

LCP Proximal Femoral Hook Plate

4.5/5.0. Part of the LCP Periarticular Plating System.

Technique Guide



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 Image intensifier control

Warning

This description is not sufficient for immediate application of the instrumentation. Instruction by a surgeon experienced in handling this instrumentation is highly recommended.

Features and Benefits

The Synthes LCP Proximal Femoral Hook Plate 4.5/5.0 is part of the LCP Periarticular Plating System, which merges locking screw technology with conventional plating techniques.

LCP Periarticular Plating System

The LCP Periarticular Plating System is capable of addressing:

- complex fractures of the distal femur with the LCP Condylar Plate 4.5/5.0.
- complex fractures of the proximal femur with the LCP Proximal Femoral Plate 4.5/5.0 or the LCP Proximal Femoral Hook Plate 4.5/5.0.
- complex fractures of the proximal tibia with the LCP Proximal Tibial Plate 4.5/5.0 or the LCP Medial Proximal Tibial Plate 4.5/5.0.

Locking Compression Plate

The Locking Compression Plate (LCP) has combi-holes in the plate shaft that combine a dynamic compression unit (DCU) hole with a locking screw hole. The combi-hole provides the flexibility of axial compression and locking capability throughout the length of the plate shaft.

Note: More detailed information on conventional and locked plating principles can be found in the Synthes Locking Compression Plate (LCP) Technique Guide (Art. No. 036.000.019).



LCP Proximal Femoral Hook Plate System

The LCP Proximal Femoral Hook Plate System has many similarities to traditional plate fixation methods, with a few important improvements. The technical innovation of locking screws provides the ability to create a fixed-angle construct while using familiar AO plating techniques. Locking capability is important for a fixed-angle construct in osteopenic bone or multifragment fractures where screw purchase is compromised. These screws do not rely on plate-to-bone compression to resist patient load, but function similarly to multiple, small angled blade plates.

- Anatomically precontoured to approximate the lateral aspect of the proximal femur.
- Two proximal hooks engage the superior tip of the greater trochanter.
- Use of locking screws provides an angular stable construct independent of bone quality.
- The most proximal screw hole accepts a 7.3 mm cannulated locking or cannulated conical screw, oriented at 95° to the plate shaft.
- The second proximal screw hole accepts a 5.0 mm cannulated locking screw oriented at 110° to the plate shaft.
- The combi-holes in the plate shaft accept 5.0 mm locking screws in the threaded portion or 4.5 mm cortex screws in the DCU portion.
- Accepts the articulated tension device to tension the plate and create a load-sharing construct.
- Limited-contact stainless steel plate.
- Manufactured of implant quality 316L stainless steel.



AO ASIF Principles

In 1958, the AO ASIF (Association for the Study of Internal Fixation) formulated four basic principles, which have become the guidelines for internal fixation.¹ Those principles as applied to the LCP Proximal Femoral Hook Plate 4.5/5.0 are:

Anatomic reduction

Proximal hooks and anatomic plate profile assist reduction of metaphysis to diaphysis and facilitate restoration of the neck-shaft angle by proper screw placement.

Stable fixation

The combination of conventional and locking plate fixation offers optimum fixation irrespective of bone density.

Preservation of blood supply

A limited-contact design reduces plate-to-bone contact and helps to preserve the periosteal blood supply.

Early mobilization

Plate features combined with AO technique create an environment for bone healing, expediting return to function.

¹ M.E. Müller, M. Allgöwer, R. Schneider, and H. Willenegger. AO Manual of Internal Fixation, 3rd Edition. Berlin: Springer-Verlag. 1991.

Indications

The LCP Proximal Femoral Hook Plate 4.5/5.0 is intended for fractures of the femur including:

- Fractures of the trochanteric region, trochanteric simple, cervicotrochanteric, trochanterodiaphyseal, multifragmentary pertrochanteric, intertrochanteric, intertrochanteric reversed or transverse or with additional fracture of the medial cortex
- Fractures of the proximal end of the femur combined with ipsilateral shaft fractures
- Metastatic fracture of the proximal femur
- Osteotomies of the proximal femur
- Also for use in fixation of osteopenic bone and fixation of nonunions or malunions



Postoperative AP and lateral views

1

Preparation

Required sets

LCP Proximal Femoral Hook Plate Set 4.5/5.0 (stainless steel)

Periarticular LCP Plating System Instrument Set

Cannulated Locking and Cannulated Conical Screw \varnothing 5.0 and 7.3 mm Set

LCP Large Fragment Instrument Set

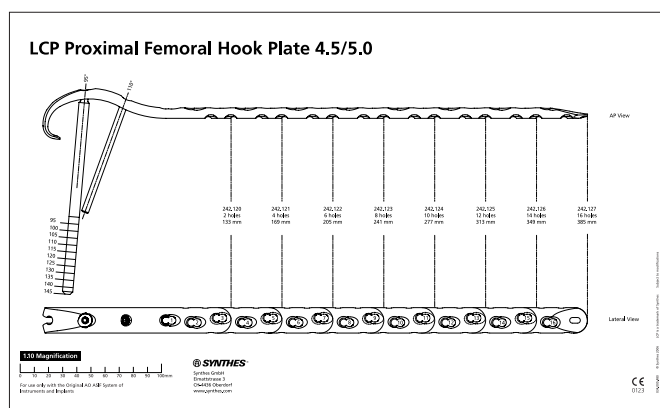
LCP Large Fragment Screw Set

Complete the preoperative radiographic assessment and prepare the preoperative plan. AP and lateral radiographs of the entire femur are necessary for complete evaluation. Traction radiographs and views of the contralateral femur are useful adjuncts in the planning process.

When considering use of the LCP Proximal Femoral Hook Plate 4.5/5.0, identify proper placement of the two proximal screws.

Use the x-ray template for LCP Proximal Femoral Hook Plate 4.5/5.0 to aid in planning the procedure. Determine plate length, and approximate screw lengths and instruments to be used.

- Position the patient supine on a radiolucent operating table or a fracture extension table for lower energy fractures. Fluoroscopic visualization of the femur in both AP and lateral views must be verified prior to patient draping.



X-ray template (Art. No. 034.000.480)

2

Reduce fracture

Reduce the fracture using a fracture table, clamps, Schanz screws, or other conventional reduction techniques. Alternatively, provisional indirect fracture reduction may be facilitated by attaching the LCP Proximal Femoral Hook Plate 4.5/5.0 to the proximal segment with appropriately oriented screws, and then to the diaphysis with plate holding forceps or 4.5 mm cortex screws.



3

Insert guide wires

Instruments

310.243	Guide Wire Ø 2.5 mm with threaded tip with trocar, length 200 mm, stainless steel
324.174	Wire Guide 5.0, for Guide Wire Ø 2.5 mm
324.175	Wire Guide 7.3, for Guide Wire Ø 2.5 mm

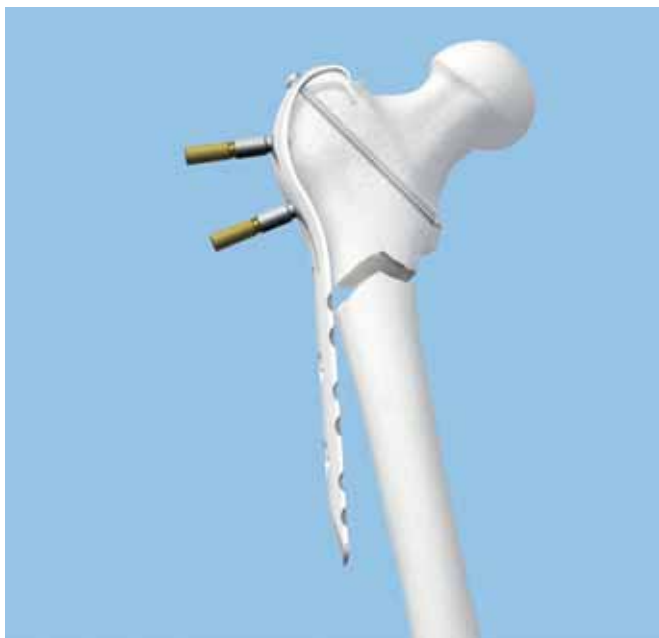
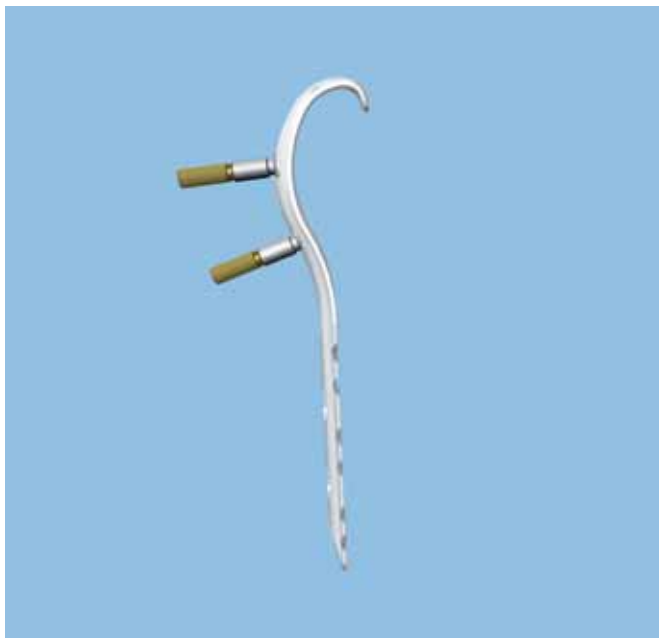
Alternative

332.210	Impactor
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Before placing the plate on the bone, thread the wire guides into the plate holes for each of the proximal locking screws. Use the wire guide 7.3 in the proximal screw hole, and a wire guide 5.0 in the second locking screw hole. The wire guides can also be used as a manipulation aid for positioning the plate on the proximal femur.

Seat hooks using a 4.5 mm cortex screw aimed toward the calcar. Screw may be removed following insertion of 7.3 mm screw in the proximal fragment.

Alternative: The impactor may be used to seat the hooks in the proximal fragment.

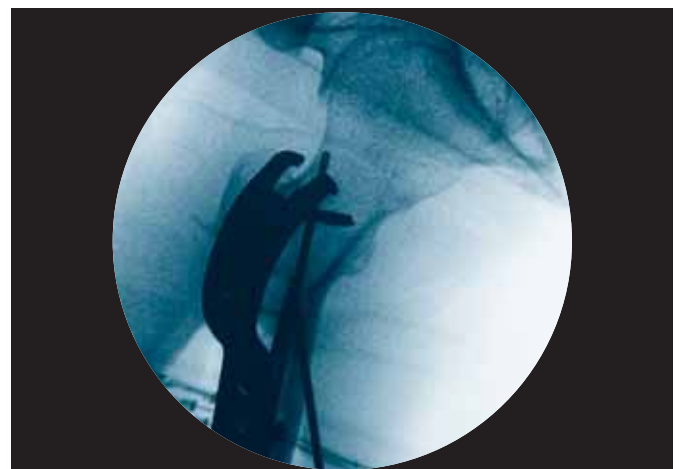


- Using fluoroscopic image control (AP and lateral), insert a guide wire \varnothing 2.5 mm through the wire guide in each of the proximal locking holes. Guide wires should reach, but not penetrate, subchondral bone.

- Placement of the proximal guide wire in the AP view is into the midportion of the inferomedial quadrant of the femoral head along a path subtending a 50° angle relative to the calcar femoralis. Guide wire placement in this manner will facilitate placement of the proximal locking screw at a 95° angle to the femoral shaft.
- The proximal guide wire is ideally placed central in the lateral view. Accurate positioning of the proximal guide wire (and ultimately the locking screw) assures frontal plane alignment.

Notes

- Before a guide wire is inserted into the second wire guide, verify correct sagittal plane alignment of the plate on the proximal femur. This usually requires both visual and fluoroscopic assessment and prevents an extension (apex anterior) deformity when the plate is attached to the diaphysis. When this alignment is satisfactory, insert the guide wire through the next (distal) wire guide, maintaining biplanar fluoroscopic control.
- It is more important to properly place guide wires in the proximal femur (considering the desired screw positions and trajectories) than it is to precisely match the contour of the plate to the anatomy of the femur. The ability to lock the screws to the plate obviates the need for precise plate contouring and compressing the plate to the bone.



4**Insert proximal 7.3 mm cannulated screw****Instruments**

314.050	Screwdriver, hexagonal, cannulated
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319.701	Measuring Device
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For predrilling in dense bone

310.632	Drill Bit Ø 5.0 mm, cannulated
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310.634	Drill Bit Ø 4.3 mm, cannulated
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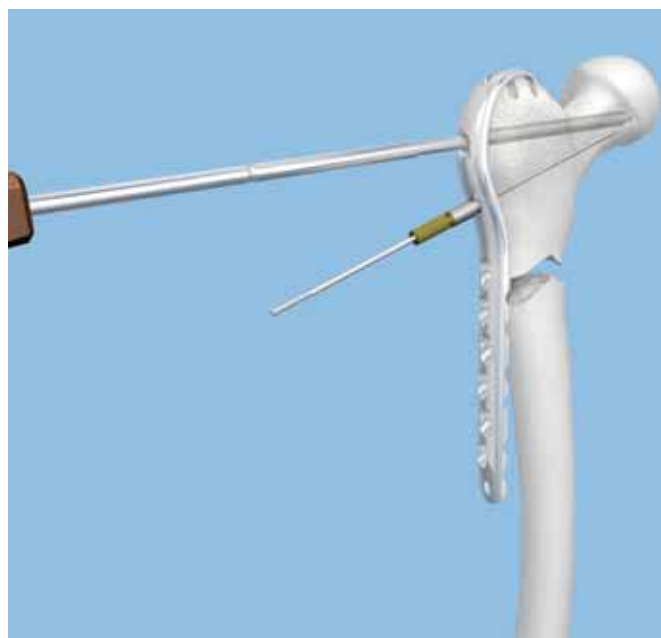
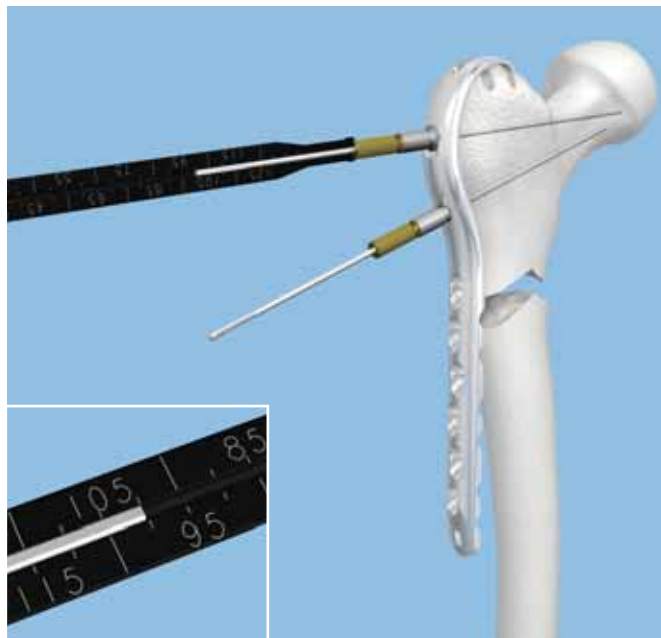
Use the measuring device over the guide wire to measure for screw length. Select the appropriate length 7.3 mm cannulated locking screw. Use the cannulated hexagonal screwdriver to remove the wire guide.

Technique Tip: The self-drilling, self-tapping flutes of the 7.3 mm and 5.0 mm screws make predrilling and pretapping unnecessary in most cases. In dense bone, the lateral cortex can be predrilled, if necessary.

- Use the 5.0 mm drill bit for 7.3 mm screws.
- Use the 4.3 mm drill bit for 5.0 mm screws.

- ④ Insert the screw, using fluoroscopy, with the cannulated hexagonal screwdriver. This screw may be inserted using power; however, final seating and tightening must be done manually. Once the screw has been locked to the plate, the guide wire may be removed.

Note: In cases where it is necessary to pull the plate to the bone, use a fully threaded 7.3 mm cannulated conical screw in the proximal screw hole.



5

Insert 5.0 mm cannulated screw

Instruments

314.050	Screwdriver, hexagonal, cannulated
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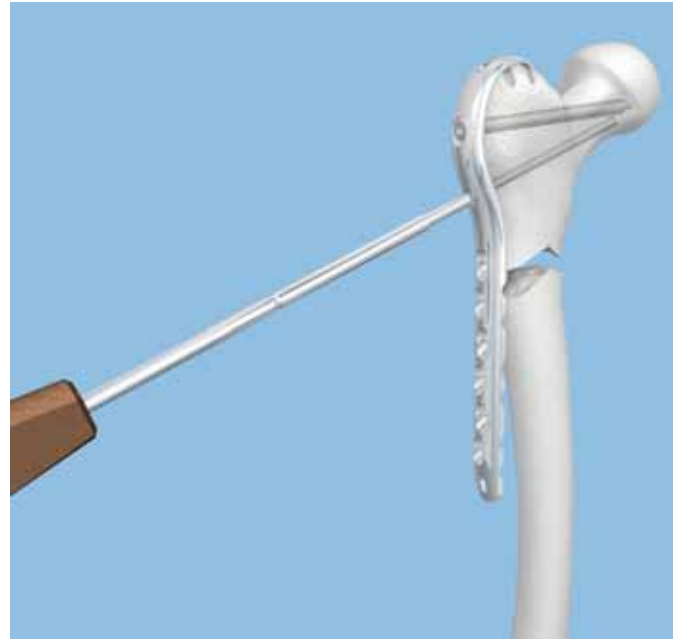
319.701	Measuring Device
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Use the measuring device over the guide wire to measure for screw length. Select the appropriate length 5.0 mm cannulated locking screw. Use the cannulated hexagonal screwdriver to remove the wire guide.

- Insert the screw, using fluoroscopy, with the cannulated hexagonal screwdriver. This screw may be inserted using power; however, final seating and tightening must be done manually. Once the screw has been locked to the plate, remove the guide wire.

Screw length considerations: The angled 5.0 mm cannulated locking screw is intended to converge with the 7.3 mm screw to create a buttress which will provide additional stability. This convergence should occur when using a 5.0 mm cannulated locking screw that is 85 mm in length.

Note: Always use a torque limiting attachment when using power to insert locking screws.



6

Approximate plate to femoral diaphysis

Instrument

321.120	Tension Device, articulated
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Secure the plate to the lateral femoral shaft with bone holding forceps, adjusting horizontal plane alignment (rotation) as appropriate. Length restoration and fracture reduction can be facilitated by a number of indirect means, including a fracture table, the articulated tension device, the large distractor, the large distractor/compressor, or a large external fixator. Judicious, soft tissue preserving, direct reduction techniques with clamps may also be appropriate in some cases.

A tensioning device should be applied to the end of the plate to tension the plate and compress the fracture.

Note: Using the tension device, tension the plate, and compress the fracture to create a load-sharing construct. Creating a loadsharing construct is required with the LCP Proximal Femoral Hook Plate 4.5/5.0.

Alternative: fracture compression cannot be accomplished

Set

LCP Proximal Femoral Plate 4.5/5.0 Set (Stainless steel)
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If the fracture pattern includes segmental comminution where fracture compression cannot be accomplished and a bridging construct is necessary, use of the LCP Proximal Femoral Plate 4.5/5.0 (without hooks) may be preferable.



7

Insert 4.5 mm cortex screws

Instruments

310.310	Drill Bit \varnothing 3.2 mm
314.270	Screwdriver, hexagonal, large
319.100	Depth Gauge for Screws \varnothing 4.5 to 6.5 mm
323.460	Universal Drill Guide 4.5/3.2, for neutral and load position

Use the drill bit through the universal drill guide to predrill the bone. For the neutral position, press the drill guide down in the non-threaded hole. To obtain compression, place the drill guide at the end of the non-threaded hole away from the fracture (do not apply downward pressure on the spring-loaded tip).

Measure for screw length using the depth gauge.



Select and insert the appropriate length 4.5 mm cortex screw using the hexagonal screwdriver. Insert as many cortex screws as necessary.

Note: All cortex screws must be inserted into the plate shaft before insertion of any locking screws in the plate shaft.



8

Insert 5.0 mm locking screws

Instruments

323.042	LCP Drill Sleeve
310.430	LCP Drill Bit \varnothing 4.3 mm
319.100	Depth Gauge
511.771	Torque Limiter, 4.0 Nm
☛ 314.119	Stardrive Screwdriver Shaft T25, self-holding
● 314.150 314.152 324.052	Hexagonal Screwdriver Shaft or Screwdriver Shaft, self-holding or Torque-indicating Screwdriver 3.5
397.705	Handle for Torque Limiter Nos. 511.770 and 511.771
311.431	Handle with Quick Coupling for 511.115



Attach the drill sleeve to the threaded portion of the hole in the plate shaft.

Note: Use of the drill sleeve is required. It centers the drill bit in the threaded portion of the combi-hole to create a screw trajectory that ensures that the screw properly engages in the plate.

Carefully drill the screw hole using the drill bit. Read the drilled depth directly from the laser mark on the drill bit or determine the screw length with the depth gauge.

Insert the appropriate length 5.0 mm locking screw with a power tool and the torque limiter or manually with a handle and the torque limiter. The screw has to be tightened manually. After one click, the optimum torque is reached.

Repeat as necessary to insert additional locking screws. Recheck each locking screw before closing to verify that the screws are securely locked to the plate. Screw heads must be flush with the plate in the locked position before they can be considered fully seated.

Notes

- For detailed instructions please consult the Synthes Locking Compression Plate (LCP) Technique Guide (036.000.019).
 - Holes for locking screws may be drilled unicortically or bicortically, depending on bone quality.
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Plates

LCP Proximal Femoral Hook Plate 4.5/5.0

Stainless steel	Holes	Length (mm)
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242.120	2	133
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242.121	4	169
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242.122	6	205
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242.123	8	241
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242.124	10	277
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242.125	12	313
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242.126	14	349
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242.127	16	385
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Plates are available non-sterile and sterile packed. For sterile plates add suffix S to article number.

Additionally available

only sterile packed

Stainless steel	Holes	Length (mm)
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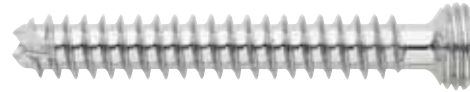
242.128S	18	421
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Screws

Cannulated Locking Screw \varnothing 7.3 mm
(02.207.020–02.207.145)

- Creates a locked, fixed-angle screw-plate construct
- Threaded conical head
 - Fully threaded shaft
 - Self-drilling, self-tapping tip



Cannulated Conical Screw \varnothing 7.3 mm
(02.207.250–02.207.295)

- Compresses the plate to the bone
- Smooth conical head
 - Fully threaded shaft
 - Self-drilling, self-tapping tip



Cannulated Conical Screw \varnothing 7.3 mm, short thread
(02.207.450–02.207.545)

- Compresses the plate to the bone and provides interfragmentary compression
- Smooth conical head
 - Partially threaded shaft
 - Self-drilling, self-tapping tip



Cannulated Locking Screw \varnothing 5.0 mm
(02.205.025–02.205.145)

- Creates a locked, fixed-angle screw-plate construct
- Threaded conical head
 - Fully threaded shaft
 - Self-drilling, self-tapping tip



Cannulated Conical Screw \varnothing 5.0 mm
(02.205.240–02.205.295)

- Compresses the plate to the bone and provides interfragmentary compression
- Smooth conical head
 - Partially threaded shaft
 - Self-drilling, self-tapping tip



Locking Screw \varnothing 5.0 mm (● 213.314–213.390/
● 212.201–212.227)

Creates a locked, fixed-angle screw-plate construct

- Threaded conical head
- Fully threaded shaft
- Self-tapping tip



Cortex Screw \varnothing 4.5 mm (214.814–214.940)








– May be used in the DCU portion of the combi-holes in the plate shaft

- Compresses the plate to the bone or creates axial compression



Instruments

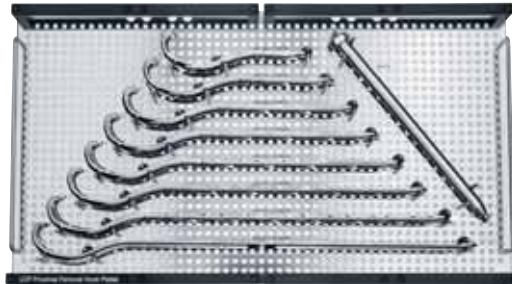
Selected instruments of the Periarticular LCP Plating System

310.243	Guide Wire Ø 2.5 mm with threaded tip with trocar, length 200 mm, Stainless Steel	
310.632	Drill Bit Ø 5.0 mm, cannulated, Length 200 mm, with Quick Coupling	
310.634	Drill Bit Ø 4.3 mm, cannulated, Length 200 mm, with Quick Coupling	
314.050	Screwdriver, hexagonal, cannulated, for Cannulated Screws Ø 6.5 and 7.3 mm	
319.701	Measuring Device for Cannulated Screws Ø 5.0 and 7.3 mm	
324.174	Wire Guide 5.0, for Guide Wire Ø 2.5 mm	
324.175	Wire Guide 7.3, for Guide Wire Ø 2.5 mm	

Sets

01.120.327 **LCP Proximal Femoral Hook Plates
4.5/5.0 (stainless steel)**

68.120.333 Insert



01.120.021 **Periarticular Instruments**

68.120.447 Vario Case

68.120.445 Insert



01.120.022 **Cannulated Conical and Cannulated
Locking Screws Ø 5.0 and 7.3 mm
(stainless steel)**

68.120.450 Sterilizing Tray

Additionally required

- LCP Large Fragment Instrument Set
- LCP Large Fragment Screw Set



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Presented by:

