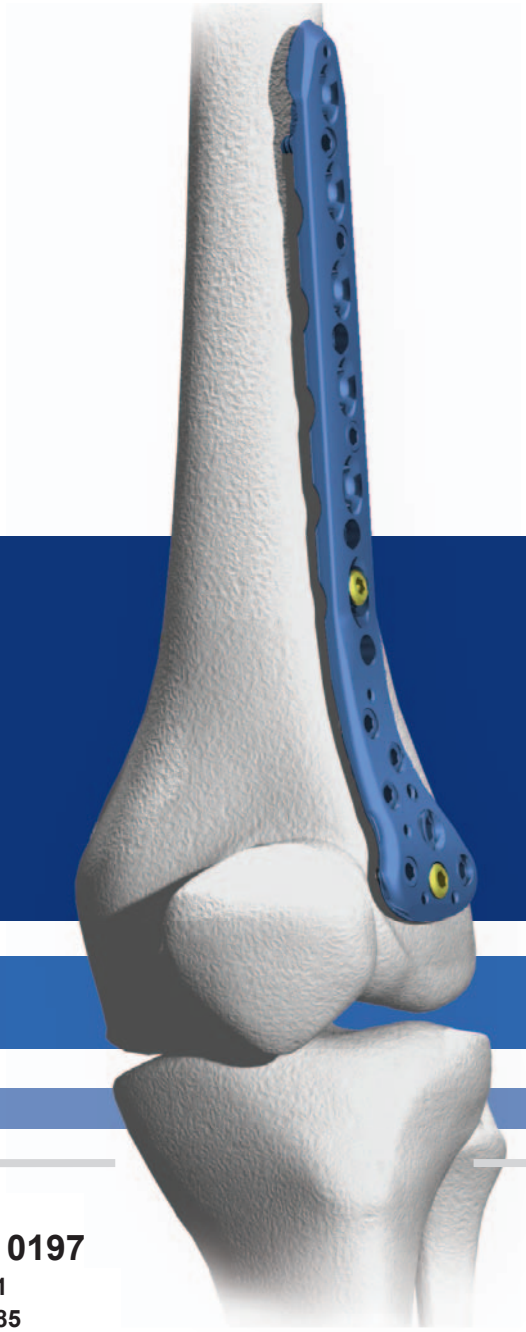
instruction

THE FEMORAL PLATES

IMPLANTS
INSTRUMENT SET
SURGICAL TECHNIQUE



31C

CE 0197
ISO 9001
ISO 13485

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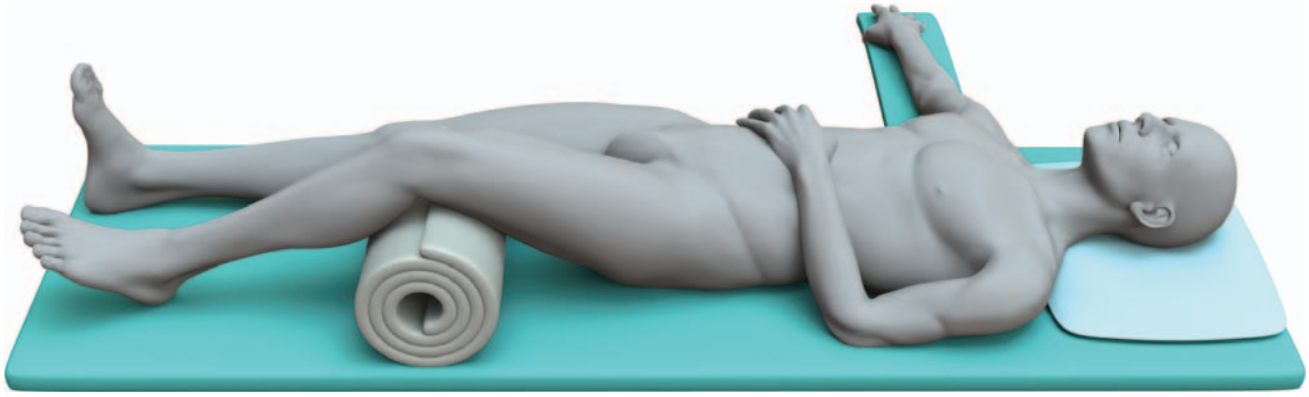
IV. SURGICAL TECHNIQUE

IV.1. Patient positioning

Place the patient in the supine position. Support the knee allowing the free movement of leg. Make sure that the position ensures getting proper X-Rays in the lateral and AP position. Due to the gastrocnemius muscle strength which may cause hyperextension of further fragments the care shall be taken to avoid the strong traction and full extension of the knee. In order to reduce the forces of the gastrocnemius muscle, the bent of the knee should be around 20-40°.

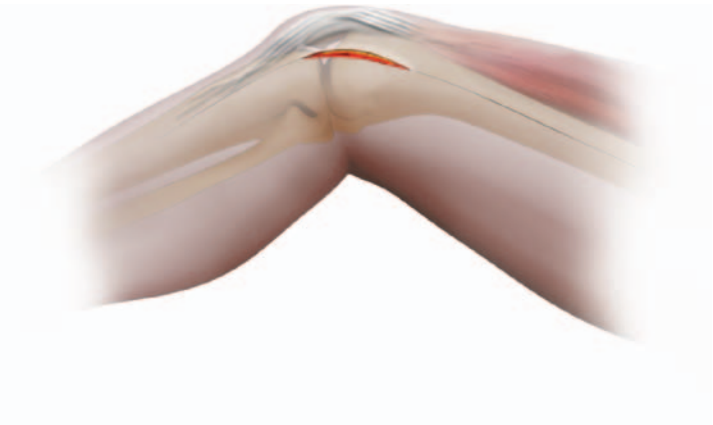


IV.2. Surgical approach

To perform the surgery the preferred technique for access and exposure to lateral distal femur shall be used. There are two types of surgical approach depending on the type of fracture.

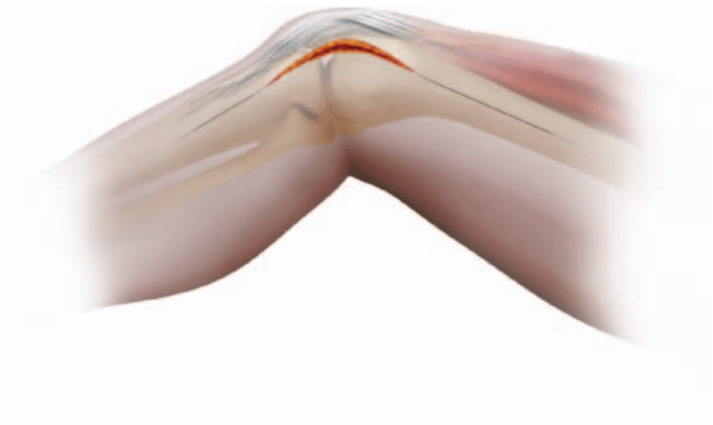
IV.2.1. Lateral approach

The 80mm lateral cut directed proximal shall be started from the Gerdy tubercle. If necessary, the cut may be extended.
Cutting recommended for extra-articular fractures and simple articular and metaphyseal fracture without displacement.



IV.2.2. AP approach

Perform parapatellar cut. In order to expose joint and perform correct reduction and fixation of the fragments medially pull the patella and extend the cut respectively exposing the femoral condyle. The lateral parapatellar cut shall be performed in case of complex, multifragmental articular fractures.



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IV.3. Fracture reduction

It is necessary to reduce the fracture before the use of femur plate with locking screws. The articular fragments shall be reduced and temporarily stabilized by using Kirschner wires and / or reducing forceps. The condyle can be protected with additional independent screws for interfragmental. The care shall be taken not to interfere with plates and screws introduced later.

If Hoff fracture occurs, adjusted the rear fragment of joint and stabilize by using Kirschner wires introduced from the front to rear part. In such case, it should be remembered that the heads of the screws stabilizing the fracture shall be placed below the surface of the articular cartilage. Confirm the proper position using the X-Ray.

IV.4. Plate selection

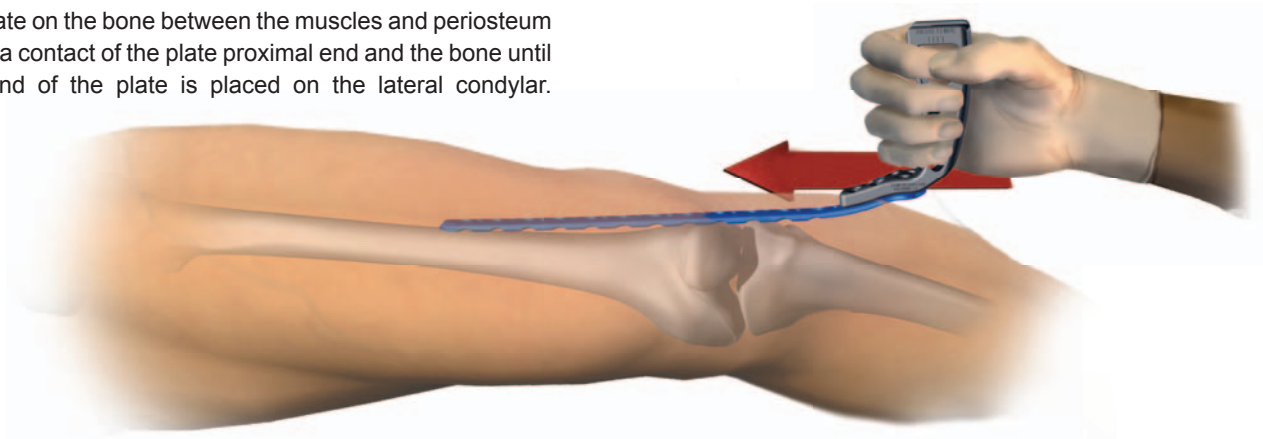
We recommend a longer femoral locking plates. The advantage of using longer plates is better force load. Plate allowing insertion of five screws over the closed fracture is the most suitable.

IV.5. Mounting plate with target

Mount the Target **[40.5609]** or **[40.5610]** and tighten the screw.

IV.6. Placing the plate

Insert the plate on the bone between the muscles and periosteum maintaining a contact of the plate proximal end and the bone until the distal end of the plate is placed on the lateral condylar.



NOTE: In order to prepare a canal for the plate insertion use the Separator Long [40.5627.000].

Verify the plate position using X-Ray.

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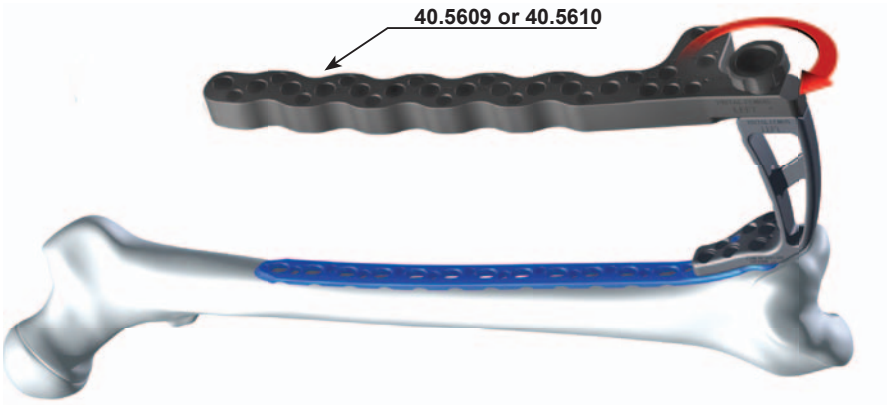
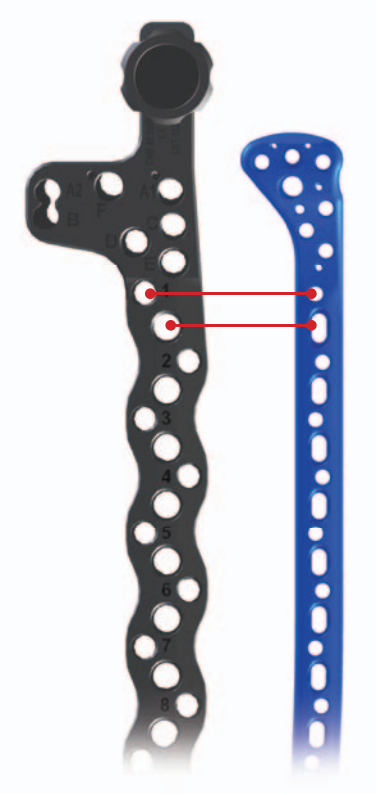
IV.7. Mounting Target D

Mount the Target D **[40.5609/40.5610]** and tighten the screw.





The holes of the Target D and plate are marked from 1 to 16. The first hole shall be used for the locking screw and second for 4.5 cortical screw.

IV.8. Distal temporary stabilization of the plate

Insert Kirschner Wires 2.0 **[40.4452.300]** through the target holes in order to obtain a temporary stabilization in the distal part.

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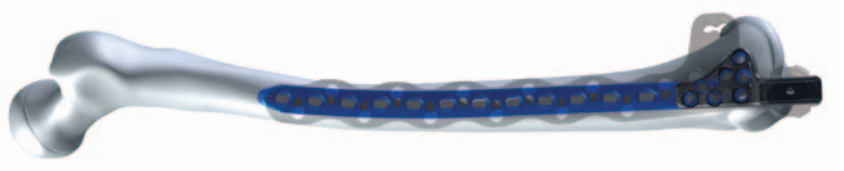
IV.9. Mounting the Target and plate in the Proximal Part

Insert the Protective Sleeve 9.0/7.0 **[40.5693.570]** within the Trocar 7.0 **[40.5695.570]** into the hole corresponding to the number of hole in the plate. Make a small cut and slide the Trocar with the Protective Sleeve and then lock the Protective Sleeve **[40.5693.570]** in the arm of Target D.
Remove the Trocar 7.0 **[40.5695.570]** and insert the Guide Sleeve 7.0/2.0 **[40.5690.520]**. Then lock the Guide Sleeve into the hole of the plate in order to maintain the rigid construction Plate and Target.

IV.10. Temporary stabilization in the proximal part

Insert Kirschnera Wire 2,0 **[40.4815.300]** throught the Guide Sleeve 7.0/2.0 **[40.5690.520]** until plate is temporary stabilize in the proximal part.
Confirm the correct position the proximal end of the plate in the lateral plane. The end plate shall be placed in the middle of the femoral shaft *(so that screws centrally pass through intramedullary canal)*.



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IV.11. IV.11. Insertion of locking screws in the distal part

Instert screws 5.0 and 7.3 in cordyral part of the plate *(holes A÷E)*.
The screws can be inserted in any order. However it is recommended to start with the 7.3 cannuleted screw. Remember, that inserted screws are essential for final flexion / extension of the condyles. X-Ray control is essential during the fracture reduction.

IV.11.1. Insertion of the 4.5 screw In eth distal part of the plate

Insert the 4.5 screw **[3.1443.016÷140]** in the F hole in the distal part of the plate.

a) Insert the Protective Guide 10.0/8.0 **[40.5694.580]** within the Guide Sleeve 8.0/3.2 **[40.5691.532]**.

b) Use the Drill With Scale 3.2/300 **[40.5650.301]**.

c) Remove the Guide Sleeve 8.0/3.2 **[40.5691.532]** and the Drill With Scale 3.2/300.

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d) Insert the screw 4.5 **[3.1443.016÷140]** through the Protective Guide 10.0/8.0 **[40.5694.580]**.

e) Remove the Sleeve and mark the hole using the Target Hole Plug **[40.5612.000]**.

IV.11.2. Insertion of the locking screw 7.3 in the distal part

Insert the screw 7.3 **[3.1661.030÷095]** in the B hole in the distal part of the plate.

a) Insert the Guide Sleeve 9.0/5.0 **[40.5689.550]** within the Sleeve 5.0/2.0 **[40.5689.520]** in the B hole.

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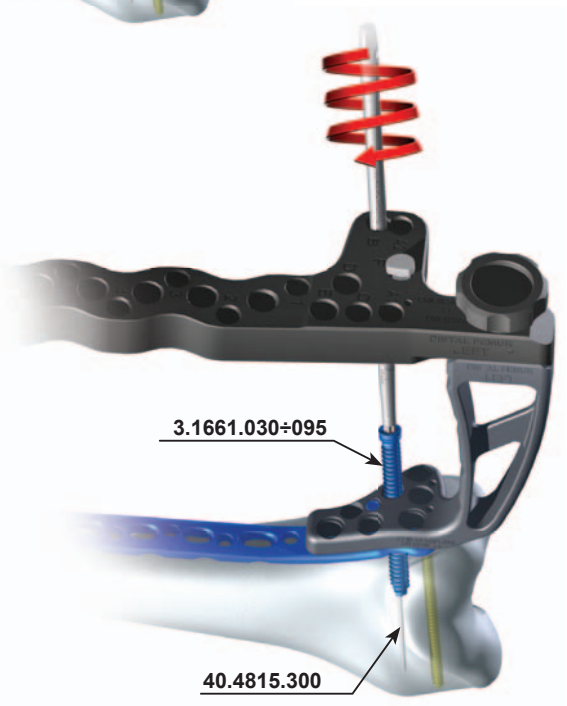
b) Insert Kirschnera Wire 2.0 **[40.4815.300]** and define the lenght of the screw using the Screw Length Measure **[40.5700.000]**.

NOTE:

*** Remove the Sleeve 5.0/2.0 [40.5689.520] and read the value using the Screw Length Measure.**

**** Without removing Sleeve 5.0/2.0 [40.5689.520] subtract 5mm from the value.**

c) Remove the Guide Sleeve and insert the Cannuleted Screw 7.3 **[3.1661.030÷095]** into the F hole of plate via Kirschner Wire **[40.4815.300]**.



d) Remove Kirschnera Wire 2.0 **[40.4815.300]** and mark the hole using the Targeter Hole Plug **[40.5612.000]**.

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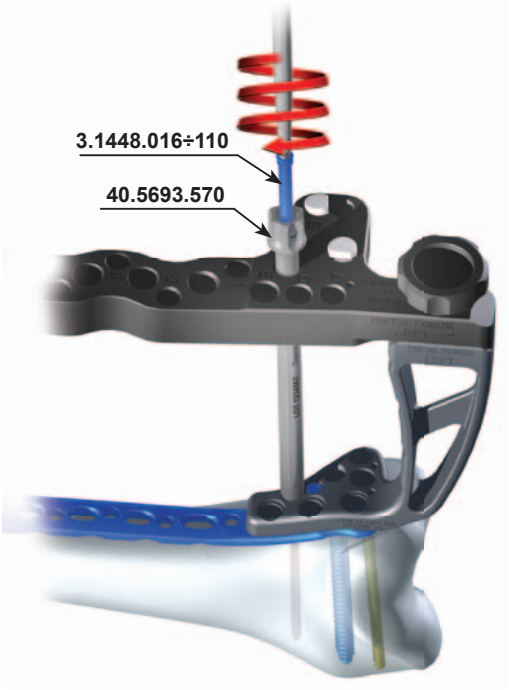
IV.11.3. Insertion of the 5.0 locking screw in the plate distal part

Insert the locking screw 5.0 **[3.1448.016÷110]** into appropriate holes A1, A2, C, D, E.

a) Insert the Protective Sleeve 9.0/7.0 **[40.5693.570]** within the Guide Sleeve **[40.5690.540]** into the proper hole.

b) Use the Drill With Scale 4.0/300 **[40.5651.301]**.

c) Insert the screw 5.0 **[3.1448.016÷110]** through the Protective Guide 9.0/7.0 **[40.5693.570]**.



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d) Remove the Protective Sleeve 9.0/7.0 **[40.5693.570]** and mark the hole using Targeter hole plug **[40.5612.000]**. Insert rest proper screw into the distal part of plate.

IV.12. Insertion of the screw in the shaft part

If necessary, use the combination of the standard cortical Screws 4.5 **[3.1443.016÷140]** with locking. It is important to insert them before the locking screws. The insertion method of cortical screw 4.5 **[3.1443.016÷140]** is defined in the section 4.12.1.

NOTE: It is essential to insert the cortical screws 4.5 in the plate shaft part before locking screws 5.0.

Insert proper number of the locking screw 5,0 **[3.1448.016÷110]** in the shaft part. Use the method defined in the section 4.12.2.

IV.12.1. Insertion Method for cortical screws 4.5

Insert the Cortical Screw 4.5 **[3.1443.016÷140]** into proper hole of the plate as follows:

a) Insert the Protective Guide 10.0/8.0 **[40.5607.080]** within the Trocar 8.0 **[40.5608.080]** and mark the point of incision.

b) Lock the Protective Guide 10.0/8.0 **[40.5607.080]** into the arm of Target D. Remove the Trocar 8.0 **[40.5608.080]** and insert the Guide Sleeve 8.0/3.2 **[40.5691.532]**.

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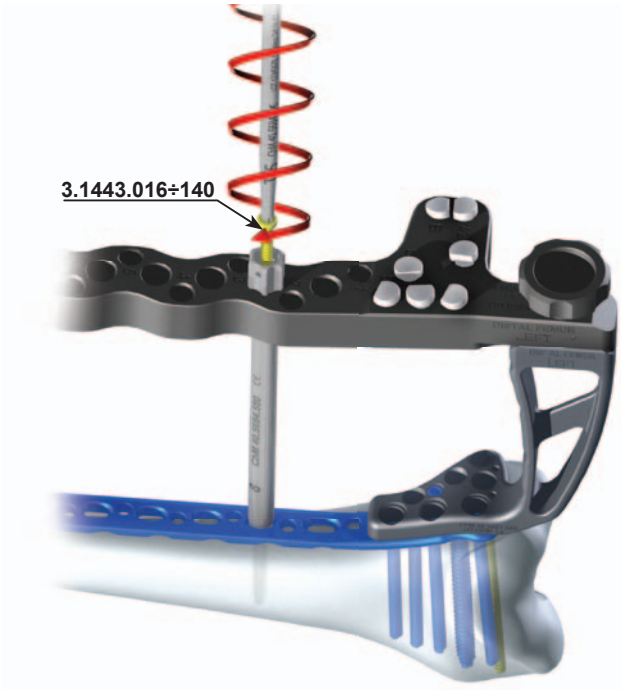
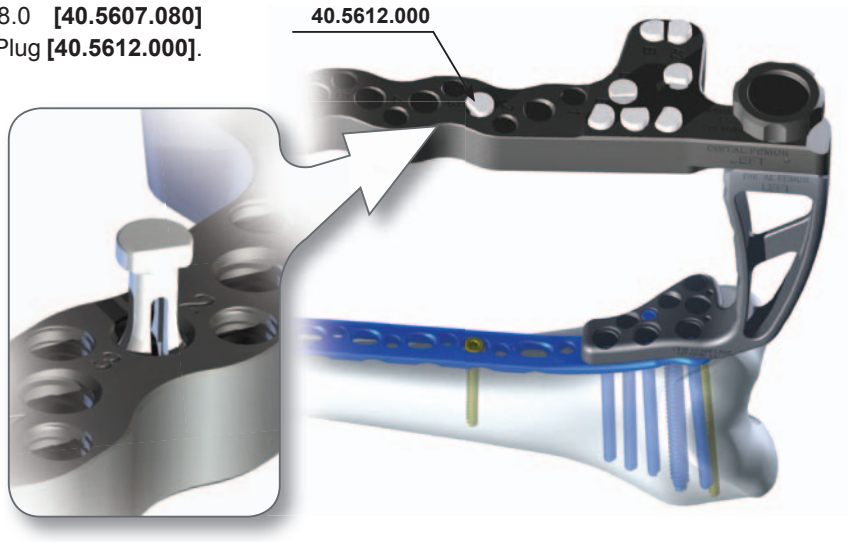
c) Use the Drill With Scale **[40.5650.301]** through both cortexes.

Define the length of the proper screw using the Drill **[40.5650.301]** or the Screw Length Measure **[40.5700.000]**.

d) Remove the Guide Sleeve 8.0/3.2 **[40.5691.532]** and insert the self-tapping cortical screw 4.5 **[3.1443.016÷140]**.



e) Remove the Protective Sleeve 10.0/8.0 **[40.5607.080]** and mark the hole using the Targeter Hole Plug **[40.5612.000]**.



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IV.12.2. Insertion method for locking screws 5.0

Insert the locking screw 5.0 **[3.1448.016÷110]** into proper hole in the shaft part of the plate as follows:

a) Insert the Protective Sleeve 9.0/7,0 **[40.5693.570]** within the Trocar 7.0 **[40.5695.570]**into the proper hole of the Target D.

b) Lock the Protective Sleeve 9.0/7.0 **[40.5693.570]** into the arm of Target D. Remove the Trocar 7.0 **[40.5695.570]** and insert the Guide Sleeve 7.0/4.0 **[40.5690.540]**.

c) Use the Drill With Scale 4.0/250 **[40.5651.301]**.

Define the proper length of the screw using the Drill With Scale or Screw Length Measure **[40.5700.000]**.

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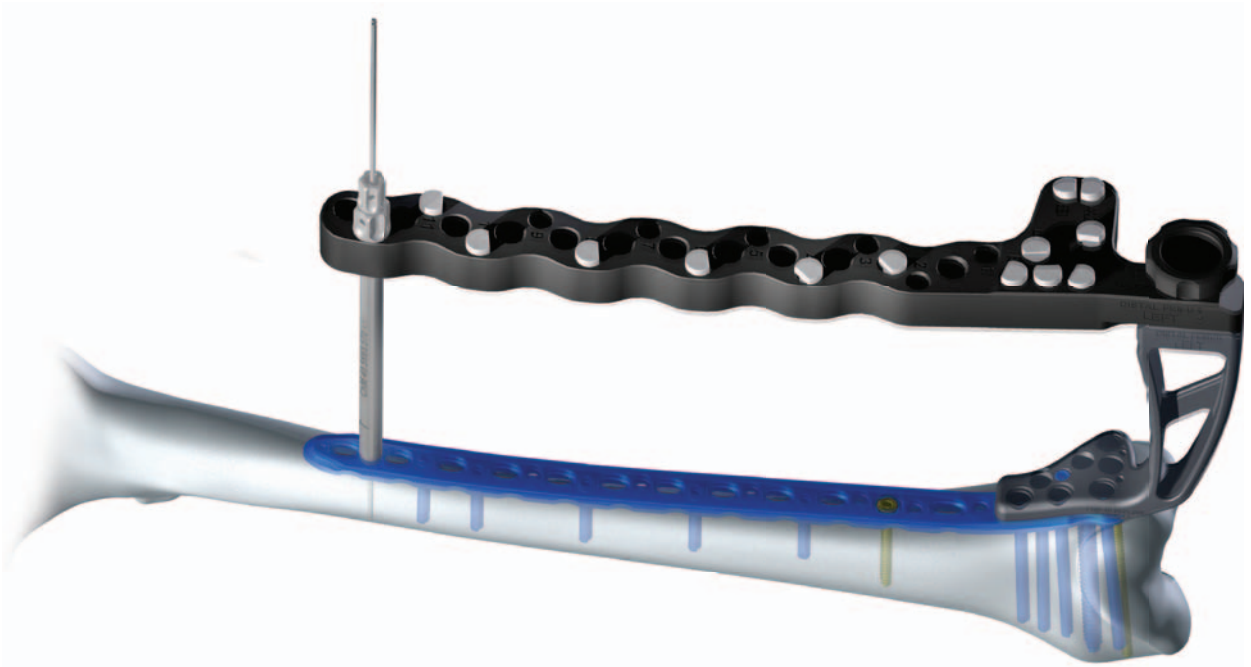
d) Insert the Screw 5.0 **[3.1448.016÷110]**.

e) Remove the Protective Guide 9.0/7.0 **[40.5693.570]** and mark the hole for the Targeter Hole Plug **[40.5612.000]**.

f) Insert other screws into the distal part of locking plate.



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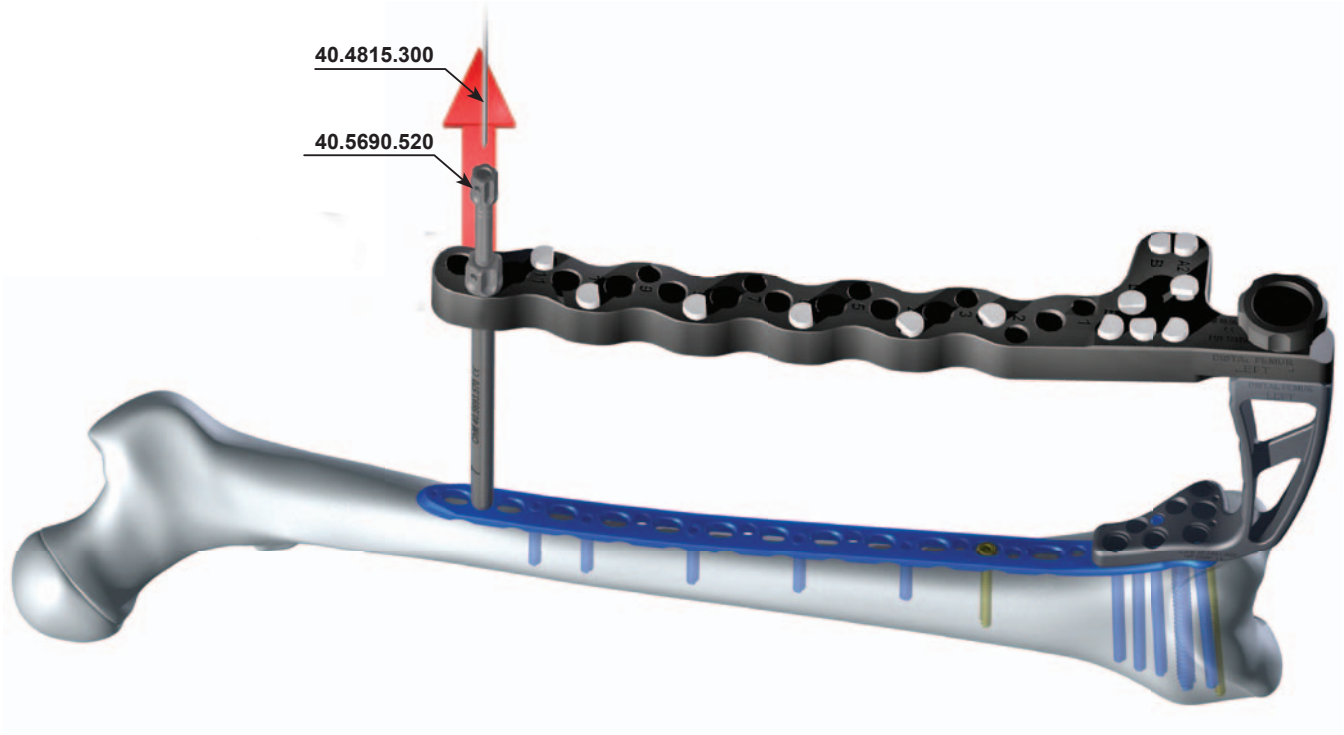
IV.12.3. Insertion of the Screw

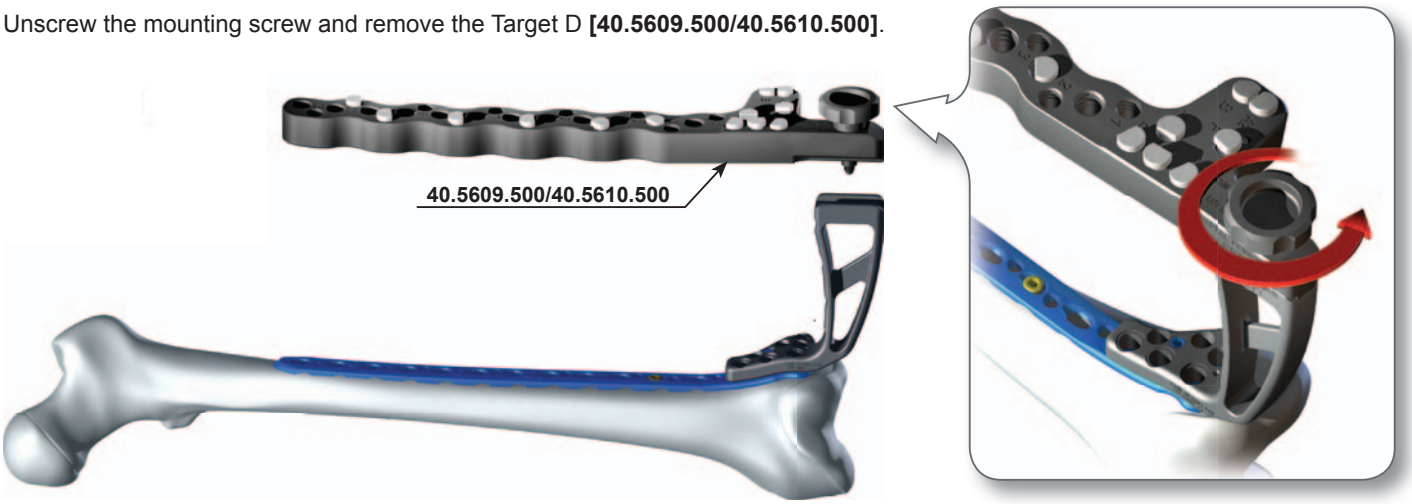
a) Remove Kirschnera Wire 2.0 **[40.4815.300]** and the Protective Sleeve 7.0/2.0 **[40.5690.520]**.



b) Insert the locking screw 5.0 **[3.1448.016÷110]** according to the method defined in section **4.12.2**.

IV.13. Removing the Target

Unscrew the mounting screw and remove the Target D **[40.5609.500/40.5610.500]**.



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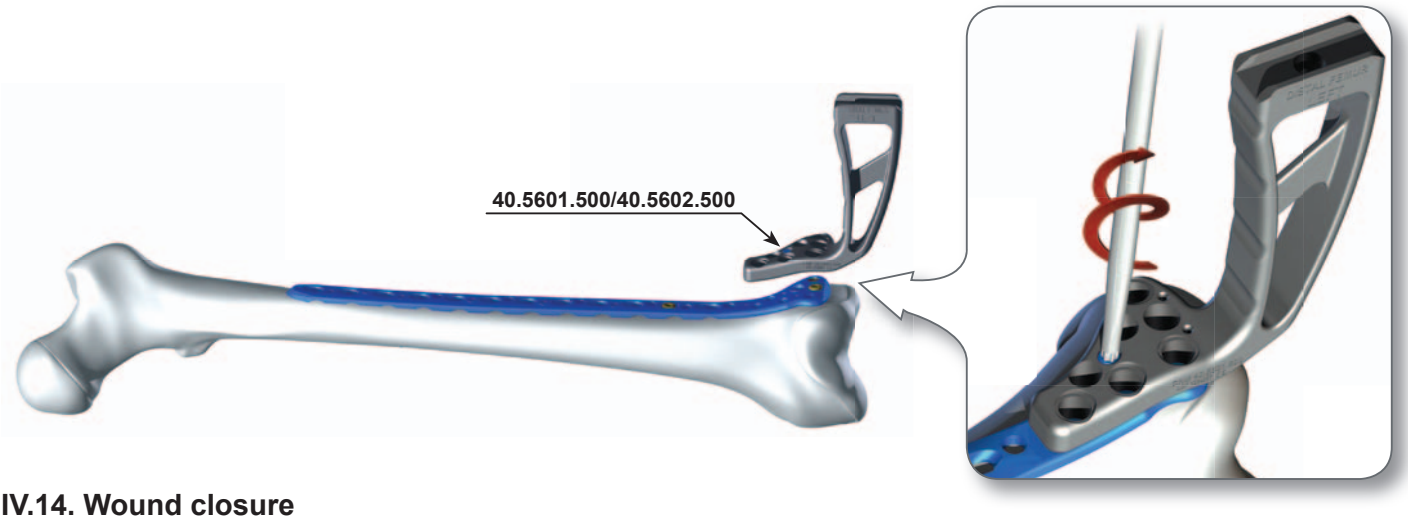
Then, unscrew the screw mounting the Target **[40.5601.500/40.5602.500]** with the screw and remove the Target.



IV.14. Wound closure

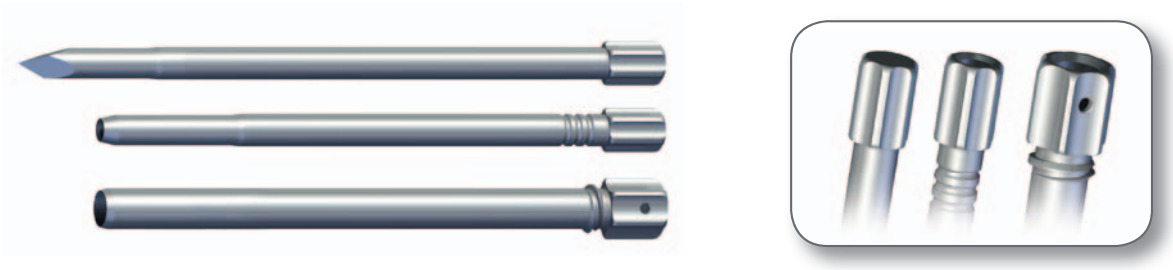
Use the appropriate surgical technique to close the wound. Before closing the wound make sure that all screws are place correctly.

V. GENERAL COMMENTS

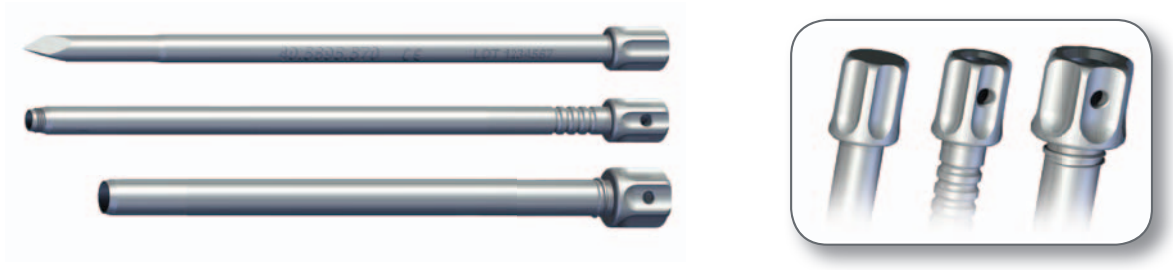
V.1. Identification the sleeves

Sleeves and trocars have properly shaped heads to facilitate their identification and mating:

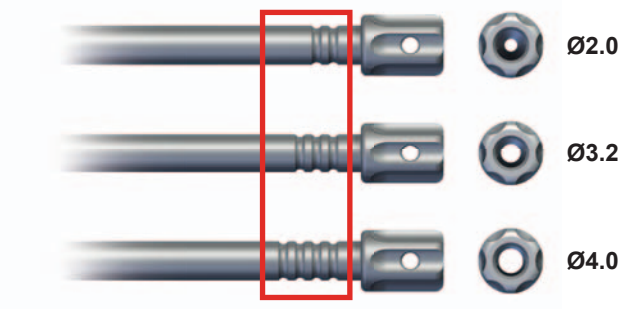
- the head of standard cortical screw 4.5 is undercut



- the head of locking screw 4.5 is partly undercut



Number of undercuts on the sleeves defines the diameter of the hole:



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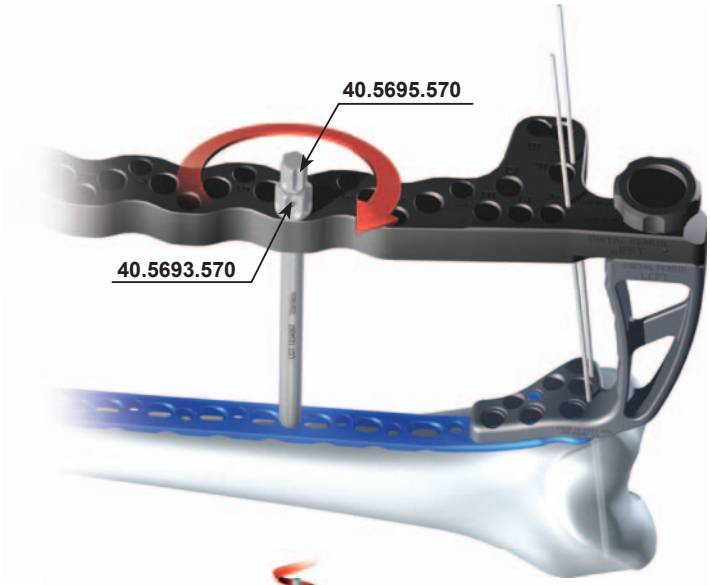
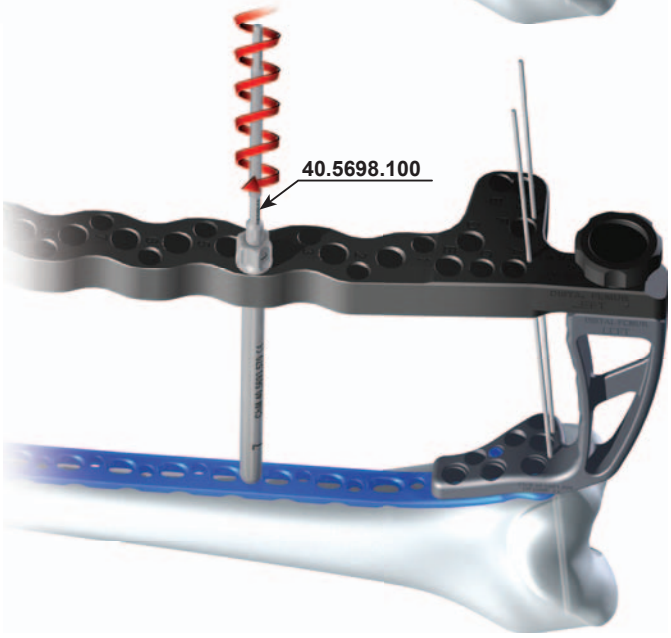
V.2. Usage of Setting-Compressing Screw

The Setting-Compressing Screw **[40.5698.100]** can be used to compress the fragments and stabilize plate before insertion of locking screw. After removal of the Setting-Compressing Screw insert the locking screw 5.0 **[3.1448]**.

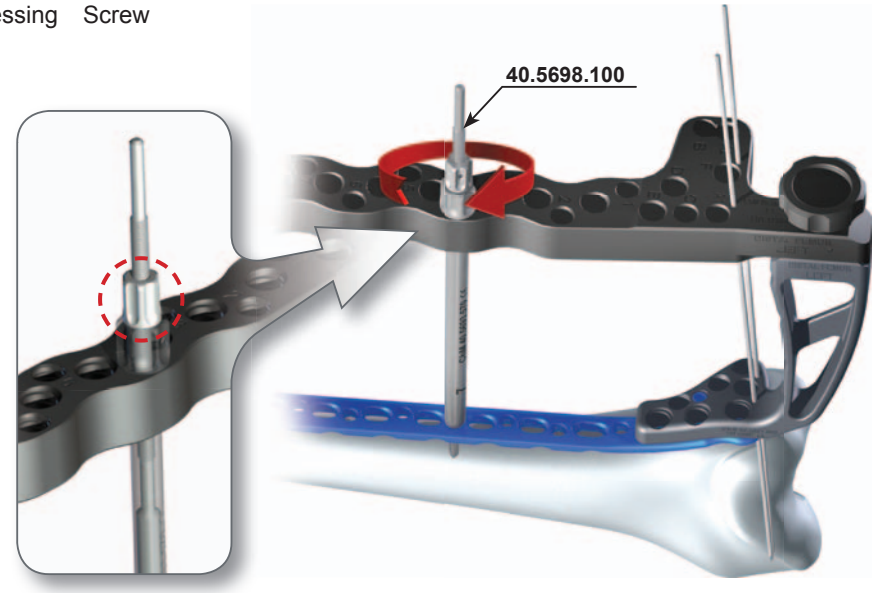
a) Insert the Protective Sleeve 9.0/7.0 **[40.5693.570]** within the Trocar 7.0 **[40.5695.570]** into the Target hole. Make a small cut and slide the Protective Sleeve within the Trocar, then locked the Protective Sleeve **[40.5693.570]** in the arm of Target D.



b) Remove the Trokar 7.0 **[40.5695.570]**. Insert the self-drilling and self-tapping tip of the Setting-Compressing Screw **[40.5698.100]**.



c) Thighten the nut of the Setting-Compressing Screw **[40.5698.100]** under X-Ray control.



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NOTE: The are four Setting-Compressing Screw [40.5698.100] in the set. In case of inserting few Setting-Compressing Screw, use additional Protective Sleeve 9.0/7.0 [40.5693.570] to insert locking screws. If all Protective Sleeves 9.0/7.0 [40.5693.570] are used, there is a possibility of removing Protective Sleeve 9.0/7.0 [40.5693.570] and tightening the nut of the Setting-Compressing Screw [40.5698.100] directly to arm of the Target D.

V.3. Usage of additional mounting sleeve

In order to secure connection of the Plate and Target while inserting the implant on the bone, it is recommended to use additional Mounting Sleeve 7/4.0 **[40.5616.540]**.
Insert the Mounting Sleeve 7/4.0 **[40.5616.540]** into proper hole of the Target. The Mounting Sleeve 7/4.0 may be remove after stabilization of the Target and Plate.

VI. POSTOPERATIVE TREATMENT

Postoperative treatment should follow standard internal surgical fixation procedures. To prevent movement restrictions after surgery, physical rehabilitation should be started as soon as possible. The care should be take not to load the limb before complete union of the fragments.

VII. IMPLANT REMOVAL

The implant can be removed only after complete consolidation of the fracture and intramedullary canal reconstruction.
a) Make the incision above the plate condylar part. Remove the screws in the distal part.
b) In order to facilitate plate removal mount the Target **[40.5601/40.5602]** using the Mounting Sleeves 7/4.0 **[40.5616.540]**.
c) Remove the screws through small incisions in the proximal part. First unlock all locking screws from the plate then remove them all. This prevents any rotation of the plate when removing the last screw.
d) Hold the Target **[40.5601/40.5602]** and remove plate.

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