

Locking Attachment Plate

For Treatment of Periprosthetic Fractures

Surgical Technique

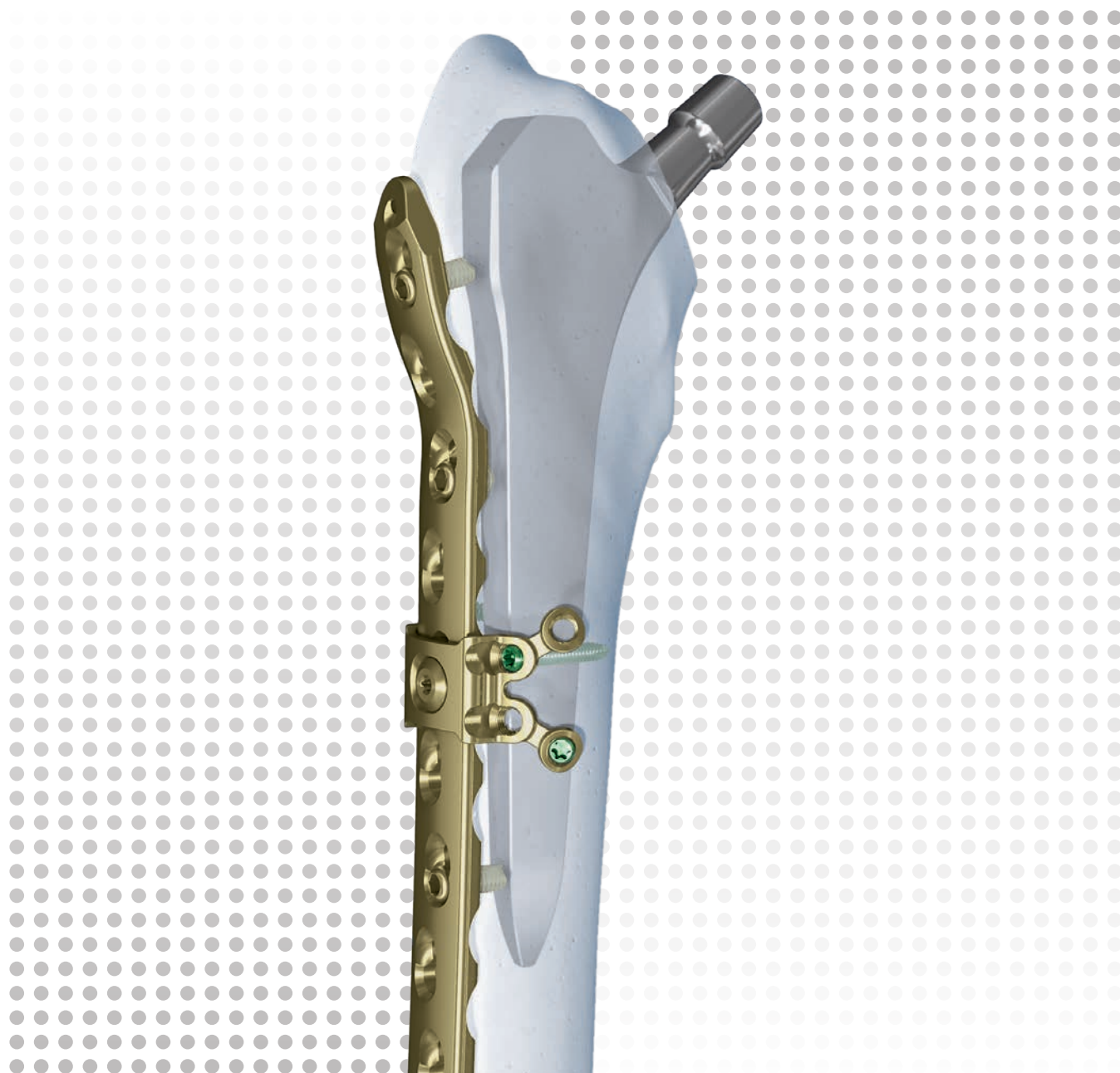


 Image intensifier control

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>

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Locking Attachment Plate

For Treatment of Periprosthetic Fractures

Overview

Description

The Locking Attachment Plate is part of the DePuy Synthes Large and Small Fragment LCP™ System. The main indication of the Locking Attachment Plate is the treatment of periprosthetic fractures. It is an alternative to cables and may 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). Locking screws provide the ability to create a fixed-angle construct while using standard AO plating techniques.

These screws do not rely on plate-to-bone compression to resist patient load, but function similarly to multiple, small angled blade plates.

■ Note:

LCP 4.5/5.0 also applies to VA-LCP 4.5/5.0

The Locking Attachment Plates for LCP™ 4.5/5.0 fit on the following plates:

- LCP DF 4.5/5.0
- VA-LCP 4.5/5.0 Condylar Plate
- 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



4 holes



8 holes



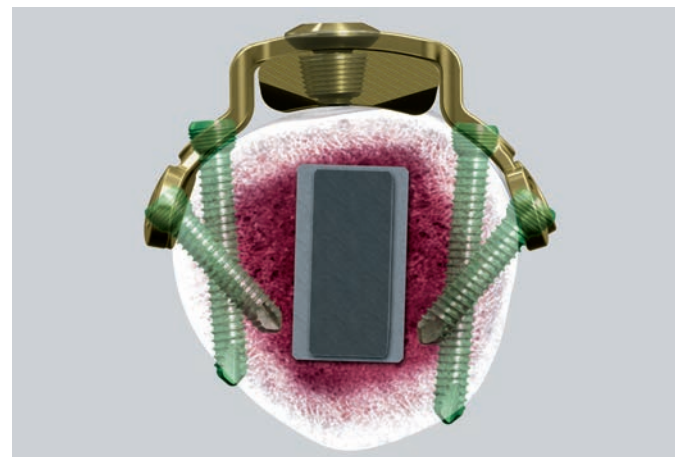
4 holes



8 holes



- 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 provides fixation with the use of 3.5 mm locking screws
- Arms can be bent and cut to fit well on the femoral shaft
- Hole for connection screw to connect the Locking Attachment Plate to the LCP Plate
- Provides mechanical stability
- Compatible with large and small fragment LCP instrumentation
- Available guiding blocks guide the drill sleeves



Note:

More detailed information on conventional and locked plating principles can be found in the Surgical Technique LCP Locking Compression Plate.

▲ Precaution:

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

Please refer to the corresponding Instructions for Use for specific information on Intended use, Indications, Contraindications, Warnings and Precautions, Potential Adverse Events, Undesirable Side Effect and Residual Risks. Instruction for Use are available at www.e-ifu.com and/or www.depuysynthes.com/ifu.

The AO Principles of Fracture Management

Mission

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

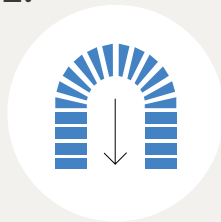
AO Principles^{1,2}

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.

Preparation

1. Preparation

Required sets

01.120.457	Large Fragment LCP Instrument Set and Standard Instrument Set in Vario Case
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01.120.140–155	Locking Screws Ø 3.5 mm, in Vario Case
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01.120.100–130	Locking Attachment Plate Set
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Instruments

01.120.101/111	Instrument Set for Locking Attachment Plates
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511.701	Compact Air Drive
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or

530.100	Power Drive
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Optional sets

3.5 mm Cortex Screw Set

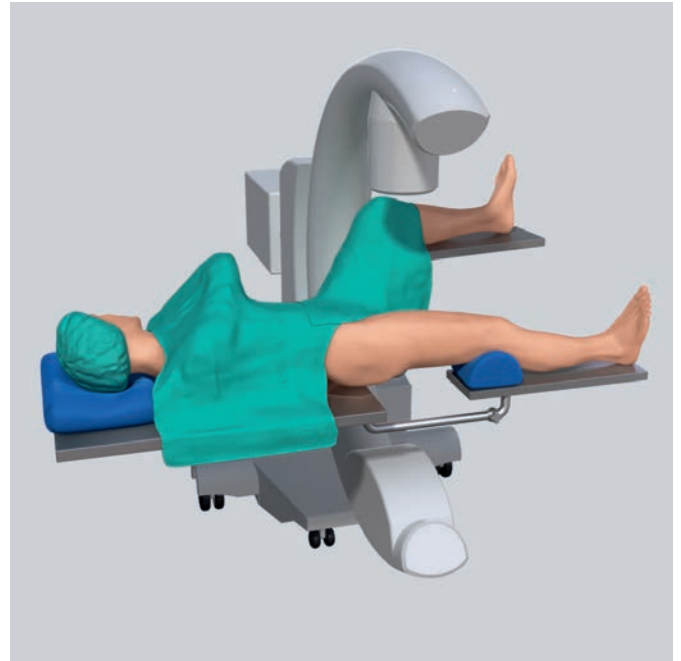
Additional reduction tools

- ❶ 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.

Patient Positioning and Approach

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.

3. Reduce fracture

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



Surgical Steps

1. Choose and insert LCP

Choose an LCP Plate 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.

Alternative Implant:

Additionally to LCP Plates the Locking Attachment Plate can also be combined with a VA-LCP Plate.

Please consult the following Surgical Techniques for detailed information on conventional and locked plating principles, as well as required instruments:

- VA-LCP Condylar Plate
- LCP Locking Compression Plate
- LISS DF*
- LCP Condylar Plate
- LCP Proximal Femoral Plate 4.5/5.0
- LCP Proximal Femoral Hook Plate 4.5/5.0

■ 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.



*LISS DF implants are discontinued.

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 and VA-LCP Condylar Plate 4.5/5.0

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 and VA-LCP Plates
Locking Attachment Plate 3.5, for LCP 4.5/5.0 → Marking: A			<ul style="list-style-type: none"> • 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 • VA-LCP Condylar Plate 4.5/5.0
Locking Attachment Plate 3.5, for LCP Proximal Femoral Plates → Marking: B			<ul style="list-style-type: none"> • 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 Ø 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.

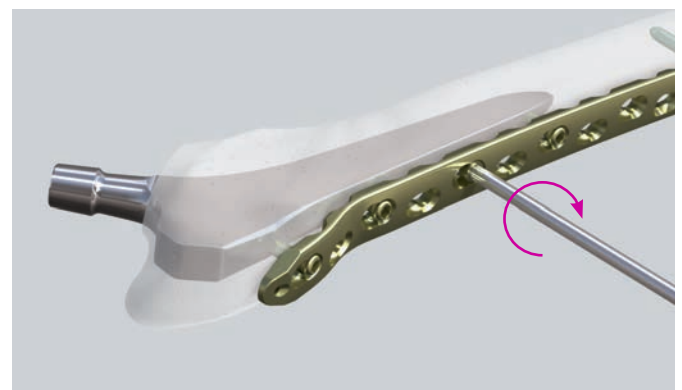
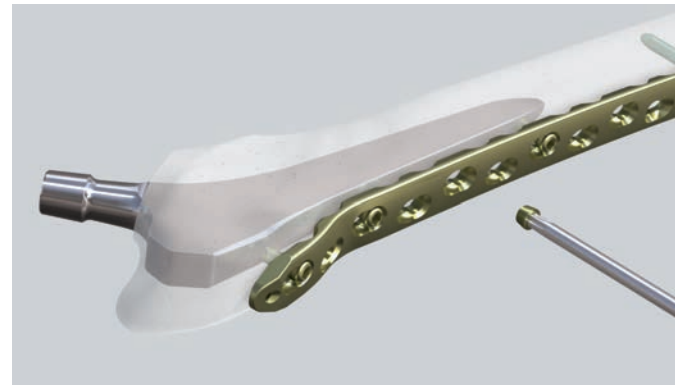


4. Insert the conical part of the connection screw

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

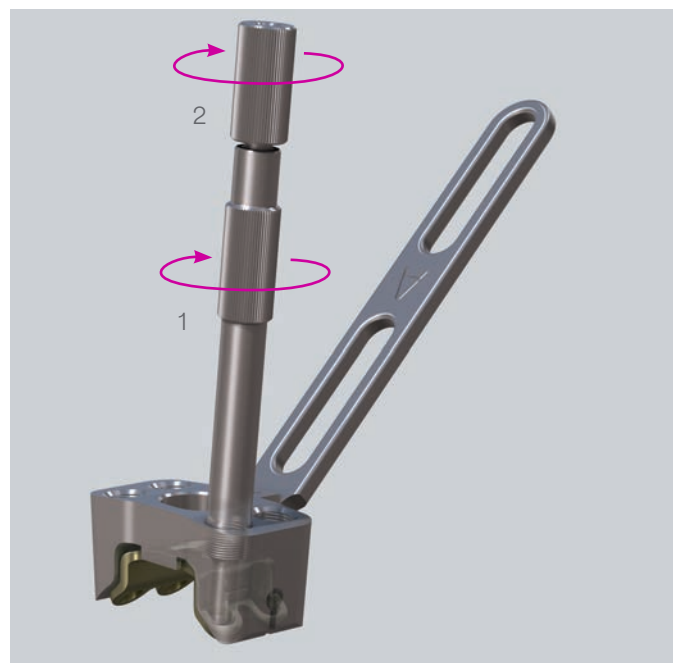
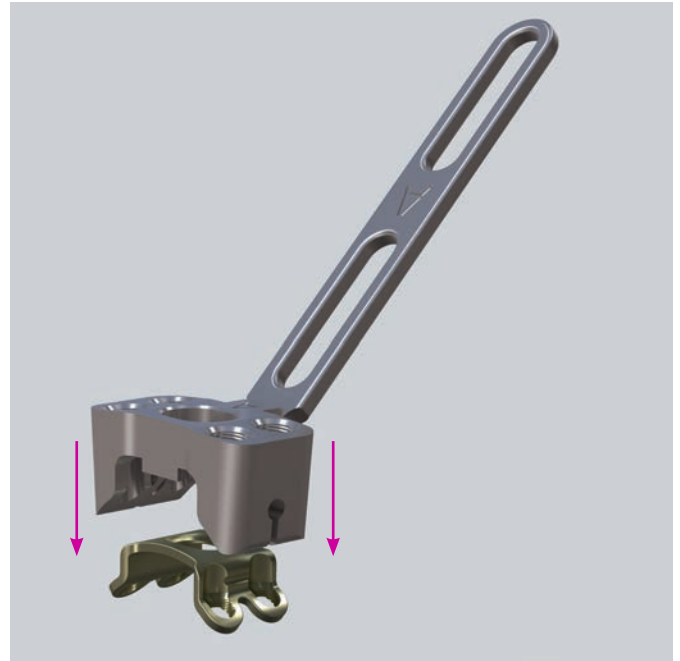
03.120.044	Guiding Block for Locking Attachment Plate 3.5 for LCP 4.5/5.0 → marking: A
or	
03.120.045	Guiding Block for Locking Attachment Plate 3.5 for LCP Proximal Femoral Plates → marking: B
03.120.043	Centering Sleeve 8.0/5.0, for Guiding Block for Locking Attachment Plate
03.120.040	LCP Drill Sleeve 3.5, for Drill Bits Ø 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

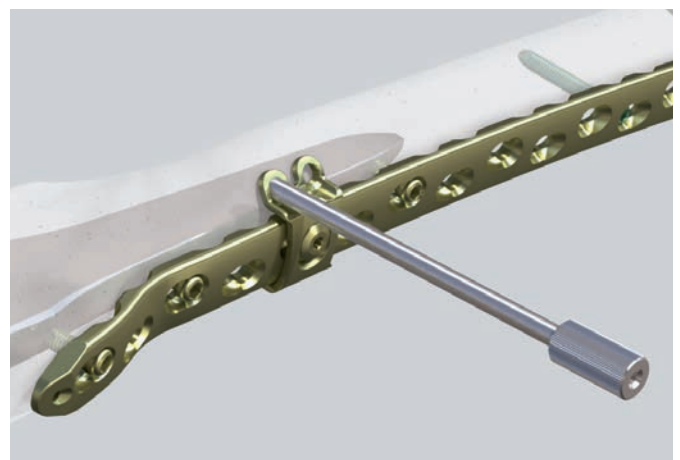
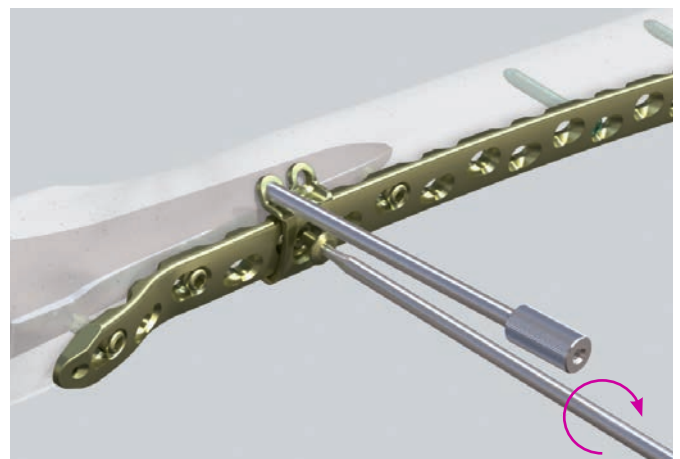
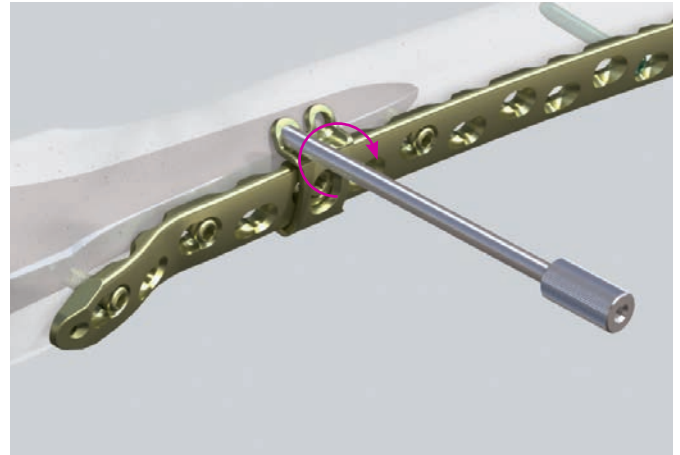
03.120.040	LCP Drill Sleeve 3.5, for Drill Bits Ø 2.8 mm (03.120.041), length 108 mm
511.115 or 511.773	Torque Limiter, 1.5 Nm
314.550 or 03.100.045	Screwdriver Shaft, hexagonal Screwdriver Shaft T15, self-holding
311.431	Handle with Quick Coupling

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 Ø 1.6 mm, length 118 mm, for No. 03.120.040
292.180.01	Kirschner Wire Ø 1.6 mm with trocar tip, length 280 mm

Function of Kirschner Wires:

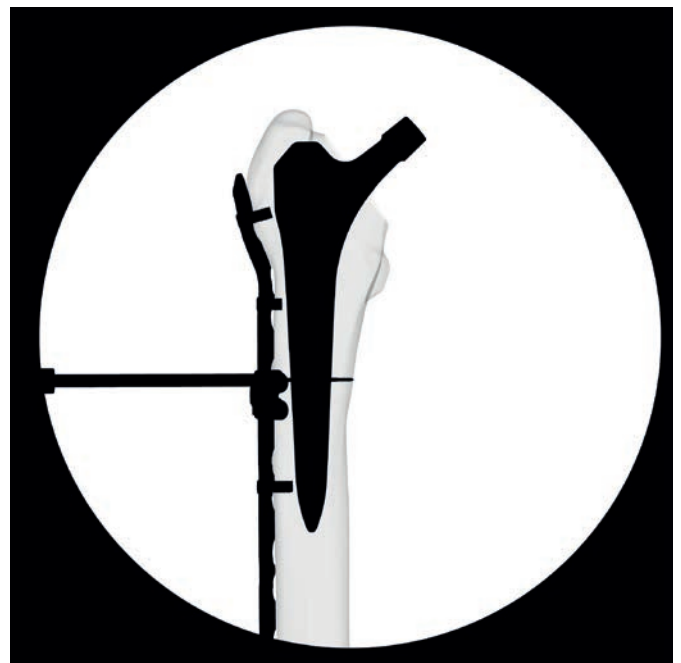
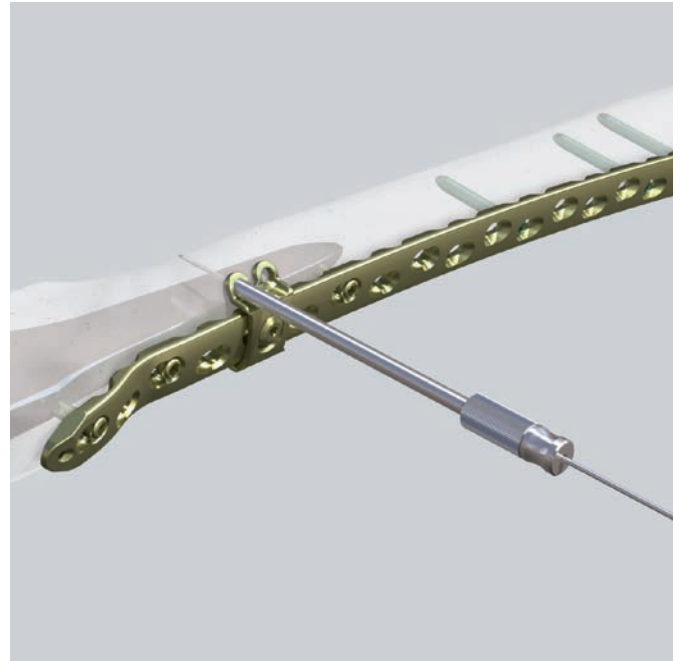
- temporary fixation
- to check position and direction of screw direction

- 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.

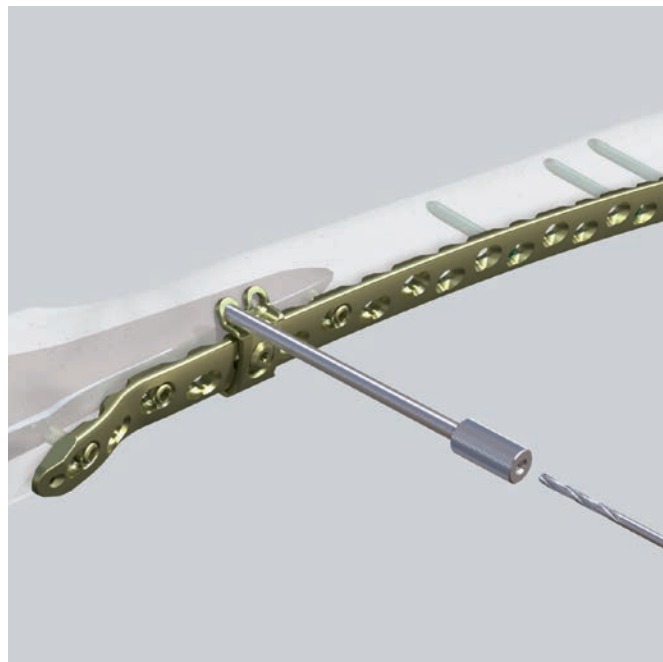


8. Pre-drill screw hole

Instrument

03.120.041 Drill Bit \varnothing 2.8 mm, with Scale, length 200 mm

- 1 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

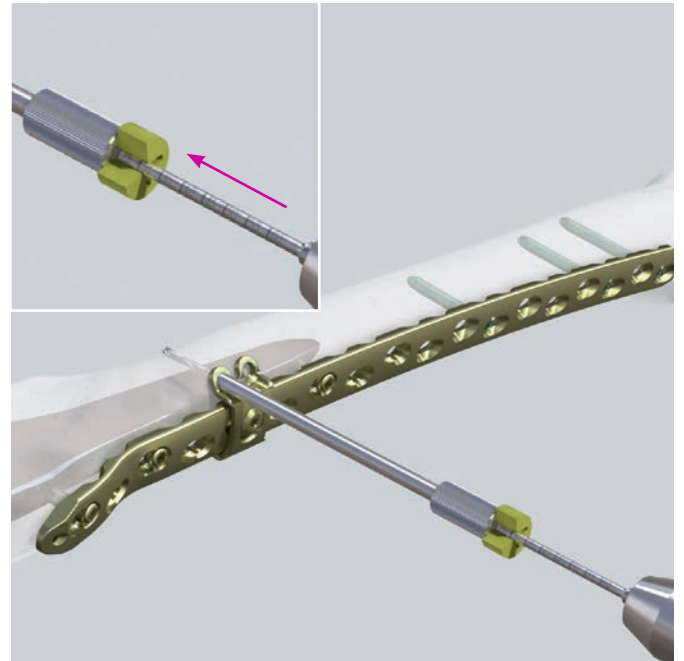
03.120.041 Drill Bit \varnothing 2.8 mm, with Scale, length 200 mm

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	Screwdriver Shaft, hexagonal or
03.100.045	Screwdriver Shaft T15, self-holding
311.431	Handle with Quick Coupling

Optional instruments

314.570	Screwdriver 2.5, hexagonal or
03.113.021	Screwdriver StarDrive™ 3.5, T15, length 270 mm

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

▲ Precaution:

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.

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 Locking Compression Plate Surgical Technique.

13. Place additional Locking Attachment Plates

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

14. Implant Removal

In case the physician decides to remove the implants, implants can be removed by using general surgical instruments. In case of difficult removal circumstances, a Screw Extraction Set is available with corresponding instructions.

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 and VA-LCP Condylar Plate 4.5/5.0 (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.

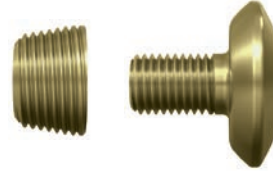
Screws

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



* Also available “TS” packed.

All screws 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
Ø 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
Ø 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 Ø 3.5 for
03.120.040, measuring range up to
60 mm*

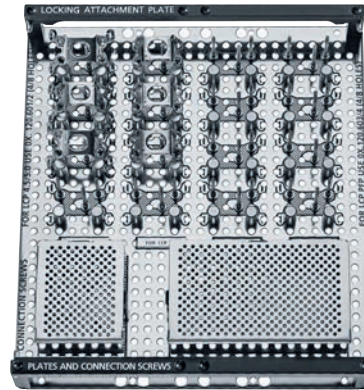


*Can only be used with the LCP drill sleeve 03.120.040

Sets

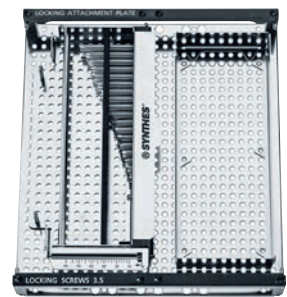
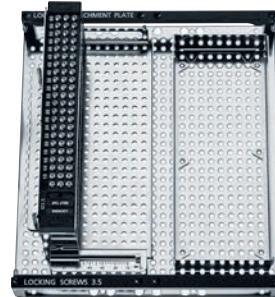
Locking Attachment Plate Sets

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	



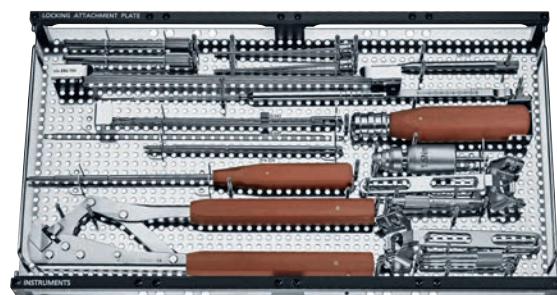
3.5 mm Locking Screw Sets

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 Ø 3.5 mm, for Tray No. 68.120.103, for Vario Case	
68.120.103	Tray for Screw Rack for Locking Screws Ø 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

MRI Information

Torque, Displacement and Image Artifacts according to ASTM F 2213, ASTM F 2052 and ASTM F2119

Non-clinical testing of worst case scenario in a 3 T MRI system did not reveal any relevant torque or displacement of the construct for an experimentally measured local spatial gradient of the magnetic field of 3.69 T/m. The largest image artifact extended approximately 169 mm from the construct when scanned using the Gradient Echo (GE). Testing was conducted on a 3 T MRI system.

Radio-Frequency-(RF-)induced heating according to ASTM F2182

Non-clinical electromagnetic and thermal testing of worst case scenario lead to peak temperature rise of 9.5 °C with an average temperature rise of 6.6 °C (1.5 T) and a peak temperature rise of 5.9 °C (3 T) under MRI Conditions using RF Coils [whole body averaged specific absorption rate (SAR) of 2 W/kg for 6 minutes (1.5 T) and for 15 minutes (3 T)].

▲ Precautions:

The above mentioned test relies on non-clinical testing. The actual temperature rise in the patient will depend on a variety of factors beyond the SAR and time of RF application. Thus, it is recommended to pay particular attention to the following points:

- It is recommended to thoroughly monitor patients undergoing MR scanning for perceived temperature and/or pain sensations.
- Patients with impaired thermo regulation or temperature sensation should be excluded from MR scanning procedures.
- Generally it is recommended to use a MR system with low field strength in the presence of conductive implants. The employed specific absorption rate (SAR) should be reduced as far as possible.
- Using the ventilation system may further contribute to reduce temperature increase in the body.

Please refer to the corresponding Instructions for Use for specific information on Intended use, Indications, Contraindications, Warnings and Precautions, Potential Adverse Events, Undesirable Side Effect and Residual Risks. Instruction for Use are available at www.e-ifu.com and/or www.depuysynthes.com/ifu.

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