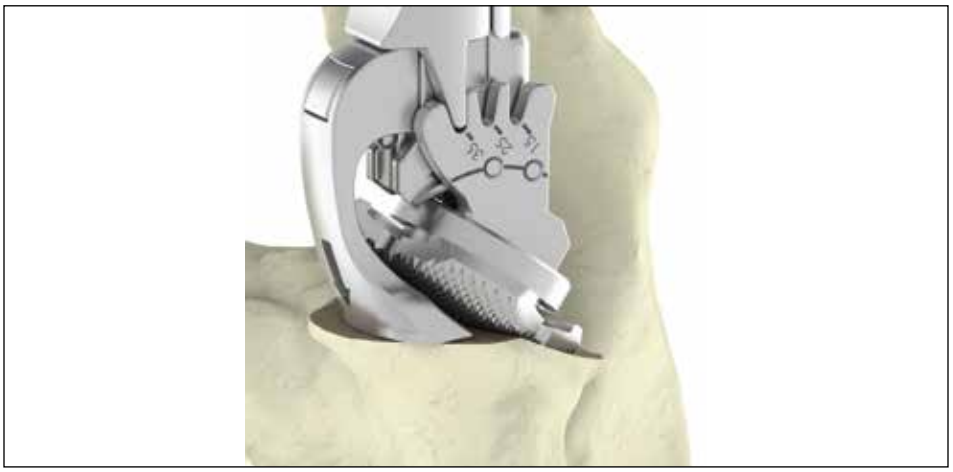


Fig. 7b

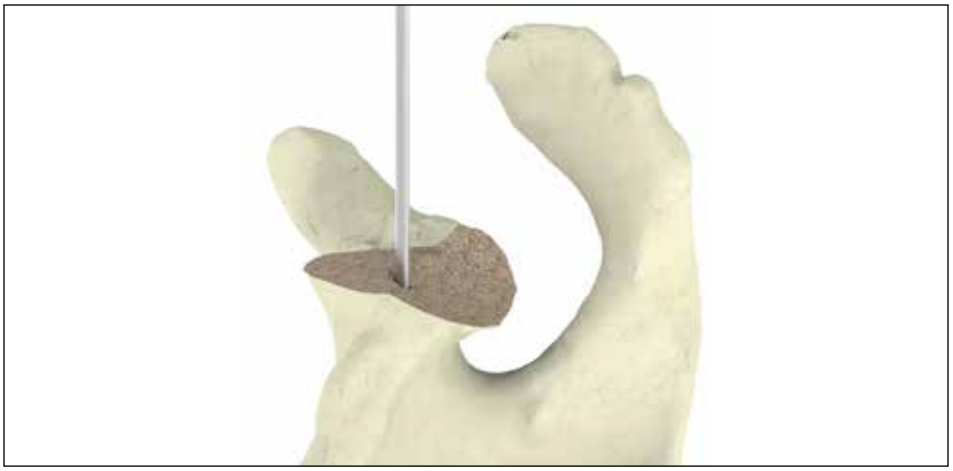


Fig. 8

Operative technique

Augment trial

With the neo surface prepared the corresponding augmented trial can be used to evaluate if proper neo reaming has been achieved. Make sure the trial being used to validate the fit is the appropriate size.

The augmented trial should seat flush and stable on the reamed surface and match the location of the laser mark location of the depth stop above. If instability (rocking) or gaps are observed additional paleo and/or neo reaming may be required to correct. Recheck following any corrective reaming to ensure the final fit is flush and stable (fig. 9).

Fig. 9

Baseplate post and central screw drilling

The hole for the baseplate post is drilled over the guide pin using the cannulated 10mm diameter drill bit. A positive stop on the drill bit ensures that drilling will not go too deep and allows for press-fit fixation of the post. Be sure to stop the post drill at the paleo surface (fig. 10).

Remove the guide pin.

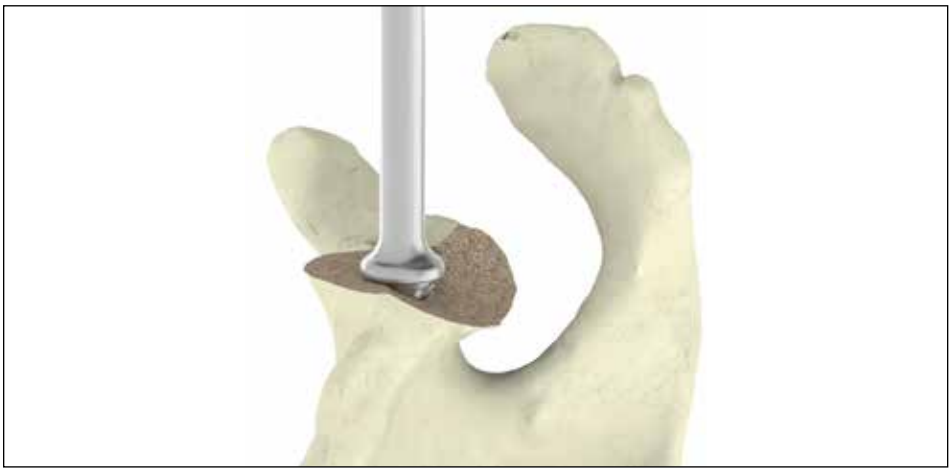


Fig. 10

Operative technique

The surgeon determines the diameter of the central screw drill bit based on patient bone quality. It is recommended to start with the 6.5mm diameter drill bit as the hole can be expanded if necessary. 9.5mm diameter screws are recommended if inadequate fixation is achieved with 6.5mm diameter screw secondary to poor bone quality or for revision cases. Place the corresponding half wedge central screw drill guide into the hole in the glenoid face that was created using the baseplate post drill. Be certain that the wedge portion of the drill guide is placed in the neo reamed defect that was created to ensure proper stability while reaming (fig. 11a-11b). Align the laser marked arrow on the drill guide to the location identified in the steps above. The central screw hole is drilled using a 6.5mm or 9.5mm diameter drill bit.

Laser marks can be used to help approximate the final implant length. The drilling is performed under power. Palpation of the drill bit tip can be performed to confirm the drill bit has exited the anterior cortex.

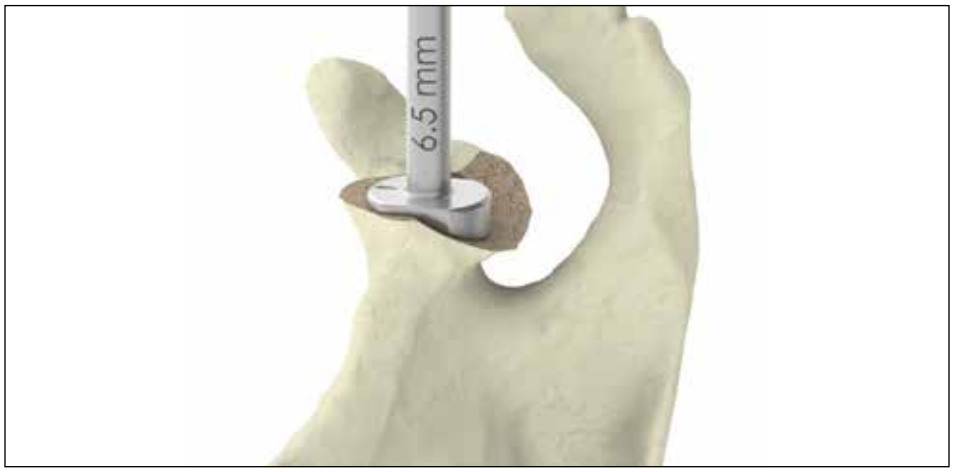


Fig. 11a

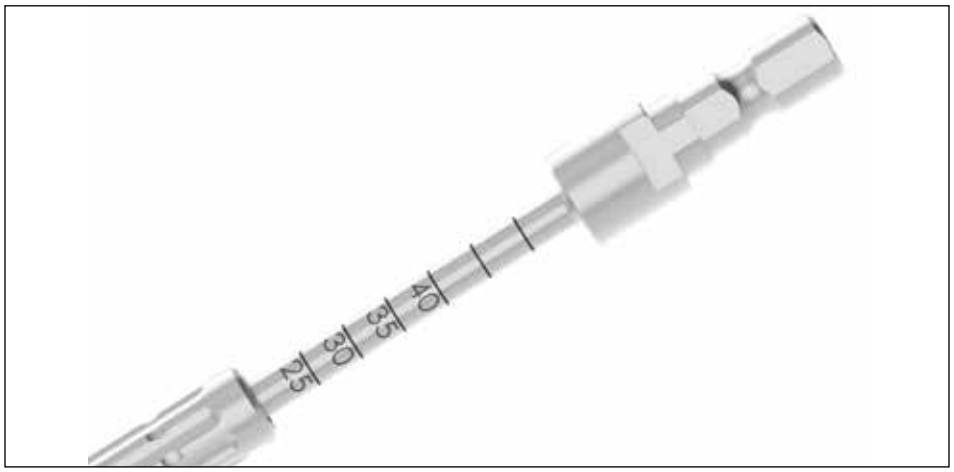


Fig. 11b

Operative technique

Sizing for central screw

To determine the final central screw length, the central screw depth gauge is used (fig. 12). The gauge measures the recommended screw length. The actual prepared hole is approximately 3mm less to allow for bicortical fixation. To ensure an accurate evaluation of the final screw length, make sure the flat end of the depth gauge is contacting the paleo surface of the glenoid. The length of the central screw is matched with the color and number that appears on the depth gauge. If you fall on a line above a color, choose the length below the line (fig. 13).

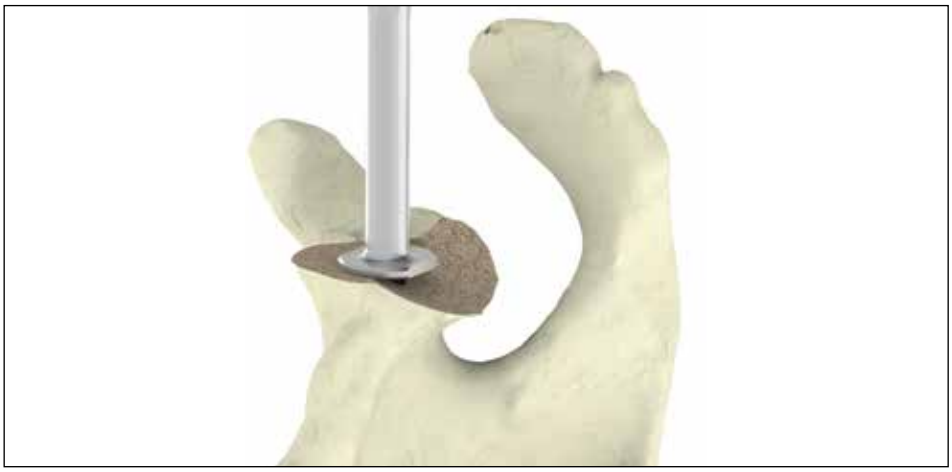


Fig. 12

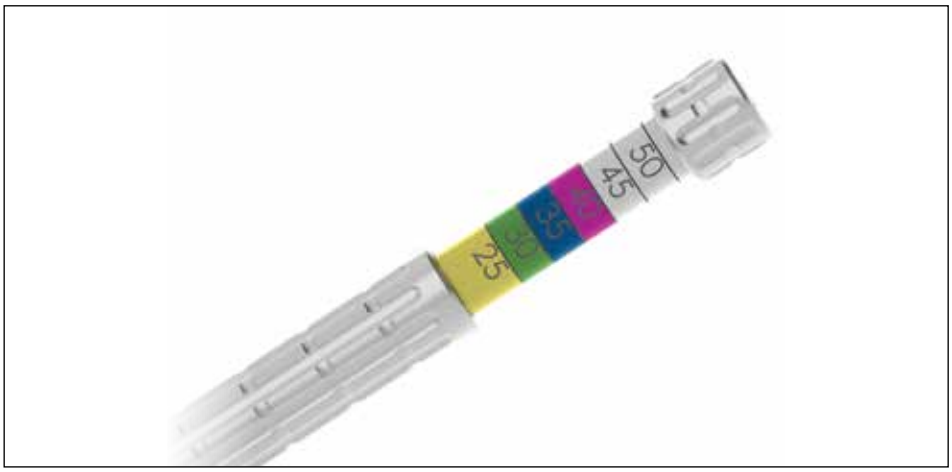


Fig. 13

Central screw tap

Although the central screws are self-tapping, after measuring the central hole, the tap can be used to prepare the threads of the final implant and reduce the possibility of glenoid fracture in cases for hard bone. Tapping is recommended when using the 9.5mm central screw in order to prevent glenoid fracture. Tapping should be done manually by connecting it to a T-handle (Do not use with power). When tapping, it is important to maintain alignment to the axis of the previously drilled hole. There are laser markings on the tap to show depth (fig. 14). The tapping depth should be chosen similar to the depth of the drilled central hole. Using the measurements of the central screw length, stop at the level of the corresponding laser mark.

Fig. 14

Operative technique

Baseplate assembly and insertion

The final baseplate is chosen according to the reamed glenoid surface (25mm half wedge or 29mm half wedge). Additionally, the final central screw is chosen according to the measured length using the central screw depth gauge.

Ensure that the inner shaft of the baseplate inserter is backed out to the point where it moves freely within the outer sleeve yet is still contained. While lining up the pegs on the inserter with the peg holes on the baseplate, snap the inserter onto the baseplate. Screw the inner shaft down the sleeve to capture the baseplate onto the inserter. Care should be taken to ensure that the two pegs on the inserter seat properly into their respective holes on the baseplate (fig 15a-15b).

NOTICE

Assemble the inserter with the arrow of the inserter opposite of the wedged portion of the baseplate.

Fig. 15a

Fig. 15b

Operative technique

There is a 6.5mm and 9.5mm slot corresponding to the screw diameter. The hex head portion of the screw is orientated in the up position (fig. 16).

The baseplate inserter with baseplate attached is placed onto the screw and turned in a counterclockwise manner. Turn the baseplate until it is fully seated onto the screw. There will be a slight drop of the baseplate indicating that it has fully seated. The baseplate will spin independently from the screw once seated (fig. 17a-17b). The baseplate/screw can be removed from assembly tool.

It is important to continuously check the orientation of the baseplate relative to the prepared hole and reamed surface to ensure accurate implantation of the half wedge baseplate. The baseplate inserter also has a laser marked arrow that can be used to align with corresponding arrows from previous instruments.

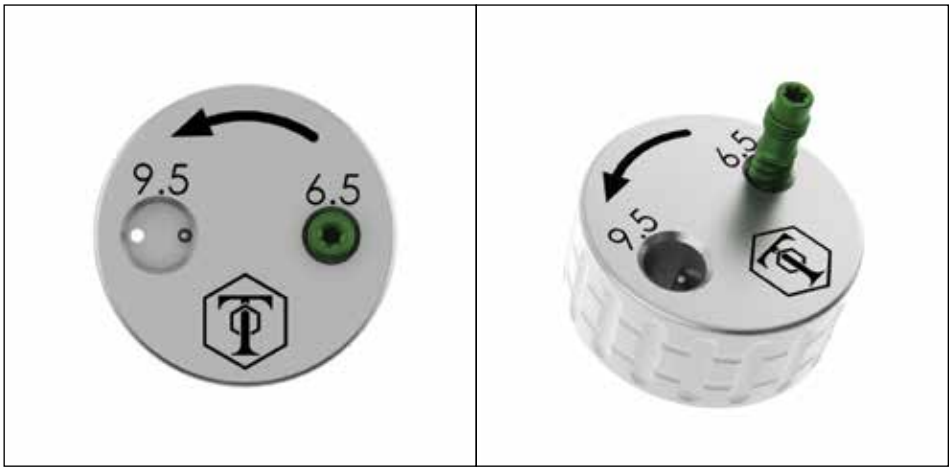


Fig. 16

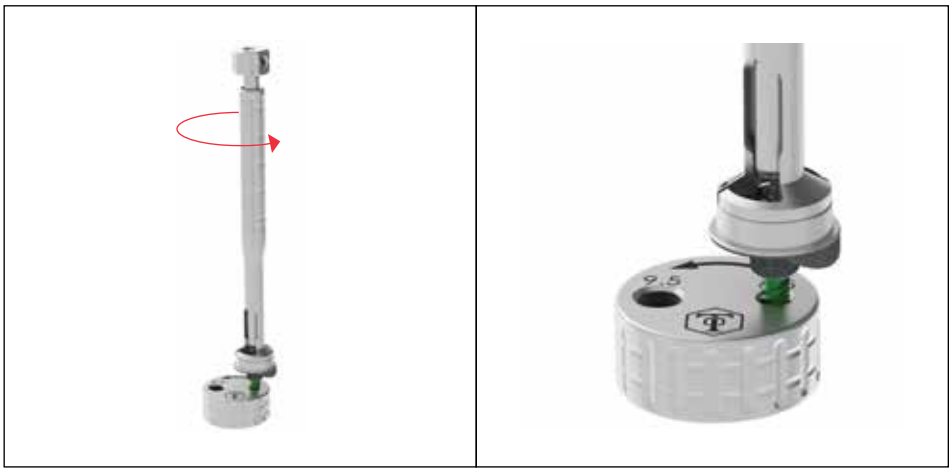


Fig. 17a **Fig. 17b**

Operative techinique

Final implantation

Insert the baseplate inserter screwdriver down the shaft of the baseplate inserter and engage the head of the central screw.

To insert the assembled baseplate, place the screw into the central screw drill hole making sure to align the laser mark on the baseplate inserter to the location identified above (fig. 18). Turn the central screw in a clockwise manner and screw the baseplate into the prepared glenoid until it has fully seated against the surface. There will be a slight audible clicking noise once the post begins to engage the prepared bone. This is normal and is due to the free-floating nature of the screw within the assembly.

NOTICE

At the completion of glenoid component installation, the central locking screw of the glenosphere locks the central compression screw into the baseplate, creating a locked fixed angle implant.

Take care to ensure proper rotational orientation of the baseplate when screwing the baseplate down (fig. 19). Once the baseplate is seated flush on the glenoid surface, the baseplate inserter can be detached from the baseplate.

Fig. 18

Fig. 19

Operative techinique

NOTICE

The baseplate should be seated completely onto the prepared glenoid surface. Avoid over-tightening or excessive advancement of the baseplate into the subchondral bone. Gaps between the baseplate and glenoid surface should also be avoided.

NOTICE

If the 6.5mm screw strips a 9.5mm screw can be used. This is accomplished by removing the baseplate and installing the 9.5mm screw in place of the 6.5mm screw.

Peripheral screw drilling, insertion and reaming

The half wedge augmented baseplates contains one peripheral screw hole which is compression and located on the thick portion of the wedge. The other peripheral screw holes are multidirectional locking (see Appendix for peripheral screw angulations).

The remaining steps for peripheral screw insertion, peripheral reaming and glenosphere attachment can be performed by following the standard procedure in the Tornier Perform Reversed operative technique.

Operative technique

Full wedge augment

Sizing the glenoid and pin placement

Using the same cannulated approach as described in steps 1-4 above, a single use 2.5mm guide pin will be placed using a combination of pin guides and pin guide handles. Place the pin guide onto the glenoid surface making sure that its bottom surface is seated on the bone. Care should be taken when placing the pin in the glenoid that contains a defect. Make sure that the pin guide is placed onto the glenoid where the best possible position can be achieved. To limit any risk of impingement, it is important to properly position the pin guide referencing the inferior glenoid edge (fig. 20).

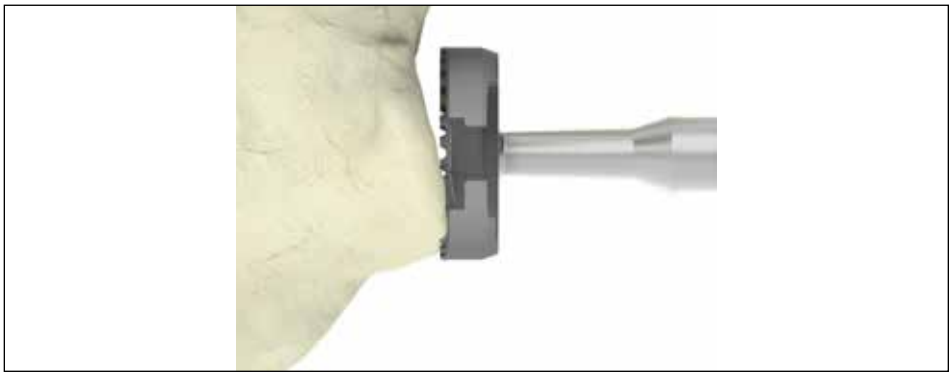


Fig. 20

Pilot hole preparation

A pilot hole must be drilled in order for the full wedge augment reamer assembly to properly ream the neo surface of the glenoid. Drill until the positive stop has been reached (fig. 21a-21b).

Fig. 21a

Fig. 21b

Augment reaming - neo reaming

When assembling the augment reamer, refer to the assembly instructions in the Appendix. Choose the appropriate neo reamer to match the baseplate diameter to be used, 25 or 29mm.

Make sure the angle indicator is positioned at the 15° angle before first starting to ream (fig. 22). The neo reamer is intended to be power driven only.

Fig. 22

Operative technique

NOTICE

The depth stop is not used for the full wedge preparation. Alignment can be determined by positioning the depth stop connection point opposite to the deepest portion of the defect.

Place the neo reamer assembly over the guide pin and slide the assembly down to the face of the glenoid. Begin reamer rotation prior to contacting the glenoid surface then apply light pressure (let the cutter do the work) (fig. 23).

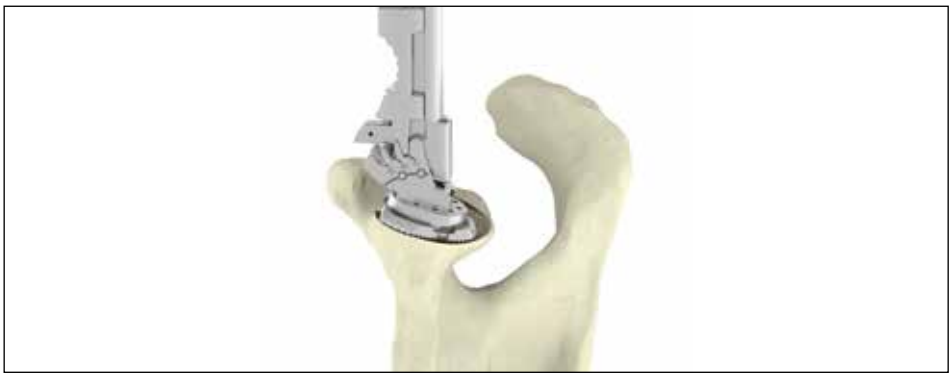


Fig. 23

NOTICE

It is imperative to maintain alignment with the guide pin and rotational alignment to the glenoid while neo reaming.

The goal of neo reaming is to obtain a bony surface that matches the backside of the glenoid component while removing as little bone as possible.

Once neo reaming is complete, remove the neo reamer assembly from the guide pin and out of the joint (fig. 24).

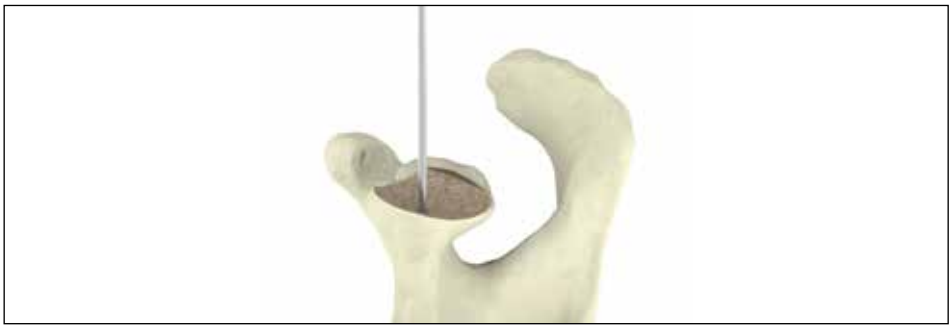


Fig. 24

Operative technique

Augment trial

With the neo surface prepared, the corresponding augmented trial can be used to evaluate if proper reaming has been achieved. Make sure the trial being used to validate the fit is the appropriate size. The augmented trial should seat flush and stable on the reamed surface and match the location of the laser mark location of the depth stop above. If instability (rocking) or gaps are observed additional neo reaming may be required to correct. Recheck following any corrective reaming to ensure the final fit is flush and stable (fig. 25).

Fig. 25

Baseplate post and central screw drilling

The hole for the baseplate post is drilled over the guide wire using the cannulated 10mm diameter drill bit. A positive stop on the drill bit maintains drilling will not go too deep and ensures a press-fit fixation for the post. Be sure to fully seat the post drill on the neo reamed surface of the glenoid (fig. 26).

Fig. 26

Operative technique

Remove the guide pin.

The surgeon determines the diameter of the central screw drill bit based on patient bone quality. It is recommended to start with the 6.5mm diameter drill bit as the hole can be expanded if necessary. 9.5mm diameter screws are recommended if inadequate fixation is achieved with 6.5mm diameter screw secondary to poor bone quality or for revision cases.

Place the corresponding full wedge central screw drill guide into the hole in the glenoid face that was made by the baseplate post drill. Align the laser mark on the drill guide to the location identified in the steps above. Be certain that the wedge portion of the drill guide is placed in the neo reamed defect that was created to ensure proper stability while reaming. The central screw hole is drilled using a 6.5mm or 9.5mm diameter drill bit. Laser marks can be used to approximate the final implant length (fig. 27). The drilling is performed under power over the guide wire. Palpation of the drill bit tip can be performed to confirm the drill bit has exited the cortex.

After the drill bit has penetrated the anterior cortex, the laser markings on the drill bit can be used in addition the depth gauge as a guide to determine the size central screw to be used when assembling the baseplate.

Fig. 27

Operative technique

Sizing for central screw

To determine the final central screw length, the central screw depth gauge is used (fig. 28a-28b). The gauge measures the recommended screw length. The actual prepared hole is approximately 3mm less to allow for bicortical fixation. To ensure an accurate evaluation of the final screw length, make sure the flat end of the depth gauge is contacting the neo reamed surface of the glenoid. The length of the central screw is matched with the color and number that appears on the depth gauge. If you fall on a line above a color, choose the length below the line.

Central screw tap

Although the central screws are self-tapping, after measuring the depth of the central hole, the tap can be used to prepare the threads of the final implant and reduce the possibility of glenoid fracture in cases for hard bone. Tapping is recommended when using the 9.5mm central screw in order to prevent glenoid fracture.

Tapping should be done manually by connecting it to a T-handle (do not use with power). When tapping, it is important to maintain alignment to the axis of the previously drilled hole. There are laser markings on the tap to show depth (fig 29). The tapping depth should be chosen similar to the depth of the drilled central hole. Using the measurements of the central screw length, stop at the level of the corresponding laser mark.

Fig. 28a

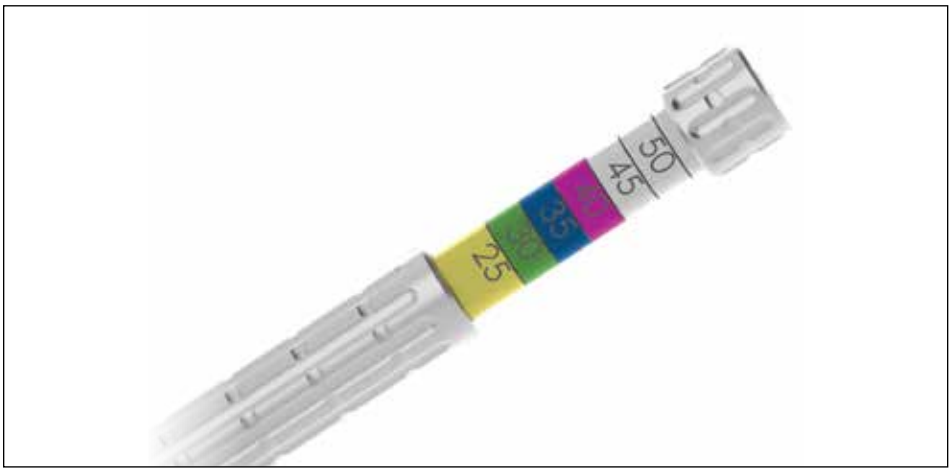


Fig. 28b

Fig. 29

Operative technique

Baseplate assembly and insertion

The final baseplate is chosen according to the reamed glenoid surface (25mm full wedge or 29mm full wedge). Additionally, the final central screw is chosen according to the measured length using the central screw depth gauge.

Ensure that the inner shaft of the baseplate inserter is backed out to the point where it moves freely within the outer sleeve yet is still contained. While lining up the pegs on the inserter with the peg holes on the baseplate, snap the inserter onto the baseplate. Screw the inner shaft down the sleeve to capture the baseplate onto the inserter. Care should be taken to ensure that the two pegs on the inserter seat properly into their respective holes on the baseplate (see fig. 15a-15b).

There is a 6.5 and 9.5mm slot corresponding to the screw diameter. The hex head portion of the screw is orientated in the up position (see fig. 16).

The baseplate inserter with baseplate attached is placed onto the screw and turned in a counterclockwise manner. Turn the baseplate until it is fully seated onto the screw. There will be a slight drop of the baseplate indicating that it has fully seated. The baseplate will spin independently from the screw once seated (see fig. 17a-17b). The baseplate/screw can be removed from assembly tool.

NOTICE

It is important to continuously check the orientation of the baseplate relative to the prepared hole and reamed surface to ensure accurate implantation of the Full Wedge baseplate to fit properly.

Operative technique

Final implantation

Insert the baseplate inserter screwdriver down the shaft of the baseplate inserter and engage the head of the central screw. To insert the assembled baseplate, place the screw into the central screw drill hole and turn the central screw in a clockwise manner (fig 30). Screw the baseplate into the prepared glenoid until it has fully seated against the surface. There will be a slight audible clicking noise once the post begins to engage the prepared bone. This is normal and is due to the free-floating nature of the screw within the assembly.

NOTICE

At the completion of glenoid component installation, the central locking screw of the glenosphere locks the central compression screw into the baseplate, creating a locked fixed angle implant.

Take care to ensure proper rotational orientation of the baseplate when screwing the baseplate down. Once the baseplate is seated flush on the glenoid surface, the baseplate inserter can be detached from the baseplate (fig. 31).

Fig. 30

Fig. 31

NOTICE

The baseplate should be seated completely onto the prepared glenoid surface. Avoid over-tightening or excessive advancement of the baseplate into the subchondral bone. Gaps between the baseplate and glenoid surface should also be avoided.

NOTICE

If the 6.5mm screw strips a 9.5mm screw can be used. This is accomplished by removing the baseplate and installing the 9.5mm screw in place of the 6.5 mm screw.

NOTICE

Longer peripheral screws are required to account for the augmented offset from the bone. A minimum peripheral screw length of 26mm should be used for the superior and inferior screws holes to ensure sufficient bone purchase.

Operative technique

NOTICE

Intra-operative removal of a central screw from an implanted Tornier Perform Reversed baseplate is not advised, as it may be difficult to unscrew from the baseplate. Introducing a central screw into a baseplate creates a compressive engagement force, which—upon implantation—may make attempts at central screw removal problematic. It is advised to confirm proper screw length prior to implantation.

If a central screw change needs to be made, please follow the steps below to properly excise/extract the implant. If the central screw does not disengage from the baseplate, a new baseplate with the correct length central screw will need to be implanted.

Step 1: Ensure the baseplate inserter handle [MWJ118] is attached to the baseplate.

- Do not use the central screw assembly tool [MWJ163]

Step 2: Apply downward pressure with the baseplate inserter screwdriver [MWJ123] and turn the baseplate inserter screwdriver counter-clockwise until the screw falls out (fig. 32).

- You may encounter some resistance, however continue turning until the screw threads out of the baseplate.

Fig. 32

Peripheral screw drilling, insertion and reaming

The full wedge augmented baseplate contains one peripheral screw hole which is compression and located on the thick portion of the wedge. The other peripheral screw holes are multidirectional locking (see Appendix for peripheral screw angulations).

The remaining steps for peripheral screw drilling and insertion, peripheral reaming and glenosphere attachment can be performed by following the standard procedure in the Tornier Perform Reversed operative technique.

Operative technique

Press-fit post options

The initial glenoid preparation is the same for the press-fit post option. Please refer to pages 6-8 for cannulated technique or pages 16-17 for non-cannulated technique. After these steps, perform the following.

Drilling for press-fit short post

Final drilling of the glenoid central hole is performed under power using the press-fit short post drill to enable a press-fit when impacting the final glenoid baseplate (the baseplate post has a diameter of 9mm). Attach the press-fit short post drill to power and drill over the guide pin to prepare for the baseplate. Drill until the depth stop contacts the surface of the glenoid bone (fig. 33). The press-fit short post drill is designed to drill the hole for the baseplate post and 7mm press-fit post in a single step. A positive stop on the drill bit ensures that drilling will not go too deep and allows for press-fit fixation of the baseplate post. Remove the drill bit.

Drilling for press-fit long post

Final drilling of the glenoid central hole is performed under power using the 8mm diameter press-fit post drill to enable a press-fit when impacting the final glenoid baseplate (the baseplate post has a diameter of 9mm).

Fig. 33

Fig. 33

Attach the 8mm diameter press-fit post drill to power and drill into the prepared hole in the glenoid. Drill until the depth stop contacts the surface of the glenoid bone (fig. 33a). The hole for the baseplate post is drilled over the guide pin using the cannulated 10mm diameter drill bit. A positive stop on the drill bit ensures that drilling will not go too deep and allows for press-fit fixation of the baseplate post. Remove the drill bit.

Operative technique

Baseplate assembly and insertion

The final baseplate is chosen according to the reamed glenoid surface (25mm or 29mm).

The baseplate is then attached to the baseplate inserter in the same manner as on page 10 from above.

The central post is attached by hand to the baseplate by screwing it onto the baseplate in a counterclockwise motion (fig. 34). The post must be securely screwed onto the baseplate. To achieve a secure attachment, insert the baseplate inserter screwdriver down the shaft of the baseplate inserter and engage the head of the post. In a clockwise motion, tighten the post to the baseplate (fig. 35).

To insert the assembled baseplate, place the post into the prepared hole and using a mallet gently impact the baseplate into the glenoid until it has fully seated against the surface. Once the baseplate is seated flush on the glenoid surface, the baseplate holder can be detached from the baseplate. The baseplate should be seated completely onto the prepared glenoid surface. Gaps between the baseplate and glenoid surface should be avoided.

Please refer to pages 13-16 of the cannulated technique above to complete the procedure.

Fig. 34

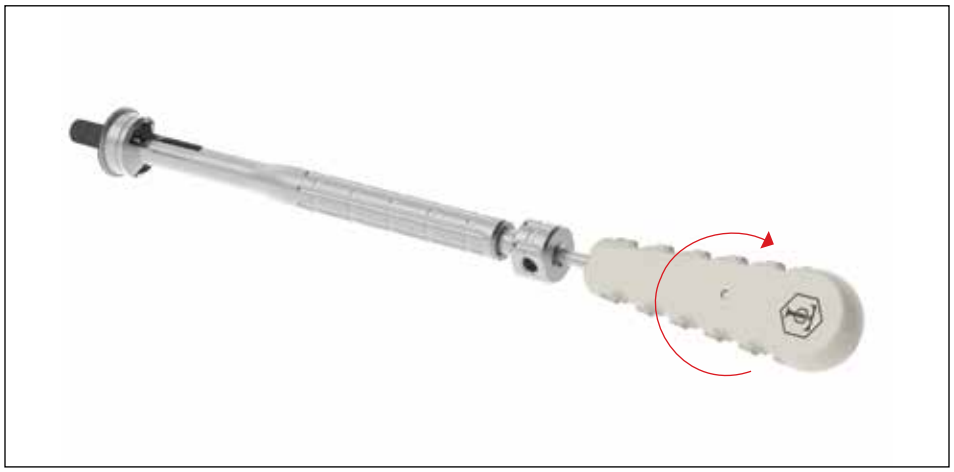


Fig. 35

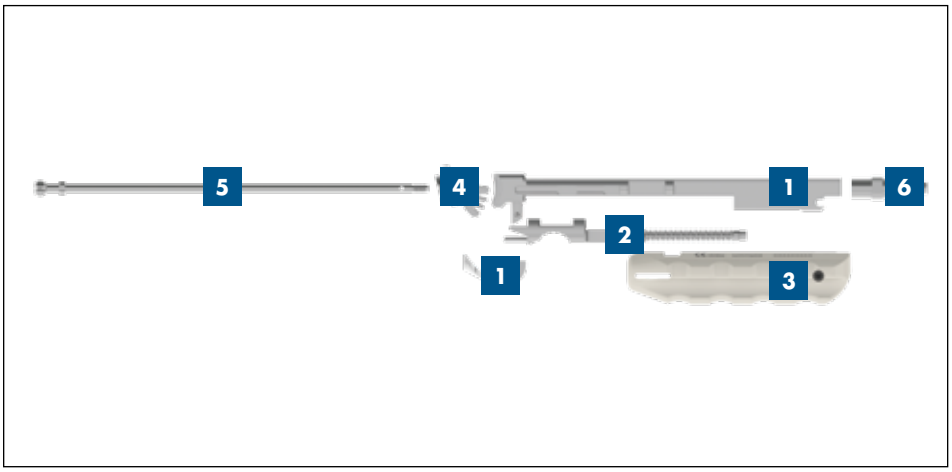
Operative technique

Augment reamer assembly instructions

1: Reamer sleeve
2: Reamer slide
3: Reamer handle
4: Angle indicator
5: Cannulated shaft
6: Drive end
7: Depth stop

Step 1

Connect the reamer sleeve and the reamer slide of the neo reamer making sure the nob on the reamer slide fits into the cut out section of the reamer sleeve. Once this connection is made, you will pull back on the trigger of the reamer slide until it is attached to reamer sleeve and the knob of the reamer slide is through the reamer sleeve (fig. 36a-36b).



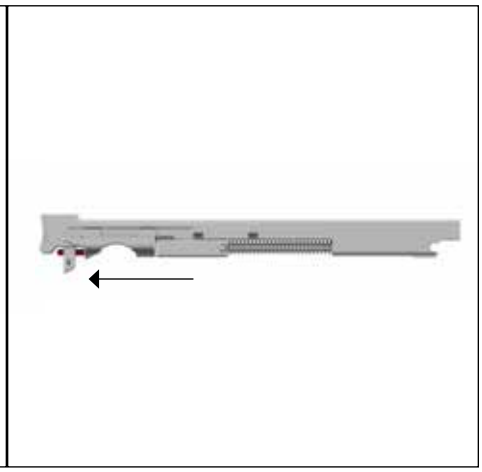


Fig. 36a **Fig. 36b**

Operative technique

Step 2

Position the pin of the reamer handle into the"U" shaped slot of the reamer sleeve. Fully retract the reamer slide and pivot the reamer handle until it snaps onto the reamer sleeve (fig. 37a-37b).

Fig. 37a

Fig. 37b

Step 3

Retract the reamer slide and place the angle indicator into the slot of the reamer sleeve. Set the angle to 15º (fig. 38).

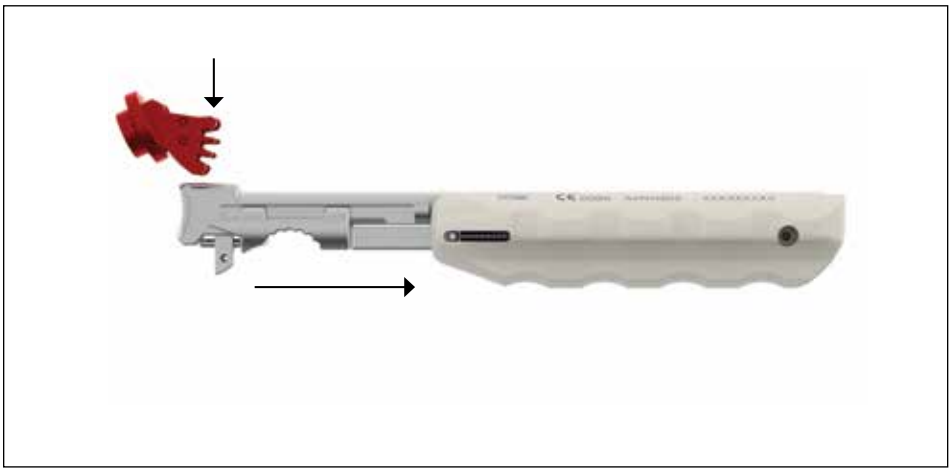


Fig. 38

Operative technique

Step 4

The cannulated shaft is now placed through the top of the angle indicator and down the reamer sleeve of the assembly. Make sure before progressing to the next step of assembly that the cannulated shaft is flush at the entry point of the angle indicator. Once fully seated, pivot the angle indicator past the 15º position to a neutral position. This will lock the device for the next step (fig. 39a-39b).

Fig. 39a

Fig. 39b

Step 5

Thread the drive end onto the reamer sleeve ensuring a tight connection (fig. 40a-40b).

Fig. 40a

Fig. 40b

Step 6

With the angle indicator still in the lock position, thread the reamer head onto the reamer sleeve. Much like the rive End in step five, make sure this connection is tight (fig. 41).

Fig. 41

Operative technique

NOTICE

When using the augment reamer for the full wedge baseplate the assembly is complete. For the half wedge baseplate proceed to Step 7.

Step 7

Pulling back once again on the trigger noted in previous steps, attach the depth stop to the reamer end of the instrument. Once these steps are complete, the instrument is assembled properly and can be used for surgery (fig. 42a-42c).

NOTICE

Disassembly instructions are the reverse of the assembly instructions.

Fig. 42a

Fig. 42b

Fig. 42c

Appendix

Tornier Perform Reversed Glenoid glenosphere and baseplate configuration chart

Tornier Perform Reversed Glenoid baseplates have been designed to be compatible with the Tornier Perform Reversed Glenoid glenospheres. With the addition of the Adaptis porous titanium on the backside of the baseplate, certain combinations may have the potential to create an impingement with the humeral insert.
For more information on the cleared combinations, refer to the configuration chart below.

The boxes highlighted in green indicate that there should be no impingement of the poly insert on the humeral side with the porous titanium on the baseplate.

Glenosphere		Baseplate									
		Standard		Lateralized				Wedge Augment			
		25mm	29mm	25mm (+3)	29mm (+3)	25mm (+6)	29mm (+6)	25mm half wedge	29mm half wedge	25mm full wedge	29mm full wedge
Standard	36mm										
	39mm										
	42mm										
Eccentric	36mm +2 ECC										
	39mm +3 ECC										
	42mm +4 ECC										
Laterelized	33mm +3 LAT										
	36mm +3 LAT										
	39mm +3 LAT										
	42mm +3 LAT										

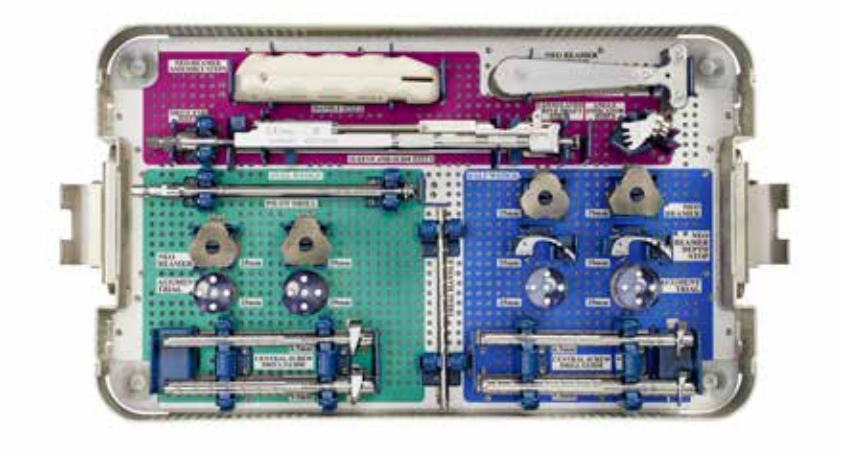
Cleared combination

Not cleared combination

Tornier Perform Reversed Glenoid peripheral screw angulation

	Multidirectional locking screws		Multidirectional locking screws	
Baseplate	Superior - Inferior	Transverse	Superior - Inferior	Transverse
Half wedge baseplates	0-25°	±10°	0°	3°
Full wedge baseplates	0-25°	±6°	0°	3°

System components



Tornier Perform Reversed Augmented Glenoid instrument tray (Ref. YKAD264)

Ref #	Description
MWH601	Neo reamer sleeve
MWH602	Neo reamer cannulated drive shaft
MWH603	Neo reamer angle indicator
MWH604	Neo reamer drive end
MWH605	Neo reamer handle
MWH606	Neo reamer slide
MWH607	Neo reamer wrench
MWH630	Checker handle
MWJ170	Neo reamer, 25mm full wedge
MWJ171	Neo reamer, 29mm full wedge
MWJ172	Neo reamer, 25mm half wedge
MWJ173	Neo reamer, 29mm half wedge
MWJ168	Neo reamer depth stop half wedge, 25mm
MWJ169	Neo reamer depth stop half wedge, 29mm
MWJ145	Augment half wedge trial, 25mm
MWJ146	Augment half wedge trial, 29mm
MWJ147	Augment full wedge trial, 25mm
MWJ148	Augment full wedge trial, 29mm
MWJ151	Central screw drill guide half wedge, 6.5mm
MWJ152	Central screw drill guide half wedge, 9.5mm
MWJ153	Central screw drill guide full wedge, 6.5mm
MWJ154	Central screw drill guide full wedge, 9.5mm
MWJ129	Full wedge pilot drill, 8mm

System components

Wedged augmented baseplates

Ref #	Description
DWJ514	Half wedge augment baseplate (35°), 29mm
DWJ504	Half wedge augment baseplate (35°), 25mm
DWJ515	Full wedge augment baseplate (15°), 29mm
DWJ505	Full wedge augment baseplate (15°), 25mm

Press-Fit post

Ref #	Description
DWJ002	Press-fit long post, 15mm
DWJ001	Press-fit short post, 7mm

Notes

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