



JPS JuniOrtho Plating System™

Operative Technique

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The surgical technique shown is for illustrative purposes only. The technique(s) actually employed in each case will always depend upon the medical judgement of the surgeon exercised before and during surgery as to the best mode of treatment for each patient. Please see Instructions for Use for the complete list of indications, warnings, precautions and other important medical information.

Introduction

The JPS JuniOrtho Plating System™ (JPS) is a complete plating system designed to address the specific demands of advanced deformity and trauma reconstruction of the lower extremities in pediatric population. The system has been designed for the treatment of congenital deformities in proximal femur, distal femur and tibia as well as articular fractures, where plating is one of the options. The JPS JuniOrtho Plating System™ consists of 3 different plate sizes, identified as 3.0mm, 3.5mm and 5.0mm, available in different lengths according to the anatomical application. Plates have been designed to accept bone screws by means of suitable diameters.

Bone screws are available in 3 different diameters (3.0mm, 3.5mm and 5.0mm, corresponding to the plate size they can be used with) and different lengths as well as in locking and non-locking options. Application and removal of the JPS JuniOrtho Plating System™ can be performed with Orthofix general orthopedic instrumentation.

Intended Use, Indications for Use

The JPS JuniOrtho Plating System™ is indicated for internal fixation and stabilization of femoral and tibial fractures, osteotomies, mal-unions and non-unions. Indications include:

- Varus, valgus, rotational and/or shortening
- osteotomies
- Femoral neck and/or pertrochanteric fractures
- Proximal and distal metaphyseal fractures
- Pathological and impeding pathological fractures

Use of the JPS JuniOrtho Plating System™ is indicated in pediatric (excluding newborns) and small stature adult patients.

Contra-indications

DO NOT USE the JPS JuniOrtho Plating System™ if a surgical candidate exhibits or is predisposed to any of the following contraindications:

- General medical conditions not suitable for surgery
 - Active or suspected latent infections in or near the fixation site
 - Suspected or documented metal sensitivity
 - Pathological fractures without a diagnosis
- As it could result in a treatment failure in the intended population

Features and Benefits

- Dedicated for treatment of lower limb fractures/deformities
- Anatomically designed implants
- Specifically developed for Infant, child and adolescent patients and small adults
- Double option for bone screws (locking and non-locking)
- Sterile implants
- Sterile single use tools (drills and wires) to guarantee optimal efficiency and cost reduction for the hospital
- Lean instrumentation to optimize the surgical steps
- Complimentary JPS pre-operative planning digital tool

Surgeon Benefits

- Multiple sizes available (3.0-3.5-5.0mm)
- Anatomical design to fit proximal femur, distal femur, proximal tibia and distal tibia
- Optimized and lean instrumentation
- Sterile implants
- Sterile single use tools (drills and wires) to guarantee optimal efficiency
- Color coded implant boxes
- Adjustable instrument tray
- Dedicated software preplanning option

Patient Benefits

- Anatomical implant to facilitate the bone fit
- Early weight-bearing as tolerated by the patient and under surgeon discretion
- Stainless steel implant to facilitate implant removal
- Multiple sizes available to offer the best option based on patient anatomy

Prior to Use Information

Intended patients

Proper patient selection and the patient's ability to comply with physician instructions and follow the prescribed treatment regimen will greatly affect the results. It is important to screen patients and select optimal therapy given physical and/or mental activity requirements and/or limitations.

Pediatric patients include infants (greater than 1 month to 2 years of age), children (greater than 2 to 12 years of age) and adolescents (greater than 12 through 21 years of age).

Intended users

The product is intended for use by Healthcare Professionals (HCP) only and such HCP must have full awareness of the appropriate orthopedic procedures and must be familiar with the devices, instruments and surgical procedures (including application and removal).

Warnings

1. Ensure to position the plate parallel to the femoral shaft in the AP and lateral view, otherwise this may lead to variations to the desired neck-shaft angle and to undesired extension/flexion.
2. When using the image intensifier, the benefit of fluoroscopy should be weighed against the risk from radiation exposure on an individual patient basis.
3. The osteotomy must be parallel to the physis and perpendicular to the longitudinal axis of the tibia; otherwise, derotation will lead to angular deformity.

Precautions

1. Use the image intensifier to ensure complete drilling of both cortices when inserting non-locking screws, to verify correct placement of the plate, wires and screws, and to avoid penetration of the femoral head growth plate, the proximal tibial growth plate, or the distal tibia growth plate.
2. Make sure that the plate adheres well to the proximal fragment of the femur, as leaving too large a gap might lead to hardware or bone breakage.
3. Do not bend wires or screws during insertion especially when flexing the hip in lateral/axial view as this may result in errors in correction or wire or screw breakage.
4. Complete each locking screw insertion entirely before inserting the next screw to avoid a possible incorrect engagement of screw on the plate.
5. Screws must not be over-tightened during insertion, locking or compression, as this may cause damage of the implant, lack of compression or bone stripping. Always perform final tightening manually.
6. Use compression only where appropriate to avoid too much stress on the plate and screws.

All Orthofix devices should be used together with their corresponding Orthofix implants, components, accessories and instrumentation following the operative technique recommended by the manufacturer. Orthofix does not guarantee the safety and effectiveness of the JPS JuniOrtho Plating System™ when used in conjunction with devices of other manufacturers or with other Orthofix devices if not specifically indicated in the operative technique.

MRI (Magnetic Resonance Imaging) Safety Information

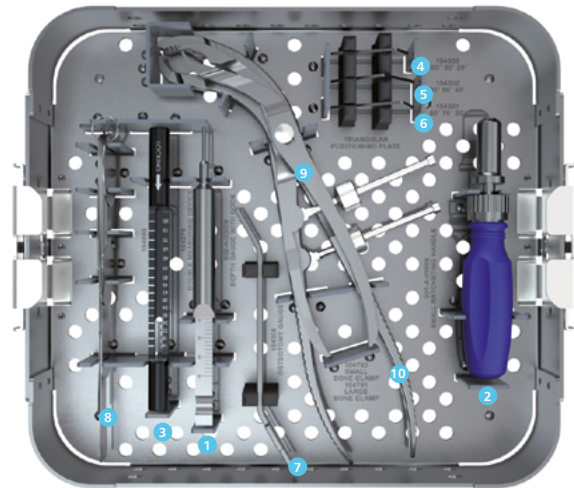
The Orthofix JPS JuniOrtho Plating System™ has not been evaluated for safety and compatibility in the MR (Magnetic Resonance) environment. It has not been tested for heating, migration, or image artifact in the MR environment. The safety of the Orthofix JPS JuniOrtho Plating System™ in the MR environment is unknown. Scanning a patient who has this device may result in patient injury.

Cleaning, Sterilization and Maintenance

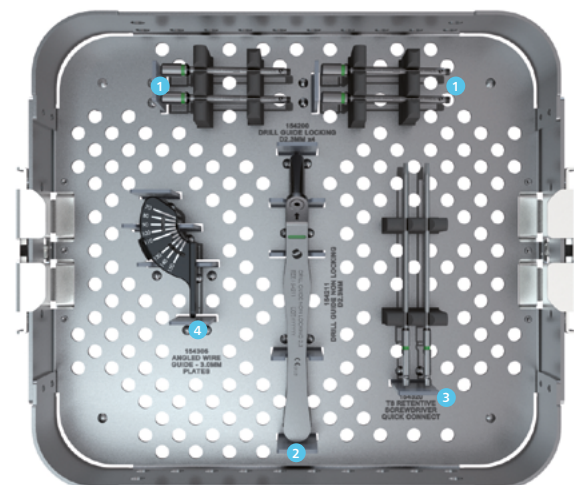
Important information – please read the PQ JPS prior to using the Orthofix JPS JuniOrtho Plating System™.

Equipment Required

GENERAL TRAY	
Part#	Description
002-A-00009	1 Depth Gauge With Hook
DH0455CE	2 Micro Ratcheting Handle with AO Connector Cannulated
154276	3 AL Double Measuring Device
154300	4 SS Triangular Positioning Plate 60 degrees 100 degrees 20 degrees
154301	5 SS Triangular Positioning Plate 70 degrees 80 degrees 30 degrees
154302	6 SS Triangular Positioning Plate 90 degrees 50 degrees 40 degrees
154306	7 SS Osteotomy Gauge
154666	8 SS JPS Template
154780	9 SS Small Bone Clamp
154781	10 SS Large Bone Clamp

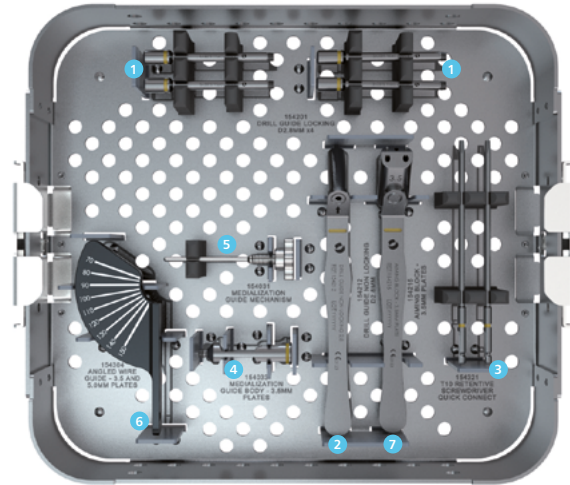


3.0mm TRAY	
Part#	Description
154200	1 SS Drill Guide Locking D2.3mm
154211	2 SS Drill Guide Non-locking D2.3mm
154320	3 SS T8 Retentive Screwdriver Quick Connect
154305	4 AL Angled Wire Guide 3.0mm Plate



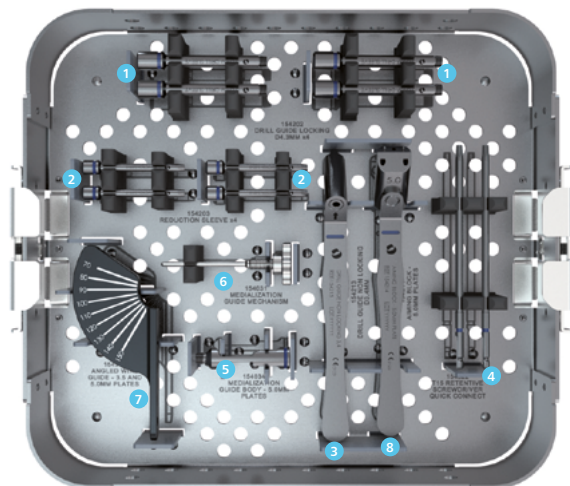
3.5mm TRAY

Part#	Description
154201	1 SS Drill Guide Locking D2.8mm
154212	2 SS Drill Guide Non-locking D2.8mm
154321	3 SS T10 Retentive Screwdriver Quick Connect
154033	4 SS Medialization Guide Body 3.5mm
154031	5 SS Medialization Guide Mechanism
154304	6 AL Angled Wire Guide 3.5mm and 5.0mm Plates
154215	7 SS Aiming Block - 3.5mm Plate



5.0mm TRAY

Part#	Description
154202	1 SS Drill Guide Locking D4.3mm
154203	2 SS Reduction Sleeve
154213	3 SS Drill Guide Non-locking D3.4mm
154322	4 SS T15 Retentive Screwdriver Quick Connect
154034	5 SS Medialization Guide Body 5.0mm
154031	6 SS Medialization Guide Mechanism
154304	7 AL Angled Wire Guide 3.5mm and 5.0mm Plates
154214	8 SS Aiming Block - 5.0mm Plate



Proximal Femur Varus Osteotomy with a 3.5mm or 5.0mm Plate

- Pre-operative planning
- Correction of deformities
- Plate and Screws
- Patient positioning and surgical approach
- Determination of anteversion
- Insertion of the 2.0mm positioning K-wires
- Osteotomy
- Plate positioning
- Measuring and insertion of the femoral neck proximal screws
- Reduction
- Drilling, measuring and insertion of the shaft screws
- Final fluoroscopic control
- Removal

Pre-operative planning

Measuring of the correction angle

Measure the current neck-shaft angle and identify the desired neck-shaft angle.

The image in **Fig. 1.a** should aid in determining correctly the various angles needed for calculating the correction angle.

Subtract the desired angle from the current neck-shaft angle to determine the required correction angle (**Fig. 1**).

Example:

Current neck-shaft angle: 150°

Desired neck-shaft angle: 120°

Correction angle: 150°-120° = 30°

The complimentary JPS pre-operative planning software may be useful during the planning phase, visualizing the anatomical angles and in simulating the calculation of the correction angle by overlaying the acquired digital radiological image.

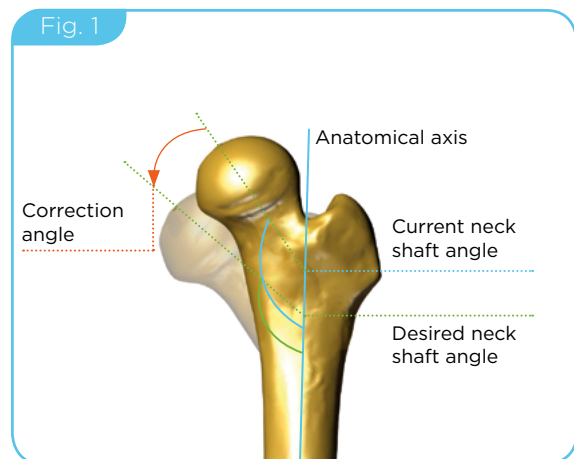
This operative technique explains the application of both the 3.5mm and 5.0mm proximal femoral plates. Most steps are identical; the steps that are different between the plates are indicated.

Plate selection

The angle of the plate should be close to the desired neck-shaft angle.

Desired neck-shaft angle: 120°

Suggested plate angle: e.g. 110°



Correction of deformities

General Principles

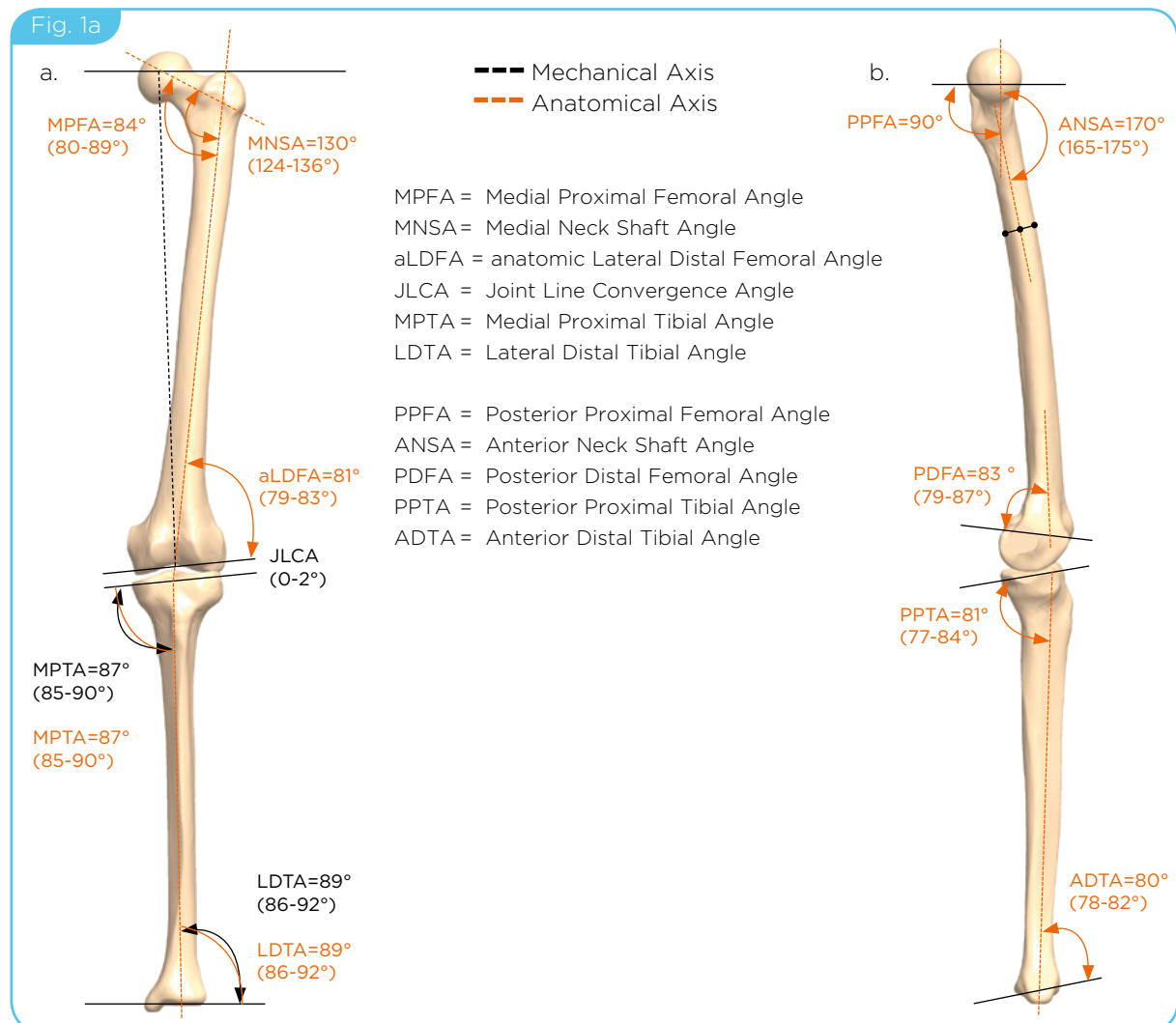
A skeletal deformity is usually a three dimensional problem. The correction of a deformity requires an understanding of the effects of the adjustments or alterations in one plane on a three dimensional problem.

Mechanical Axis

This is the line of force of the axial mechanical load in static weightbearing. In the tibia, it coincides with the anatomical axis. In the femur, it extends from the center of rotation of the femoral head to the center of the knee joint. For the lower limb, it extends from the center of the femoral head to the center of the tibio-talar joint, and should normally pass through near the center of the knee joint.

Anatomical Axis

The mid diaphyseal line of a long bone is the anatomical axis. In a deformed bone, each segment of the bone will have a separate anatomical axis and they will intersect.



A line drawn from the center of the femoral head to the center of the tibial plafond should pass through near the center of the knee joint on a long leg view. If it does not, there is a Mechanical Axis Deviation (MAD).

Measuring the K-wire angle

To determine the K-wire angle, add the chosen plate-screw angle to the previously calculated correction angle.

Example:

- Chosen Plate-screw angle: 110°
- Required Correction angle: 30°
- K-wire angle: 110° + 30° = 140°

(Fig. 2)

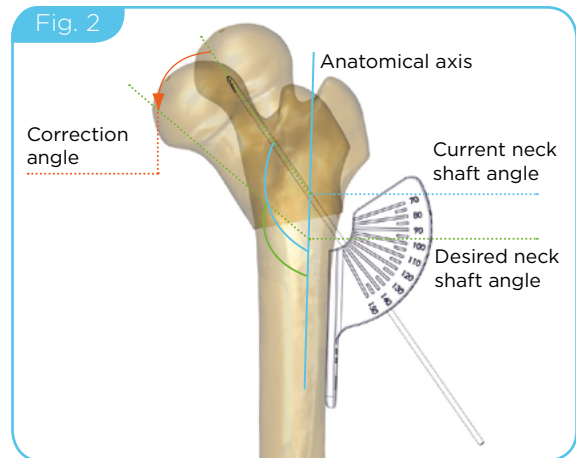


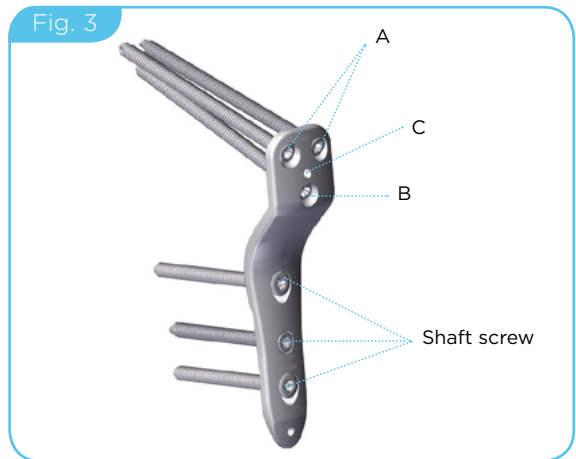
Plate and Screws

- A: Femoral neck proximal screw holes
- B: Femoral neck distal screw hole
- C: Positioning K-wire hole
- Shaft screws: shaft screw holes

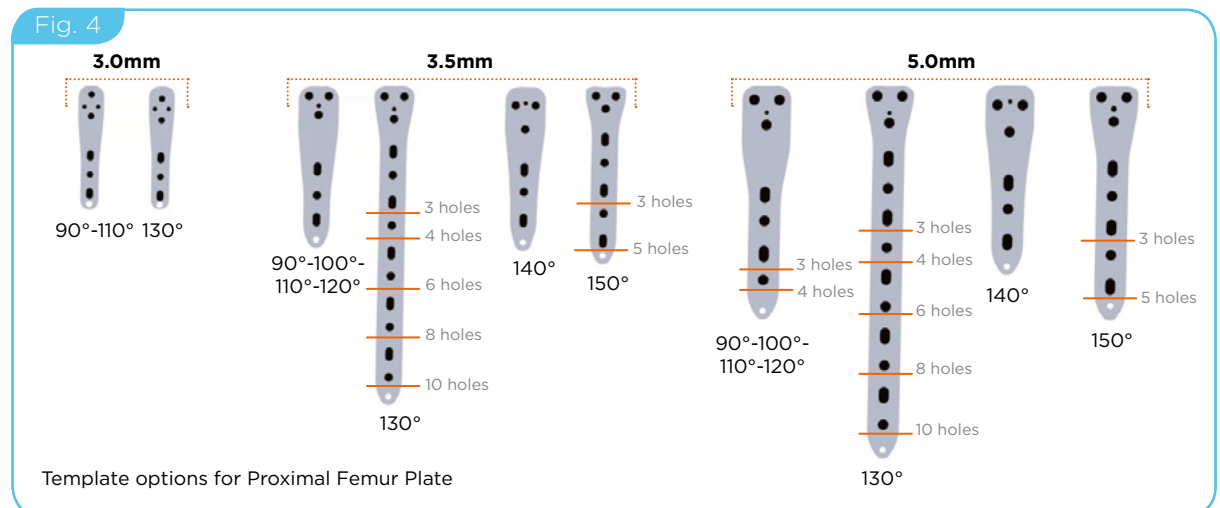
Non-Locking Screw



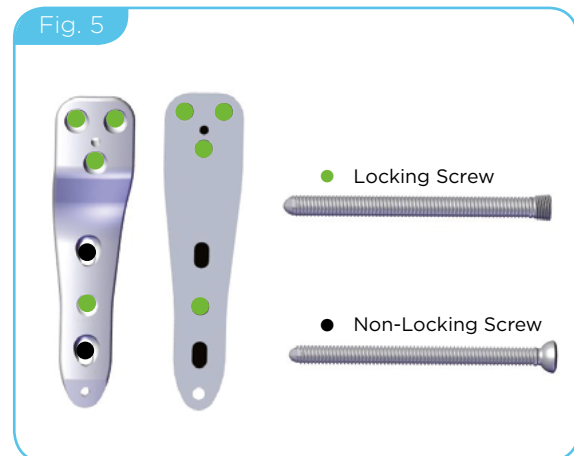
Locking Screw



Templates can be used to select the appropriate plate for the patient: the lines in Fig. 4 identify the different sizes available.



Locking and non-locking screws must be used in the appropriate holes (**Fig. 5**).



Patient positioning and surgical approach

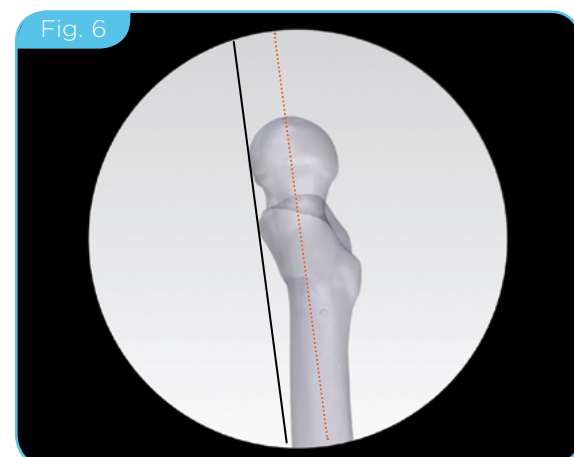
Determination of the correction angle

Place the patient in the supine position. Use a standard lateral approach to the proximal femur.

Determination of anteversion

Part#	Description
99-154281	SS GUIDE WIRE D2.0MM L200MM PACK OF 2 STERILE

Hold a 2.0mm K-wire anterior to the femoral neck to determine anteversion under lateral fluoroscopic control, align the K-wire parallel to the central axis of the femoral neck (**Fig.6**).



Insertion of the 2.0mm positioning K-wires

3.5mm Plate

Part#	Description
99-154281	SS GUIDE WIRE D2.0MM L200MM PACK OF 2 STERILE
99-154283	SS GUIDE WIRE D2.8MM L200MM PACK OF 2 STERILE
154304	AL ANGLED WIRE GUIDE 3.5MM AND 5.0MM PLATES
154215	SS AIMING BLOCK - 3.5MM PLATE
154781	SS LARGE BONE CLAMP

5.0mm Plate

Part#	Description
99-154281	SS GUIDE WIRE D2.0MM L200MM PACK OF 2 STERILE
99-154283	SS GUIDE WIRE D2.8MM L200MM PACK OF 2 STERILE
154304	AL ANGLED WIRE GUIDE 3.5MM AND 5.0MM PLATES
154214	SS AIMING BLOCK - 5.0MM PLATE
154781	SS LARGE BONE CLAMP

Insert the 2.0mm K-wire in the slot in the angled guide wire that corresponds to the calculated angle and place it against the femoral shaft. If angular correction is not required, the base of the angled wire guide should be parallel to the femoral shaft in the AP and lateral views (**Fig. 7**).

Secure the angled guide wire to the femur shaft with the bone clamp (**Fig. 8**).

Under fluoroscopic control (**Fig. 9a**), insert the posterior positioning K-wire parallel to the anteversion K-wire in the lateral/axial view up into the middle third of the femoral neck (**Fig. 9b**). Remove the anteversion K-wire and the angled wire guide.

Fig. 7

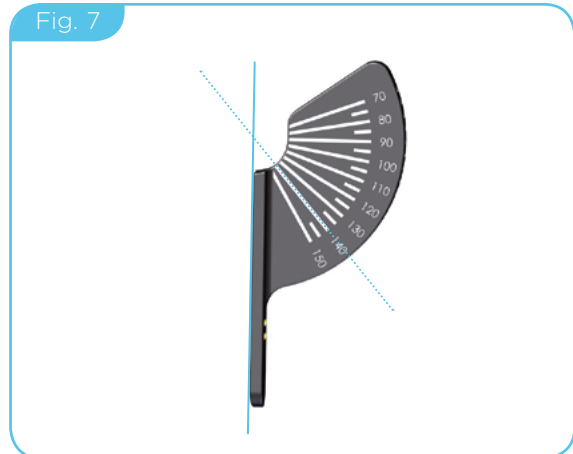


Fig. 8

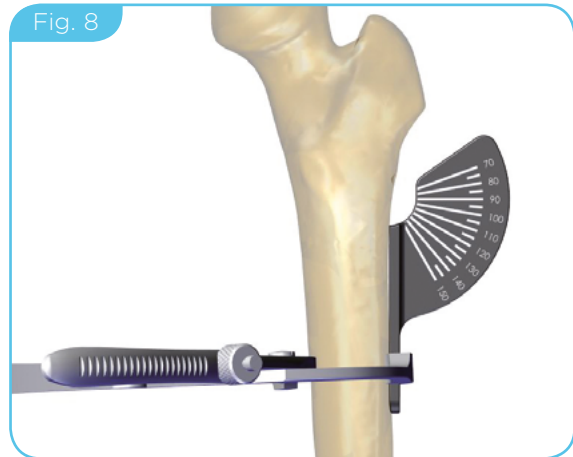


Fig. 9a

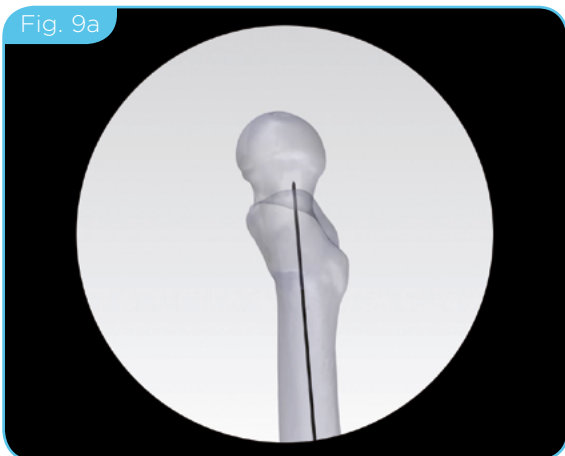
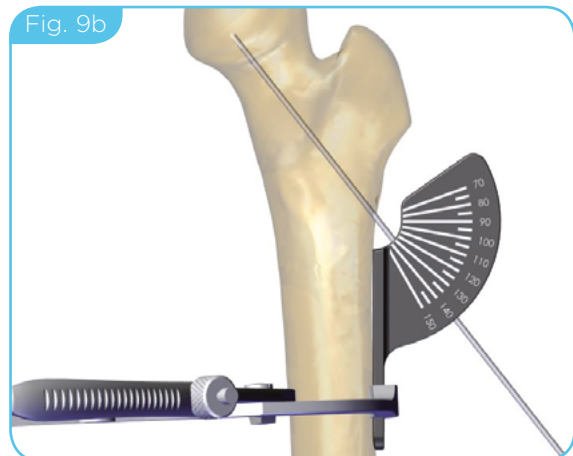


Fig. 9b



The following steps refer to the 130° and 150° plates. Please see below for the 140° plate.

Slide the aiming block over the positioning wire and insert the two 2.8mm wires to the middle third of the femoral neck (Fig. 10).

Under fluoroscopy (Fig.11) slide the aiming block over the positioning wire and insert the two 2.8mm wires to the middle third of the femoral neck (Fig. 10).

When using a 140° plate, the aiming block can not be used.

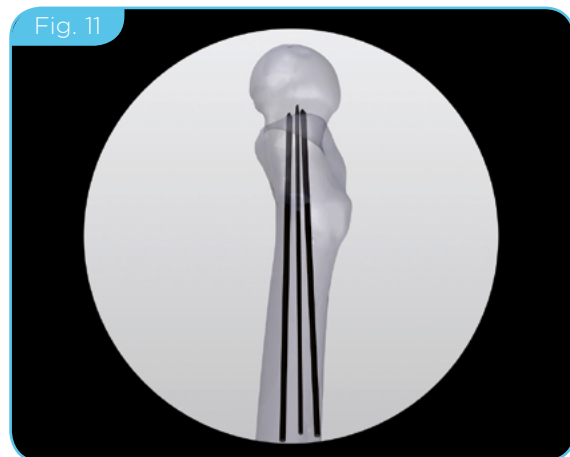
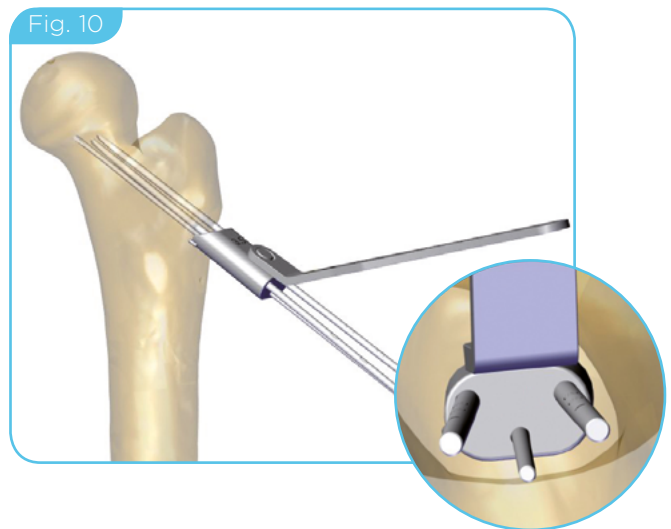


PRECAUTION: Use the image intensifier to verify correct placement of the wires and to avoid penetration of the femoral head growth plate.



PRECAUTION: Do not bend wires during insertion especially when flexing the hip in lateral/axial view as this may result in errors in correction or wire breakage.

Remove the aiming block and proceed with the osteotomy.



Specific steps for a 140° plate

Measuring of the correction angle

Measure the current neck-shaft angle and identify the desired neck-shaft angle.

The image in Fig. 12 should aid in determining correctly the various angles needed for calculating the correction angle.

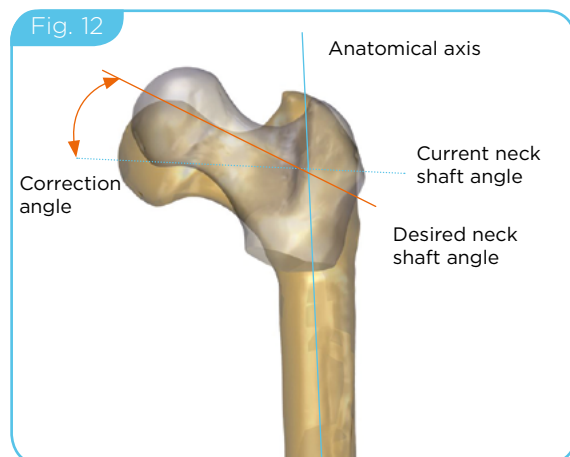
Subtract the current angle from the desired neckshaft angle to determine the required correction angle (Fig. 12).

Example:

Current neck-shaft angle: 100°

Desired neck-shaft angle: 130°

Correction angle: $130^\circ - 100^\circ = 30^\circ$



The angle of the plate should be close to the desired neck-shaft angle.

Desired neck-shaft angle: 130°

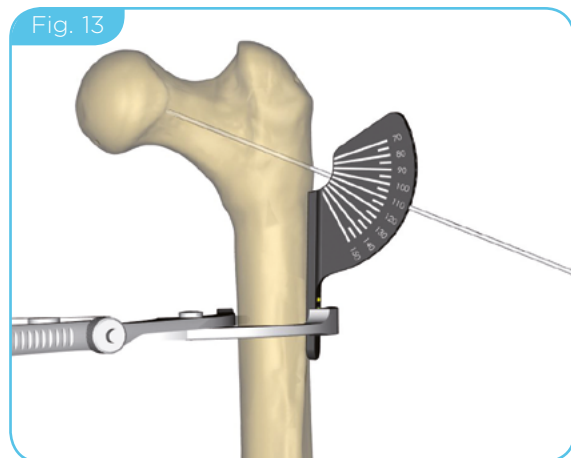
Suggested plate angle: e.g. 140°

Example:

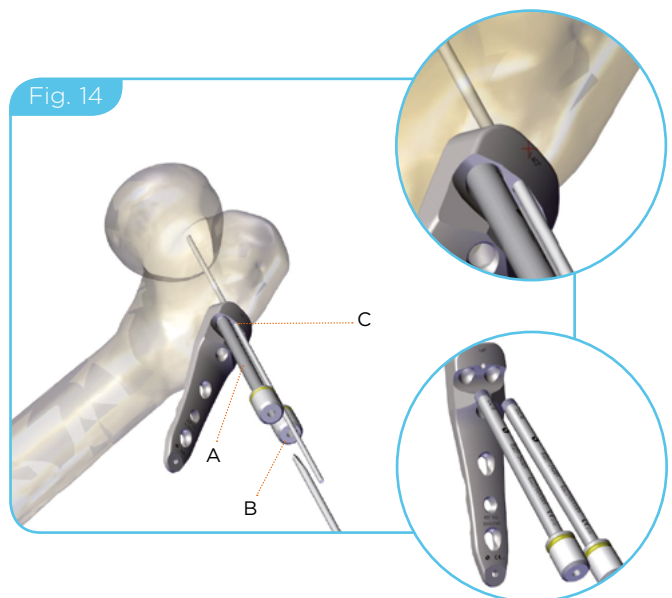
Chosen Plate-screw angle: 140°

Required Correction angle: 30°

K-wire angle: $140^\circ - 30^\circ = 110^\circ$

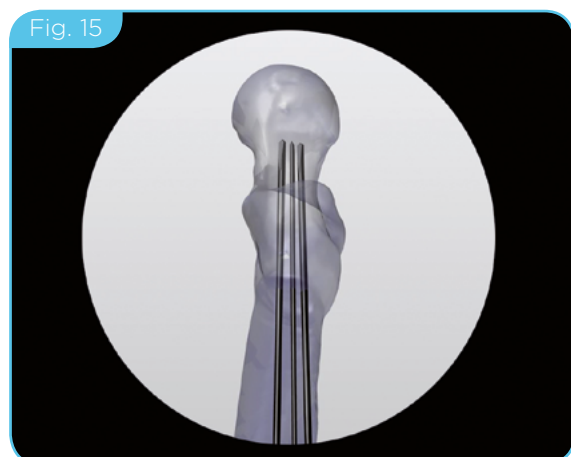


Apply the appropriate guide wires to the plate (see page 17) and slide the plate over the positioning wire (Fig 14), making sure to position the plate correctly on the bone.



Insert the two 2.8mm wires under fluoroscopy (Fig 15).

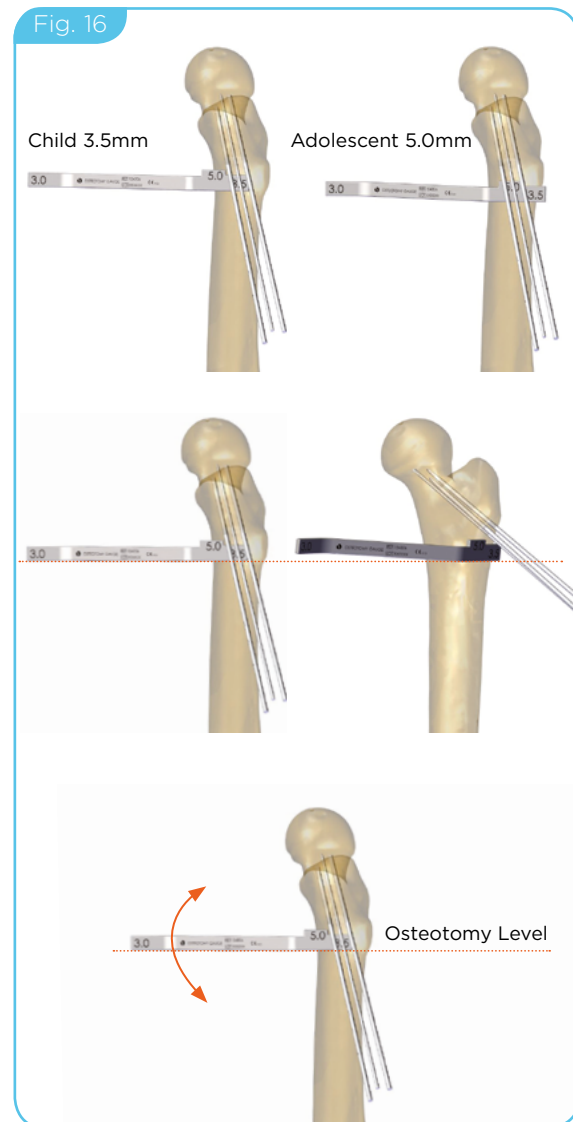
Remove the plate and proceed with the osteotomy.



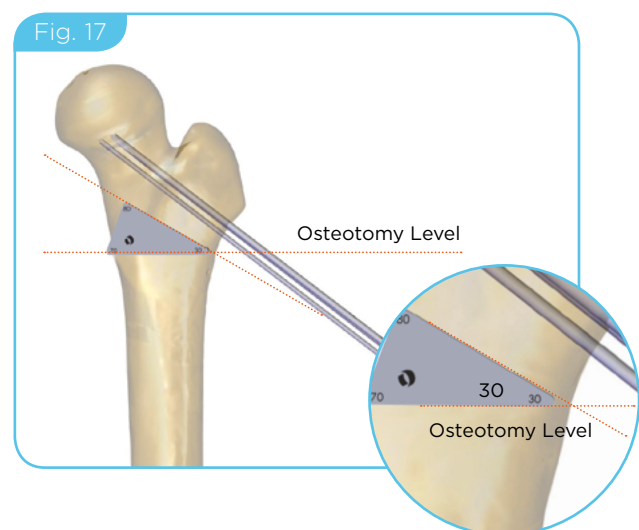
Osteotomy

Part#	Description
154306	SS OSTEOTOMY GAUGE
154300	SS TRIANGULAR POSITIONING PLATE 60 DEGREES 100 DEGREES 20 DEGREES
154301	SS TRIANGULAR POSITIONING PLATE 70 DEGREES 80 DEGREES 30 DEGREES
154302	SS TRIANGULAR POSITIONING PLATE 90 DEGREES 50 DEGREES 40 DEGREES

Place the appropriate side of the osteotomy gauge against the distal positioning 2.0mm K-wire (Fig. 16) and mark the distance with the oscillating saw or another sharp instrument onto the bone. Perform the osteotomy in one cut perpendicular to the femur shaft.



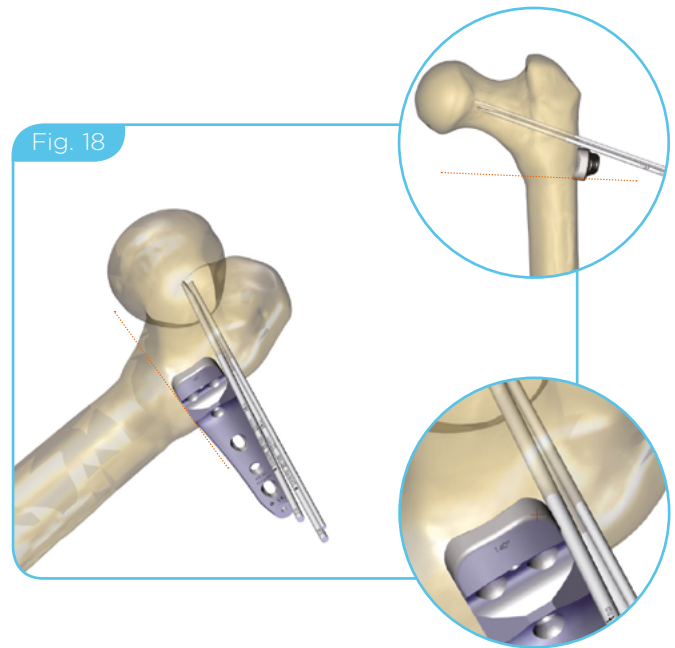
If a wedge osteotomy is needed, choose the triangular positioning plate based on the calculated correction angle. Make the second cut using the triangle positioning plate (Fig. 17).



Osteotomy for a 140° plate

Use the plate as a template to determine the correct position of the osteotomy by placing the lateral edge of the plate distal of the two 2.8mm wires and mark the femur along the plate (**Fig. 18**). Perform the osteotomy in one cut perpendicular to the femur shaft.

After having performed the osteotomy, proceed with the insertion of the screws, [see page 18](#).



In case of internal/external rotation osteotomy, insert K-wires bicortically in the great trochanter and in the distal fragment as guides to control rotation before performing the osteotomy (**Fig. 19**).

Even if no rotation is planned, insertion of two K-wires or making a mark on the bone is recommended to ensure rotational alignment is maintained.

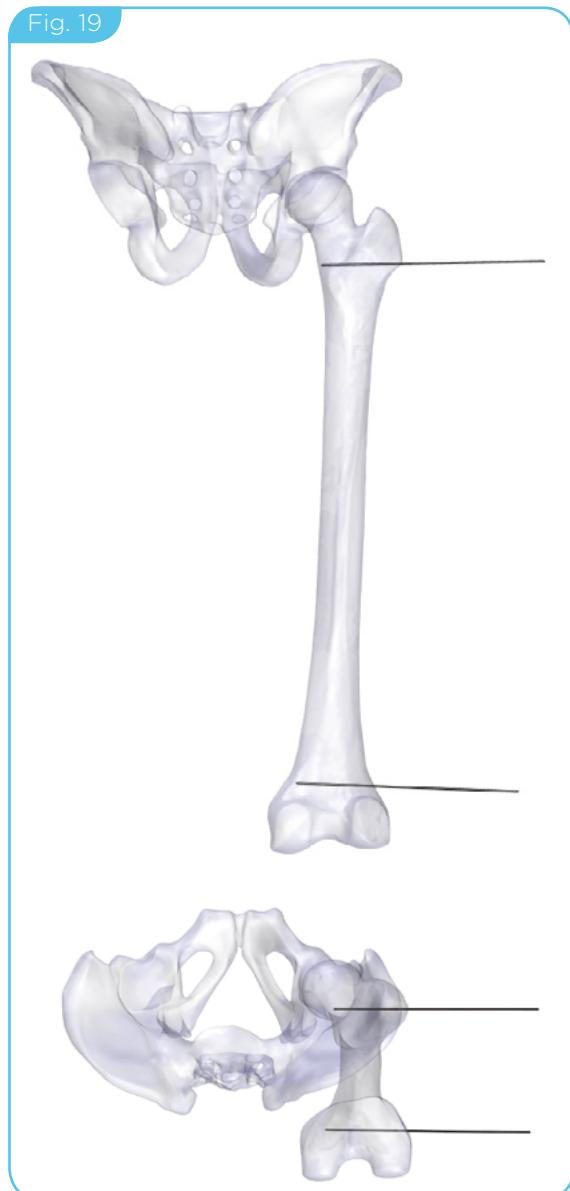


Plate positioning

3.5mm Plate

Part#	Description
154201	SS DRILL GUIDE LOCKING D2.8MM

5.0mm Plate

Part#	Description
154202	SS DRILL GUIDE LOCKING D4.3MM
154203	SS REDUCTION SLEEVE

Fixation of the proximal head/neck fragment is performed with locking screws.

3.5mm Plate

Tighten the drill guides locking into the femoral neck proximal screw holes and slide the plate, through the drill guides (A), over the wires (**Fig. 20**). The distal positioning K-wire (C) must be inserted in the positioning K-wire hole in the plate.

5.0mm Plate

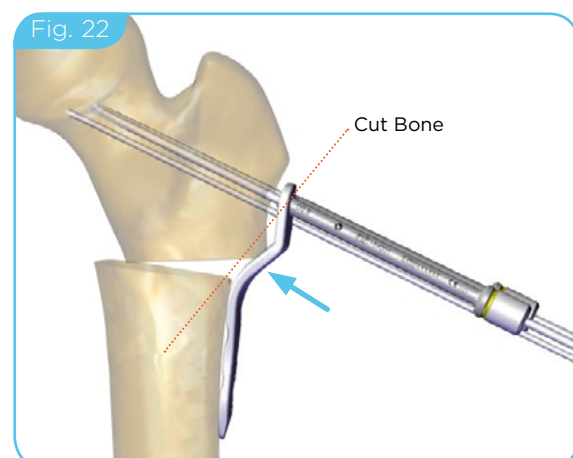
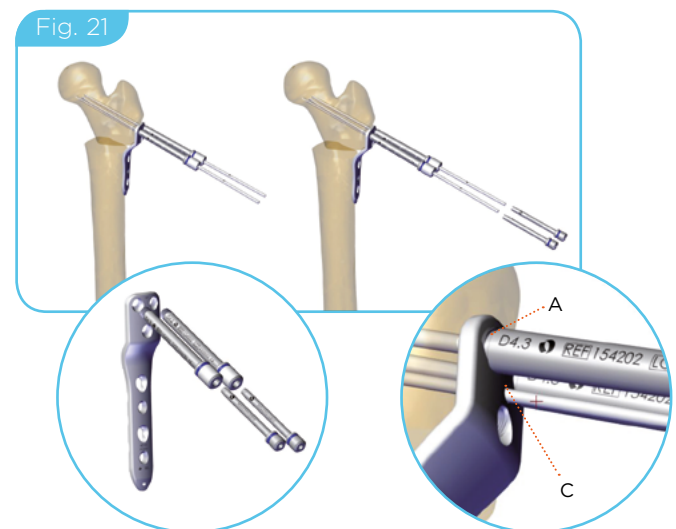
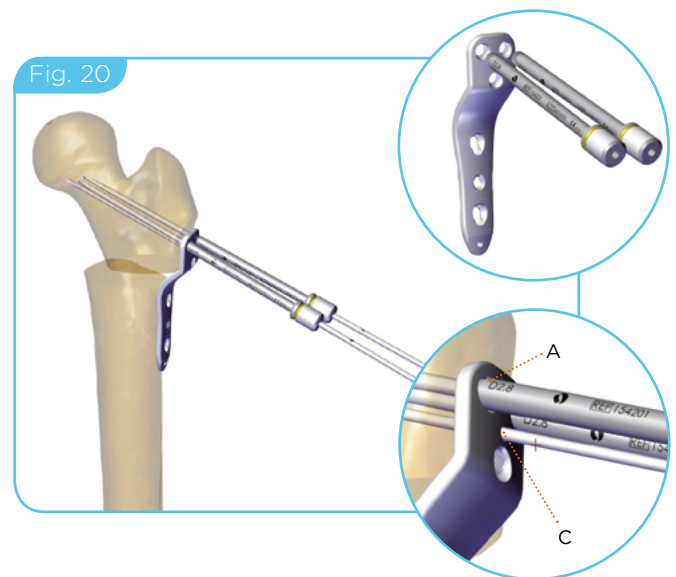
Tighten the drill guide locking into the femoral neck proximal screw holes, and slide the plate, through the drill guides (A), over the wires (**Fig. 21**). The distal positioning K-wire (C) must be inserted in the positioning K-wire hole in the plate.

Insert the reduction sleeves over the wires in the upper 2 drill guides locking.



PRECAUTION: Make sure that the plate adheres well to the proximal fragment of the femur, as leaving a too large gap might lead to hardware or bone breakage.

If the plate stands out too far, it is helpful to remove a small bone wedge from the lateral cortex at the osteotomy to optimize the position of the plate on the proximal fragment (**Fig. 22**).



Measuring and insertion of the femoral neck proximal screws

Part#	Description
154276	AL DOUBLE MEASURING DEVICE
DH0455CE	MICRO RATCHETING HANDLE WITH AO CONNECTOR CANNULATED

3.5mm Plate

Part#	Description
154321	SS T10 RETENTIVE SCREWDRIVER QUICK CONNECT

5.0mm Plate

Part#	Description
99-154285	SS GUIDE WIRE D4.3MM L190MM PACK OF 2 STERILE
99-154185	SS DRILL BIT D4.3MM QUICK CONNECT STERILE
154322	SS T15 RETENTIVE SCREWDRIVER QUICK CONNECT

Slide the double measuring device over the wire against the drill guide locking (**3.5mm plate; Fig. 23**) or the reduction sleeve (**5.0mm plate; Fig. 24**).

Ensure that the double measuring device is on the "Locking" side to determine the length of the femoral neck proximal screw.

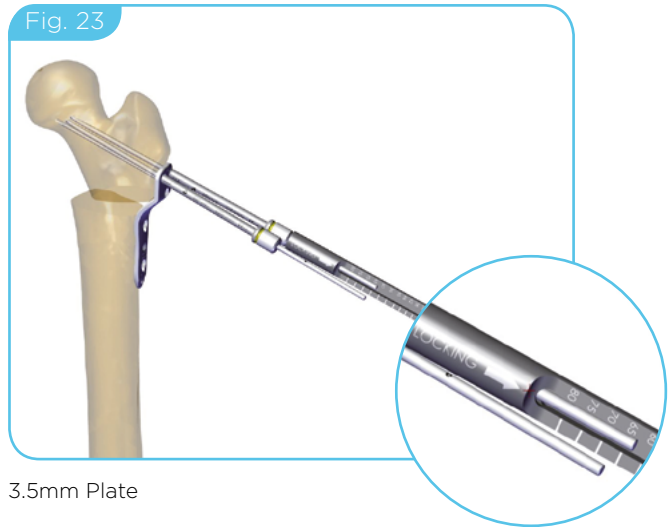
3.5mm Plate

As the wire already prepares the hole for screw insertion, drilling with a drill bit is not necessary.

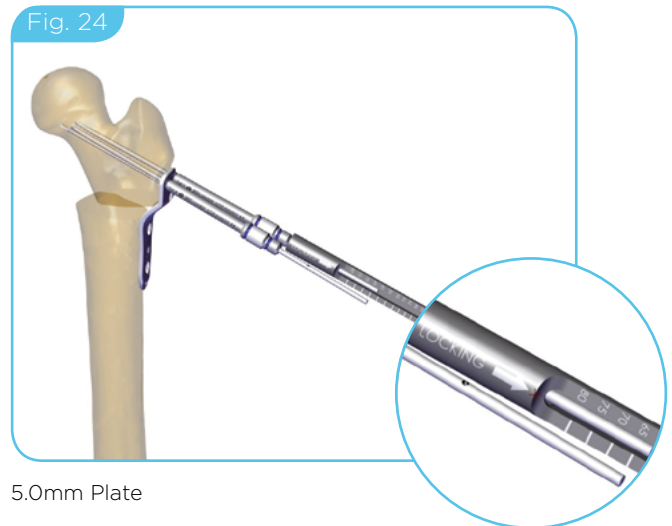
Remove the measuring device, wire and drill guide from one of the femoral neck proximal screw holes.

5.0mm Plate

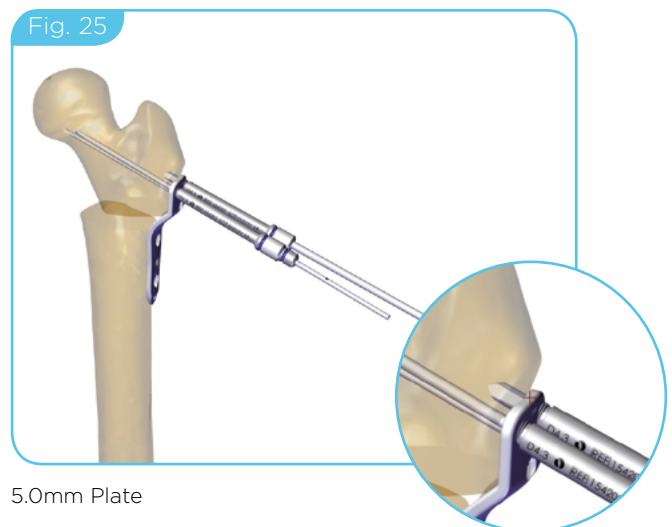
Remove the measuring device and reduction sleeve. Remove one of the 2.8mm wires and drill the first cortex with the 4.3mm wire or drill (**Fig. 25**), then remove the drill guide locking.



3.5mm Plate



5.0mm Plate



5.0mm Plate

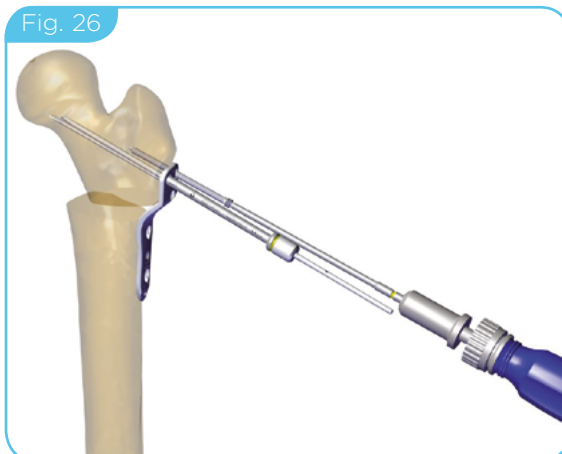
Insert the selected locking screw:

Option 1: Manual insertion

Attach the appropriate screwdriver to the ratcheting handle and insert the screw by hand (Fig. 26).



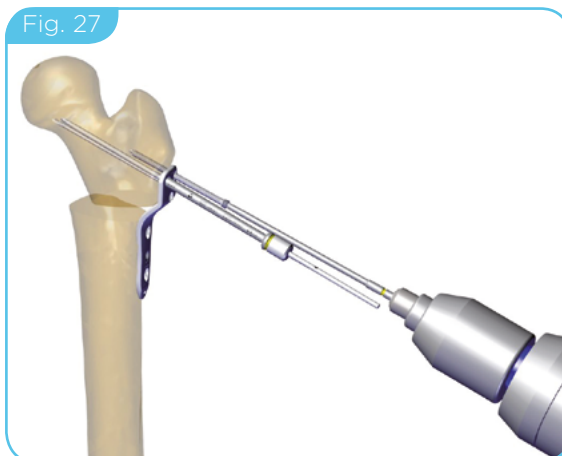
Fig. 26



Option 2: Insertion under power

Insert the locking screw partially under power, then complete insertion by hand (Fig. 27).

Fig. 27



PRECAUTION: Screws must not be over-tightened during insertion, locking or compression, as this may cause damage to the implant, lack of compression or bone stripping. Always perform final tightening manually.

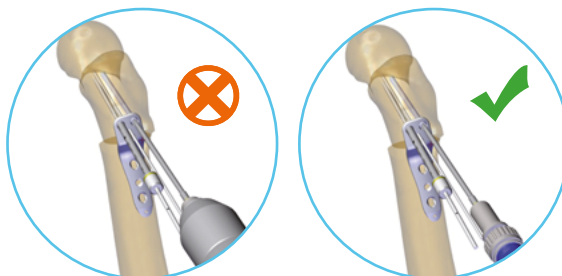


PRECAUTION: Use the image intensifier to verify correct placement of the plate, wires and screws and to avoid penetration of the femoral head growth plate.



PRECAUTION: Complete each locking screw insertion entirely before inserting the next screw to avoid a possible incorrect engagement of screw on the plate (Fig. 28).

Fig. 28



Repeat the steps from [page 18, Fig. 23](#), for the second femoral neck proximal screw ([Fig. 29](#)) and the femoral neck distal screw ([Fig. 30](#)). Remove the guide wire.

Fig. 29

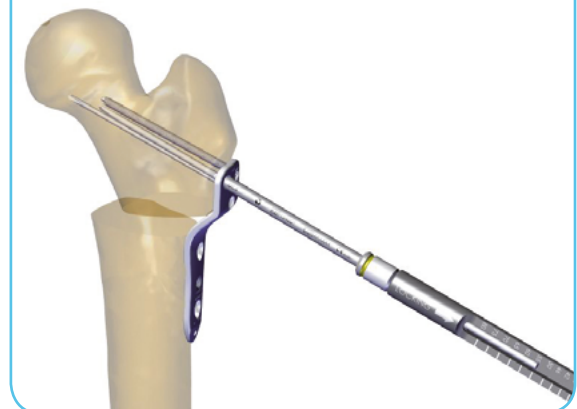
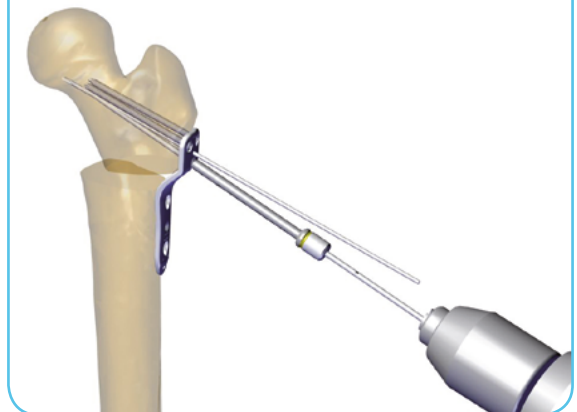


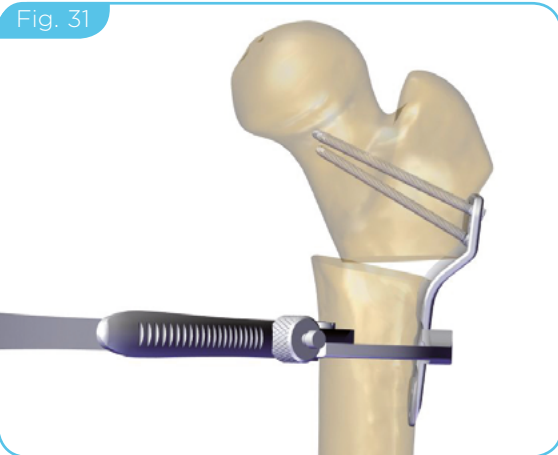
Fig. 30



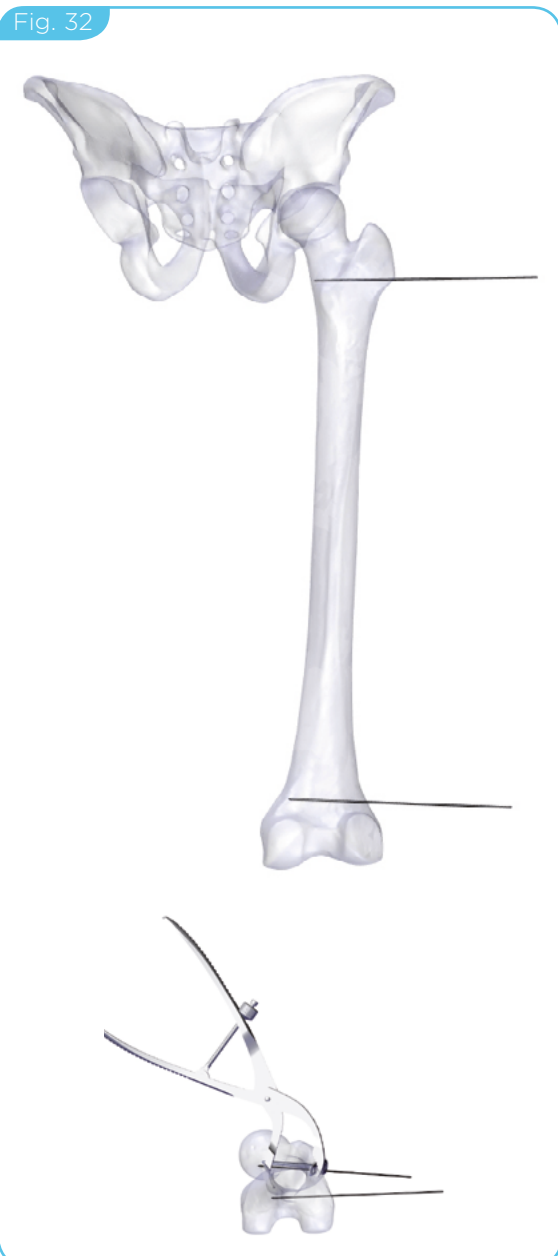
Reduction

Part#	Description
154781	SS LARGE BONE CLAMP

Align the plate parallel with the femoral shaft axis in AP and lateral view and secure it with the clamp (**Fig. 31**).

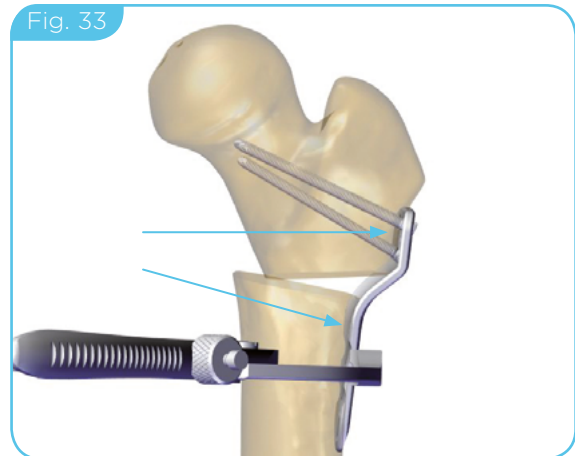


In case of internal/external rotation osteotomy, rotate the distal fragment of the femur until the two rotation K-wires are parallel in axial view. These two wires should always be parallel before the shaft screws are inserted. Once the plate is fixed, they can be removed (**Fig. 32**).



**WARNING:**

Ensure to position the plate parallel to the femoral shaft in the AP and lateral view, otherwise this may lead to variations to the desired neck-shaft angle and to undesired extension/flexion (Fig. 33).



Drilling, measuring and insertion of the shaft screws

3.5mm Plate

Part#	Description
154201	SS DRILL GUIDE LOCKING D2.8MM
99-154283	SS GUIDE WIRE D2.8MM L200MM PACK OF 2 STERILE
154212	SS DRILL GUIDE NON-LOCKING D2.8MM
99-154183	SS DRILL BIT D2.8MM QUICK CONNECT STERILE
002-A-00009	DEPTH GAUGE WITH HOOK
154276	AL DOUBLE MEASURING DEVICE
154781	SS LARGE BONE CLAMP
DH0455CE	MICRO RATCHETING HANDLE WITH AO CONNECTOR CANNULATED
154321	SS T10 RETENTIVE SCREWDRIVER QUICK CONNECT

5.0mm Plate

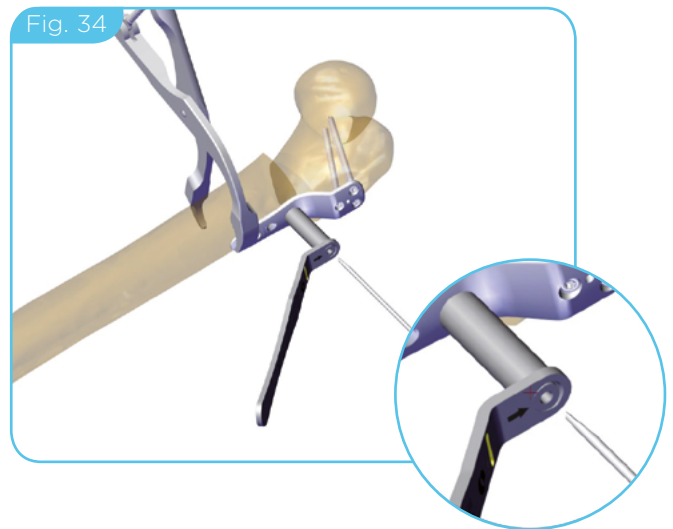
Part#	Description
154202	SS DRILL GUIDE LOCKING D4.3MM
99-154285	SS GUIDE WIRE D4.3MM L190MM PACK OF 2 STERILE
99-154185	SS DRILL BIT D4.3MM QUICK CONNECT STERILE
154213	SS DRILL GUIDE NON-LOCKING D3.4MM
99-154284	SS GUIDE WIRE D3.4MM L200MM PACK OF 2 STERILE
154213	SS DRILL GUIDE NON-LOCKING D3.4MM
99-154184	SS DRILL BIT D3.4MM QUICK CONNECT STERILE
002-A-00009	DEPTH GAUGE WITH HOOK
154276	AL DOUBLE MEASURING DEVICE
154781	SS LARGE BONE CLAMP
DH0455CE	MICRO RATCHETING HANDLE WITH AO CONNECTOR CANNULATED
154322	SS T15 RETENTIVE SCREWDRIVER QUICK CONNECT

Locking or non-locking screws can be used in the shaft. If compression is required, insert non-locking screws prior to any locking screw.

Drilling, measuring and insertion of a non-locking screw in a compression hole.

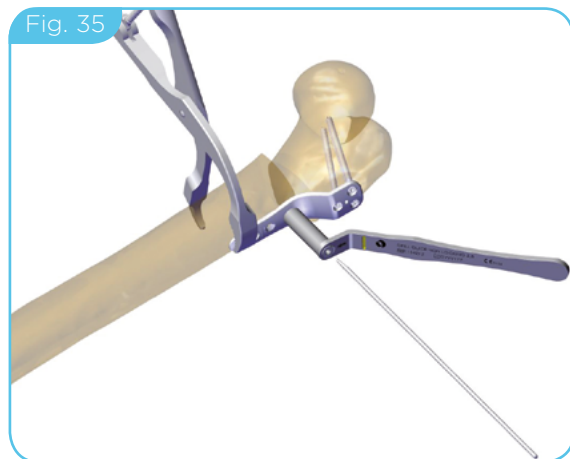
To obtain compression, place the drill guide in the selected compression hole with the arrow oriented towards the osteotomy line (**Fig. 34**).

In case of compression it is advisable to start with proximal non-locking screw.



If compression is not required, place the drill guide locking in the selected compression hole with the arrow on the opposite side of the osteotomy line (**Fig. 35**).

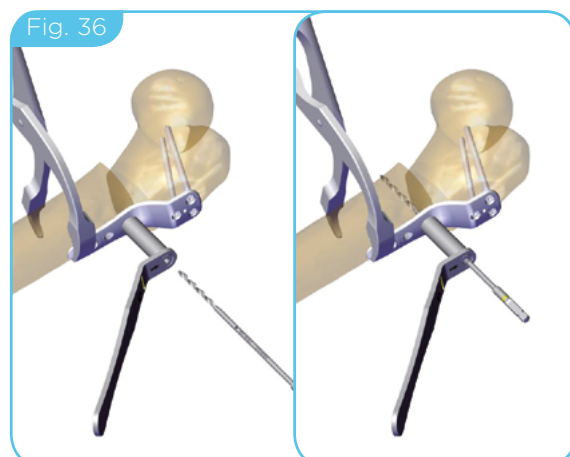
In both cases the non-locking screws must be positioned first, prior to the locking screw insertion.



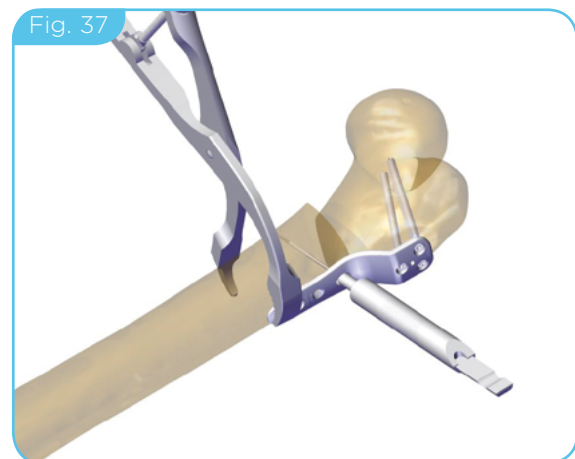
Drilling and measuring

Option 1

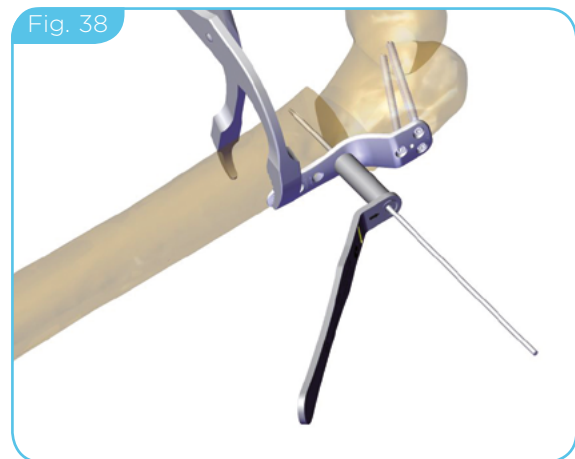
Insert the appropriate drill bit in the drill guide and ensure complete drilling of both cortices (**Fig. 36**).



Remove the drill guide non-locking.
Use the depth gauge with hook to measure screw length (**Fig. 37**).



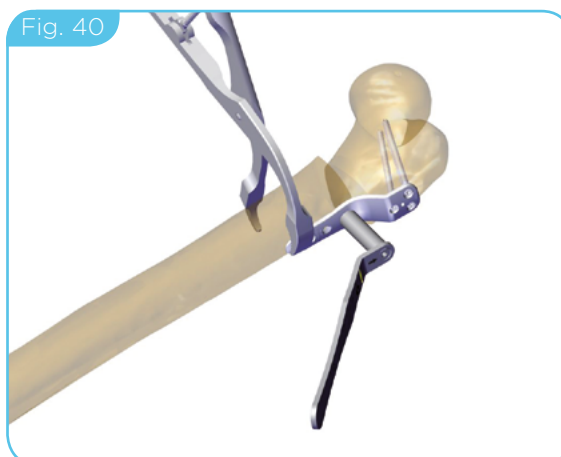
Option 2
Insert the appropriate wire in the drill guide and ensure complete drilling of both cortices (**Fig. 38**).



Slide the double measuring device over the wire against the drill guide. Ensure that the double measuring device is on the "Non locking" side to determine the length of the screw (**Fig. 39**).



Remove the double measuring device and the wire (Fig. 40).



Screw insertion

If compression is desired, partially insert the selected non-locking screw into the plate. Attach the screwdriver to the ratcheting handle and insert the non-locking screw into place manually.

Unlock the bone clamp to allow compression and then complete screw insertion manually (Fig. 41).

Insert the second screw as described above until its head begins to engage the plate. When engagement is being felt, slightly loosen the first screw just enough (approx. half a turn) to allow the plate to slide further along the femoral shaft. Fully seat the second screw and then re-tighten the first screw.



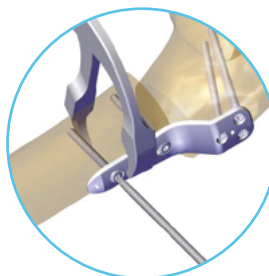
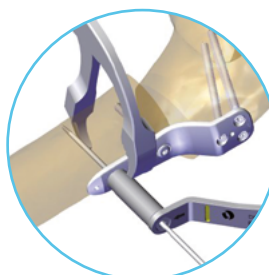
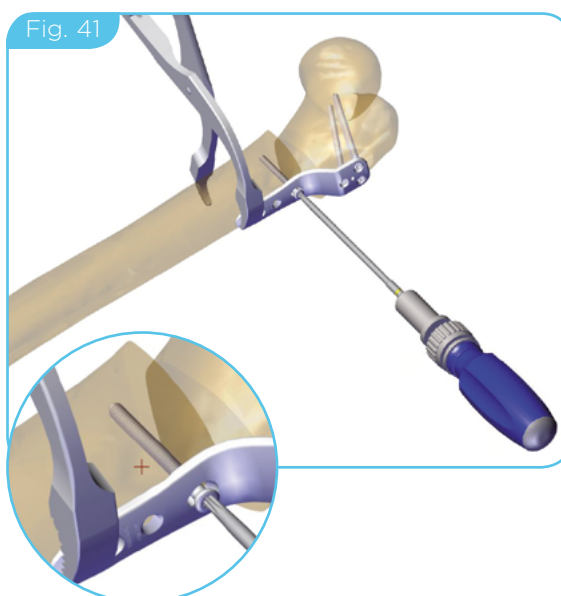
If compression is not desired, insert the selected non-locking screw as described here below.

Option 1: Manual insertion

Attach the screwdriver to the ratcheting handle and insert the non-locking screw into place manually.

Option 2: Insertion under power

Insert the non-locking screw partially under power, then complete insertion manually.



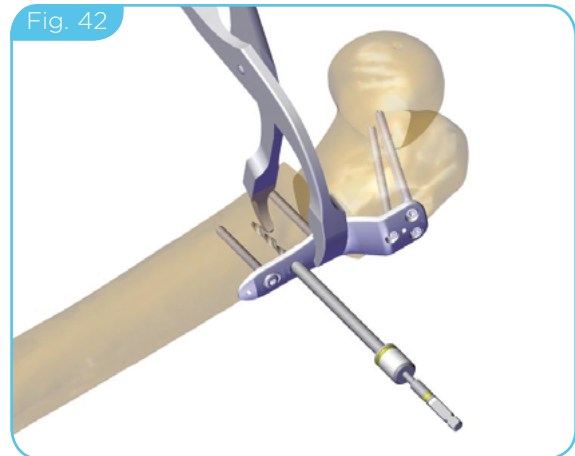
Drilling and measuring and insertion locking screw

Attach the drill guide locking on the locking hole.

Option 1

Using the appropriate drill bit, ensure complete drilling of both cortices (**Fig. 42**). Remove the drill guide locking.

Use the depth gauge with hook to measure screw length.

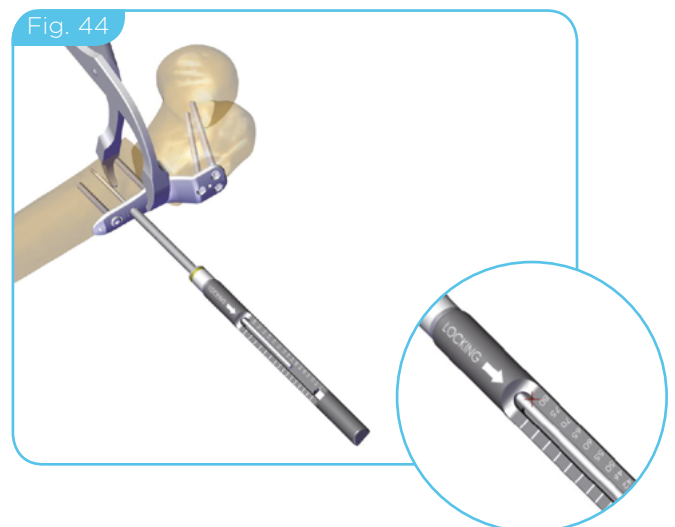
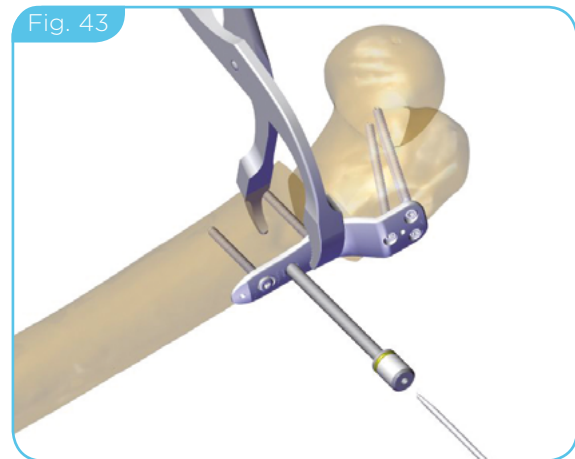


Option 2

Insert the appropriate wire in the drill guide locking and ensure complete drilling of both cortices (**Fig. 43**).

Slide the double measuring device over wire against the drill guide locking. Ensure that the "Locking" side of the double measuring device is visible to determine the screw length (**Fig.44**).

Remove the measuring device, the wire and the drill guide locking.



Screw insertion

Insert the selected locking screw:

Option 1: Manual insertion

Attach the screwdriver to the ratcheting handle and insert the locking screw manually with a two finger technique .

Option 2: Insertion under power

Insert the locking screw partially under power, then complete insertion manually, again with a two finger technique.

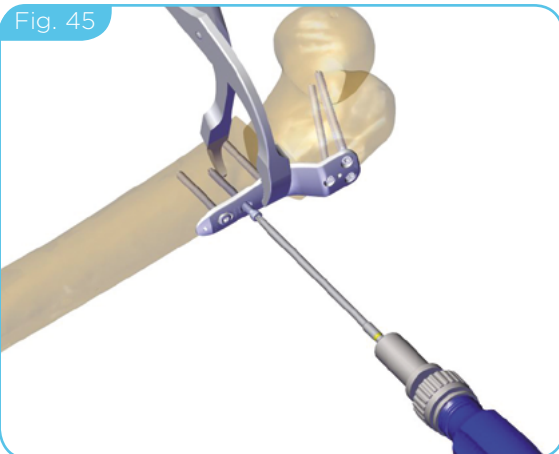
Drill, measure and insert the other shaft screws as described (Fig. 45).



PRECAUTION: Screws must not be over-tightened during insertion, locking or compression, as this may cause damage to the implant, lack of compression or bone stripping. Always perform final tightening manually.



PRECAUTION: Complete each locking screw insertion entirely before inserting the next screw to avoid a possible incorrect engagement of screw on the plate.

**Final fluoroscopic control**

Use the image intensifier to ensure correct plate and screw placement and to confirm planned correction. (Fig. 46).

Removal**3.5mm Plate**

Part#	Description
99-154341	SS T10 EXTRACTION SCREWDRIVER STERILE
99-154338	SS T10-T15 CONICAL EXTRACTOR STERILE

5.0mm Plate

Part#	Description
99-154342	SS T15 EXTRACTION SCREWDRIVER STERILE
99-154338	SS T10-T15 CONICAL EXTRACTOR STERILE

Once the treatment with the plate is complete, the surgeon should decide whether the implant can be removed. Premature removal should be considered in case of adverse events. Remove all screws prior to removing the plate.

The conical extractor has a left-handed thread and should be used if the extraction screwdriver cannot engage the head of the screw. The conical extractor should be inserted and turned anti-clockwise until the screw is extracted (Fig. 47).



Proximal Femur Varus Osteotomy with a 3.0mm Plate

- Pre-operative planning
- Patient positioning and surgical approach
- Measurement of anteversion
- Insertion of the 2.3mm wire for femoral neck proximal screw
- Insertion of the 1.5mm wire for femoral neck proximal screw
- Osteotomy
- Plate positioning
- Measuring and insertion of the femoral neck proximal screw
- Reduction
- Drilling, measuring and insertion of the shaft screws
- Final fluoroscopic control
- Removal

Pre-operative planning

Determination of the correction angle

Measure the current neck-shaft angle and identify the desired neck-shaft angle.

Subtract the desired angle from the current neck-shaft angle to determine the required correction angle (**Fig. 1**).

Example:

Current neck-shaft angle: 150°

Desired neck-shaft angle: 120°

Correction angle: $150^\circ - 120^\circ = 30^\circ$

The complimentary JPS pre-operative planning software could be useful during the planning phase, visualizing the anatomical angles and in simulating the calculation of the correction angle by overlaying the acquired digital radiological image with the most appropriate JPS plate image shapes.

Plate selection

The angle of the plate should be close to the desired neck-shaft angle.

Desired neck-shaft angle: 120°

Suggested plate angle: e.g. 110°

Measuring of the positioning K-wire angle

To determine the K-wire angle, add the chosen plate-screw angle to the previously calculated correction angle.

Example:

Chosen Plate-screw angle: 110°

Required Correction angle: 30°

K-wire angle: $110^\circ + 30^\circ = 140^\circ$

(**Fig. 2**)

Fig. 1

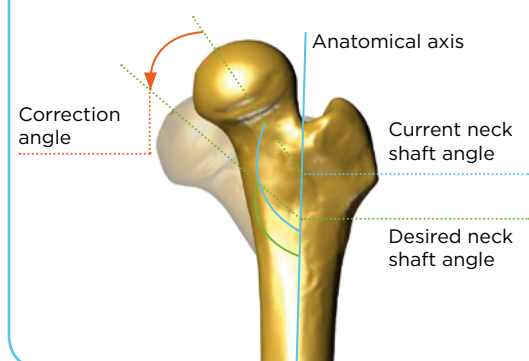
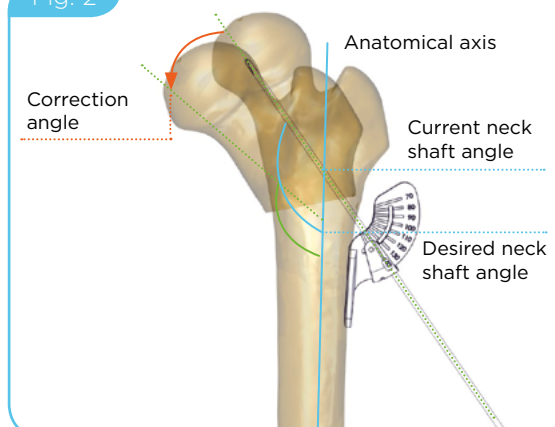


Fig. 2



Patient positioning and surgical approach

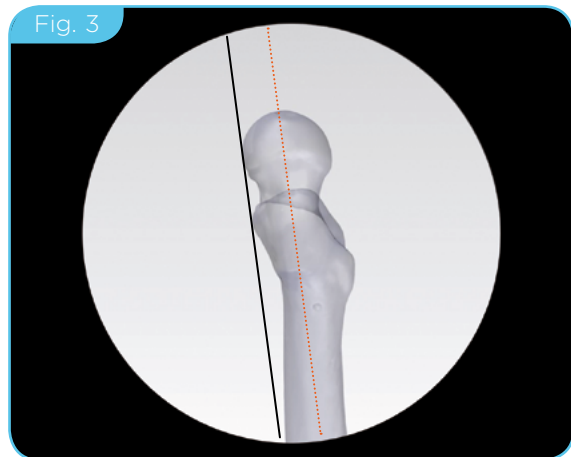
Determination of the correction angle

Position the patient supine; use a standard lateral approach to the proximal femur.

Measurement of anteversion

Part#	Description
001-A-1502P	GUIDE WIRE 1.5MM, 4.0/5.5MM BITE COMPRESSION SCREW (KIT OF 2)

Position a 1.5mm K-wire on the anterior aspect of the neck of the femur to determine anteversion. Under fluoroscopic control, align the K-wire with the central axis of the femoral neck (**Fig.3**).



Insertion of the 2.3mm wire for femoral neck proximal screw

Part#	Description
99-154282	SS GUIDE WIRE D2.3MM L200MM PACK OF 2 STERILE
154305	AL ANGLED WIRE GUIDE 3.0MM PLATE
154780	SS SMALL BONE CLAMP

Set the adjustable angle of the angled wire guide to the previously calculated K-wire angle (**Fig. 4**). Secure the angled wire guide to the femoral shaft with the clamp (**Fig. 5**).

Under fluoroscopic control, insert the posterior positioning K-wire parallel to the anteversion K-wire in the lateral/axial view up to the the middle third of the femoral neck (**Fig. 6**).

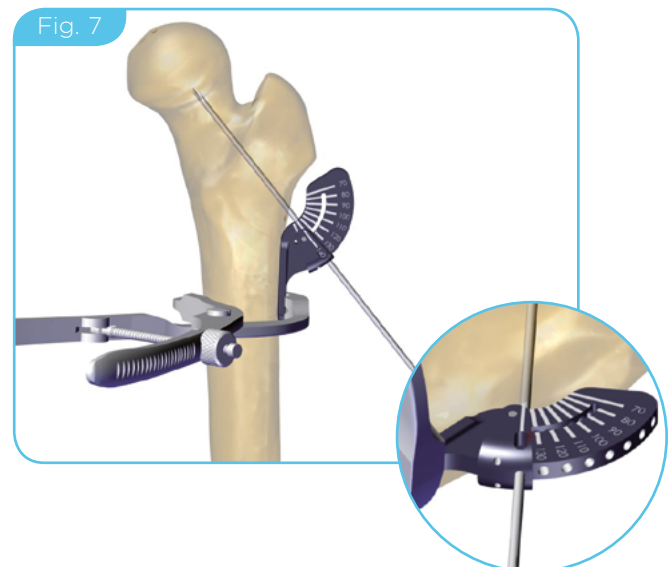
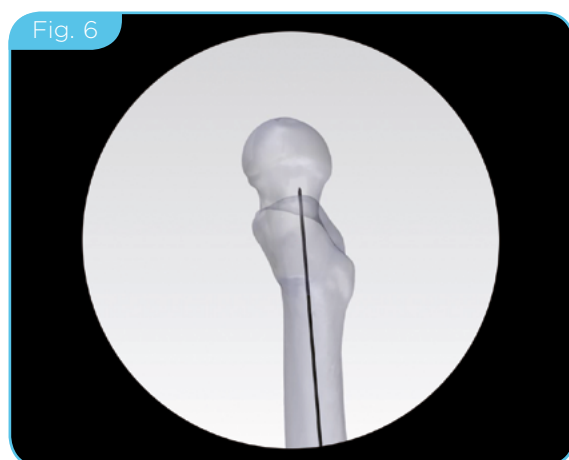
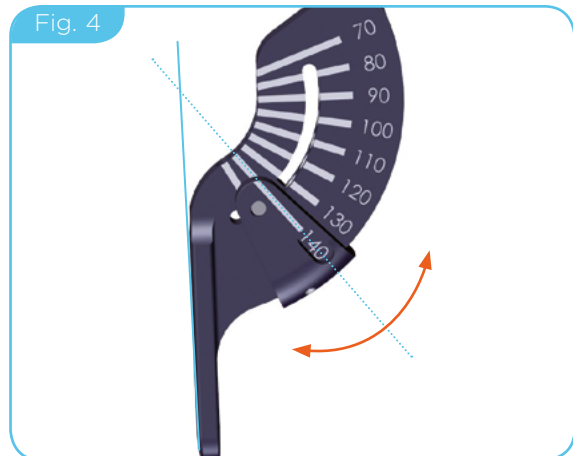
Under fluoroscopic control, insert the 2.3mm wire for the proximal screw in the femoral neck up to within 5.0mm of the femoral head growth plate (**Fig. 7**).

If flexion or extension is not required, the angled wire guide must be parallel to the femoral shaft in the AP and lateral views.

If extension or flexion is required, remove the clamp and rotate the angled wire guide accordingly before inserting the second positioning K-wire (**Fig. 8**).

Re-secure the angled wire guide to the femur shaft with the clamp.

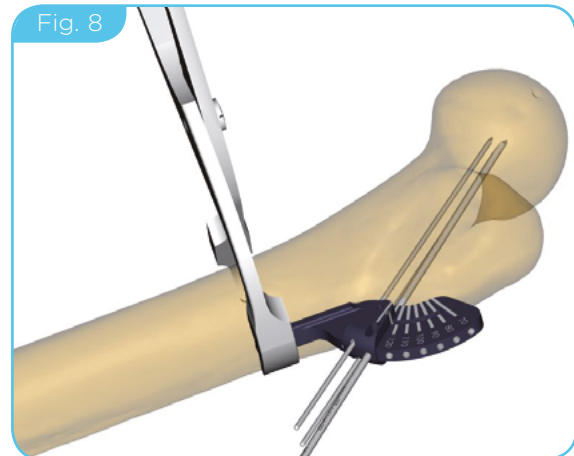
Remove the anteversion K-wire.



Insertion of the 1.5mm wires for femoral neck proximal screw

Part#	Description
001-A-1502P	GUIDE WIRE 1.5MM, 4.0/5.5MM BITE COMPRESSION SCREW (KIT OF 2)

Insert the 1.5mm K-wires in the angled wire guide (**Fig. 8**).



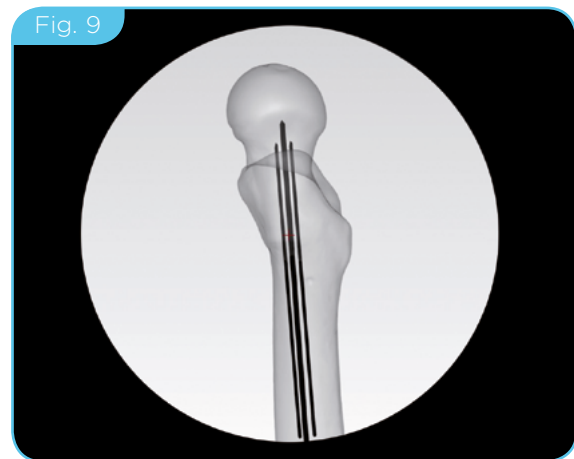
Insert the positioning K-wires up to the middle third of the femoral neck (**Fig. 9**).



PRECAUTION: Use the image intensifier to verify correct placement of the wire and to avoid penetration of the femoral head growth plate.



PRECAUTION: Do not bend wires during insertion especially when flexing the hip in lateral/axial view as this may result in errors in correction or wire breakage.



Remove the angled wire guide (**Fig. 10**).



Osteotomy

Part#	Description
154306	SS OSTEOTOMY GAUGE

Place the appropriate side of the osteotomy gauge against both the positioning K-wires (**Fig. 11**) and mark the distance with the oscillating saw or another sharp instrument onto the bone.



In case of internal/external rotation osteotomy, insert K-wires bicortically in the greater trochanter and in the lateral condyle as guides to control rotation before performing the osteotomy (**Fig. 12**).

Even if no rotation is planned, insertion of two K-wires is recommended to ensure rotational alignment is maintained.

Perform the osteotomy in one cut perpendicular to the femoral shaft.

If a wedge osteotomy is needed, perform the second cut parallel to the 2.3mm wire.

Fig. 12

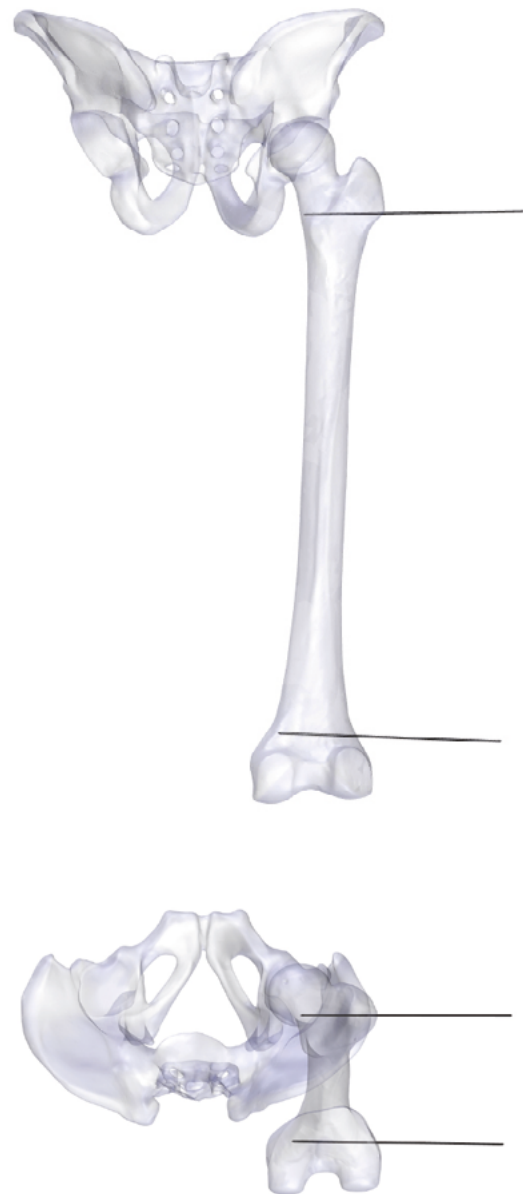


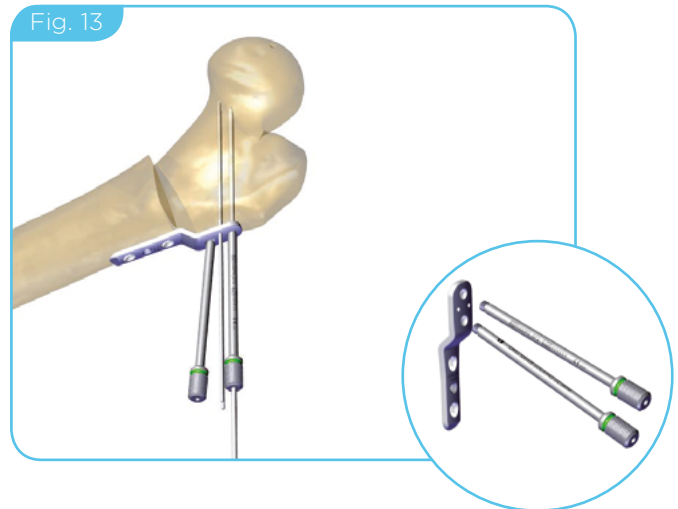
Plate positioning

Part#	Description
154200	SS DRILL GUIDE LOCKING D2.3MM

Fixation of the proximal head/neck fragment is performed with locking screws.

Tighten the drill guide locking into the femoral neck screw holes (see page 17) and slide the plate over the wires (Fig. 13).

If the plate stands out too far, it is helpful to remove a small bone wedge from the lateral cortex at the osteotomy to optimize the position of the plate on the proximal fragment (see page 17 Fig. 22).



Measuring and insertion of the femoral neck proximal screw

Part#	Description
154276	AL DOUBLE MEASURING DEVICE
DH0455CE	MICRO RATCHETING HANDLE WITH AO CONNECTOR CANNULATED
154320	SS T8 RETENTIVE SCREWDRIVER QUICK CONNECT

As the 2.3mm wire already prepares the hole for screw insertion, drilling with a drill bit is not necessary.

Slide the double measuring device over the 2.3mm wire against the drill guide locking. Ensure that the measuring scale is on the "Locking" side to determine the length of the femoral neck proximal screw (Fig. 14).

Remove the measuring device, 2.3mm wire and drill guide locking from the femoral neck proximal screw hole.

Insert the selected locking screw

Option 1: Manual insertion

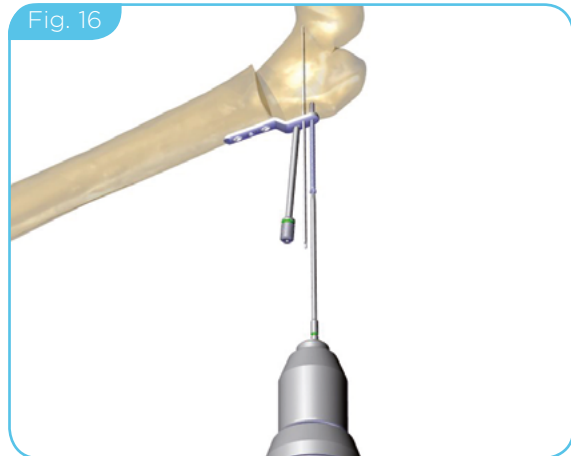
Attach the screwdriver to the ratcheting handle and insert the screw by hand with a two-finger technique (Fig. 15).



Option 2: Insertion under power

Partially insert the locking screw under power, then complete insertion manually with a two finger technique (**Fig. 16**).

Insert the second locking screw, repeating the steps from **page 34**.



PRECAUTION: Screws must not be over-tightened during insertion, locking or compression, as this may cause damage to the implant, lack of compression or bone stripping. Always perform final tightening manually.



PRECAUTION: Use the image intensifier to verify correct placement of the plate, wires and screws and to avoid penetration of the femoral head growth plate.



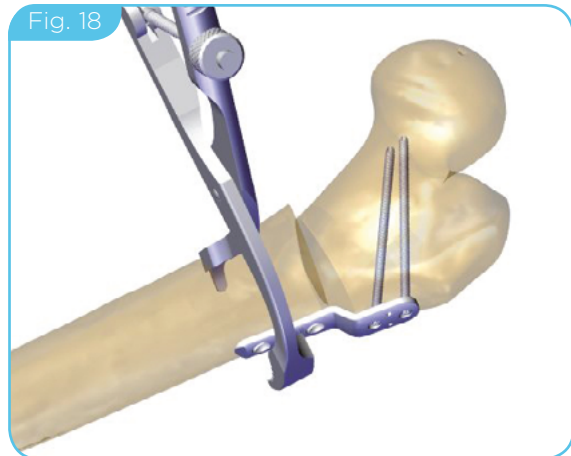
PRECAUTION: Complete each locking screw insertion entirely before inserting the next screw to avoid a possible incorrect engagement of screw on the plate (**Fig. 17**).



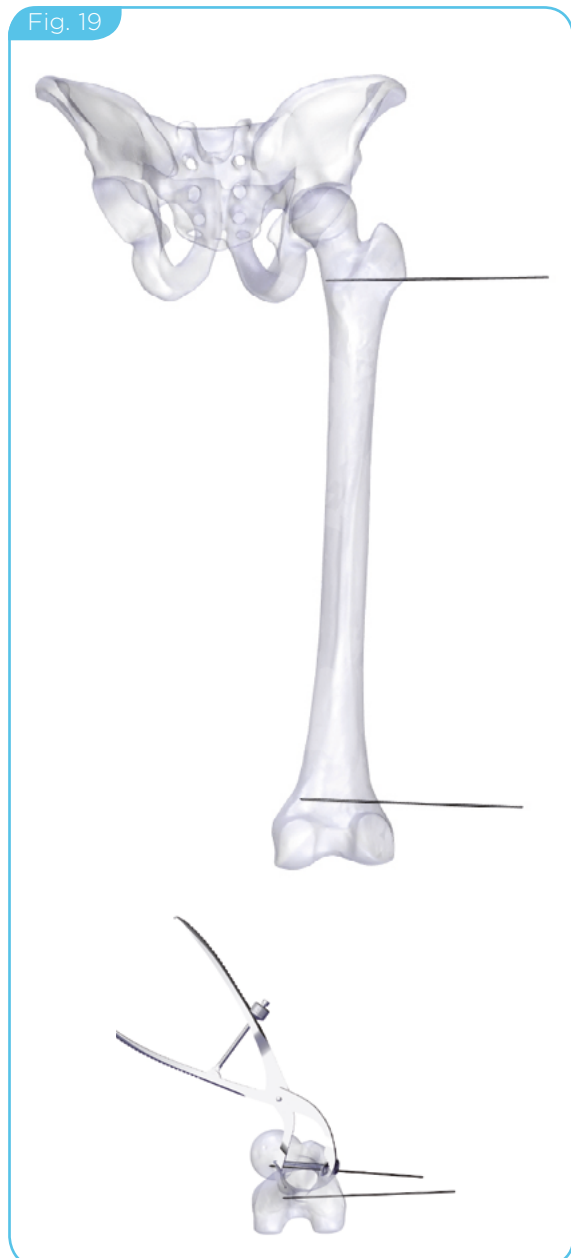
Reduction

Part#	Description
154780	SS SMALL BONE CLAMP

Align the plate parallel with the femoral shaft axis in AP and lateral view and secure it with a clamp (Fig. 18).

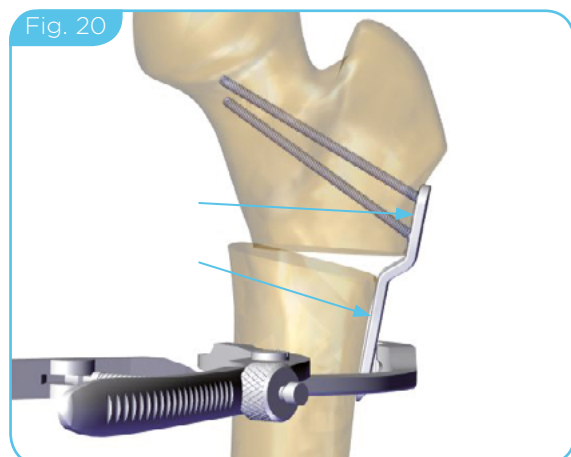


In case of internal/external rotation osteotomy, rotate the distal fragment of the femur until the two rotation K-wires are parallel in axial view. Remove the two rotation K-wires only after shaft screws are inserted (Fig. 19).



WARNING

Ensure to position the plate parallel to the femoral shaft in the AP and lateral view, otherwise this may lead to variations to the desired neck-shaft angle and to undesired extension/flexion. (Fig. 20)



Drilling, measuring and insertion of the shaft screws

Part#	Description
154200	SS DRILL GUIDE LOCKING D2.3MM
99-154282	SS GUIDE WIRE D2.3MM L200MM PACK OF 2 STERILE
154211	SS DRILL GUIDE NON-LOCKING D2.3MM
99-154182	SS DRILL BIT D2.3MM QUICK CONNECT STERILE
002-A-00009	DEPTH GAUGE WITH HOOK
154276	AL DOUBLE MEASURING DEVICE
154780	SS SMALL BONE CLAMP
DH0455CE	MICRO RATCHETING HANDLE WITH AO CONNECTOR CANNULATED
154320	SS T8 RETENTIVE SCREWDRIVER QUICK CONNECT

Locking or non-locking screws can be used in the shaft. If compression is required, insert non-locking screws prior to any locking screw.

Drilling, measuring and insertion of a non-locking screw in a compression hole

To obtain compression, place the drill guide non-locking in the selected compression hole with the arrow oriented towards the osteotomy line (**Fig. 21**).

If compression is not required, place the drill guide non-locking in the selected compression hole with the arrow on the opposite side of the osteotomy line (**Fig. 22**).

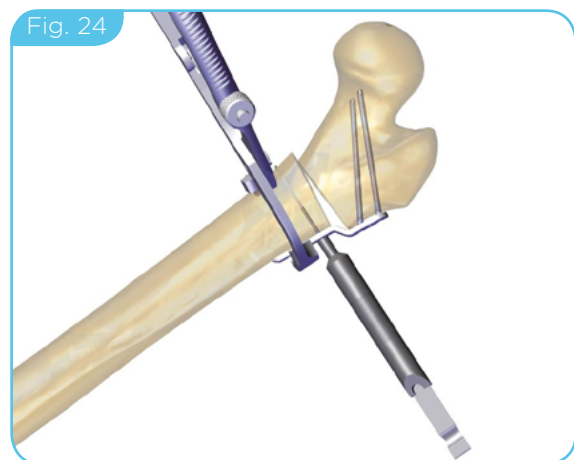
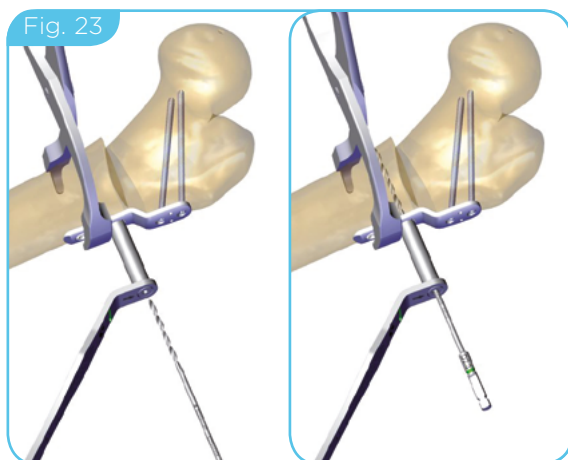
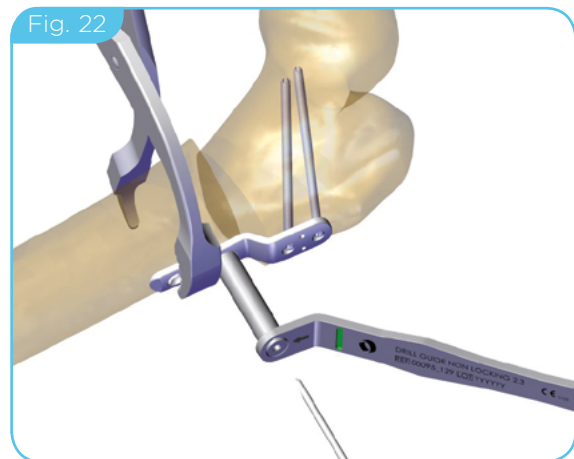
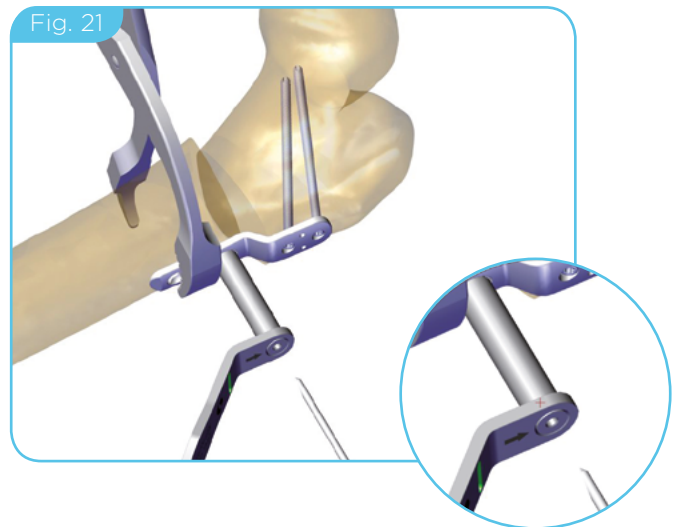
Drilling and measuring

Option 1

Insert the 2.3mm drill bit in the drill guide and ensure complete drilling of both cortices (**Fig. 23**).

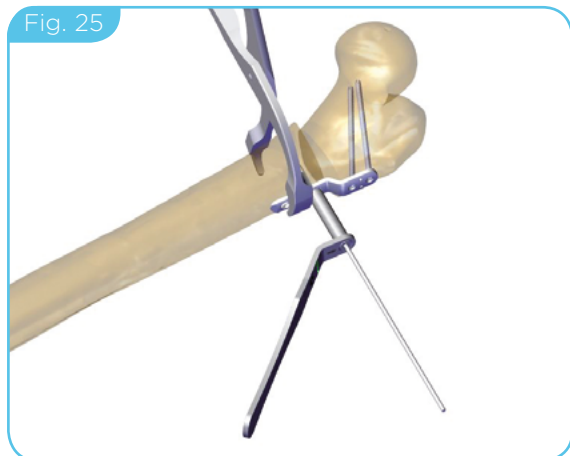
Remove the drill guide non-locking.

Measure screw length (**Fig. 24**) with the depth gauge.



Option 2

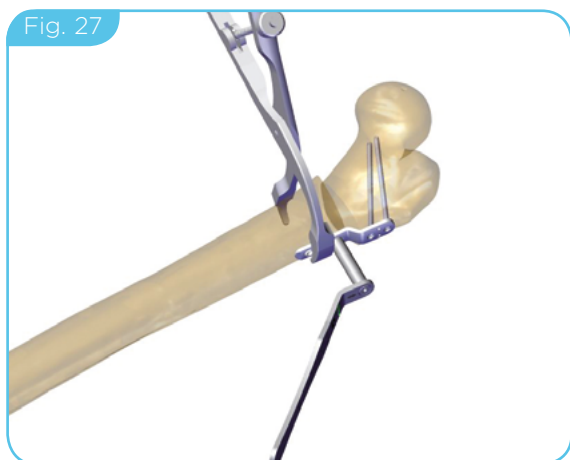
Insert a 2.3mm wire in the drill guide and ensure complete drilling of both cortices (**Fig. 25**).



Measure screw length with the measuring device using the side labelled "non-locking" to determine the length of the screw (**Fig. 26**).

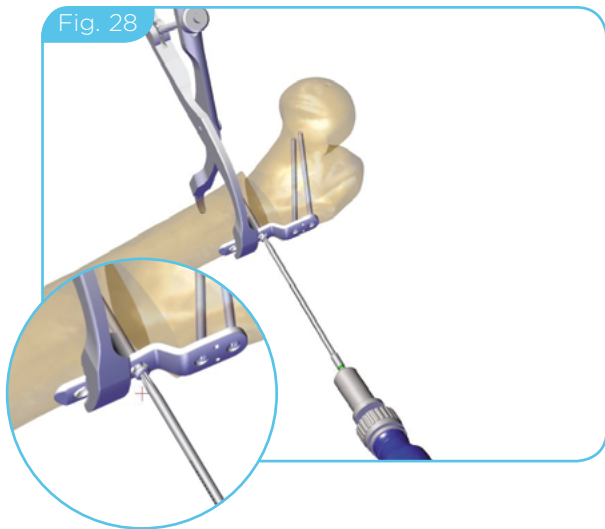


Remove the measuring device, the drill guide and the wire prior to inserting the screw (**Fig. 27**).



Screw insertion

If compression is desired, partially insert the selected non-locking screw into the plate, remove the bone clamp in order to allow compression and then complete screw insertion manually with the two-finger technique (**Fig. 28**).



If compression is not desired, insert the selected non-locking screw as described here below:

Option 1: Manual insertion

Insert the screw by hand with the ratcheting handle, using the two finger technique.

Option 2: Insertion under power

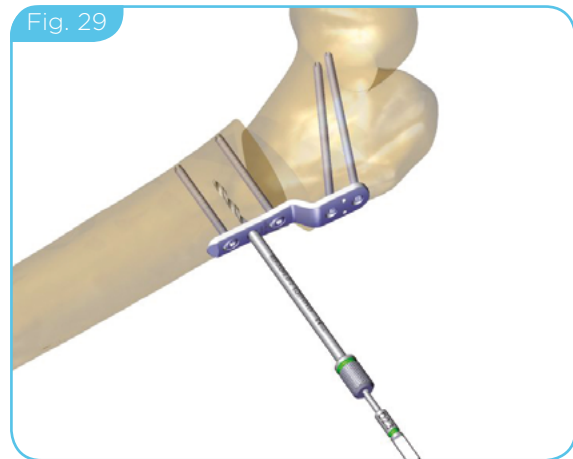
Partially insert the non-locking screw under power, then complete insertion manually with the two finger technique.

Drilling and measuring for locking screws

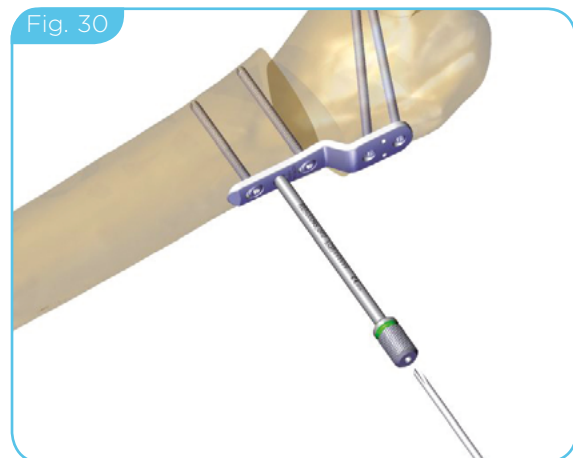
Attach the drill guide locking to the locking hole.

Option 1

Drill and measure the screw hole as before (**Fig. 29**) with the depth gauge.

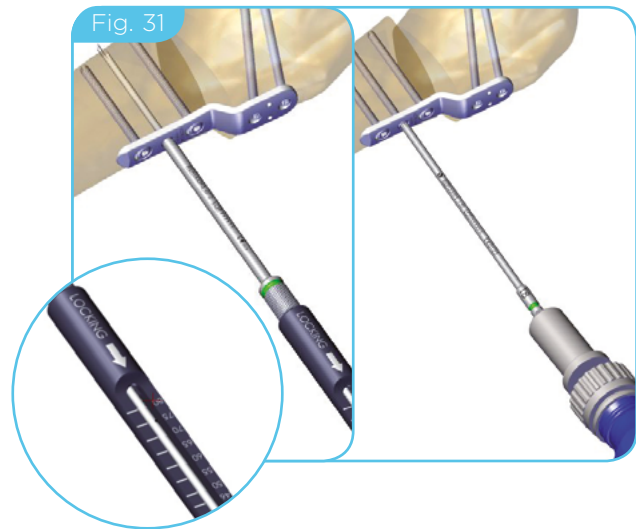
**Option 2**

Insert a 2.3mm wire in the drill guide and ensure complete drilling of both cortices (**Fig. 30**).



Measure screw length with the double measuring device on the “Locking” side (**Fig. 31**).

Remove the measuring device, wire and drill guide locking.



Locking screw insertion

Insert the selected locking screw as described here below

Option 1: Manual insertion

Attach the screwdriver to the ratcheting handle and insert the locking screw manually with a two finger technique.

Option 2: Insertion under power

Partially insert the locking screw under power, then complete insertion manually with a two finger technique

Drill, measure and insert the other shaft screws as just described.



PRECAUTION: Screws must not be over-tightened during insertion, locking or compression, as this may cause damage to the implant, lack of compression or bone stripping. Always perform final tightening manually.



PRECAUTION: Use the image intensifier to ensure complete drilling of both cortices when inserting non-locking screws; to verify correct placement of the plate, wires and screws and to avoid penetration of the femoral head growth plate.



PRECAUTION: Complete each locking screw insertion entirely before inserting the next screw to avoid a possible incorrect engagement of screw on the plate.

Final fluoroscopic control

Use image intensifier to ensure correct plate and screw placement and to confirm planned correction (**Fig. 32**).

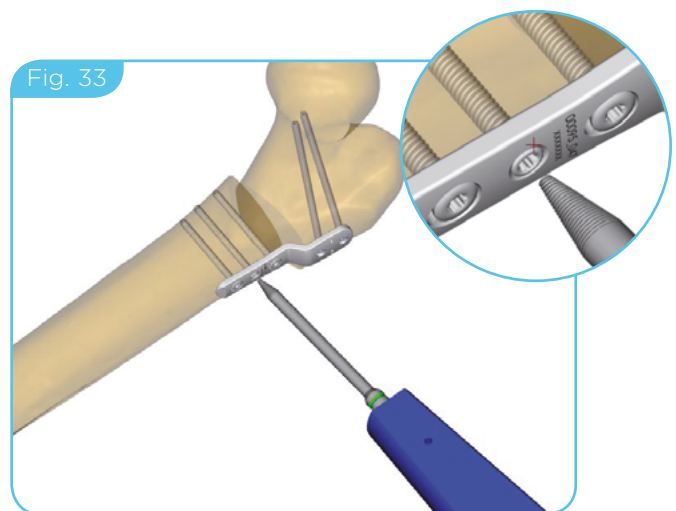


Removal

Part#	Description
99-154340	SS T8 EXTRACTION SCREWDRIVER STERILE
99-154337	SS T8 CONICAL EXTRACTOR STERILE

Once the treatment with the plate is complete, the surgeon should decide whether the implant can be removed. Premature removal should be considered in case of adverse events.

Remove all screws prior to removing the plate. The conical extractor has a left-handed thread and should be used if the extraction screwdriver will not engage the head of the screw. The conical extractor should be inserted and turned anti-clockwise until the screw is extracted (**Fig. 33**).

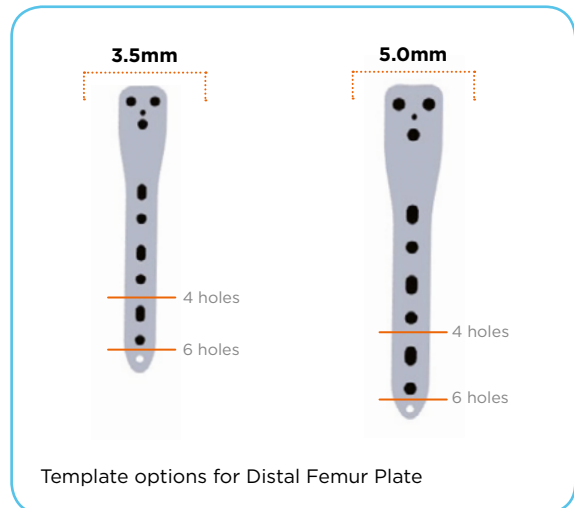


Distal Femur 5.0mm Plate and 3.5mm Plate

- Pre-operative planning
- Patient positioning and surgical approach
- Insertion of the 2.0mm K-wire
- Insertion of the 2.8mm wires
- Osteotomy
- Plate positioning
- Drilling, measuring and insertion of distal screws
- Reduction
- Drilling, measuring and insertion of proximal screws
- Final fluoroscopic control
- Removal

Pre-operative planning

The complimentary JPS pre-operative planning software could be useful during the planning phase, visualizing the anatomical angles and in simulating the calculation of the correction angle by overlaying the acquired digital radiological image with the most appropriate JPS plate image shapes.



Patient positioning and surgical approach

Place the patient in supine position. Use a standard lateral approach to the distal femur reflecting the vastus lateralis anteriorly.

Insertion of the 2.0mm K-wire

Part#	Description
99-154281	SS GUIDE WIRE D2.0MM L200MM PACK OF 2 STERILE

Rotate the leg under image intensifier control until the patella is perfectly anterior and in the midline (**Fig. 1**). After sub-periosteal preparation of the distal femur, place a 2.0mm K-wire extra-periosteally across the front of the femur in the frontal plane, 1cm proximal to growth plate. Check K-wire alignment with the Image Intensifier (**Fig. 2**).

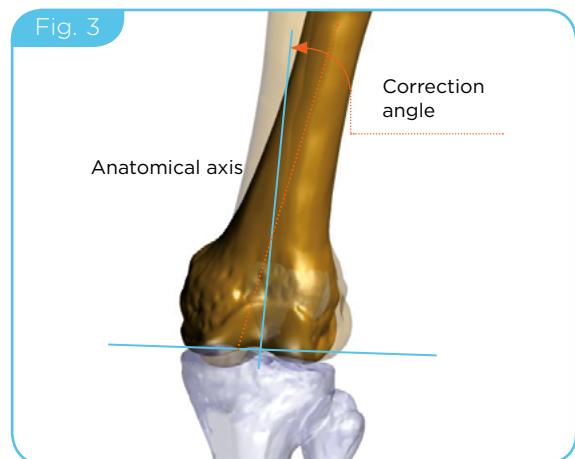
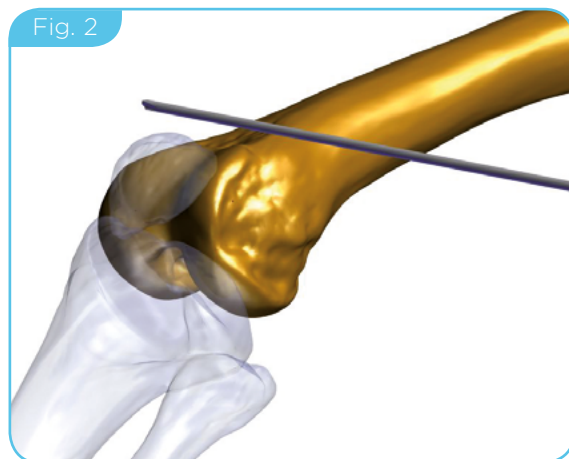
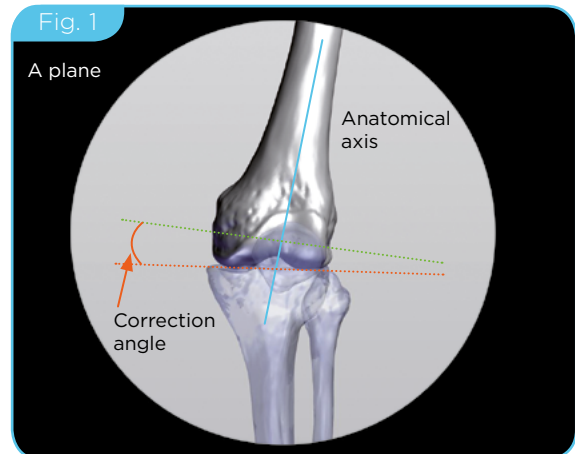
Calculate the correction angle to achieve the desired mechanical axis (**Fig. 3**) See page 9.

Example:

Current Distal femur angle: 75°

Desired Distal femur angle: 81°

Correction angle: 81°-75° = 6°



Insertion of the 2.8mm wires

3.5mm Plate

Part#	Description
99-154281	SS GUIDE WIRE D2.0MM L200MM PACK OF 2 STERILE
99-154283	SS GUIDE WIRE D2.8MM L200MM PACK OF 2 STERILE
154304	AL ANGLED WIRE GUIDE 3.5MM AND 5.0MM PLATES
154215	SS AIMING BLOCK - 3.5MM PLATE
154781	SS LARGE BONE CLAMP

5.0mm Plate

Part#	Description
99-154281	SS GUIDE WIRE D2.0MM L200MM PACK OF 2 STERILE
99-154283	SS GUIDE WIRE D2.8MM L200MM PACK OF 2 STERILE
154304	AL ANGLED WIRE GUIDE 3.5MM AND 5.0MM PLATES
154214	SS AIMING BLOCK - 5.0MM PLATE
154781	SS LARGE BONE CLAMP

The angle of the plate should be close to the desired neck-shaft angle.

Desired neck-shaft angle: 81°

Suggested plate angle: e.g. 90°

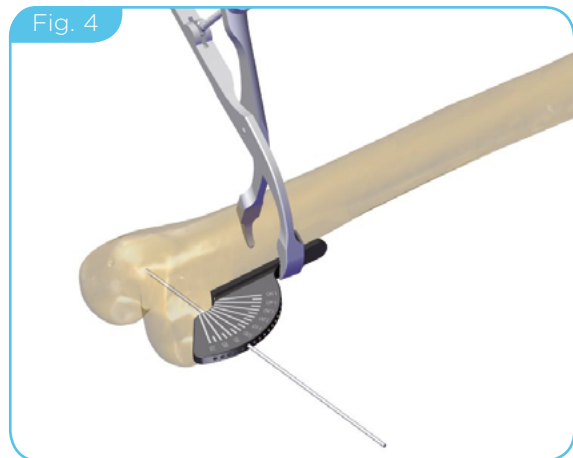
Example:

Chosen Plate-screw angle: 90°s

Required Correction angle: 6°

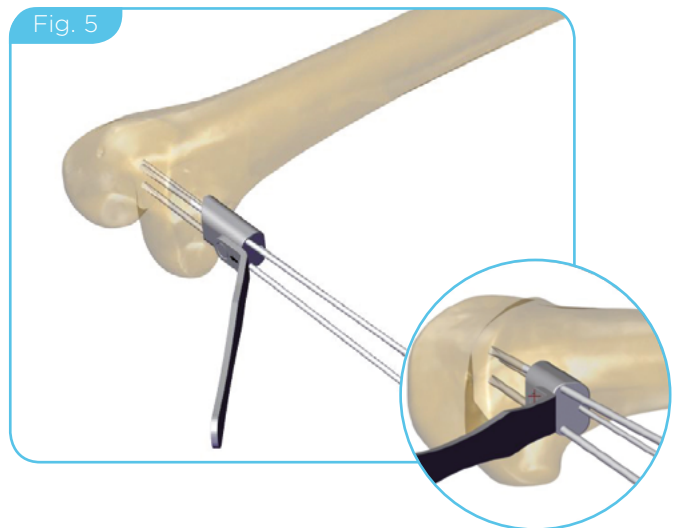
K-wire angle: $90^\circ + 6^\circ = 96^\circ$ (insertion angle 95°)

Insert the 2.0mm K-wire in the slot in the angled wire guide that corresponds to the calculated angle, place it in contact with the femoral shaft and secure the wire guide with the clamp. If flexion or extension is not required, the base of the wire guide must be parallel to the femoral shaft in the AP and lateral views. Under fluoroscopic control, insert the K-wire (**Fig. 4**).



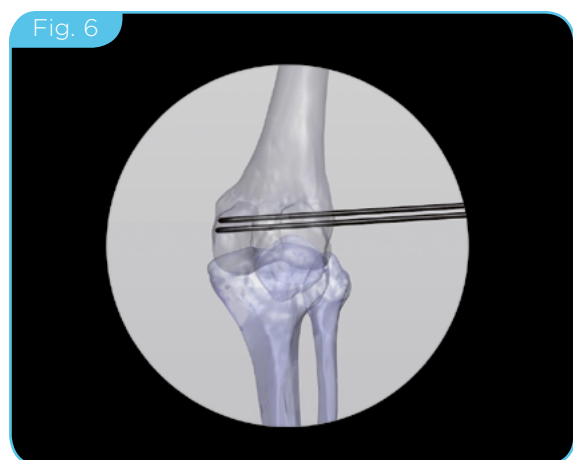
Remove the anterior positioning K-wire, bone clamp and angled wire guide. Slide the appropriate aiming block over the positioning K-wire and insert the two 2.8mm wires (**Fig. 5-6**) using fluoroscopy.

Remove the aiming block.



Osteotomy

Perform the osteotomy as explained on [page 15](#).



In case of internal/external rotation osteotomy, insert K-wires bicortically in the greater trochanter and lateral condyle as guides to control rotation before performing the osteotomy (**Fig. 7**).

Even if no rotation is planned, insertion of two K-wires or making a marking on the bone is recommended to ensure rotational alignment is maintained.

Perform the osteotomy in one cut parallel to the wires.

After the osteotomy these wires will be made parallel to correct the rotational deformity (**Fig. 7**).

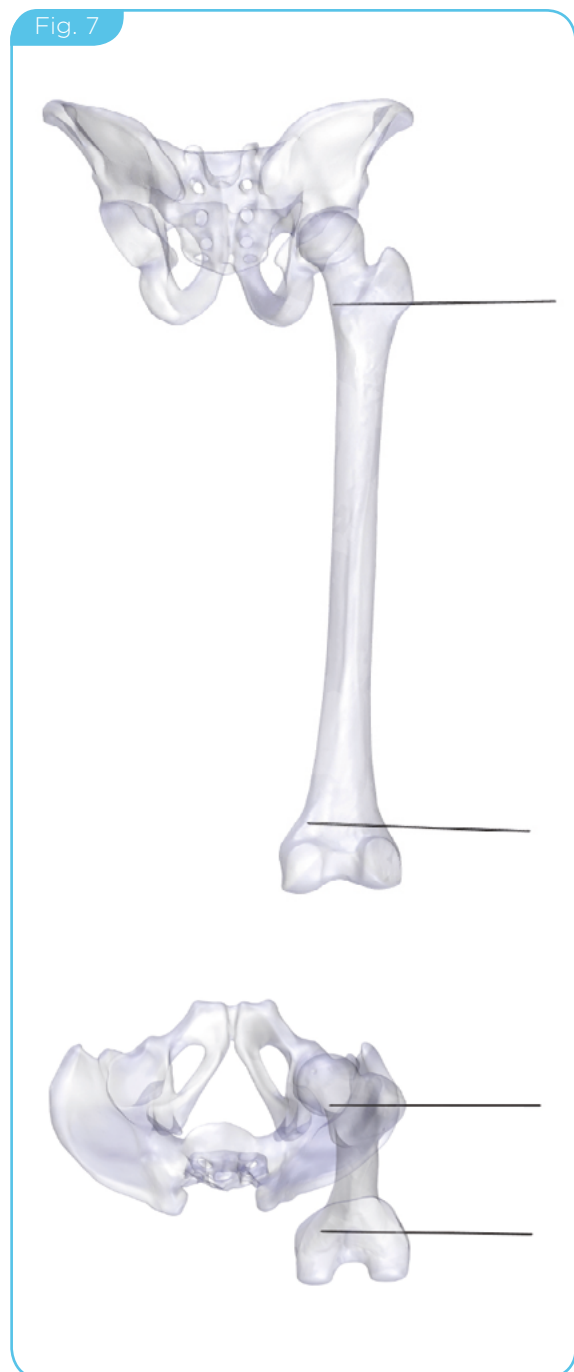


Plate positioning

3.5mm Plate

Part#	Description
154201	SS DRILL GUIDE LOCKING D2.8MM

5.0mm Plate

Part#	Description
154202	SS DRILL GUIDE LOCKING D4.3MM
154203	SS REDUCTION SLEEVE

3.5mm Plate

Tighten the drill guide locking into the two distal screw holes (**Fig. 9**) and slide the plate over the wires.

5.0mm Plate

Tighten the drill guide locking into the two distal screw holes and slide the plate over the wires. Insert the reduction sleeves in the upper 2 drill guide locking (**Fig. 10**).

Fig. 9



3.5mm plate

Fig. 10



5.0mm plate

Drilling, measuring and insertion of distal screws

Instruments for 3.5mm plate

Part#	Description
99-154283	SS GUIDE WIRE D2.8MM L200MM PACK OF 2 STERILE
154201	SS DRILL GUIDE LOCKING D2.8MM
154276	AL DOUBLE MEASURING DEVICE
154321	SS T10 RETENTIVE SCREWDRIVER QUICK CONNECT
DH0455CE	MICRO RATCHETING HANDLE WITH AO CONNECTOR CANNULATED

Instruments for 5.0mm plate

Part#	Description
99-154283	SS GUIDE WIRE D2.8MM L200MM PACK OF 2 STERILE
99-154285	SS GUIDE WIRE D4.3MM L190MM PACK OF 2 STERILE
154202	SS DRILL GUIDE LOCKING D4.3MM
154203	SS REDUCTION SLEEVE
154276	AL DOUBLE MEASURING DEVICE
99-154184	SS DRILL BIT D3.4MM QUICK CONNECT STERILE
99-154185	SS DRILL BIT D4.3MM QUICK CONNECT STERILE
154322	SS T15 RETENTIVE SCREWDRIVER QUICK CONNECT
DH0455CE	MICRO RATCHETING HANDLE WITH AO CONNECTOR CANNULATED

Secure the distal fragment by placing locking screws in the distal aspect of the plate.

Using the appropriate instruments, follow the steps as described at [page 18](#) of Proximal Femur application, “Measuring and insertion of the femoral neck proximal screw”.

Repeat the same steps for the other distal holes ([Fig. 11](#)).



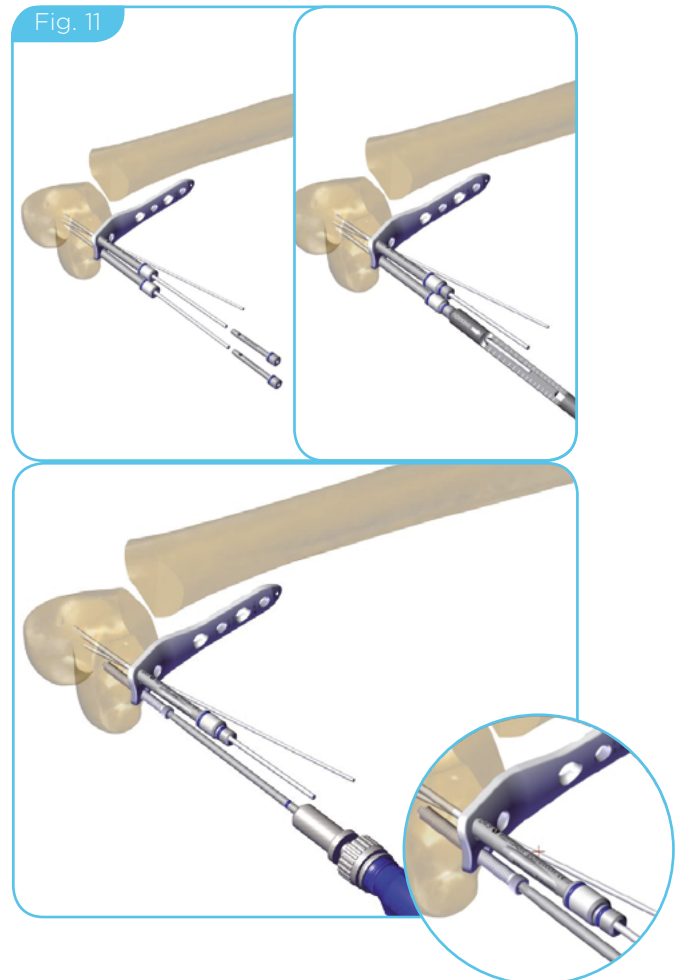
PRECAUTION: Screws must not be over-tightened during insertion, locking as this may cause damage of the implant or bone stripping. Always perform final tightening manually.



PRECAUTION: Use the image intensifier to verify correct placement of the plate, wires and screws.



PRECAUTION: Complete each screw insertion entirely before inserting to the next screw to avoid a possible incorrect engagement of screw on the plate.



Reduction

Instruments for 3.5mm plate

Part#	Description
154780	SS SMALL BONE CLAMP
154033	SS MEDIALIZATION GUIDE BODY 3.5MM
154031	SS MEDIALIZATION GUIDE MECHANISM

Instruments for 5.0mm plate

Part#	Description
154781	SS LARGE BONE CLAMP
154034	SS MEDIALIZATION GUIDE BODY 5.0MM
154031	SS MEDIALIZATION GUIDE MECHANISM

Align the plate parallel with the femoral shaft axis in AP and lateral view and secure it with the clamp (Fig. 12).

Medialization can be performed prior to locking the proximal part of the plate to the bone.

Insert the SS Medialization Guide Mechanism into the SS Medialization Guide Body 3.5mm (for the 3.5mm plate) or the SS Medialization Guide Body 5.0mm (for the 5.0mm plate) and screw the medialization guide into the distal locking screw hole.

(Fig. 13).

Turn the knob clockwise until the desired amount of medialization is achieved (Fig. 14-15).

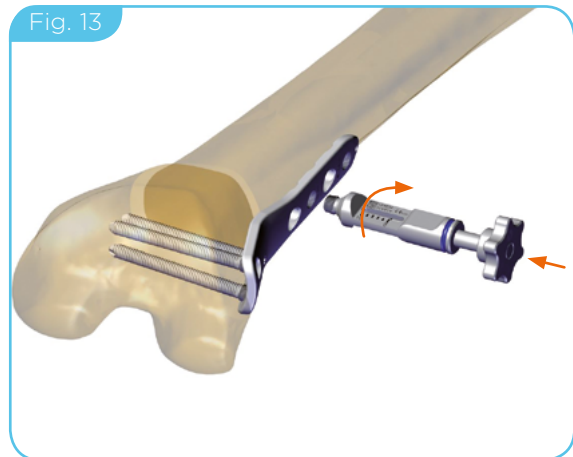
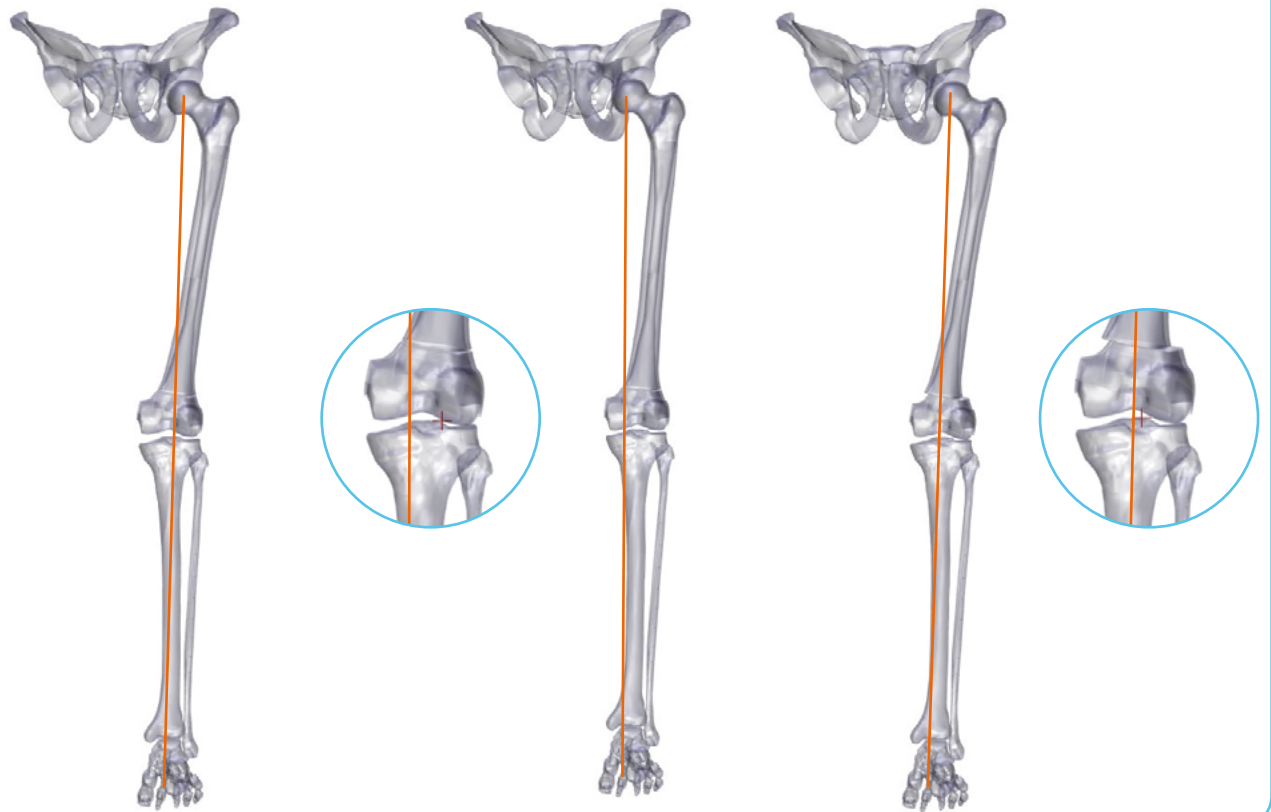


Fig. 15



Drilling, measuring and insertion of proximal screws

3.5mm plate

Part#	Description
154201	SS DRILL GUIDE LOCKING D2.8MM
99-154283	SS GUIDE WIRE D2.8MM L200MM PACK OF 2 STERILE
154212	SS DRILL GUIDE NON-LOCKING D2.8MM
99-154183	SS DRILL BIT D2.8MM QUICK CONNECT STERILE
002-A-00009	DEPTH GAUGE WITH HOOK
154276	AL DOUBLE MEASURING DEVICE
154780	SS SMALL BONE CLAMP
DH0455CE	MICRO RATCHETING HANDLE WITH AO CONNECTOR CANNULATED
154321	SS T10 RETENTIVE SCREWDRIVER QUICK CONNECT

5.0mm plate

Part#	Description
154202	SS DRILL GUIDE LOCKING D4.3MM
99-154284	SS GUIDE WIRE D3.4MM L200MM PACK OF 2 STERILE
154213	SS DRILL GUIDE NON-LOCKING D3.4MM
99-154184	SS DRILL BIT D3.4MM QUICK CONNECT STERILE
002-A-00009	DEPTH GAUGE WITH HOOK
154276	AL DOUBLE MEASURING DEVICE
154781	SS LARGE BONE CLAMP
DH0455CE	MICRO RATCHETING HANDLE WITH AO CONNECTOR CANNULATED
154322	SS T15 RETENTIVE SCREWDRIVER QUICK CONNECT

Secure the proximal fragment by placing locking or non-locking screws in the proximal fragment. If compression is required, insert non-locking screws prior to any locking screw.

Using the appropriate instrument drill, measure and insert proximal screw as described on [page 22](#) of the Proximal Femur application (Drilling, measuring and insertion of the shaft screws).

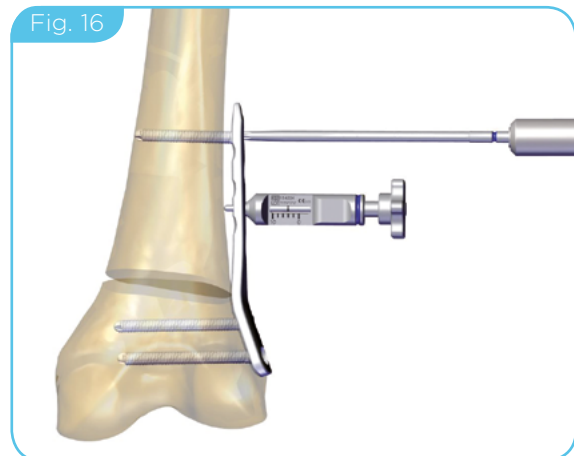


PRECAUTION: Screws must not be over-tightened during insertion, locking or compression, as this may cause damage to the implant, lack of compression or bone stripping. Always perform final tightening manually.

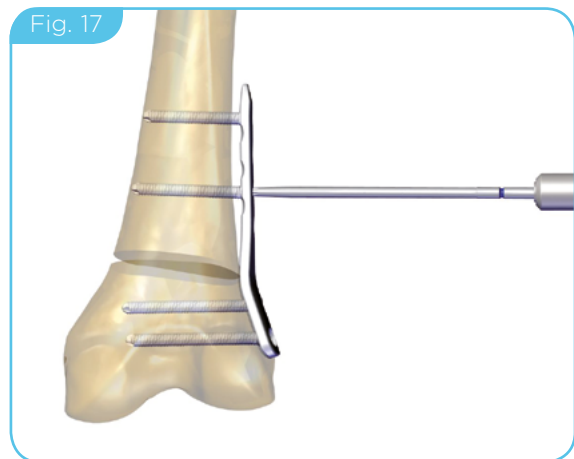


PRECAUTION: Use the image intensifier to ensure complete drilling of both cortices when inserting non-locking screws to verify correct placement of the plate, wires and screws.

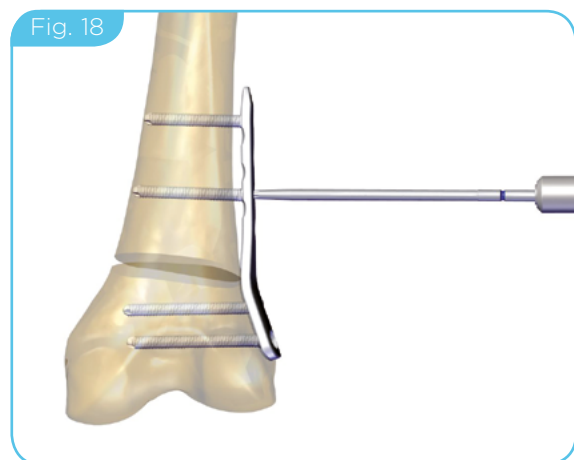
Insert a locking screw in the most proximal screw hole as previously described on [page 37 \(Fig. 16\)](#).



Remove the medialization guide and insert a locking screw in its place ([Fig. 17](#)).



Insert all other locking screws as previously described ([Fig. 18](#)).



Final fluoroscopic control

Use image intensifier to ensure correct plate and screw placement and to confirm planned correction (**Fig. 19**).

Fig. 19



Removal

3.5mm Plate

Part#	Description
99-154341	SS T10 EXTRACTION SCREWDRIVER STERILE
99-154338	SS T10-T15 CONICAL EXTRACTOR STERILE

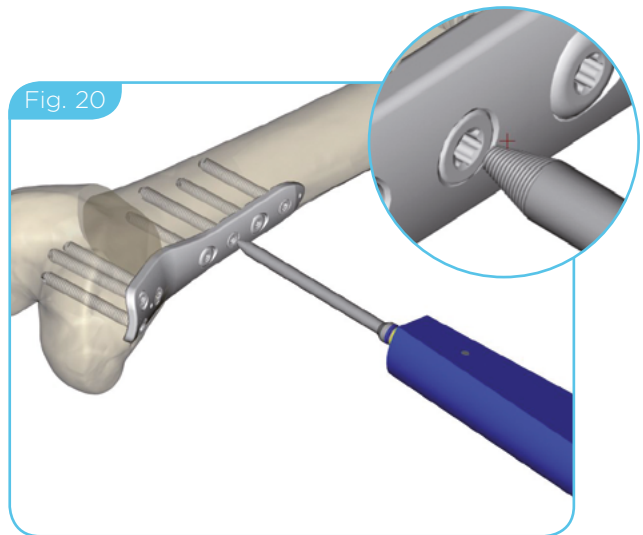
5.0mm Plate

Part#	Description
99-154342	SS T15 EXTRACTION SCREWDRIVER STERILE
99-154338	SS T10-T15 CONICAL EXTRACTOR STERILE

Once the treatment with the plate is complete, the surgeon should decide whether the implant can be removed. Premature removal should be considered in case of adverse events. Remove all screws prior to removing the plate.

The conical extractor has a left-handed thread and should be used if the extraction screwdriver cannot engage the head of the screw. The conical extractor should be inserted and turned anti-clockwise until the screw is extracted (**Fig. 20**).

Fig. 20



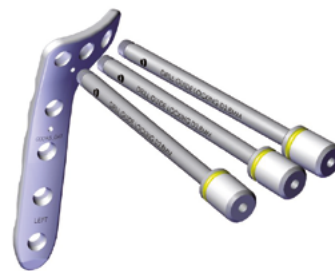
Proximal Tibia Fracture Fixation with a 3.5mm Anterolateral Plate

- Pre-operative planning
- Patient positioning
- Fracture reduction
- Plate positioning
- Measuring and insertion of the proximal screws
- Plateau to shaft reduction
- Drilling, measuring and insertion of shaft screws
- Final fluoroscopic control
- Removal

Pre-operative planning

Determine plate length, screw placement and screw length to ensure proper screw placement in the metaphysis.

The complimentary JPS pre-operative planning software may be useful during the planning phase, visualizing the anatomical angles and in simulating the calculation of the correction angle by overlaying the acquired digital radiological image with the most appropriate JPS plate image shapes.



Patient positioning

Place the patient in the supine position and expose the surgical site.

Fracture reduction

Reduce the fracture fragments and verify optimal reduction by using the image intensifier.

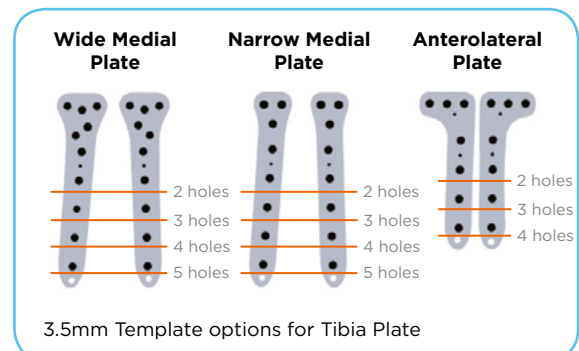


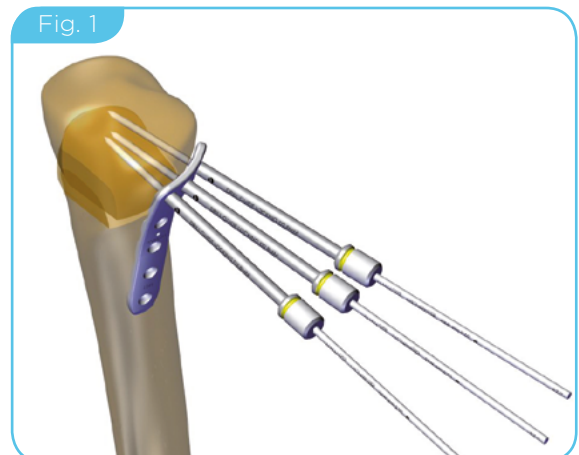
Plate positioning

Part#	Description
154201	SS DRILL GUIDE LOCKING D2.8MM
99-154283	SS GUIDE WIRE D2.8MM L200MM PACK OF 2 STERILE

Attach the drill guide locking in the three proximal screw holes and then place the plate on the tibial plateau. Do not reduce the distal portion of the fragment at this stage. Insert three 2.8mm wires in the proximal holes (**Fig. 1**).



PRECAUTION: Use the image intensifier to verify correct placement of the plate, wires and screws and to avoid penetration of the proximal tibial growth plate.



Measuring and insertion of the proximal screws

Part#	Description
154276	AL DOUBLE MEASURING DEVICE
DH0455CE	MICRO RATCHETING HANDLE WITH AO CONNECTOR CANNULATED
154321	SS T10 RETENTIVE SCREWDRIVER QUICK CONNECT

As the 2.8mm wire already prepares the hole for screw insertion, drilling with a drill bit is not necessary.

Slide the double measuring device over the 2.8mm wire against the drill guide locking. Ensure that the double measuring device is on the "Locking" side to determine the length of the screw (Fig. 2). If the length measured is between two readings, choose the most appropriate screw length for the procedure being performed.

Remove the double measuring device, the wire and the drill guide locking.

Use the appropriate instruments and following the steps described at page 18 of the Proximal femur 3.5mm plate application (drilling, measuring and locking screw insertion) insert the proximal locking screws (Fig. 3).



PRECAUTION: Screws must not be over-tightened during insertion, as this may cause damage to the implant or bone stripping. Always perform final tightening manually.



PRECAUTION: Use the image intensifier to verify correct placement of the plate, wires and screws and to avoid penetration of the proximal tibial growth plate.



PRECAUTION: Complete each locking screw insertion entirely before inserting the next screw to avoid a possible incorrect engagement of screw on the plate.

Plateau to shaft reduction

Part#	Description
154780	SS SMALL BONE CLAMP

Reduce the tibial plateau to the diaphysis and secure it to the plate with the bone clamp (Fig. 4).

Fig. 2

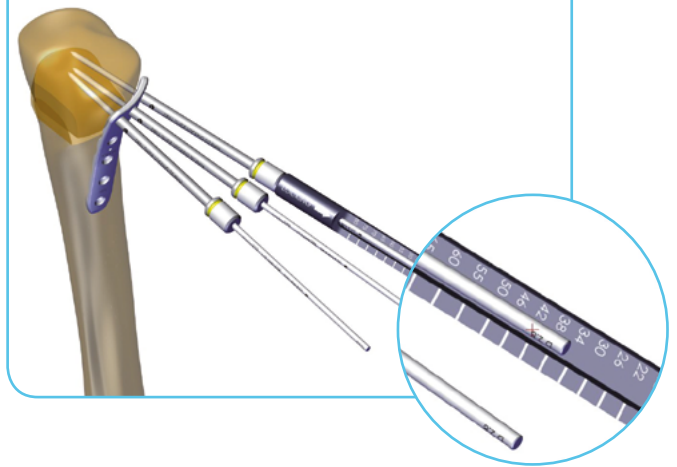
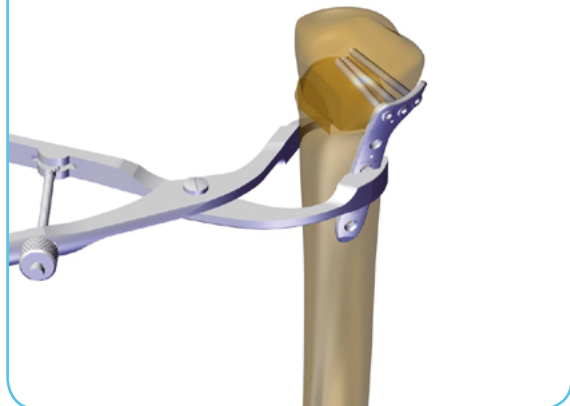


Fig. 3



Fig. 4



Drilling, measuring and insertion of shaft screws

Part#	Description
002-A-00009	DEPTH GAUGE WITH HOOK
99-154183	SS DRILL BIT D2.8MM QUICK CONNECT STERILE
154276	AL DOUBLE MEASURING DEVICE
154201	SS DRILL GUIDE LOCKING D2.8MM
99-154283	SS GUIDE WIRE D2.8MM L200MM PACK OF 2 STERILE
DH0455CE	MICRO RATCHETING HANDLE WITH AO CONNECTOR CANNULATED
154321	SS T10 RETENTIVE SCREWDRIVER QUICK CONNECT

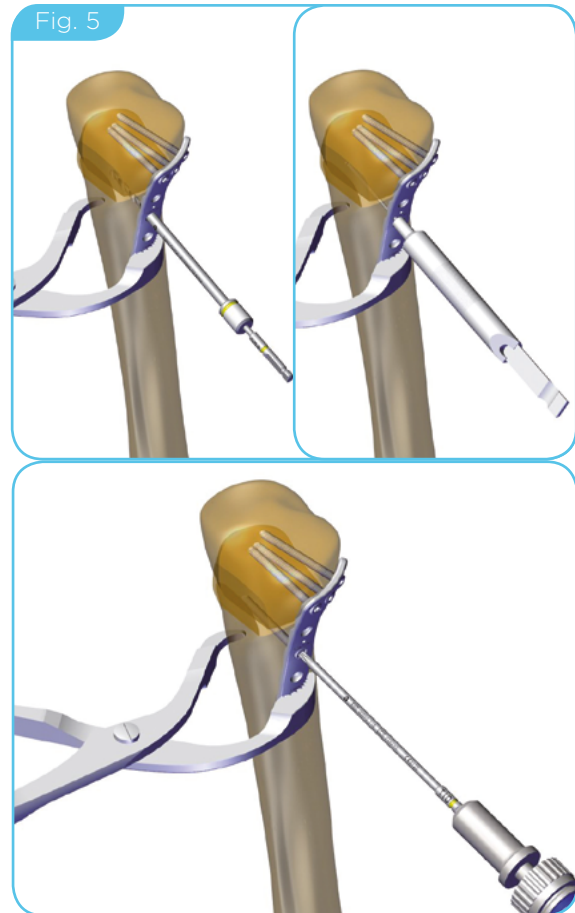
Using the appropriate instrument drill, measure and insert proximal screw as described on [page 26](#) “Drilling, measuring and insertion of a locking screw in a locking hole” of the proximal femur application ([Fig. 5](#)).



PRECAUTION: Screws must not be over-tightened during insertion, locking or compression, as this may cause damage to the implant, lack of compression or bone stripping. Always perform final tightening manually.



PRECAUTION: Use the image intensifier to ensure complete drilling of both cortices when inserting locking screws, to verify correct placement of the plate, wires and screws and to avoid penetration of the proximal tibial growth plate.



Final fluoroscopic control

Use the image intensifier to confirm correct screw and plate placement (**Fig. 6**).



Removal

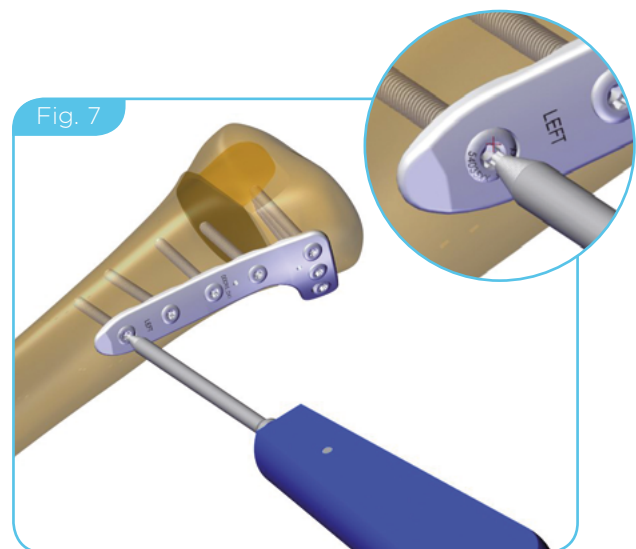
3.5mm Plate

Part#	Description
99-154341	SS T10 EXTRACTION SCREWDRIVER STERILE
99-154338	SS T10-T15 CONICAL EXTRACTOR STERILE

Once the treatment with the plate is complete, the surgeon should decide whether the implant can be removed. Premature removal should be considered in case of adverse events.

Remove all screws prior to removing the plate.

The conical extractor has a left-handed thread and should be used in case the extraction screwdriver cannot engage the head of the screw. The conical extractor should be inserted and turned anti-clockwise until the screw is extracted (**Fig. 7**).



Distal Tibia Rotation Osteotomy with a 3.5mm Plate

- Patient positioning and surgical approach
- Plate selection
- Placement of derotation pins and osteotomy
- Drilling, measuring and insertion of distal screws
- Drilling, measuring and insertion of proximal screws
- Final Fluoroscopic control
- Removal

Patient positioning and surgical approach

Place the patient in supine position.

Option 1

Identify and locate the distal tibial physis using fluoroscopy and mark the location of the incision. Make a longitudinal incision anteromedially, with the distal end of the incision at the level of the physis. Alternatively, a transverse incision can be made at the level of the preplanned osteotomy. Identify and protect the saphenous vein. Make a longitudinal incision in the periosteum. Begin 1.5cm proximal to the physis and proceed as far proximal as the incision allows. Complete subperiosteal dissection.

Option 2

Make a transverse incision at the level of the pre-planned osteotomy. Incise the periosteum longitudinally, beginning 1.5cm proximal to the physis and proceeding as far proximal as the incision allows. Complete subperiosteal dissection.

When making the incisions, identify and protect the saphenous vein.

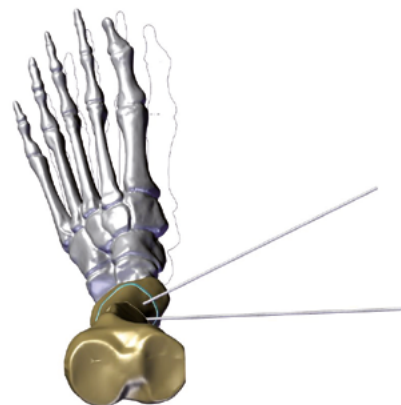
Plate selection

The complimentary JPS pre-operative planning software may be useful during the planning phase, visualizing the anatomical angles and in simulating the calculation of the correction angle by overlaying the acquired digital radiological image with the most appropriate JPS plate image shapes.

Placement of derotation pins and osteotomy

Place derotation K-wires proximal and distal to the planned osteotomy to identify rotation deformity. Both wires should be orthogonal to the tibial axis and parallel to the ankle joint (**Fig. 1**).

Fig. 1

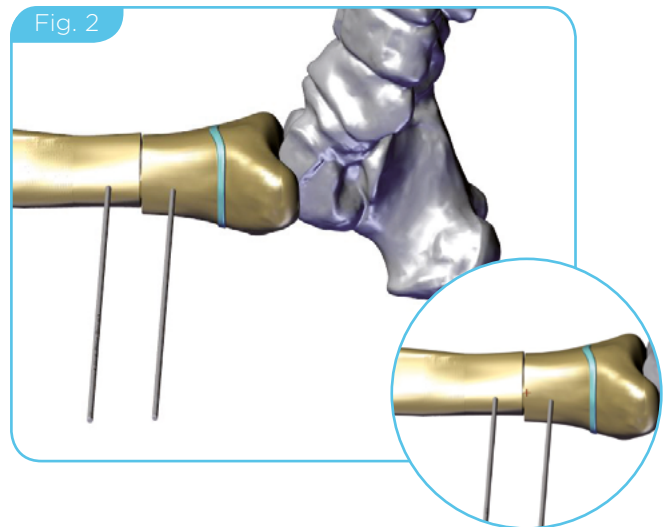


Perform the osteotomy 1cm proximal to the physis. A diaphyseal fibular osteotomy is recommended to assist the derotation when the correction angle is greater than 20°. Derotate the distal fragment by aligning the derotation pins in the same plane (Fig. 2).



WARNING

The osteotomy must be parallel to the physis and perpendicular to the longitudinal axis of the tibia; otherwise, derotation will lead to angular deformity.



Drilling, measuring and insertion of distal screws

Part#	Description
002-A-00009	DEPTH GAUGE WITH HOOK
154201	SS DRILL GUIDE LOCKING D2.8MM
99-154183	SS DRILL BIT D2.8MM QUICK CONNECT STERILE
99-154283	SS GUIDE WIRE D2.8MM L200MM PACK OF 2 STERILE
154276	AL DOUBLE MEASURING DEVICE
DH0455CE	MICRO RATCHETING HANDLE WITH AO CONNECTOR CANNULATED
154321	SS T10 RETENTIVE SCREWDRIVER QUICK CONNECT

Secure the distal fragment by placing locking screws in the distal aspect of the plate. Attach the drill guide locking to the locking hole. Use the appropriate instruments and following the steps described on [page 26](#) of the proximal femur 3.5mm plate application (drilling, measuring and insertion locking screw) to insert the locking screws (Fig. 3).



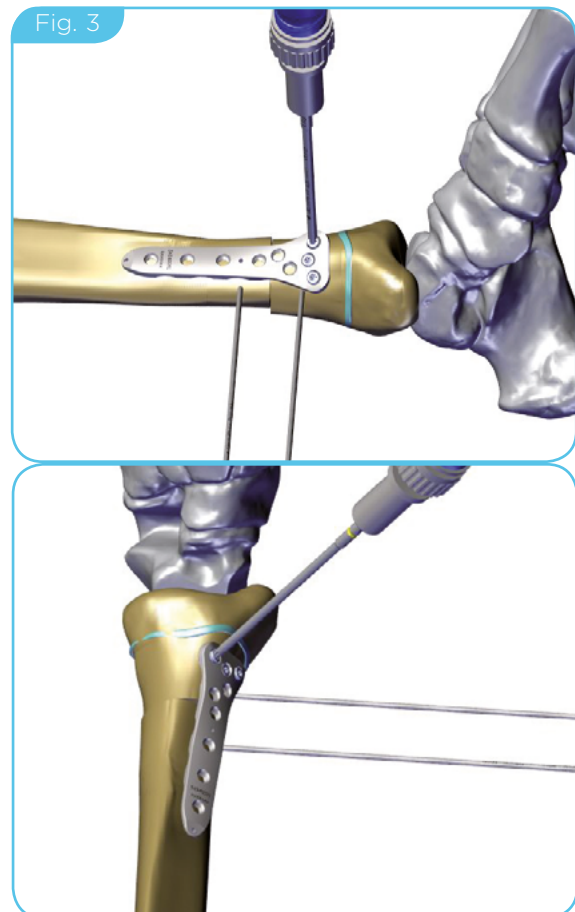
PRECAUTION: Screws must not be over-tightened during insertion or locking, as this may cause damage to the implant or bone stripping. Always perform final tightening manually.



PRECAUTION: Use the image intensifier to verify correct placement of the plate, wires and screws and to avoid penetration of the distal tibia growth plate.



PRECAUTION: Complete each locking screw insertion entirely before inserting the next screw to avoid a possible incorrect engagement of screw on the plate.



Drilling, measuring and insertion of proximal screws

Part#	Description
002-A-00009	DEPTH GAUGE WITH HOOK
154276	AL DOUBLE MEASURING DEVICE
154201	SS DRILL GUIDE LOCKING D2.8MM
99-154283	SS GUIDE WIRE D2.8MM L200MM PACK OF 2 STERILE
DH0455CE	MICRO RATCHETING HANDLE WITH AO CONNECTOR CANNULATED
154321	SS T10 RETENTIVE SCREWDRIVER QUICK CONNECT

Using the appropriate instrument drill, measure and insert proximal screws as described on [page 26](#) "Drilling, measuring and insertion of a locking screw in a locking hole" of the proximal femur application ([Fig. 4](#)).



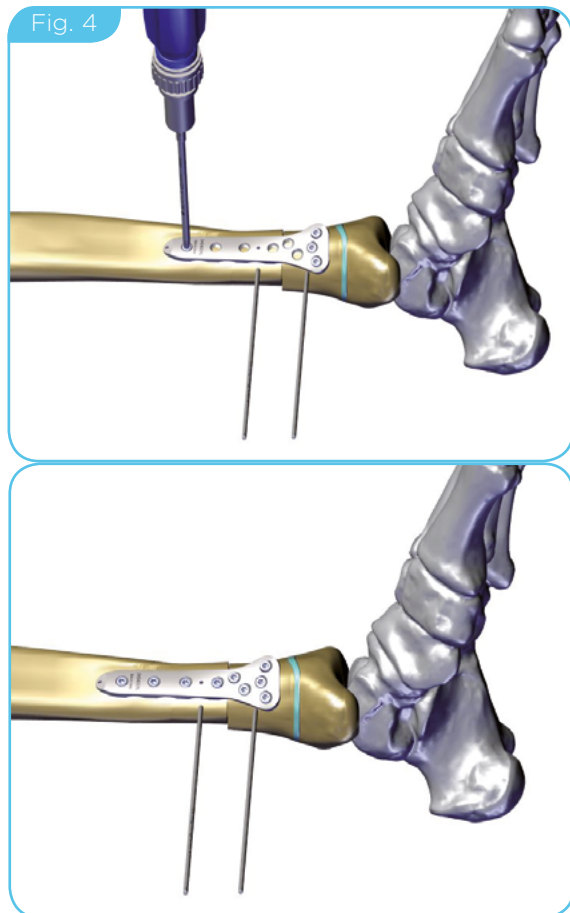
PRECAUTION: Screws must not be over-tightened during insertion, as this may cause damage to the implant or bone stripping. Always perform final tightening manually.



PRECAUTION: Use the image intensifier to ensure complete drilling of both cortices when inserting locking screws, to verify correct placement of the plate, wires and screws and to avoid penetration of the distal tibia growth plate.

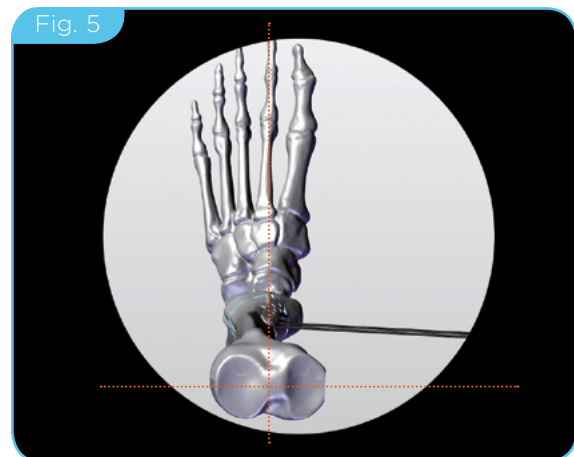


PRECAUTION: Complete each locking screw insertion entirely before inserting the next screw to avoid a possible incorrect engagement of screw on the plate.



Final fluoroscopic control

Use image intensifier to ensure correct plate and screw placement and to confirm planned correction (**Fig. 5**).



Removal

3.5mm Plate

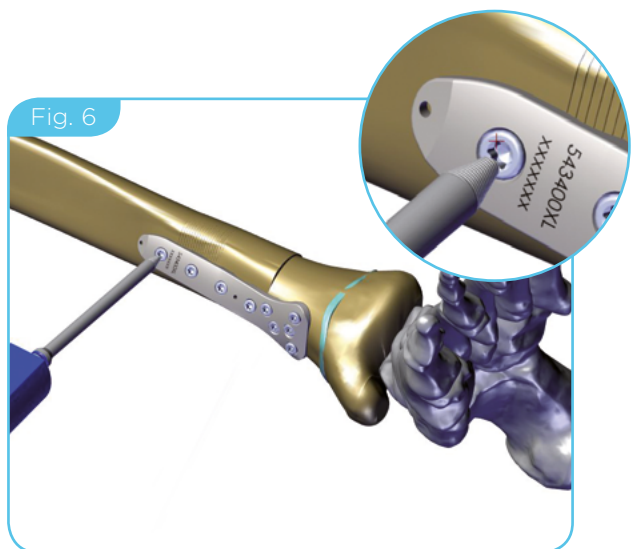
Part#	Description
99-154341	SS T10 EXTRACTION SCREWDRIVER STERILE
99-154338	SS T10-T15 CONICAL EXTRACTOR STERILE

5.0mm Plate



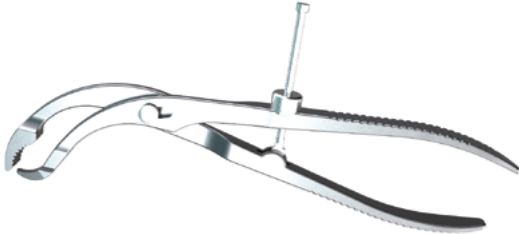
Part#	Description
99-154342	SS T15 EXTRACTION SCREWDRIVER STERILE
99-154338	SS T10-T15 CONICAL EXTRACTOR STERILE

Once the treatment with the plate is complete, the surgeon should decide whether the implant can be removed. Premature removal should be considered in case of adverse events. Remove all screws prior to removing the plate.





The conical extractor has a left-handed thread and should be used if the extraction screwdriver cannot engage the head of the screw. The conical extractor should be inserted and turned anti-clockwise until the screw is extracted (**Fig. 6**).



GENERAL TRAY

Part#	Description	
002-A-00009	Depth Gauge With Hook	
DH0455CE	Micro Ratcheting Handle with AO Connector Cannulated	
154276	AL Double Measuring Device	
154300	SS Triangular Positioning Plate 60 degrees 100 degrees 20 degrees	
154301	SS Triangular Positioning Plate 70 degrees 80 degrees 30 degrees	
154302	SS Triangular Positioning Plate 90 degrees 50 degrees 40 degrees	
154306	SS Osteotomy Gauge	
154666	SS JPS Template	
154780	SS Small Bone Clamp	
154781	SS Large Bone Clamp	

3.0mm TRAY

Part#	Description	
154200	SS Drill Guide Locking D2.3mm	
154211	SS Drill Guide Non-locking D2.3mm	
154320	SS T8 Retentive Screwdriver Quick Connect	
154305	AL Angled Wire Guide 3.0mm Plate	

3.5mm TRAY

Part#	Description	
154201	SS Drill Guide Locking D2.8mm	
154212	SS Drill Guide Non-locking D2.8mm	
154321	SS T10 Retentive Screwdriver Quick Connect	
154033	SS Medialization Guide Body 3.5mm	
154031	SS Medialization Guide Mechanism	
154304	AL Angled Wire Guide 3.5mm and 5.0mm Plates	
154215	SS Aiming Block - 3.5mm Plate	

5.0mm TRAY

Part#	Description	
154202	SS Drill Guide Locking D4.3mm	
154203	SS Reduction Sleeve	
154213	SS Drill Guide Non-locking D3.4mm	
154322	SS T15 Retentive Screwdriver Quick Connect	
154034	SS Medialization Guide Body 5.0mm	
154031	SS Medialization Guide Mechanism	
154304	AL Angled Wire Guide 3.5mm and 5.0mm Plates	
154214	SS Aiming Block - 5.0mm Plate	

JPS STERILE CONSUMABLES

Reference#	Description
99-154182	SS DRILL BIT D2.3MM QUICK CONNECT STERILE
99-154183	SS DRILL BIT D2.8MM QUICK CONNECT STERILE
99-154184	SS DRILL BIT D3.4MM QUICK CONNECT STERILE
99-154185	SS DRILL BIT D4.3MM QUICK CONNECT STERILE
001-A-1502P	GUIDE WIRE 1.5MM, 4.0/5.5MM BITE COMPRESSION SCREW (KIT OF 2)
99-154281	SS GUIDE WIRE D2.0 L200MM PACK OF 2 STERILE
99-154282	SS GUIDE WIRE D2.3 L200MM PACK OF 2 STERILE
99-154283	SS GUIDE WIRE D2.8MM L200MM PACK OF 2 STERILE
99-154284	SS GUIDE WIRE D3.4MM L200MM PACK OF 2 STERILE
99-154285	SS GUIDE WIRE D4.3 L190MM PACK OF 2 STERILE

JPS STERILE EXTRACTION SET

Reference#	Description
99-154340	SS T8 EXTRACTION SCREWDRIVER STERILE
99-154341	SS T10 EXTRACTION SCREWDRIVER STERILE
99-154342	SS T15 EXTRACTION SCREWDRIVER STERILE
99-154337	SS T8 CONICAL EXTRACTOR STERILE
99-154338	SS T10-T15 CONICAL EXTRACTOR STERILE

PLATES

JPS SS 3.0mm PROXIMAL FEMUR PLATE

Reference#	Description
99-5431001	90 DEGREES - 3 HOLES 6MM OFFSET STERILE
99-5431002	110 DEGREES - 3 HOLES 6MM OFFSET STERILE
99-5431003	130 DEGREES - 3 HOLES STERILE

JPS SS 3.5mm PROXIMAL FEMUR PLATE

Reference#	Description
99-5431004	90 DEGREES - 3 HOLES 6MM OFFSET STERILE
99-5431005	90 DEGREES - 3 HOLES 12MM OFFSET STERILE
99-5431006	100 DEGREES - 3 HOLES 6MM OFFSET STERILE
99-5431007	100 DEGREES - 3 HOLES 12MM OFFSET STERILE
99-5431008	110 DEGREES - 3 HOLES 6MM OFFSET STERILE
99-5431009	110 DEGREES - 3 HOLES 12MM OFFSET STERILE
99-5431010	120 DEGREES - 3 HOLES 6MM OFFSET STERILE
99-5431011	120 DEGREES - 3 HOLES 12MM OFFSET STERILE
99-5431012	130 DEGREES - 3 HOLES STERILE
99-5431013	130 DEGREES - 4 HOLES STERILE
99-5431014	130 DEGREES - 6 HOLES STERILE
99-5431015	130 DEGREES - 8 HOLES STERILE
99-5431016	130 DEGREES - 10 HOLES STERILE
99-5431017	140 DEGREES - 3 HOLES STERILE
99-5431018	150 DEGREES - 3 HOLES STERILE
99-5431019	150 DEGREES - 5 HOLES STERILE

JPS SS 5.0mm PROXIMAL FEMUR PLATE

Reference#	Description
99-5431020	90 DEGREES - 4 HOLES 6MM OFFSET STERILE
99-5431021	90 DEGREES - 4 HOLES 14MM OFFSET STERILE
99-5431022	90 DEGREES - 3 HOLES 6MM OFFSET STERILE
99-5431023	90 DEGREES - 3 HOLES 14MM OFFSET STERILE
99-5431024	100 DEGREES - 4 HOLES 6MM OFFSET STERILE
99-5431025	100 DEGREES - 4 HOLES 14MM OFFSET STERILE
99-5431026	110 DEGREES - 4 HOLES 6MM OFFSET STERILE
99-5431027	110 DEGREES - 4 HOLES 14MM OFFSET STERILE
99-5431028	120 DEGREES - 4 HOLES 6MM OFFSET STERILE
99-5431029	120 DEGREES - 4 HOLES 14MM OFFSET STERILE
99-5431030	130 DEGREES - 3 HOLES STERILE
99-5431031	130 DEGREES - 4 HOLES STERILE
99-5431032	130 DEGREES - 6 HOLES STERILE
99-5431033	130 DEGREES - 8 HOLES STERILE
99-5431034	130 DEGREES - 10 HOLES STERILE
99-5431035	140 DEGREES - 3 HOLES STERILE
99-5431036	150 DEGREES - 3 HOLES STERILE
99-5431037	150 DEGREES - 5 HOLES STERILE

JPS SS 3.5mm DISTAL FEMUR PLATE

Reference#	Description
99-5433005	80 DEGREES - 4 HOLES 5 DEGREES FLARE STERILE
99-5433006	80 DEGREES - 6 HOLES 5 DEGREES FLARE STERILE
99-5433001	90 DEGREES - 4 HOLES 18 DEGREES FLARE STERILE
99-5433002	90 DEGREES - 6 HOLES 18 DEGREES FLARE STERILE
99-5433003	90 DEGREES - 4 HOLES 5 DEGREES FLARE STERILE
99-5433004	90 DEGREES - 6 HOLES 5 DEGREES FLARE STERILE

JPS SS 5.0mm DISTAL FEMUR PLATE

Reference#	Description
99-5433011	80 DEGREES - 4 HOLES 5 DEGREES FLARE STERILE
99-5433012	80 DEGREES - 6 HOLES 5 DEGREES FLARE STERILE
99-5433007	90 DEGREES - 4 HOLES 18 DEGREES FLARE STERILE
99-5433008	90 DEGREES - 6 HOLES 18 DEGREES FLARE STERILE
99-5433009	90 DEGREES - 4 HOLES 5 DEGREES FLARE STERILE
99-5433010	90 DEGREES - 6 HOLES 5 DEGREES FLARE STERILE

JPS SS 3.5mm WIDE MEDIAL TIBIA PLATE

Reference#	Description
99-5434001L	LEFT - 2 HOLES STERILE
99-5434002L	LEFT - 3 HOLES STERILE
99-5434003L	LEFT - 4 HOLES STERILE
99-5434004L	LEFT - 5 HOLES STERILE
99-5434001R	RIGHT - 2 HOLES STERILE
99-5434002R	RIGHT - 3 HOLES STERILE
99-5434003R	RIGHT - 4 HOLES STERILE
99-5434004R	RIGHT - 5 HOLES STERILE

JPS SS 3.5mm NARROW MEDIAL TIBIA PLATE

Reference#	Description
99-5434005L	LEFT - 2 HOLES STERILE
99-5434006L	LEFT - 3 HOLES STERILE
99-5434007L	LEFT - 4 HOLES STERILE
99-5434008L	LEFT - 5 HOLES STERILE
99-5434005R	RIGHT - 2 HOLES STERILE
99-5434006R	RIGHT - 3 HOLES STERILE
99-5434007R	RIGHT - 4 HOLES STERILE
99-5434008R	RIGHT - 5 HOLES STERILE

JPS SS 3.5mm ANTEROLATERAL TIBIA PLATE

Reference#	Description
99-5434009L	LEFT - 2 HOLES STERILE
99-5434010L	LEFT - 3 HOLES STERILE
99-5434011L	LEFT - 4 HOLES STERILE
99-5434009R	RIGHT - 2 HOLES STERILE
99-5434010R	RIGHT - 3 HOLES STERILE
99-5434011R	RIGHT - 4 HOLES STERILE

On Demand

SCREWS

**JPS SS 3.0mm NON-LOCKING SCREW
DOUBLE START THREAD**

Reference#	Description
99-5403010	L10MM STERILE
99-5403012	L12MM STERILE
99-5403014	L14MM STERILE
99-5403016	L16MM STERILE
99-5403018	L18MM STERILE
99-5403020	L20MM STERILE
99-5403022	L22MM STERILE
99-5403024	L24MM STERILE
99-5403026	L26MM STERILE
99-5403028	L28MM STERILE
99-5403030	L30MM STERILE
99-5403032	L32MM STERILE
99-5403034	L34MM STERILE
99-5403036	L36MM STERILE
99-5403038	L38MM STERILE
99-5403040	L40MM STERILE

**JPS SS 3.5mm NON-LOCKING SCREW
DOUBLE START THREAD**

Reference#	Description
99-5403510	L10MM STERILE
99-5403512	L12MM STERILE
99-5403514	L14MM STERILE
99-5403516	L16MM STERILE
99-5403518	L18MM STERILE
99-5403520	L20MM STERILE
99-5403522	L22MM STERILE
99-5403524	L24MM STERILE
99-5403526	L26MM STERILE
99-5403528	L28MM STERILE
99-5403530	L30MM STERILE
99-5403532	L32MM STERILE
99-5403534	L34MM STERILE
99-5403536	L36MM STERILE
99-5403538	L38MM STERILE
99-5403540	L40MM STERILE

**JPS SS 4.5mm NON-LOCKING SCREW
DOUBLE START THREAD**

Reference#	Description
99-5404514	L14MM STERILE
99-5404516	L16MM STERILE
99-5404518	L18MM STERILE
99-5404520	L20MM STERILE
99-5404522	L22MM STERILE
99-5404524	L24MM STERILE
99-5404526	L26MM STERILE
99-5404528	L28MM STERILE
99-5404530	L30MM STERILE
99-5404532	L32MM STERILE
99-5404534	L34MM STERILE
99-5404536	L36MM STERILE
99-5404538	L38MM STERILE
99-5404540	L40MM STERILE
99-5404542	L42MM STERILE
99-5404544	L44MM STERILE
99-5404546	L46MM STERILE
99-5404548	L48MM STERILE
99-5404550	L50MM STERILE

**JPS SS 3.0mm LOCKING SCREW
DOUBLE START THREAD**

Reference#	Description
99-5413010	L10MM STERILE
99-5413012	L12MM STERILE
99-5413014	L14MM STERILE
99-5413016	L16MM STERILE
99-5413018	L18MM STERILE
99-5413020	L20MM STERILE
99-5413022	L22MM STERILE
99-5413024	L24MM STERILE
99-5413026	L26MM STERILE
99-5413028	L28MM STERILE
99-5413030	L30MM STERILE
99-5413032	L32MM STERILE
99-5413034	L34MM STERILE
99-5413036	L36MM STERILE
99-5413038	L38MM STERILE
99-5413040	L40MM STERILE
99-5413042	L42MM STERILE
99-5413044	L44MM STERILE
99-5413046	L46MM STERILE
99-5413048	L48MM STERILE
99-5413050	L50MM STERILE
99-5413055	L55MM STERILE
99-5413060	L60MM STERILE

**JPS SS 3.5mm LOCKING SCREW
DOUBLE START THREAD**

Reference#	Description
99-5413510	L10MM STERILE
99-5413512	L12MM STERILE
99-5413514	L14MM STERILE
99-5413516	L16MM STERILE
99-5413518	L18MM STERILE
99-5413520	L20MM STERILE
99-5413522	L22MM STERILE
99-5413524	L24MM STERILE
99-5413526	L26MM STERILE
99-5413528	L28MM STERILE
99-5413530	L30MM STERILE
99-5413532	L32MM STERILE
99-5413534	L34MM STERILE
99-5413536	L36MM STERILE
99-5413538	L38MM STERILE
99-5413540	L40MM STERILE
99-5413542	L42MM STERILE
99-5413544	L44MM STERILE
99-5413546	L46MM STERILE
99-5413548	L48MM STERILE
99-5413550	L50MM STERILE
99-5413555	L55MM STERILE
99-5413560	L60MM STERILE

**JPS SS 5.0mm LOCKING SCREW
DOUBLE START THREAD**

Reference#	Description
99-5415014	L14MM STERILE
99-5415016	L16MM STERILE
99-5415018	L18MM STERILE
99-5415020	L20MM STERILE
99-5415022	L22MM STERILE
99-5415024	L24MM STERILE
99-5415026	L26MM STERILE
99-5415028	L28MM STERILE
99-5415030	L30MM STERILE
99-5415032	L32MM STERILE
99-5415034	L34MM STERILE
99-5415036	L36MM STERILE
99-5415038	L38MM STERILE
99-5415040	L40MM STERILE
99-5415042	L42MM STERILE
99-5415044	L44MM STERILE
99-5415046	L46MM STERILE
99-5415048	L48MM STERILE
99-5415050	L50MM STERILE
99-5415055	L55MM STERILE
99-5415060	L60MM STERILE
99-5415065	L65MM STERILE
99-5415070	L70MM STERILE
99-5415075	L75MM STERILE
99-5415080	L80MM STERILE

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