

Standard DHS Lag Screw with LCP DHHS Sideplate.

Surgical Technique



This publication is not intended for distribution in the USA.

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 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.depuyshsynthes.com/hcp/reprocessing-care-maintenance>

For general information about reprocessing, care and maintenance of Synthes reusable devices, instrument trays and cases, as well as processing of Synthes non-sterile implants, please consult the Important Information leaflet (SE_023827) or refer to:

<http://emea.depuyshsynthes.com/hcp/reprocessing-care-maintenance>

Indications/Contraindications

Indications

- Pertrochanteric fractures of type 31-A1 and 31-A2
- Intertrochanteric fractures of type 31-A3
- Basilar neck fractures 31-B
(DHS Screw in conjunction with an antirotation screw)
- Subtrochanteric fractures

Contraindications

- The DHS is not to be used in cases where there is a high incidence of:
 - Sepsis
 - Malignant primary or metastatic tumors
 - Material sensitivity
 - Compromised vascularity

Recommendation

- For certain subtrochanteric fractures, a 95° DCS plate is recommended.
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Standard DHS Lag Screw with LCP DHHS Sideplate Technique

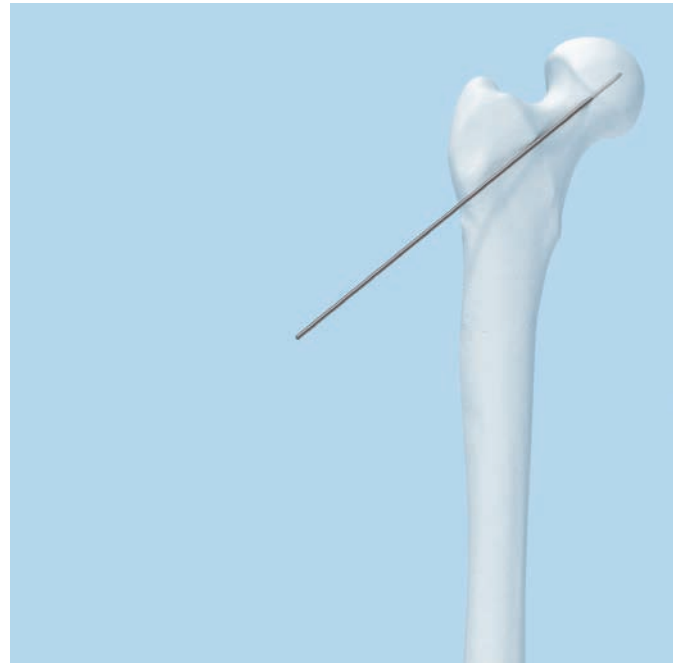
1

Insert anteversion wire

Instrument

338.000	DHS/DCS Guide Wire Ø 2.5 mm with threaded tip with trocar, length 230 mm
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Reduce the fracture. Determine anteversion by placing a 2.5 mm threaded guide wire anteriorly along the femoral neck. Gently hammer the wire into the femoral head. This anteversion wire will later allow correct placement of the central guide wire in the center of the femoral head.

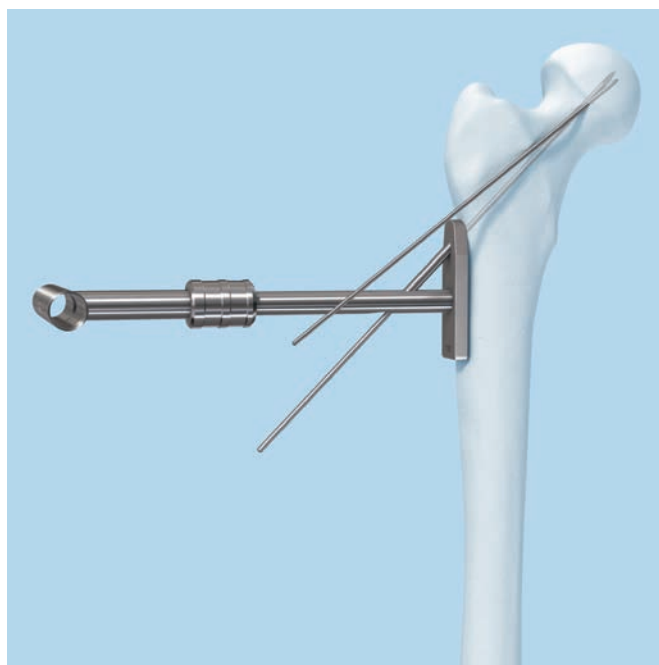


2

Insert guide wire

Instruments

310.190	Drill Bit \varnothing 2.0 mm, length 100/75 mm, 2-flute, for Quick Coupling
338.005	DHS Angled Guide 130°
or	
338.010	DHS Angled Guide 135°
or	
338.020	DHS Angled Guide 140°
or	
338.030	DHS Angled Guide 145°
or	
338.040	DHS Angled Guide 150°
or	
338.044	LCP DHHS Angled Guide, adjustable
900.723	Guide Wire \varnothing 2.5 mm with spade point tip, length 230 mm



Align the appropriate DHS angle guide or the LCP DHHS variable angle guide along the axis of the femoral shaft, and place it on the femur. Point the guide tube toward the center of the femoral head. Predrilling of the lateral cortex with the 2.0 mm drill bit is recommended in dense bone. Insert a 2.5 mm threaded guide wire through the appropriate angle guide, parallel to the anteversion wire and directed toward the center of the femoral head. This point of introduction varies with barrel angle. When a 135° barrel angle is used, the guide wire enters the proximal femur approximately 2.5 cm distal to the vastus ridge.

3

Confirm wire placement

- 1 Confirm placement of the 2.5 mm threaded guide wire under image intensification. It must lie along the axis of the femoral neck in both the AP and lateral views, and parallel to the anteversion wire. The appropriate final position is in the center of the femoral head in both AP and lateral views. The tip of the guide wire should be a few millimeters short of the subchondral bony plate.

Note: When inserted, the tip of the lag screw will coincide with the tip of the guide wire.

If the position of the guide wire is incorrect, insert a new guide wire.

Remove the anteversion wire.

4

Determine length of DHS screw

Instruments

338.050	DHS/DCS Direct Measuring Device
or	
338.329	Measuring Device for adjustable LCP DHHS Angled Guide

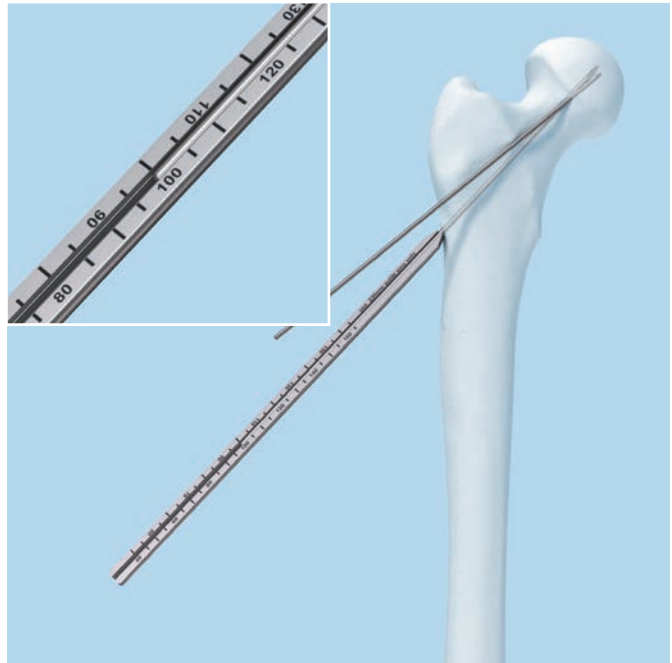
Slide the DHS direct measuring device over the 2.5 mm threaded guide wire to determine guide pin insertion depth. Calibration on the measuring device provides a direct reading.

Alternatively, insert a 2.5 mm threaded guide wire through the variable angle guide. Then use the depth gauge for LCP DHHS angle guide over the 2.5 mm threaded guide wire.

Precaution: Take a direct measurement. Do not over-insert the lag screw.

Notes

- It is not possible to over-insert the lag screw due to the length and position of the locking mechanism inside of the DHHS Side-plate. If one were to over-insert the lag screw, it could potentially get caught on the key's ridge so it would not slide up and down the barrel during guided collapse.
 - The diameter and length of the guide wires are the same. They may be used with either measuring device. The difference is that 338.000 has a threaded tip and 900.723 has a spade point tip.
-



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Ream for insertion of DHS screw

Instruments

338.100	Drill Bit \varnothing 8.0 mm, length 245 mm, for DHS/DCS System
338.120	Nut, knurled, for DHS Reamer and for DCS Reamer
338.333	LCP DHHS Reamer

Assemble the triple reamer using the DHHS reaming head (gold), the drill bit and the nut. Set the reamer to the correct depth (the direct measurement previously determined). Insert the assembly into the small battery drive using the large quick coupling attachment. Slide the reamer over the guide wire to simultaneously drill for the lag screw, ream for the plate barrel and countersink for the plate/barrel junction to the preset depth. When reaming in dense bone, continuously irrigate to prevent thermal necrosis.



6

Tap for DHS screw

Instruments

338.170	DHS/DCS Tap
338.180	DHS/DCS Centering Sleeve, short
311.440	T-Handle with Quick Coupling

If necessary, tap to the predetermined depth using the tap assembly. Tapping depth can be seen through the window in the short centering sleeve.

Warning: Tap only dense, hard femoral bone. Do not tap osteoporotic bone.



7

Screw in DHS screw

Instruments

338.060	DHS/DCS Wrench
338.190	DHS/DCS Centering Sleeve, long
338.200	Connecting Screw, short
338.230	Guide Shaft with Flats, for DHS/DCS Screws

Select the DHS/DCS lag screw and assemble the lag screw insertion assembly. Slide the assembly over the guide wire and into the reamed hole. Seat the long centering sleeve in the hole to center and stabilize the assembly. Insert the lag screw by turning the handle clockwise, until the threaded tip of the lag screw lies at the end of the guide wire.

Note: Be sure to use the DHS/DCS guide shaft with flats (338.230) rather than the DHS/DCS guide shaft. This will allow the surgeon to align the flats of the plate barrel with the flats of the lag screw. This instrument is additionally available to the set and may need to be specially ordered for this application

Precaution: Do not insert an additional 5 mm as permitted in the DHS technique.

Note: It is not necessary to align the T-handle.



8

Slide LCP DHHS plate onto guide shaft/ lag screw

Remove the DHS/DCS wrench and long centering sleeve. Slide the appropriate DHHS Plate onto the guide shaft/lag screw assembly until it contacts the lateral cortex.

Loosen and remove the coupling screw and guide shaft.



9

Impact LCP DHHS plate onto the bone

Instruments

338.347	LCP DHHS Impactor, cannulated, length 300 mm
338.348	LCP DHHS Cap for Impactor
338.200	Connecting Screw, short
338.230	Guide Shaft with Flats, for DHS/DCS Screws
338.280	DHS/DCS Impactor, for One-step Insertion Technique, for No. 338.300
399.430	Hammer 700 g

Using the LCP DHHS impactor and impactor cap to seat the plate is recommended in order to prevent premature locking of the plate.

Slide the impactor cap onto the tip of the cannulated LCP DHHS key impactor until fully seated. A positive “click” will be noticed when assembling.

Place the impactor cap and shaft assembly over the 2.5 mm guide wire and seat it directly onto the barrel hole of the sideplate.

Use of light blows with the hammer is recommended until the sideplate is seated completely against the lateral cortex.

Precaution: Do not use the impactor cap and shaft to seat the plate if the plate is more than 5 mm off the bone.

If the plate appears to be more than 5 mm off the bone, the flats on the DHS lag screw and the internal flats on the key may not be properly aligned.

Impacting the plate in this condition could cause further unwanted advancement of the lag screw. In this situation, reinsertion of the coupling screw and guide shaft and use of the DHS impactor may be necessary to seat the plate against the lateral cortex.

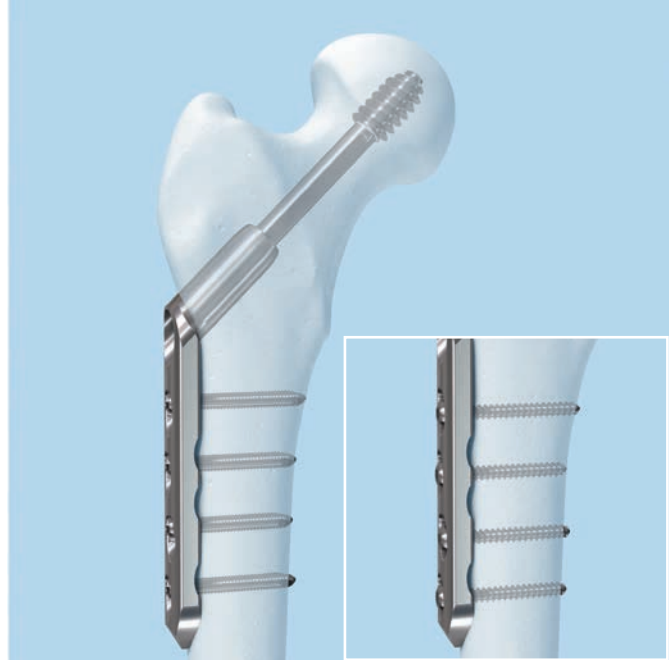


10

Fix the LCP DHHS plate onto the shaft

Remove the 2.5 mm threaded guide wire.

Affix the LCP DHHS sideplate to the bone with 4.5 mm cortex screws, 5.0 mm locking screws or a combination of both, using standard AO technique.



11

Lock rotation/key impactor

Instrument

338.347	LCP DHHS Impactor, cannulated, length 300 mm
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Once the desired placement of the LCP DHHS sideplate has been achieved, the surgeon can use the cannulated LCP DHHS key impactor to advance the internal sideplate key and permanently lock rotation of the lag screw.

Note: Remove the plastic impactor tip before proceeding.

Insert the key impactor into the barrel of the sideplate until it is fully seated. Moderate taps with the hammer will lock rotation, rendering the lag screw rotationally stable, but still allow axial dynamic collapse.



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Option: Insert DHHS compression screw

For further intraoperative compression of the trochanteric fracture, an LCP DHHS compression screw may be inserted in the lag screw.

The LCP DHHS compression screw may also be used in unstable fractures to prevent disengagement of the lag screw from the plate barrel in non-weight-bearing patients.

Notes

- Use of the compression screw may cause the lag screw to pull out of osteoporotic bone.
 - The compression screws are designed for the different sideplates and cannot be substituted for one another. When using a DHHS sideplate, use a DHHS compression screw.
-

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Confirm implant placement

- ① Take final C-arm images or x-rays to confirm proper implant placement.

DHS One-step Lag Screw with DHHS Sideplate Technique

Follow steps 1–5 of the Standard DHS Lag Screw with DHHS Sideplate Technique.

6

Tap for DHS Screw

Instruments

338.170	DHS/DCS Tap
338.320	DHS/DCS Centering Sleeve, to be locked, for Nos. 338.300 and 338.170
311.440	T-Handle with Quick Coupling

If necessary, tap to the predetermined depth using the tap assembly. Tapping depth can be seen through the window in the short centering sleeve.

Warning: Tap only dense, hard femoral bone. Do not tap osteoporotic bone.



7

Assemble screw insertion instruments

Instruments

338.310	Connecting Screw, for DHS/DCS Wrench No. 338.300
338.320	DHS/DCS Centering Sleeve, to be locked, for Nos. 338.300 and 338.170
338.302	DHS/DCS Wrench, with octagonal coupling, for One-step Insertion Technique
Or 338.300	DHS/DCS Wrench, for One-step Insertion Technique

Insert the coupling screw into the one-step insertion wrench and slide the LCP DHHS side plate onto the shaft of the wrench.

Select the appropriate length lag screw and place it on the end of the wrench; the flats of the lag screw must be aligned with the flats on the wrench. Thread the coupling screw into the end of the lag screw.

Place the centering sleeve onto the wrench between the lag screw and the plate.

8a

Screw in DHS screw

Turn the wrench clockwise until the back of the lag screw is seated on the lateral cortex (as observed through the window on the centering sleeve).

Note: The threaded tip of the lag screw now lies at the end of the guide wire.

To remove the centering sleeve from the wrench, twist the inner and outer sleeves in opposite directions.

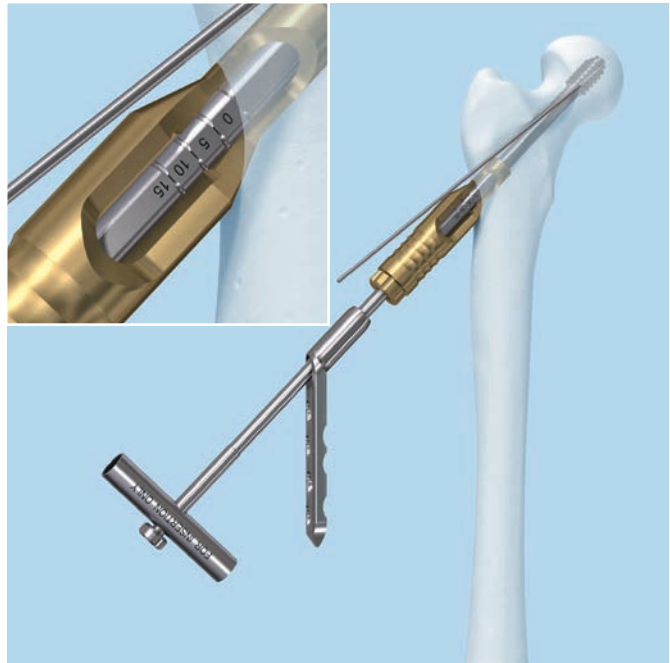
8b

Advance LCP DHHS plate on the bone

Advance the side plate along the shaft of the wrench and manually insert the barrel into the reamed hole.

8c

Continue with step 9 of the Standard DHS Lag Screw with DHHS Sideplate Technique.






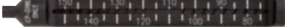



9

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 (036.000.917).

Product Information

338.000	DHS/DCS Guide Wire \varnothing 2.5 mm with threaded tip with trocar, length 230 mm	
900.723	Guide Wire \varnothing 2.5 mm with spade point tip, length 230 mm	
338.050	DHS Angled Guide 130°	
338.010	DHS Angled Guide 135°	
338.020	DHS Angled Guide 140°	
338.030	DHS Angled Guide 145°	
338.040	DHS Angled Guide 150°	
338.044	LCP DHHS Angled Guide, adjustable	
338.050	DHS/DCS Direct Measuring Device	
338.329	Measuring Device for adjustable LCP® DHHS Angled Guide	
310.190	Drill Bit \varnothing 2.0 mm, length 100/75 mm, 2-flute, for Quick Coupling	

338.100 Drill Bit \varnothing 8.0 mm, length 245 mm,
for DHS/DCS System



338.120 Nut, knurled, for DHS Reamer
and for DCS Reamer



338.333 LCP DHHS Reamer

338.170 DHS/DCS Tap



338.180 DHS/DCS Centering Sleeve, short










338.190 DHS/DCS Centering Sleeve, long



311.440 T-Handle with Quick Coupling



338.060	DHS/DCS Wrench	
338.200	Connecting Screw, short	
338.230	Guide Shaft with Flats, for DHS/DCS Screws	
338.302	DHS/DCS Wrench, with octagonal coupling, for One-step Insertion Technique	
338.300	DHS/DCS Wrench, for One-step Insertion Technique	
338.310	Connecting Screw, for DHS/DCS Wrench No. 338.300	
338.347	LCP DHHS Impactor, cannulated, length 300 mm	

338.348

LCP DHHS Cap for Impactor



338.280

DHS/DCS Impactor,
for One-step Insertion Technique,
for No. 338.300



399.430

Hammer 700 g



338.320

DHS/DCS Centering Sleeve,
to be locked, for Nos. 338.300 and
338.170



