

FEMUR NECK SYSTEM



Surgical
Technique





The Femoral Neck System (FNS) is a dedicated product for the fixation of femoral neck fractures and offers the following features:

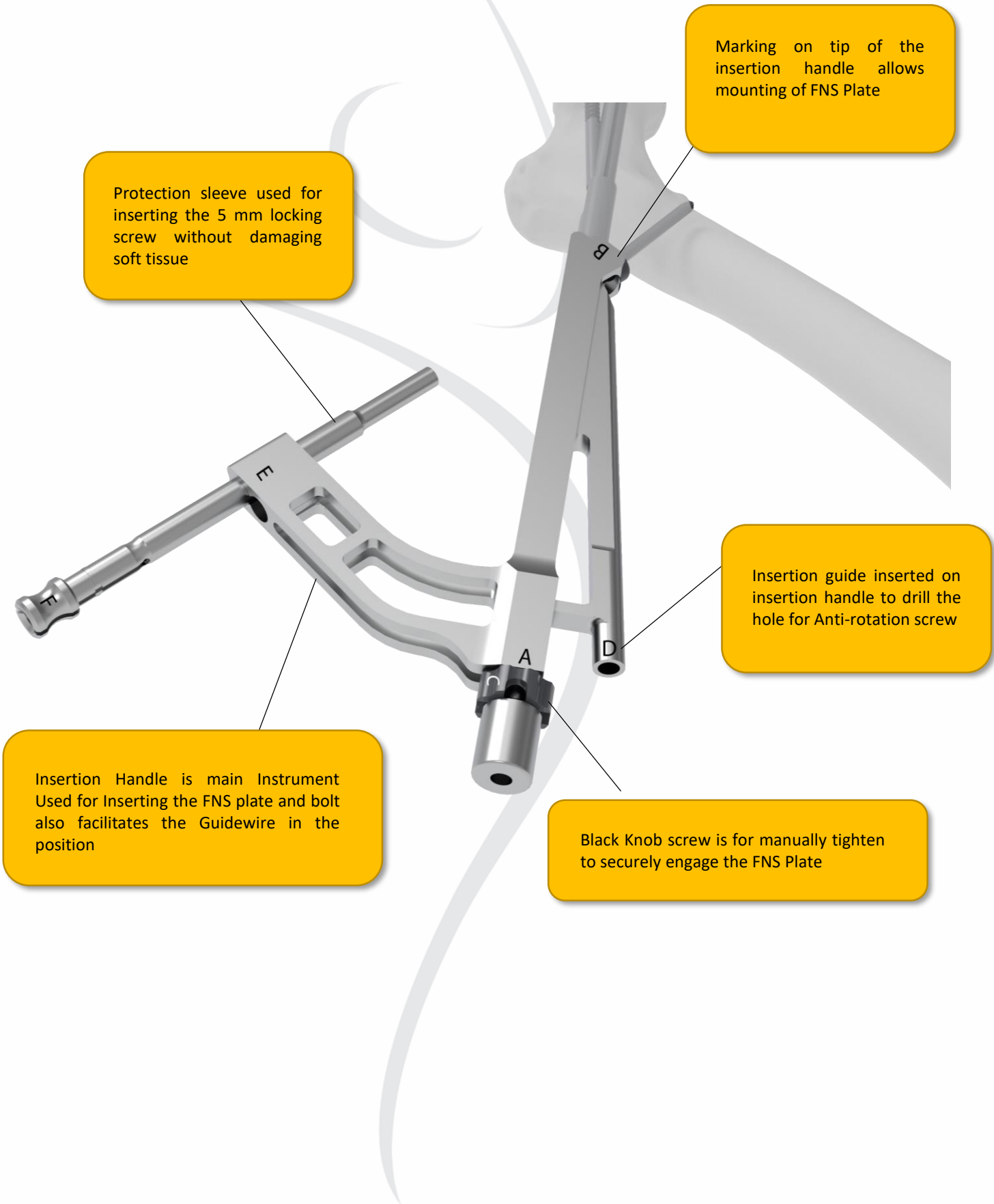
Antirotation-Screw (ARScrew):

- Provides rotational stability (diverging design between ARScrew and Bolt)
- Allows implant placement even in a small femoral neck

- Bolt:**
- Provides angular stability (fixed angle between Bolt and ARScrew)
 - Dynamic design with up to 20 mm of controlled collapse, without lateral protrusion for the first 15 mm



- Bolt:**
- Provides angular stability (fixed angle between Bolt and ARScrew)
 - Dynamic design with up to 20 mm of controlled collapse, without lateral protrusion for the first 15 mm



Protection sleeve used for inserting the 5 mm locking screw without damaging soft tissue

Marking on tip of the insertion handle allows mounting of FNS Plate

Insertion guide inserted on insertion handle to drill the hole for Anti-rotation screw

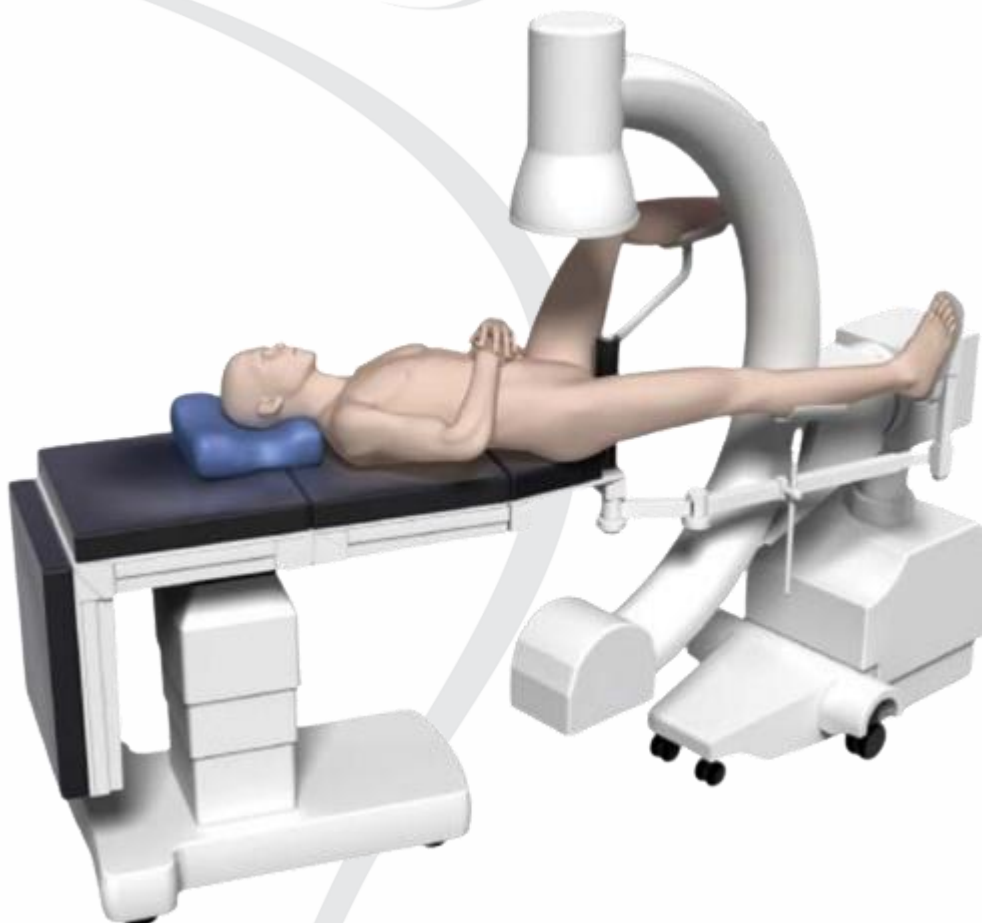
Black Knob screw is for manually tighten to securely engage the FNS Plate

Insertion Handle is main Instrument Used for Inserting the FNS plate and bolt also facilitates the Guidewire in the position

Preparation

Step 1: Position Patient

Position the individual on their back on the surgical table. Adjust the image intensifier to ensure clear views of the proximal femur in both the AP and lateral planes.





Step 2: Fracture Management

Medical Tool
Product Code: TP309.17
Instrument: Ø3.2 mm Guidewire
Length: 400 mm

Important Note:

Achieving a proper reduction of the fracture is of utmost significance for promoting effective bone healing, optimal function, and the prevention of complications.

Reduce the fracture by means of gentle traction/flexion, adduction/abduction, and internal rotation maneuvers (around 15°, aligning the femur neck parallel to the surgical table).

Verify the reduction from two Planes using image intensifier guidance. Should the reduction be insufficient, consider the potential need for an open reduction procedure.

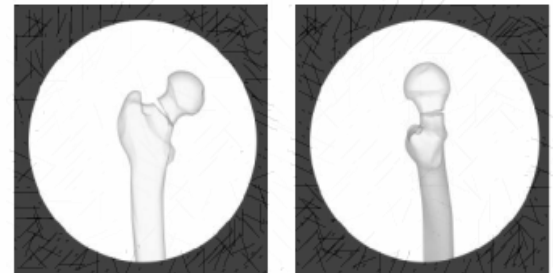
To prevent unintended femur head rotation, insert a guidewire as an antirotation mechanism in the upper/anterior section of the femur neck.

Additional Notes:

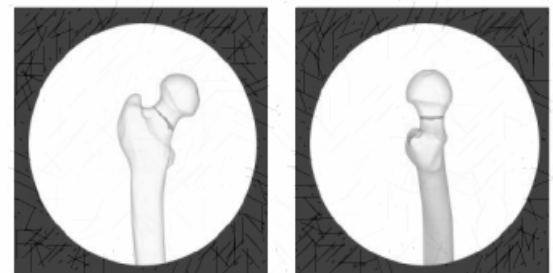
- Improper positioning of the antirotation wire might interfere with the correct implant placement.
- The antirotation wire can be inserted percutaneously or through the lateral incision.

Precaution:

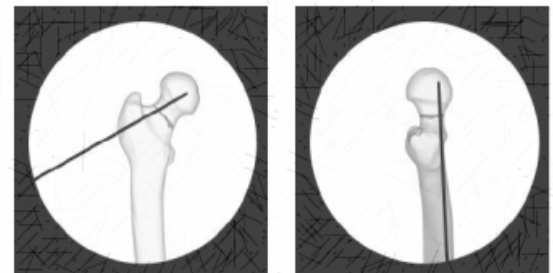
Exercise caution while inserting the wire, closely monitoring its positioning. Validate the wire's final location using the image intensifier. Excessive insertion may risk harm to vital organs.



Before Reduction



After Reduction



Temp. Fixation



Step 3: Surgical Access

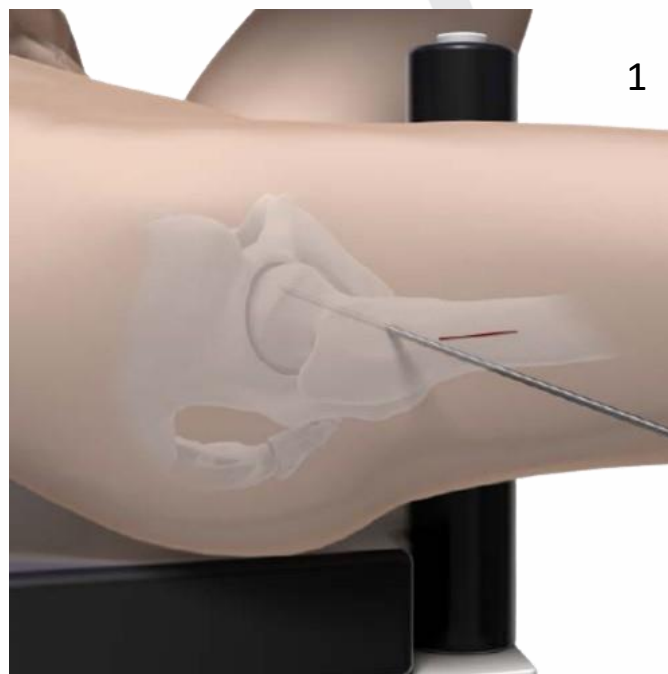
Initial Action:

Create a direct lateral incision on the skin, measuring around 6 cm in length. Begin this incision approximately 2 to 3 cm above the midpoint of the femur neck axis. (1)

Ensure proper exposure of the lateral surface of the femur to facilitate optimal positioning of the hardware.

Alternate Approach:

For patients with obesity, consider an additional incision during the insertion of locking screws. This supplementary incision should be made at the entrance point of the protective sleeve, situated proximal to the primary incision. (Refer to the step "Locking Screw Insertion" for extra guidance on attaching the protective sleeve.)





Insertion of the Implant

Perform irrigation and utilize suction to clear away any debris that may arise during the implant insertion process.

Step 1: Introduce Guidewire

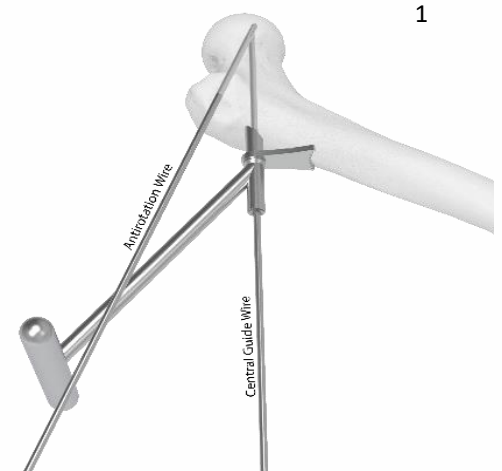
Required Instruments:

TP309.17 : 3.2 mm Guidewire, Length: 400

TP309.12 : 130° Angled Guide for 3.2 mm Guidewires

To establish a central reference, introduce an additional Guidewire using the 130° angled guide. (1) Utilize image intensification to position the Guidewire just below the apex of the femur head, extending into the subchondral bone in the anterior-posterior view. (2)

In the lateral view, ensure the Guidewire is centered within the femur neck and head. (3)

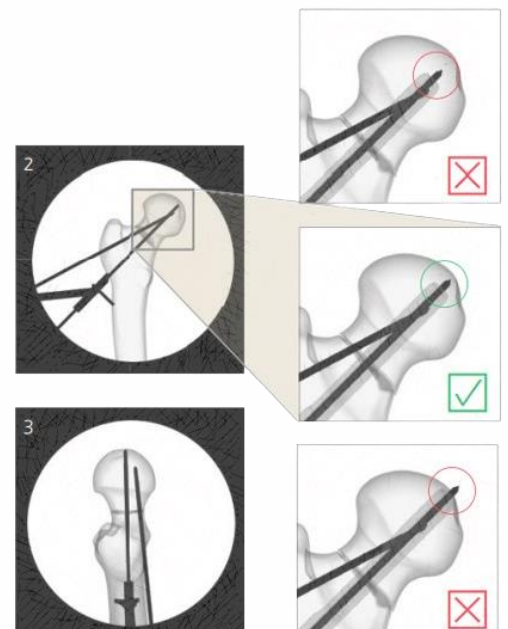


Points to remember :

- The positioning of the Guidewire within the femur neck and head should be determined based on the patient's pre-fracture anatomical characteristics. The implant plate permits an angular placement of approximately $\pm 5^\circ$ in relation to the 130° angle.
- Depending on the calculated construct size (refer to page 8), the bolt's tip will be around 5 to 10 mm shorter compared to the Guidewire's tip.

Safety Measures:

- Maintain vigilant oversight over the wire's positioning during insertion and confirm its ultimate placement using the image intensifier. Excessive wire insertion could lead to potential harm to vital organs.
- Subsequent to insertion, replace wires that exhibit bending.



1



Optional Step: Adjusting the Guidewire

Required Instruments:

TP309.17 : 3.2 mm Guidewire, Length: 400
TP309.13 : Correction Guide for Guidewires (optional)

For precise modifications, utilize the correction guide along with an additional Guidewire to fine-tune the central Guidewire's placement concerning the original central Guidewire. There are three possible types of adjustments:

Parallel Correction (5 mm):

Place the correction guide over the initial wire (orange) and rotate it to designate the new entry point (anterior/posterior or inferior/superior). Then, introduce a new wire into the parallel hole (green) and remove the initial wire.

1. Parallel correction with new entry point anterior.



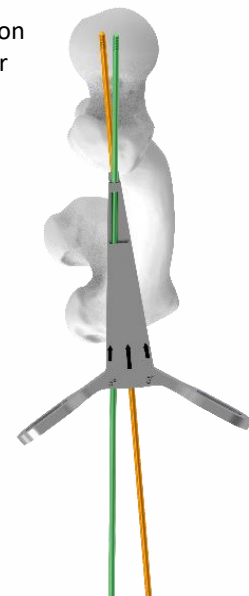
Parallel Wire – new entry point anterior



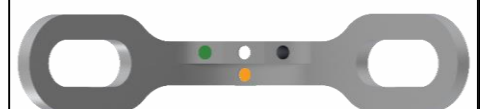
Angle Correction (5°) and Entry Point Correction (5 mm):

Position the correction guide over the initial wire (orange) and rotate it to establish the new entry point. Subsequently, use a new wire in either the left or right 5° hole (green).

2. Angle correction towards anterior with new entry point superior.



Wire towards anterior – new entry point superior





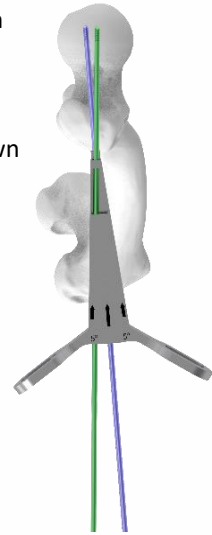
Angle Correction (5°) with Same Entry Point:

Introduce the correction guide over the initial wire (side-view orange hole), turn it to select the new temporary entry point, insert a fresh wire into the parallel hole (blue), and eliminate the initial wire. Then, employ a new wire in either the left or right 5° hole (green) for angle adjustment.

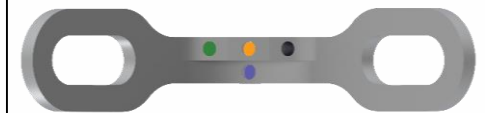
Safety Measures:

- Maintain vigilance over the wire's position during insertion and validate the ultimate position using the image intensifier. Excessive wire insertion could result in potential harm to vital organs.
- If wires exhibit bending after insertion, ensure replacement.

3. Angle correction towards anterior with same entry point. Initial wire (orange) only shown in side-view).



Wire towards anterior – same entry point.





Step 3: Determine the Appropriate Length

Required Instruments:

TP309.16 : Direct Measuring Device for 3.2 mm Guidewires

Place the accurate measurement tool onto the central Guidewire. (1)

Read the Guidewire's depth measurement from the tool. (2)

As the Guidewire is introduced into the subchondral bone (as shown on page 5 in the AP view), subtract 5 mm from the recorded depth. Select the nearest shorter construct size based on this calculated construct size.

For instance:

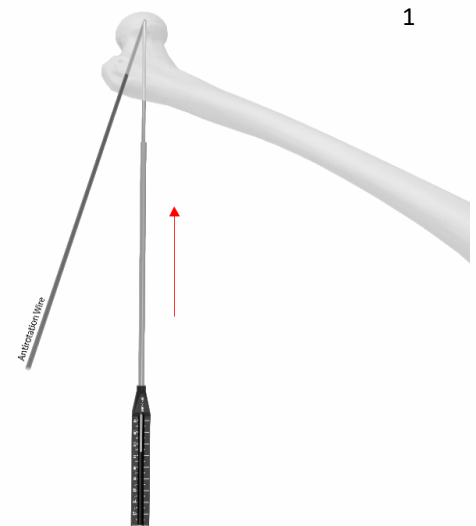
If the measurement on the tool reads 102 mm, then the chosen implant construct size should be 95 mm ($102 - 5 = 97$; round down to 95 mm).

Available Construct Sizes:

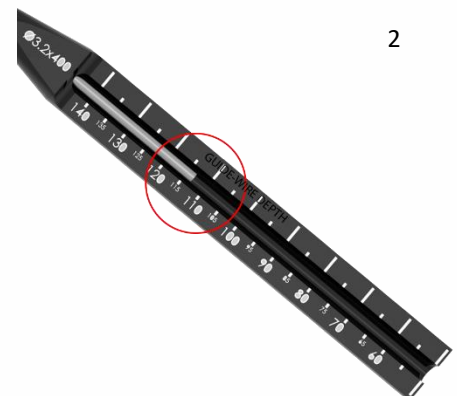
70 mm (see notes below)	95 mm	120 mm
75 mm	100 mm	125 mm
80 mm	105 mm	130 mm
85 mm	110 mm	
90 mm	115 mm	

Additional Information:

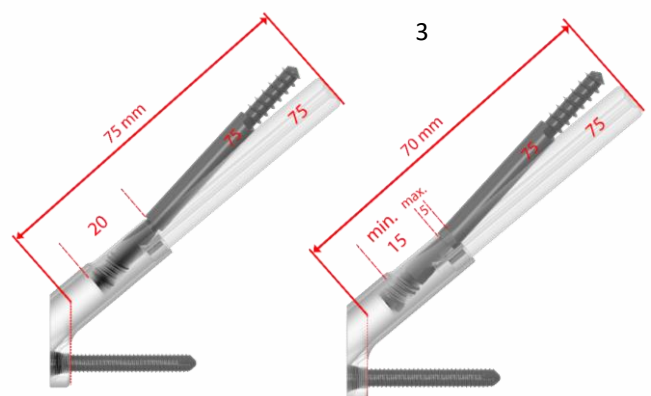
- In cases where patient anatomy requires, a calculated construct size of 70 mm can be achieved by using a pre-collapsed 75 mm construct size. (3)
- Refer to pages 26 to 31 for guidance on pre-collapsed insertion before returning to pages 15 to 22 for instructions on inserting locking screws and anti-rotation screws.
- This approach reduces the permissible collapse from 20 mm to a minimum of 15 mm and is applicable to various construct sizes.



1



2



3



Step 4: Prepare for Plate and Bolt Insertion

Required Instruments: TP309.15 : Reamer

Assemble the reamer by sliding the reamer component onto the drill bit until it audibly clicks into place at the chosen construct size (e.g., 95 mm as in the previous example). Secure the reamer by attaching and fully tightening the nut. (1)

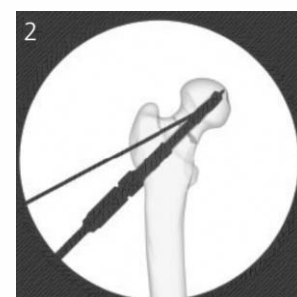
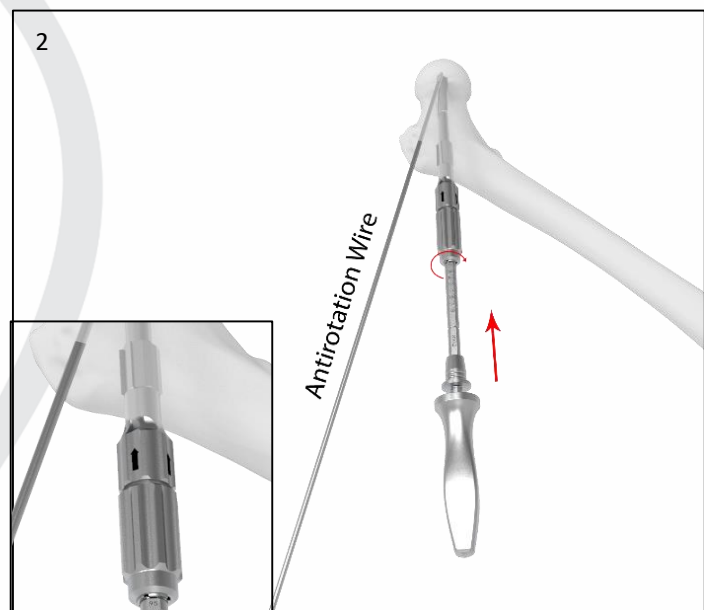
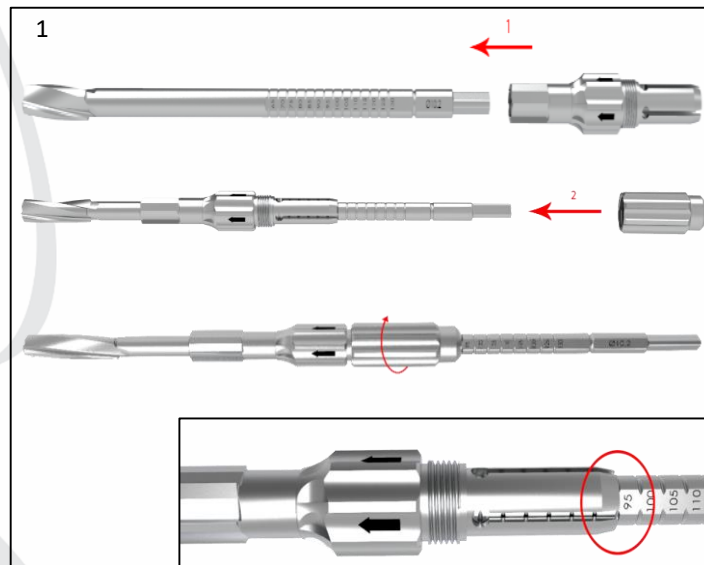
Proceed to ream until the reamer halts upon reaching the bone surface. (2)

Additional Information:

- It is advisable to temporarily secure the femur head with an anti-rotation wire before commencing reaming.
- Ensure that the anti-rotation wire is positioned appropriately to avoid any interference with implant placement.
- Throughout the reaming process, carefully monitor Guidewire position, verify reaming depth, and ensure thorough reaming using the image intensifier.
- In cases of dense bone, consider utilizing continuous irrigation during reaming.
- Employ controlled reaming force, avoiding excessive pressure.

Removing the Reamer:

It is of paramount importance to reinstate the Guidewire in the event of inadvertent removal. To do so, gently push the reamer back into the reamed hole (without using a power tool) and utilize the cannulation for reinserting the Guidewire into its original position.





Step 5: Assemble Implant and Insertion Tools

Required Instruments:

TP309.10 : Insertion Handle

TP309.11 : Insert for Insertion Handle

A:

- Gently insert the component into the insertion handle, without fully fastening the black screw. (1)
- Completely insert the chosen construct size bolt (e.g., 95 mm as in the earlier example) into the plate. (2)

Optional: An extended side plate with two locking holes (2-hole plate) is available as an alternative choice.

B:

- Affix the implant onto the insertion handle. (3)

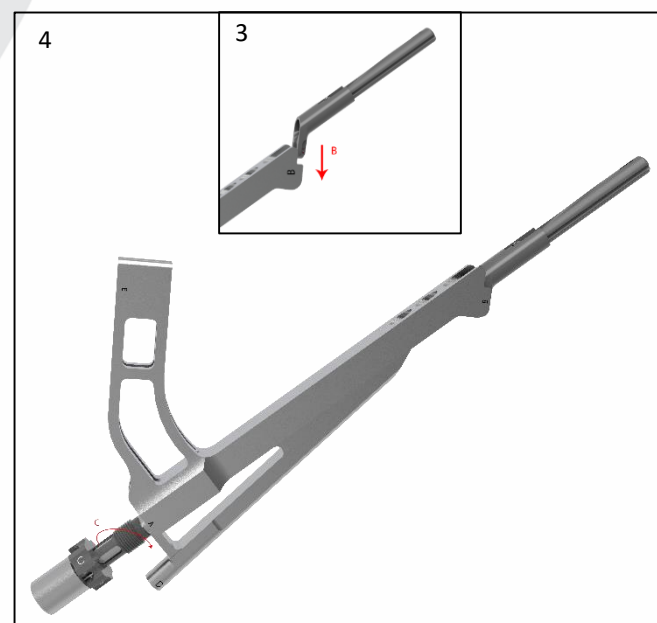
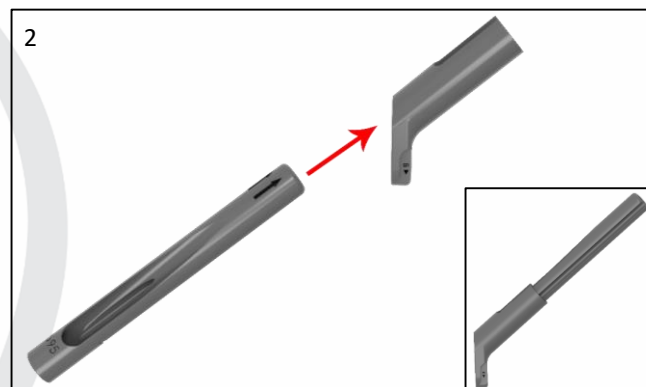
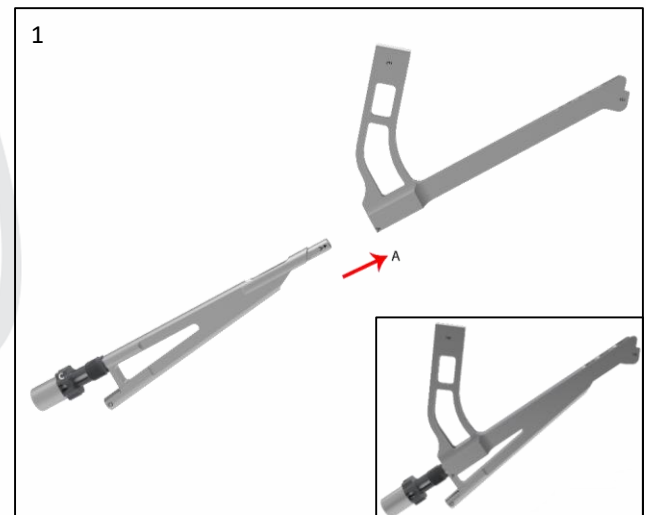
Note: Ensure precise attachment of the implant to the insertion tool and confirm the bolt is fully extended

C:

- Securely fasten the black screw of the insert by hand to connect the implant. (4)

Precaution:

Hand-tightening the black screw is recommended. The use of additional tools might lead to over-tightening.





Step 6: Introduce the Implant

Required Instruments:

TP309.14 : Cylinder for Insertion Handle

Gently position the implant over the central Guidewire and insert it into the pre-reamed hole. (1)

Precaution:

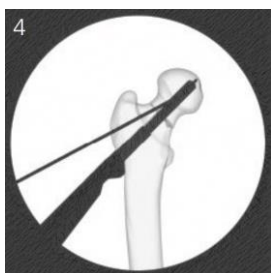
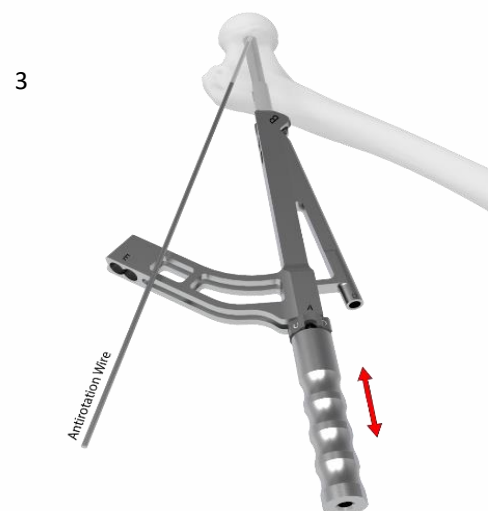
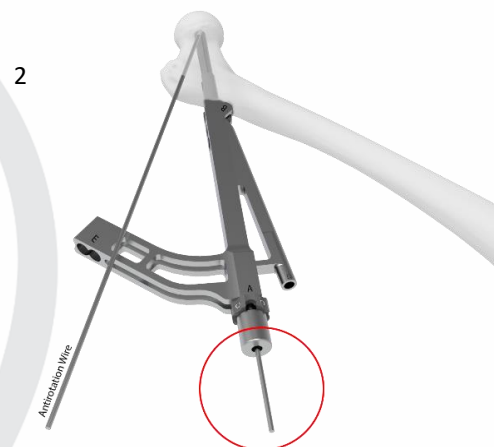
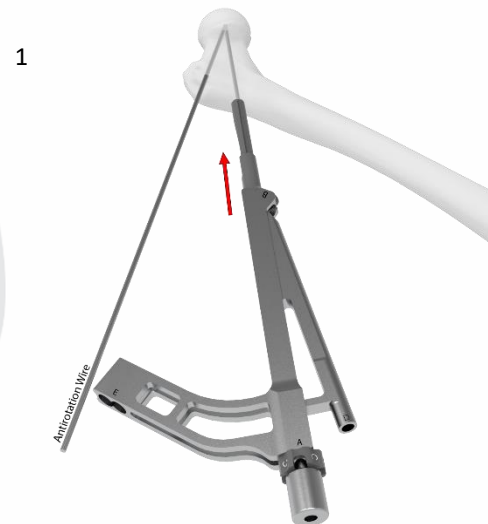
In cases where the cylinder is not utilized, the Guidewire might be visible on the outer side of the insertion. Carefully avoid any movement of the Guidewire. (2)

Optional:

- The cylinder can be employed for manual placement of the plate onto the bone. (3)
- If additional tapping is necessary, utilize a standard surgical hammer to gently tap the cylinder.
- Use image intensification to verify the depth of insertion, ensuring the plate is securely positioned on the bone and properly aligned with the femur shaft's axis. (4)

Additional Information:

- Prior to implant insertion, it is advisable to temporarily secure the femur head using an anti-rotation wire.
- Exercise caution to prevent excessive force during insertion.
- During the insertion process, ensure the black screw remains stationary when tapping is required.

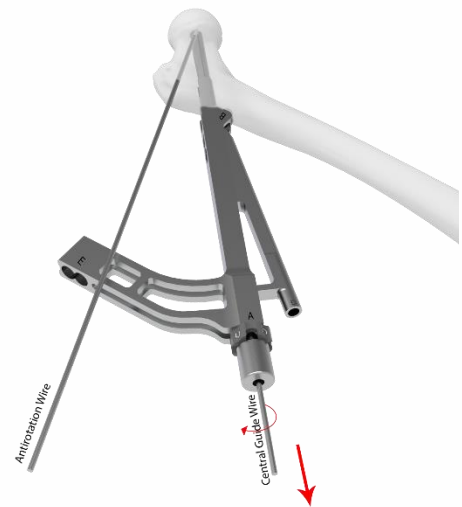




Step 7: Remove the Guidewire

Carefully remove the central Guidewire.

Retain the antirotation wire in place to safeguard against reduction loss and head rotation.





Inserting Locking Screws and Anti-rotation Screws

Clear the area by irrigating and utilizing suction to remove potential debris resulting from the insertion of antirotation screws and locking screws.

Step 1: Attach the Protective Sleeve for Locking Screw Insertion

Required Instruments:

TP309.09 : Drill Sleeve for \varnothing 4.3 mm Drill Bit

Note:

- Ensure the central Guidewire has been removed.

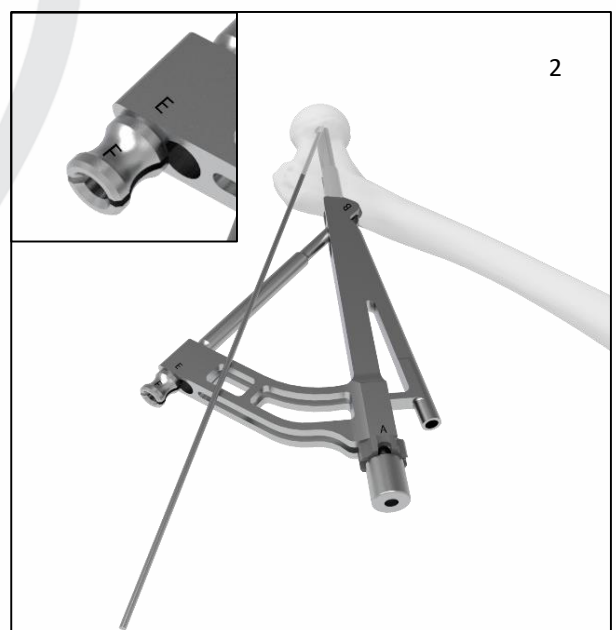
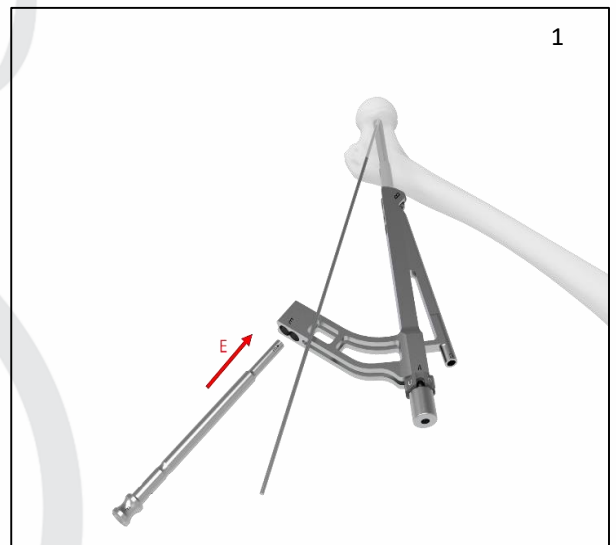
E:

- Attach the protection sleeve to the insertion handle. (1)

Additional Information:

- In cases of overweight patients, contemplate using an additional incision to facilitate protective sleeve insertion.
- Confirm that the protective sleeve aligns with the proper position (1-hole plate or 2-hole plate) on the insertion handle.
- If a 2-hole plate is being utilized, commence with inserting the proximal locking screw first.

Ensure complete insertion of the protective sleeve. (2)





Step 2: Prepare for Drilling & Insertion of locking Screw

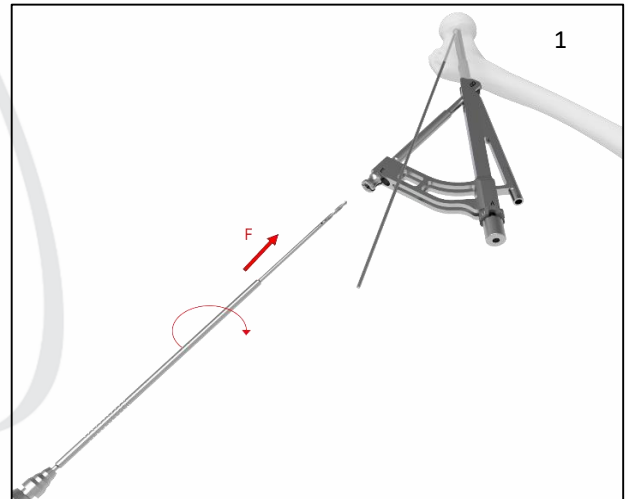
Required Instruments:

TP309.07 : Ø4.3 mm Drill Bit

TP309.06 : Depth Gauge, Up to 100 mm
(Optional)

Precaution:

- Ensure precise alignment of the insertion handle and plate with the femur shaft axis.
- Apply pressure on the insertion handle to confirm that the plate rests securely on the bone.



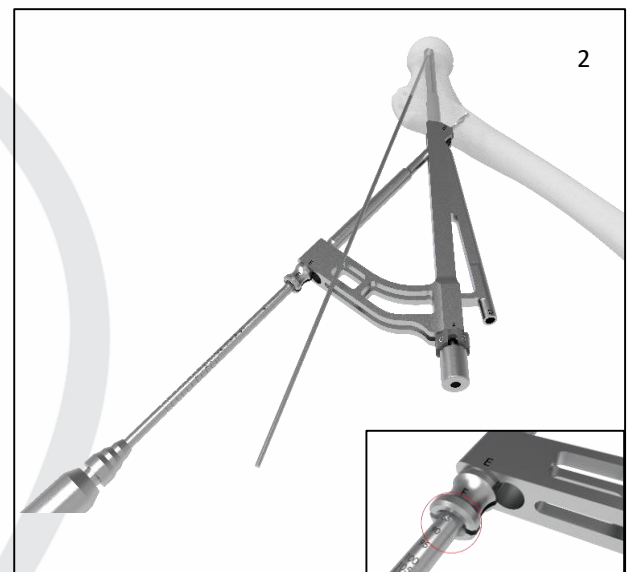
F:

- Proceed to drill the hole for the bi-cortical locking screw using the protection sleeve. (1)

Directly interpret the screw length from the marking etched on the drill bit. (2)

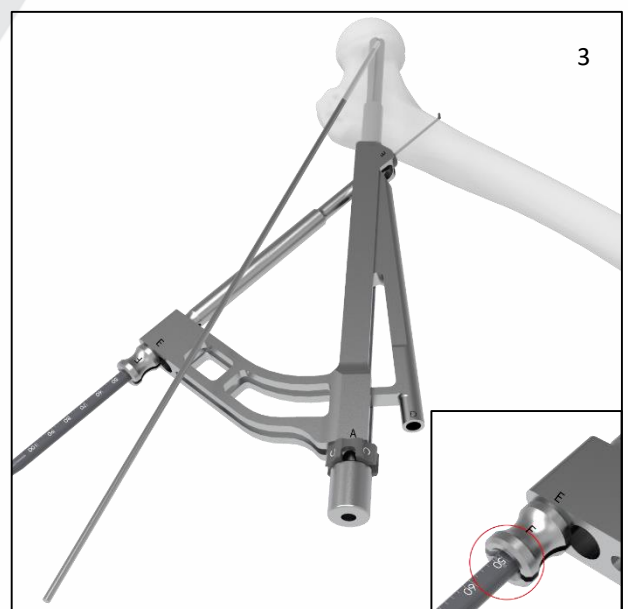
Optional:

- Utilize the depth gauge through the protection sleeve to ascertain the depth of the drilled hole. (3)



Additional Information:

- The screw length should be selected to be at least 4 mm longer than the determined hole depth.





Step 3: Introduce Locking Screw

Required Instruments:

- TP309.04: Screwdriver Shaft T25
- TP309.01: Quick Coupling Torque Limiting Attachment, 4.0 N.m.
- TP309.02: Quick Coupling Handle

Precaution:

- Verify that the insertion handle and plate remain aligned with the femur shaft.
- Apply pressure on the insertion handle to ensure consistent contact with the bone.

F:

- Insert the locking screw according to the determined length, as obtained from the drill bit or depth gauge reading. (1)

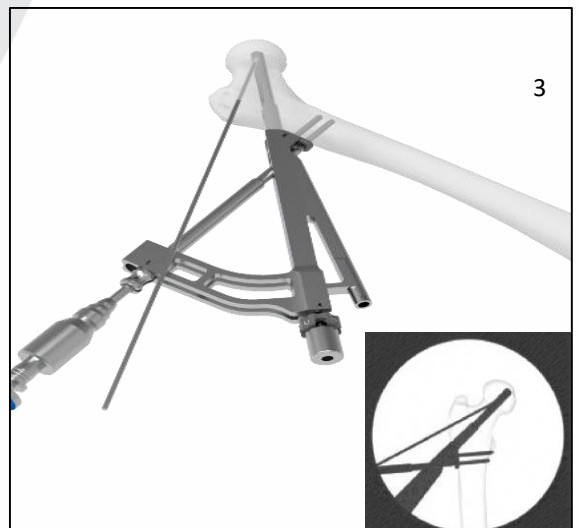
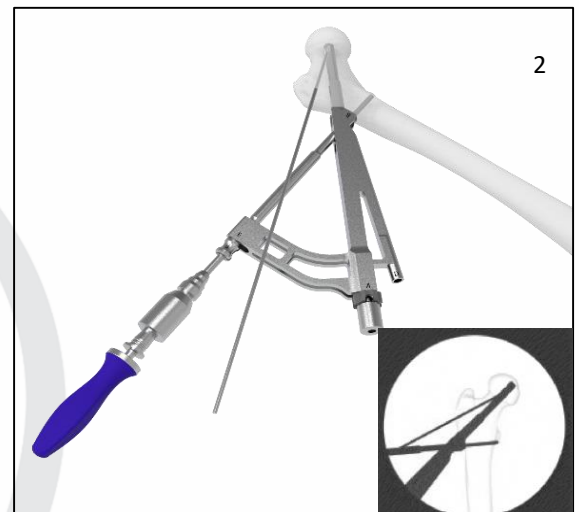
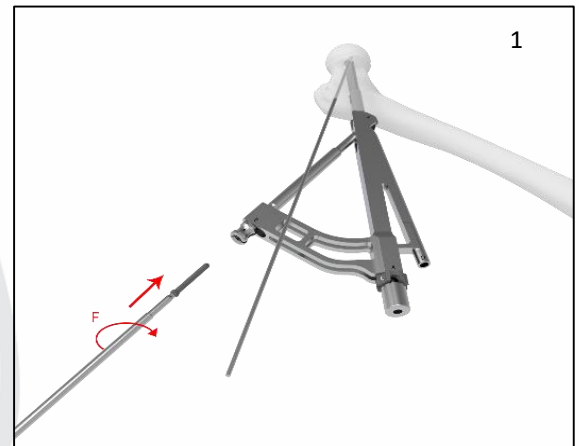
For insertion, power equipment may be used. However, the final tightening should be carried out manually and gradually using the screwdriver shaft, along with the 4 Nm torque limiter and the suitable handle. (2)

Additional Information:

Supervise the insertion of the locking screw, and before final tightening, validate screw position and length using the image intensifier.

Optional:

For a 2-hole plate configuration, repeat steps 1 to 3 to introduce the distal screw. (3)





Step 4: Remove the Protective Sleeve

Remove the protection sleeve by simultaneously pressing its head while pulling





Step 5: Inspect Insertion Tools

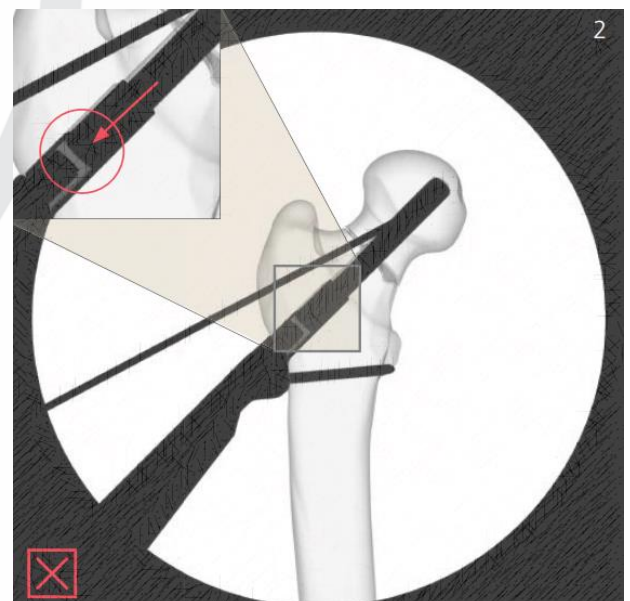
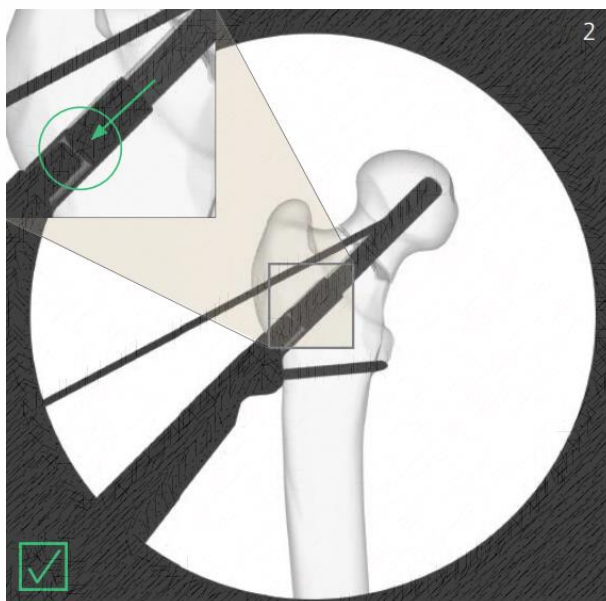
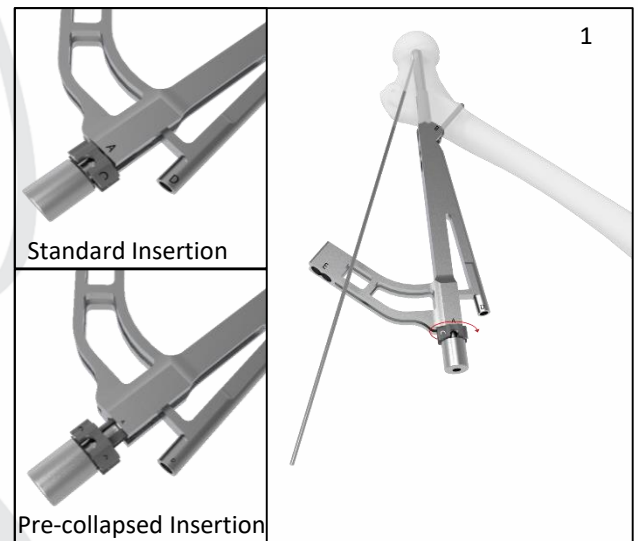
Ensure that the tip makes contact with the bolt by carefully rotating the black screw clockwise. (1) If necessary, this will reduce the space between the insert tip and the bolt. (2)

Additional Information:

In instances where the implant is introduced pre-collapsed, even after tightening, the black screw can maintain a distance of up to 5 mm from the handle.

Precaution:

- Utilize image intensification to double-check that the insert tip is in direct contact with the bolt. (2)
- Employ image intensification to re-verify the bolt's insertion depth. (2)



Step 6: Preparation for Anti-rotation-Screw Drilling

Required Instruments:

TP309.07: 4.3 mm Drill Bit

TP309.08: Stopper for Ø4.3mm Drill Bit

Slide the drill stop onto the rear of the drill bit and assess its condition in line with the guidance (1) Configure the drill stop to match the chosen construct size as the bolt (e.g., 95 mm as in the prior example, or 75 mm for pre-collapsed insertion, as indicated in the table. (2)

Additional Information:

The length of the bolt and anti-rotation-screw is predefined based on the computed construct size.

Precaution:

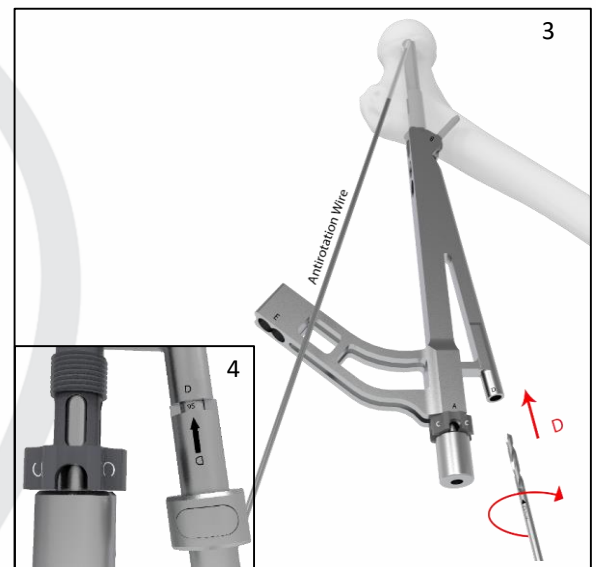
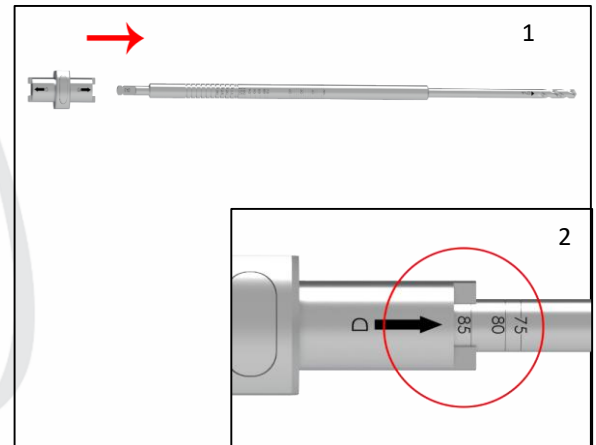
- During drilling, use image intensification to monitor the depth. Drilling too deeply could result in bone damage.
- If employing the alternative approach of inserting the anti-rotation-screw prior to the locking screw, ensure alignment of the insertion screw handle and plate with the femur shaft.

D:

Employ the insert's guide to drill the hole intended for the anti-rotation-screw. (3)

Continue drilling until the drill stop halts against the insert's guide. (4)

Conclude by removing the drill bit.



Step 7: Introduce Anti-rotation Screw

Required Instruments:

TP309.04: Screwdriver Shaft T25

TP309.01: Quick Coupling Torque Limiting Attachment, 4.0 N.m.

TP309.02: Quick Coupling Handle

Precautions:

- Ensure the femur head is temporarily secured with an antirotation wire, and maintain handle position during final tightening to prevent unintended rotation
- Confirm continued alignment of the insertion handle and plate with the femur shaft, if the alternative of inserting the antirotation-screw before the locking screw is chosen.

D:

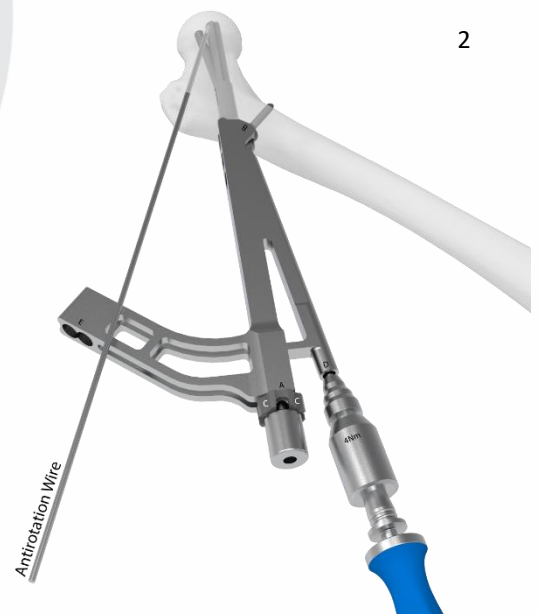
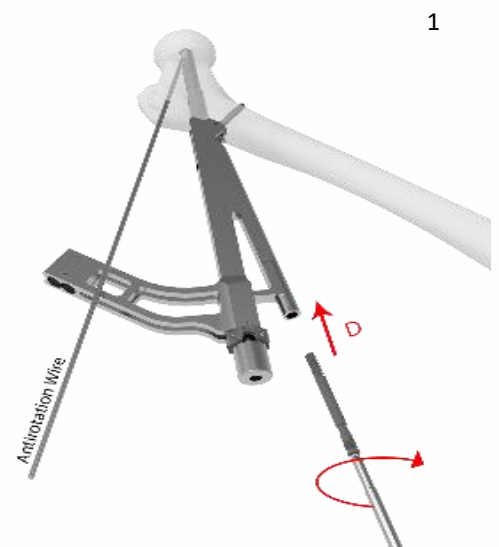
- Introduce the antirotation-screw with the identical construct size as the bolt (e.g., 95 mm as in the earlier example, or 75 mm for pre-collapsed insertion, as detailed in the table on page 29). (1)

Both insertion and final tightening should be carried out gradually and manually using the screwdriver shaft, in conjunction with the 4 Nm torque limiter and the suitable handle. (2) If dense bone poses difficulties for antirotation-screw insertion, cautiously employ the handle without the torque limiter for insertion.

Precaution:

Supervise the anti-rotation-screw insertion and validate screw position using the Image Intensifier prior to final tightening.

Conclude by removing any antirotation wires.



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Step 8: Verify Anti-rotation Screw

Precautions:

- Following the tightening, utilize the image intensifier to ensure the complete insertion of the antirotation-screw. (3) In cases where this is not the case, release and reintroduce the antirotation-screw as required. Employ the 4 Nm torque limiter along with the suitable handle for the final tightening process.

A:

- The antirotation-screw head should remain enclosed within the bolt.

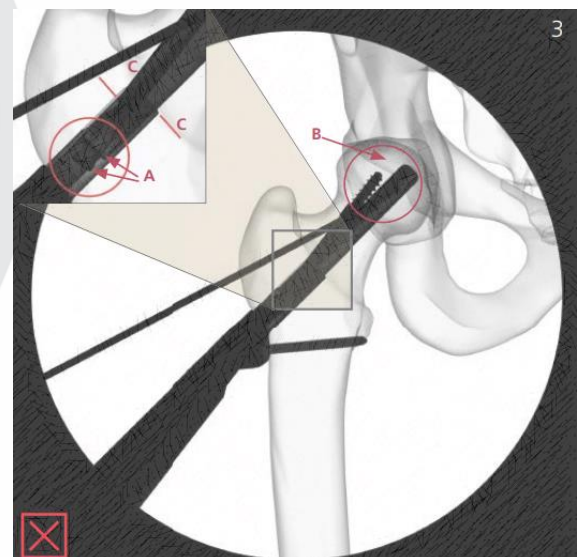
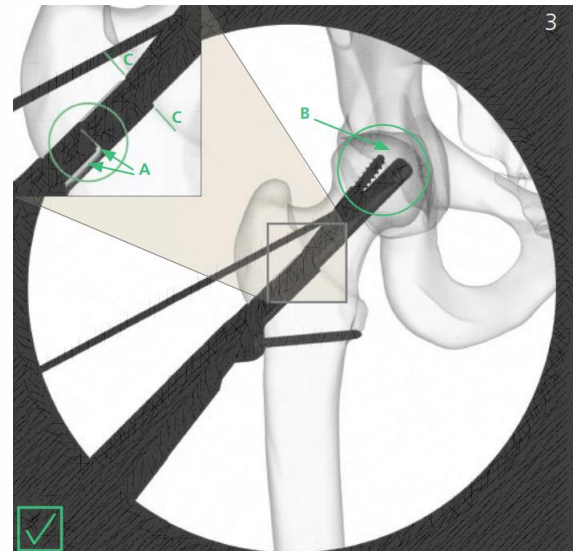
B:

- The antirotation-screw tip's insertion depth should be in harmony with the bolt's tip.

For Standard Insertion (not applicable to Pre-Collapsed Insertion):

C:

- The antirotation-screw's notch should align with the plate barrel's notch at the same level.





Instrument Disassembly and Last Verification

Option:

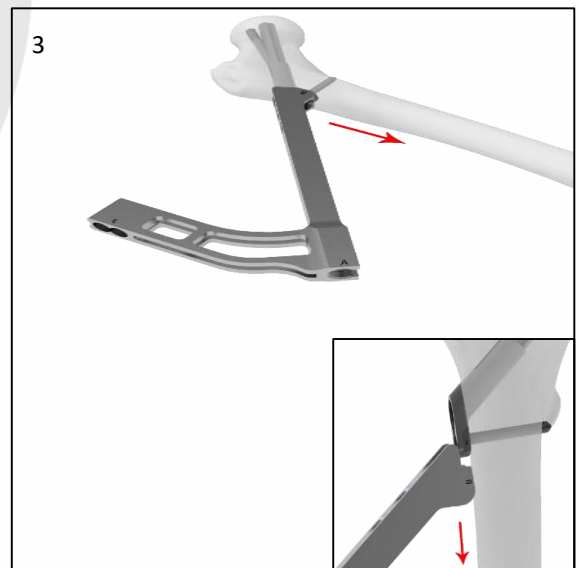
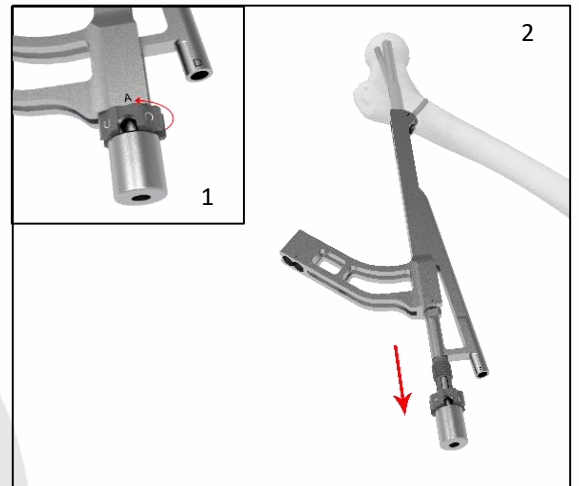
The system provides the capability for applying intraoperative compression. Refer to page 32 for executing this option prior to disassembling the instruments.

Step 1: Dismantle Insertion Tools

Rotate the insert counterclockwise to detach it from the insertion handle, ensuring the complete loosening of the insert screw. (1).

Remove the insert from the insertion handle. (2)

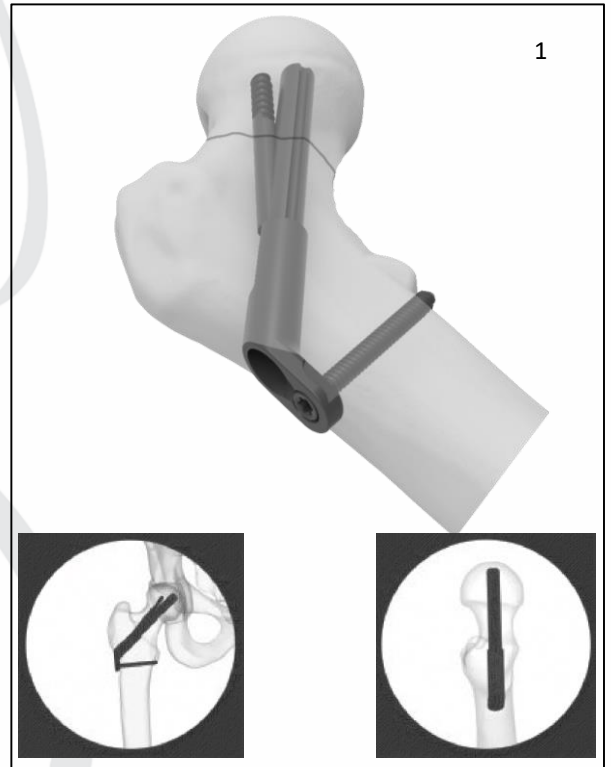
Slide the insertion handle off the plate in a distal direction to remove it. (3)





Step 2: Final Inspection

Before suturing the incision, employ the image intensifier to validate implant dimensions and positioning. Reconfirm full engagement of the anti-rotation-screw and the locking screw. (1)





Assessing Drill Stop Wear

Step 1: Conduct Drill Stop Wear Examination

Required Instruments:

TP309.07: 4.3 mm Drill Bit

TP309.08: Stopper for Ø4.3mm Drill Bit.

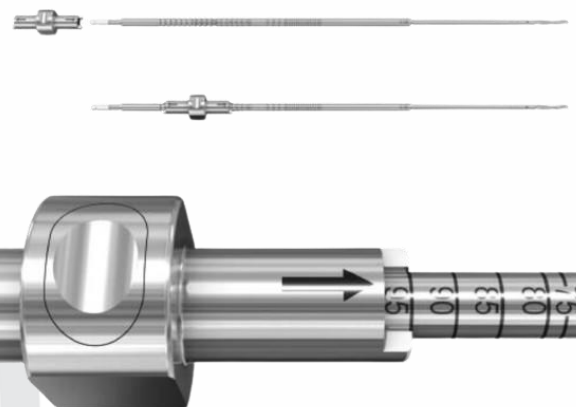
Excessive wear of the drill stop can lead to slipping, causing inaccurate drilling depths.

Before Proceeding:

- Attach the drill stop to the drill bit.
- Apply thumb pressure to the drill stop without engaging the button. If the drill stop shifts while pressure is applied, replace it.
- Repeat the same assessment in the opposite direction. If movement occurs, replace the drill stop.

Precaution:

- Employ periodic image intensifier supervision while drilling.
- Avoid excessive force during drilling.
- Swap out drill stops that fail the wear test described





Optional: Pre-Collapsed Insertion

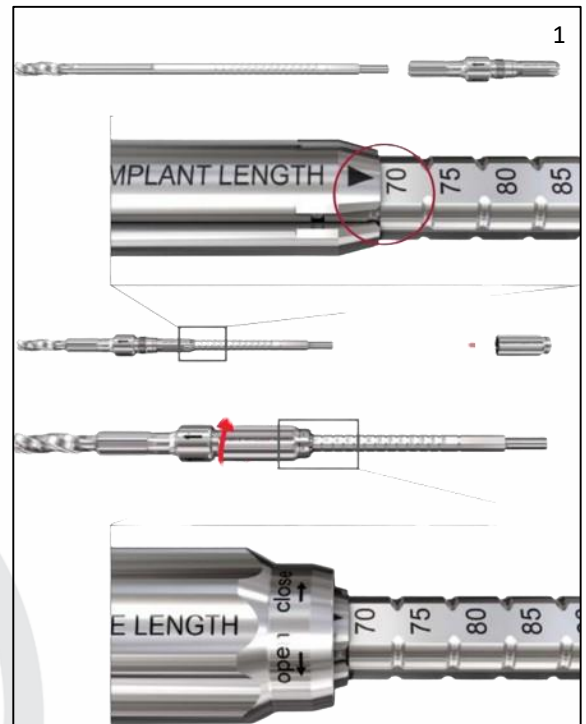
Step 4: Prepare for Plate and Bolt Insertion

Required Instruments:
TP309.15: Reamer

Assemble the reamer by fitting the reamer component onto the drill bit until it securely clicks into position at the determined construct size (e.g., 70 mm in the instance*). Secure the reamer by attaching the nut and firmly tightening it. (1)

Note:

- Set the reamer to the calculated construct size (which is 5 mm shorter than the intended construct size, as illustrated in the table below).



Pre-Collapsed Insertion – Reference Table:

Calculated Construct Size	Setting Reamer Size	Construct Size to be Used (Bolt/ARScrew)	Setting on Drill for ARScrew
(Page no. 08)	(Refer to above)	(Page no. 19/26)	(Page no. 18)
70	75*	75	75

*If not marked, select the groove located near 75 mm towards the drill tip.

Note:

- This technique is applicable to various construct sizes. For instance, with a calculated construct size of 95 mm, you can use a 100 mm construct size (as seen in the table below)

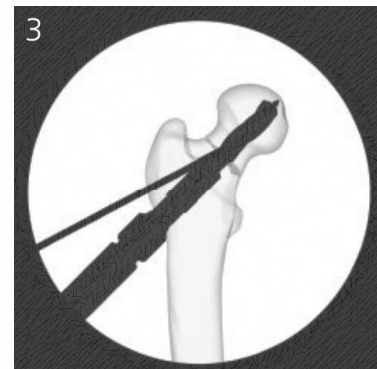
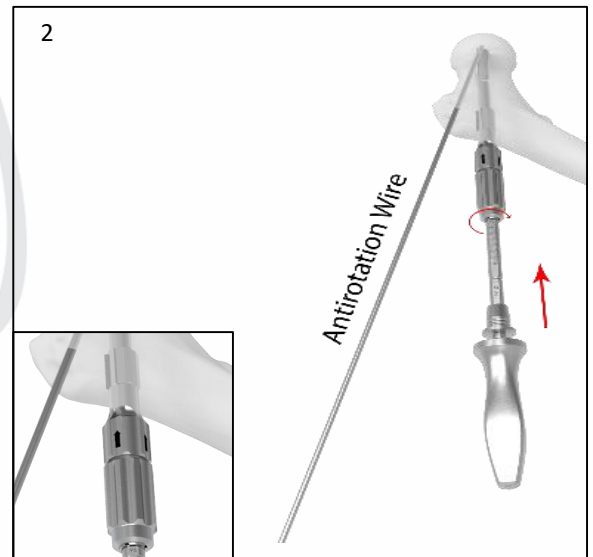
Calculated Construct Size	Setting Reamer Size	Construct Size to be Used (Bolt/ARScrew)	Setting on Drill for ARScrew
(Page no. 08)	(Refer to above)	(Page no. 19/26)	(Page no. 18)
95	95	100	100



Proceed to ream until the reamer halts upon encountering the bone. (2)

Additional Information:

- Prior to reaming, it is advisable to temporarily secure the femur head with an antirotation wire.
- An improperly positioned antirotation wire might disrupt the optimal implant placement.
- Exercise vigilance by monitoring Guidewire movement, assessing reaming depth throughout the procedure, and guaranteeing comprehensive reaming through the use of image intensification. (3)
- In scenarios of dense bone, consider adopting continuous irrigation during the reaming process.
- Employ a cautious approach to avoid excessive force when reaming, especially in denser bone environments.



Disassembling the Reamer:

Ensuring the inadvertent removal of the Guidewire is a priority. To reintroduce the wire, gently push the reamer back into the reamed hole, refraining from the use of power tools. Utilize the cannulation technique to navigate the Guidewire back into its original position.



Step 5: Attach Implant and Insertion Tools

Required Instruments:

TP309.10: Insertion Handle

TP309.11: Insert for Insertion Handle

A:

- Slide the insert into the insertion handle, without tightening the black screw. (1)

Fully insert the bolt with a 5 mm longer construct size than calculated and reamed (therefore 75 mm in the example, refer to table on page 29) into the plate. (2)

Additional Choice:

- An extended side plate featuring two locking holes (2-hole plate) is also available.

B:

- Securely mount the implant onto the insertion handle. (3)

Reminder:

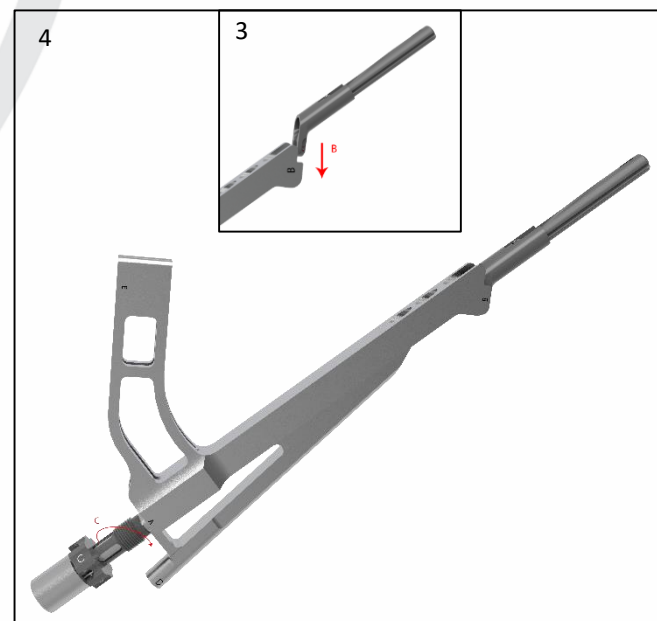
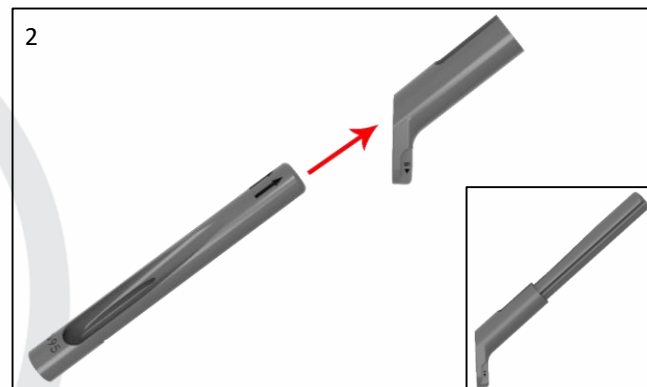
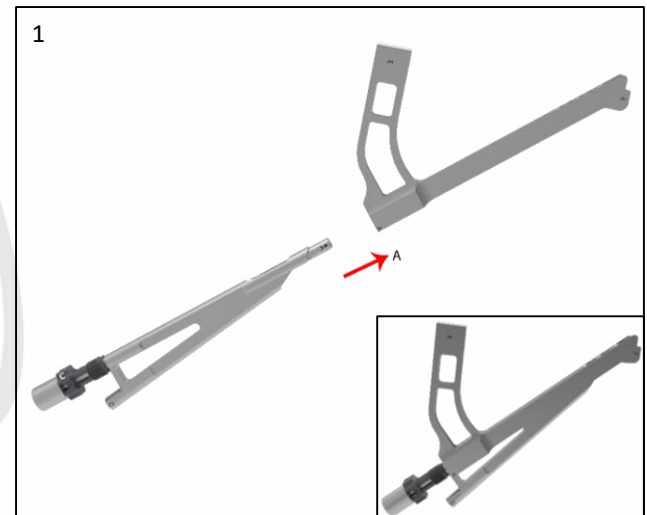
- Ensure the accurate fixation of the implant onto the insertion tool and confirm that the bolt is in its fully elongated position.

C:

- Gently tighten the black screw of the insert manually to affix the implant. (4)

Safety Measure:

Opt for hand-tightening to avoid unnecessary strain. Overuse of auxiliary tools might lead to overtightening.





Step 6: Tools for Pre-Collapsed Insertion

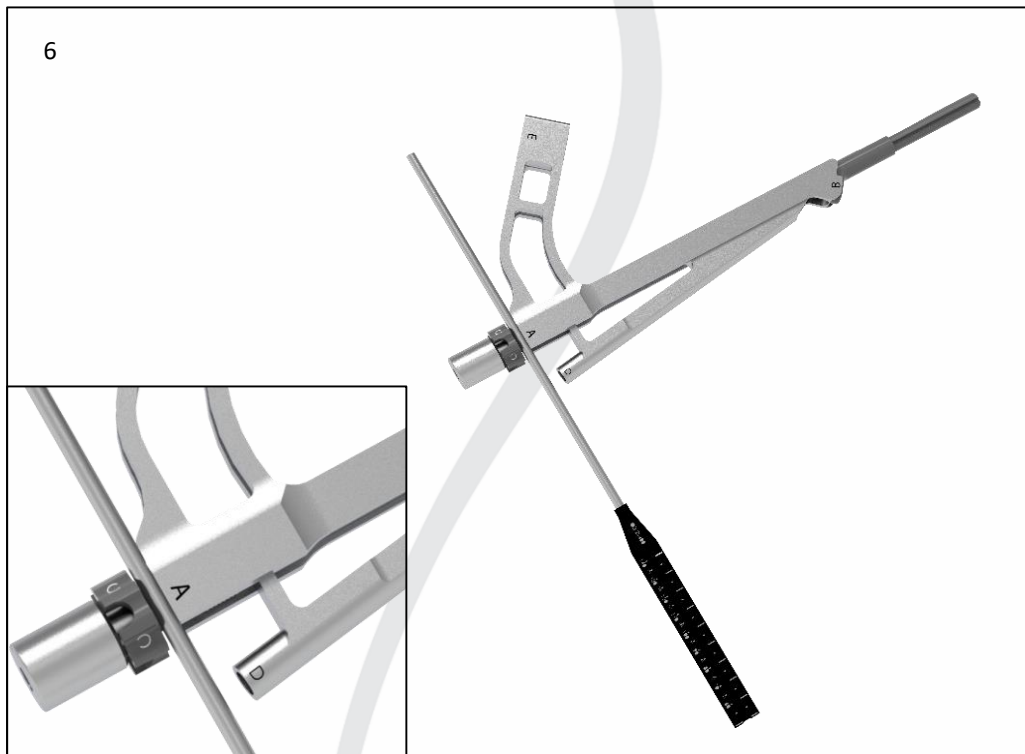
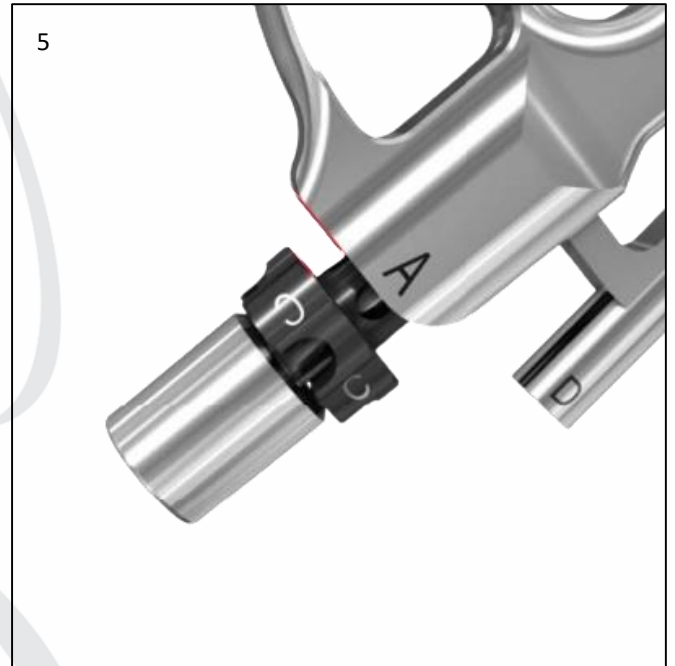
Required Instruments:

TP309.16: Direct Measuring Device for 3.2 mm Guidewires

Following the tightening, reverse the action (counterclockwise) of the black screw by a minimum of 5 mm (equivalent to 5 half-turns). This action permits the implant construct to retract by 5 mm. (5)

Safety Tip:

Ensure that the distance achieved is indeed 5 mm by gently placing the direct measuring device between the black screw and the insertion handle. (6)





Step 7: Implant Insertion

Required Instruments:

TP309.14: Cylinder for Insertion Handle.
(optional)

Gently insert the implant over the central
Guidewire into the hole that was pre-
reamed. (1)

Safety Note:

In case you decide not to use the cylinder,
be cautious as the Guidewire might become
visible on the outer side of the insert.
Ensure no unintended movement of the
Guidewire occurs. (2)

Choice:

For manual plate placement, the cylinder
can be employed to delicately tap the plate
onto the bone. (3) In cases where additional
tapping is required, a standard surgical
hammer can be used to gently tap on the
cylinder.

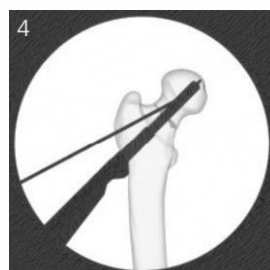
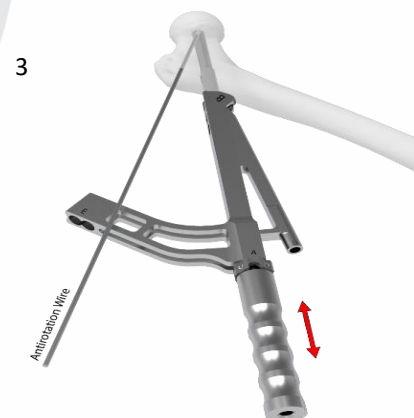
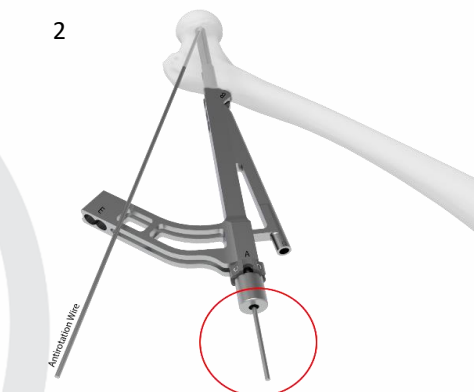
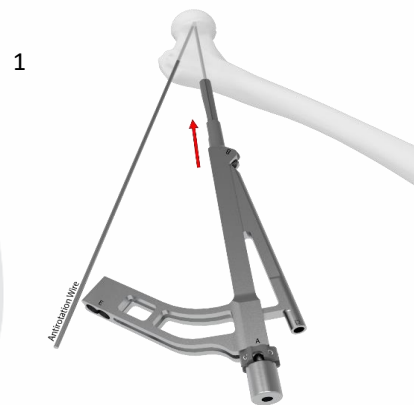
Safety Precaution:

- Make sure the black screw remains stationary (for example, by holding it) when tapping is necessary during the insertion process.

To confirm the implant's depth of insertion
and its alignment with the axis of the femur
shaft, employ image intensification. (4)

Important Notes:

- It is advisable to temporarily secure the femur head using an antirotation wire before proceeding with implant insertion.
- Employ caution to prevent excessive force during implant insertion.



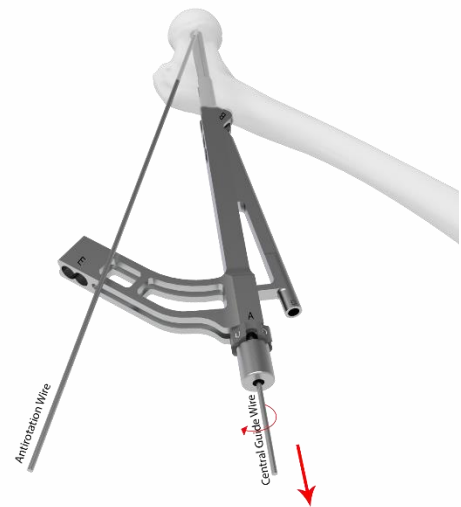


Step 8: Remove the Guidewire

Gently remove the central Guidewire. (1)

Retain the antirotation wire to ensure the preservation of reduction and to prevent unintended rotation of the head.

Proceed with the subsequent step: Locking Screw and Antirotation-Screw Insertion.





Option: Intraoperative Compression

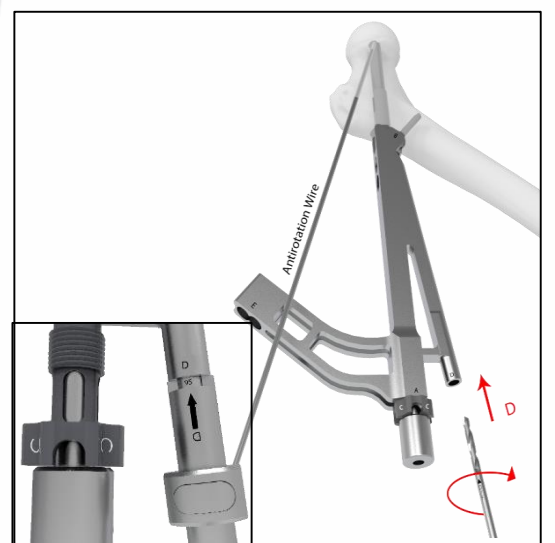
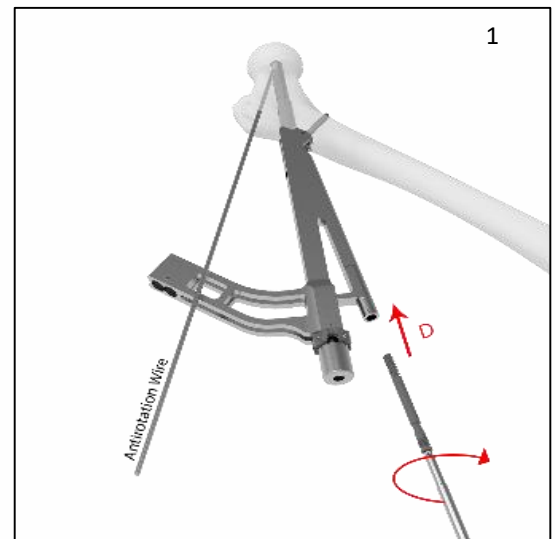
During the surgery, you have the option to apply interfragmentary compression, ensuring optimal alignment. To proceed with compression, the locking screw and antirotation-screw must be in place.

Step 1: Connect Multifunction Rod for Compression

Required Instruments:

TP309.03: Multifunction Rod for Insertion Instruments.

Introduce the multifunction rod through the guide of the antirotation-screw. (1)
Secure the rod manually by turning it clockwise until it's fully inserted. (2)





Step 2: Apply Compression

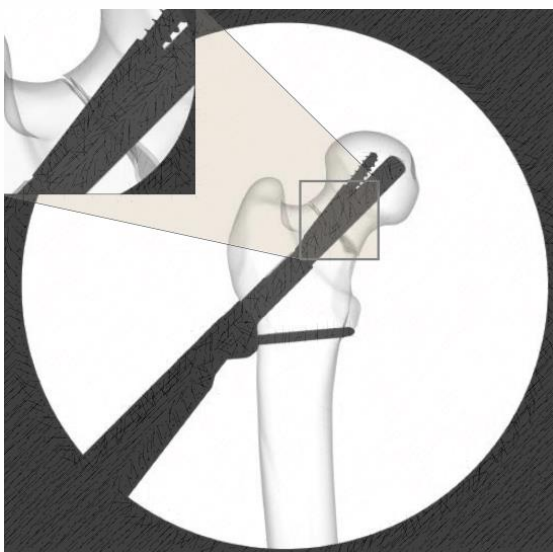
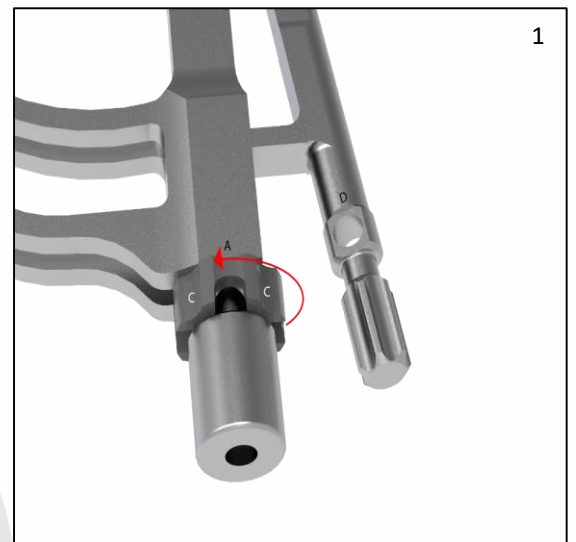
Notes:

- If applicable, release any existing traction before initiating compression.
- Monitor the implant's position throughout compression using the image intensifier.

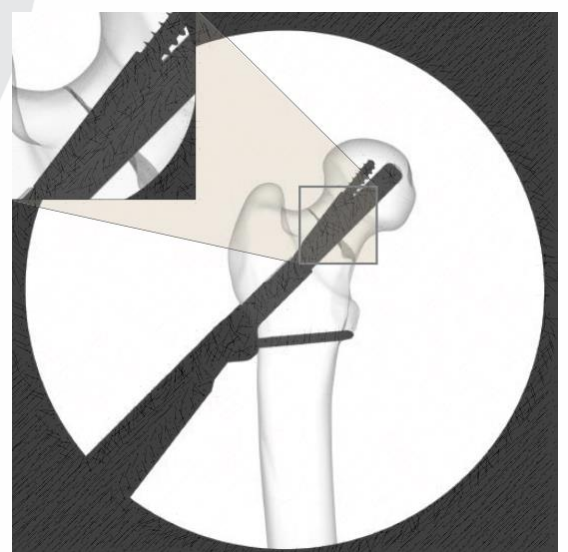
Rotate the insert's screw counterclockwise to apply inter-fragmentary compression. (1)

Precaution:

Applying compression manually is sufficient. Avoid using additional tools to prevent excessive force.



Before Compression



After Compression



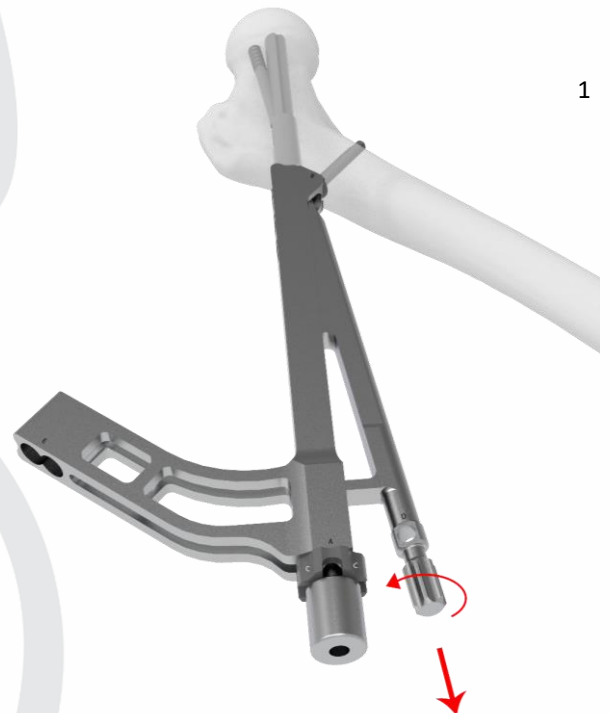
Step 2: Detach Multifunction Rod

Remove the multifunction rod by turning it counterclockwise. (1)

Notes:

- If manual loosening is challenging, employ another instrument (e.g., a screwdriver shaft) through the hole in the multifunction rod for untightening.

Use image intensification to verify the secure locking of the antirotation-screw within the implant.





Optional: Implant Removal

For implant removal, ensure proper irrigation and suction to eliminate any generated debris

Step 1: Extract Locking Screw(s)

Required Instruments:

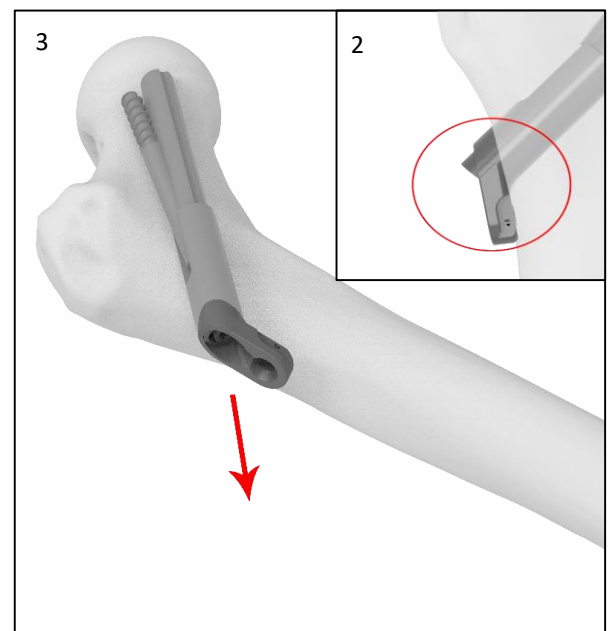
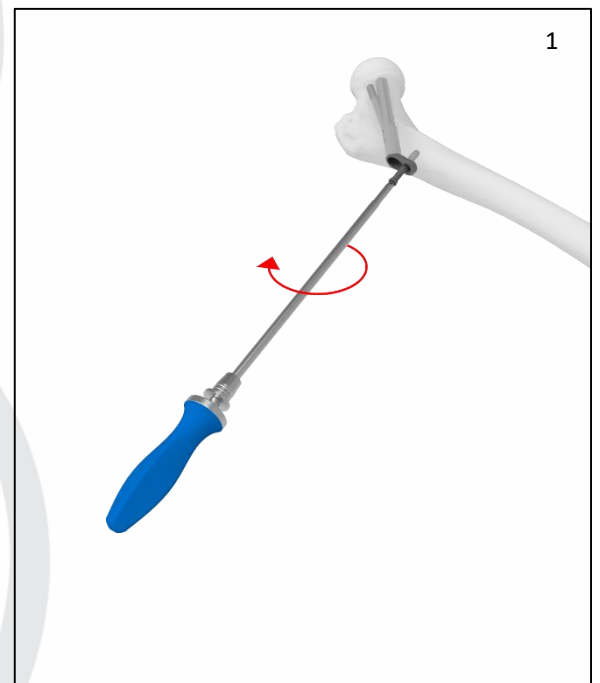
TP309.04: StarDrive Screwdriver Shaft T25

TP309.02: Quick Coupling Handle

Manually remove the locking screw(s) using the screwdriver shaft and the compatible handle – no torque limiter is necessary. (1)

Note:

If the implant has telescoped fully, causing the bolt to sit more laterally than the plate (2), gently pull on the plate (e.g., using surgical pliers) to extend it from the bolt by about 5 mm before proceeding with the steps detailed on the subsequent pages. (3)



Step 2: Removing the Antirotation-Screw

Required Instruments:

TP309.04: Screwdriver Shaft T25 241 mm

TP309.02: Quick Coupling Handle

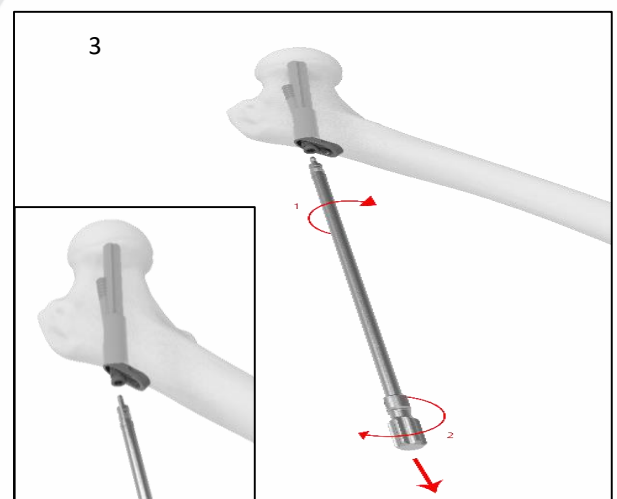
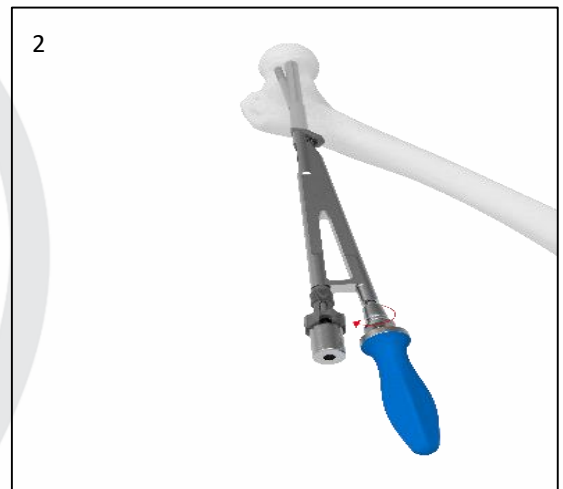
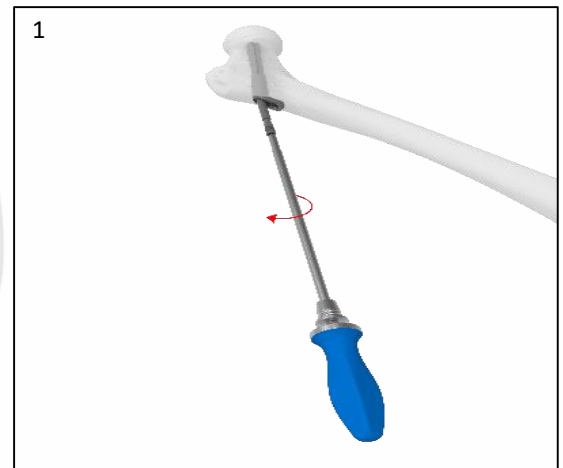
TP309.11: Insert for Insertion Handle (optional)

TP309.03: Multifunction Rod for Insertion Instruments (optional)

With care, unfasten the antirotation-screw manually using the T25 StarDrive screwdriver shaft and the suitable handle – torque limiter is unnecessary. (1)

Option:

- If pinpointing the antirotation-screw's recess presents difficulty, consider utilizing the Insert as a guide within the plate. (2)
- Should the antirotation-screw disengage from the screwdriver, employ the multifunction rod. Turn it clockwise to engage with the antirotation-screw, then pull the rod and turn counterclockwise to completely extract the screw. (3)
- Should the antirotation-screw prove stubborn to remove using the screwdriver or multifunction rod,





Step 3: Detaching the Plate and Bolt

Required Instruments:

TP309.03: Multifunction Rod for Insertion Instruments

TP309.14: Cylinder for Insertion Handle

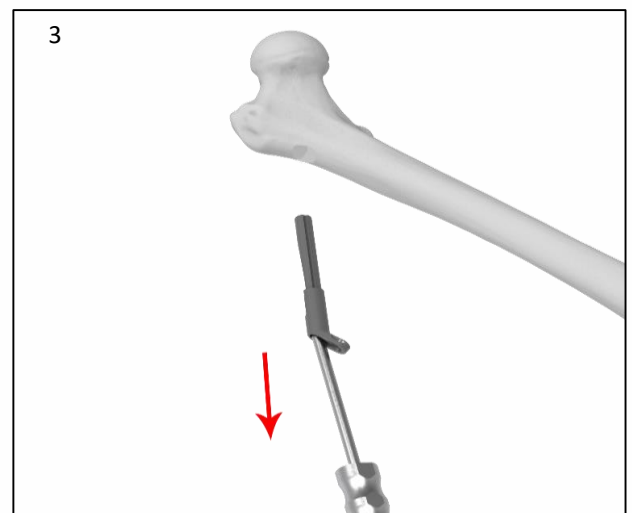
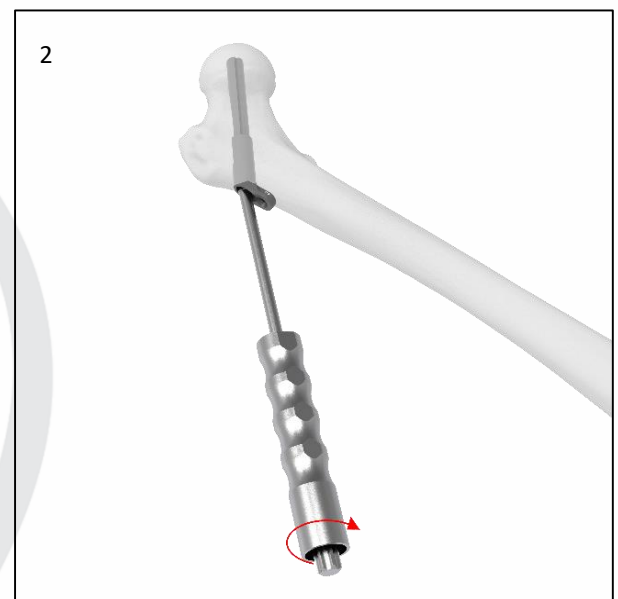
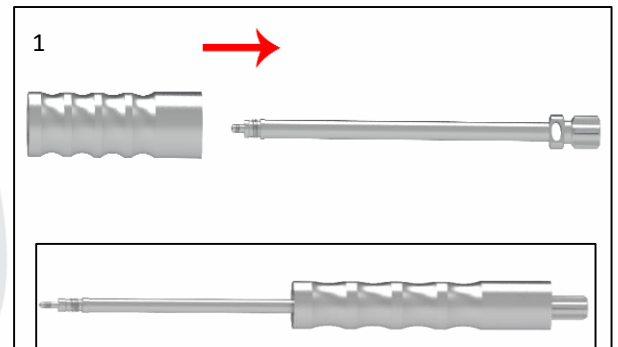
Place the cylinder onto the multifunction rod. (1)

Fasten the multifunction rod by turning it clockwise, following the same direction as when removing the antirotation-screw. (2)

Gently tap outward using the cylinder to simultaneously extract the plate and bolt. (3)

Reminder:

Exercise caution to avoid applying excessive force during the removal process.





Implants

FNS plate

Titanium	Holes
PT291.01	1
PT291.02	2



FNS bolt

Titanium	Length(mm)
ST292.75	75
ST292.80	80
ST292.85	85
ST292.90	90
ST292.95	95
ST292.100	100
ST292.105	105
ST292.110	110
ST292.115	115
ST292.120	120
ST292.125	125
ST292.130	130



FNS Anti-rotation screw

Titanium	Length(mm)
ST293.75	75
ST293.80	80
ST293.85	85
ST293.90	90
ST293.95	95
ST293.100	100
ST293.105	105
ST293.110	110
ST293.115	115
ST293.120	120
ST293.125	125
ST293.130	130





Instruments

1. TP309.01 Quick coupling torque limiting handle 4.0 Nm



2. TP309.02 Quick coupling handle



3. TP309.03 Multifunction rod for Insertion Instrument



4. TP309.04 Screwdriver Shaft T25



5. TP309.05 Screwdriver Shaft SW 3.5



6. TP309.06 Depth Gauge (100 mm)



7. TP309.07 Ø 4.3 mm Drill Bit





8. TP309.08 Stopper for Ø 4.3 mm Drill bit



9. TP309.09 Drill sleeve for Ø 4.3 mm Drill bit



10. TP309.10 Insertion Handle



11. TP309.11 Insert for Insertion Handle



12. TP309.12 Angle Guide 130°





13. TP309.13 Correction Guide for Guidewires



14. TP309.14 Cylinder for Insertion Handle



15. TP309.15 Reamer



16. TP309.16 Direct measuring device for
Guidewires $\varnothing 3.2$ mm

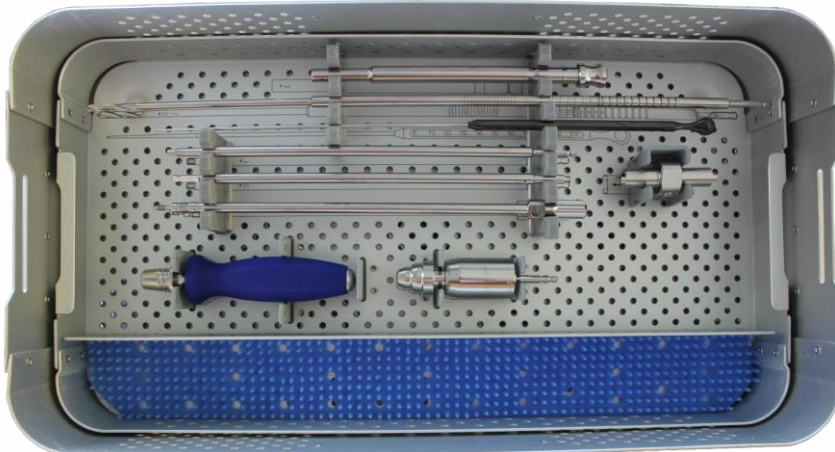
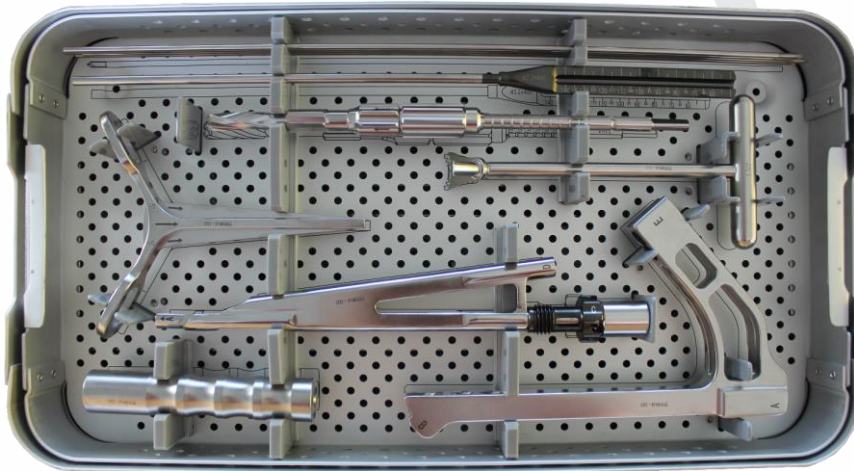
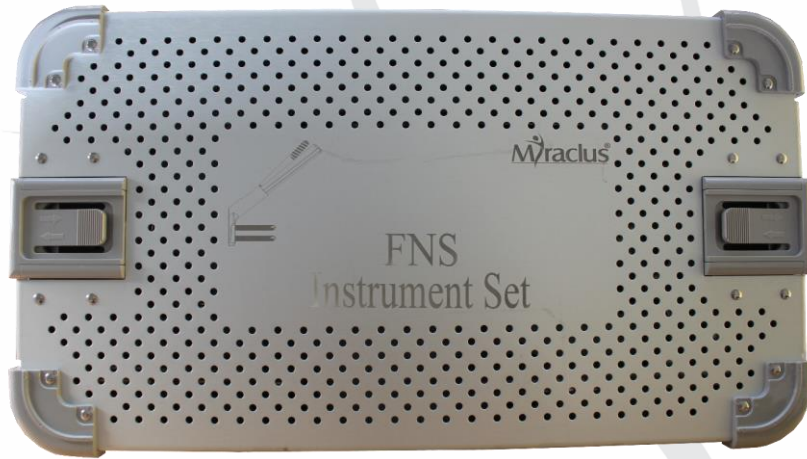


17. TP309.17 $\varnothing 3.2$ mm Guidewire





Instruments Set





Miraclus Orthotech Pvt. Ltd.

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