Operative technique

ESTREMO
CITIEFFE NAILING SYSTEM

Nailing system for tibia and femur

- Suprapatellar tibial nailing
- Retrograde femoral nailing

citieffe®
Essential moves in Trauma

The information herein is intended to describe the product. Surgeons must always decide the best approach to follow based on their clinical judgement and the patient's needs. Before use, the surgeon must always refer to the instruction manual included in the product package.

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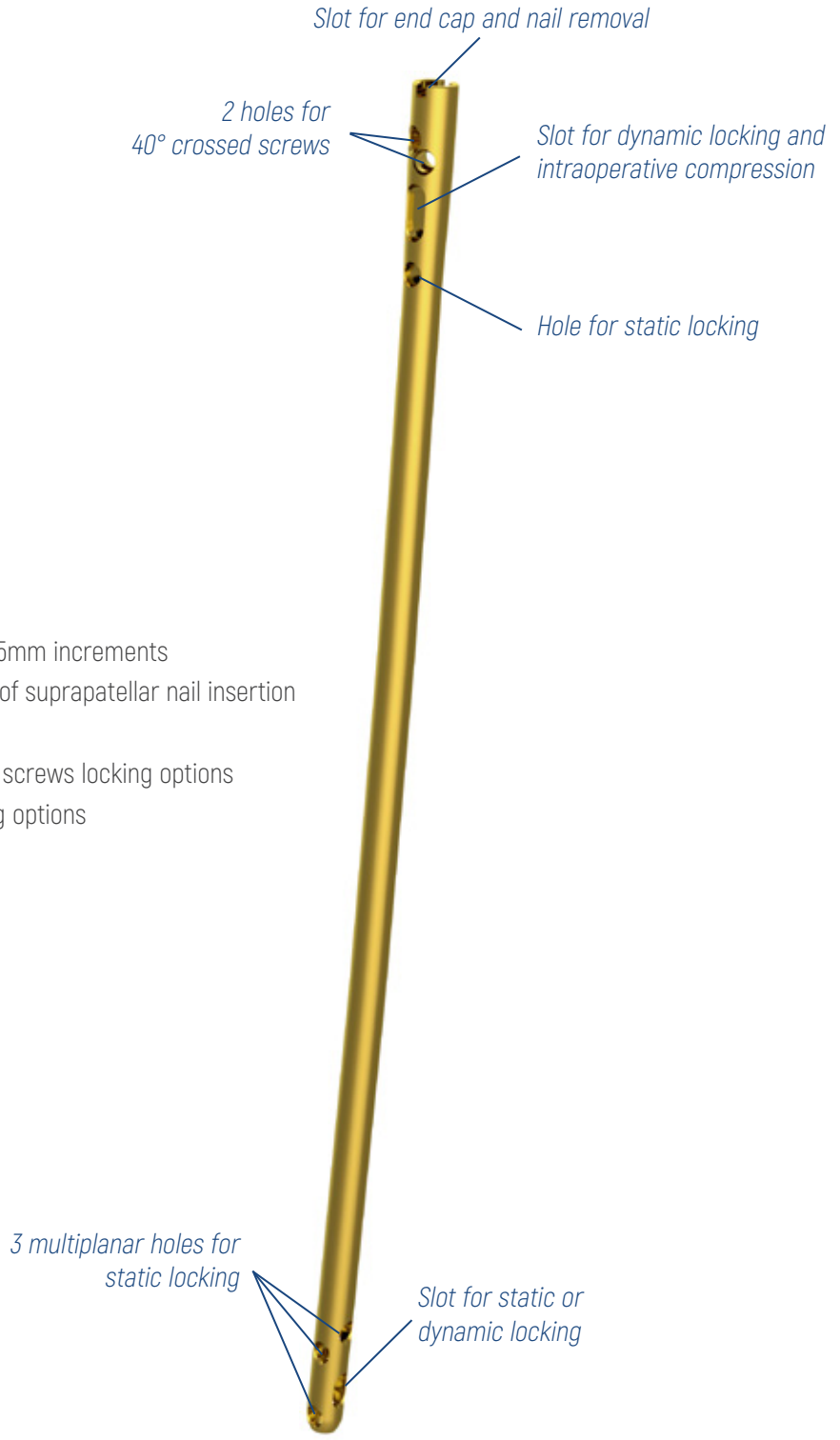
PRODUCT DESCRIPTION

TITANIUM STERILE

ESTREMO citieffe nailing system

Intramedullary nailing system with a unique design that allows both a comfortable suprapatellar tibial approach with a semi-extended knee and a retrograde femur approach.



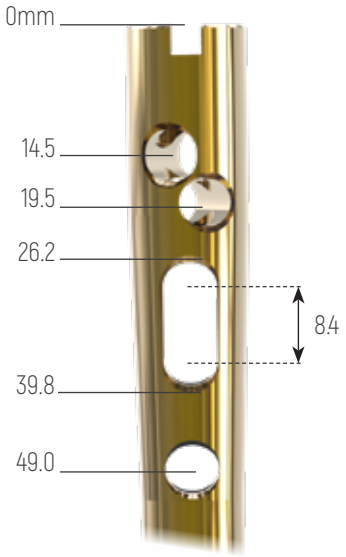
- Titanium alloy ASTM F136
- Solid nail diameter:
  8mm (on request)
- Cannulated nail diameter:
  9, 10, 11, 12, 13mm
- Available lengths:
  from 260 to 470mm with 15mm increments
- Anatomical bend for ease of suprapatellar nail insertion
- Screw size: ø 5.2mm
- Different multi-directional screws locking options
- Static and dynamic locking options

Image shows the cannulated nail

Proximal holes

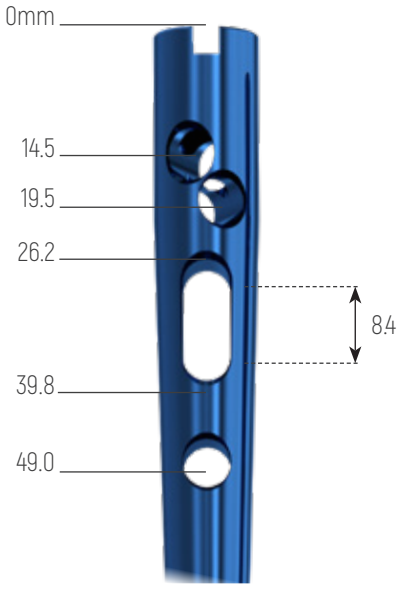
CANNULATED NAILS

ø9mm-ø13mm



SOLID NAILS

ø8mm



Compression range

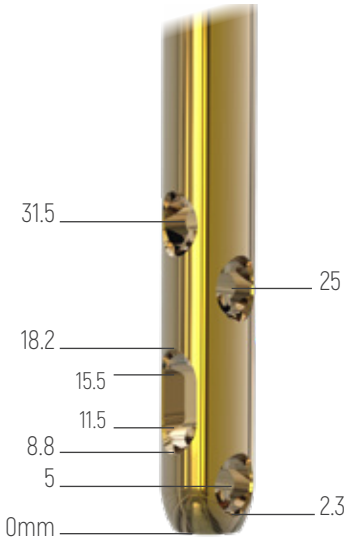
Total slot length	13.6mm
Screw diameter (-)	5.2mm
Maximum screw movement	8.4mm

NOTE:
Micrometric compression cannot be performed on the ø8mm solid nail.

Distal holes

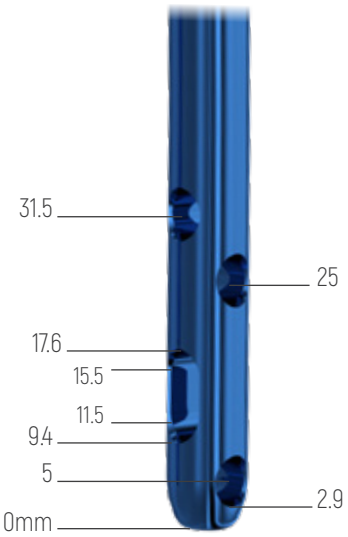
CANNULATED NAILS

ø9mm-ø13mm



SOLID NAILS

ø8mm



Standard screws and caps

Both screws and caps feature a built-in threaded locking system.
All screws and caps use the same 5mm Allen T-screwdriver.

Cortical screw ø5.2mm

- Titanium alloy
- Self-tapping
- Proximal part of the screw built up for enhanced stability
- Threaded head for retentive connection with the screwdriver
- Available lengths:
  from 22.5mm to 55mm with 2.5mm increments;
  from 55mm to 110mm with 5mm increments.

Cortical screw characteristics:

A - Increased core diameter.

B - Proximal part of the screw built up for enhanced stability.

Cortical screw ø4mm

- Titanium alloy
- Self-tapping
- Proximal part of the screw built up for enhanced stability
- Threaded head for retentive connection with the screwdriver

Available lengths:
from 25mm to 40mm with 5mm increments

NOTE:
Used only in the distal holes of the ø8mm solid nail.

Condylar screw ø5.2mm

- Titanium alloy
- Available lengths: from 50mm to 110mm with 5mm increments
- Cannulated for K. wire ø2mm
- With washer and compression nut

NOTE:
Use for femurs only.

TITANIUM STERILE

Cancellous screw ø5.2mm

- Titanium alloy
- Self-tapping
- Available lengths: from 50mm to 110mm with 5mm increments
- Partially threaded with variable thread length

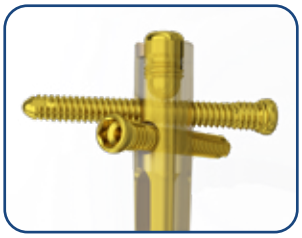
End cap

- Standard - 5mm - 10mm

- Titanium alloy
- Available sizes:
- Standard
- 5mm
- 10mm
- To prevent bone in-growth
- To increase nail height

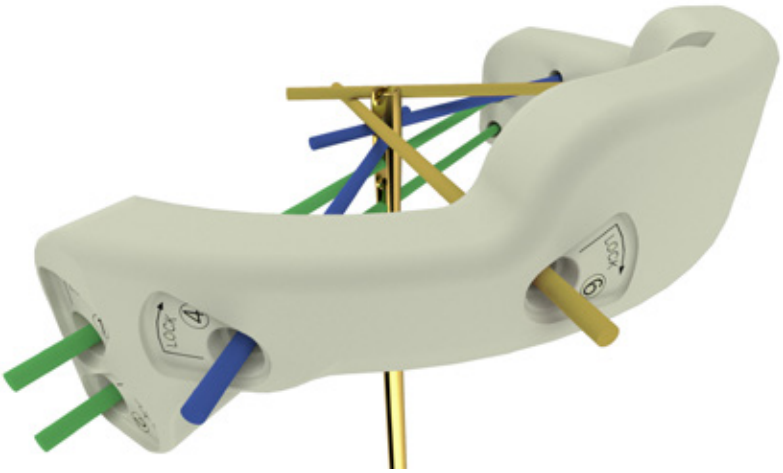
Locking end cap

- Standard - 5mm - 10mm



- Titanium alloy
- Available sizes:
- Standard
- 5mm
- 10mm
- To prevent bone in-growth
- To lock crossed screws (with 40° angle)

Guided locking options



Parallel screws
Crossed screws at 40°
Out-nail screws

Depending on the fracture pattern, the locking can be performed with the following options:

- two parallel screws
- two crossed screws at 40°.

Reduction of bone fragments can be performed with the insertion of two out-nail screws.

NOTE:
Intraoperative compression using the compression device can be performed starting from the dynamic hole corresponding to the marking (1) on the guide.

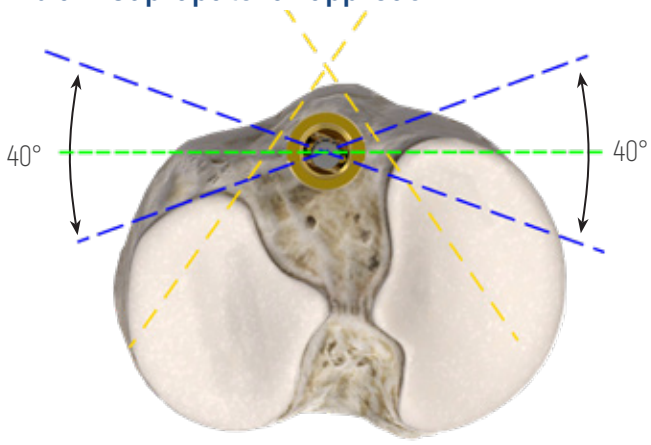
NOTE:
To achieve optimal angular stability with crossed screws, insertion of the ESTREMO locking end cap is required.

The holes on the radiolucent arch of the centring guide allow the guided insertion of all screws.

Holes 1 and 2
Insertion of parallel screws
Holes 3 and 4
Insertion of crossed screws at 40°.
Holes 5 and 6
Insertion of out-nail screws.

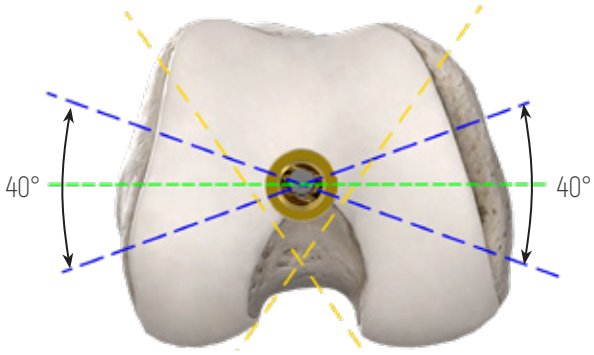
NOTE: for screw insertion in the out-nail holes (5 and 6), cannulated Rondò screws are also available for proper compression of the bone fragments.

Tibial - Suprapatellar approach



Parallel screws
Crossed screws at 40°
Out-nail screws

Femoral - Retrograde approach



Parallel screws
Crossed screws at 40°
Out-nail screws

INDICATIONS

Tibia

The ESTREMO citieffe nailing system implants are indicated for the fixation of tibial fractures:

- diaphyseal tibial fractures;
- corrective osteotomies;
- pseudoarthrosis;
- non-unions and mal-unions

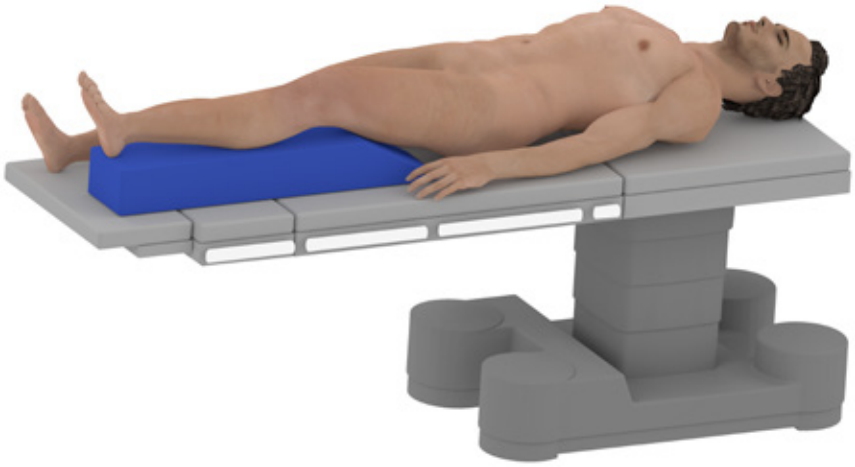
Femur

The ESTREMO citieffe nailing system implants are indicated for the fixation of femoral fractures:

- diaphyseal femoral fractures;
- supracondylar femoral fractures;
- corrective osteotomies;
- pseudoarthrosis;
- non-unions and mal-unions

TS Suprapatellar tibial nailing with semi-extended knee

Patient positioning

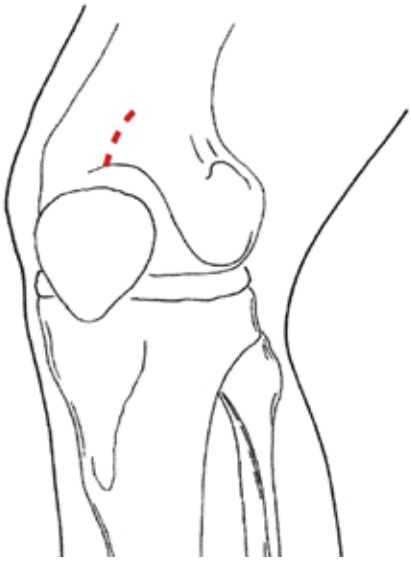


Position the patient supine on the radiolucent operating table. The knee must be kept flexed by 15°-20°.

NOTE: to maintain the correct knee flexion, we recommend using a foam support or surgical drapes to relax the quadriceps muscle and avoid the risk of procurvatum deformity.

Reduce the fracture and proceed with fixation.

Incision and entry point



To correctly position the nail, make a 2-4 cm longitudinal suprapatellar skin incision.

Make a longitudinal incision of the quadriceps tendon; specifically, this incision passes through the medial third of the quadriceps tendon.
Perform a dissection of the joint capsule.

NOTE:
Alternatively, a 1.5 cm transverse skin incision can be made above the supralateral angle of the patella. This incision minimises the development of the large retracting scars typical of infrapatellar incisions.

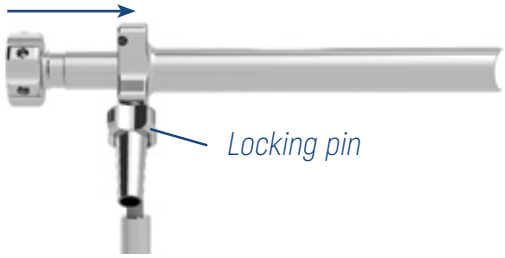
Check the entry point under X-ray control. The entry point is medial to the lateral tibial spine in the AP projection and adjacent to the articular surface in the ML projection.

Proximal tibia
antero-posterior projection

Proximal tibia
medio-lateral projection

All power tools present in the operative technique must be used with a low-speed drill.

Preparing for K. wire insertion

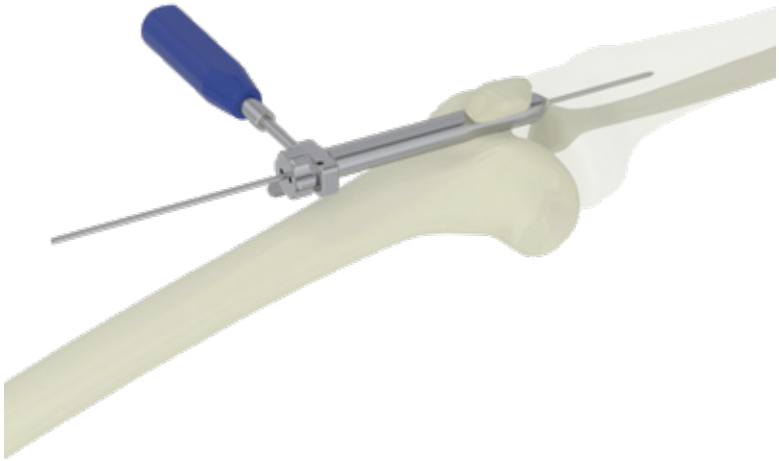


Insert the multi-hole trocar into the tissue protection sleeve and lock it by rotating the locking pin clockwise.
Place the tissue protection sleeve with the trocar through the incision in the knee joint, posterior to the patella.

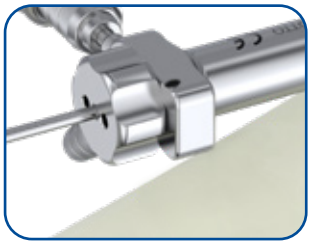
⚠ ***To direct the trocar toward the "safe zone" on the tibial plateau and to use the trochlear groove as a guide, the patella can be medially subluxed.***
NOTE:
A surgical aspirator can be connected to the locking pin.

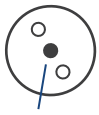
NOTE:
As an alternative to the standard tissue protection sleeve and its multi-hole trocar (DT030022 + DT030026), it is possible to use a tissue protection sleeve and its multi-hole trocar specifically designed for suprapatellar approach (DT030023 + DT030028) which are OPTIONAL instruments.

Inserting the K. wire



Keeping the trocar in contact with the cortex, insert the K. wire, trocar tip ø3x350mm into the central hole, reaching a depth of approximately 30mm (at or beyond the level of the tibial tubercle).





1st K. wire
(Central hole)

INSTRUMENTS REQUIRED

DT030026
Multihole trocar

DT030022
Tissue protection sleeve

66987
Guide wire trocar tip ø3x350mm
STERILE

Inserting the K. wire

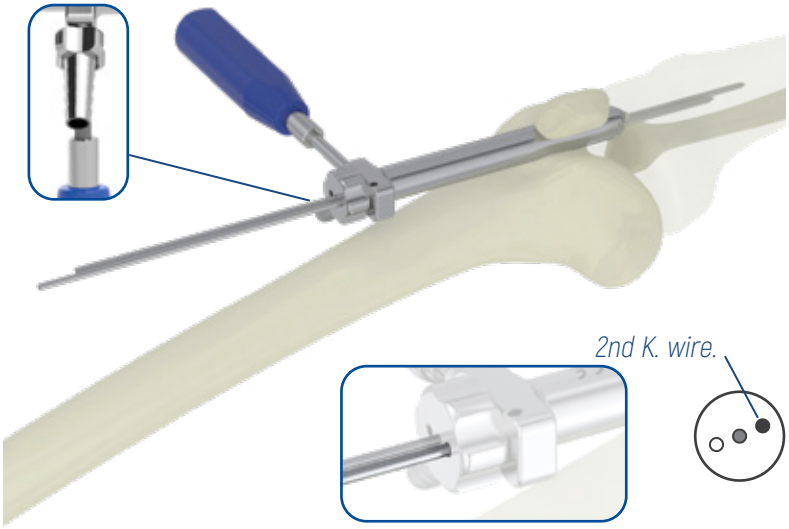
Under X-ray control, check the positioning of the K. wire.
If the wire is positioned in line with the intramedullary canal, continue drilling. When drilling is complete, unscrew the locking pin and remove the trocar.

Left tibia
AP Projection

Left tibia
ML Projection

Courtesy of
Massimo "Max" Morandi,
MD, FACS
LSU Health Sciences Centre -
Shreveport, Louisiana US

Possible adjustments to the K. wire positioning



If the K. wire is incorrectly positioned, loosen the locking pin and rotate the multi-hole trocar to place a second wire while holding the first one in place.

Insert the second K. wire to approximately 30 mm or to a similar depth to the first.

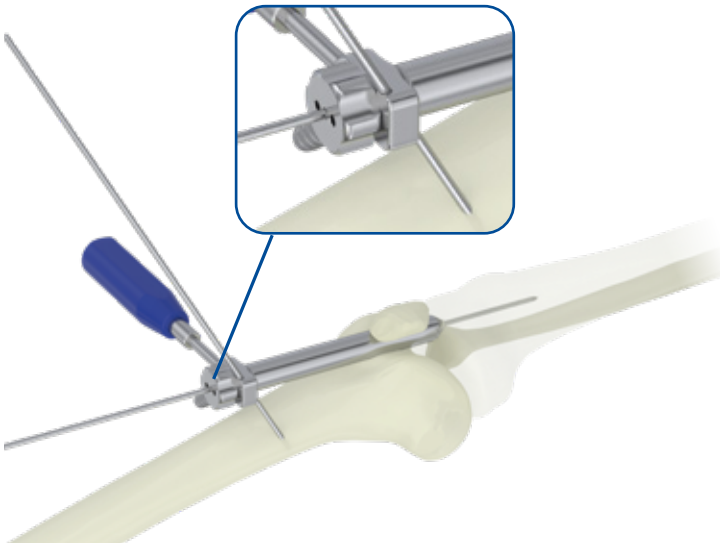
If the second wire is aligned with the medullary canal, tighten the locking pin and continue drilling.

Once correctly positioned, remove the first wire.

INSTRUMENTS REQUIRED

66987
Guide wire trocar tip ø3x350mm
STERILE

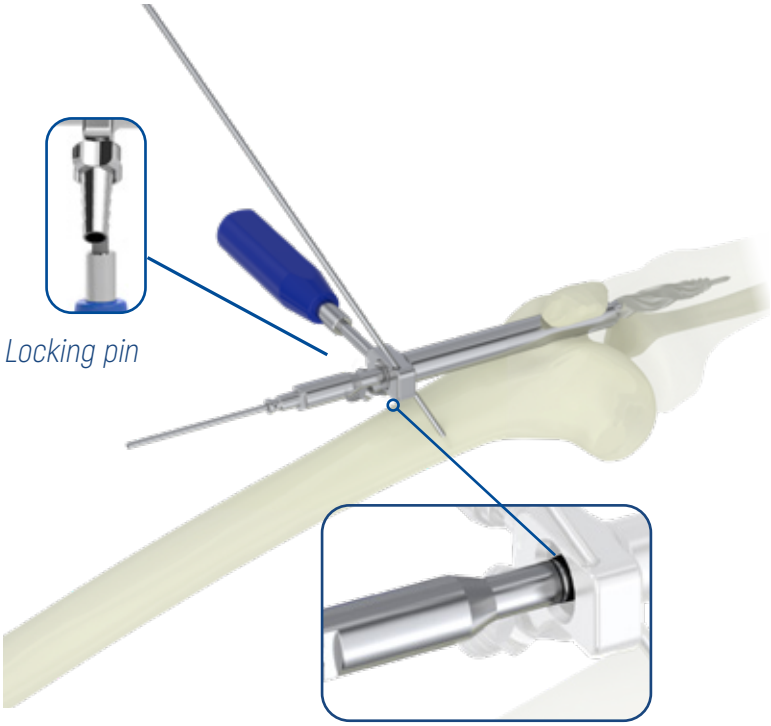
Stabilising the tissue protection sleeve (optional)



A K. wire can be inserted through the stabilising hole of the tissue protection sleeve to anchor it to the femur.

⚠ *The tissue protection sleeve and the stabilising K. wire will be removed only at the end of the surgery.*

Preparing the medullary canal



Locking pin

Reference notch (on the reamer)

Unscrew the locking pin and remove the trocar.

NOTE:
A surgical aspirator can be connected to the locking pin.

Insert the Cannulated reamer ø12.5mm (Hudson connection) over the wire and through the tissue protection sleeve, perforating the proximal tibia to a depth of approximately 70mm, which corresponds to the point where the reference mark on the reamer reaches the edge of the tissue protection sleeve.

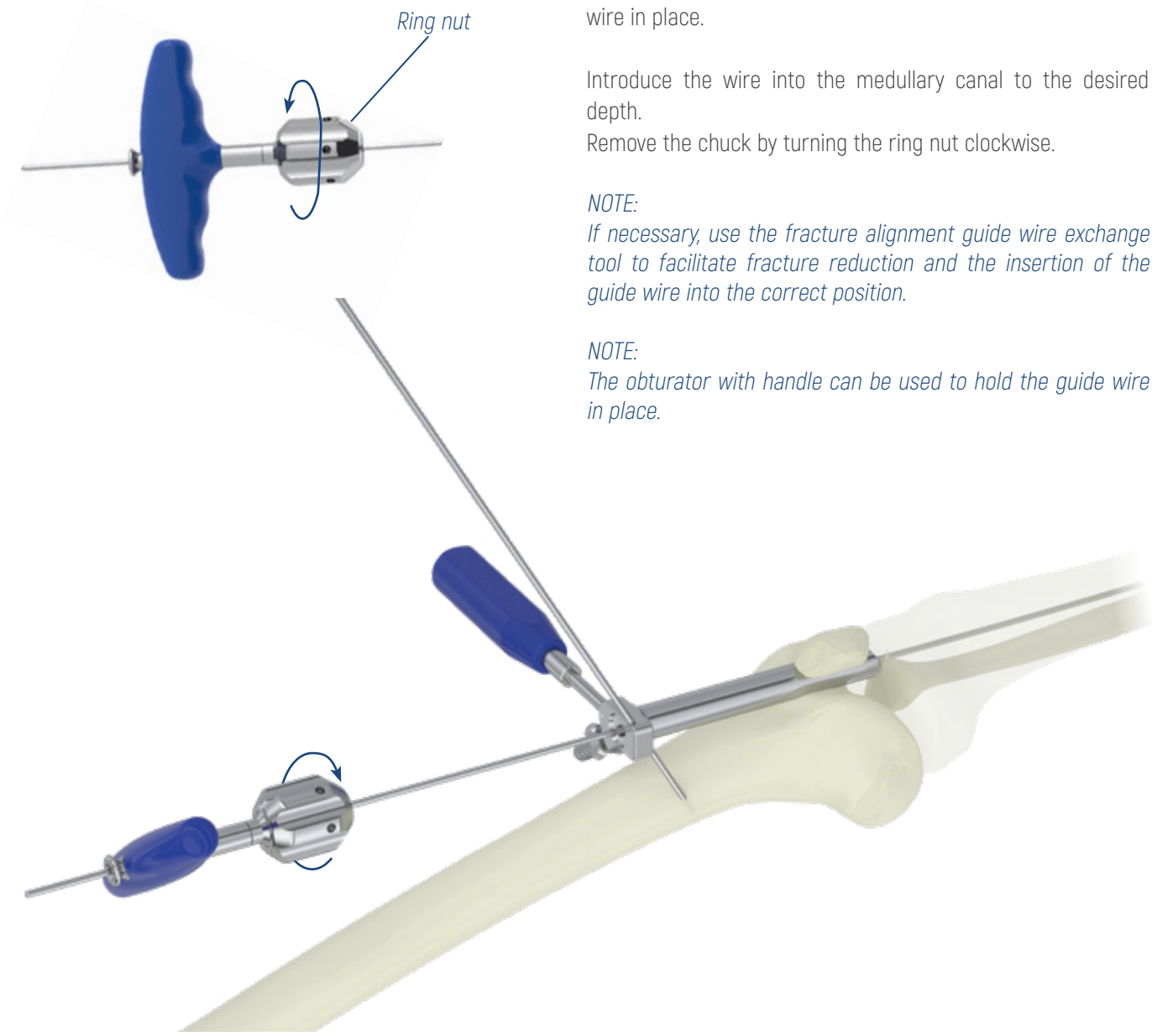
Remove the cannulated reamer and the K. wire.

INSTRUMENTS REQUIRED

66987
Guide wire trocar tip ø3x350mm
STERILE

DT03010H
Cannulated reamer ø12.5mm

Inserting the guide wire



Insert the Guide wire with olive ø3x800mm into the chuck for ø2.5-3mm wire and rotate the ring nut anticlockwise to lock the wire in place.

Introduce the wire into the medullary canal to the desired depth.
Remove the chuck by turning the ring nut clockwise.

NOTE:
If necessary, use the fracture alignment guide wire exchange tool to facilitate fracture reduction and the insertion of the guide wire into the correct position.

NOTE:
The obturator with handle can be used to hold the guide wire in place.

INSTRUMENTS REQUIRED

EBA-5345
chuck for ø2.5-3mm wire

DT030002
Guide wire with olive
ø3x800mm (STERILE)

EBA-5316
Fracture alignment
guide wire exchange tool

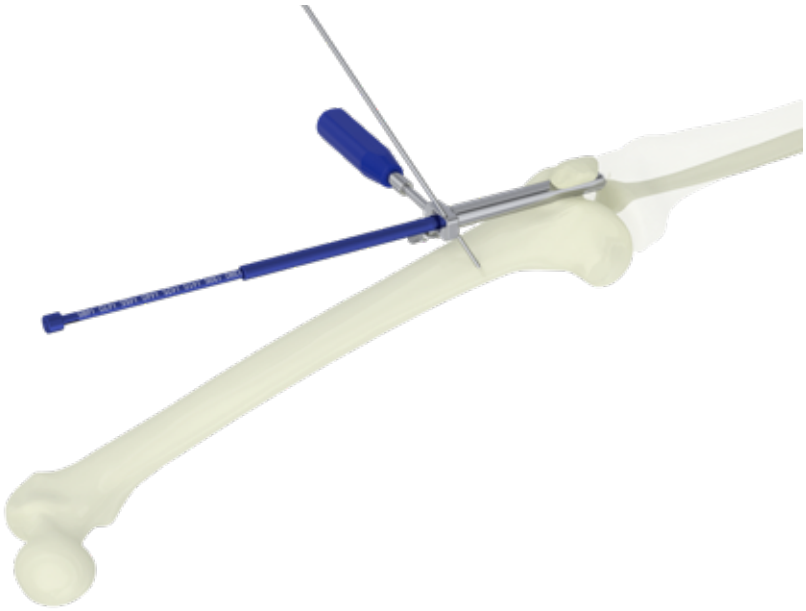
DT030090
Obturator with handle

Measuring the nail length and reaming the medullary canal

Insert the Nails ruler over the Guide wire with olive, bringing it into contact with the cortex.

1) *2)*

The images refer to the 395mm length.



1) Ensure the end of the guide wire is in contact with the end of the Nails ruler (the wire must be visible through the slot).

2) Read the nail length directly from the marking on the Nails ruler.

⚠ ***For intermediate readings, we recommend using the shorter size.***

Progressively ream the canal in 0.5mm increments. We recommend reaming 1.5mm more than the nail chosen for the implant.

NOTE:
If necessary, the GH5040 (Hudson-Hudson) or GH5041 (Zih-Zih) adapter can be used.

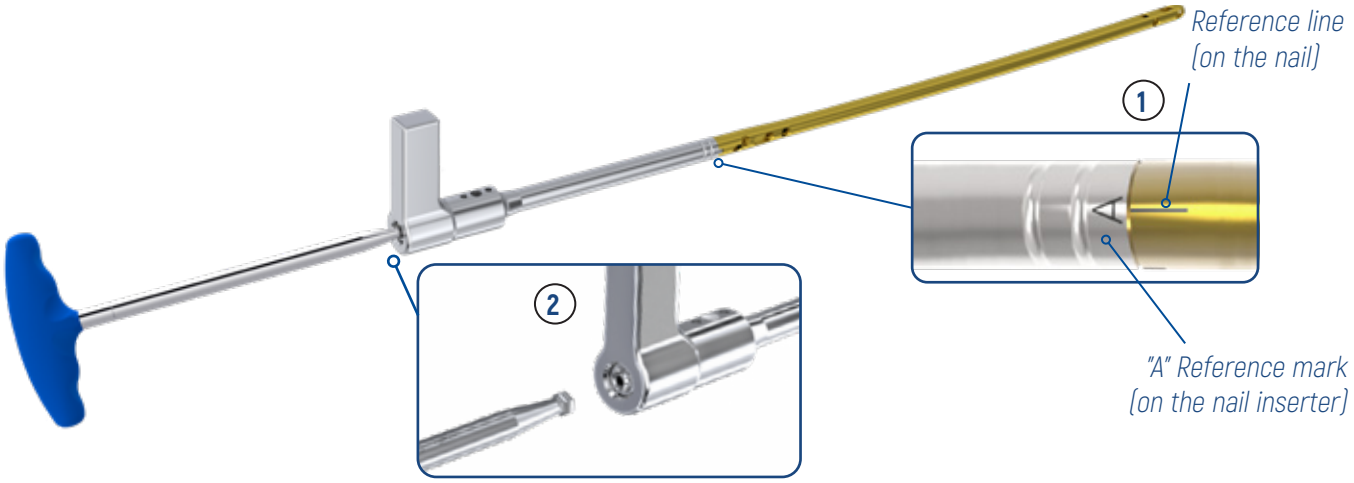
INSTRUMENTS REQUIRED

DT030032
Nails ruler, wire 800mm

Nail-inserter assembly

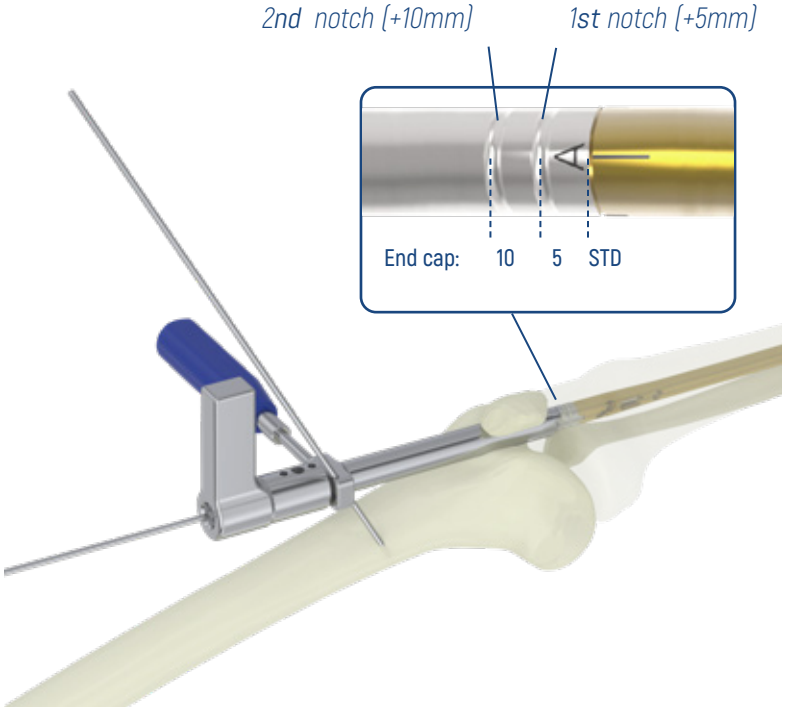
The connection between the Nail inserter and the nail itself is the same for both the left and right tibia.

Position the chosen nail in contact with the inserter, aligning the reference line on the nail with the "A" marker on the inserter. (1)
Tighten the inserter's connecting screw with the 8mm Allen T-Wrench. (2)



connection screw

Insertion of the nail



Manually insert the ESTREMO nail over the guide wire and advance it into the medullary canal through the tissue protection sleeve.
If necessary, tap the handle of the inserter with the slotted hammer until reaching one of the two depth reference marks, which correspond to the two other end cap sizes in addition to the standard one.

Once the nail has passed the fracture line, remove the Guide wire with olive ø3x800mm and verify the final position of the nail in both the anteroposterior (AP) and mediolateral (ML) projections.

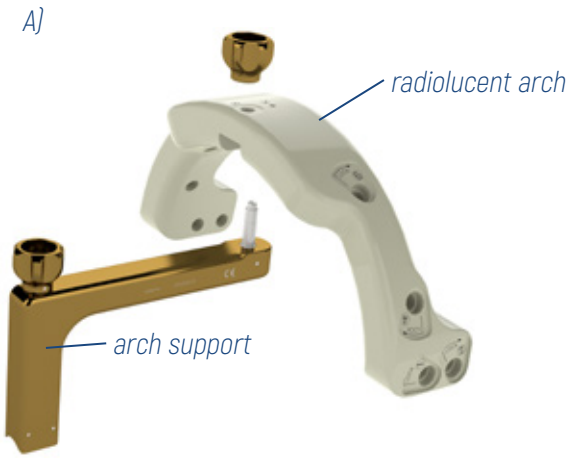
INSTRUMENTS REQUIRED

Nail inserter
(guide ESTREMO DT030010)

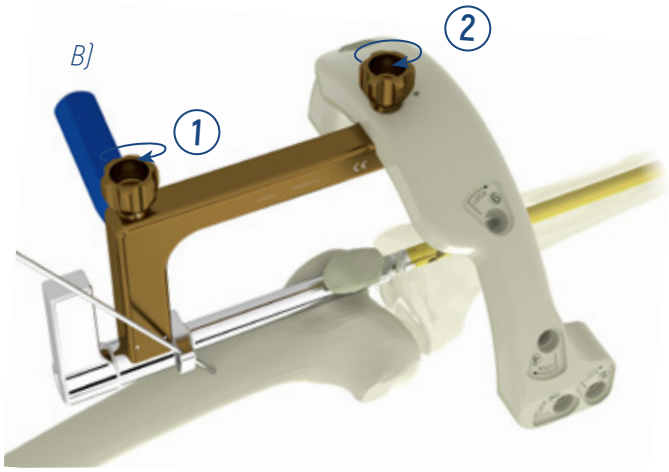
EBA-5350
Allen T-wrench, 8mm

DT030080
Slotted hammer

Assembling the centring guide

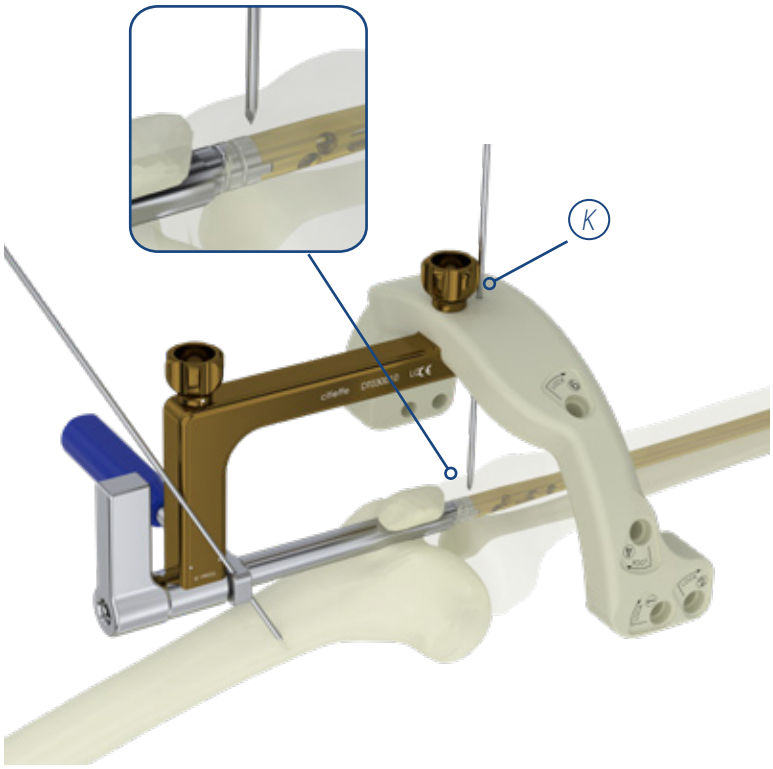


A) Assemble the arch support with the radiolucent arch.



B) Connect the arch support and the radiolucent arch with the nail inserter by tightening the two knobs.

Nail depth monitoring



It is possible to verify the correct sinking of the nail by inserting a K. wire through the hole of the radiolucent arch marked (K).

Use the image intensifier to check the nail position:
the tip of the wire indicates the proximal end of the nail.

NOTE:
If intraoperative compression is performed with the compression device, the nail will move proximally up to a maximum of 8.4 mm (for details, see page 5).

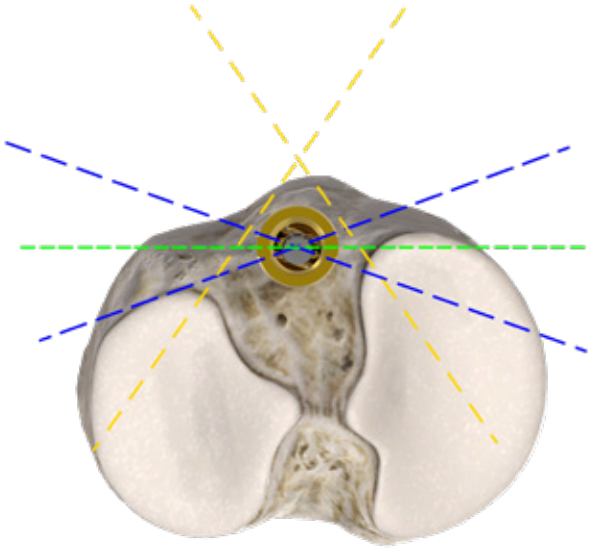
Remove the wire.

INSTRUMENTS REQUIRED

DT030010
ESTREMO Guide

66987
Guide wire trocar tip ø3x350mm
STERILE

Guided proximal locking options



- - - 2 parallel screws
- - - 2 crossed screws at 40°
- - - 2 out-nail screws

Holes 1 and 2
Insertion of parallel screws with medio-lateral access.
Holes 3 and 4
Insertion of crossed screws at 40°.
Holes 5 and 6
Insertion of out-nail screws.

NOTE:
for the insertion of out-nail screws, in addition to cortical screws, Rondò cannulated screws are also available for proper compression of the bone fragments. For further details, see page 55.

Depending on the fracture pattern, proximal locking can be performed with the following options:
- two parallel screws with medio-lateral access;
- two crossed screws at 40°.

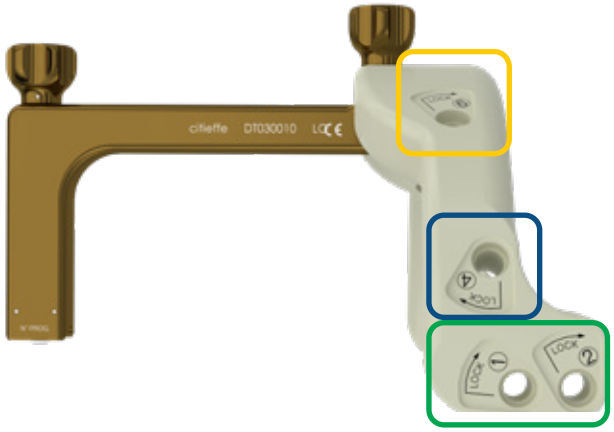
It is also possible to reduce the tibial plateau bone fragments by inserting two out-nail screws.

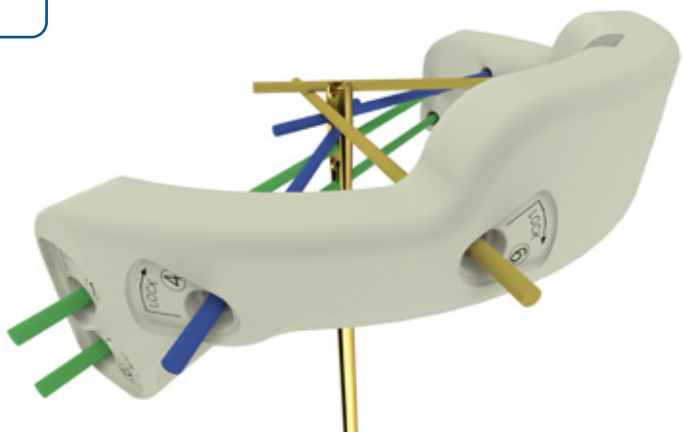
⚠ ***Intraoperative compression using the compression device can be performed starting from the dynamic hole corresponding to the 1 mark.***
For more details on compression, see page 25.

⚠ ***Intraoperative compression using the compression device cannot be performed on the solid nail.***

NOTE:
locking with crossed screws is the most proximal locking option.
For optimal angular stability, we recommend inserting the ESTREMO locking end cap.

The holes on the radiolucent arch of the centring guide allow the guided insertion of all screws.

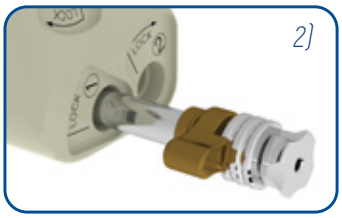




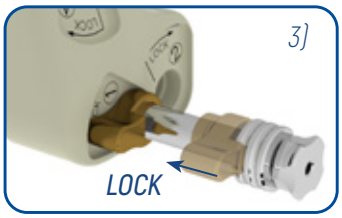
Proximal, distal, and compression locking

Proximal guided locking: dynamic screw (hole 1)

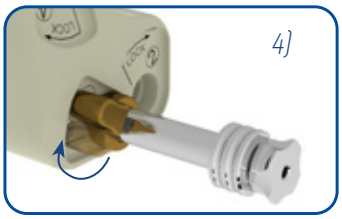
1) Insert and screw the trocar for ø4mm drill bit into the cannula.



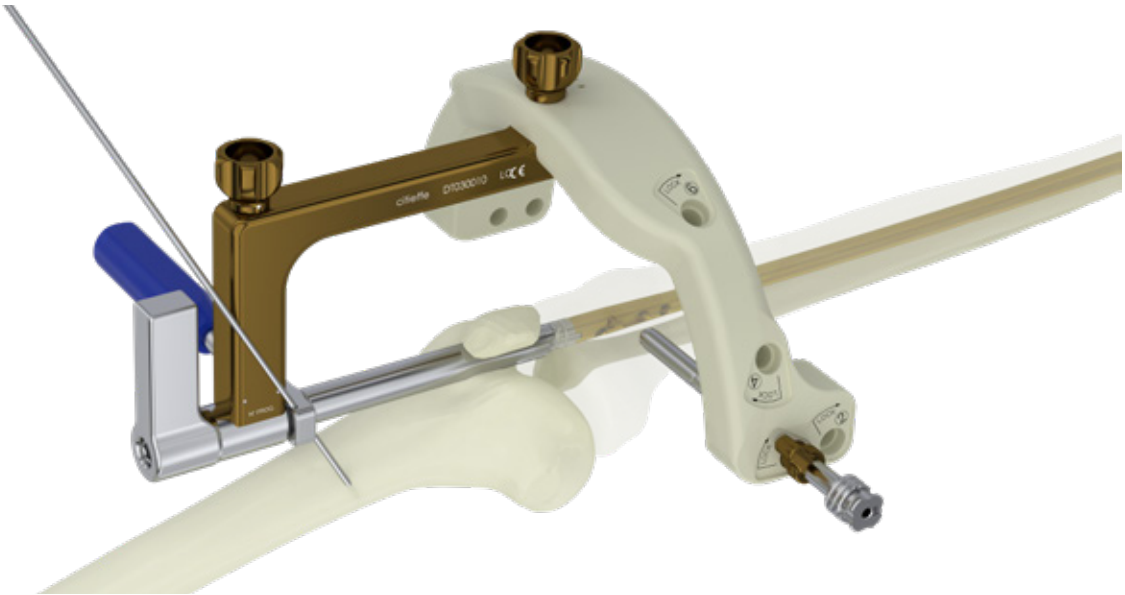
2) Insert them into the dynamic hole (1) of the radiolucent arch until they come into contact with the cortex.



3) Push the gold lever of the cannula towards its seat in the radiolucent arch.



4) Rotate the lever following the "lock" marking to lock the cannula in place and keep it in contact with the bone.
The use of the dynamic hole (1) will enable the controlled compression technique.

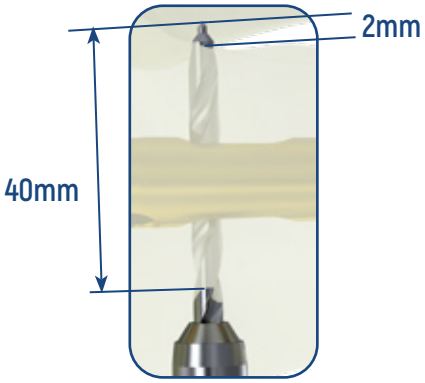


INSTRUMENTS REQUIRED

DT030020
Cannula

DT030027
Trocar for drill bit ø4mm

Dynamic proximal screw preparation and measurement

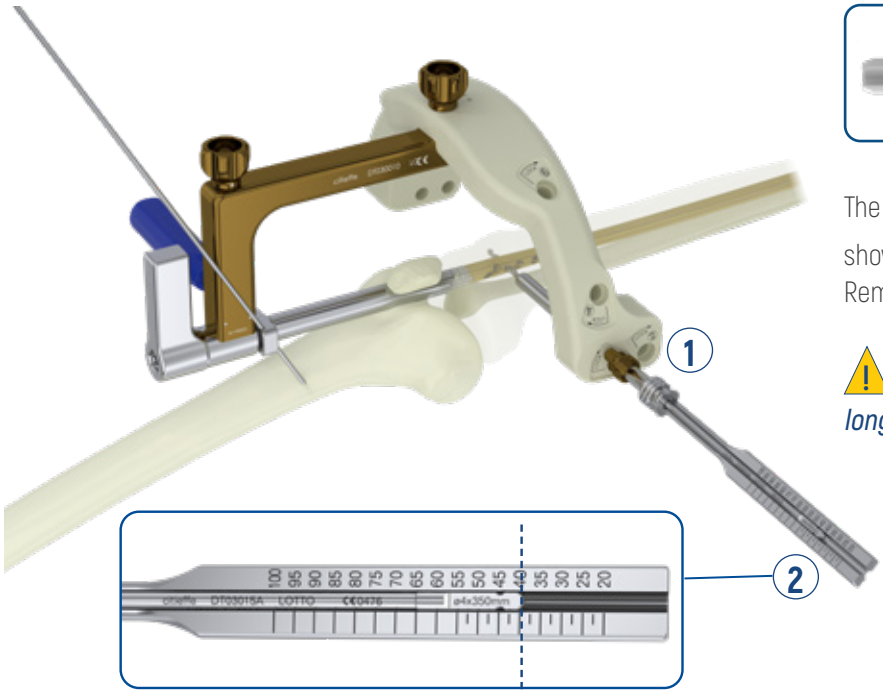


Insert the Drill bit, ø4x350mm and drill both cortical bones. Make sure the drill bit is in the correct position before measuring, as shown in the image: the drill bit must protrude beyond the second cortex by at least 2mm.

Insert the screws ruler (with the "TROCAR" marking facing upwards) on the Drill bit, ø4x350mm until it touches the Trocar. (1)

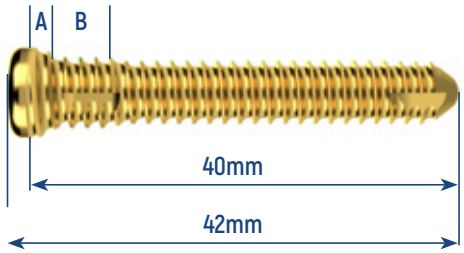
The end of the Drill bit, ø4x350mm, on the ruler, shows the length of the screw to be used. (2)
Remove the Drill bit, ø4x350mm and the Trocar.

⚠ *For intermediate measurements, select the longer screw.*



The image refers to the 40mm screw

Cortical screw characteristics:



A - Increased core diameter.
B - Proximal part of the screw built up for enhanced stability.

Example: code DT352040 (Cortical screw ø5.2mm L40mm)

INSTRUMENTS REQUIRED

DT03020A
Drill bit ø4x350mm

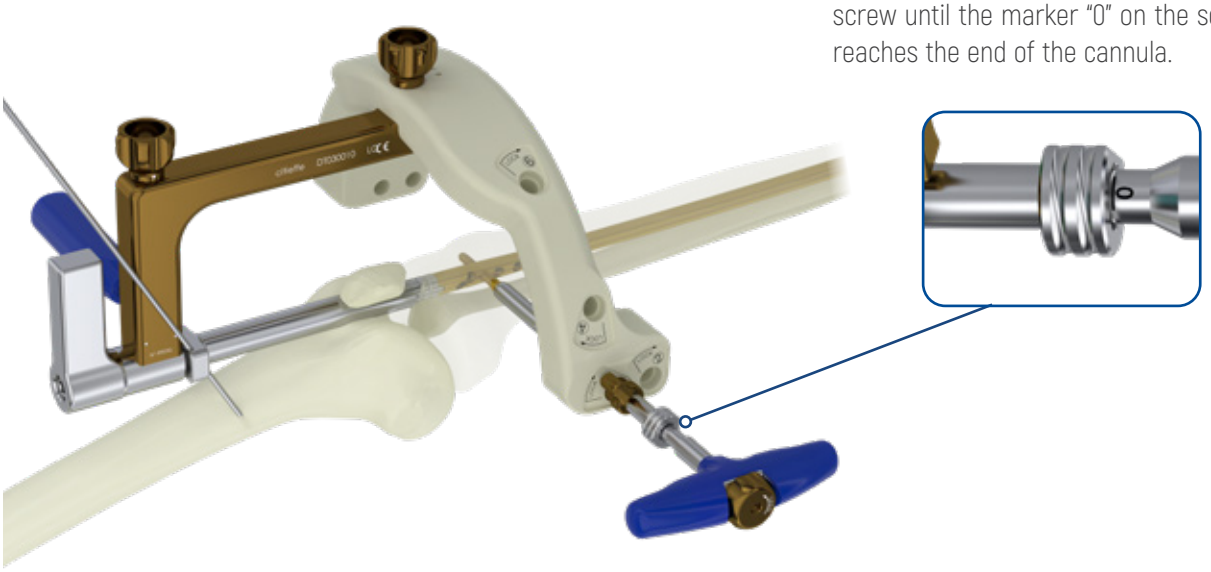
DT030030
Screws ruler ("TROCAR" facing upwards)

Inserting the proximal dynamic screw

Select the cortical screw ø5.2mm with the correct length.

1) Lock the screw onto the screwdriver using the retention system.

2) Insert the screwdriver into the cannula and screw until the marker "0" on the screwdriver reaches the end of the cannula.



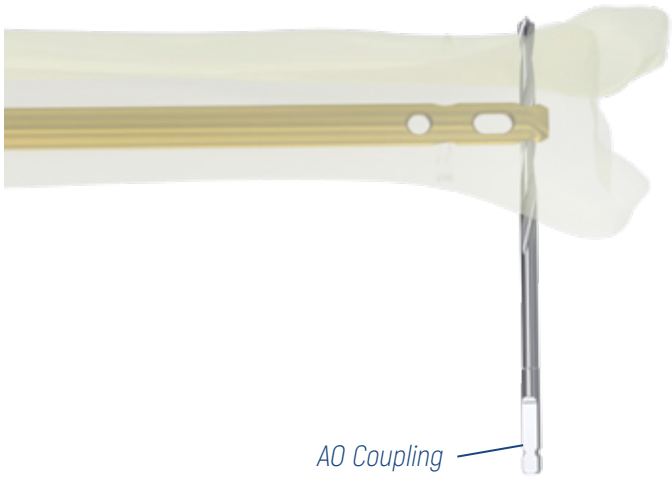
3) To remove the screwdriver, unscrew the retention system.

INSTRUMENTS REQUIRED

DT030040
Allen T-screwdriver, 5mm

The steps described illustrate freehand screw insertion.
For information on using the distal centring guide, see page 59.

Distal locking (freehand technique)



Under X-ray control, check the reduction, correct the fragment alignment and the limb length before performing freehand distal locking.

Drill both cortices using the Drill bit, ø4x110mm or the Drill bit, ø4x195mm.

Under X-ray control, ensure that the drill bit passes through the nail holes on both the AP and ML axes.

NOTE:
We recommend starting with the most distal hole.

⚠ ***If using a ø8mm solid nail, the bone screws to be used for this locking are ø4mm and the drill bit to be used is ø3.2x195mm (SF1324).***

INSTRUMENTS REQUIRED

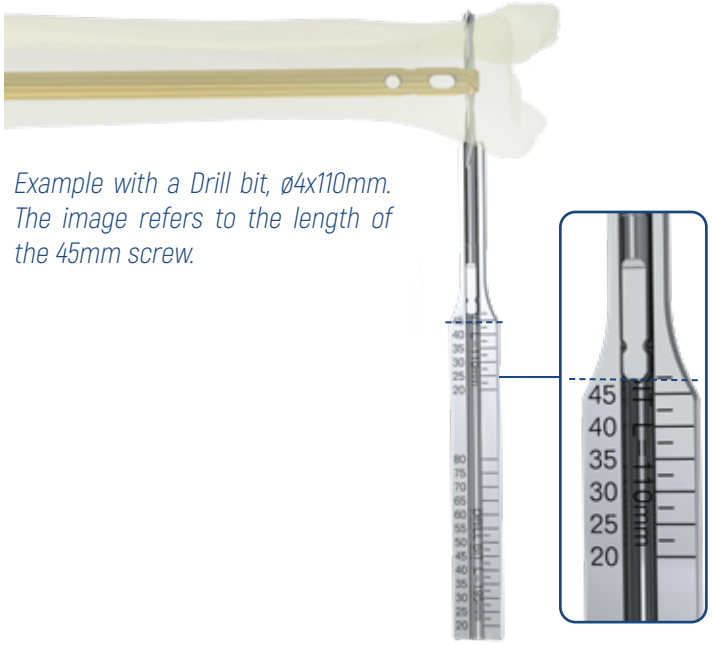
DT03016A
Drill bit ø4x195mm STERILE

DT03019A
Drill bit ø4x110mm STERILE

Distal screw length measurement options

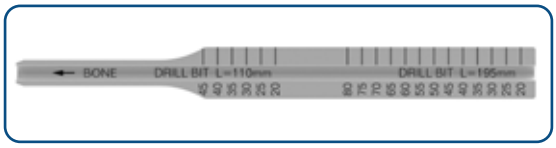
To measure the length of the cortical screws, either the screws ruler (A) or the screws depth gauge (B) can be used.

A) Screws ruler



Example with a Drill bit, ø4x110mm. The image refers to the length of the 45mm screw.

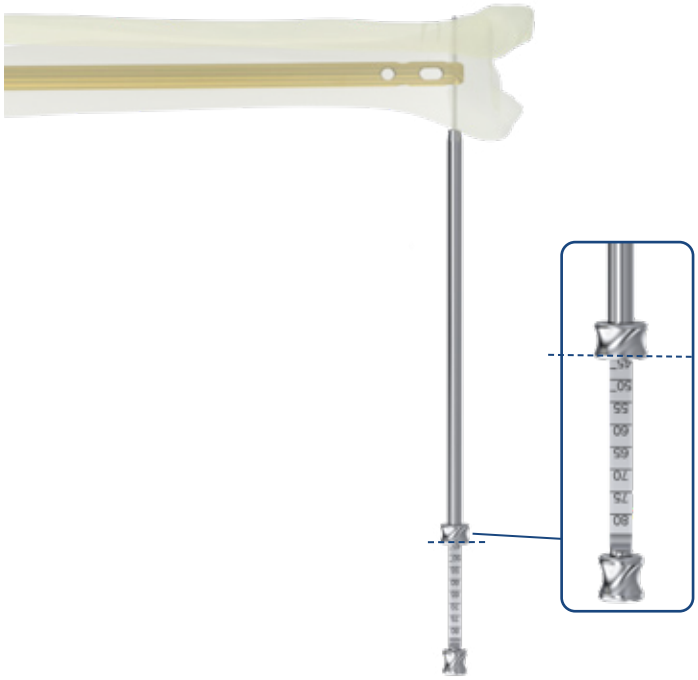
A) Insert the screws ruler (with the "BONE" marking facing upwards) onto the Drill bit, ø4x110mm until it touches the cortex. The end of the Drill bit, ø4x350mm on the ruler's graduated scale, indicates the length of the screw to be used.



Remove the Drill bit, ø4x110mm.

⚠ *The graduated scale indicates the correct screw size based on the length of the drill bit used (the 110mm drill bit was used in the image).*

B) Screws depth gauge



B) If using the screws depth gauge, remove the drill bit. Insert the gauge into the hole, ensuring that the outer cylinder touches the bone and that the drill bit engages the second cortex.
Read the screw length directly from the graduated scale on the screws depth gauge.

⚠ *For intermediate measurements, select the longer length.*

INSTRUMENTS REQUIRED

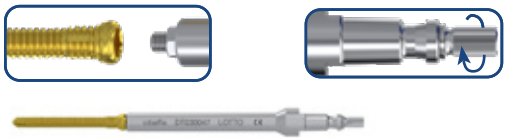
DT030030
Screws ruler ("BONE" facing upwards)

DT030061
Screws depth gauge (OPTIONAL)

First distal screw insertion

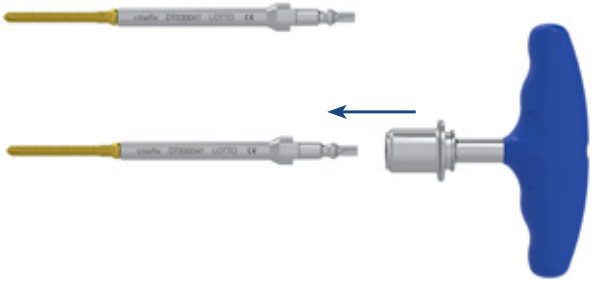
Select the cortical screw ø5.2mm with the correct length and remove the drill bit.

1



1) Place the screw on the Screwdriver, 5mm Hudson coupling, short, and assemble it manually by turning the pin clockwise.

2)



2) Connect the cannulated T-handle to the screwdriver.

3)

3) Insert the first distal screw.

4)

4) Remove the cannulated T-handle, leaving the stem attached to the screw.

INSTRUMENTS REQUIRED

DT030047
5 mm Screwdriver, Hudson coupling, short

DT030070
Cannulated T-handle with Hudson coupling

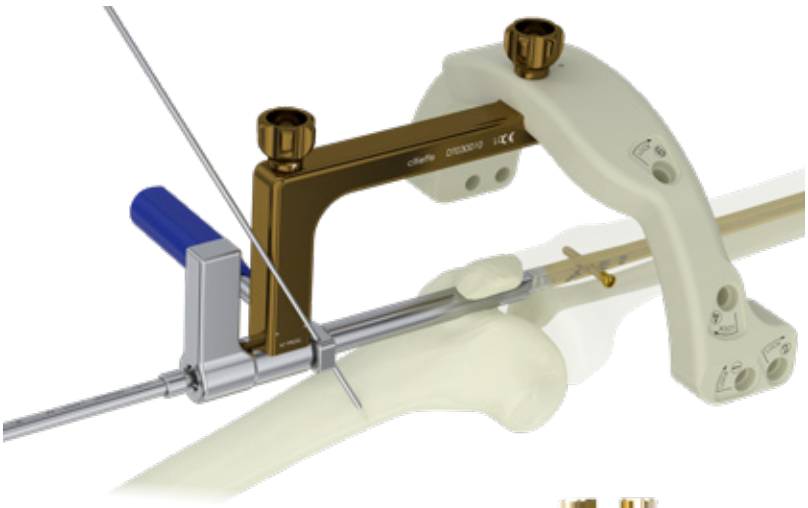
970025
Allen wrench, 2.5mm

Second distal screw insertion

Repeat the same steps for selecting (page 23) the cortical screw 5.2 mm and for inserting the second distal screw (page 24).

Fracture compression (optional)

Compression device insertion

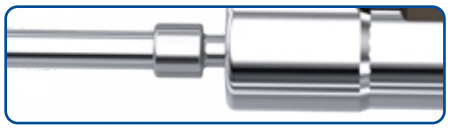


Compression of the fracture line can only be performed when the nail is locked proximally with the screw inserted in the dynamic hole (hole 1) and at least one distal screw is used.

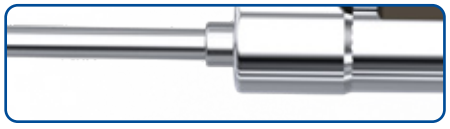
Connect the compression device to the Screwdriver, 5mm Hudson coupling, and insert it into the nail inserter.

Compression device.

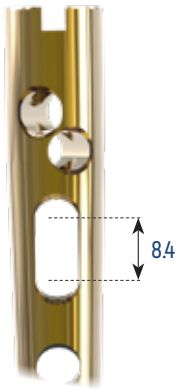
Rotate the screwdriver clockwise, checking the compression progress by x-ray.



Before compression



After compression



NOTE:
During compression, the nail will move proximally up to a maximum of 8.4 mm.

⚠ ***Compression with the compression device cannot be performed on the solid nail.***

INSTRUMENTS REQUIRED

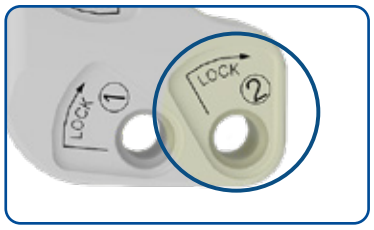
DT030070
Cannulated T-handle with Hudson coupling

DT030046
Screwdriver, 5mm Hudson coupling

DT030052
Compression device

Fracture compression (optional)

Compression device removal

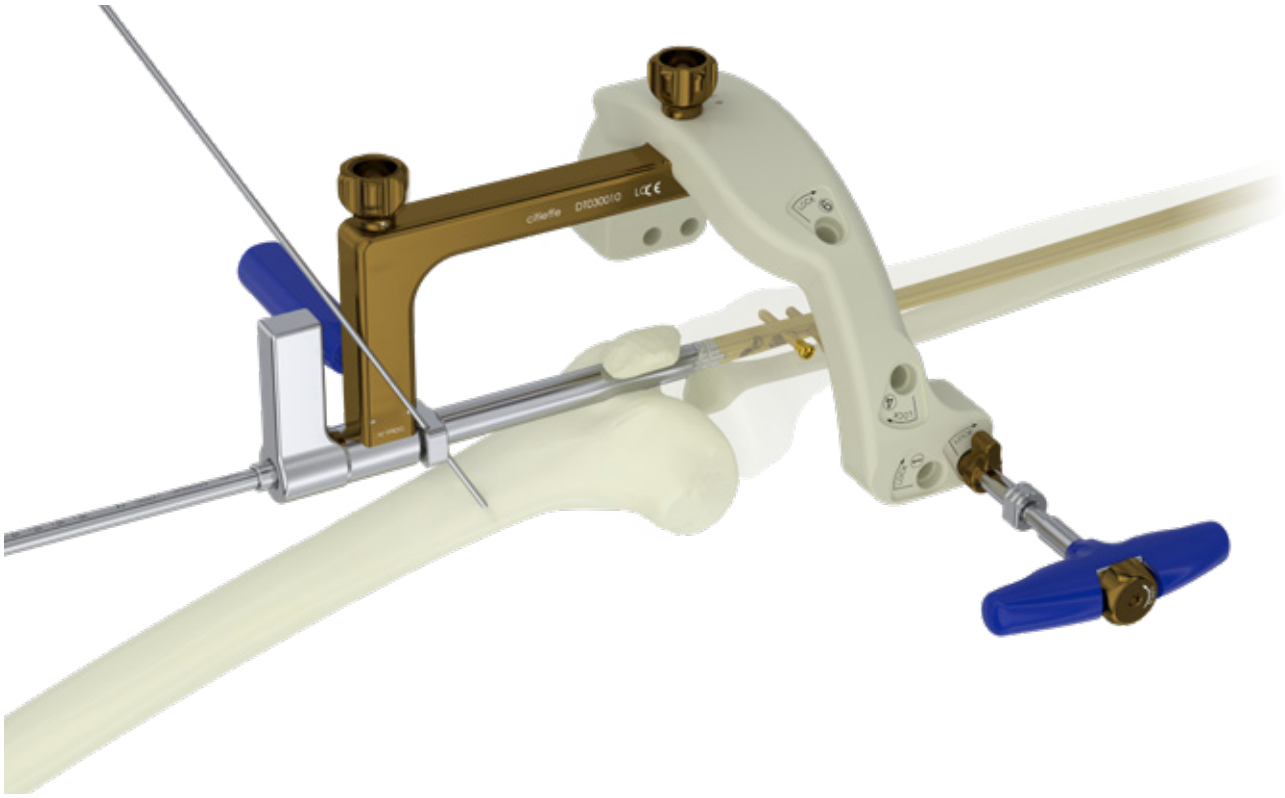


Insert the static proximal screw (hole 2) to maintain the compression achieved. Follow the steps on pages 19 to 21.

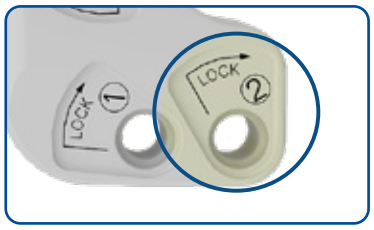
Remove the compression device.

NOTE:
During compression, the nail will move proximally up to a maximum of 8.4 mm.

Compression with the compression device cannot be performed on the solid nail.

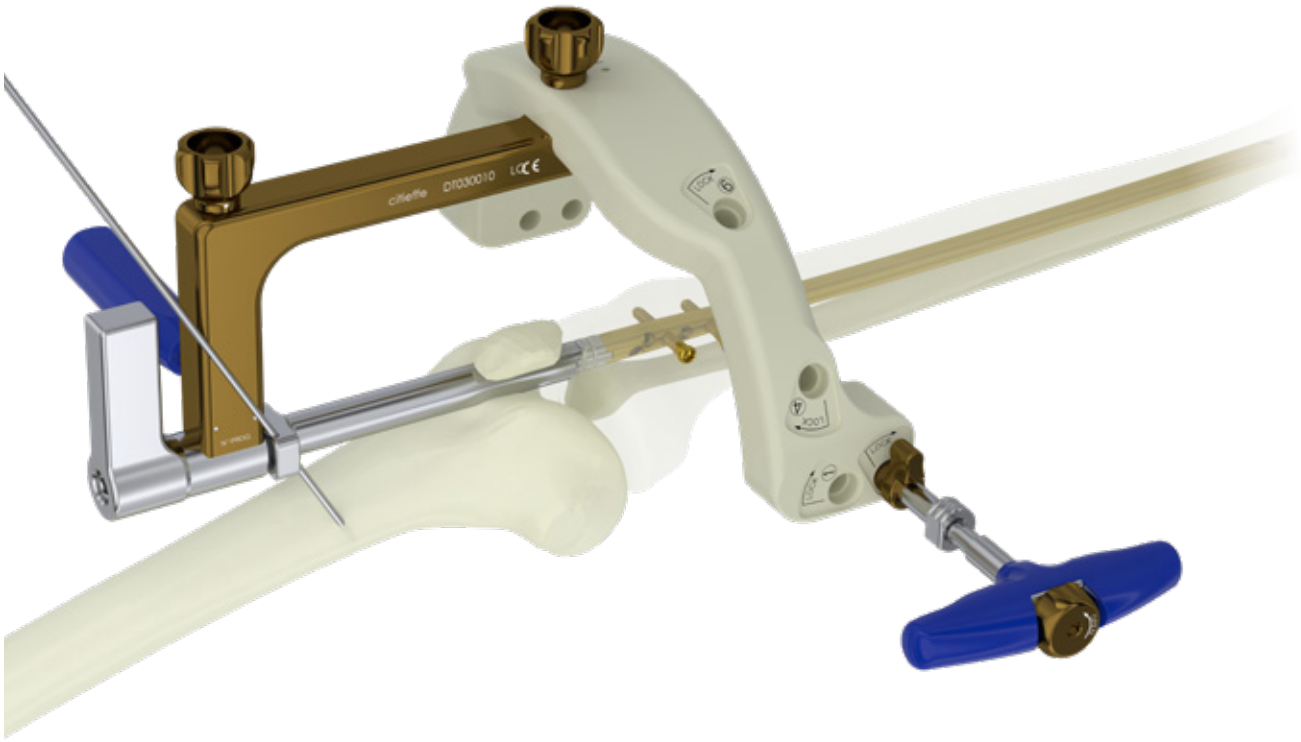


Proximal guided locking: static screw (hole 2)

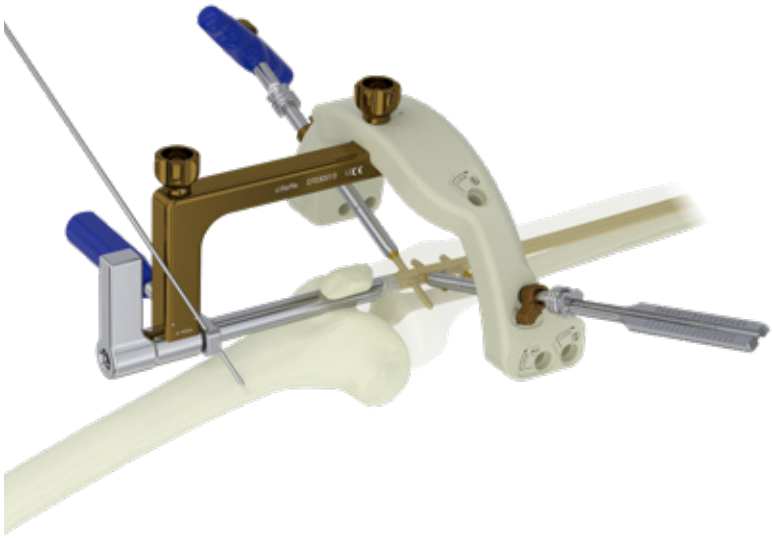


Repeat the steps on page 19 using the static hole (hole 2). Select the correct cortical screw ø5.2mm (Page 20).

Repeat the same steps as carried out for inserting the dynamic proximal screw (Page 21).

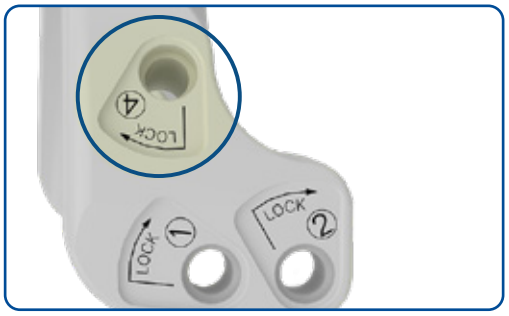


Proximal guided locking: crossed screws (Holes 3 and 4)



To insert the crossed screws, repeat the same steps on page 19 using the holes marked "3" or "4". Repeat the same steps for selecting the correct cortical screw ø5.2mm (as shown on page 20) and for inserting the screw (as shown on page 21).

NOTE:
Locking with crossed screws is the most proximal locking option. For optimal angular stability, we recommend inserting the ESTREMO locking end cap.

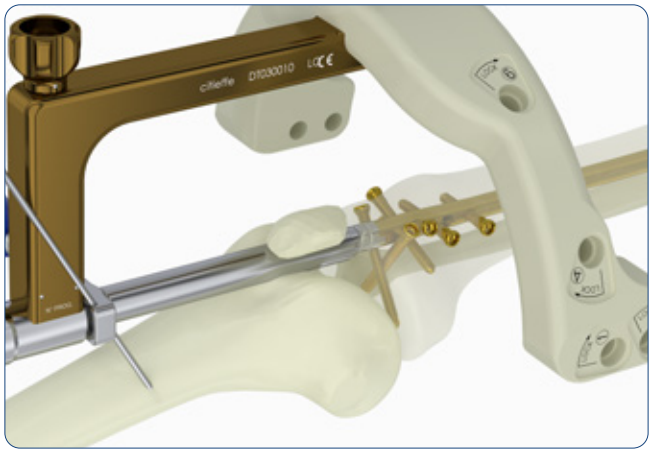


Proximal guided locking: out-nail screws (holes 5 and 6)

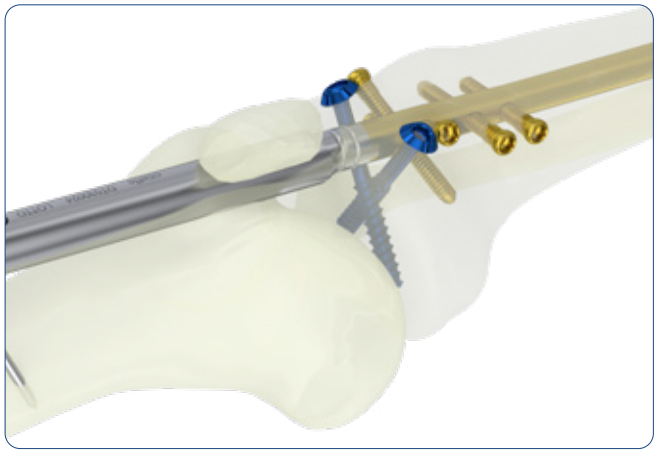
To insert the out-nail screws, repeat the same steps on page 19 using the holes marked "OUT NAIL 5" and "OUT NAIL 6". For more details on insertion, follow the steps "Addendum: Inserting Out-Nail Screws" on page 55.

You can choose from two options:

A) cortical screws ø5.2mm (Page 55)

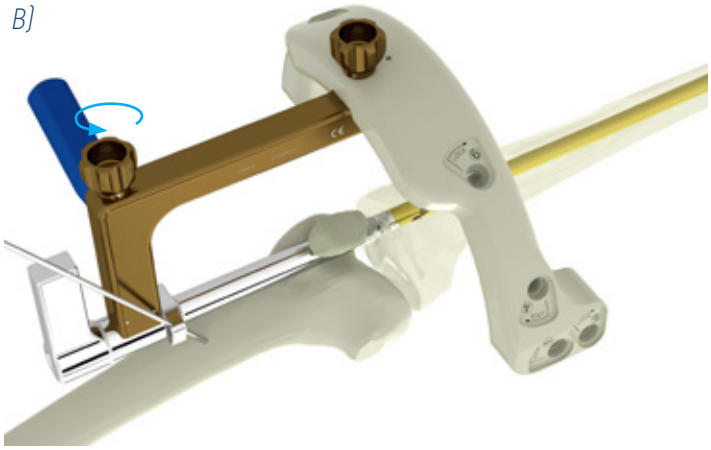


B) Rondò cannulated screws ø6.5mm. (Page 57)

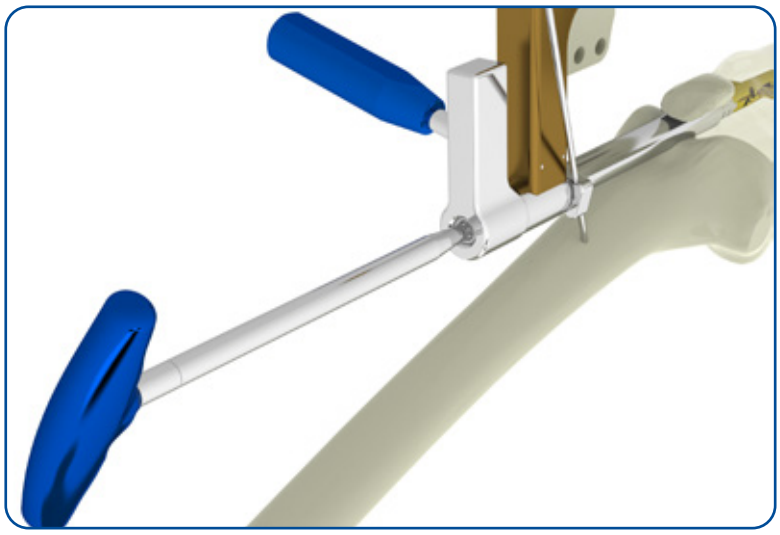


Removing the ESTREMO centring guide

B)



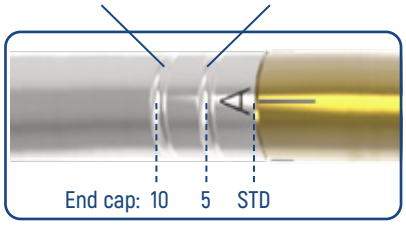
1) Remove the guide from the nail inserter by loosening the gold knob.



2) Before removing the nail inserter note the reference notch on the inserter to facilitate selecting the end cap.

Remove the nail inserter using the T-wrench.

2nd notch (+10mm) *1st notch (+5mm)*



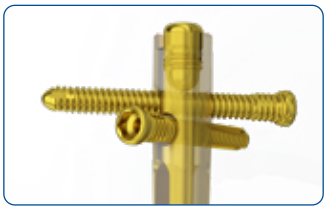
INSTRUMENTS REQUIRED

EBA-5350
Allen T-wrench, 8mm

End cap insertion

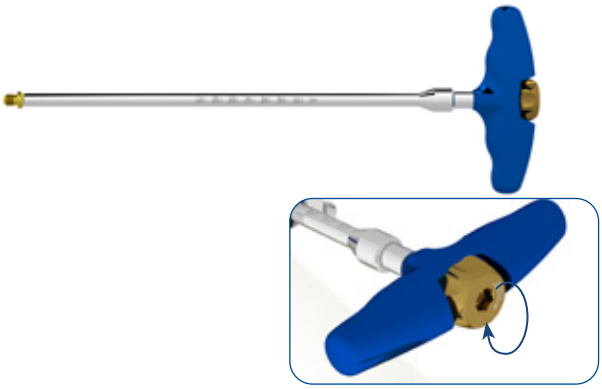
Select the correct size of end cap.

If the crossed screws (holes 3 and 4) were used, we recommend using the locking end cap to achieve ideal angular stability.



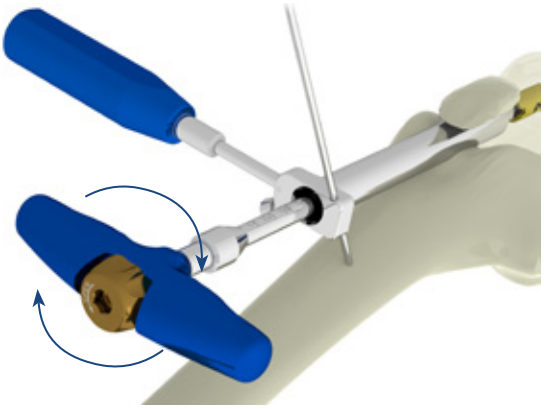
Locking end cap correct placement

A)



A) Connect the selected end cap to the Allen T-screwdriver and lock it by turning the gold knob clockwise.

B)



B) Place the end cap on the nail through the cannula and secure it to the nail by turning the screwdriver clockwise

Remove the screwdriver by unscrewing the knob.

Remove the stabilisation K. wire.

Remove the tissue protection sleeve.

INSTRUMENTS REQUIRED

DT030040
Allen T-screwdriver, 5mm

Final implant

ESTREMO nail implant on tibia with suprapatellar approach.

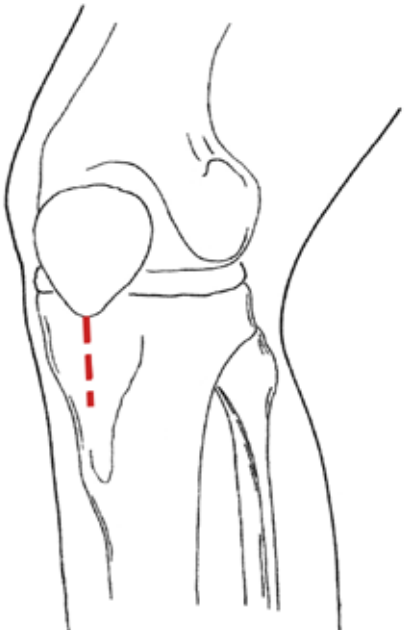
FR

Retrograde femoral nailing

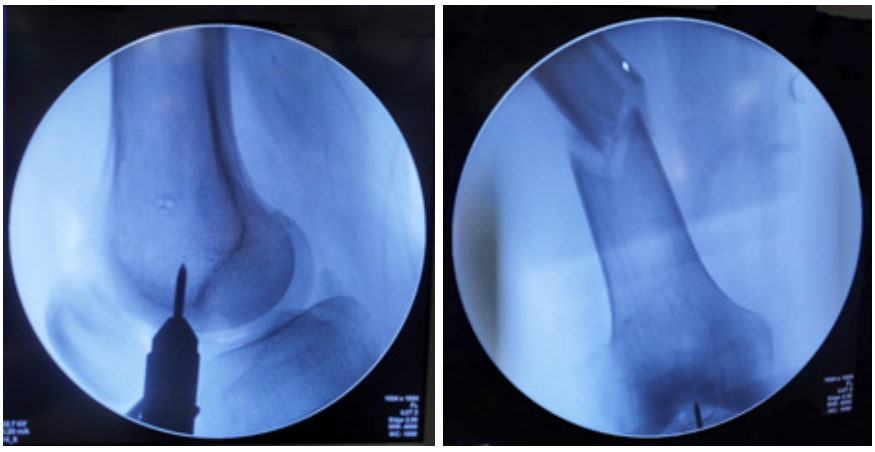
Patient positioning

Place the patient supine on the radiolucent operating table, flexing the knee of the affected limb by approximately 70°-90°.
Reduce the fracture and proceed with fixation.

Incision and entry point



Make a 2 cm longitudinal skin incision, just distal to the inferior patellar pole, on the midline of the patellar tendon.

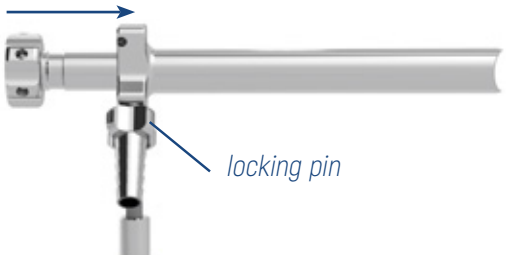


The nail entry point is in line with the medullary canal when viewed in an AP projection, and anterior to Blumensaat's line when viewed in an ML projection.
NOTE:
The entry point is crucial to the final outcome of the fracture fixation, especially as concerns the nail's position inside the medullary canal, respecting the anatomical conditions.

It is particularly important in the case of distal metaphyseal fractures.

All power tools present in the operative technique must be used with a low-speed drill.

Preparing for K. wire insertion



Insert the multi-hole trocar into the tissue protection sleeve and lock it by turning the locking pin clockwise.
Position them at the centre of the intercondylar notch, anterior to Blumensaat's line identified using the image intensifier with an ML projection.

NOTE:
A surgical aspirator can be connected to the locking pin.

K. wire insertion

Keeping the trocar in contact with the cortex, insert the K. wire trocar tip, ø3x350mm into the central hole of the multi-hole trocar to a depth of approximately 30mm.

Check the position of the K. Wire under X-ray control.

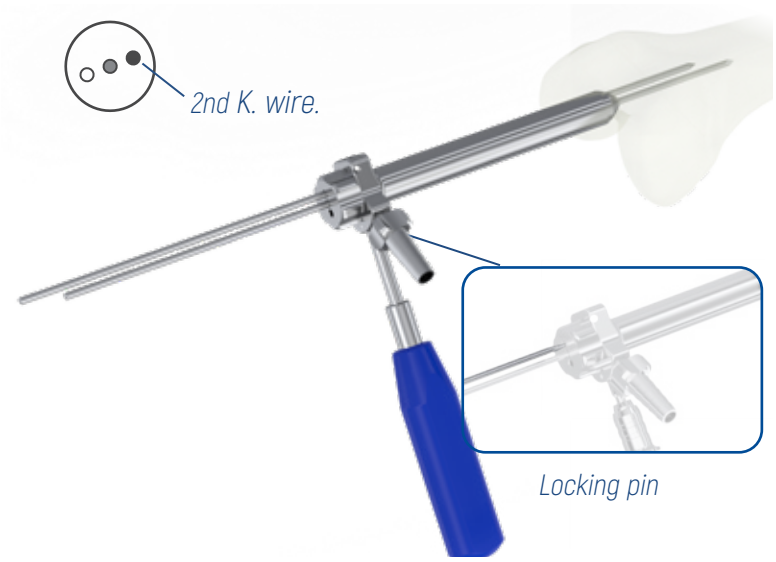
INSTRUMENTS REQUIRED

DT030022
Tissue protection sleeve

DT030026
Multihole trocar

66987
Guide wire trocar tip ø3x350mm
STERILE

Possible adjustments to the K. wire positioning



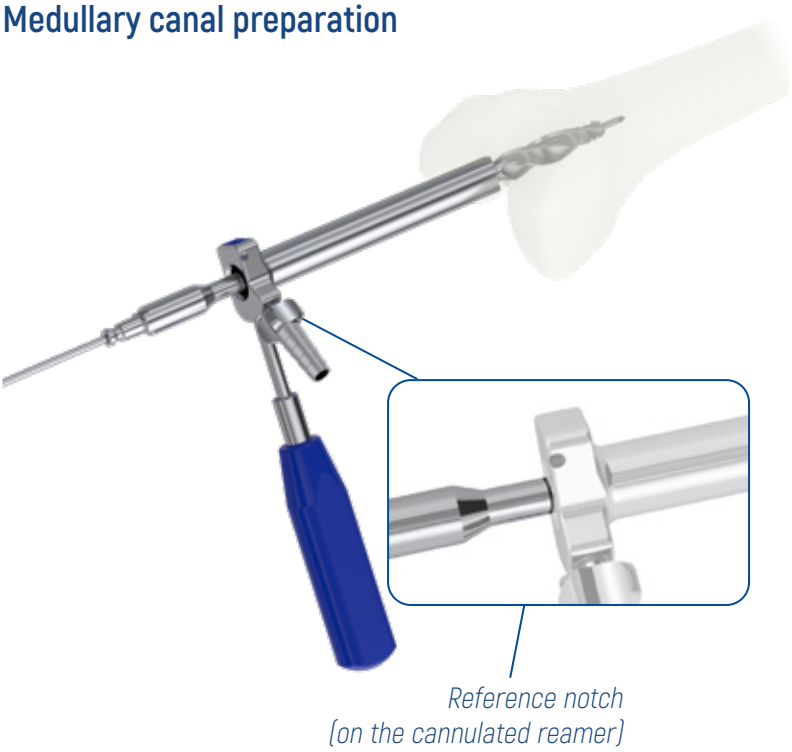
If the K. wire is not positioned correctly, unscrew the locking pin and rotate the multi-hole trocar to position a second wire, keeping the first K. wire in place.

Insert a second K. wire to a depth of approximately 30mm. If the second wire is aligned with the medullary canal, tighten the locking pin and continue drilling.

Once correctly positioned, remove the first wire, unscrew the locking pin, and remove the trocar.

NOTE:
A surgical aspirator can be connected to the locking pin.

Medullary canal preparation



Insert the ø12.5mm cannulated reamer (Hudson Coupling) over the wire and through the tissue protection sleeve, piercing the distal femur to a depth of approximately 70mm, which corresponds to the point where the reference mark on the reamer reaches the edge of the tissue protection sleeve.

Remove the cannulated reamer.

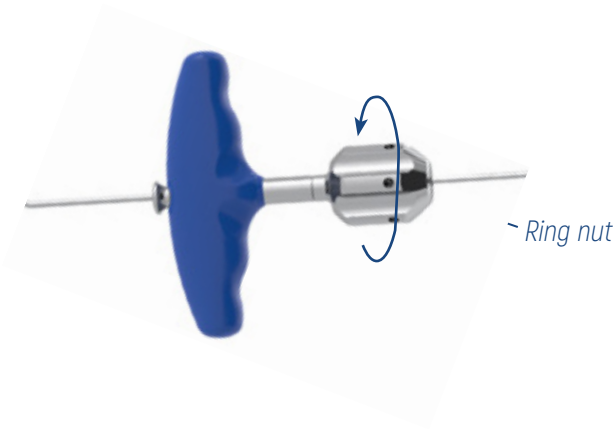
Remove the K. wire.

INSTRUMENTS REQUIRED

66987
Guide wire trocar tip ø3x350mm, sterile
STERILE

DT03010H
Cannulated reamer ø12.5mm

Guide wire insertion



Insert the ø3x800mm guide wire with olive into the chuck for ø2.5-3mm wire and rotate the ring nut anticlockwise to lock the wire in place.

Introduce the wire into the medullary canal to the desired depth.
Remove the chuck by turning the ring nut clockwise.

NOTE:
If necessary, use the fracture alignment guide wire exchange tool to facilitate fracture reduction and the insertion of the guide wire into the correct position.

NOTE:
The obturator with handle can be used to hold the guide wire in place.

INSTRUMENTS REQUIRED

EBA-5345
chuck for ø2.5-3mm wire

DT030002
Guide wire with olive
ø3x800mm (STERILE)

EBA-5316
Fracture alignment
guide wire exchange tool

DT030090
Obturator with handle

Nail length measurement and medullary canal reaming

Insert the Nails ruler over the guide wire with olive, bringing it into contact with the cortex.

1) *2)*

The images refer to the 395mm length.

1) Ensure the end of the guide wire is aligned with the end of the Nails ruler (the wire must be visible through the slot).

2) Read the nail length directly from the marking on the Nails ruler.

⚠ ***For intermediate readings, we recommend using the shorter nail size.***

Progressively ream the canal in 0.5mm increments. We recommend reaming 1.5mm more than the nail selected for the implant.

NOTE:
If necessary, you can use the GH5040 (Hudson-Hudson) or GH5041 (Zih-Zih) adapter.

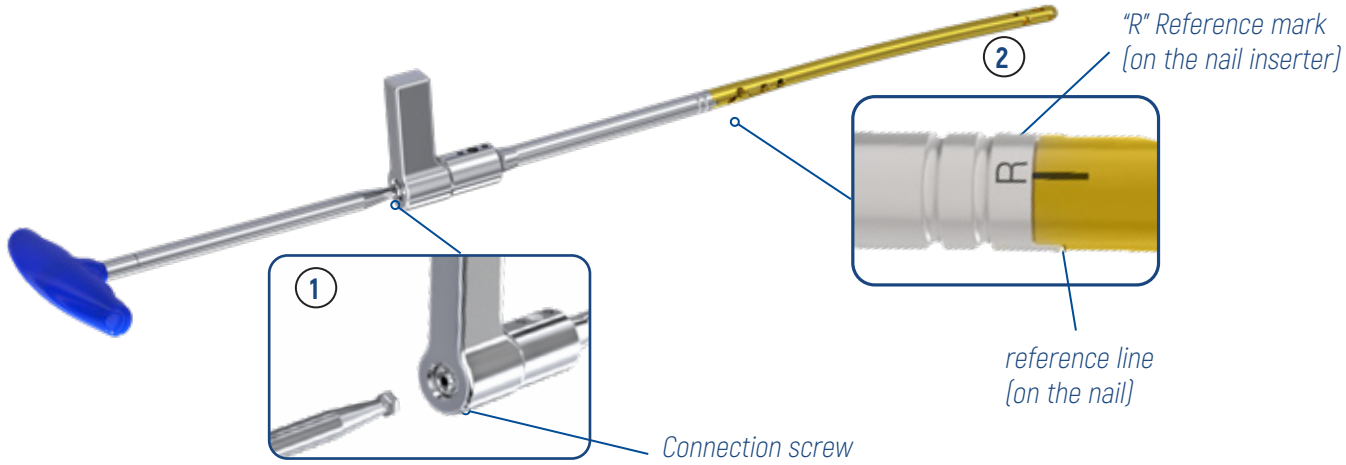
INSTRUMENTS REQUIRED

DT030032
Nails ruler, wire 800mm

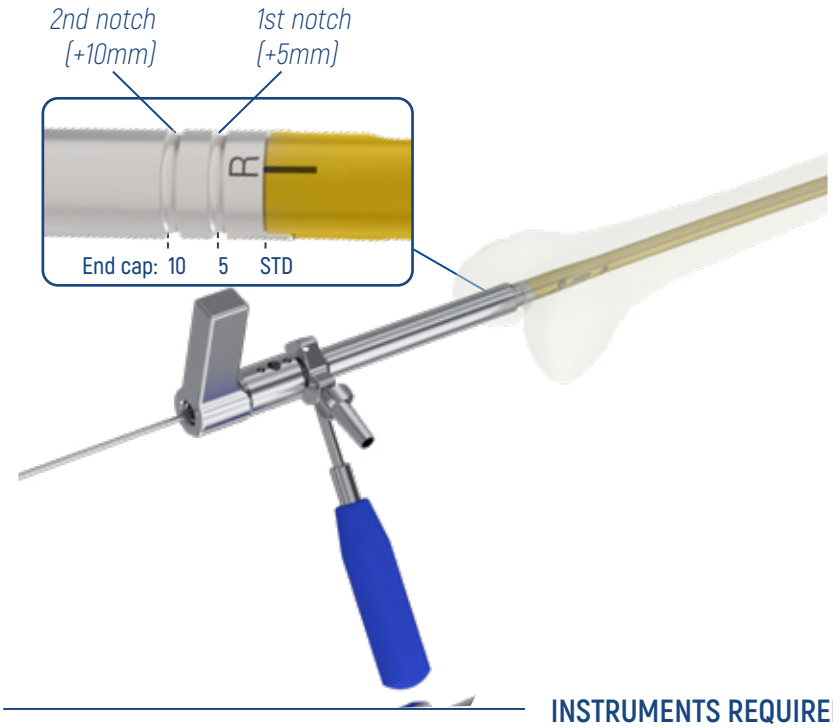
Nail-inserter assembly

The connection between the inserter and the nail is the same for both the left and the right femur.
Lock the selected nail onto the inserter, aligning the reference line on the nail with the "R" marking on the inserter.

Position the selected nail against the inserter, aligning the reference line on the nail with the "R" marker on the inserter. (1)
Tighten the inserter's connecting screw with the 8mm Allen T-Wrench. (2)



Nail insertion



Manually insert the ESTREMO nail over the guide wire and advance it into the medullary canal through the tissue protection sleeve.
If necessary, tap the handle of the inserter with the slotted hammer until reaching one of the two depth reference marks, which correspond to the two other end cap sizes in addition to the standard one.

Once the nail has passed the fracture line, remove the ø3x800mm guide wire with olive and verify the final position of the nail in both the anteroposterior (AP) and mediolateral (ML) projections.

INSTRUMENTS REQUIRED

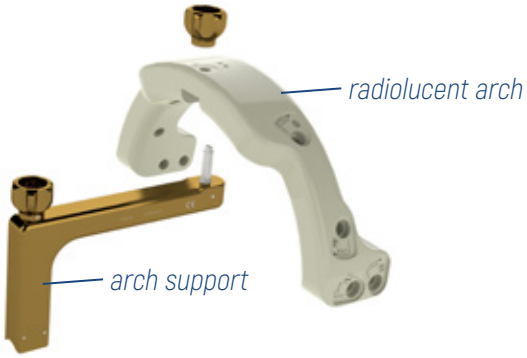
Nail Inserter
(guide ESTREMO DT030010)

EBA-5350
Allen T-wrench, 8mm

DT030080
Slotted hammer

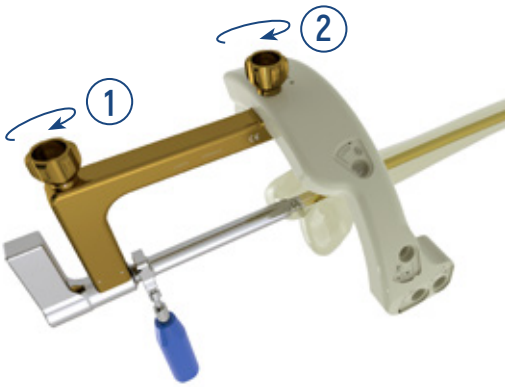
Assembling the centring guide

A)



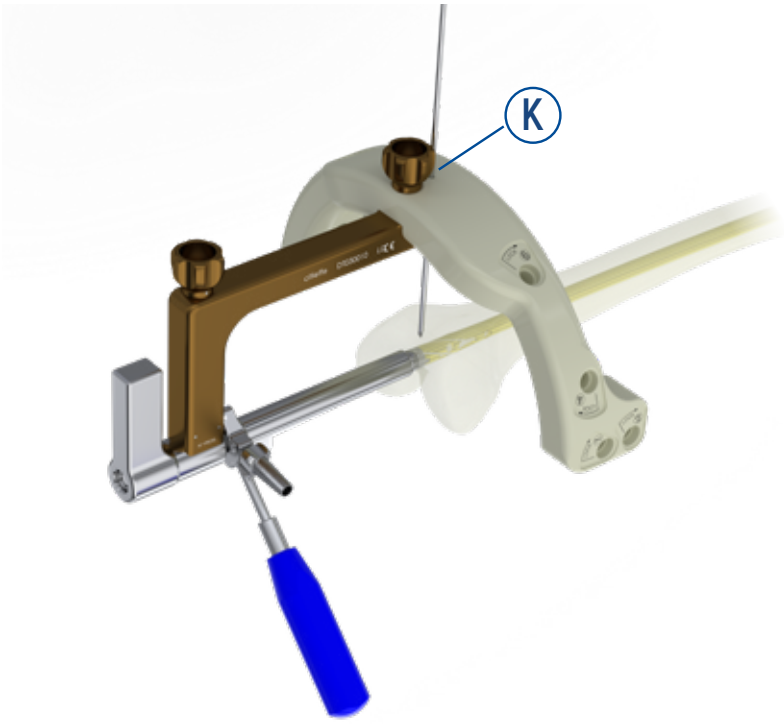
A) Assemble the arch support with the radiolucent arch.

B)

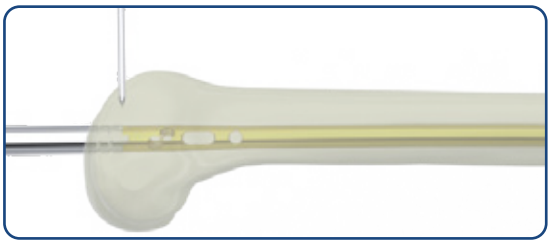


B) Connect the arch support and radiolucent arch to the nail inserter by tightening the two knobs.

Nail depth monitoring



The correct nail depth can be verified by inserting a K. wire through the hole in the aiming device, marked (K). The tip of the K. wire indicates the distal end of the nail. Use the image intensifier to check the nail depth.



NOTE:
If compression is performed with the Compression device, the nail will move distally up to a maximum of 8.4 mm (see page 5 for details).

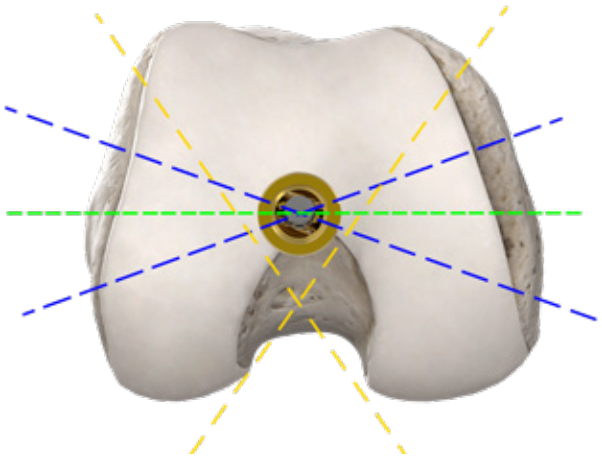
Remove the K. wire.

INSTRUMENTS REQUIRED

DT030010
ESTREMO guides

66987
Guide wire trocar tip ø3x350mm, sterile
STERILE

Guided distal locking options



- parallel screws
- crossed screws at 40°
- out-nail screws

Holes 1 and 2
Insertion of parallel screws with lateromedial access.
Holes 3 and 4
Insertion of crossed screws at 40°.
Holes 5 and 6
Insertion of out-nail screws.

NOTE:
for the insertion of out-nail screws, in addition to cortical screws, Rondò cannulated screws are also available for proper compression of the bone fragments. For further details, see page 55.

Condylar screws can be used by following the steps described on page 52.

Depending on the fracture type, distal locking can be performed with the following options:

- Two parallel screws with lateromedial access;
- Two crossed screws at 40°.

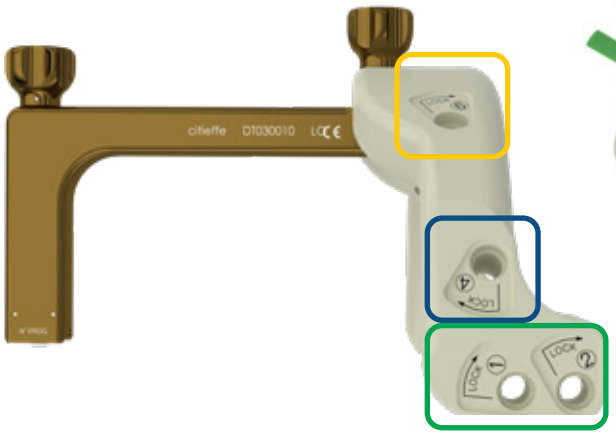
An additional locking option can be achieved by inserting two out-nail screws.

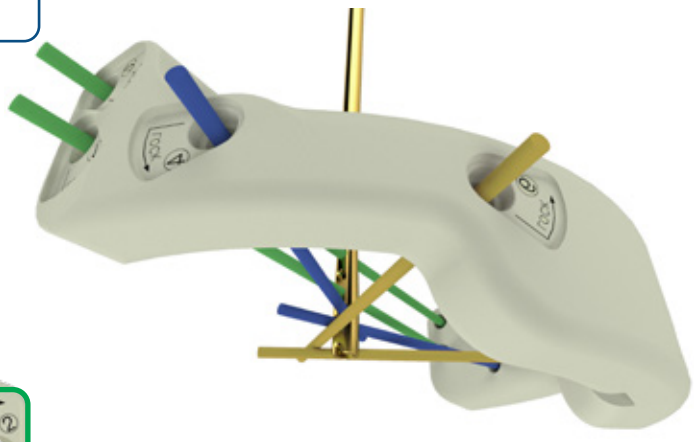
⚠ *Intraoperative compression using the compression device can be performed starting from the dynamic hole corresponding to the 1 mark.*
For more details on compression, see page 46.

⚠ *Intraoperative compression using the compression device cannot be performed on the solid nail.*

NOTE:
Locking with crossed screws is the most distal locking option. For optimal angular stability, we recommend inserting the ESTREMO locking end cap.

The holes on the radiolucent arch of the centring guide allow the guided insertion of all screws.





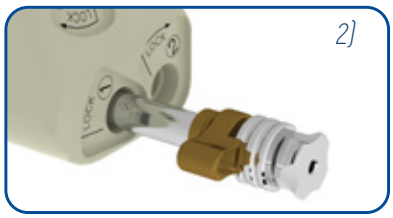
The following technical steps refer to distal locking with parallel screws.

Distal, proximal locking, and compression phases

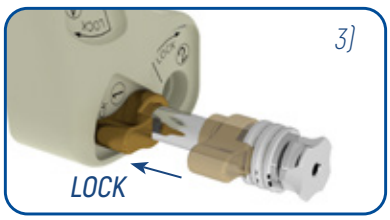
Distal guided locking: dynamic screw (hole 1)

1)

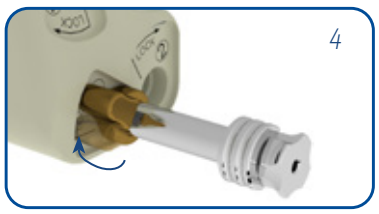
1) Insert and screw the trocar for ø4mm drill bit into the cannula.



2) Insert them into the dynamic hole (1) of the radiolucent arch until they come into contact with the cortex.



3) Push the cannula lever down on the cannula until reaching the seat of the centring guide.



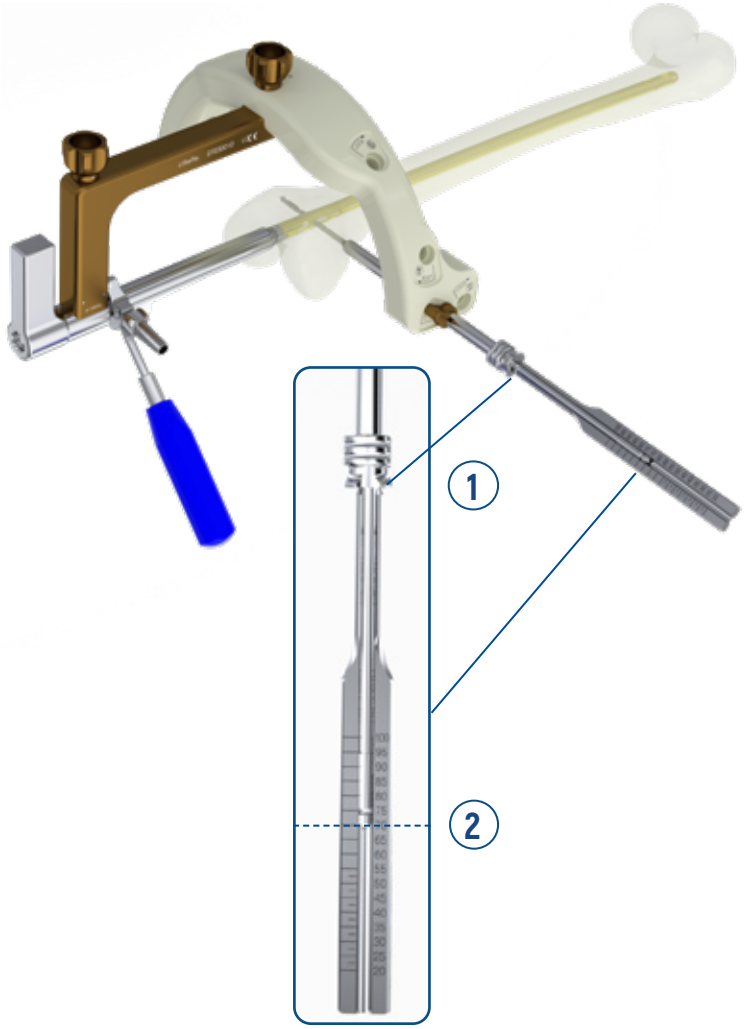
4) Rotate the lever following the "lock" marking to lock the cannula in place and keep it in contact with the bone.
The use of the dynamic hole (1) will enable the controlled compression technique.

INSTRUMENTS REQUIRED

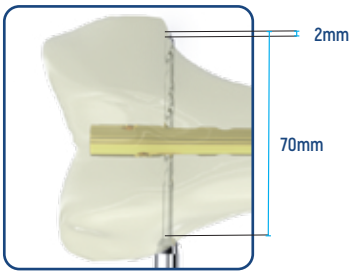
DT030020
Cannula

DT030027
Trocar for drill bit ø4mm

Dynamic distal screw preparation and measurement



Insert the Drill bit, ø4x350mm into the trocar and drill through both cortices.
Before measuring, ensure the drill bit is in the correct position, as shown in the image: the drill bit must protrude beyond the second cortex by at least 2mm.



The image refers to a 70mm screw size.

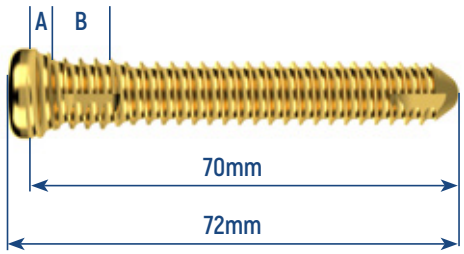
Insert the Screws ruler (with the "TROCAR" marking facing upwards) on the Drill bit, ø4x350mm until it touches the trocar. (1)

The end of the Drill bit, ø4x350mm on the ruler, shows the length of the screw to be used. (2)

Remove the Drill bit, ø4x350mm and the trocar.

⚠ *For intermediate readings, select the longer size.*

Cortical screw characteristics:



A 2mm length with increased core diameter.

B Increased resistance will be felt during screw insertion thanks to the larger self-tapping structure of the proximal screw (0.5mm) for enhanced stability (length approximately 4mm).

Example: code DT352070 (Cortical screw ø5.2mm L70mm).

INSTRUMENTS REQUIRED

DT03020A
Drill bit ø4x350mm

DT030030
screws ruler ("TROCAR" facing upwards)

Dynamic distal screw insertion

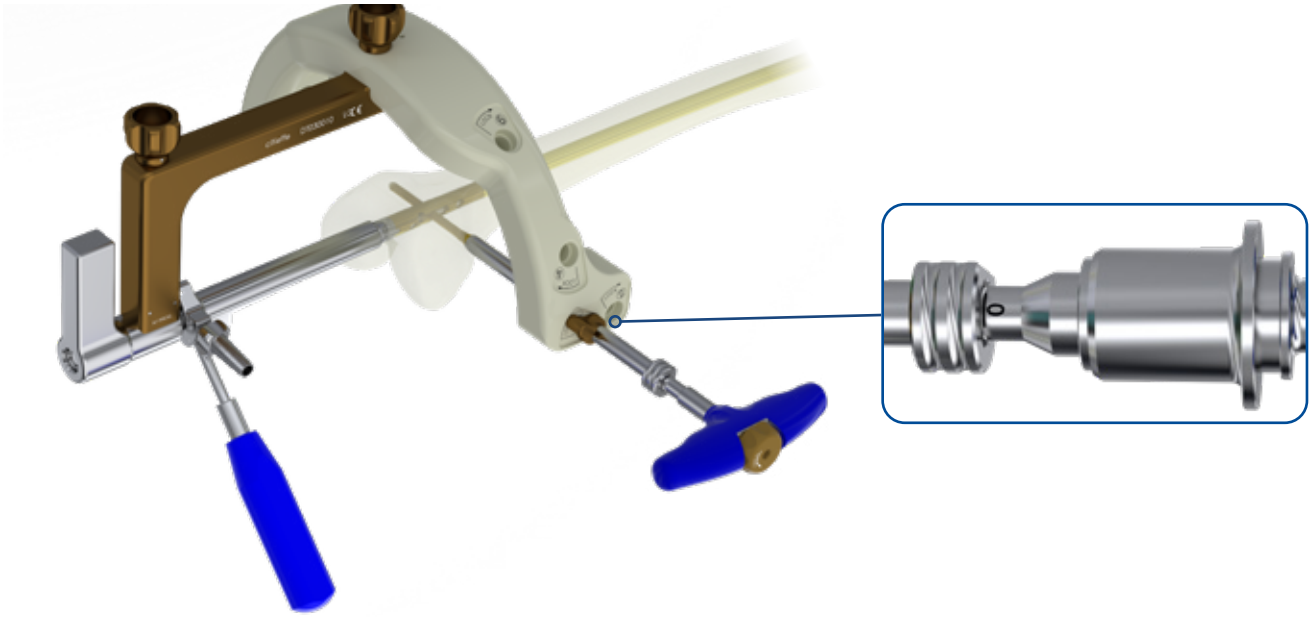
Select the cortical screw, ø5.2mm with the correct length.

1) Lock the screw onto the screwdriver using the retention system.

2) Insert the screwdriver into the cannula and screw until the marker "0" on the screwdriver reaches the end of the cannula.

1)

2)



3)

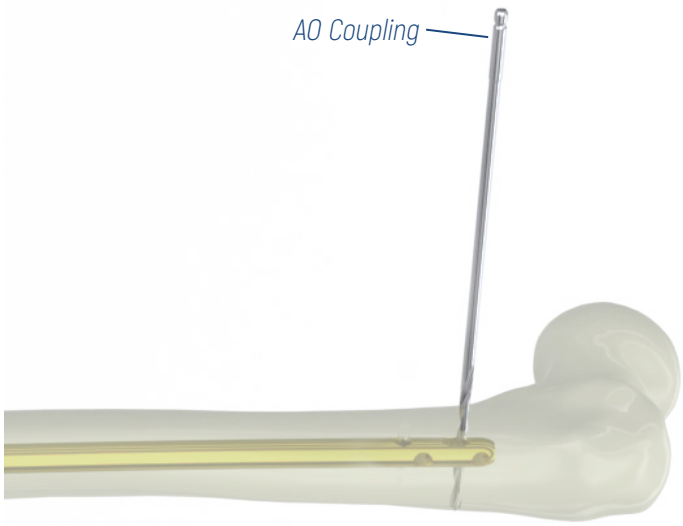
3) To remove the screwdriver, unscrew the retention system.

INSTRUMENTS REQUIRED

DT030040
Allen T-screwdriver, 5mm

Proximal locking (freehand technique)

Preparation of the proximal lock



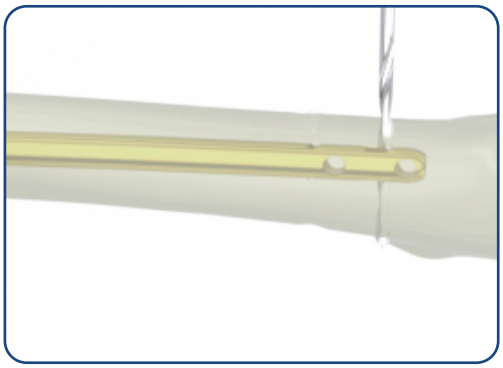
Under X-ray control, check the reduction, correct the fragment alignment and the limb length before performing freehand proximal locking.

Drill both cortices using the Drill bit, ø4x195mm.

Under X-ray control, ensure the drill bit passes through the nail holes on both the AP and ML axes.

NOTE:
We recommend starting with the most proximal hole.

If using a solid nail (ø8mm), use the ø4mm bone screws and the Drill bit ø3.2x195mm (SF1324).



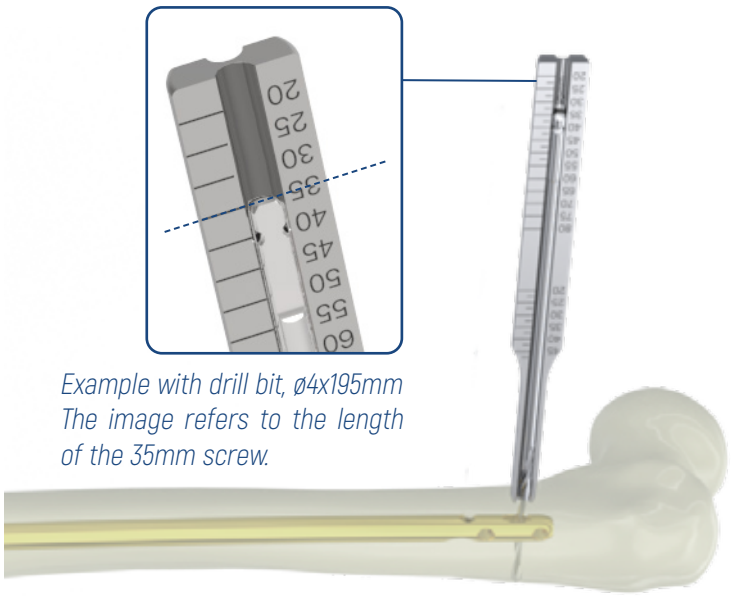
INSTRUMENTS REQUIRED

DT03011A
Drill bit ø4x195mm

Proximal screw length measurement options

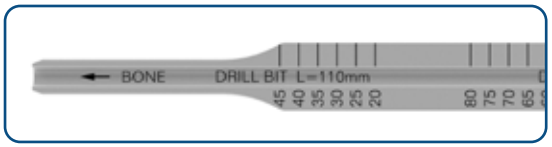
To measure the length of the cortical screws, either the screws ruler (A) or the screws depth gauge (B) can be used.

A) Screws ruler



Example with drill bit, ø4x195mm The image refers to the length of the 35mm screw.

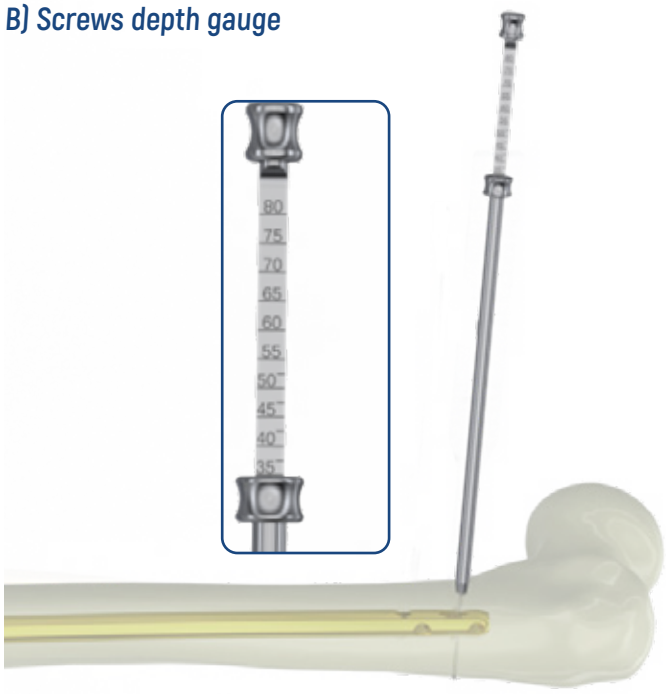
A) Insert the Screws ruler (with the word "BONE" facing upwards) onto the Drill bit, ø4x195mm until it touches the cortex. The end of the drill bit on the screws ruler indicates the length of the screw to be used.



Remove the Drill bit, ø4x195mm.

⚠ *The graduated scale indicates the correct screw size based on the length of the drill bit used (the 110mm drill bit was used in the image).*

B) Screws depth gauge



B) If using the Screws depth gauge, remove the drill bit.
Insert the gauge into the hole, ensuring that the outer cylinder touches the bone and that the drill bit engages the second cortex. Read the screw length directly on the screws depth gauge scale.

⚠ *For intermediate measurements, select the longer length.*

INSTRUMENTS REQUIRED

DT030030
Screws ruler ("BONE" writing facing upwards)

DT030061
Screws depth gauge (optional)

First proximal screw insertion

1)

2)

3)

4)

Select the cortical screw ø5.2mm with the correct length and remove the drill bit.

1) Place the screw on the screwdriver, 5mm Hudson coupling, and assemble it manually by turning the pin clockwise.

2) Connect the cannulated T-handle to the screwdriver.

3) Insert the first proximal screw.

4) Remove the cannulated T-handle and loosen the pin manually or with the 2.5 mm Allen key. Remove the screwdriver.

Second proximal screw insertion

Repeat the same steps for selecting the cortical screw, 5.2 mm (page 44) and for inserting the second distal screw (page 45).

INSTRUMENTS REQUIRED

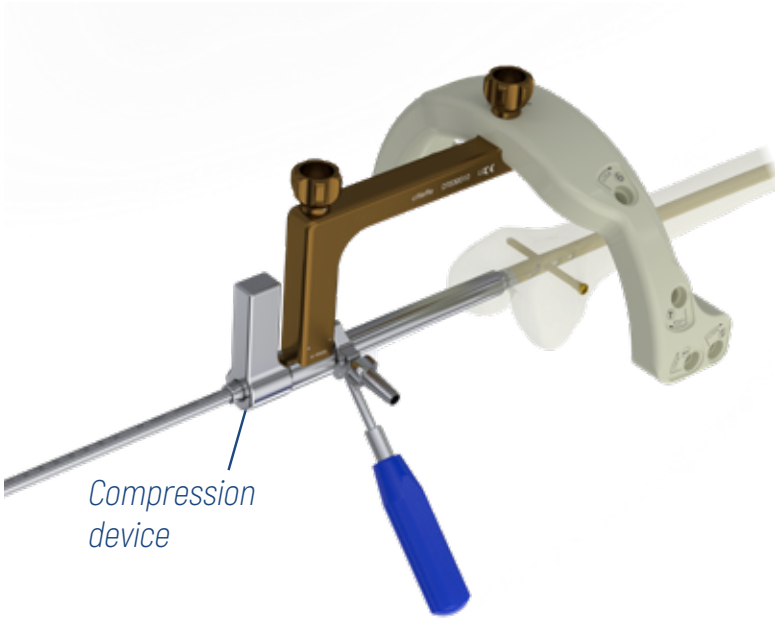
DT030046
Screwdriver, 5mm Hudson coupling

DT030070
Cannulated T-handle with Hudson coupling

970025
2.5mm Allen wrench

Fracture compression (Optional)

Inserting the compression device



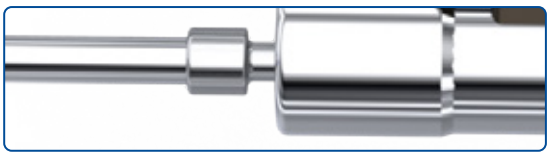
Compression of the fracture line can only be performed when the nail is locked proximally with the screw inserted in the dynamic hole (hole 1) and at least one distal screw is used.

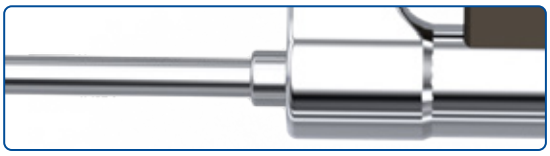
Connect the Compression device to the 5mm Allen T-screwdriver and insert it into the nail inserter.
Rotate the screwdriver clockwise, checking the compression progress under X-ray control.

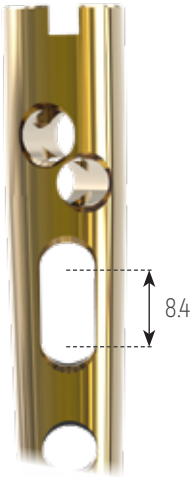
Compression device

NOTE:
During compression, the nail will shift distally up to a maximum of 8.4mm.

⚠ ***Compression with the compression device cannot be performed on the solid nail.***


Pre-compression


Post-Compression



INSTRUMENTS REQUIRED

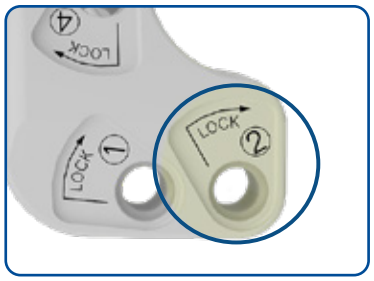
DT030052
Compression device

DT030070
Cannulated T-handle with Hudson coupling

DT030046
Screwdriver, 5mm Hudson coupling

Fracture compression (Optional)

Removing the compression device

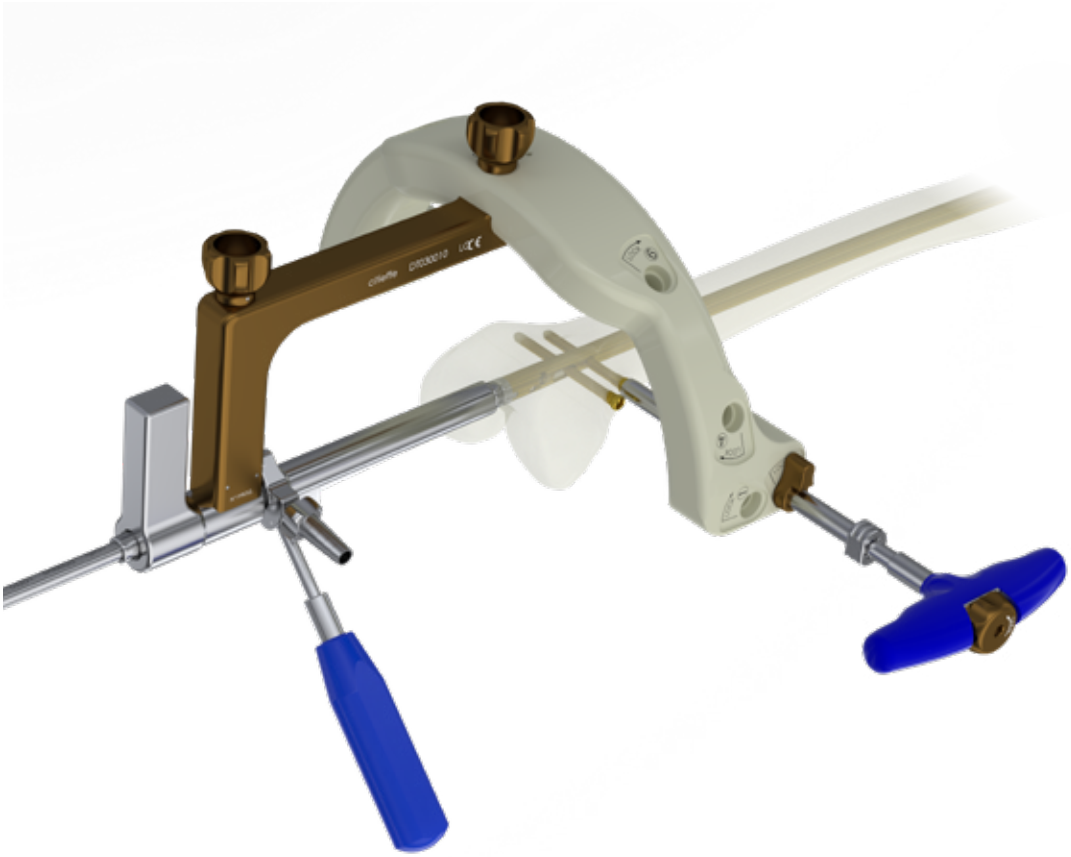


Insert the static distal screw into the static hole (2) to maintain the compression achieved.
Follow the steps on pages 40 through 42.

Remove the compression device.

NOTE:
during compression, the nail may move distally up to a maximum of approximately 8.4mm.

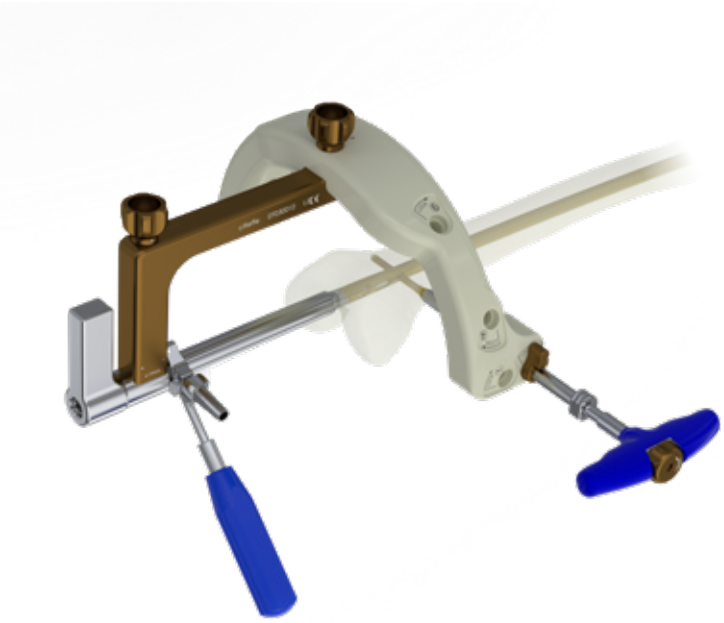
⚠ ***Compression with the compression device cannot be performed on the solid nail.***



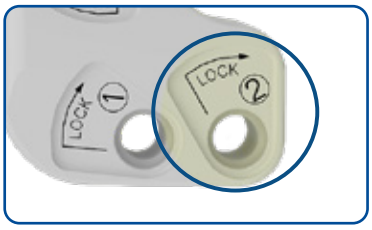
INSTRUMENTS REQUIRED

DT030040
Allen T-screwdriver, 5mm

Distal guided locking: static screw (hole 2)



Repeat the steps on page 40 using the static hole (2).
Select the correct cortical screw, ø5.2mm. (Page 41).
Repeat the same steps performed for inserting the dynamic distal screw. (Page 42)



Distal guided locking: crossed screws (Holes 3 and 4)

To insert the crossed screws, repeat the same steps on page 40 using the holes marked (3) and (4).
Repeat the same steps for selecting the correct cortical screw (as shown on page 41) and for inserting the screw (as shown on page 42).

NOTE:
Locking with crossed screws is the most distal locking option. For optimal angular stability, we recommend inserting the ESTREMO locking end cap.

NOTE:
The same locking procedure performed with condylar screws can be found on page 52.

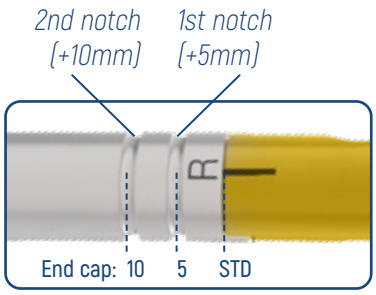
Distal guided locking: Out-Nail screws (holes 5 and 6)

To insert the out-nail screws, repeat the same steps as on page 40, but in the holes (5) and (6) marked with the OUT-NAIL marking. You can choose from two options:

A) cortical screws, ø5.2mm
B) Rondò cannulated screws, ø6.5mm

For more details on the insertion, follow the steps "ADDENDUM: OUT-NAIL SCREWS (holes 5 and 6)" on page 55.

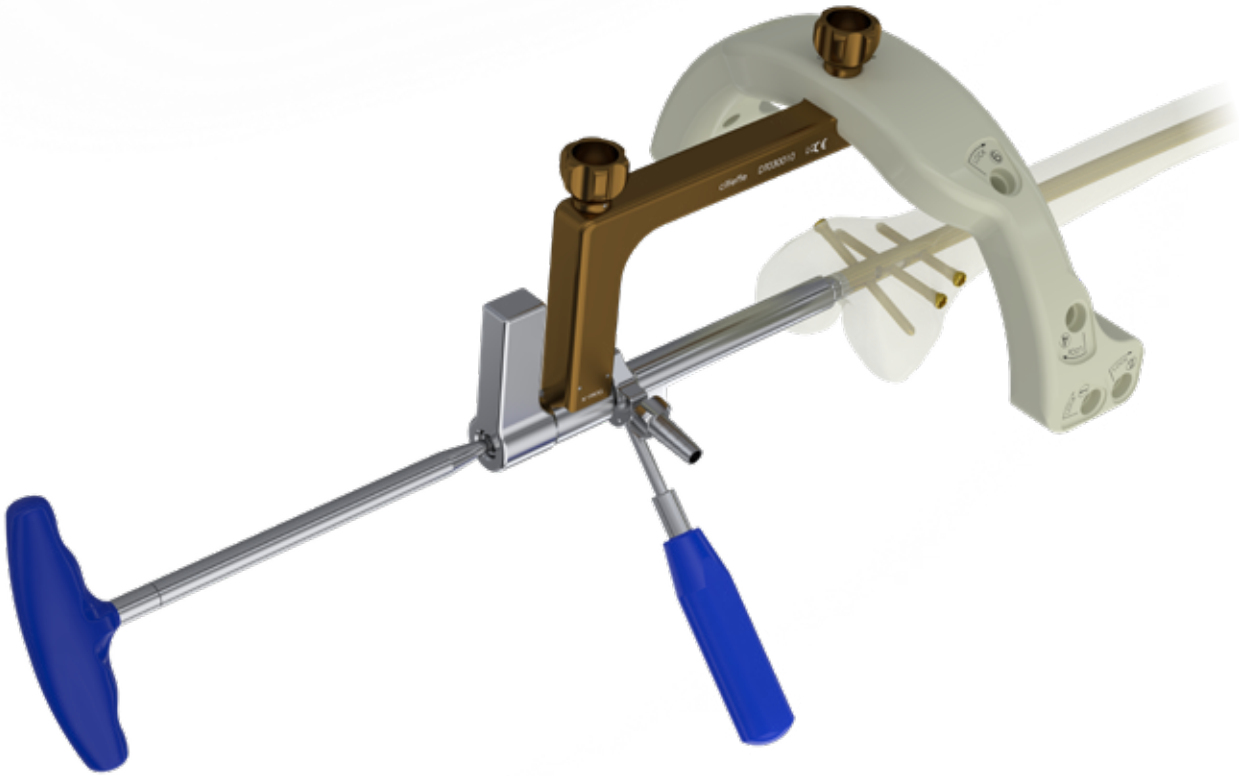
Removing the Estremo centring guide



1) Remove the guide from the nail inserter by loosening the gold knob.

2) Before removing the nail inserter note the reference notch on the inserter to facilitate selecting the end cap.

Remove the nail inserter using the T-wrench.



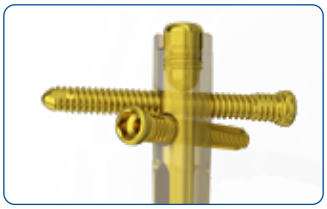
INSTRUMENTS REQUIRED

EBA-5350
Allen T-wrench, 8mm

Inserting the end cap and completing the implant

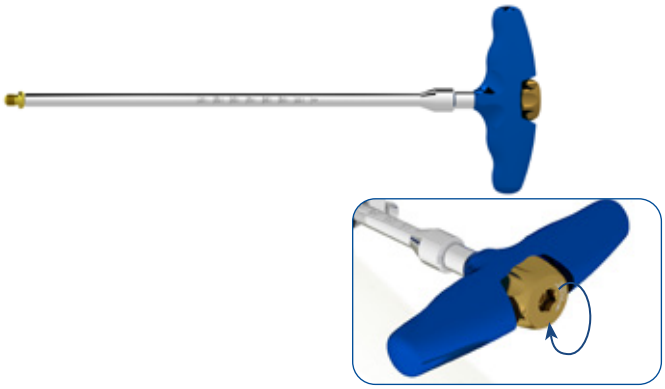
Select the correct size of end cap.

If the crossed screws (holes 3 and 4) were used, we recommend using the locking end cap to achieve ideal angular stability.



Positioning the locking end cap

A)



A) Connect the selected end cap to the Allen T-screwdriver and lock it by turning the gold knob clockwise.

B)

B) Place the end cap on the nail through the cannula and secure it to the nail by turning the screwdriver clockwise

Remove the screwdriver by unscrewing the knob.

Remove the stabilising guide wire.

Remove the tissue protection sleeve.

INSTRUMENTS REQUIRED

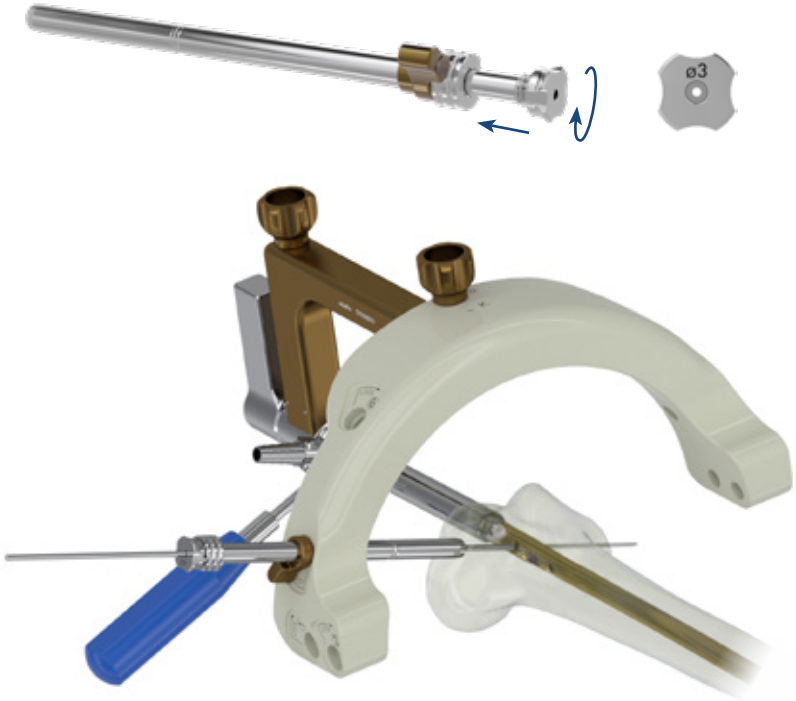
DT030040
Allen T-screwdriver, 5mm

Final implant

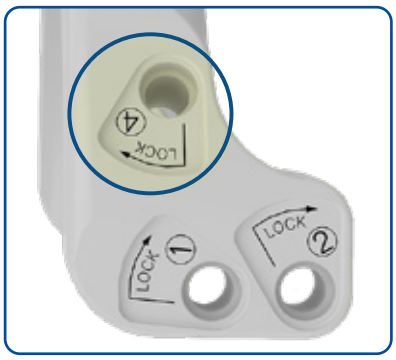
ESTREMO nail implant in the femur via retrograde access.

Operative technique - condylar screws (optional)

Checking the direction of the condylar screws



Insert and screw the ø3mm trocar into the hole (4) following the same steps for inserting and locking the cannula on page 40.



Insert a ø3mm K. wire trocar drill bit into the trocar to check the correct direction of the condylar screws.

If the direction is incorrect, remove the wire, trocar, and cannula and rotate the guide to the desired position.

INSTRUMENTS REQUIRED

DT030020
Cannula

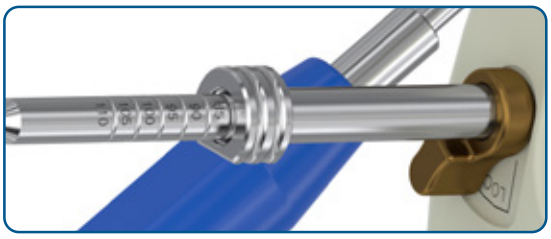
DT030025
Trocar, ø3mm

66987
Guide wire trocar tip
ø3x350mm, sterile

Measuring the condylar screw

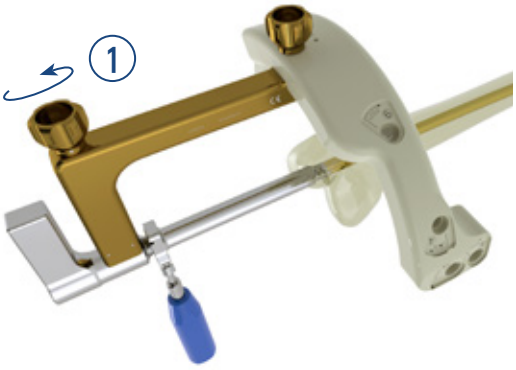
Remove the wire and the ø3mm trocar.
Insert the graduated drill, ø5.3mm, touching the second cortex with the drill bit, but without going beyond it.

Record the measurement on the graduated scale at the edge of the cannula.



Preparing to insert the condylar screw

After recording the measurement, go beyond the second cortex with the drill bit.



Remove the graduated drill and the cannula. Unscrew the gold knob and remove the centring template, leaving only the nail inserter and the cannula. (1)

Insert a K. wire ø2mm trocar drill bit into the newly created hole with the drill.

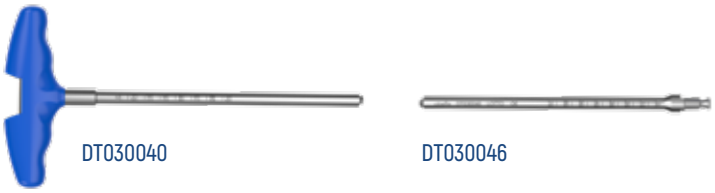
INSTRUMENTS REQUIRED

DT03014A
Graduated drill bit, ø5.3mm
(AO coupling)

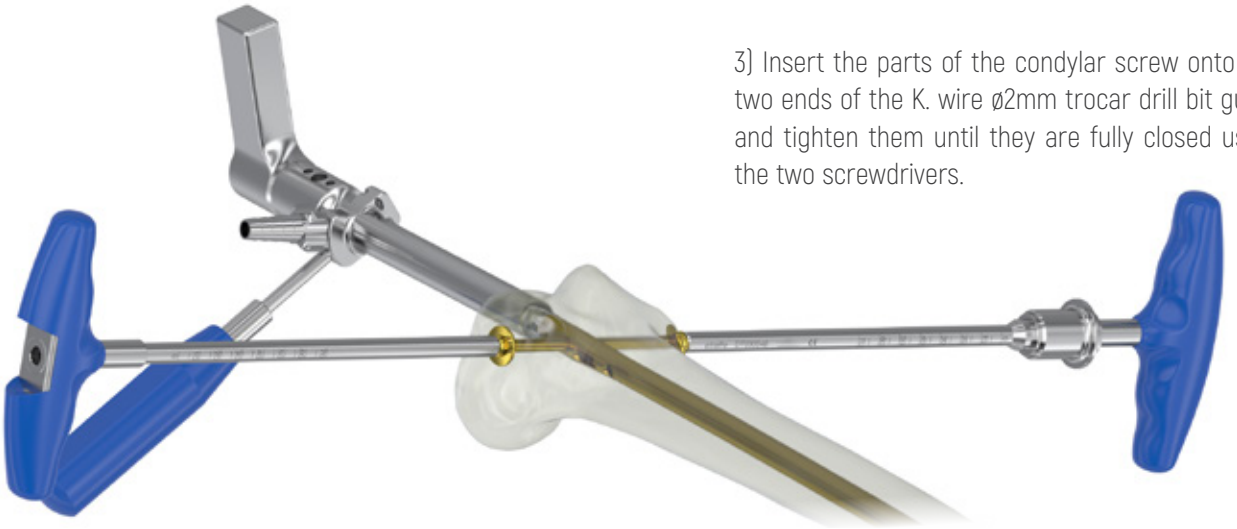
Kirschner wire ø2x270mm
trocar drill bit (STERILE)

Insertion of the first condylar screw

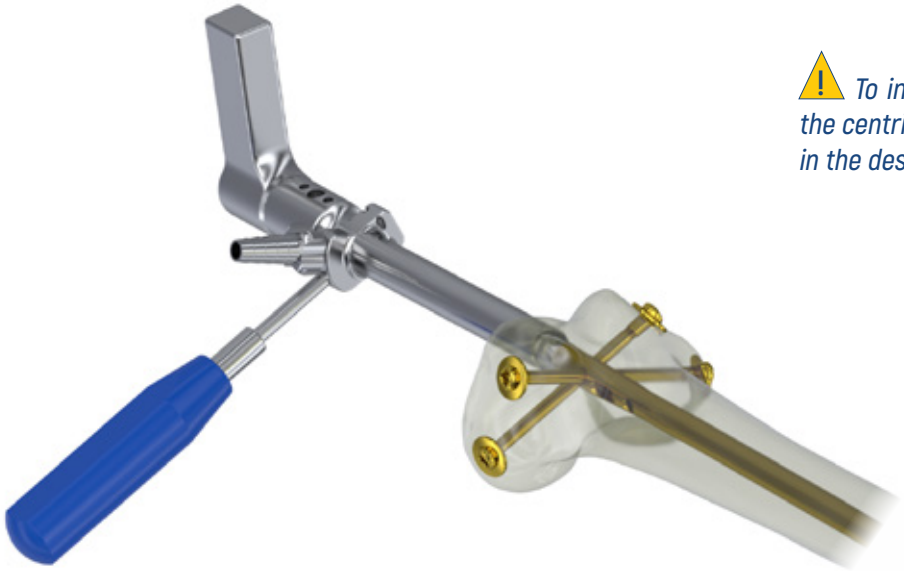
1) Separate the condylar screw so that the short stem and washer are on one side and the screw body on the other.



2) Remove the retention core from the traditional Allen screwdriver and from the quick-release screwdriver.



3) Insert the parts of the condylar screw onto the two ends of the K. wire ø2mm trocar drill bit guide and tighten them until they are fully closed using the two screwdrivers.



⚠ *To insert a second condylar screw, reattach the centring template and repeat the steps above in the desired hole.*

INSTRUMENTS REQUIRED

DT030040
Allen T-screwdriver, 5mm

DT030070
Cannulated T-handle with Hudson coupling

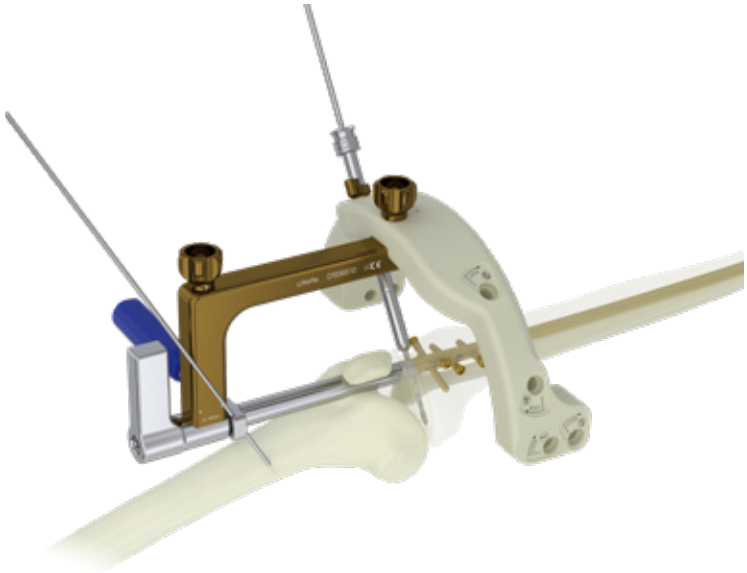
DT030046
Screwdriver, 5mm Hudson coupling

Operative technique - cortical screws out-nail screws ø5.2mm (optional)

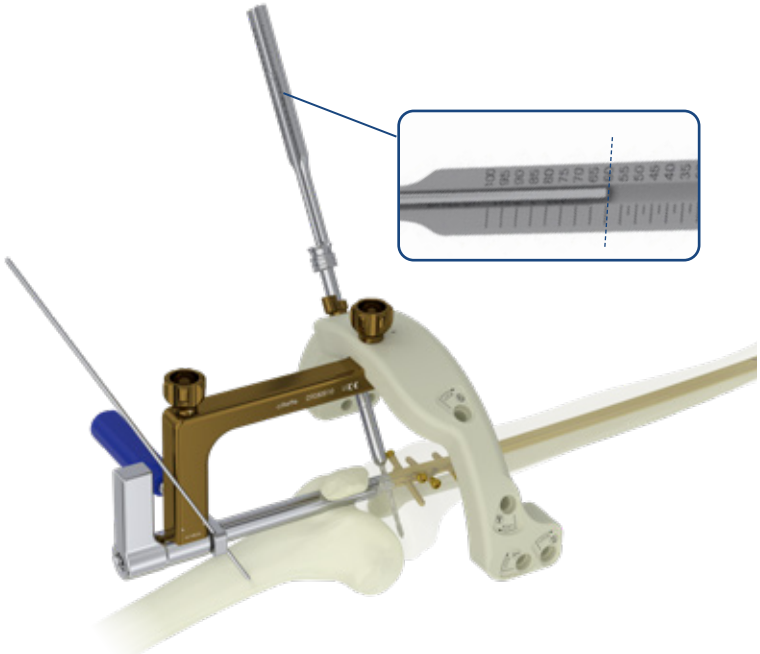
Preparing to insert the out-nail screw

Insert and screw the ø4mm trocar drill bit into the cannula.

Insert them into the hole marked (5) OUT-NAIL hole until touching the cortical bone.



Push the gold lever of the cannula towards its seat in the radiolucent arch.
Rotate the lever following the "lock" marking to lock the cannula in place and keep it in contact with the bone.
Insert the Drill bit, ø4x350mm into the trocar and drill to the desired depth.



Insert the Screws ruler (with the "TROCAR" marking facing upwards) onto the drill bit until touching the trocar.
Determine the length of the screw to be used at the end of the drill bit on the ruler.

Remove the drill bit and the Trocar.

The image refers to the length of the 60mm screw.

INSTRUMENTS REQUIRED

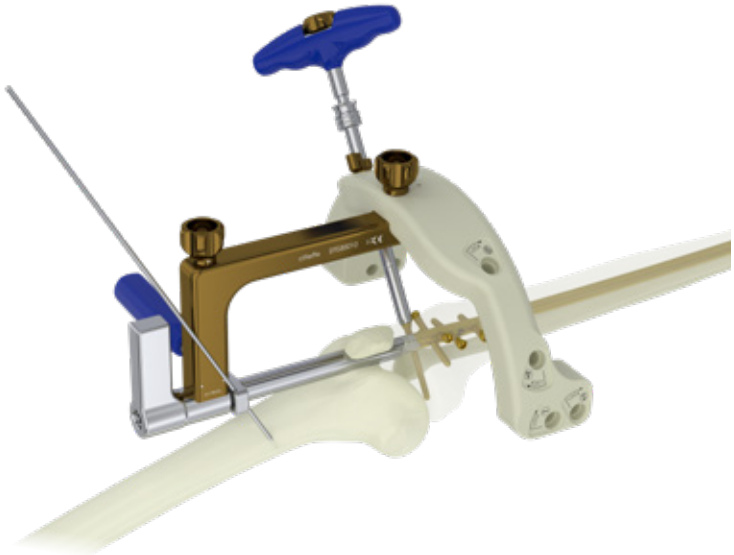
DT030020
Cannula

DT030027
Trocar for drill bit ø4mm

DT03020A
Drill bit ø4x350mm

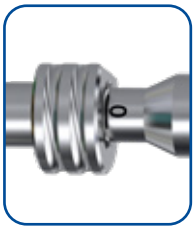
DT030030
Ruler

Inserting Out-Nail Screws

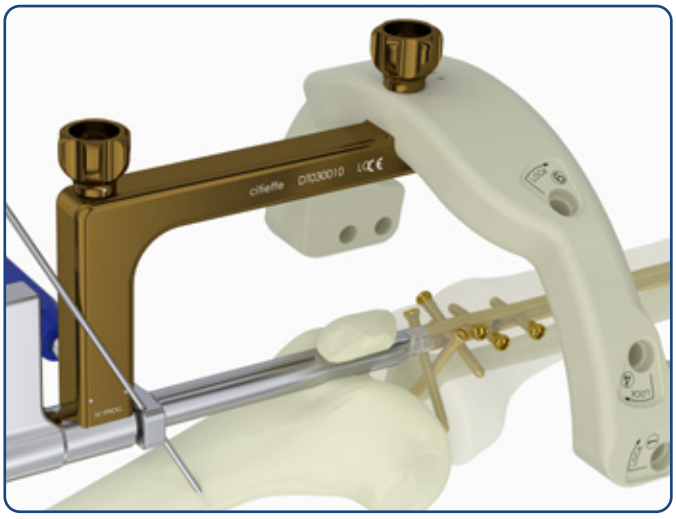


Select the correct length cortical screw and secure it to the screwdriver.

Insert the screwdriver into the cannula and screw it until the "0" mark on the screwdriver reaches the edge of the cannula.



Remove the screwdriver and cannula.

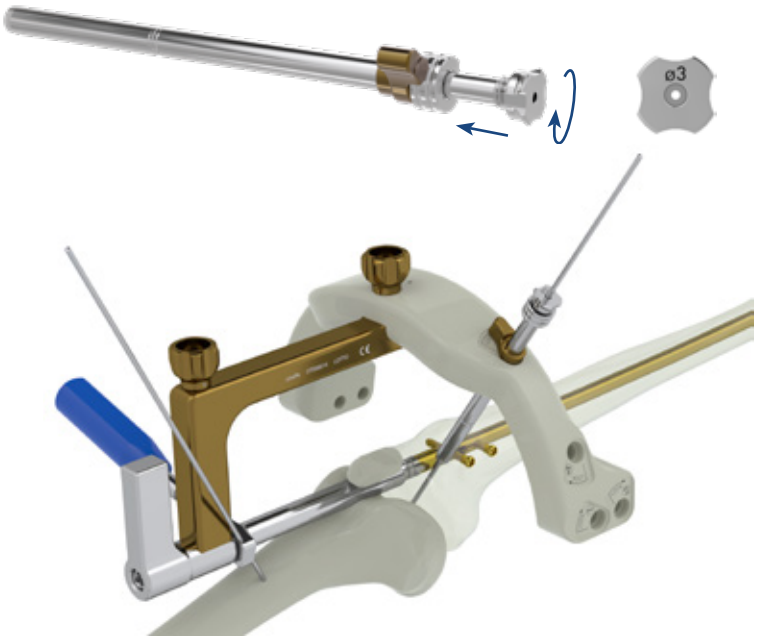


INSTRUMENTS REQUIRED

DT030040
Allen T-screwdriver, 5mm

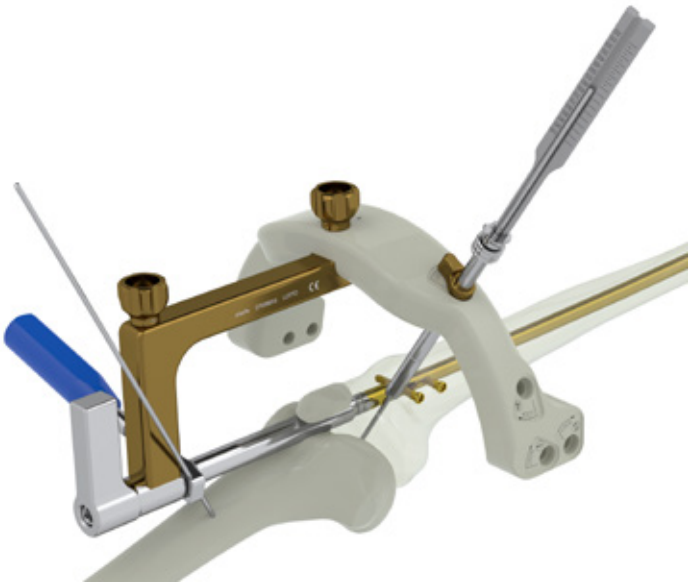
Operative technique - Rondò out-nail screws ø6.5mm (optional)

Preparing to insert the out-nail screw



Insert and screw the ø3mm trocar into the cannula.

Insert them into the hole (6) marked OUT-NAIL until touching the cortical bone.



Push the gold lever of the cannula towards its seat in the radiolucent arch.
Rotate the lever following the "lock" marking to lock the cannula in place and keep it in contact with the bone. (For details, see page 19)

Insert the Kirschner wire ø3x350mm trocar drill bit through the trocar and ensure the tip of the wire is in the desired position before measuring.

Place the screws ruler (with the word "TROCAR" facing upwards) over the K. wire until the tip touches the trocar.

The end of the K. wire on the screws ruler indicates the length of the screw to be used.

INSTRUMENTS REQUIRED

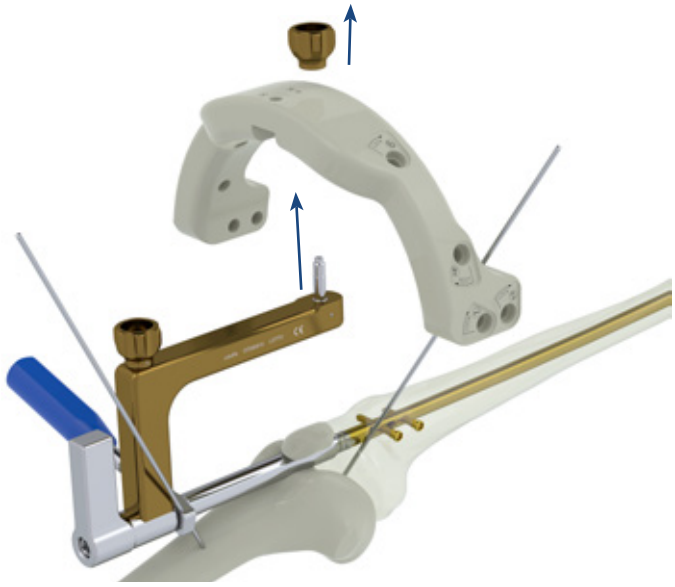
DT030020
Cannula

DT030025
Trocar ø3mm

66987
Guide wire trocar tip ø3x350mm, sterile

DT030030
Screws ruler ("TROCAR" facing upwards)

Inserting Out-Nail Screws



Remove the cannula and trocar.

Unscrew the gold knob and remove the centring guide, leaving the nail inserter in place.

Select the correct out-nail screw (Rondò sizes detail page 66).
Remove the pin (retention core) from the screwdriver stem.

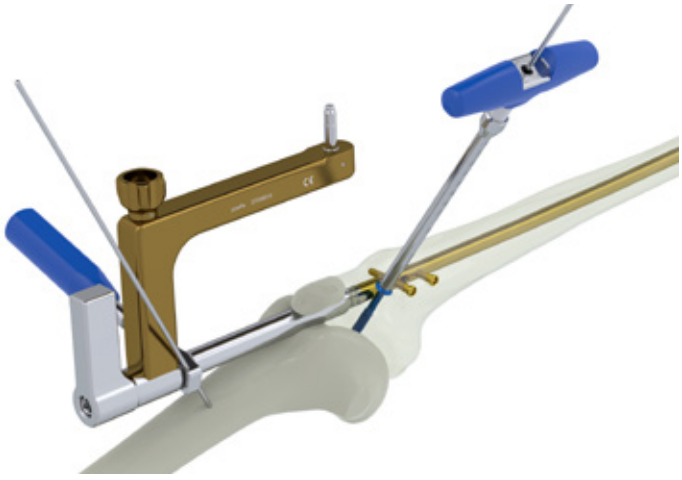
DT030046

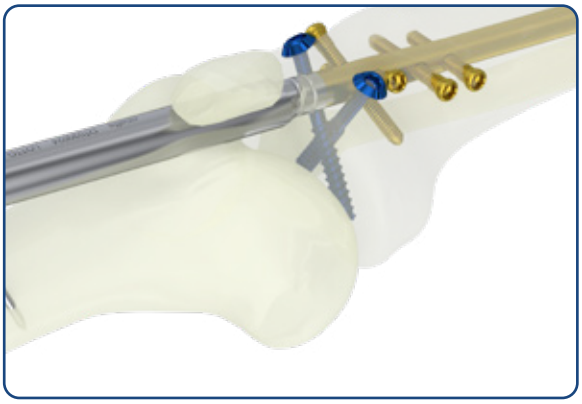
Insert the screw onto the wire using the screwdriver and rotate it clockwise.

In contact with the first cortex, the washer prevents the screw from sinking into the bone.

Remove the Kirschner wire.

NOTE:
If necessary, reconnect the centring guide to the nail inserter and repeat the steps for the second out-nail screw.





INSTRUMENTS REQUIRED

DT030046
Screwdriver, 5mm Hudson coupling

DT030070
Cannulated T-handle with Hudson coupling

Guided distal locking

Assembling the distal centring guide

Remove the radiolucent arch by unscrewing the gold knob. (1)

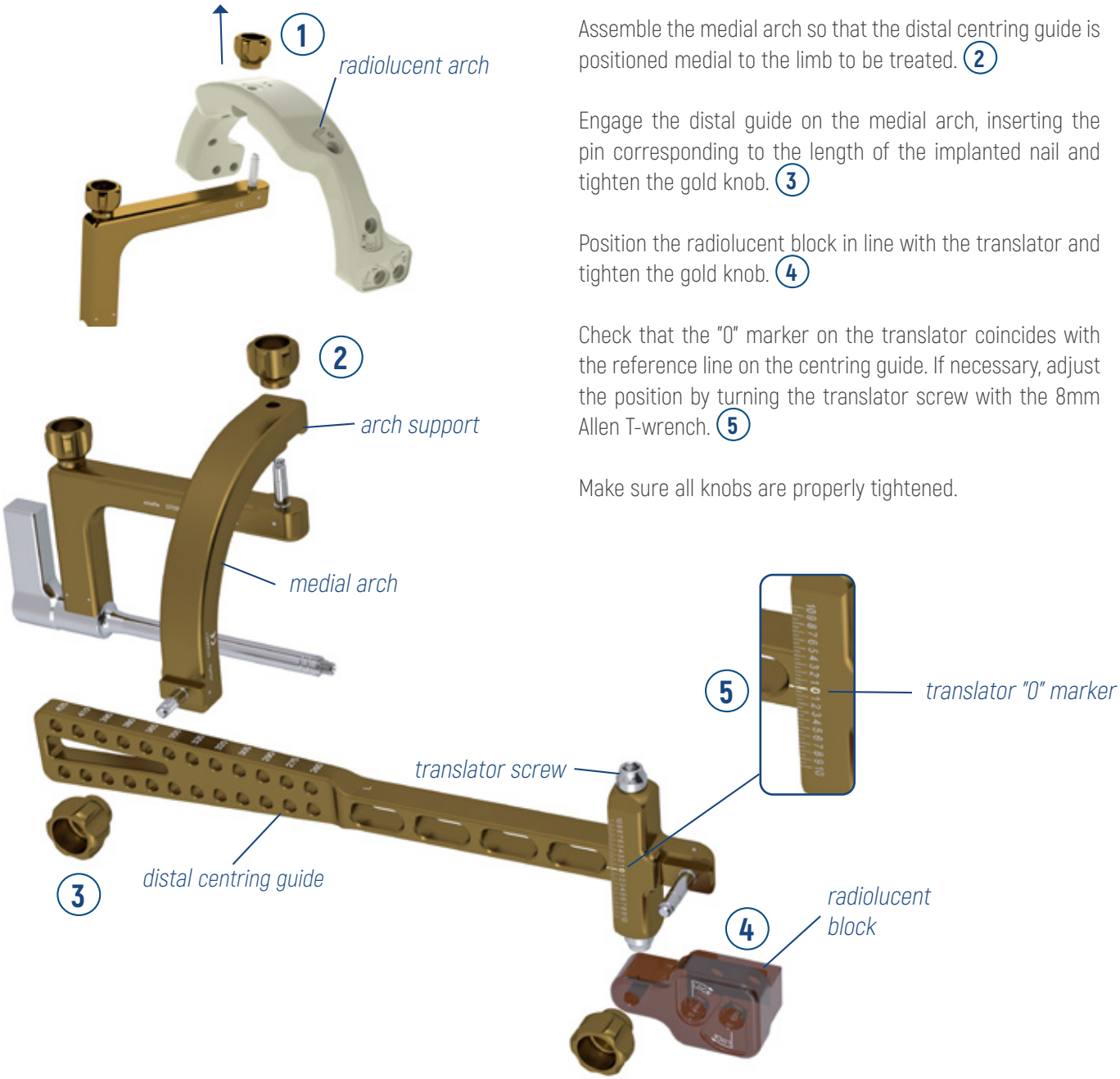
Assemble the medial arch so that the distal centring guide is positioned medial to the limb to be treated. (2)

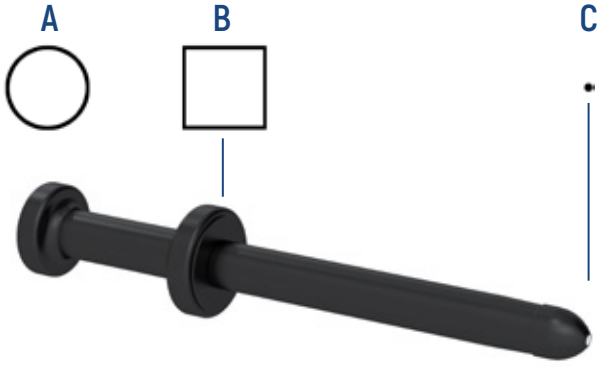
Engage the distal guide on the medial arch, inserting the pin corresponding to the length of the implanted nail and tighten the gold knob. (3)

Position the radiolucent block in line with the translator and tighten the gold knob. (4)

Check that the "0" marker on the translator coincides with the reference line on the centring guide. If necessary, adjust the position by turning the translator screw with the 8mm Allen T-wrench. (5)

Make sure all knobs are properly tightened.

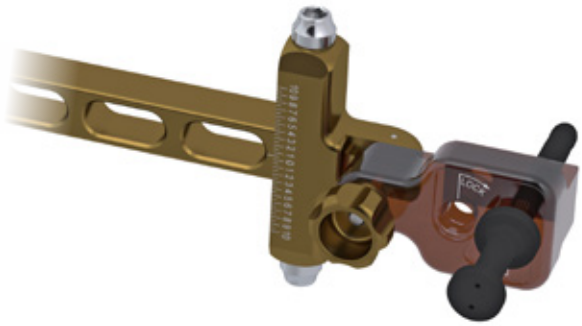




Collimator

The collimator features 2 radiopaque markers (**A** and **B**) **visible only under X-ray control** and 1 marker (**C**) visible both to the naked eye and under X-ray control.

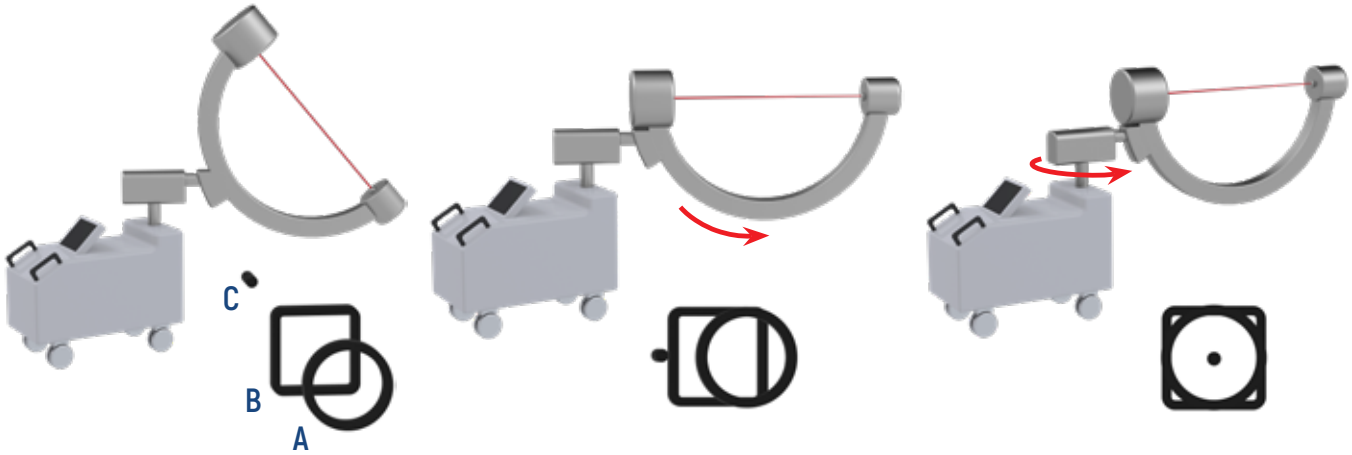
Correct alignment of the radiopaque references allows the precise centring of the guide for inserting the locking screws.



Positioning the collimator on the guide

Insert the collimator into the distal hole of the radiolucent block until touching the block itself.

Movement of the image intensifier



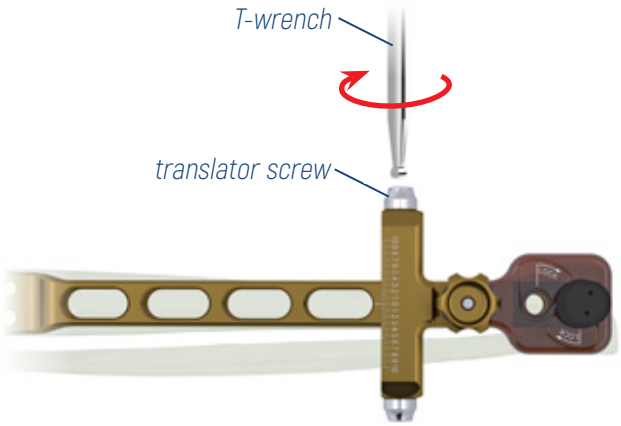
Under X-ray control, visualise the radiopaque markers on the collimator.

Correct the position of the image intensifier arch **acting on one plane at a time**, until obtaining an X-ray image in which the markers **A** and **B** are superimposed and centred with respect to each other.

In this position, the marker **C** will be at the centre of the other 2 markers.

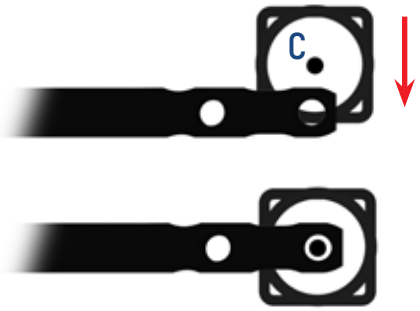
NOTE: The images illustrate the view under X-ray control.

Translating the distal centring guide



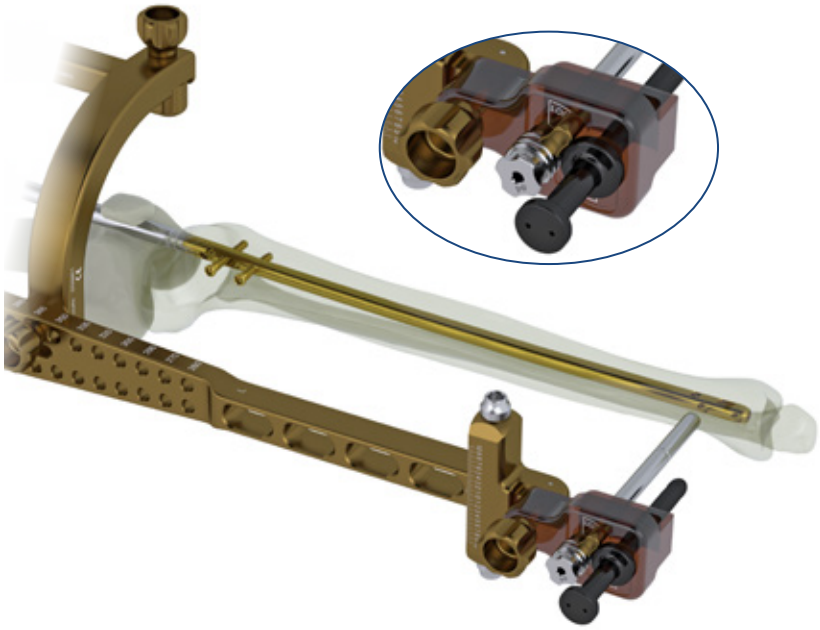
After achieving the correct alignment of the radiopaque markers, adjust the distal block of the guide by turning the translator screw with the 8 mm Allen T-wrench.

The final X-ray image will be obtained when the marker **C** is in the centre of the nail hole.



Tibia: guided distal centering

Preparing the distal lock



Insert and screw the Trocar for ø4mm drill bit into the Cannula.

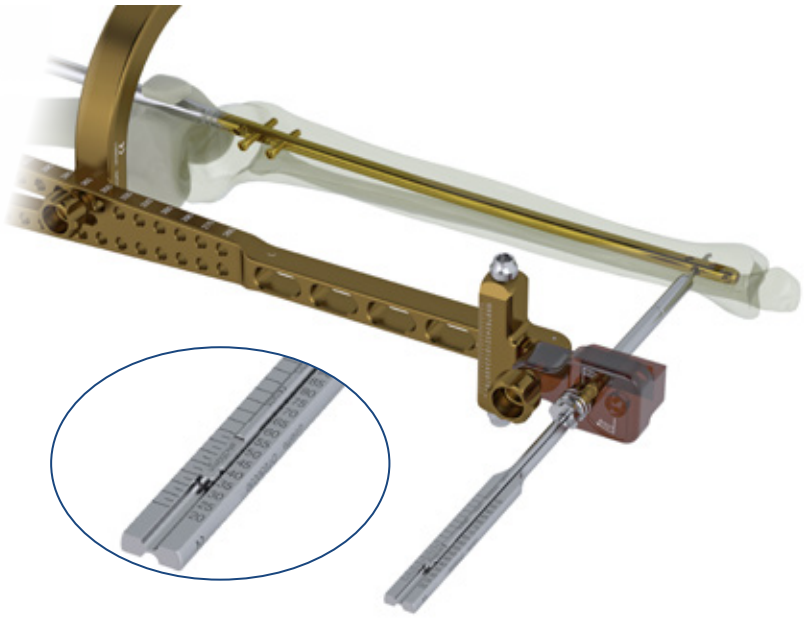
Insert the trocar with the cannula into the hole next to the collimator until it touches the bone.

Move the cannula lever towards the seat of the radiolucent block.

Rotate the cannula lever to the "LOCK" position to keep the cannula in contact with the bone.

Remove the collimator.

Measuring the distal screw



Make a small incision at the tip of the trocar and rotate the cannula with the trocar through the soft tissue until it touches the lateral cortical bone.

Insert the Drill bit, ø4x350mm into the trocar until it passes approximately 2 mm beyond the second cortex and check its correct sinking under X-ray control in anteroposterior (AP) projection.

Insert the Screws ruler (with the "TROCAR" marking facing upwards) on the drill bit and read the length of the screw to be implanted at the end of the tip on the graduated scale.

Remove the ruler and drill bit and unscrew the trocar from the cannula.

INSTRUMENTS REQUIRED

DT030020
Cannula

DT030027
Trocar for drill bit ø4mm

DT03020A
Drill bit ø4x350mm

DT030030
Screws ruler ("TROCAR" facing upwards)

Insertion of the first distal screw

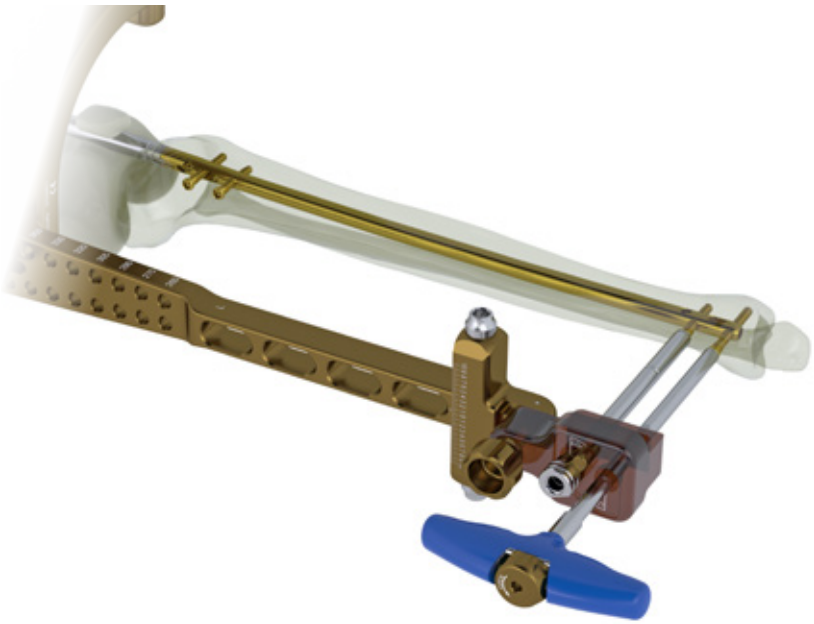
Select the cortical screw, ø5.2mm with the correct length.

Position the screw and lock it using the retention system on the Screwdriver, Hudson coupling. Connect the T-Handle.

Tighten the screw until the "0" marker on the screwdriver aligns with the edge of the cannula. Check the final position under X-ray control.

Remove the screwdriver and the T-Handle, leaving the cannula inserted on the screw head to limit any movement of the guide or alignment errors.

Insertion of the second distal screw



Insert the second cannula and the cannulated diaphyseal trocar into the distal hole of the centring guide.

Follow the steps described above to insert the second distal screw.

Remove all instruments and the centring guide.

INSTRUMENTS REQUIRED

DT030046
Screwdriver, 5mm Hudson coupling

DT030070
Cannulated T-handle with Hudson coupling

DT030040
Allen T-screwdriver, 5mm

Ordering information

TITANIUM STERILE

Solid Nail ø8mm

Code	L. (mm)
DT308260	260
DT308275	275
DT308290	290
DT308305	305
DT308320	320

Code	L. (mm)
DT308335	335
DT308350	350
DT308365	365
DT308380	380
DT308395	395

Cannulated Nail

ø9mm

Code	L. (mm)
DT309260	260
DT309275	275
DT309290	290
DT309305	305
DT309320	320
DT309335	335
DT309350	350
DT309365	365
DT309380	380
DT309395	395
DT309410	410
DT309425	425
DT309440	440
DT309455	455
DT309470	470

ø10mm

Code	L. (mm)
DT310260	260
DT310275	275
DT310290	290
DT310305	305
DT310320	320
DT310335	335
DT310350	350
DT310365	365
DT310380	380
DT310395	395
DT310410	410
DT310425	425
DT310440	440
DT310455	455
DT310470	470

ø11mm

Code	L. (mm)
DT311260	260
DT311275	275
DT311290	290
DT311305	305
DT311320	320
DT311335	335
DT311350	350
DT311365	365
DT311380	380
DT311395	395
DT311410	410
DT311425	425
DT311440	440
DT311455	455
DT311470	470

ø12mm

Code	L. (mm)
DT312260	260
DT312275	275
DT312290	290
DT312305	305
DT312320	320
DT312335	335
DT312350	350
DT312365	365
DT312380	380
DT312395	395
DT312410	410
DT312425	425
DT312440	440
DT312455	455
DT312470	470

ø13mm

Code	L. (mm)
DT313260	260
DT313275	275
DT313290	290
DT313305	305
DT313320	320
DT313335	335
DT313350	350
DT313365	365
DT313380	380
DT313395	395
DT313410	410
DT313425	425
DT313440	440
DT313455	455
DT313470	470

On request

Ordering information

TITANIUM STERILE

Cortical screw ø5.2mm

Code	L. (mm)
DT352022	22.5
DT352025	25
DT352027	27.5
DT352030	30
DT352032	32.5
DT352035	35
DT352037	37.5
DT352040	40

Code	L. (mm)
DT352042	42.5
DT352045	45
DT352047	47.5
DT352050	50
DT352052	52.5
DT352055	55
DT352060	60
DT352065	65

Code	L. (mm)
DT352070	70
DT352075	75
DT352080	80
DT352085	85
DT352090	90
DT352095	95
DT352100	100
DT352105	105
DT352110	110

Cortical screw ø4mm (distal holes)

Code	L. (mm)
DT340020	20
DT340025	25
DT340030	30
DT340035	35
DT340040	40

Condylar screw ø5.2mm *

* *For femur only*

Code	L. (mm)
DT354050	50
DT354055	55
DT354060	60
DT354065	65
DT354070	70

Code	L. (mm)
DT354075	75
DT354080	80
DT354085	85
DT354090	90
DT354095	95

Code	L. (mm)
DT354100	100
DT354105	105
DT354110	110

Cancellous screw ø5.2mm

Code	L. (mm)
DT353050	50
DT353055	55
DT353060	60
DT353065	65
DT353070	70

Code	L. (mm)
DT353075	75
DT353080	80
DT353085	85
DT353090	90
DT353095	95

Code	L. (mm)
DT353100	100
DT353105	105
DT353110	110

on request

ESTREMO end cap

Code	Size	nail length increase
DT300000	STD	3.5mm
DT300005	5	8.5mm
DT300010	10	13.5mm

ESTREMO locking end cap

Code	Size	nail length increase
DT300100	STD	1.5mm
DT300105	5	5mm
DT300110	10	10mm

Out-nail Screws

Rondò Screws ø6.5mm (Double pitch thread L. 16mm)

Code	Screw ø (mm)	Washer ø (mm)	Thread L. (mm)	Total L. (mm)
VT-65030	6.5	12	16	30
VT-65035	6.5	12	16	35
VT-65040	6.5	12	16	40
VT-65045	6.5	12	16	45
VT-65050	6.5	12	16	50
VT-65055	6.5	12	16	55
VT-65060	6.5	12	16	60
VT-65065	6.5	12	16	65
VT-65070	6.5	12	16	70

Code	Screw ø (mm)	Washer ø (mm)	Thread L. (mm)	Total L. (mm)
VT-65075	6.5	12	16	75
VT-65080	6.5	12	16	80
VT-65085	6.5	12	16	85
VT-65090	6.5	12	16	90
VT-65095	6.5	12	16	95
VT-65100	6.5	12	16	100
VT-65105	6.5	12	16	105
VT-65110	6.5	12	16	110
VT-65115	6.5	12	16	115
VT-65120	6.5	12	16	120

Rondò Screws ø6.5mm (Double pitch thread L. 32mm)

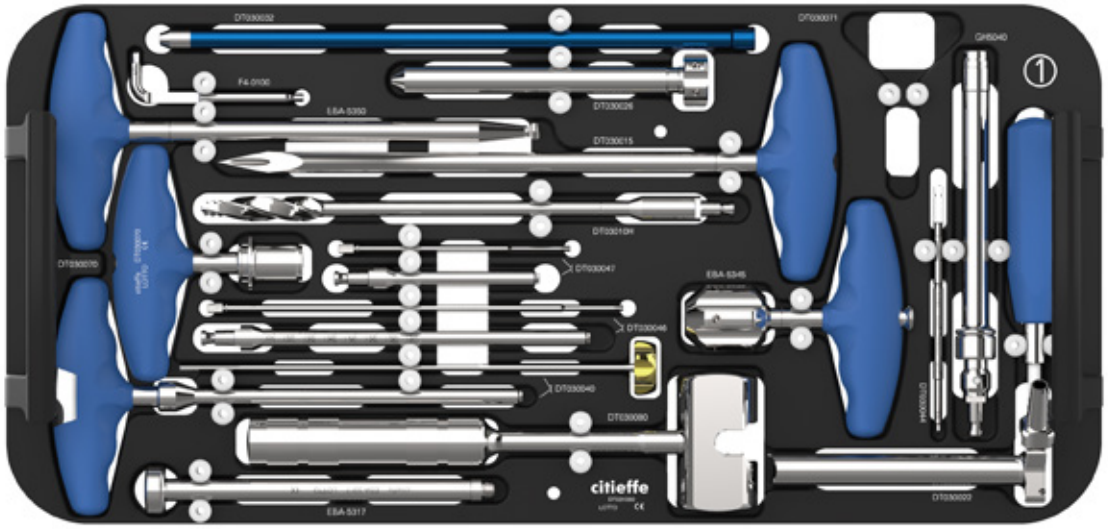
Code	Screw ø (mm)	Washer ø (mm)	Thread L. (mm)	Total L. (mm)
VT-66040	6.5	12	32	40
VT-66045	6.5	12	32	45
VT-66050	6.5	12	32	50
VT-66055	6.5	12	32	55
VT-66060	6.5	12	32	60
VT-66065	6.5	12	32	65
VT-66070	6.5	12	32	70
VT-66075	6.5	12	32	75
VT-66080	6.5	12	32	80

Code	Screw ø (mm)	Washer ø (mm)	Thread L. (mm)	Total L. (mm)
VT-66085	6.5	12	32	85
VT-66090	6.5	12	32	90
VT-66095	6.5	12	32	95
VT-66100	6.5	12	32	100
VT-66105	6.5	12	32	105
VT-66110	6.5	12	32	110
VT-66115	6.5	12	32	115
VT-66120	6.5	12	32	120

On request

Ordering information - INSTRUMENTS

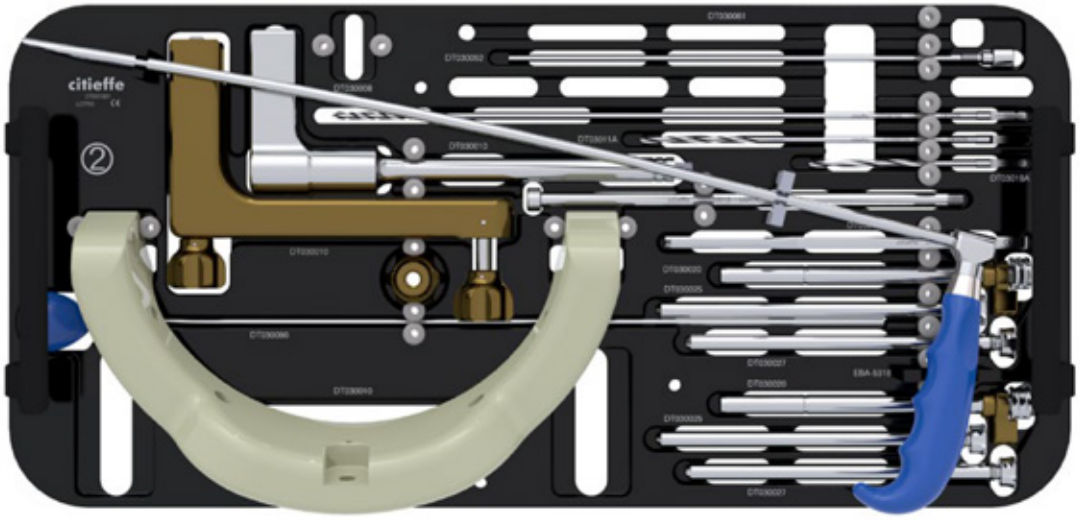
Tray 1



Code	Description	Qty
DT03010H	Cannulated reamer ø12.5mm	1
DT030015	Cannulated awl	1
DT030022	Tissue protection sleeve	1
DT030026	Multihole trocar	1
DT030032	Nails ruler, wire 800mm	1
DT030040	5mm Allen T-screwdriver, short	1
DT030046	Screwdriver, 5mm Hudson coupling	1
DT030047	5 mm Screwdriver, Hudson coupling, short	1
DT030070	Cannulated T-handle with Hudson coupling	1
970025	2.5mm Allen wrench	1
DT030080	Slotted hammer	1
EBA-5317	Impaction bolt, cannulated	1
EBA-5345	Chuck for ø2.5-3mm wire	1
EBA-5350	Allen T-wrench, 8mm	1
F4-0100	5mm Allen Wrench	1
GH5040	Hudson-Hudson Adapter	1
DT031000	ESTREMO 1 instrument tray, empty	1

Ordering information - INSTRUMENTS

Tray 2



Code	Description	Qty
DT030010	ESTREMO Guide	1
DT030020	Cannula	2
DT030025	Trocar ø3mm	2
DT030027	Trocar for drill bit ø4mm	2
DT030030	Screws ruler	1
DT030052	Compression device	1
DT030090	Obturator with handle	1
EBA-5316	Fracture alignment wire introduction device	1
DT031001	ESTREMO 2 instrument tray, empty	1
DT03020A	Drill bit ø4x350mm	1
DT03018A	Drill bit ø4x110mm	1
DT03011A	Drill bit ø4x195mm	1

Sterile devices

Code	Description	Qty	
66987	Guide wire trocar tip ø3x350mm, sterile	5	STERILE
66220	Kirschner wire trocar drill bit ø2x270mm	optional	STERILE
DT030002	Guide wire with olive ø3x800mm	1	STERILE
DT030004	Guide wire with olive ø3.2x800mm	optional	STERILE
EBA-5304	Guide wire with olive ø2.5x800mm	optional	STERILE
DT03015A	Drill bit ø4x350mm, AO coupling	optional	STERILE
DT03016A	Drill bit ø4x195mm, AO coupling	optional	STERILE
DT03019A	Drill bit ø4x110mm, AO coupling	optional	STERILE
DT03017A	Graduated drill bit ø4mm, AO coupling	optional	STERILE
DT030062	Nails ruler kit with 800mm wire	optional	STERILE
DT030063	Nails ruler kit with 1000mm wire	optional	STERILE

Optional non-sterile instruments

Code	Description
DT030001	Guide wire with olive ø3x800mm
66981	Kirschner wire trocar drill bit ø3x350mm
DT03012A	Graduated drill bit ø4mm, AO coupling
601000	Femur-tibia collimator ø10mm
DT030053	Compression device (antegrade femur access)
DT030054	Compression device (tibia parapatellar access)
DT030060	Screws depth gauge
DT030011	ESTREMO distal centring guide for tibia
DT030013	ESTREMO distal centring guide for antegrade femur
DT03014A	ø5.3mm Graduated drill bit (AO coupling)
DT030031	Nail ruler template
DT03010T	ø12.5mm Cannulated reamer, Trinkle coupling
DT03013T	ø5mm Cannulated drill, Trinkle coupling
DT03014H	Ø5.3mm Graduated drill bit, Hudson coupling
DT03014T	Ø5.3mm Graduated drill bit, Trinkle coupling

EstreMO
CITIEFFE NAILING SYSTEM

Nailing system for tibia and femur

- Suprapatellar tibial nailing
- Retrograde femoral nailing

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Citieffe s.r.l.
Via Armaroli, 21, 40012 Calderara di Reno (BO) - Italy
Tel +39 051 721850 - Fax +39 051 721870
info@citieffe.com | www.citieffe.com

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