Locking Attachment Plate. For treatment of periprosthetic fractures.

Technique Guide

SYNTHES®

Instruments and implants
approved by the AO Foundation

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Image intensifier control

Warning
This description alone does not provide sufficient background for direct use of the instrument set. Instruction by a surgeon experienced in handling these instruments is highly recommended.

Reprocessing, Care and Maintenance of Synthes Instruments
For general guidelines, function control and dismantling of multipart instruments, please refer to: www.synthes.com/reprocessing

Locking Attachment Plate. For treatment of periprosthetic fractures.

Overview

Description
The Locking Attachment Plate is part of the Synthes Large and Small Fragment LCP System. The main indication of the Locking Attachment Plate is the treatment of periprosthetic fractures. Other indications are prevention of lateral screw pull-out in osteoporotic bone and fractures around intramedullary implants. It is an alternative to cables and can be used with different Locking Compression Plates 4.5/5.0.

The arms on each side of the plate offer the possibility to avoid the prosthesis stem with 3.5 mm locking screws (or 3.5 mm cortex screws). The locking capability is important for a fixed-angle construct in osteopenic bone, periprosthetic fractures 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.

The Locking Attachment Plates for LCP 4.5/5.0 fit on the following plates:
– LCP DF 4.5/5.0
– LCP Condylar Plate 4.5/5.0
– LCP 4.5/5.0 broad and broad, curved

The Locking Attachment Plates for LCP Proximal Femoral Plates fit on the following plates:
– LCP Proximal Femoral Plate 4.5 /5.0
– LCP Proximal Femoral Hook Plate 4.5/5.0

Features and benefits

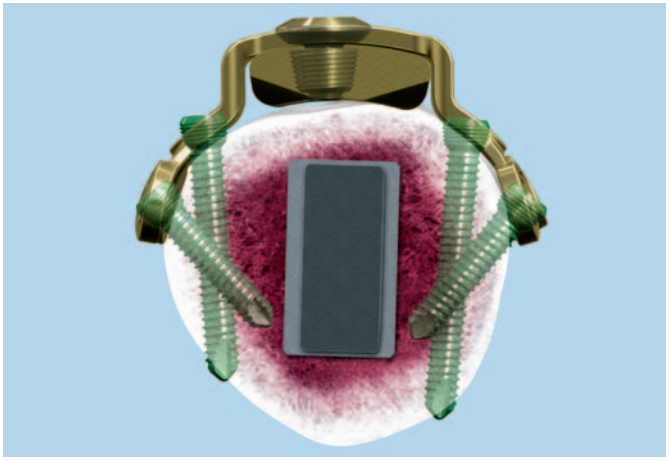
4 holes

8 holes

4 holes

8 holes

- Low profile
- Anatomically contoured to fit on the femoral shaft
- One plate version available to fit on Large Fragment LCP plates. A second version available for LCP Proximal Femoral Plates
- Crossed arms on each side of the plate for 3.5 mm locking screws (and 3.5 mm cortex screws), which offer the possibility to avoid the prosthesis stem
- Creates a fixed angled construct and improves fixation with the use of 3.5 mm locking screws
- Arms can be bent and cut to fit perfectly on the femoral shaft
- Hole for connection screw to connect the Locking Attachment Plate to the LCP
- Good mechanical stability
- Simple and established LCP technique
- Compatible with large and small fragment LCP instrumentation
- Available guiding blocks guide the drill sleeves while providing easy handling



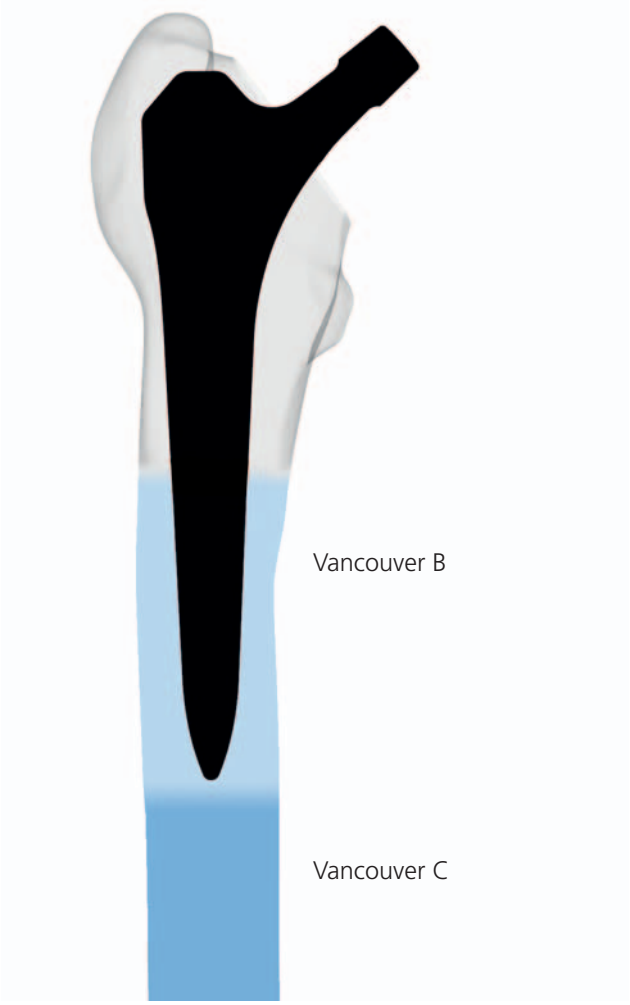
Note: More detailed information on conventional and locked plating principles can be found in the Synthes Locking Compression Plate (LCP) Technique Guide (Art. No. 036.000.019) and in the AO Manual of Fracture Management – Internal Fixators by M. Wagner and R. Frigg.[1]

[1] M. Wagner, R. Frigg, AO Manual of Fracture Management – Internal Fixators, Thieme, Stuttgart, New York, 2006

Indications

– Periprosthetic femoral shaft fractures:
  Vancouver B
  Vancouver C
– Prevention of lateral screw pull-out in osteoporotic bone
– Fractures around intramedullary implants

Note: In case of a completely loose prosthesis, a revision prosthesis is needed.

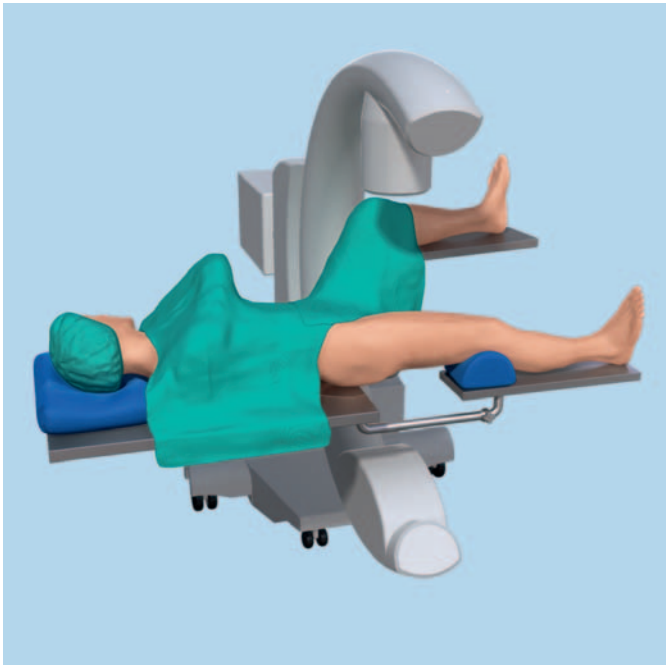


Patient Positioning

1

Position the patient

Position the patient supine on a radiolucent table. The leg should be freely movable. The contralateral leg can be placed in an obstetric leg holder. Place the knee joint line slightly distal to the hinged part of the table to allow flexion of the knee during surgery.



2

Approach

Cut a straight incision, or two to three small incisions, on the lateral side of the thigh depending on the reduction and plate insertion technique.

1
Preparation

Required sets	
01.120.457	Large Fragment LCP Instrument Set and Standard Instrument Set in Vario Case
01.120.140–155	Locking Screws ∅ 3.5 mm, in Vario Case
01.120.100–130	Locking Attachment Plate Set
Instruments	
01.120.101/111	Instrument Set for Locking Attachment Plates
511.701 or 530.100	Compact Air Drive Power Drive
511.790	Quick Coupling for Kirschner Wires
Optional sets	
	3.5 mm Cortex Screw Set
181.500	Collinear Reduction Forceps
	Additional reduction tools

Complete a preoperative radiographic assessment and prepare the preoperative plan. Position the patient supine on a radiolucent operating table. Viewing the femoral shaft under fluoroscopy in both the lateral and AP views is necessary when using a minimally invasive plating technique.

2
Reduce fracture

Reduce and temporarily secure the fragments (i.e.: with collinear reduction forceps or cerclage).

1

Choose and insert LCP

Choose an LCP of adequate length which sufficiently bridges the fracture, e.g.: LCP DF 4.5/5.0, LCP 4.5/5.0 broad curved or LCP 4.5/5.0 Proximal Femoral (Hook) Plate.

In cases of osteoporotic bone, it is recommended to place bicortical screws distally to the prosthesis stem and monocortical periprosthetic screws in the area of the prosthesis stem. Alternatively, insert angulated cortex screws in the area of the prosthesis stem.

Please consult the following technique guides for detailed information on conventional and locked plating principles, as well as required instruments:
- Synthes Locking Compression Plate (LCP) Technique Guide (Art. No. 036.000.019)
- LISS DF Technique Guide (Art. No. 036.000.235)
- LCP Condylar Plate Technique Guide (Art. No. 036.000.727)
- LCP Proximal Femoral Plate Technique Guide (Art. No. 036.000.403)
- LCP Proximal Femoral Hook Plate Technique Guide (Art. No. 036.000.863).

Note: There should be no screws already inserted in the combi-holes where the Locking Attachment Plate is to be connected to the LCP. These holes will be needed for the connection screws.

2

Choose the appropriate Locking Attachment Plate

The Locking Attachment Plate for LCP 4.5/5.0 is used with LISS/LCP DF, LCP Condylar Plate 4.5/5.0, LCP 4.5/5.0 broad and broad curved.

The Locking Attachment Plate for LCP Proximal Femoral Plates, with its slightly rounded shape is used with LCP Proximal Femoral (Hook) Plates. They are marked with the letters A and B.

	4 holes	8 holes	Fit on LCP Plates
Locking Attachment Plate 3.5, for LCP 4.5/5.0 →Marking: **A**			– LCP 4.5/5.0 broad – LCP 4.5/5.0 broad, curved – LCP DF 4.5/5.0 and LISS DF 5.0 – LCP Condylar Plate 4.5/5.0
Locking Attachment Plate 3.5, for LCP Proximal Femoral Plates →Marking: **B**			– LCP Proximal Femoral Plate 4.5/5.0 – LCP Proximal Femoral Hook Plate 4.5/5.0

3
Optional: bend the Locking Attachment Plate

Instruments	
329.916	Bending Pin for LCP Plates 3.5, with thread
329.151	Cutting Pliers with Positioning Pin ∅ 3.0 mm

If required, the four outer holes of the Locking Attachment Plate can be pre-bent manually with the bending pins.

Screw the threaded bending pin into one of the outer holes of the locking attachment plate. Use the bending pin as a joystick to manually bend the arm of the plate.

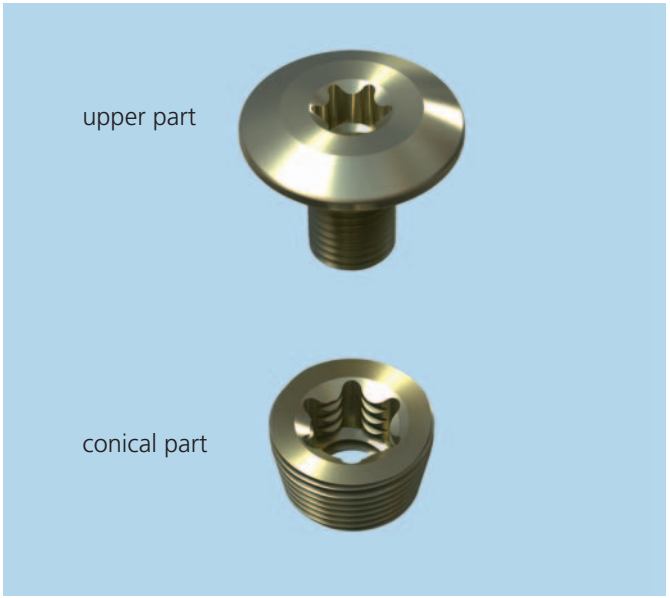
Notes
- The arms of the 8 hole Locking Attachment Plate can be cut with the cutting pliers if they are too long.
- The guiding block can only be used if the plate is not manually pre-bent.

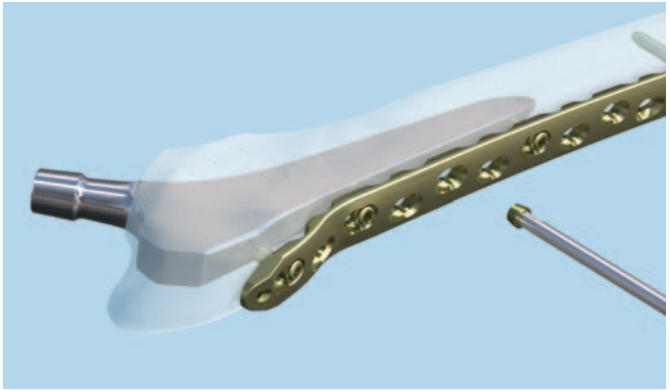
4

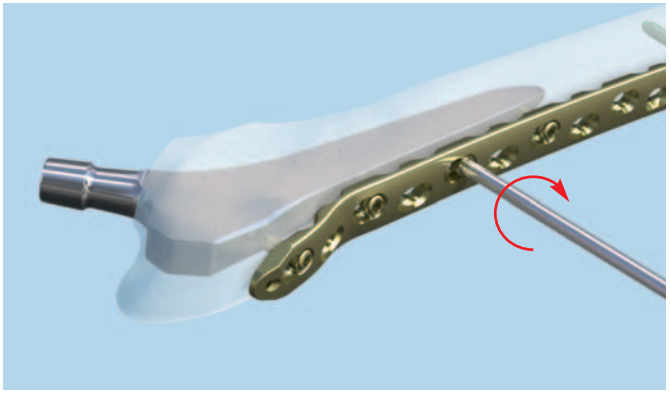
Insert the conical part of the connection screw

Instruments	
324.052	Torque-limiting Screwdriver 3.5
or	
314.163	Torque-limiting Screwdriver Stardrive, T25

The connection screw consists of two parts (see picture). After having decided where to attach the Locking Attachment Plate, screw the conical part of the connection screw into the locking part of the LCP combi-hole with the torque-limiting screwdriver (large fragment). After one click, optimum torque is reached.



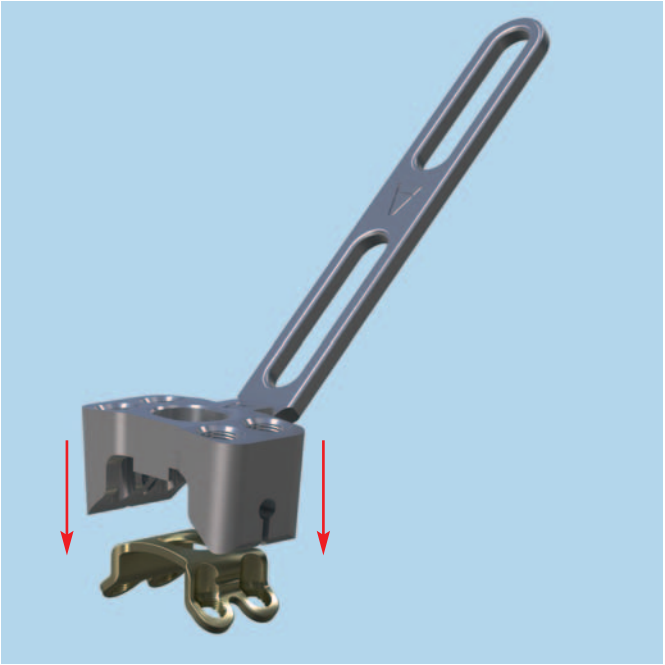




5

Optional: fix the guiding block onto the Locking Attachment Plate

Instruments	
03.120.044 or	Guiding Block for Locking Attachment Plate 3.5 for LCP 4.5/5.0 → marking: **A**
03.120.045	Guiding Block for Locking Attachment Plate 3.5 for LCP Proximal Femoral Plates → marking: **B**
03.120.043	Centering Sleeve 8.0/5.0, for Guiding Block for Locking Attachment Plate
03.120.040	LCP Drill Sleeve 3.5, for Drill Bits ∅ 2.8 mm (03.120.041), length 108 mm

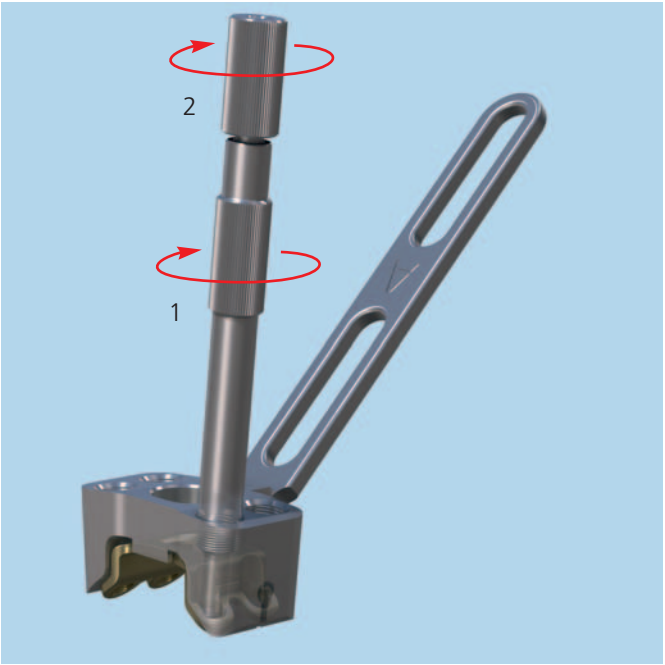


Fix the appropriate guiding block onto the Locking Attachment Plate by pressing it down upon the plate until a click is heard. Make sure that the marking on the guiding block is the same as the one on the Locking Attachment Plate (letters A or B).

Slide the 3.5 LCP drill sleeve into the 8.0/5.0 centering sleeves for optimal guidance.

After having screwed the centering sleeves into the guiding block (1), screw the LCP drill sleeves into the locking hole (2).

If needed, bend the outer holes with the bending pin after the fixation of the guiding block.



Notes

– The guiding block guides the sleeves of the four closest holes to the plate. It can only be used if the plate is not manually pre-bent.
– If the Locking Attachment Plate needs to be changed after being clicked into the guiding block, it may be necessary to push the plate out using the drill sleeve.

Option: While using the guiding block, the centering- and drill sleeves can also be inserted after having screwed in the upper part of the connection screw.

6

Connect the Locking Attachment Plate to the LCP (with or without guiding block)

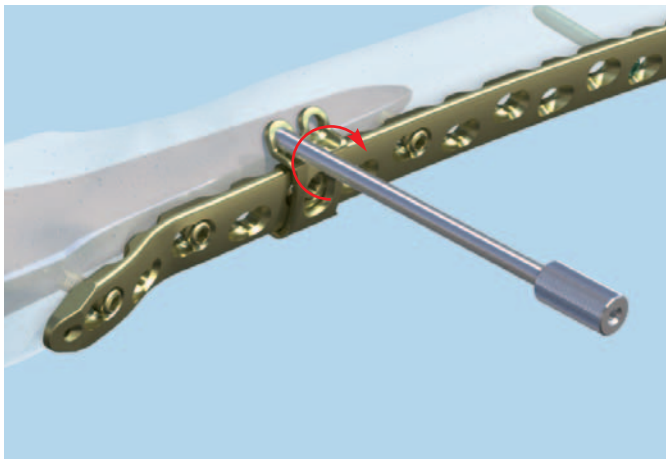
Instruments	
03.120.040	LCP Drill Sleeve 3.5, for Drill Bits ∅ 2.8 mm (03.120.041), length 108 mm
511.115 or 511.773	Torque Limiter, 1.5 Nm Torque Limiter, 1.5 Nm
314.550 or 03.100.045	Screwdriver Shaft, hexagonal Screwdriver Shaft T15, self-holding
311.431	Handle with Quick Coupling

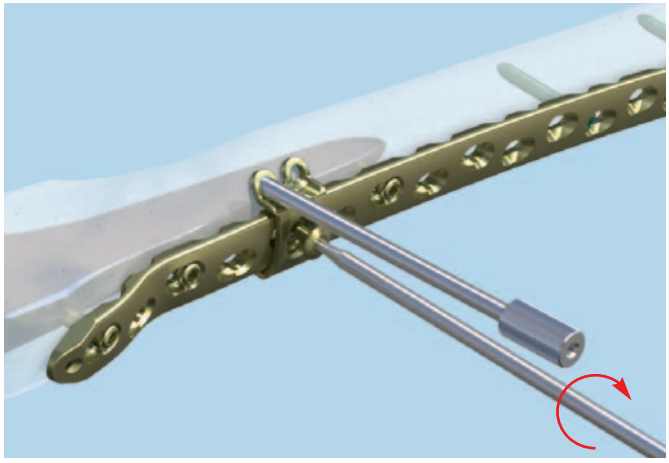
In cases where no guiding block is used, screw in the drill sleeves to use them as handles.

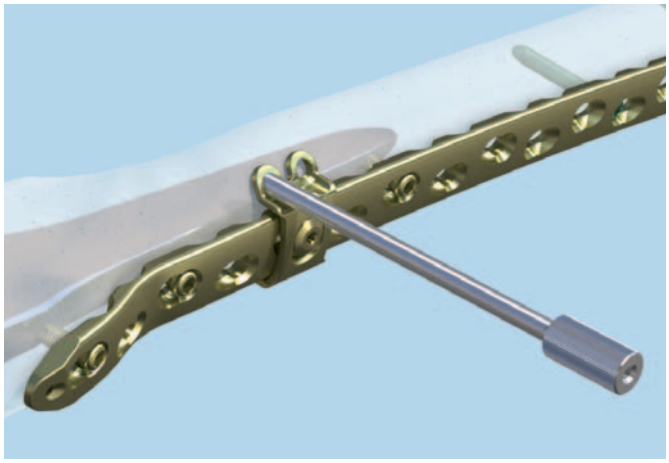
Position the Locking Attachment Plate correctly onto the LCP in the area of the prosthesis stem. The hole for the connection screw must lie directly above the threaded part of the combi-hole of the LCP, where the conical part of the connection screw is already screwed in.

To fix the Locking Attachment Plate to the LCP, screw the upper part of the connection screw into the threaded hole of the conical part using instrumentation for small fragment. After one click, the optimum torque is reached.

Check position under image intensification.





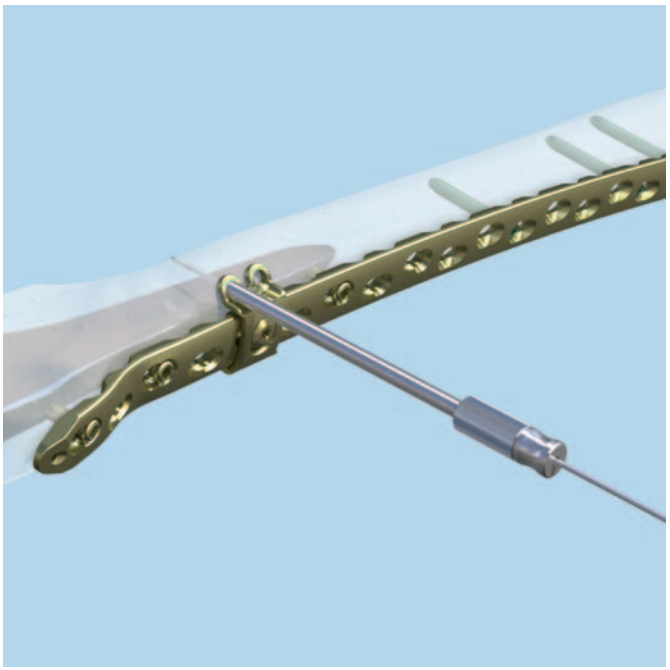


7
Optional: Insert Kirschner wires

Instruments	
03.120.042	Centering Sleeve for Kirschner Wire ∅ 1.6 mm, length 118 mm, for No. 03.120.040
292.180	Kirschner Wire ∅ 1.6 mm with trocar tip, length 280 mm, Stainless Steel

Function of Kirschner wires:
– temporary fixation
– to check position and direction of screw direction

Insert the centering sleeves for Kirschner wires into the drill sleeves. Use a power tool to insert the Kirschner wires and check their position and direction under image intensification.



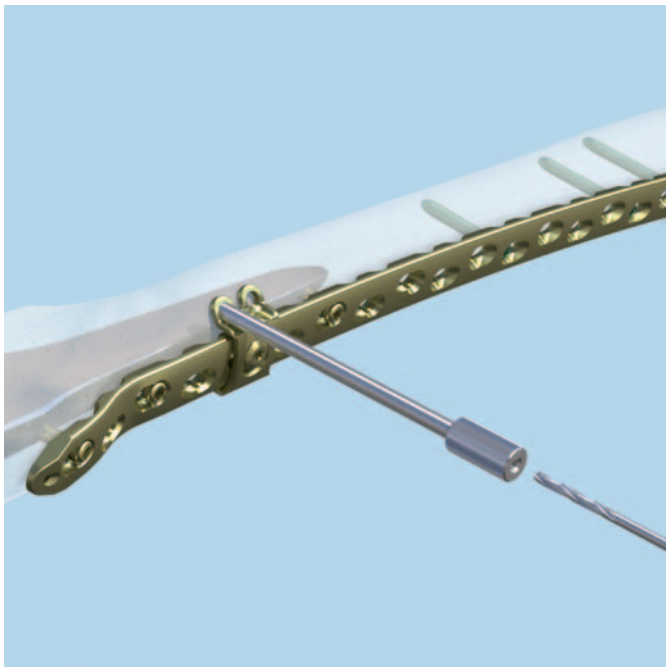
Note: If the angle is not optimal, it can be easily corrected by bending the plate as needed with the bending pins (see step 3).

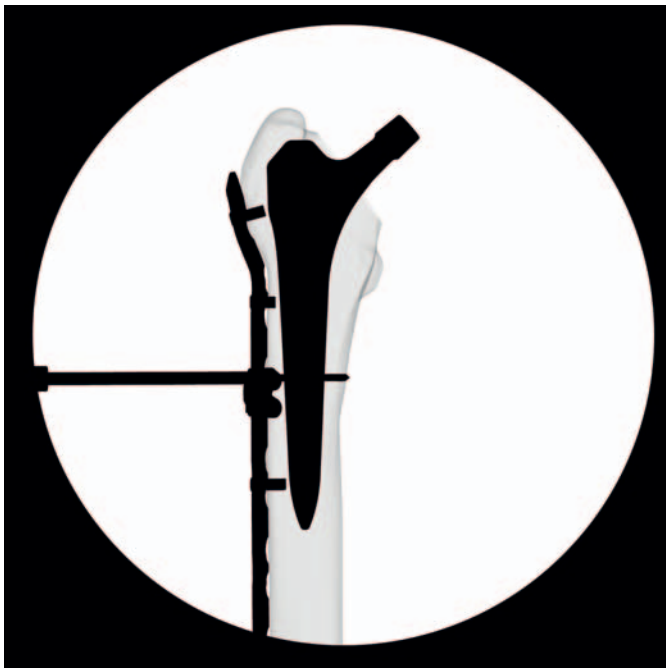
Remove the centering sleeves and the Kirschner wires in order to drill the screw holes.

8
Pre-drill screw hole

Instrument	
03.120.041	Drill Bit ∅ 2.8 mm, with Scale, length 200 mm

Using the drill bit, drill the screw hole under image intensification. Drill past or as close to the prosthesis stem as possible to allow for the placement of the longest screw.





9

Determine screw length

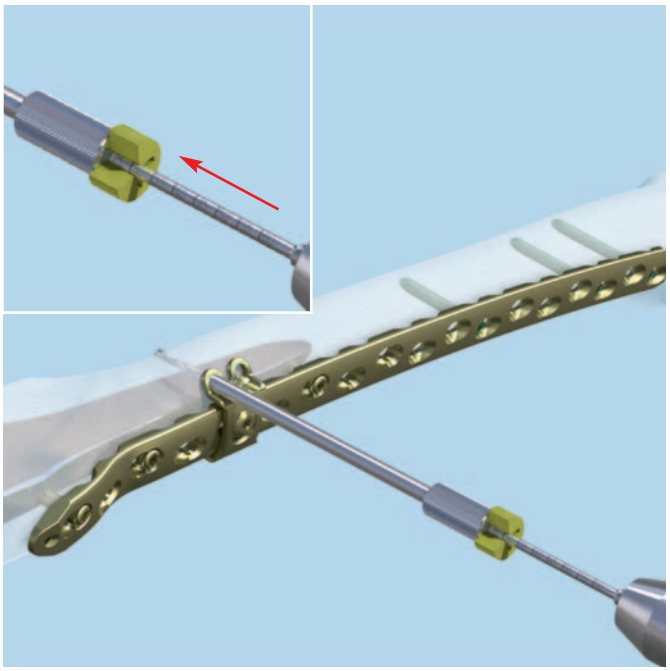
a. Measurement with drill bit

Instrument	
03.120.041	Drill Bit ∅ 2.8 mm, with Scale, length 200 mm

For easier reading, slide the stop ring down until it reaches the drill sleeve. Read the drilled depth directly from the laser mark on the drill bit.

Remove the drill bit and the drill sleeve.

Note: Replacement stop rings can be ordered from a local Synthes representative.

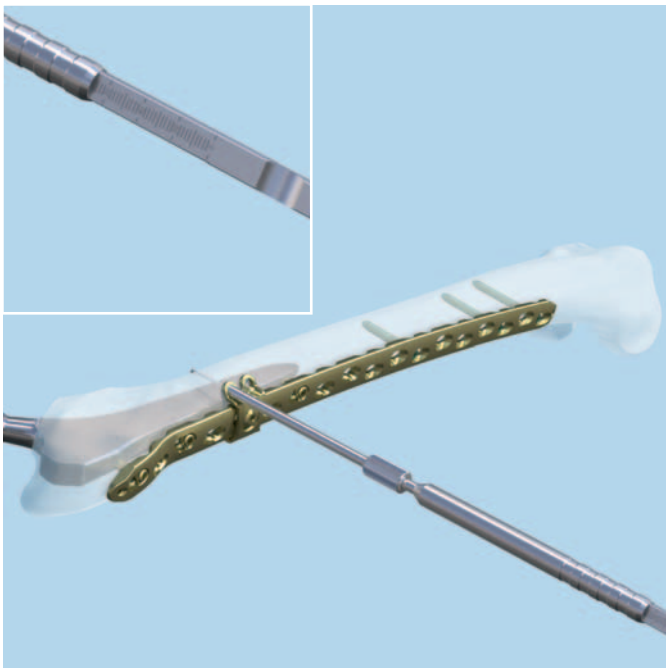


b. Measurement with depth gauge

Instrument	
03.120.049	Depth Gauge for 03.120.040

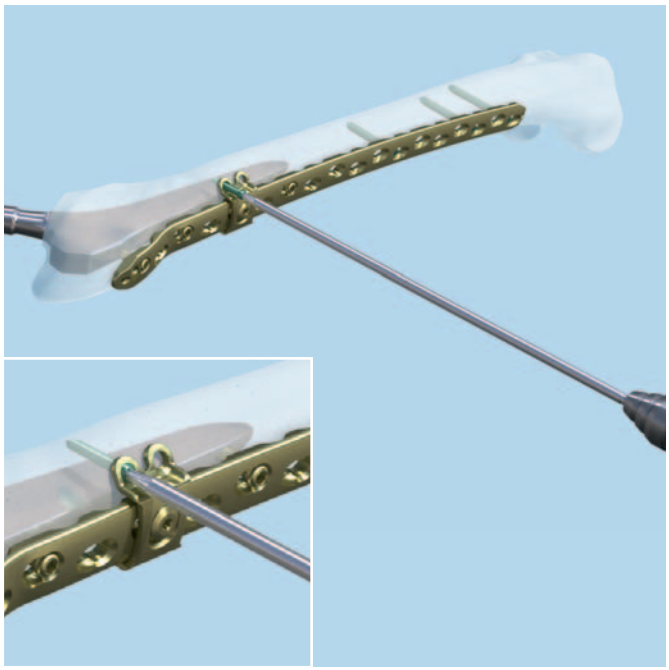
Measure the screw length through the drill sleeves with the depth gauge.

Note: If using the conventional small fragment depth gauge, remove the drill sleeves before measurement.



10
Insert locking screw

Instruments	
511.115	Torque Limiter, 1.5 Nm
314.550 or 03.100.045	Screwdriver Shaft, hexagonal Screwdriver Shaft T15, self-holding
311.431	Handle with Quick Coupling
Optional instruments	
314.570 or 03.113.021	Screwdriver 2.5, hexagonal Screwdriver Stardrive 3.5, T15, length 270 mm



Choose a 3.5 mm locking screw according to the measured length.

Note: If the prosthesis becomes impinged during drilling, choose a 2 mm shorter screw than measured to prevent stripping of the thread in the bone and loss of screw anchoring.

To insert the locking screw using a power tool, fit the torque limiter to the power tool, then insert the screwdriver shaft into the torque limiter. Pick up the locking screw and insert it into the locking hole. Stop the power tool before locking.

Uncouple the power tool, mount the handle, and manually tighten the screw with the torque limiter. After one click, optimum torque is reached.

Notes
- If the guiding block is used, insert the screw through the 8.0/5.0 centering sleeve.
- If there is thick cortical bone or cement, the 1.5 Nm torque limiter may not be strong enough. In this case the screw has to be inserted and tightened manually with the screwdriver, or the handle and the screwdriver shaft.

11

Place additional locking screws

Place additional locking screws as described in the previous steps.

Note: If used, remove the guiding block and the 8.0/5.0 centering sleeves after having inserted the appropriate number of 3.5 mm locking screws.

12

Optional: Place cortical screws

It is possible to place 3.5 mm cortical screws, instead of 3.5 mm locking screws, into the 3.5 mm holes of the Locking Attachment Plate.

For detailed instructions on how to place cortical screws, please consult the Synthes Locking Compression Plate (LCP) Technique Guide (Art. No. 036.000.019).

13

Place additional Locking Attachment Plates

If required, place additional Locking Attachment Plates as described in the previous steps.

Locking Attachment Plates 3.5

For LCP DF 4.5/5.0 and LISS DF 5.0, LCP Condylar Plate 4.5/5.0, LCP 4.5/5.0 broad and broad, curved (marking: **A**):

Stainless Steel	Titanium	Holes
02.120.601	04.120.601	4
02.120.602	04.120.602	8



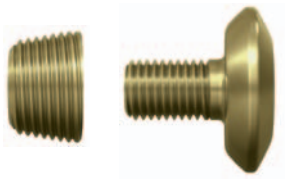

For LCP Proximal Femoral Plate 4.5/5.0 and LCP Proximal Femoral Hook Plate 4.5/5.0 (marking: **B**):

Stainless Steel	Titanium	Holes
02.120.603	–	4
02.120.604	–	8


All plates are available sterile packed.
For sterile implants add suffix "S" to article number.

Screws

Connection Screws for Locking Attachment Plate
- Hex: 0X.120.605
- Stardrive: 0X.120.606
  – Connects the Locking Attachment Plate to the LCP 4.5/5.0 through the locking holes



Locking Screws 3.5, self-tapping
- Hex: X13.010–X13.080
- Stardrive: X12.101–128

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

- Cortex Screws 3.5, self-tapping (X04.810–860)
  – Compresses the plate to the bone or creates axial compression
  – Can be slightly angulated

All screws are available sterile packed.
For sterile implants add suffix "S" to article number.

All plates are available sterile packed.
For sterile implants add suffix "S" to article number.

X = 2: stainless steel
X = 4: TAN

Instruments

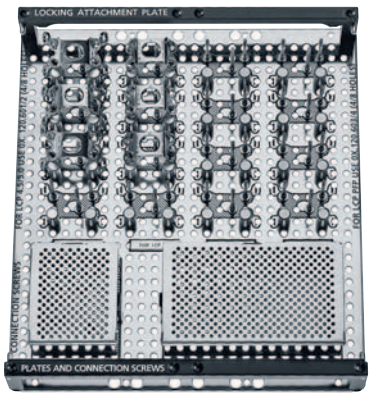
03.120.040	LCP Drill Sleeve 3.5, for Drill Bits ∅ 2.8 mm (03.120.041), length 108 mm	
03.120.041	Drill Bit ∅ 2.8 mm, with Scale, length 200 mm, 3-flute, for Quick Coupling	
03.120.042	Centering Sleeve for Kirschner Wire ∅ 1.6 mm, length 118 mm, for No. 03.120.040	
03.120.043	Centering Sleeve 8.0/5.0, for Guiding Block for Locking Attachment Plate, length 74 mm	
03.120.044	Guiding Block for Locking Attachment Plate 3.5 for LCP 4.5/5.0 →marking: **A**	
03.120.045	Guiding Block for Locking Attachment Plate 3.5 for LCP Proximal Femoral Plates →marking: **B**	
03.120.049	Depth Gauge for Screws ∅ 3.5 for 03.120.040, measuring range up to 60 mm*	

* Can only be used with the LCP drill sleeve 03.120.040

Sets

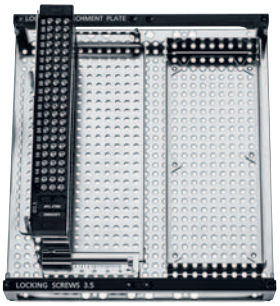
Locking Attachment Plate Sets

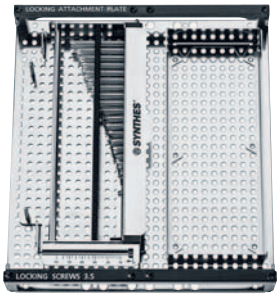
Description	Hex	Stardrive
For LCP 4.5/5.0, Stainless Steel	01.120.100	01.120.110
For LCP 4.5/5.0, Titanium	01.120.105	01.120.115
For LCP Proximal Femoral Plates, Stainless Steel	01.120.120	01.120.130
68.120.100	Tray for Locking Attachment Plates 3.5 and Connection Screws, for Vario Case	



3.5 mm Locking Screw Sets

Description	Hex	Stardrive
Locking Screws 3.5, Stainless Steel	01.120.140	01.120.150
Locking Screws 3.5, Titanium	01.120.145	01.120.155
68.120.102	Screw Rack for Locking Screws ∅ 3.5 mm, for Tray No. 68.120.103, for Vario Case	
68.120.103	Tray for Screw Rack for Locking Screws ∅ 3.5 mm, for Vario Case	

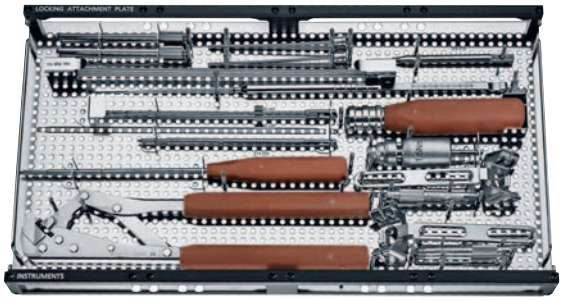




Instrument Set for Locking Attachment Plates

	Hex	Stardrive
	01.120.101	01.120.111
68.120.101	Tray for Instrument Set for Locking Attachment Plates 3.5, for Vario Case	

Additionally required
Large Fragment Instrumentation



Synthes Biomaterials Overview

Synthetic and allogenic bone replacement materials have the advantage of uniform quality, unlimited availability and absence of potential complications at a donor site.

Additionally, the application of synthetic and allogenic bone graft substitutes reduces the duration of the surgery.

Synthes offers a wide range of synthetic biomaterial products in different application forms and with distinct biological properties:

chronOS

Osteoconductive, resorbable, synthetic

chronOS Perfusion Concept

Enhancing chronOS with biological factors

chronOS Inject

Injectable remodelling

Norian SRS

Injectable stability

DBX*

Osteoinductive power

MTF Musculoskeletal Transplant Foundation
THE ALLOGRAFT LEADER™

*Facilitated through Synthes

Furthermore a comprehensive portfolio of allograft products is available in selected countries.

For more detailed information about a specific product or availability of allografts please contact your local Synthes representative.

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