MIS Radiolucent Targeting Device NCB® Periprosthetic Femur Plate System

Surgical Technique

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This surgical technique is intended to be used in conjunction with the *NCB* Periprosthetic Femur Plate System Surgical Technique (06.02013.012).

Introduction

Fully radiolucent Targeting Devices are available, allowing MIS techniques to be used for the *NCB* Periprosthetic Proximal Femur and *NCB* Periprosthetic Distal Femur Plates. The addition of Bottom Covers provides proper targeting according to plate size by blocking holes that do not correspond to the plate **(Fig. 1&2)**. Each plate length and type has a unique Bottom Cover that targets its hole pattern.

NOTE: Use of the Targeting Device prevents polyaxial screw insertion.

Fig. 2 *NCB* Periprosthetic Femur Plates and *NCB* MIS Radiolucent Targeting Device with Bottom Covers

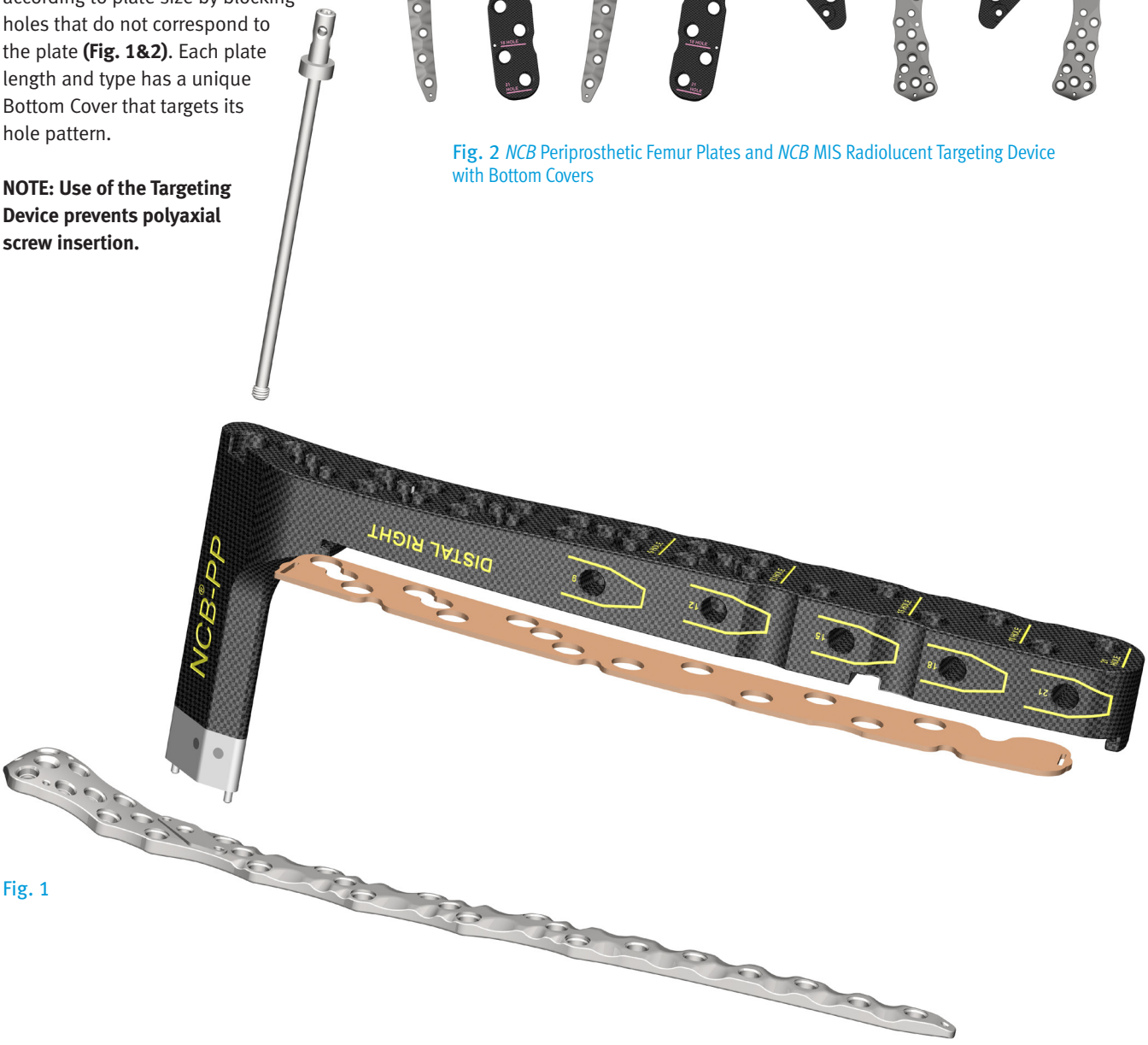

Fig. 1

MIS Technique - Targeting Device Assembly for Insertion

Thread the Connection Bolt (REF 02.00024.380) through the *NCB* Periprosthetic Targeting Device **(Fig. 3)**. Attach the Targeting Device by screwing the connection bolt into the *NCB* Periprosthetic Femur Plate**.** Attach the *NCB* Periprosthetic Targeting Device to the corresponding *NCB* Periprosthetic Plate. (Left Proximal REF 02.00024.371; Left Distal REF 02.00024.373 ; Right Proximal REF 02.00024.370; Right Distal REF 02.00024.372). Screw the Connection Bolt into the *NCB* Periprosthetic Plate and tighten with the 6Nm Torque Limiting Screwdriver (REF 02.00024.021).

Choose the appropriate Bottom Cover (Proximal REF 02.00024.390-394; Distal REF 02.00024.395-399) by matching the plate size with the number of holes indicated on the Bottom Cover for the plate **(Fig. 4)**. Snap it into the bottom of the Targeting Device.

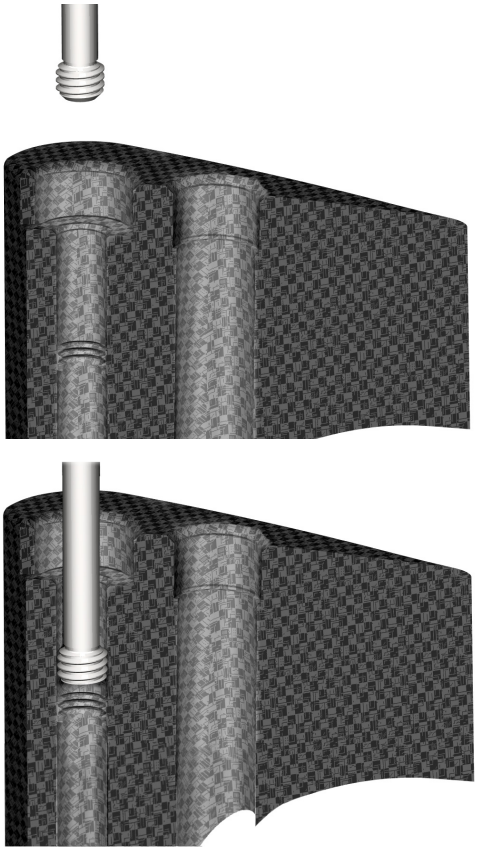

Fig. 3 The Connection Bolt is first threaded into the top of the Targeting Device to prevent it from falling out.

The Bottom Cover is flipped over for right or left application.

Fig. 4 Each plate length and type uses a unique Bottom Cover to match its specific hole pattern. For reference, the 21 hole and 12 hole proximal plates with corresponding bottom covers are shown above.

Proximal NCB Periprosthetic MIS Technique

Make the incision using a lateral subvastus approach. Alternately, incorporate the existing incision if applicable. Avoid excessive stripping of the soft tissue and keep the periosteum intact.

Reduce the fracture prior to inserting the plate. Bone fragments can be secured with 2.0mm K-wires (REF 290.20.280) or clamps, such as pointed reduction forceps. Ensure that preliminary fixation devices do not interfere with the future location of the plate and screws, with the prosthesis or with the *NCB* Periprosthetic Targeting Device.

Insertion of the Proximal NCB Plate

1. Insert the plate between the vastus lateralis muscle and the periosteum. Place the Proximal Femur Plate just below the vastus tubercle until you achieve good contact with the bone. Keep the distal end of the plate in close contact with the bone during insertion. Ensure both proximal and distal ends of the plate have good placement on the bone.
2. Make a stab incision at the most distal plate hole. Insert the *NCB* Trocar (REF 02.00024.062) and Stabilization Bolt (REF 02.00024.074) into the *NCB* Periprosthetic Plate **(Fig. 5)**. Use the three K-wire holes to hold the targeting device in place, ensuring that the targeting device does not sag. Depending on the patient anatomy, these K-wires may rest on the anterior aspect of the femur when the plate is centered on the bone.

NOTE: To place a screw in the distal end of the plate, exchange out the *NCB* Stabilization Bolt with the *NCB* Trocar, Drill Guide, and Tissue Protection Sleeve assembly after all other screws have been inserted.

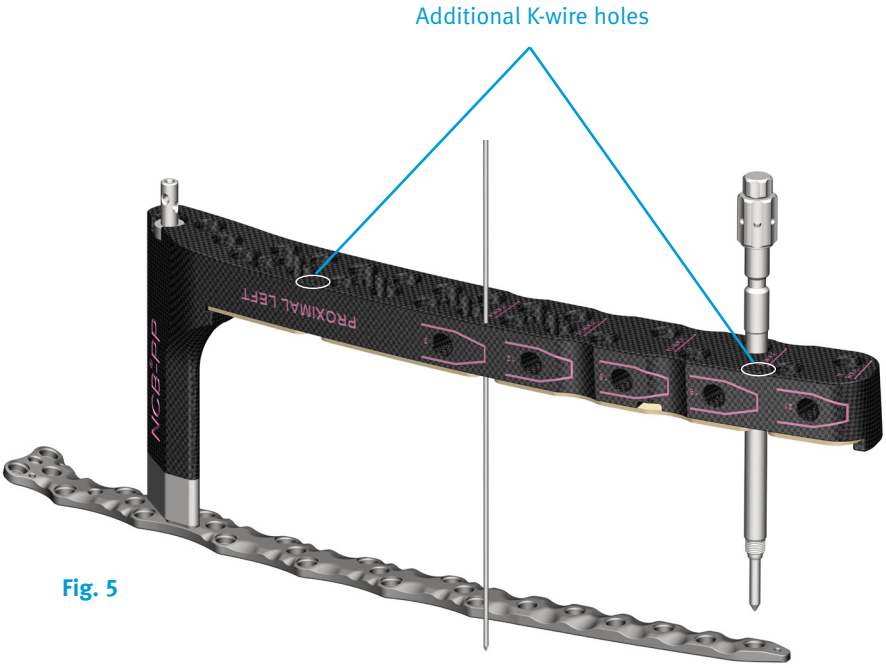

Fig. 5

Distal NCB Periprosthetic MIS Technique

A lateral incision is recommended. The skin incision should start at Gerdy's tubercle and extend proximally. The muscles are left attached to the fracture fragments for optimal blood supply. Do not strip the periosteum.

Reduce the fracture prior to inserting the plate. Bone fragments can be secured with 2.0mm K-wires (REF 290.20.280) or clamps, such as pointed reduction forceps. Ensure that preliminary fixation devices do not interfere with the future location of the plate and screws, with the prosthesis or with the *NCB* Periprosthetic Targeting Device.

Insertion of the Distal NCB Plate

1. Insert the plate between the vastus lateralis muscle and the periosteum. Keep the proximal end of the plate in close contact with the bone during insertion. Place the distal end of the plate as distal as possible. Ensure both proximal and distal ends of the plate have good placement on the bone.
2. Make a stab incision at the most proximal plate hole. Insert the *NCB* Trocar (REF 02.00024.062) and Stabilization Bolt (REF 02.00024.074) into the *NCB* Periprosthetic Plate **(Fig. 6).** Use the three K-wire holes to hold the targeting device in place, ensuring that the targeting device does not sag. Depending on the patient anatomy, these K-wires may rest on the anterior aspect of the femur when the plate is centered on the bone.

NOTE: To place a screw in the proximal end of the plate, exchange out the *NCB* Stabilization Bolt with the *NCB* Trocar, Drill Guide, and Tissue Protection Sleeve assembly after all other screws have been inserted.

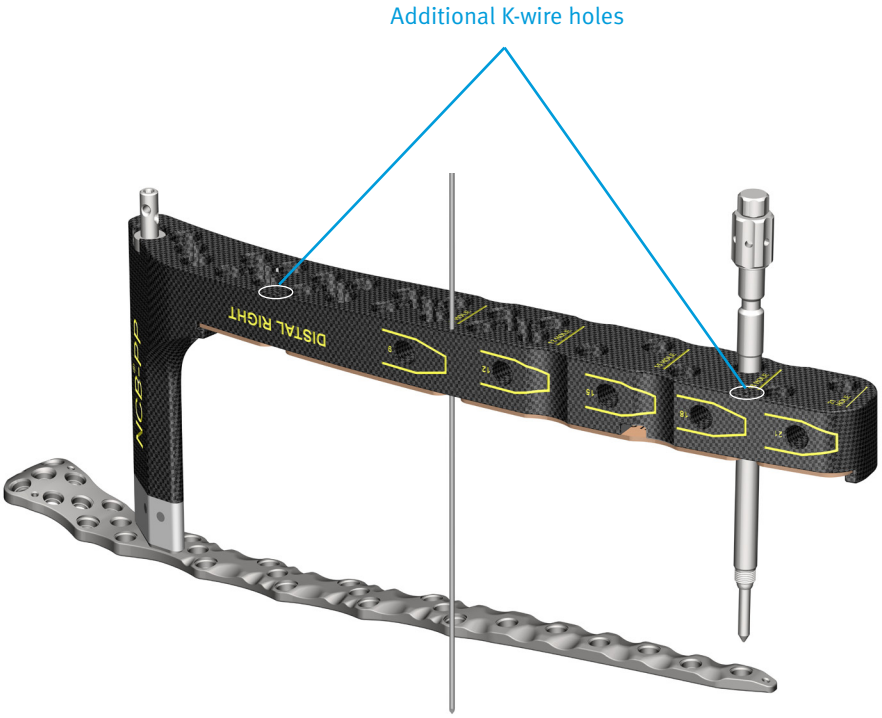

Fig. 6

Proximal & Distal NCB Periprosthetic MIS Technique (cont'd)

Secure the Safety Lock Pin

Insert the *NCB* Periprosthetic Safety Lock Pin (REF 02.00024.382) into the *NCB* Periprosthetic Targeting Device from the anterior side to ensure proper distance is maintained between the Targeting Device and the plate throughout the procedure **(Fig. 7).** To ensure the Pin is locked in place, adjust the distance between the end of the Targeting Device and the end of the plate by gently pushing on the Targeting Device.

Fig. 7 Adjust the height of the Targeting Device to allow Safety Lock Pin placement.

Reduction of the Metaphyseal Bone Fragments

Insert screws into the metaphyseal area of the plate using the open technique on page 20 of the *NCB* Periprosthetic Femur Plate System Surgical Technique.

NOTE: 15° angulation may be restricted when inserting screws in the metaphyseal region with the Targeting Device attached to the plate.

NOTE: Some Locking Caps near the metaphyseal region must be placed after the Targeting Device has been removed from the plate.

Insertion of the NCB Screws in Diaphyseal Bone

1. Make a stab incision to access the plate hole. Insert the *NCB* Trocar, Drill Guide, and Tissue Protection Sleeve assembly (REF 02.00024.060-062) **(Fig. 8).**
2. Screw the Tissue Protection Sleeve into the *NCB* Periprosthetic Targeting Device. The Tissue Protection Sleeve will be in direct contact with the plate.
3. Screw the Drill Guide into the plate hole.
4. Remove the Trocar.

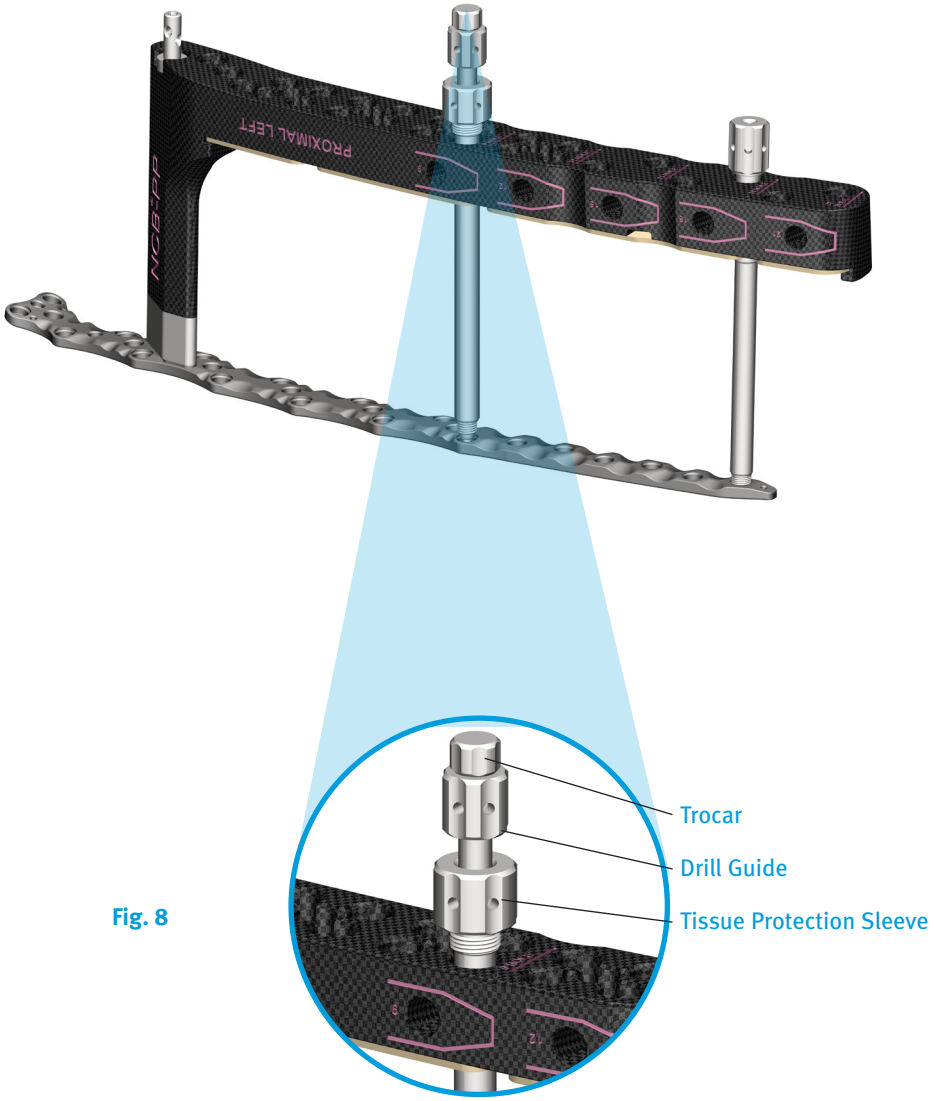

Fig. 8

5. Insert the correct diameter Drill Bit for the desired screw. The same Drill Guide is used for both the 3.3mm and 4.3mm drill bits. The calibration lines on the Drill Bit can be used to determine the screw length **(Fig. 9).** Alternatively, determine the screw length using the *NCB* Depth Gauge (REF 02.00024.006) by measuring through the Drill Guide and Tissue Protection Sleeve **(Fig. 10).**

NOTE: Ensure that other existing medical devices and their fixation and/or anchorage elements are not affected or damaged by drill bits, taps, or screws. Do not hit the prosthesis with the tip of the drill, tap, or screw.

Fig. 9

Fig. 10

6. Remove the Drill Guide and insert the appropriate screw using the *NCB* Hexagonal Screwdriver (REF 02.00024.023) **(Fig. 11)**.

NOTE: If the screw is inserted using power, final tightening should be done by hand.

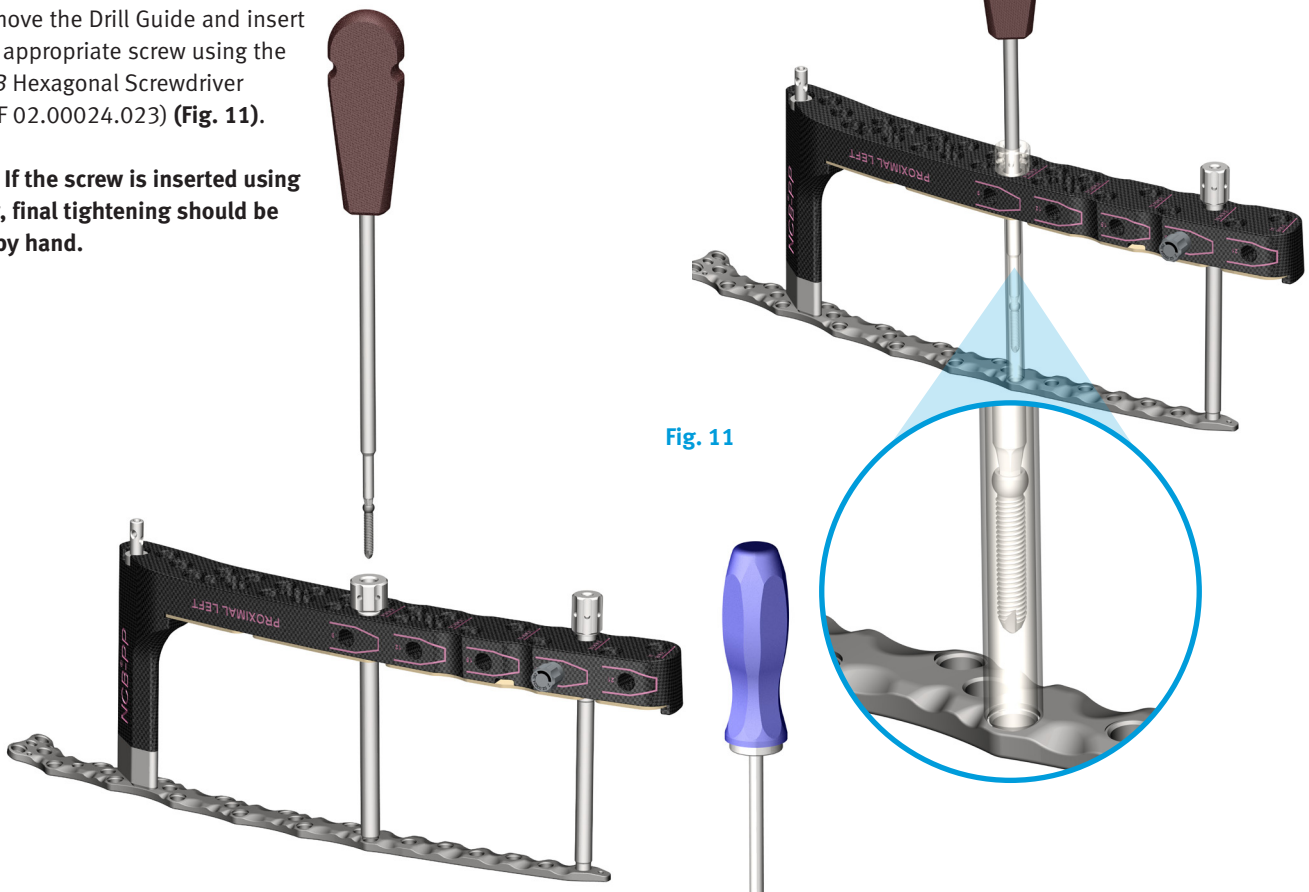

Fig. 11

7. To lock the screw, insert a Locking Cap (REF 02.03150.300) and tighten the Cap with the 6Nm Torque Limiting Screwdriver (REF 02.00024.021) until a clicking sound is heard **(Fig. 12).**

NOTE: The Self-Retaining Screwdriver (REF 5912) can be used to prevent screws and Locking Caps from being lost inside the Tissue Protection Sleeve, however the *NCB* hexagonal screwdriver may be needed to insert the Screw. Final tightening of the Locking Caps must always be done using the 6Nm Torque Limiting Screwdriver.

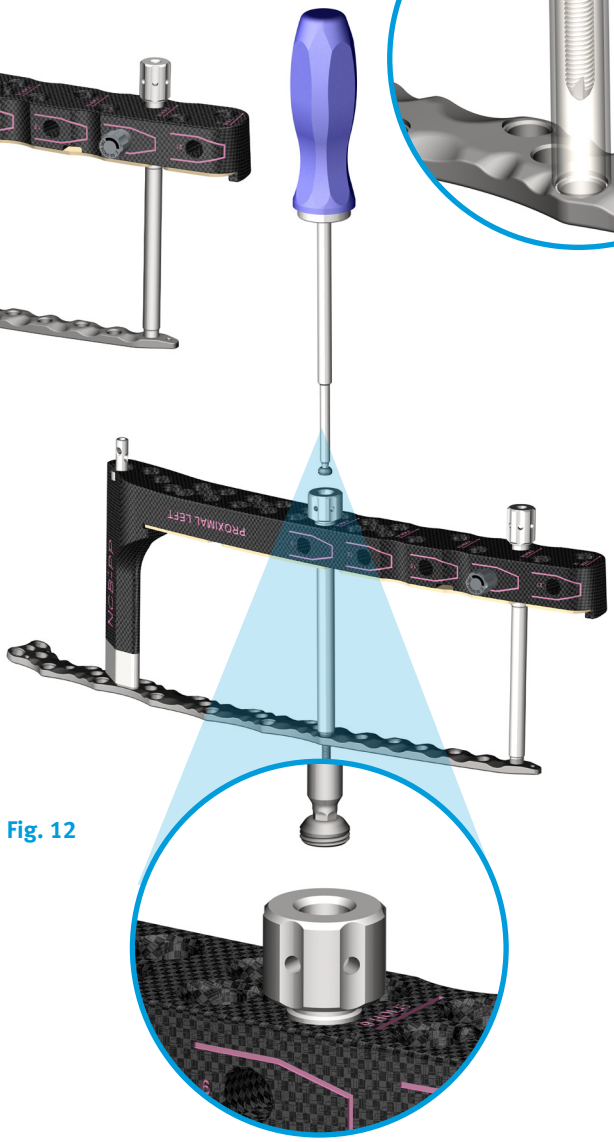

Fig. 12

8. Remove the Tissue Protection Sleeve and place a Screw Marker (02.00024.077) into the hole in the *NCB* Periprosthetic Targeting Device to indicate which plate holes contain screws **(Fig. 13).**
9. Repeat the above steps as needed to insert additional screws.

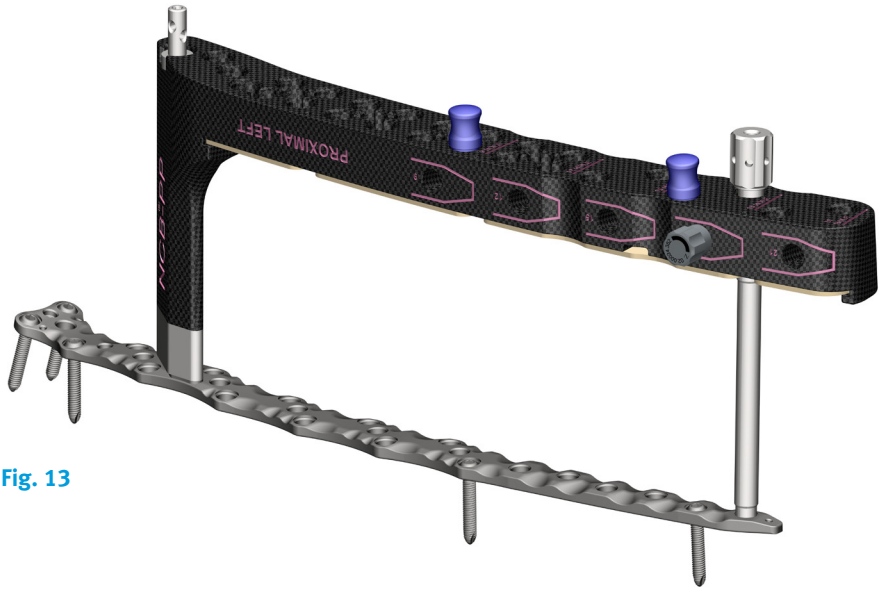

Fig. 13

(Optional)

Creating Compression between the Plate and the Bone

1. Screw the Reduction Spin Knob (REF 00-2360-011-03) onto the threads nearest to the AO adapter on the Plate Reduction Instrument (REF 00-2360-011-01).
2. Insert the *NCB* Trocar, Drill Guide, and Tissue Protection Sleeve Assembly as described in steps 1-4 from the section entitled *"Insertion of the NCB Screws in Diaphyseal Bone"* on page 9.
3. Drill the Plate Reduction Instrument into the bone.
4. Turn the Spin Knob against the Drill Guide until it provides the desired amount of compression **(Fig. 14)**.

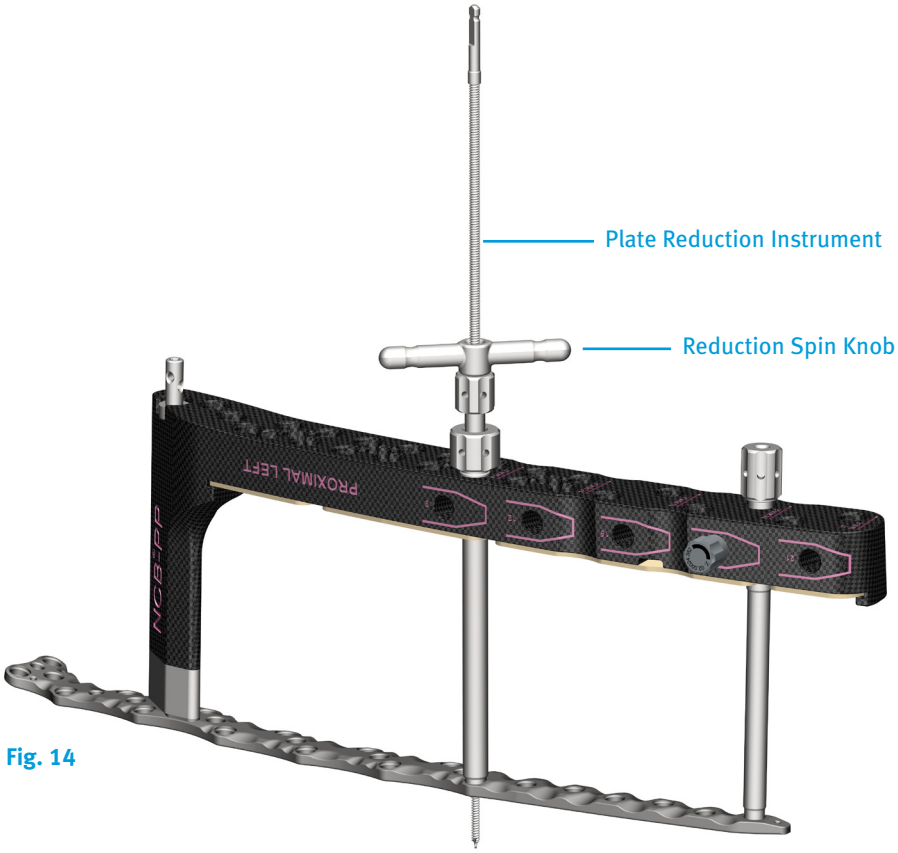

Fig. 14

Product Information – MIS Guides and Instruments

NCB® Periprosthetic MIS Instruments

REF	*Description*
02.00002.001	Assembly Pin
02.00024.003	*NCB*-PT Drill Bit 4.3MM QC
02.00024.006	*NCB*-DF Depth Gauge
02.00024.060	*NCB*-DF Soft Tissue Protection Sleeve 10.0/8.2MM
02.00024.061	*NCB*-DF Drill Guide 8.2/4.3MM
02.00024.062	*NCB*-DF Trocar
02.00024.074	*NCB*-DF Stabilization Bolt
02.00024.077	*NCB*-PT Screw Marker
02.00024.370	*NCB* Periprosthetic Femur targeting device, right proximal
02.00024.371	*NCB* Periprosthetic Femur targeting device, left proximal
02.00024.372	*NCB* Periprosthetic Femur targeting device, right distal
02.00024.373	*NCB* Periprosthetic Femur targeting device, left distal
02.00024.380	*NCB* Periprosthetic Femur connection bolt for targeting device
02.00024.381	*NCB* Periprosthetic Femur MIS drill bit Ø 3.3mm, with quick coupling
02.02024.381	*NCB* Periprosthetic Femur MIS drill bit Ø 3.3mm, with quick coupling (sterile)
02.00024.382	*NCB* Periprosthetic Femur Safety Lock Pin
02.00024.390	*NCB* Periprosthetic Proximal Femur targeting device bottom cover for 9 hole plate
02.00024.391	*NCB* Periprosthetic Proximal Femur targeting device bottom cover for 12 hole plate
02.00024.392	*NCB* Periprosthetic Proximal Femur targeting device bottom cover for 15 hole plate
02.00024.393	*NCB* Periprosthetic Proximal Femur targeting device bottom cover for 18 hole plate
02.00024.394	*NCB* Periprosthetic Proximal Femur targeting device bottom cover for 21 hole plate
02.00024.395	*NCB* Periprosthetic Distal Femur targeting device bottom cover for 9 hole plate
02.00024.396	*NCB* Periprosthetic Distal Femur targeting device bottom cover for 12 hole plate
02.00024.397	*NCB* Periprosthetic Distal Femur targeting device bottom cover for 15 hole plate
02.00024.398	*NCB* Periprosthetic Distal Femur targeting device bottom cover for 18 hole plate
02.00024.399	*NCB* Periprosthetic Distal Femur targeting device bottom cover for 21 hole plate
00-2360-011-01	Plate Reduction Instrument
00-2360-011-03	Reduction Spin Knob
5912	Self-Retaining Screwdriver

Graphic Cases for *NCB* Periprosthetic MIS Instruments

Standard Graphic Cases

REF	*Description*
02.00024.913	*NCB* Periprosthetic Femur MIS Case Assembly
02.00024.914	*NCB* Periprosthetic Femur MIS Case Base
02.00024.915	*NCB* Periprosthetic Femur MIS Case Tray
00-5900-099-00	Generic Lid

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