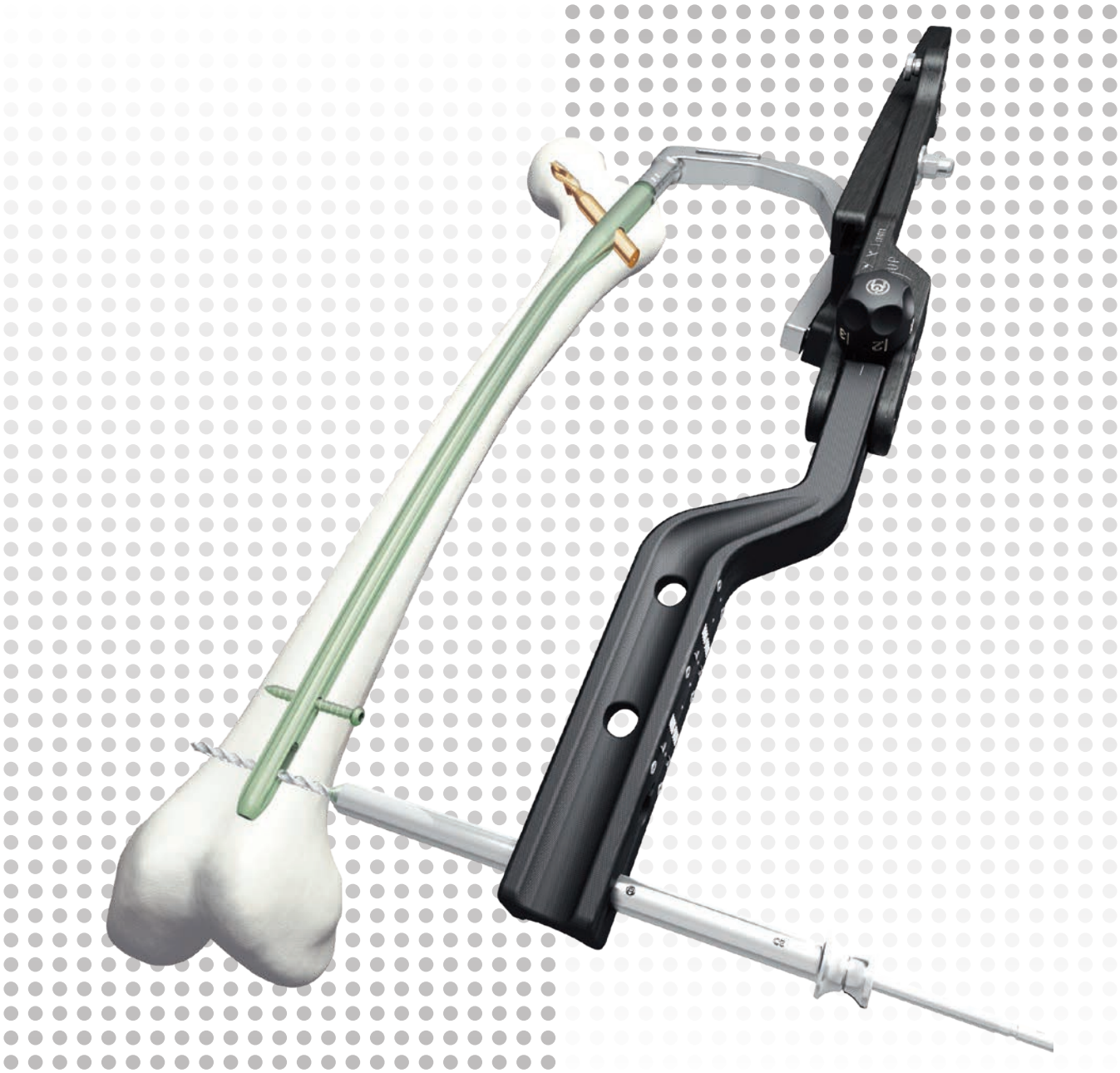
SureLock Distal Targeting Device

Surgical Technique

C-arm Guided Targeting for TFN-ADVANCED™ Proximal Femoral Nailing System (TFNA), Proximal Femoral Nail Antirotation (PFNA), Proximal Femoral Nail (PFN), and Trochanteric Fixation Nail (TFN)



AO approved by AO Technical Commission

DePuy Synthes
THE ORTHOPAEDICS COMPANY OF Johnson & Johnson

Image intensifier control

This description alone does not provide sufficient background for direct use of DePuy Synthes products. Instruction by a surgeon experienced in handling these products is highly recommended.

Processing, Reprocessing, Care and Maintenance
For general guidelines, function control and dismantling of multi-part instruments, as well as processing guidelines for implants, please contact your local sales representative or refer to:
http://emea.depuysynthes.com/hcp/reprocessing-care-maintenance
For general information about reprocessing, care and maintenance of DePuy Synthes reusable devices, instrument trays and cases, as well as processing of DePuy Synthes non-sterile implants, please consult the Important Information leaflet (SE_023827) or refer to:
http://emea.depuysynthes.com/hcp/reprocessing-care-maintenance

Table of Contents

■ **Notes**
▲ **Precautions**
▲ **WARNINGS**

SureLock Distal Targeting Device

The SureLock device facilitates distal locking of DePuy Synthes nails including:

- TFN-ADVANCED™ Proximal Femoral Nailing System (TFNA)
- Proximal Femoral Nail Antirotation (PFNA)
- Proximal Femoral Nail (PFN)
- Trochanteric Fixation Nail (TFN)

Two different techniques are described in this Surgical Technique:

- The Standard Technique – Aiming Procedure
- The Alternative Technique – Aiming Procedure

■ Note:

For TFNA System, the SureLock System will only target the two most proximal distal locking holes in the long nail and only works with nails 280 mm to 460 mm in length.

The AO Principles of Fracture Management

Mission

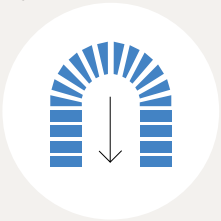
The AO's mission is promoting excellence in patient care and outcomes in trauma and musculoskeletal disorders.

AO Principles[1,2]

1.

Fracture reduction and fixation to restore anatomical relationships.

2.



Fracture fixation providing absolute or relative stability, as required by the "personality" of the fracture, the patient, and the injury.

3.

Preservation of the blood supply to soft-tissues and bone by gentle reduction techniques and careful handling.

4.

Early and safe mobilization and rehabilitation of the injured part and the patient as a whole.

[1] Müller ME, Allgöwer M, Schneider R, Willenegger H. Manual of Internal Fixation. 3rd ed. Berlin, Heidelberg New York: Springer 1991.
[2] Buckley RE, Moran CG, Apivatthakakul T. AO Principles of Fracture Management: 3rd ed. Vol. 1: Principles, Vol. 2: Specific fractures. Thieme; 2017.

Preoperative Planning

1. Attach SureLock labels

Instrument	
018.000.629	SureLock Labels for C-arm

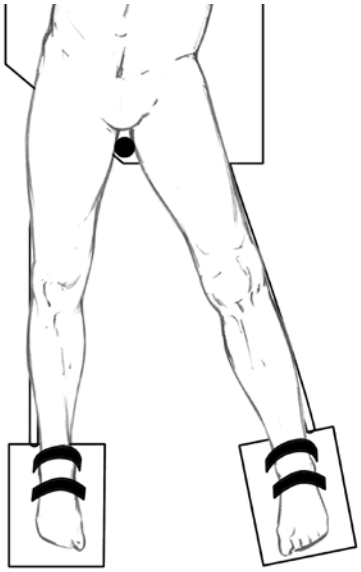
Ensure that the scale provided is attached to the C-arm, to facilitate exact orbital C-arm movements.

■ Note:

The scale is only useful when using the SureLock device according to the standard technique.

2. Patient positioning

Position the patient supine on the fracture table. Ensure that the femoral head, shaft and distal femur can be obtained with the C-arm in both planes. Reduce the fracture.



3. Select nail sizes

Determine the appropriate nail length and diameter, according to the system surgical technique.

The SureLock device must be calibrated before nail insertion.

Calibration of SureLock Targeting Device (Before Nail Insertion)

1. Assemble nail and instrument

Instruments	
03.010.200	SureLock Aiming Arm for Antegrade Femoral Nails
03.010.201	SureLock Connector, left, for long Proximal Femoral Nails (PFN, TFN and PFNA)
03.010.202	SureLock Connector, right, for long Proximal Femoral Nails (PFN, TFN and PFNA)
03.010.203	Adjustment Knob for SureLock

Assemble the nail on the insertion handle.

Attach the appropriate connector (for left leg or right leg) to the insertion handle (1).

Slide the SureLock aiming arm into the SureLock connector. The aiming arm's mating pins will guide the assembly through the connector (use the "RIGHT" pin for the right leg and the "LEFT" pin for the left leg).

Insert the second nutted pin of the aiming arm into the slot of the connector (2).

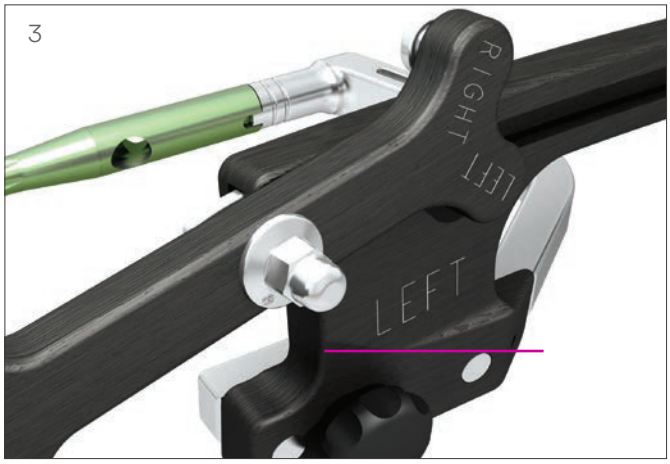
■ Note:

Do not tighten the fixation screw yet (3).

1

2

3



Attach the adjustment knob to the aiming arm, ensuring that the aiming arm is straight. (This corresponds to the zero position.)

▲ Precautions:

- Instruments and screws may have sharp edges or moving joints that may pinch or tear user's glove or skin.
- Handle devices with care and dispose worn bone cutting instruments in an approved sharps container.

2. Calibration

Instruments	
03.010.204	Calibration Pin ∅ 12.0 mm
321.160	Combination Wrench ∅ 11.0 mm

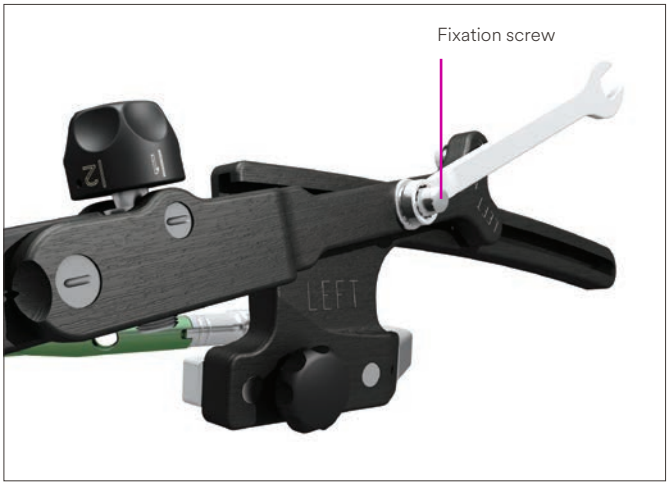
Insert the calibration pins through the two distal holes of the SureLock aiming arm. Adjust the aiming arm length to precisely align the calibration pins with the distal nail holes.

■ Note:

If the nail does not line up with the device, the freehand distal locking technique will have to be used.

Tighten the fixation screw securely using the combination wrench. The SureLock device is now calibrated and ready for use.

Remove the SureLock device from the insertion handle.



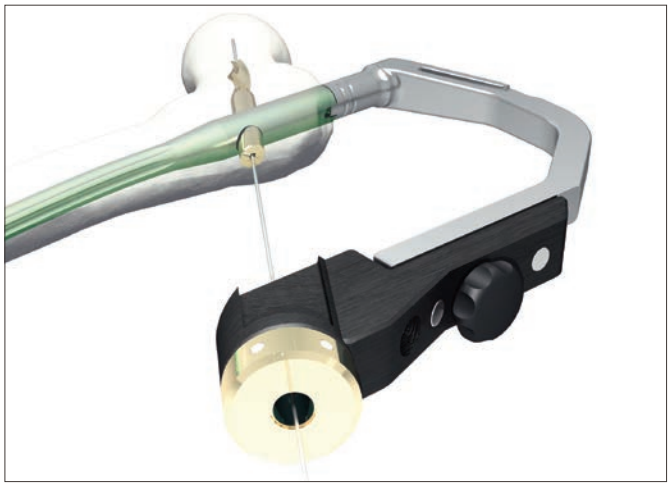
Preparation for Use of the SureLock Targeting Device

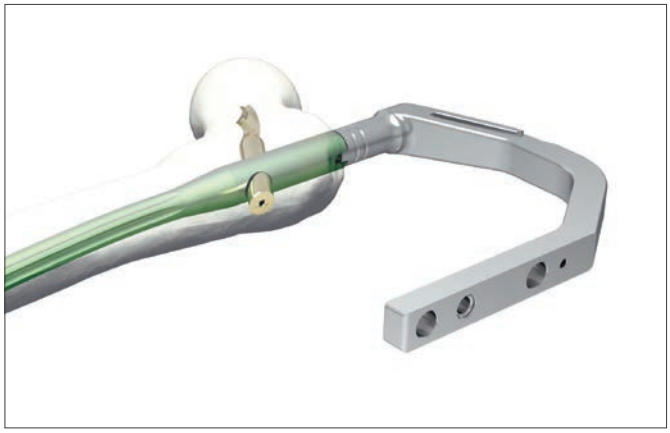
1. Nail insertion

Please refer to the system surgical technique for the following steps:

- Opening the femur
- Reaming, if desired or required
- Inserting the nail
- Proximal locking

When proximal locking is completed, remove the standard aiming arm from the insertion handle.





2. Attach calibrated SureLock device

Reattach the calibrated SureLock device to the insertion handle.

3. Position C-arm for distal locking

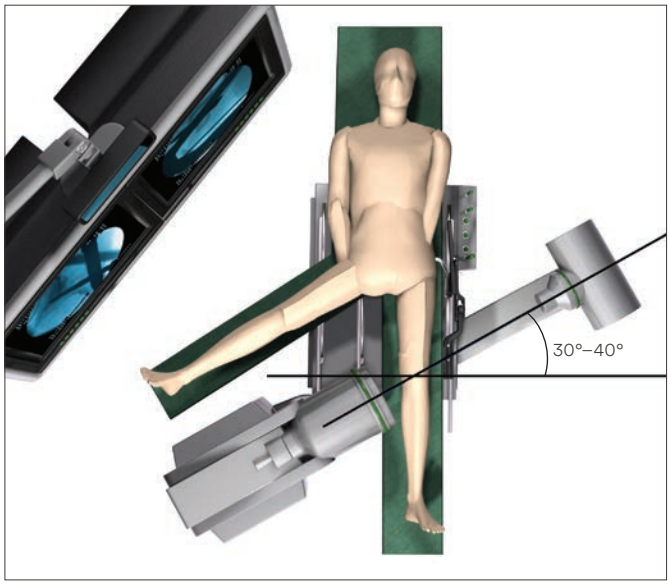
Move the C-arm distally, toward the end of the nail.

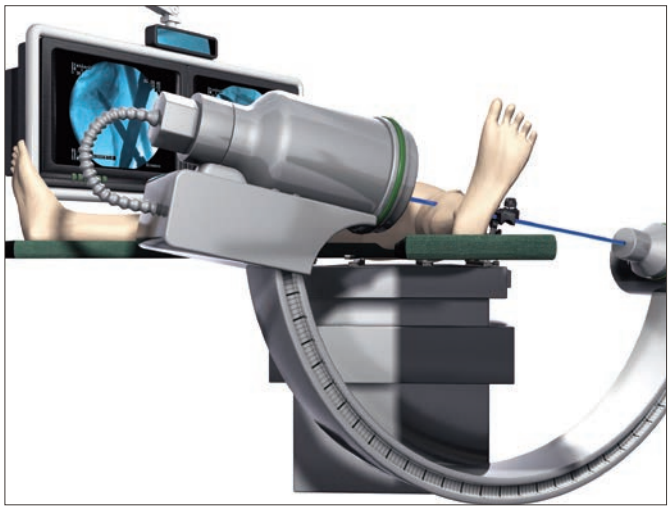
Position the C-arm at an angle of 30°–40° relative to the axis of the distal locking holes.

■ Note:

This C-arm position utilized during the procedure helps avoid the contralateral limb. The positioning keeps the surgeon out of the radiation beam and allows space for power tools.

Rotate the C-arm orbitally into approximately the same plane as the nail, insertion handle and aiming arm assembly.



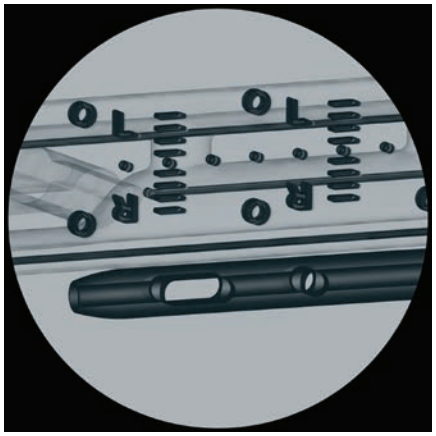


4. Verify C-arm image orientation

Check that the C-arm images are correct: ”Left” or ”Right” symbol on the SureLock aiming arm must be visible in the appropriate orientation.

Examples:

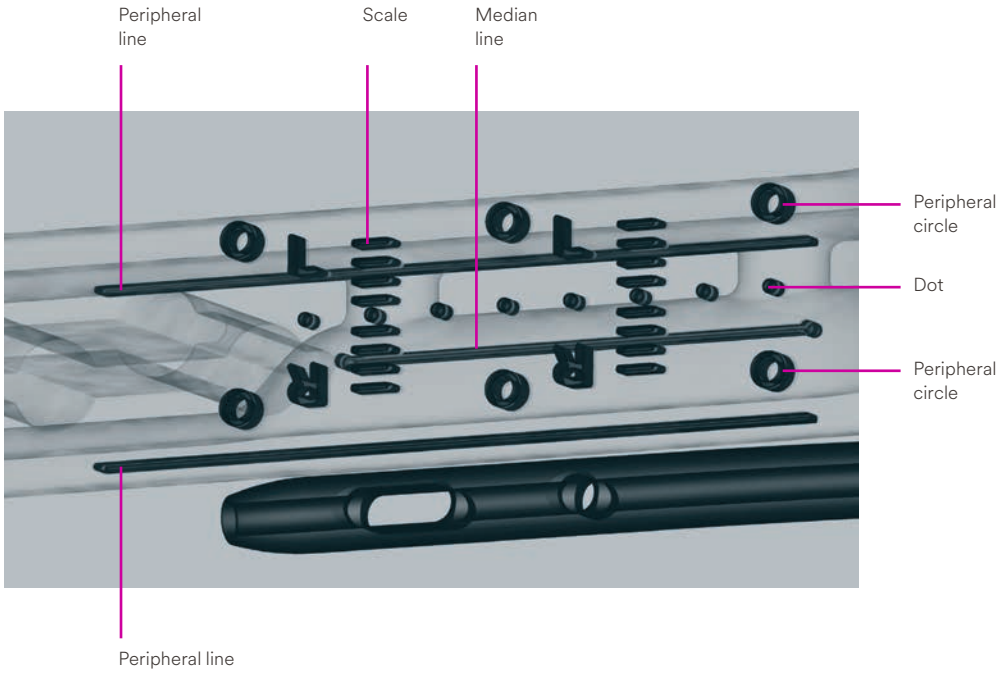
- “L” must be oriented correctly for a left leg.
- If necessary flip (mirror) or rotate the image.



Standard Technique – Aiming Procedure

1. Identify markings

Identify the following under image intensification:



If these markings are not visible in the image, adjust the position of the C-arm and make a new image.

2. Align C-arm with nail and aiming arm

Orbitally rotate the C-arm until the dots are overlying the median line (control under image).

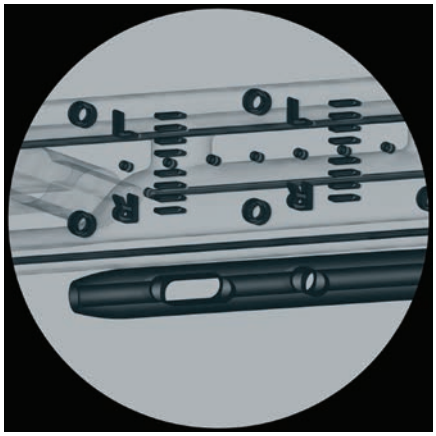
In relation to the peripheral/median lines:

- If the dots are lower, rotate the C-arm up
- If the dots are higher, rotate the C-arm down
- Each scale graduation on the SureLock aiming arm corresponds to 2° of the C-arm orbital rotation

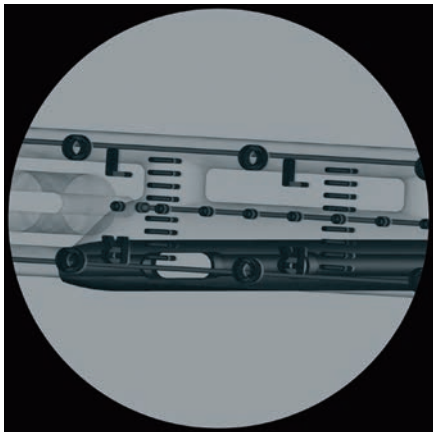
If the dots and median line are not clearly visible, orbitally rotate the C-arm so that the relationship between the peripheral lines and peripheral circles is symmetrical.

▲ Precautions:

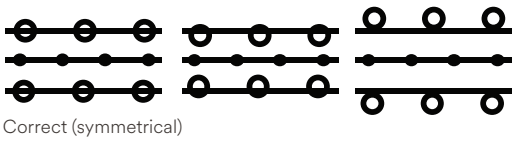
- Be exact (up to 0.5°).
- Do not consider the nail position at this step of the procedure.
- Do not change the height of the C-arm; rotate only.



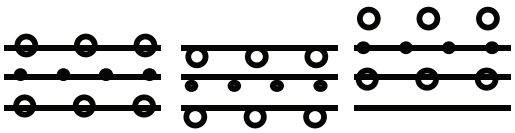
Starting position



Ending correct position



Correct (symmetrical)



Incorrect (not symmetrical)

3. Align the aiming arm with the nail

- Compensate for nail deflection in the AP plane by turning the adjustment knob to raise or lower the aiming arm until the median line is visible in the center of the nail's locking holes.

  Each full turn of the adjustment knob raises or lowers the aiming arm by 6 mm (every graduation on the knob = 1 mm).

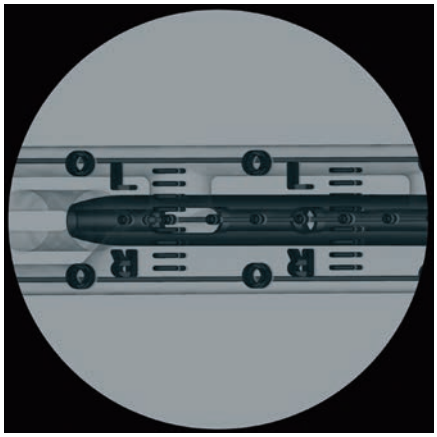
  If the locking holes are not visible, align the median line with the nail tip instead.

  Use the nail diameter as a reference to calculate the amount of correction needed.

- Ensure that the dots or circles and the lines are still aligned. If not, go back to step 2.

■ Note:

The SureLock aiming arm scale does not give guidance on distance – it is only calibrated for the rotation of the C-arm.



4. Insert locking screws

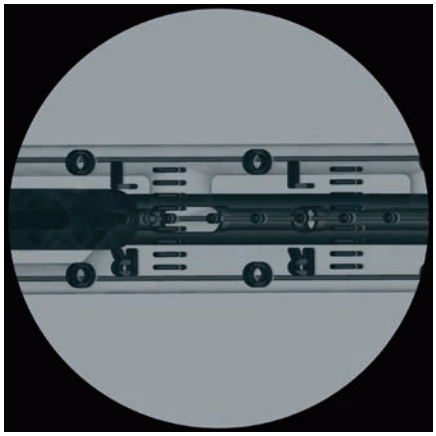
Instruments	
356.708	Screwdriver, hexagonal, ∅ 3.5 mm, for AFN
03.010.061	Drill Bit ∅ 4.2 mm, calibrated, length 340 mm, 3-flute, for Quick Coupling, for No. 03.010.065
03.010.063	Protection Sleeve 12.0/8.0, length 188 mm
03.010.065	Drill Sleeve 8.0/4.2, for No. 03.010.063
03.010.070	Trocar ∅ 4.2 mm, for No. 03.010.065
03.010.072	Depth Gauge for Locking Screws, measuring range up to 110 mm, for No. 03.010.063

Carefully perform a stab skin incision through the most distal hole of the SureLock aiming arm. Insert the protection sleeve/drill sleeve/trocar assembly through the aiming arm. Remove the trocar.

- Check again that the dots and the median line overlie perfectly or that the circles and peripheral lines are perfectly symmetrical.

- Ensure that the sleeves are centered in the most distal nail hole. If needed, remove the sleeves, make a downward or upward incision perpendicular to the existing incision to reposition the sleeves correctly.

  Drill for the first distal locking screw, leaving the drill bit in place.

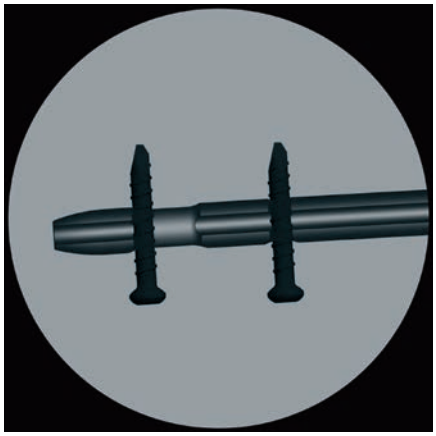


Use the same technique to drill through the second hole in the SureLock aiming arm. Measure for screw length and insert the appropriate locking screw according to standard surgical technique.

Remove the drill bit from the most distal hole and repeat the same steps to insert the second locking screw.

5. Remove SureLock device

Remove the SureLock device from the insertion handle and continue surgery according to standard surgical technique.



Alternative Technique – Aiming Procedure

Preparation for use of SureLock

Refer to
- Preoperative Planning Section
- Calibration Section
- C-arm set-up Section

Adjust C-arm intensity

If the image is too dark, change the intensity of the C-arm until the locking holes in the nail are clearly visible.

1. Insert sleeve assembly

Instruments	
03.010.063	Protection Sleeve 12.0/8.0, length 188 mm
03.010.065	Drill Sleeve 8.0/4.2, for No. 03.010.063

Insert the protection sleeve/drill sleeve assembly through the most proximal hole of the aiming arm to the soft tissues.

2. Align aiming arm with nail

Instrument	
018.000.630	SureLock Template for Screen

Compensate for nail deflection in the AP plane by turning the adjustment knob to raise or lower the aiming arm until the protection sleeve/drill sleeve assembly is pointing precisely at the nail's locking hole.

■ Note:

For more precision, use a template with parallel lines on the screen.

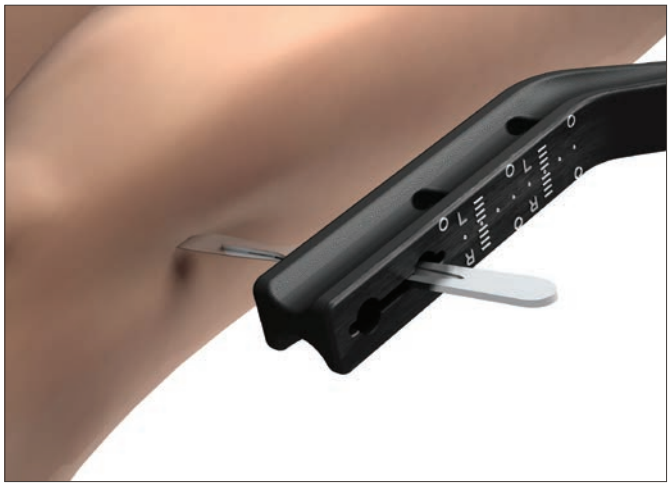
3. Insert locking screws

Instruments	
03.010.061	Drill Bit ∅ 4.2 mm, calibrated, length 340 mm, 3-flute, for Quick Coupling, for No. 03.010.065
03.010.070	Trocar ∅ 4.2 mm, for No. 03.010.065
03.010.072	Depth Gauge for Locking Screws, measuring range up to 110 mm, for No. 03.010.063
356.708	Screwdriver, hexagonal, ∅ 3.5 mm, for AFN

Remove sleeve assembly.

Carefully perform a stab skin incision through the most proximal hole of the SureLock aiming arm.

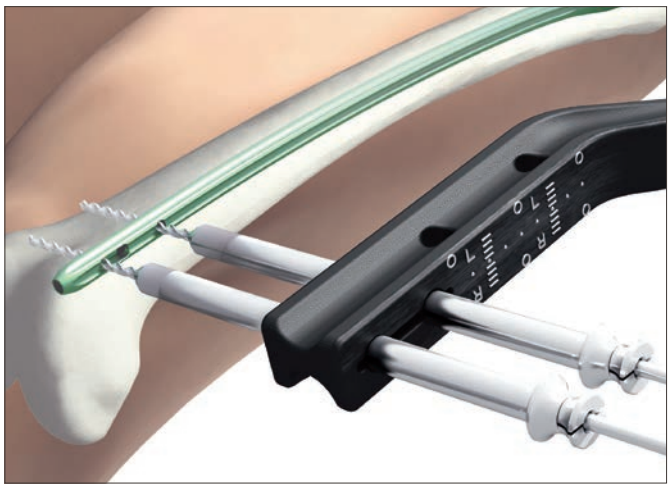
Insert the protection sleeve/drill sleeve/trocar assembly through the aiming arm and advance to the bone. Remove the trocar.



Check again that the sleeve assembly is pointing precisely at the nail's locking hole, using the central line on the template as a reference.

Drill for the first distal locking screw, leaving the drill bit in place.

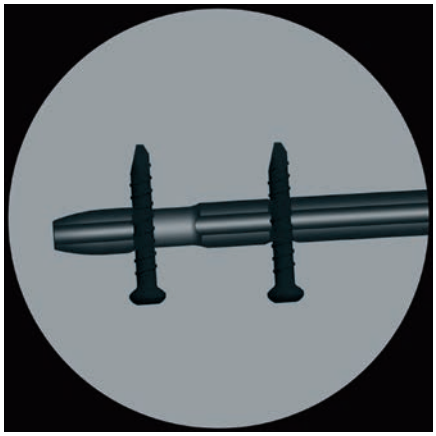
Drill through the second locking hole, measure for screw length and insert the appropriate locking screw according to standard surgical technique.



Remove the drill bit from the most proximal hole and repeat the same steps to insert the second locking screw.

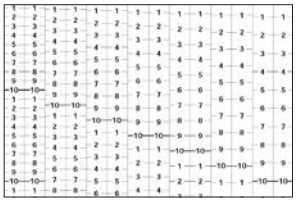
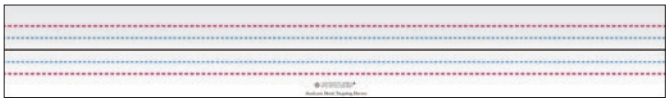
4. Remove SureLock device

Remove the SureLock device from the insertion handle and continue surgery according to the standard surgical technique.



Instruments

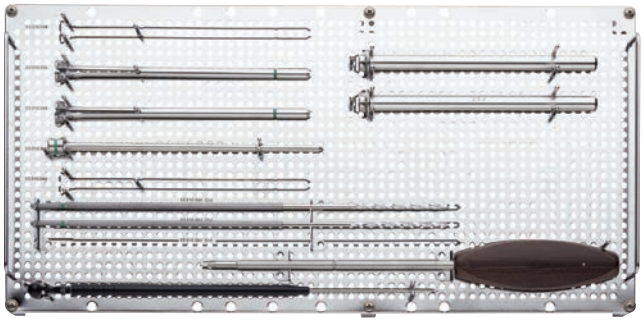
03.010.061	Drill Bit ∅ 4.2 mm, calibrated, length 340 mm, 3-flute, for Quick Coupling, for No. 03.010.065	
03.010.063	Protection Sleeve 12.0/8.0, length 188 mm	
03.010.065	Drill Sleeve 8.0/4.2, for No. 03.010.063	
03.010.070	Trocar ∅ 4.2 mm, for No. 03.010.065	
03.010.072	Depth Gauge for Locking Screws, measuring range up to 110 mm, for No. 03.010.063	
356.708	Screwdriver, hexagonal, ∅ 3.5 mm, for AFN	
03.010.200	SureLock Aiming Arm for Antegrade Femoral Nails	

03.010.201	SureLock Connector, left, for long Proximal Femoral Nails (PFN, TFN and PFNA)	
03.010.202	SureLock Connector, right, for long Proximal Femoral Nails (PFN, TFN and PFNA)	
03.010.203	Adjustment Knob for SureLock	
03.010.204	Calibration Pin ∅ 12.0 mm	
321.160	Combination Wrench ∅ 11.0 mm	
018.000.629	SureLock Labels for C-arm	
018.000.630	SureLock Template for screen	

SureLock Distal Targeting Device for TFN Instrument Set (01.010.201)

Vario Case

68.010.201	Vario Case for SureLock, without Contents, without Lid
689.530	Lid (Stainless Steel), extra-large, for Vario Case



Instruments

03.010.061	Drill Bit ∅ 4.2 mm, calibrated, length 340 mm, 3-flute, for Quick Coupling, for No. 03.010.065
03.010.063	Protection Sleeve 12.0/8.0, length 188 mm
03.010.065	Drill Sleeve 8.0/4.2, for No. 03.010.063
03.010.070	Trocar ∅ 4.2 mm, for No. 03.010.065
03.010.072	Depth Gauge for Locking Screws, measuring range up to 110 mm, for No. 03.010.063
356.708	Screwdriver, hexagonal, ∅ 3.5 mm, for AFN
03.010.200	SureLock Aiming Arm for Antegrade Femoral Nails
03.010.201	SureLock Connector, left, for long Proximal Femoral Nails (PFN, TFN and PFNA)
03.010.202	SureLock Connector, right, for long Proximal Femoral Nails (PFN, TFN and PFNA)
03.010.203	Adjustment Knob for SureLock
03.010.204	Calibration Pin ∅ 12.0 mm
321.160	Combination Wrench ∅ 11.0 mm
018.000.629	SureLock Labels for C-arm
018.000.630	SureLock Template for screen

Note: For additional information, please refer to package insert.

Not all products are currently available in all markets.
This publication is not intended for distribution in the USA.
Intended use, Indications and Contraindications can be found in the corresponding system Instructions for Use.
All Surgical Techniques are available as PDF files at www.depuysynthes.com/ifu

DePuy Synthes
THE ORTHOPAEDICS COMPANY OF Johnson&Johnson

Synthes GmbH
Eimattstrasse 3
4436 Oberdorf
Switzerland
Tel: +41 61 965 61 11

www.depuysynthes.com

SE_874744 AA (DSEM/TRM/0816/0728) EOS: 104761-220214 02/2022

CE
0123