

LOGTEC®

Osteotomy Plates 4.5
Surgical Technique



Locking Compression Technology by aap

Disclaimer

This surgical technique is exclusively intended for medical professionals, especially physicians, and therefore may not be regarded as a source of information for non-medical persons. The description of this surgical technique does not constitute medical advice or medical recommendations nor does it convey any diagnostic or therapeutic information on individual cases. Therefore, the attending physician is fully responsible for providing medical advice to the patient and obtaining the informed consent of the patient which this surgical technique does not supersede.

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The LOQTEQ® Osteotomy System 4.5 is part of the LOQTEQ® portfolio and unifies angular stability with modern plate design for peri-knee osteotomies.

The LOQTEQ® Osteotomy System 4.5 includes two plates:

- The **LOQTEQ® High Tibia Osteotomy Plate 4.5 (HTO)** is designed for corrective osteotomy of the tibial head and is characteristic of joint-preserving corrections of tibial malalignment. Despite its short design, the LOQTEQ® High Tibia Osteotomy Plate 4.5 ensures stable fixation of open-wedge osteotomies and can therefore speed up postoperative mobilization through a smaller approach and excellent angular stability.
- The **LOQTEQ® Distal Femur Osteotomy Plate 4.5 (DFO)** was developed for supracondylar femoral varus osteotomy and hence to correct the axis of the genu valgum in order to reduce the stress on the lateral joint compartment to counteract the progress of degenerative joint disease. The standard methods for corrective distal varus osteotomy are the lateral open-wedge technique or the medial closed-wedge technique. The method described here is state of the art and demonstrates the special features of the LOQTEQ® Distal Femur Osteotomy Plate 4.5 using the (femoral) closed-wedge method. The LOQTEQ® Distal Femur Osteotomy Plate 4.5 guarantees stable fixation of the correction. The unique feature of LOQTEQ® locking compression allows the plate to compress and maintain the required closed wedge osteotomy without any great effort.

Material

The LOQTEQ® implants and instruments are manufactured using high-quality materials, which have been proven to be successful in medical technology for decades. The anatomical plates and bone screws are made of titanium alloy.

All materials employed comply with national and international standards. They are characterized by good biocompatibility, a high degree of safety against allergic reactions and good mechanical properties. LOQTEQ® implants show an excellent, highly polished surface.

Intended Use

The plate and screw implants of the LOQTEQ® Osteotomy Plates 4.5 system are intended for the temporary fixation, correction or stabilization after an osteotomy in the distal femur or proximal tibia. The implants are intended for single use in human bone.

Processing (Sterilization & Cleaning)

aap markets unsterilized products which are appropriately labeled and must be appropriately processed before use (see Instructions for Use, chapter "Processing of products").

Never use damaged implants or implants from damaged packaging.

MRI Safety Information

Non-clinical testing has demonstrated that the LOQTEQ® Osteotomy Plates 4.5 system is **MR Conditional**. Further information is included in the Instructions for Use that are enclosed with the products.



Indications / Contraindikations

Indications for use

LOQTEQ® High Tibia Osteotomy Plate 4.5

- Open-wedge osteotomy on the proximal medial tibia
- Treatment of bone and joint deformities
- Treatment of malpositions caused by injuries or disorders such as osteoarthritis

LOQTEQ® Distal Femur Osteotomy Plate 4.5

- Closed-wedge osteotomy of the medial distal femur
- Treatment of bone and joint deformities
- Treatment of malpositions caused by injuries or disorders such as osteoarthritis

Absolute Contraindications

- Infection or inflammation (local or systemic)
- Allergies to the implant material
- Acute or chronic osteomyelitis at or close to the surgical field
- Unacceptably high anesthesia risk
- Severe soft tissue swelling compromising normal wound healing
- Insufficient soft tissue coverage
- Fractures in children and adolescents with epiphyseal plates that are not yet ossified
- Grade IV chondrosis of the medial compartment
- Total medial meniscectomy
- Gonarthrosis involving more than one compartment

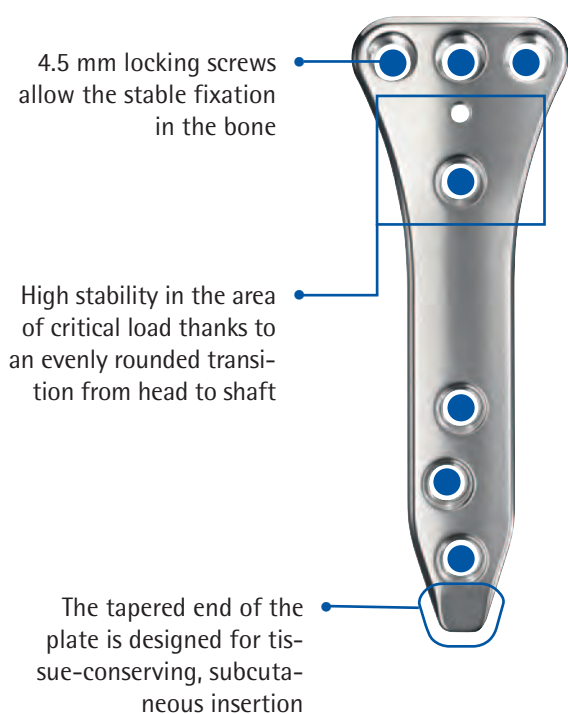
Caution

aap products are not approved for the spine.

Detailed information on indications, contraindications and a complete list of adverse effects is included in the instructions for use.

Features & Benefits

- The anatomical plate design minimizes the need for intraoperative plate contouring
- All plate holes are compatible with locking cortical screws
- A fitted, radiolucent aiming device is designed for the safe placement of drill guides at a preset angle
- A guide sleeve ensures right positioning of distal screws
- Symmetrical plate in one length reduces the required storage capacities in the OR

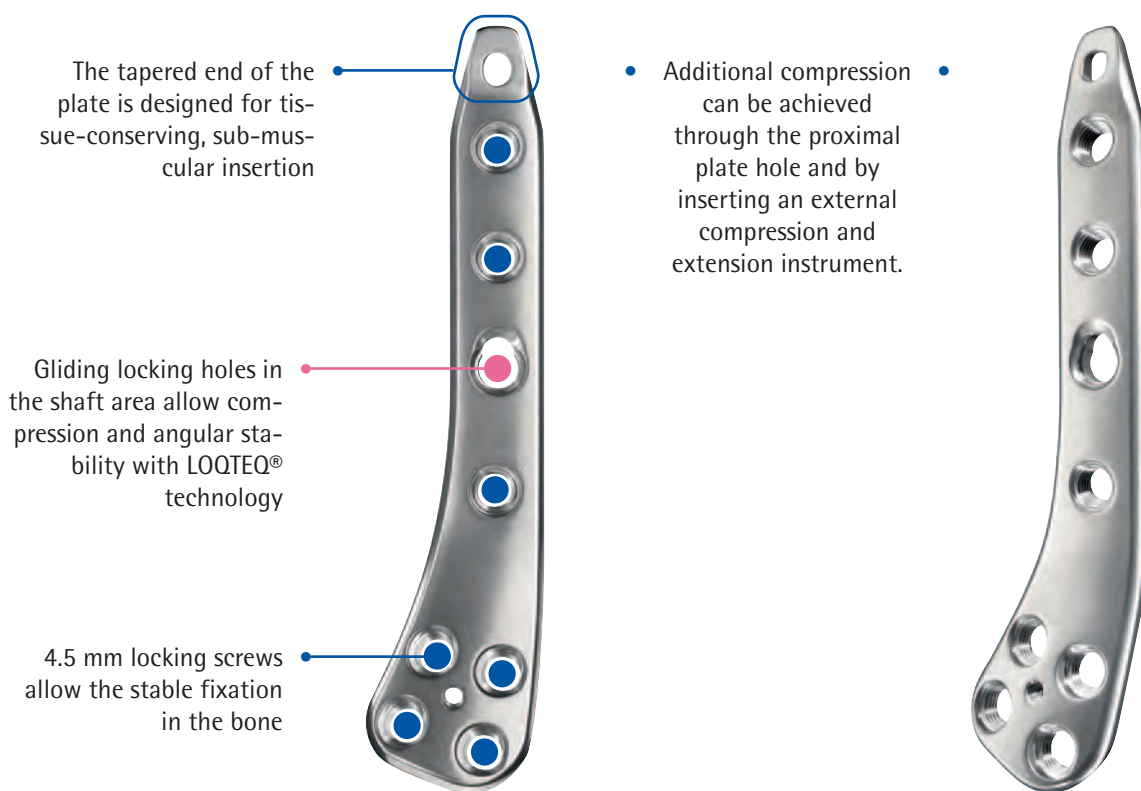


- Special spacers protect the pes anserinus



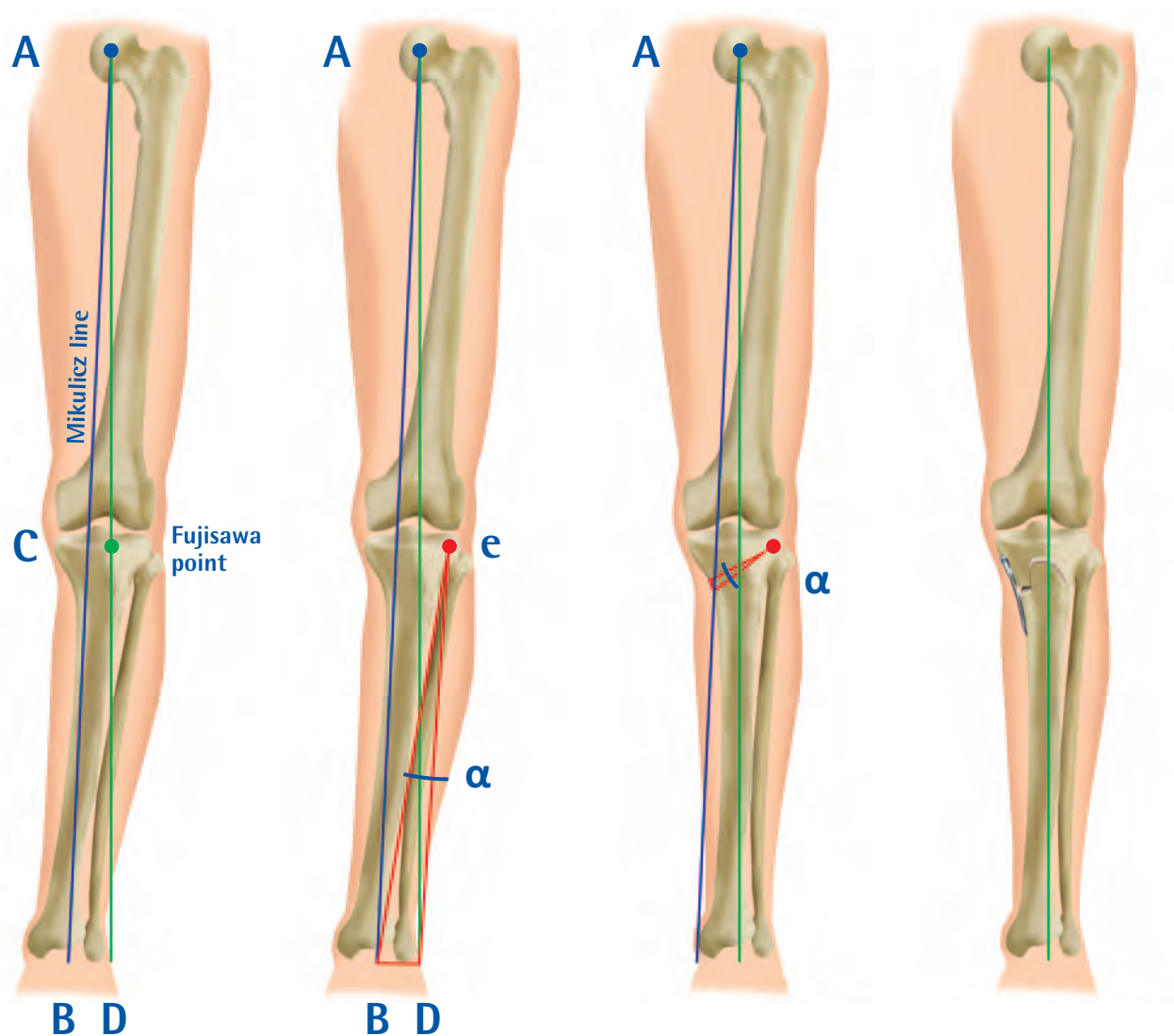
Features & Benefits

- The anatomical plate design minimizes the need for intraoperative plate contouring
- All plate holes are compatible with locking cortical screws
- Fitted, radiolucent aiming devices are designed for the safe placement of drill guides at a preset angle
- A guide sleeve ensures right positioning of distal screws
- Minor contact undercuts may help to preserve the blood supply to the periosteum
- Available as right and left version



Preoperative planning

- This surgical technique describes tibial head osteotomy using the example of the open-wedge method. Precise preoperative planning is essential for a successful procedure. This requires detailed knowledge of the anatomical and mechanical axes of the lower limb. For this purpose, take a weight-bearing X-ray of the entire leg in AP view and proceed as follows:



1. Determine the mechanical leg axis (Mikulicz line). For this purpose, draw a straight line from the center of the femoral head (A) to the middle of the ankle joint (B).
2. Determine the desired weight-bearing line. From the center of the femoral head (A), draw the line through the Fujisawa point (C), lateral to the preoperative center of the knee joint (60%), to the postoperative talocrural joint (D).
3. Determine the center of rotation (e) laterally, in the proximal third of the tibiofibular joint but at least 15mm below the joint line.
4. Connect the center of rotation with the preoperative endpoint (B) and the planned endpoint of the mechanical axis (D), and determine the resulting angle. This angle (α) should correspond to the open wedge osteotomy.

- Conventional planning software can very clearly demonstrate the exact correction angles, incision depth of the osteotomy, and the resulting height of the osteotomy.
- For the intraoperative control of the leg axis, the external alignment can be (optionally) used as well.

◆ **NOTE:**

Planning software does not replace thorough planning and in-depth surgeon training on correcting axial malalignments.

Patient positioning

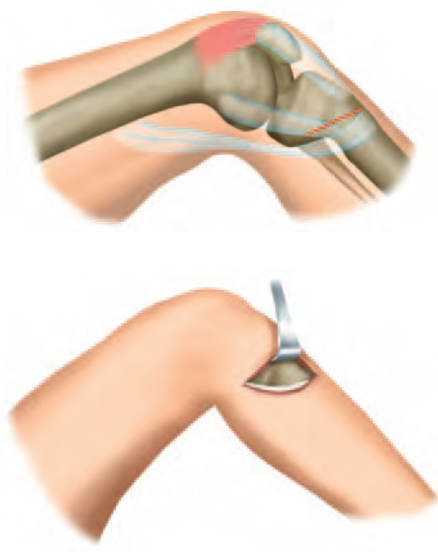
- The patient is positioned supine on a radiolucent operating table. Ensure that the leg to receive surgery can be placed in 90-degree flexion and complete extension.
- The surgery is performed in approx. 20° flexion to protect neurovascular structures. To facilitate the approach to the medial aspect of the proximal tibia, extend the other leg and position it slightly lower. Intraoperatively, you must be able to easily extend the leg to check the leg axis. A tourniquet may be placed.

◆ **NOTE:**

Ensure that the head of femur and the ankle can be viewed under fluoroscopy.



Approach



- Slightly bend the leg. Place the incision just below the tibial tuberosity along the upper margin of the pes anserinus to the posteromedial edge of the medial tibial plateau.
- For approach, perform the following steps:
 1. Exposure of the pes anserinus and the superficial portion of the medial collateral ligament.
 2. Mobilization of the medial collateral ligament and release of the superficial part using a raspatory.
 3. Insertion of a soft tissue retractor between the medial collateral ligament and tibia.
 4. Detachment of the periosteum along the planned osteotomy.

Preparing the plate



INSTRUMENTS

Angle stable locking spacer LOQTEQ® 4.5
 Aiming device LOQTEQ® HTO plate
 Screwdriver Duo, T25, quick coupling
 Fixing screw aiming device LOQTEQ® LFI T25
 Large handle, cannulated, quick coupling

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 IU 8176-04
 IU 7706-00

- Screw the angle stable spacers (green) into the respective holes manually.
- The spacers (green) are intended to prevent irritation of the pes anserinus.
- Manually install the targeting device on the plate using the fixing screw. This allows the correct screw connection of the drill guides and the later use of the guide sleeve.

◆ NOTE:

The fixing screw is connected to the aiming device in such a way that it is self-retaining. It can be removed for cleaning by applying gentle pressure to the tip of the screw from below.

◆ CAUTION:

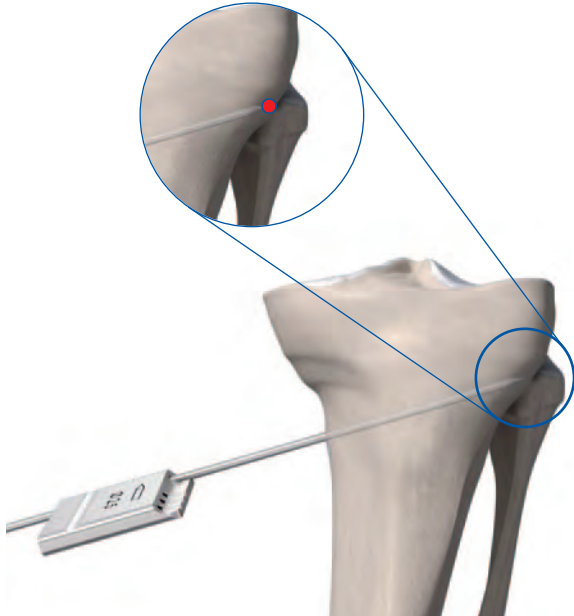
Anatomically preformed plates should not be bent where possible. If plates are adapted to anatomical bone structures, the implants should not be bent back and forth repeatedly and excessively as this may result in implant failure. Damage caused by sharp edges should be avoided when bending. Locking plates should in principle be bent in the area between the holes only. Bending plates along locking holes may impair or even abolish their function completely. If angular stability is compromised by bending, a non-locking screw should be used.

Placing K-wires
INSTRUMENTS

K-wire with trocar point, ø2.5, L 200
 Parallel drill guide for K-wire, ø2.5, narrow, PEEK
 Parallel drill guide for K-wire, ø2.5, broad
 Measuring device for K-wire 2.5, L 200

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 IU 7925-20



- Place the knee in 20° flexion and adjust the fluoroscope in such a way as to enable an AP view of the tibia.
- Start the osteotomy immediately above the pes anserinus. Ensure that there is enough space to easily place all proximal screws and that they do not project into the osteotomy gap.
- Under fluoroscopic monitoring, insert a K-wire ø2.5 into the head of tibia in accordance with the planned osteotomy. For this purpose, start over the pes anserinus, target the head of fibula, and insert to the far cortex.

◆ NOTE:

Under fluoroscopic monitoring, check the position of the K-wire. If its positioning is not satisfactory, a second wire can be placed directly next to it and compared with the first one under fluoroscopic monitoring. Then remove the wrongly positioned K-wire.

- Insert the parallel drill guide over the K-wire to the bone and insert a second K-wire along the planned osteotomy. Under fluoroscopy, position the K-wires above one another.

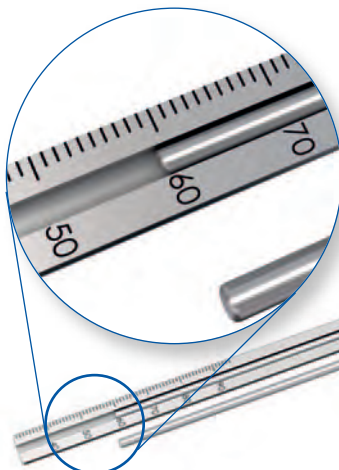
◆ NOTE:

The sagittal inclination of the osteotomy should be parallel the tibial plateau.

- To determine the incision depth, measure the depth of the inserted K-wires using the direct measuring device for K-wires. Subtract 10 mm from the measured value for the far cortex. Mark the determined value on the saw blade (e.g. with sterile pen or Steri-Strip).

◆ NOTE:

In case of rotation correction or slope correction, parallel K-wires or Steinmann pins can be inserted into the proximal and distal fragments.



Osteotomy



- Using an oscillating saw, start below the K-wires and saw to the marked depth along the K-wires. Ensure that the dorsal cortex is completely sawed through. Do not transect the tuberosity.
- After completing the transverse cut to the planned depth, perform the anterior cut using a thin saw blade. This cut is continuous from the medial to the lateral cortical bone. Depending on the osteotomy height and position of the patella (Caton index), it can be performed proximally or distally.

◆ **NOTE:**

Proceed slowly when sawing, to prevent the saw blade from deviating, and cool the saw blade using irrigation. The cutting depth may be controlled under fluoroscopy.



Opening the osteotomy gap using a Lambotte chisel

INSTRUMENTS

Lambotte chisel, 15 mm
Lambotte chisel, 20 mm

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IU 3000-20

- Using gentle mallet taps, carefully insert the first chisel to the lateral bridge along the transverse cut. The depth equals the cutting depth.
- Slowly insert the second chisel between the first chisel and the K-wires. The second chisel should be inserted less deeply than the first one.
- ◆ **CAUTION:**
To avoid damaging the lateral bridge, spread slowly and very cautiously.
- To further spread the osteotomy, a third chisel may be inserted between the first two chisels. Each additional chisel is inserted slowly and less deeply, until the desired osteotomy angle has been achieved.



Checking, measuring, and stabilizing the osteotomy gap

INSTRUMENTS

Wedge gauge Osteotomy
External alignment device

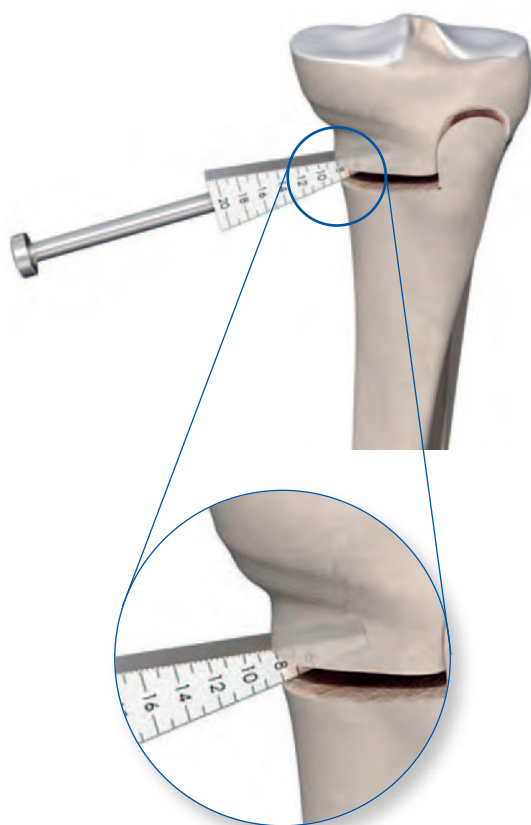
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OPTIONAL

Bone spread forceps, L 280

IU 2503-00



- While spreading, continuously check the result on the basis of the preoperative plan.
- After removing the chisels, carefully exert valgus stress. To determine the gap's opening height and to maintain the opening, place the wedge gauge in the gap. If a neutral tibial slope is desired, the wedge gauge should be inserted dorsally.

◆ NOTE:

When inserting the wedge gauge, proceed carefully and if possible do not use mallet taps to avoid damaging the cortical bone.

- The base height of the osteotomy gap can be read off the wedge gauge; this height should equal the preoperatively determined height.

◆ NOTE:

For fixation and precise adjustment of the osteotomy gap, a bone spreader can be used alternatively.

◆ NOTE:

If anterior K-wires or Steinmann pins have been used, they can also serve to check slope correction.

◆ NOTE:

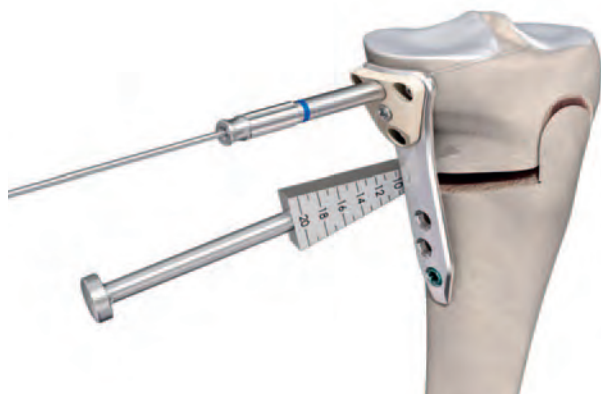
Use fluoroscopic monitoring to check the gap with the leg extended, in two planes. Also note the tibial slope. The external alignment can be used to check the results of the correction and the mechanical axis.

**Inserting the LOQTEQ®
High Tibia Osteotomy Plate**
INSTRUMENTS

Aiming device LOQTEQ® HTO plate
 Drill guide for round hole LOQTEQ® 4.5, I-ø3.9, blue
 Reduction sleeve for K-wire ø2.0
 K-wire with trocar point, ø2.0, L 250

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 IU 8167-15
 NK 0020-25



- The wedge gauges keep the osteotomy gap open at the desired angle.
- Carefully remove the K-wires.
- Insert the prepared plate subcutaneously.

◆ CAUTION:

The plate shaft should be approximately parallel to the tibial diaphysis. Position the plate in such a way that screws can be placed in all four proximal screw holes. The stabilizing part of the plate (without holes) must bridge the gap.

- Screw a drill guide (blue) into the central proximal hole and insert a reduction sleeve.

◆ CAUTION:

The screwdriver duo is not intended for screwing the drill guide into the plate.

- Use a K-wire ø2.0 to temporarily fix in place the plate through the reduction sleeve and use fluoroscopy to check the fit of the plate as well as the course of the screws to be placed, and correct if necessary.



Proximal plate fixation

**INSTRUMENTS**

Drill guide for round hole LOQTEQ® 4.5, I-ø3.9, blue
 Twist drill ø3.8, L 200, coil 50, quick coupling
 Stop ring for depth measurement, LF
 Depth gauge for screws ø4.5-6.5, up to L 100
 LOQTEQ® Screw guide sleeve 4.5, blue
 Handle with quick coupling, with torque limiter 3.5 Nm
 Screwdriver Duo, T25, quick coupling

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◆ **CAUTION:**

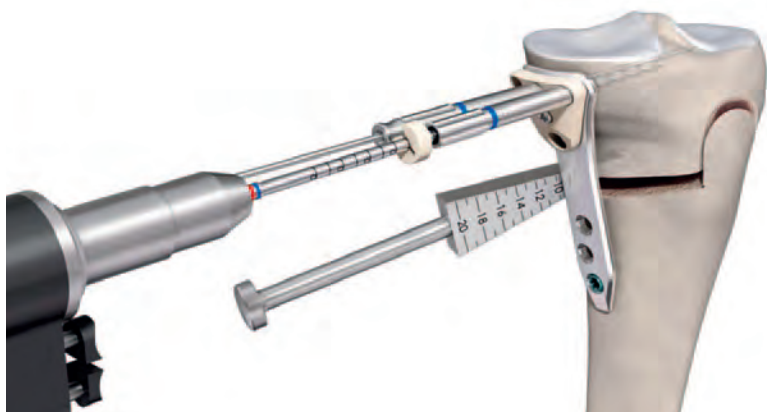
Ensure to use all plate holes for screw fixation!
 LOQTEQ® Osteotomy plates should be fixated with locking screws only for achieving maximum stability.

- Secure the round locking holes in the proximal portion of the plate using locking screws (blue). Use the previously used drill guide (blue) for round holes.
- Drill to the desired depth using a drill bit ø3.8 (red/blue) for locking screws without penetrating the contra cortical bone, and remove the drill guide.

◆ **NOTE:**

The screwdriver duo facilitates manual removal of the drill guide.

- Measure the drill depth with the depth gauge.



◆ **NOTE:**

As an alternative to the depth gauge, the stop ring can be used to measure the drill depth. The exact drill depth can be read off the drill in the open area of the stop ring. If drilling against the far cortex, reduce the screw length by one size.

- Insert a locking screw (blue) of appropriate length. Use the guide sleeve (blue) for secure insertion of the screw by seating it in the aiming device in the sequence required and insert the screw through the guide sleeve using the screwdriver T25.

◆ **NOTE:**

Ensure proper alignment of the screwdriver and that the screwdriver tip is fully seated in the screw head.

- Finish the screw manually using the screwdriver T25 with the torque limiting handle 3.5Nm. Optimal locking should be achieved with an audible and tactile click of the torque limiter.

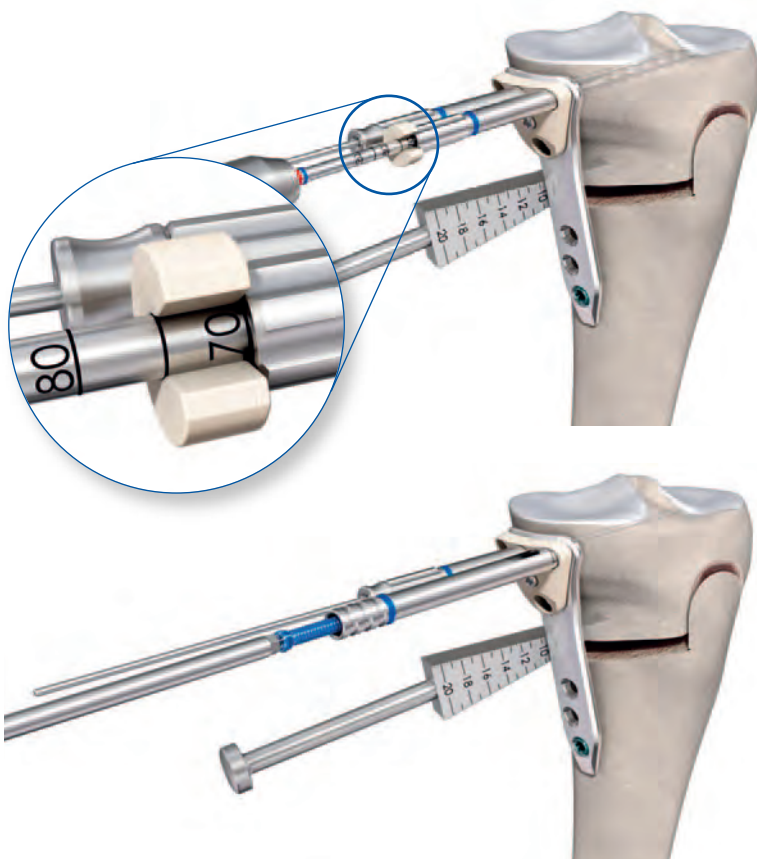
◆ **CAUTION:**

As soon as the screw head is visible in the window of the guide sleeve, it is compulsory to switch to the torque limiter.

◆ **NOTE:**

We recommend using screws of maximum possible length. However, ensure that the lateral cortex is not penetrated.

- Secure all three proximal plate holes in this way.



Compressing the lateral cortex (optional)

INSTRUMENTS

Drill guide for round hole LOQTEQ® 4.5, I-ø3.9, blue
 Twist drill ø3.2, L 195, coil 50, quick coupling
 Depth gauge for screws ø4.5-6.5, up to L 100
 Screwdriver Duo, T25, quick coupling
 Screwdriver, hexagonal, ø3.5 for quick coupling
 Large handle, cannulated, quick coupling

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- In the first shaft hole below the osteotomy, a standard screw (gold) can be inserted to draw the plate towards the tibia. For this purpose, screw the drill guide (blue) for round holes into the hole.

◆ CAUTION:

The screwdriver duo is not intended for screwing the drill guide into the plate.

- Drill to the desired depth using a drill bit ø3.2 for standard screws, and remove the drill guide.

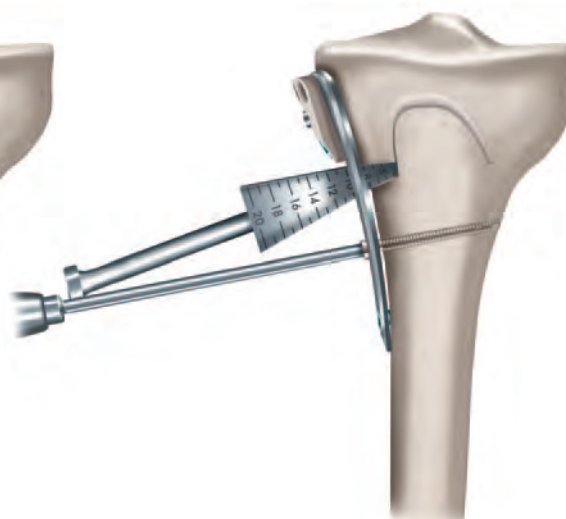
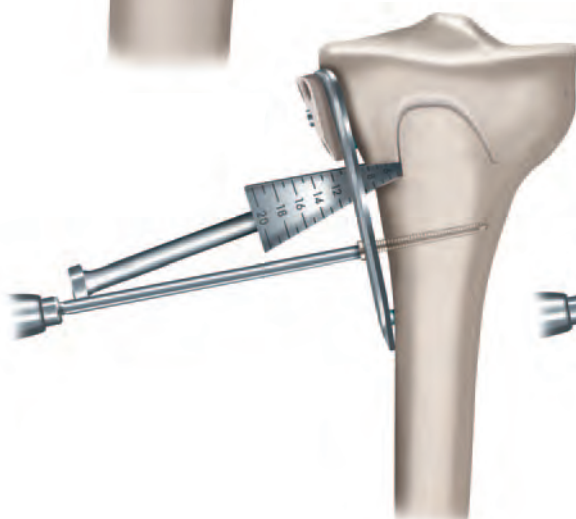
◆ NOTE:

The screwdriver duo facilitates manual removal of the drill guide.

- Determine the drill depth using the depth gauge and tighten a standard screw of appropriate length using the respective screwdriver.
- By tightening the screw, the plate is elastically bent; this means that it is closer to the bone and creates a spring effect that causes compressive stress on the lateral cortex.

◆ NOTE:

After compression with a standard screw, a locking screw should be inserted in the next distal plate hole to ensure that the compression is maintained. The standard screw must then be replaced by a locking screw.



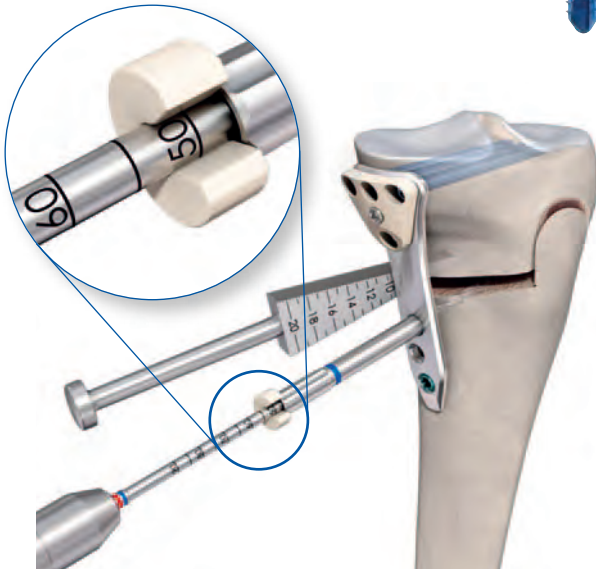
Distal plate fixation

INSTRUMENTS

Drill guide for round hole LOQTEQ® 4.5, I-ø3.9, blue
 Twist drill ø3.8, L 200, coil 50, quick coupling
 Stop ring for depth measurement, LF
 Depth gauge for screws ø4.5-6.5, up to L 100
 Large handle, cannulated, quick coupling
 Handle with quick coupling, with torque limiter 3.5 Nm
 Screwdriver Duo, T25, quick coupling

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CAUTION:

Ensure to use all plate holes for screw fixation!
 LOQTEQ® Osteotomy plates should be fixated with locking screws only for achieving maximum stability.

- Insert locking screws in the plate holes in the distal area of the plate. For this purpose, screw the drill guide (blue) for round holes in the plate holes in preferred order.

CAUTION:

The screwdriver duo is not intended for screwing the drill guide into the plate.

- Drill bicortically to the desired depth using a drill bit ø3.8 (red/blue) for locking screws, and remove the drill guide.

NOTE:

The screwdriver duo facilitates manual removal of the drill guide.

- Determine the drill depth using the depth gauge.
- As an alternative to the depth gauge, the stop ring can be used to measure the drill depth. The exact drill depth can be read off at the drill in the open area of the stop ring.
- Insert a locking screw (blue) of the appropriate length using the screwdriver T25 and then tighten the screw with the torque limiter. Optimal locking should be achieved with an audible and tactile click of the torque limiter.

CAUTION:

As soon as the head of the screw reaches the plate hole, it is compulsory to switch to the torque limiter. In cases of uncommonly hard bone, it may be necessary to finish the screw without the torque limiter to ensure the screw head is flush with the plate and the screw is locked.

NOTE:

When using spacers, please follow the instructions on page 18.



Replacing the spacers and securing the remaining holes

INSTRUMENTS

Drill guide for round hole LOQTEQ® 4.5, I-ø3.9, blue
 Twist drill ø3.8, L 200, coil 50, quick coupling
 Stop ring for depth measurement, LF
 Depth gauge for screws ø4.5-6.5, up to L 100
 LOQTEQ® Screw guide sleeve 4.5, blue
 Screwdriver Duo, T25, quick coupling
 Handle with quick coupling, with torque limiter 3.5 Nm

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- Remove both spacers (green) and replace each of them by a locking screw (blue). Follow the instruction in section "Proximal plate fixation" on page 14 and "Distal plate fixation" on page 17.



Replacing the standard screw by a locking cortical screw

INSTRUMENTS

Drill guide for round hole LOQTEQ® 4.5, I-ø3.9, blue
 Twist drill ø3.8, L 200, coil 50, quick coupling
 Depth gauge for screws ø4.5-6.5, up to L 100
 Screwdriver Duo, T25, quick coupling
 Screwdriver, hexagonal, ø3.5 for quick coupling
 Handle with quick coupling, with torque limiter 3.5 Nm

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- If the lateral cortical bone was compressed with the aid of a standard screw, subsequently remove this screw and replace it by a locking screw. Then remove the targeting device.

◆ NOTE:

You must drill again using a drill bit ø3.8 and the drill guide.

- Remove the drill guide, determine the screw length with the depth gauge and bicortically insert an appropriate length locking screw (blue) using the screwdriver.
- Finally, tighten the screw using the torque limiter. Optimal locking should be achieved with an audible and tactile click of the torque limiter.

◆ CAUTION:

As soon as the head of the screw reaches the thread of the plate hole, it is compulsory to switch to the torque limiter.

- Confirm the final position and alignment of the plate and the screws via fluoroscopy in two planes. Then close the wound.

◆ NOTE:

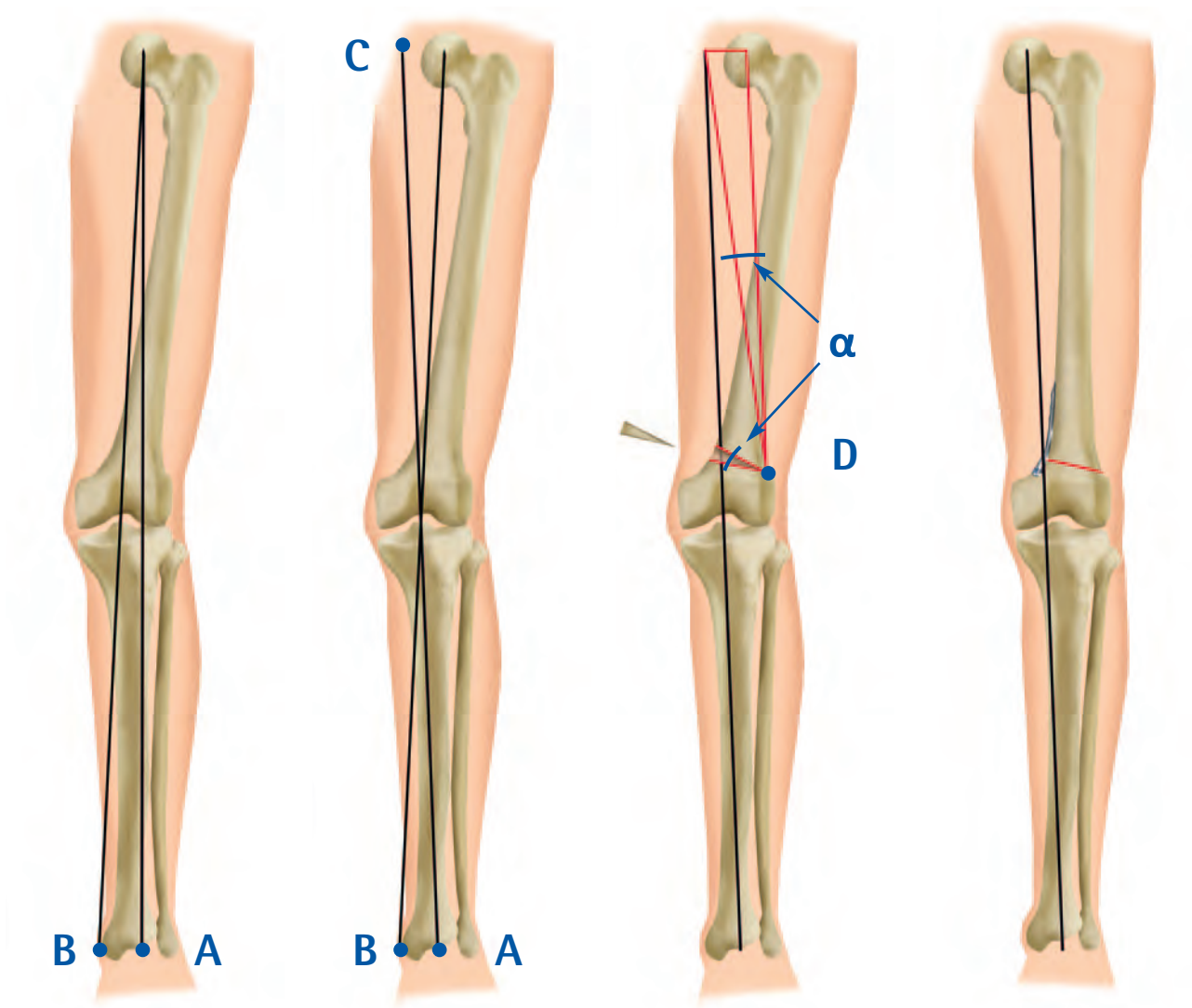
The external alignment can be additionally used to check the corrected mechanical axis.





Preoperative planning

- This surgical technique describes the distal femoral varus osteotomy using the example of the closed-wedge method. Precise preoperative planning is essential for a successful procedure. This requires detailed knowledge of the anatomical and mechanical axes of the lower limb. For this purpose, take a weight-bearing X-ray of the entire leg in AP view and proceed as follows:



- Determine the mechanical leg axis. For this purpose, draw a straight line from the center of the femoral head to the middle of the ankle joint (**A**).
- Determine the postoperative weight-bearing line. Draw a line from the center of femoral head to the desired point medial to the center of the preoperative knee joint (**B**).
- Draw a parallel line from the center of the femoral head ending at the extension of point **A** to point **C**.
- Position (**D**) is the rotation or hinge point of the osteotomy. The chosen position is slightly above the lateral condyle.
- Angle alpha (α) corresponds to the angle of the osteotomy.

The osteotomy should not be parallel to the joint line, because this may form a step-off in the bone. To guarantee the optimum cortical support and the resulting stability, the incision should run diagonally from the medial metaphysis towards the lateral condyle to position (D) (see figure page 21).

Conventional planning software can very clearly demonstrate the exact correction angles, incision depth of the osteotomy, and the resulting height of the osteotomy.

◆ **NOTE:**

Planning software cannot replace thorough planning by, and the experience of, the surgeon in working with procedures for correcting axial malalignments.

Patient positioning

- The patient is positioned supine on a radio-lucent operating table. Position the contra-lateral leg slightly lower and straight for easier approach to the medial aspect of the distal femur.
- A tourniquet may be placed.

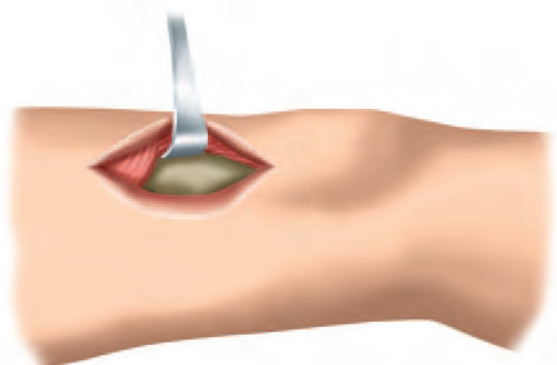
◆ **RECOMMENDATION:**

Before the incision, the indication for corrective osteotomy should be verified via arthroscopy, and any intra-articular damage should be addressed.



Approach

- Make an anteromedial longitudinal incision with the knee joint fully extended. Start the 10cm incision above the patella and continue cranially along the femur. Release the fascia of vastus lateralis and lift the muscle ventrally. It must be exposed sufficiently to allow secure placement of the plate. The incision can be reopened for potential subsequent operations, such as a knee TEP.



Preparing the plate



INSTRUMENTS

Aiming device LOQTEQ® DFO plate, R/L
 Fixing screw aiming device LOQTEQ® LFI T25
 Screwdriver Duo, T25, quick coupling
 Large handle, cannulated, quick coupling

ART.-NO.

IU 8185-0x
 IU 8176-04
 IU 7835-56
 IU 7706-00

- Manually install the targeting device on the plate using the fixing screw. This allows the correct screw connection of the drill guides and the later use of the guide sleeve.

◆ NOTE:

The fixing screw is connected to the aiming device in such a way that it is self-retaining. It can be removed for cleaning by applying gentle pressure to the tip of the screw from below.

◆ CAUTION:

Anatomically preformed plates should not be bent where possible. If plates are adapted to anatomical bone structures, the implants should not be bent back and forth repeatedly and excessively as this may result in implant failure. Damage caused by sharp edges should be avoided when bending. Locking plates should in principle be bent in the area between the holes only. Bending plates along locking holes may impair or even abolish their function completely. If angular stability is compromised by bending, a non-locking screw should be used.

Placing K-wires



INSTRUMENTS

K-wire with trocar point, ø2.5, L 200
 Measuring device for K-wire 2.5, L 200
 Parallel drill guide for K-wire, ø2.5, narrow, PEEK
 Parallel drill guide for K-wire, ø2.5, broad

ART.-NO.

NK 0025-20
 IU 7925-20
 IU 8188-25
 IU 8190-25

- Extend the leg fully and position it to enable an AP view of the femur under fluoroscopy.
- Placement of the plate assists with determining the position of the osteotomy and the height of the first K-wire on the medial aspect.



- The 2.5 mm K-wire is aimed at the hinge point of the lateral cortical bone under fluoroscopy, similar to the technique used with the HTO. The target point is slightly proximal to the lateral femoral condyle, as specified in the preoperative planning.
- Insert the K-wire as far as the contra cortical bone. Thread the parallel drill guide over the K-wire.
- A second K-wire is placed parallel to the first with the aid of the parallel drill guide.
- The insertion depth of the K-wires is measured with the direct measuring device. Approximately 10mm must be subtracted from the measured value to ensure that the contra cortical bone remains intact during sawing.



Osteotomy



- Place an oscillating saw superior to the K-wires and saw down to the calculated depth along the K-wires. Ensure that the dorsal cortex is completely sawed through.
- If the angle gauge for closed-wedge osteotomy is used, the K-wires can be removed after completion of the saw cut.

◆ NOTE:

Proceed slowly when sawing, to prevent the saw blade from deviating, and cool the saw blade using irrigation. The cutting depth may be controlled under fluoroscopy.

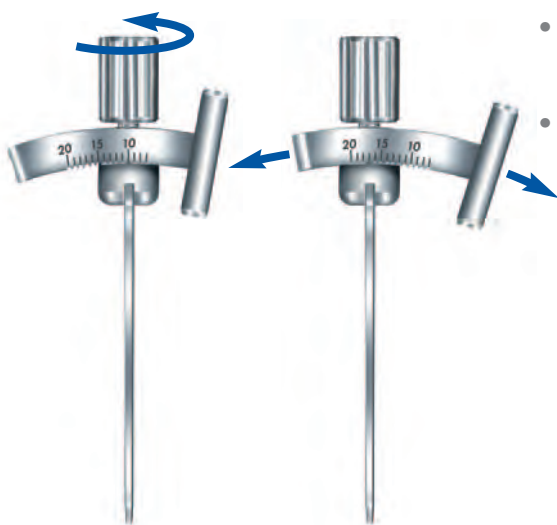
Preparation of the angle gauge for closed-wedge osteotomy

INSTRUMENTS

Angle gauge for closed wedge osteotomy

ART.-NO.

IU 7970-00



- Loosen the nut above the gauge arm to allow the gauge arm to move freely.
- Set the correction angle calculated in preoperative planning on the angle scale by pivoting the gauge arm. Pivot it until the desired value is above the arrow. Then lock the gauge arm with the nut.



- Push the angle gauge into the previously sawn incision as far as the lateral cortical bone. Align the gauge arm parallel to the femoral shaft.

◆ **NOTE:**

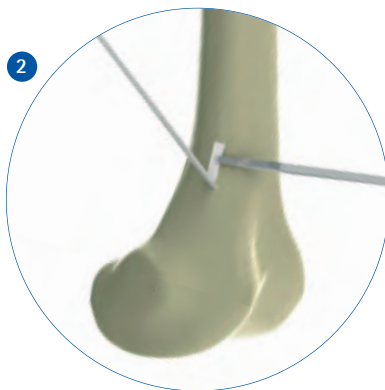
The angle gauge can be secured with a 2.0 mm K-wire to prevent slipping.

- Insert two 2.5 mm K-wires through the K-wire guide on the gauge arm.
- To release the angle gauge, first loosen the nut and then remove the entire angle gauge.
- Place an oscillating saw inferior to the K-wires and saw down to the calculated depth along the K-wires. Ensure that the dorsal cortex is completely sawn through.

◆ **NOTE:**

Primary stability is particularly important for closed-wedge osteotomy. This requires ensuring full cortical contact after closing the osteotomy gap. An isosceles triangle-shaped wedge of bone measured with the angle gauge is sawn out as one piece of bone.





Procedure without angle gauge

- The guide wire 2.5 mm is aimed at the hinge point of the lateral cortical bone under fluoroscopy. The target point is slightly proximal to the lateral femoral condyle, as specified in the preoperative planning.
- Insert the guide wire as far as the contra cortical bone. If desired, a second wire can also be placed through the parallel drill guide (see p. 30).
- A second guide wire is now placed in such a way that the tip of the wire also points to the hinge point. Using a sterile ruler or section of a ruler, ensure that the distance between the entry points of the two guide wires (height of cuneiform base) corresponds to the distance in the preoperative planning (Figs. 2 and 3). Check this step with fluoroscopic imaging if applicable.
- The measurement of the distance between the guide wires corresponds to the height of the sawn-out wedge.
- After correct placement of the guide wires, the wedge between the wires (Fig. 4) is sawn out and removed.

◆ NOTE:

When sawing, ensure that the lateral cortical bone remains intact. As a benchmark, the osteotomy should end about 10 mm in front of the lateral cortical bone.



- On completion of the transverse cuts to the planned depth, the anterior cut is performed with a thin saw blade. This cut is continuous from the medial to the lateral cortical bone.

◆ **NOTE:**

For a better osteotomy result, a biplanar cut is recommended.

◆ **NOTE:**

Proceed slowly. Irrigate the saw blade to cool it and make sure that the blade does not slip.

- Once the wedge has been sawn out and removed, the osteotomy gap is closed and compressed and held by manual pressure. The leg correction is now checked against the preoperative drawings.

◆ **NOTE:**

The wedge must be completely removed to allow complete closure of the osteotomy gap. The external alignment can be used to check the results of the correction and the mechanical axis.

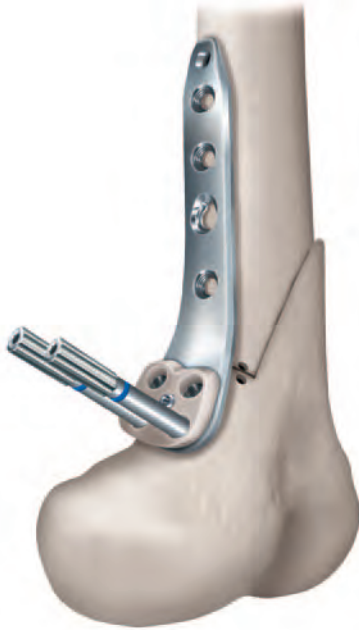


**Inserting the LOQTEQ®
Distal Femur Osteotomy Plate**
INSTRUMENTS

Aiming device LOQTEQ® DFO plate, R/L
 Drill guide for round hole LOQTEQ® 4.5, I-ø3.9, blue
 Reduction sleeve for K-wire ø2.0
 K-wire with trocar point, ø2.0, L 250

ART.-NO.

IU 8185-0x
 IU 8167-20
 IU 8167-15
 NK 0020-25



- After closing the osteotomy, the plate is inserted so the distal section is correctly placed on the medial condyle and the proximal section follows the shaft.
- K-wires can be used for temporary plate fixation and to check the subsequent screw positions. Insert a drill guide (blue) into one of the distal plate holes through the targeting device, insert the reduction sleeve, and insert a 2.0 mm K-wire through the reduction sleeve.

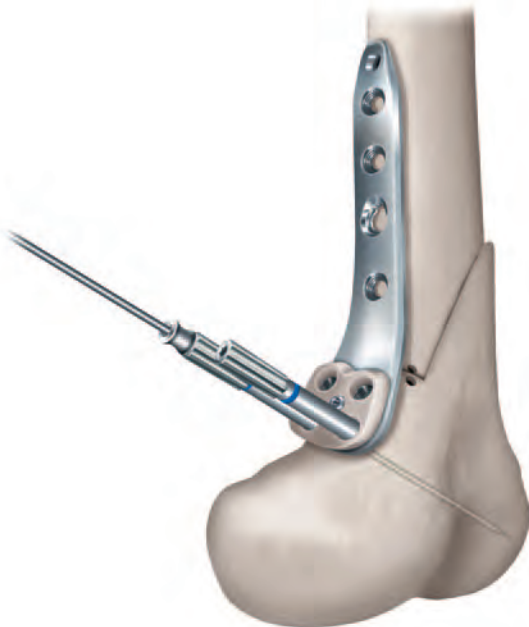
◆ CAUTION :

The screwdriver duo is not intended for screwing the drill guide into the plate.

- Then check the position of the K-wire under fluoroscopy.

◆ NOTE:

Insert the K-wire through to the contra cortical bone, but be careful not to penetrate the lateral cortical bone. Check the position of the plate and the subsequent screw and correct if necessary.



Distal plate fixation

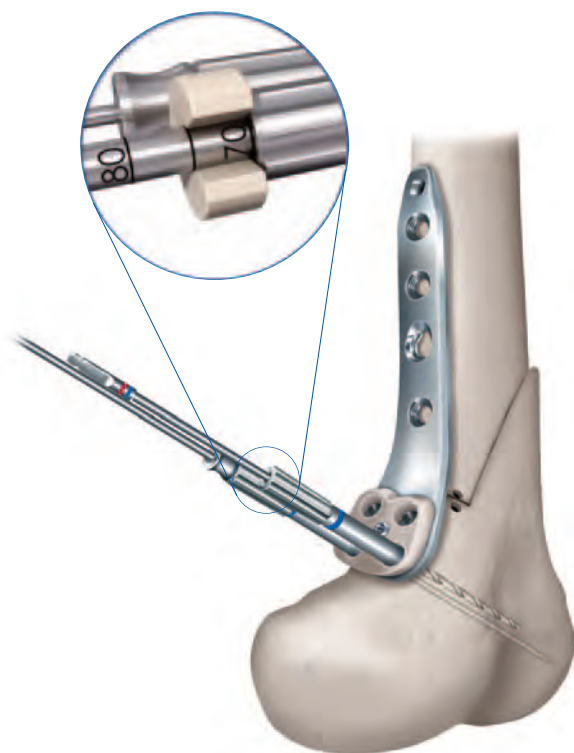


INSTRUMENTS

Drill guide for round hole LOQTEQ® 4.5, I-ø3.9, blue
 Twist drill ø3.8, L 200, coil 50, quick coupling
 Stop ring for depth measurement, LF
 Depth gauge for screws ø4.5-6.5, up to L 100
 LOQTEQ® Screw guide sleeve 4.5, blue
 Handle with quick coupling, with torque limiter 3.5 Nm
 Screwdriver Duo, T25, quick coupling

ART.-NO.

IU 8167-20
 IU 7438-20
 IU 8184-03
 IS 7905-20
 IU 8210-45
 IU 7707-35
 IU 7835-56



◆ CAUTION:

Ensure to use all plate holes for screw fixation!
 LOQTEQ® Osteotomy plates should be fixated with locking screws only for achieving maximum stability.

- Insert locking screws (blue) into the round locking holes in the distal part of the plate. Use the previously used drill guide (blue) for round holes.

◆ CAUTION:

The screwdriver duo is not intended for screwing the drill guide into the plate.

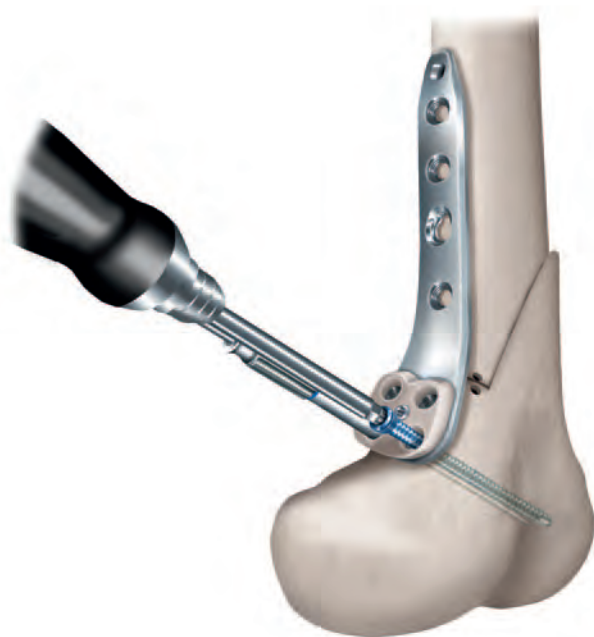
- Drill to the desired depth using a drill bit ø3.8 (red/blue) for locking screws without penetrating the contra cortical bone, and remove the drill guide.

◆ NOTE:

The screwdriver duo facilitates manual removal of the drill guide.

- Measure the drill depth with the depth gauge.
- As an alternative to the depth gauge, the stop ring (above image) can be used to measure the drill depth. The exact drill depth can be read off at the drill in the open area of the stop ring.





- Insert a locking screw (blue) of the appropriate length using the screwdriver T25.

◆ **NOTE:**

Ensure proper alignment of the screwdriver and that the screwdriver tip is fully seated in the screw head.

- Tighten the screw with the torque limiter. Optimal locking should be achieved with an audible and tactile click of the torque limiter.

◆ **CAUTION:**

As soon as the head of the screw reaches the thread of the plate hole, it is compulsory to switch to the torque limiter.

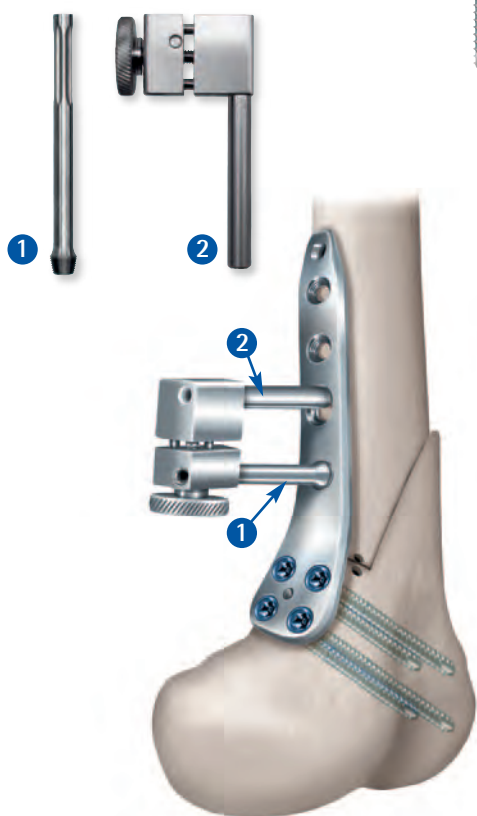
◆ **NOTE:**

We recommend that you use a screw of maximum possible length. However, ensure that the lateral cortical bone is not penetrated.

- The guide sleeve 4.5 (blue) can be used for the secure and correct insertion of the screws. Please follow the instructions on page 15.
- Secure all 4 distal plate holes in this way. Then remove the targeting device.



Compression of the osteotomy with a gliding locking hole screw (red)



INSTRUMENTS

Basic insert for load drill guide, LOQTEQ® 4.5, round hole
 Load drill guide LOQTEQ® 4.5, adjustable up to 2 mm
 Twist drill ø3.8, L 200, coil 50, quick coupling
 Depth gauge for screws ø4.5-6.5, up to L 100
 Handle with quick coupling, with torque limiter 3.5 Nm
 Screwdriver Duo, T25, quick coupling

ART.-NO.

IU 8167-45
 IU 8167-03
 IU 7438-20
 IS 7905-20
 IU 7707-35
 IU 7835-56

- If fracture compression is required, the LOQTEQ® technology enables the compression with subsequent angle-stable locking.
- Screw the basic insert for load drill guide into the first distal shaft hole. This holds the load drill guide to allow drilling in the correct alignment and to reach the required compression. The adjustment wheel of the variable load drill guide is rotated to the required compression to a maximum of 2mm (see Figure).

◆ CAUTION:

The screwdriver duo is not intended for screwing the basic insert into the plate.

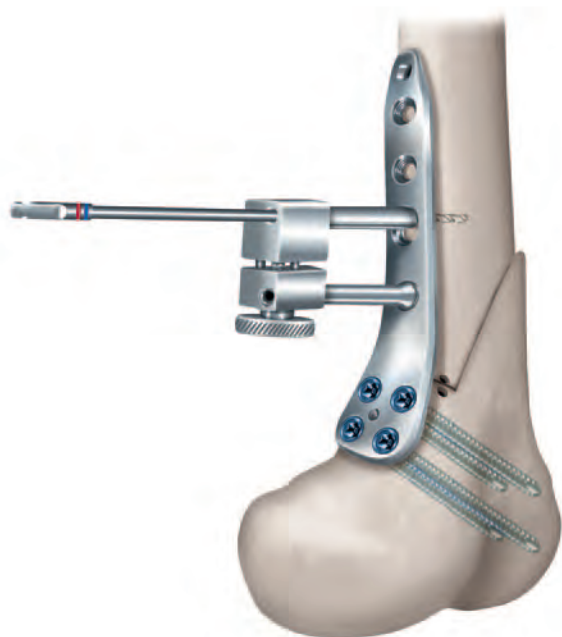
- Drill to the desired depth monocortically using the drill bit ø3.8 (red/blue) and remove the load drill guide as well as the basic insert.

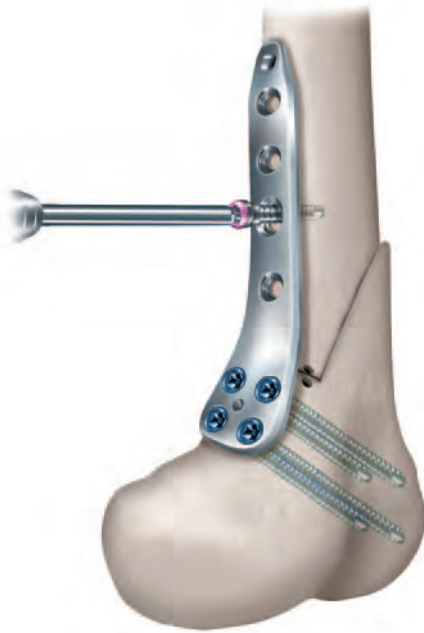
◆ NOTE:

The screwdriver duo facilitates manual removal of the basic insert.

◆ NOTE:

Monocortical compression is possible with the locking screw (red) for gliding locking hole and it offers sufficient stability for closed wedge osteotomy.





- After removal of the basic insert and load drill guide, loosely insert a LOQTEQ® Locking Compression Screw 4.5mm (red) of the appropriate length with screwdriver T25 and finally tighten the screw with the torque limiter 3.5Nm. Optimal locking should be achieved with an audible and tactile click of the torque limiter.

◆ **CAUTION:**

As soon as the head of the screw reaches the plate hole, it is compulsory to switch to the torque limiter. In cases of uncommonly hard bone, it may be necessary to finish the screw without the torque limiter to ensure the screw head is flush with the plate and the screw is locked.

◆ **NOTE:**

For an easier and correct screw insertion the blue marked screw guide sleeve can be used. Please follow instructions on page 15.

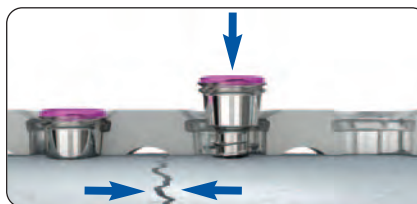
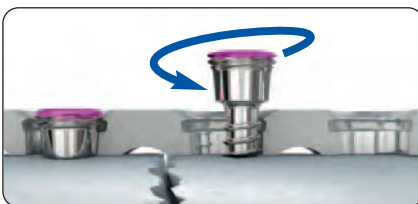
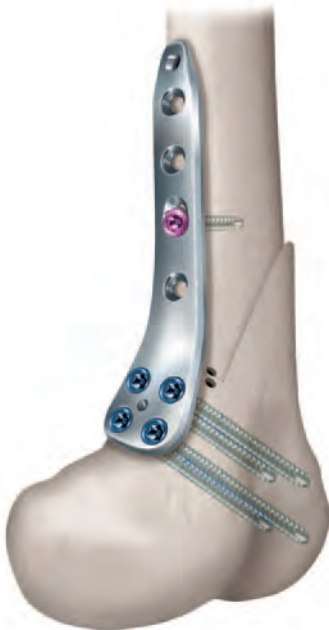
- Confirm the final position and alignment of the plate and the screws via fluoroscopy in two planes.

◆ **NOTE:**

After compression it is recommended to review the leg axis under fluoroscopy. Therefore the external alignment device can be used.

◆ **NOTE:**

If compression is not to be used, close the load drill guide and drill the pilot hole in neutral position.



Proximal plate fixation

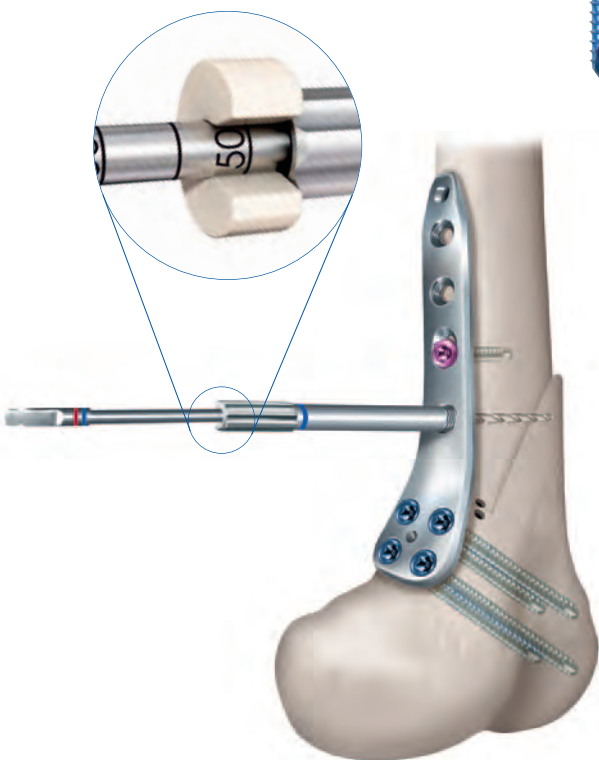


INSTRUMENTS

Drill guide for round hole LOQTEQ® 4.5, I-ø3.9, blue
 Stop ring for depth measurement, LF
 Screwdriver Duo, T25, quick coupling
 Twist drill ø3.8, L 200, coil 50, quick coupling
 Depth gauge for screws ø4.5-6.5, up to L 100
 Handle with quick coupling, with torque limiter 3.5 Nm

ART.-NO.

IU 8167-20
 IU 8184-03
 IU 7835-56
 IU 7438-20
 IS 7905-20
 IU 7707-35



◆ CAUTION:

Ensure to use all plate holes for screw fixation!
 LOQTEQ® Osteotomy plates should be fixated with locking screws only for achieving maximum stability.

- After compression with the locking screw for gliding locking holes, the locking compression screws (blue) are screwed into the remaining shaft holes. Proceed from distal to proximal.
- The basic insert for the load drill guide in the most distal hole is replaced by a drill guide for round holes (blue). Drill bicortically to the desired depth using a drill bit ø3.8 (red/blue) for locking screws, and remove the drill guide.

◆ CAUTION:

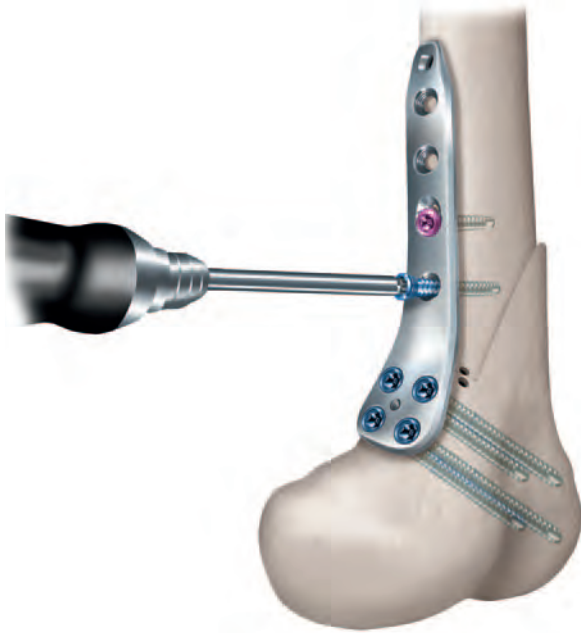
The screwdriver duo is not intended for screwing the drill guide into the plate.

◆ NOTE:

The screwdriver duo facilitates manual removal of the drill guide.

- As an alternative to the depth gauge, the stop ring can be used to measure the drill depth. The exact drill depth can be read off at the drill in the open area of the stop ring. If drilling against the contra cortical bone, reduce the screw length by one size.
- Determine the drill depth using the depth gauge.





- Choose a locking screw (blue) of the appropriate length and insert using the power screwdriver T25.

◆ **NOTE:**

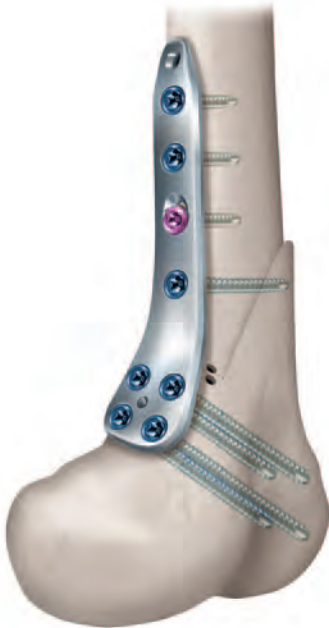
Ensure proper alignment of the screwdriver and that the screwdriver tip is fully seated in the screw head.

- Finally, tighten using the torque limiter. Optimal locking should be achieved with an audible and tactile click of the torque limiter.

◆ **CAUTION:**

As soon as the head of the screw reaches the plate hole, it is compulsory to switch to the torque limiter. In cases of uncommonly hard bone, it may be necessary to finish the screw without the torque limiter to ensure the screw head is flush with the plate and the screw is locked.

- Locking compression screws are placed in the remaining two holes in the same way. Either monocortical or bicortical.
- Finally, confirm the final position and alignment of the plate and the screws via fluoroscopy in two planes. Then close the wound.

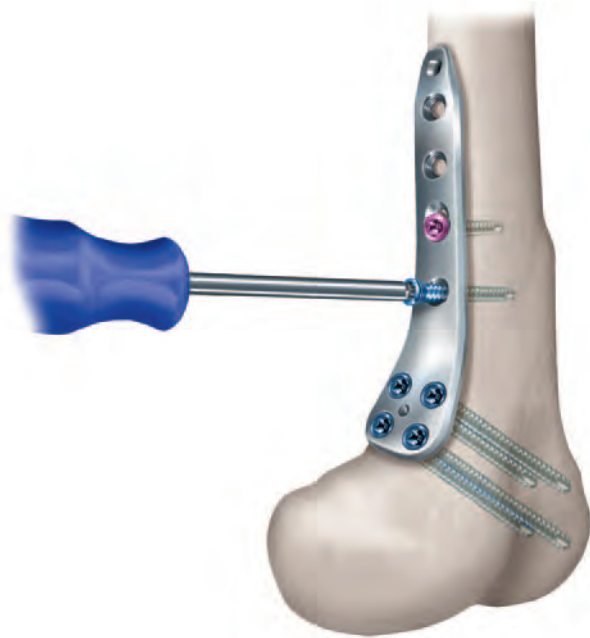


INSTRUMENTS

Explantation screwdriver T25, round handle
Screwdriver hexagonal 3.5

ART.-NO.

IU 7811-25
IU 7865-00



◆ NOTE:

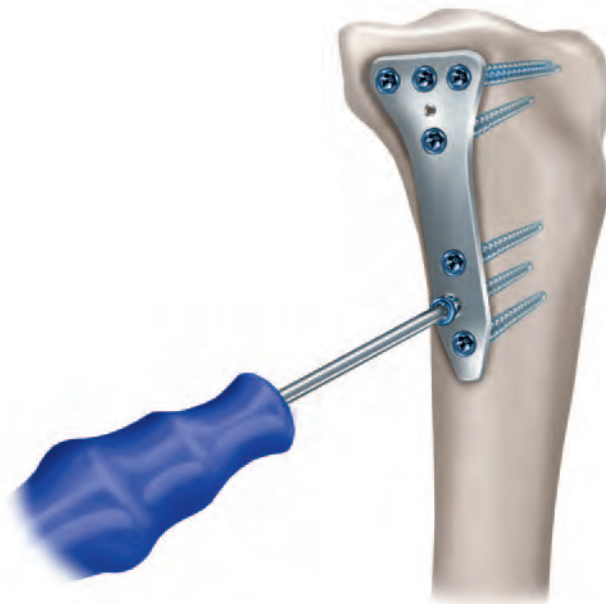
The screwdrivers T25 (IU 7835-56) in the set are self-retaining and should not be used for screw explantation.

- Use the corresponding explantation screwdriver for safe removal of a screw. Explantation screwdrivers are not self-retaining, penetrate further into the screw head and thus permit a higher torque when removing screws. They are not included in the set as standard and must be ordered separately.

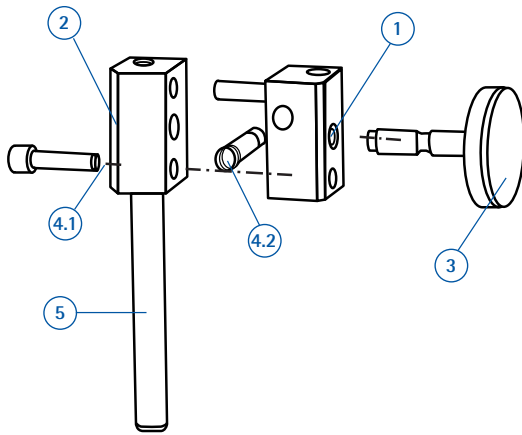
◆ NOTE:

The implant should be removed only after complete healing of the osteotomy.

- Place an incision on the old scar. Manually undo all screws and sequentially remove them. After manually unlocking all screws, removal may be performed using a power tool.



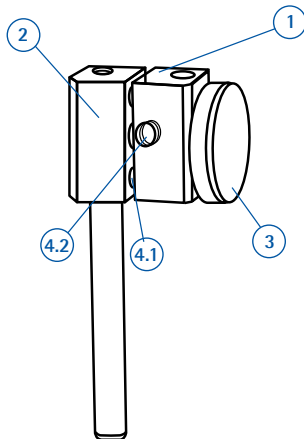
Disassembly



Adjustable load drill guide (IU 8167-03)

- Remove screws (item 4.1 and 4.2) using a hexagonal screwdriver 2.5
- Unscrew the set screw (item 3)
- Pull the compression block apart (items 1 and 2)

Assembly



- Fit together the compression block (items 1 and 2)
- Insert the set screw (item 3) into the compression block, middle hole
- Insert the retaining screws (items 4.1 and 4.2) using a hexagonal screwdriver 2.5



LOQTEQ® High Tibia Osteotomy Plate 4.5

LENGTH	ART.-NO.
90	PO 4560-01-2



LOQTEQ® Distal Femur Osteotomy Plate 4.5

LENGTH	ART.-NO.	ART.-NO.
	LEFT	RIGHT
111	PO 4562-01-2	PO 4561-01-2

**LOQTEQ® Cortical Sscrew 4.5,
T25, self-tapping**



L 14	SK 4525-14-2*
L 16	SK 4525-16-2*
L 18	SK 4525-18-2
L 20	SK 4525-20-2
L 22	SK 4525-22-2
L 24	SK 4525-24-2
L 26	SK 4525-26-2*
L 28	SK 4525-28-2*
L 30	SK 4525-30-2*
L 32	SK 4525-32-2*
L 34	SK 4525-34-2*
L 36	SK 4525-36-2*
L 38	SK 4525-38-2*
L 40	SK 4525-40-2*
L 42	SK 4525-42-2*
L 45	SK 4525-45-2*
L 50	SK 4525-50-2*
L 55	SK 4525-55-2*
L 60	SK 4525-60-2*
L 65	SK 4525-65-2*
L 70	SK 4525-70-2*
L 75	SK 4525-75-2*
L 80	SK 4525-80-2*
L 85	SK 4525-85-2*
L 90	SK 4525-90-2*

**LOQTEQ® Cortical Sscrew 4.5,
small head, T25, self-tapping**



L 14	SK 4526-14-2*
L 16	SK 4526-16-2*
L 18	SK 4526-18-2
L 20	SK 4526-20-2
L 22	SK 4526-22-2
L 24	SK 4526-24-2
L 26	SK 4526-26-2
L 28	SK 4526-28-2
L 30	SK 4526-30-2
L 32	SK 4526-32-2
L 34	SK 4526-34-2
L 36	SK 4526-36-2
L 38	SK 4526-38-2
L 40	SK 4526-40-2
L 42	SK 4526-42-2
L 45	SK 4526-45-2
L 50	SK 4526-50-2
L 55	SK 4526-55-2
L 60	SK 4526-60-2
L 65	SK 4526-65-2
L 70	SK 4526-70-2
L 75	SK 4526-75-2
L 80	SK 4526-80-2
L 85	SK 4526-85-2
L 90	SK 4526-90-2*

**Cortical Sscrew 4.5,
small head, self-tapping****



L 14	SK 4512-14-2
L 16	SK 4512-16-2
L 18	SK 4512-18-2
L 20	SK 4512-20-2
L 22	SK 4512-22-2
L 24	SK 4512-24-2
L 26	SK 4512-26-2
L 28	SK 4512-28-2
L 30	SK 4512-30-2
L 32	SK 4512-32-2
L 34	SK 4512-34-2
L 36	SK 4512-36-2
L 38	SK 4512-38-2
L 40	SK 4512-40-2
L 42	SK 4512-42-2
L 45	SK 4512-45-2
L 50	SK 4512-50-2
L 55	SK 4512-55-2
L 60	SK 4512-60-2
L 65	SK 4512-65-2
L 70	SK 4512-70-2
L 75	SK 4512-75-2
L 80	SK 4512-80-2
L 85	SK 4512-85-2
L 90	SK 4512-90-2

**Cortical Sscrew 4.5,
T25, self-tapping**



L 20	SK 4514-20-2*
L 22	SK 4514-22-2*
L 24	SK 4514-24-2*
L 26	SK 4514-26-2*
L 28	SK 4514-28-2*
L 30	SK 4514-30-2
L 32	SK 4514-32-2
L 34	SK 4514-34-2
L 36	SK 4514-36-2
L 38	SK 4514-38-2
L 40	SK 4514-40-2
L 42	SK 4514-42-2*
L 45	SK 4514-45-2
L 50	SK 4514-50-2
L 55	SK 4514-55-2*
L 60	SK 4514-60-2*
L 65	SK 4514-65-2*
L 70	SK 4514-70-2*
L 75	SK 4514-75-2*
L 80	SK 4514-80-2*
L 85	SK 4514-85-2*
L 90	SK 4514-90-2*

* Not included in the set, must be ordered separately

**** Caution:**

Current tray contents do no longer include these screws. Use the part numbers on the screw racks for your order or ask your local sales agent.



Depth gauge for screws ø4.5-6.5, up to L 100

IS 7905-20



Bone spread forceps, L 280

IU 2503-00



Lambotte chisel, 15 mm

IU 3000-15



Lambotte chisel, 20 mm

IU 3000-20



Twist drill ø3.2, L 195, coil 50, quick coupling

IU 7432-30

Twist drill ø3.8, L 200, coil 50, quick coupling

IU 7438-20



Large handle, cannulated, quick coupling

IU 7706-00



Handle with quick coupling, with torque limiter 3.5 Nm

IU 7707-35



Screwdriver, hexagonal, ø3.5 for quick coupling

IU 7835-00



Screwdriver Duo, T25, quick coupling

IU 7835-56



Measuring device for K-wire 2.5, L 200

IU 7925-20



Wedge gauge Osteotomy

IU 7960-00



Angle gauge for closed wedge osteotomy

IU 7970-00



Angle stable locking spacer LOQTEQ® 4.5

IU 7972-00



External alignment device

IU 7973-00



Load drill guide LOQTEQ® 4.5, adjustable up to 2mm

IU 8167-03



Reduction sleeve for K-wire ø2.0

IU 8167-15



Drill guide for round hole LOQTEQ® 4.5, I-ø3.9,3 blue

IU 8167-20



Basic insert for load drill guide, LOQTEQ® 4.5, round hole

IU 8167-45



Aiming device LOQTEQ® HTO plate

IU 8184-01

Fixing screw aiming device LOQTEQ® LFI T25

IU 8176-04



Stop ring for depth measurement, LF

IU 8184-03



Aiming device LOQTEQ® DFO plate, R

IU 8185-01

Aiming device LOQTEQ® DFO plate, L

IU 8185-02

Fixing screw aiming device LOQTEQ® LFI T25

IU 8176-04



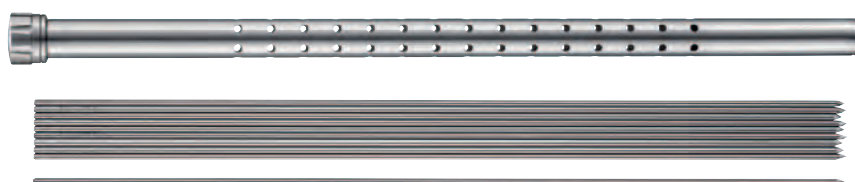
Parallel drill guide for K-wire, ø2.5, narrow, PEEK

IU 8188-25



LOQTEQ® Screw guide sleeve 4.5, blue

IU 8210-45

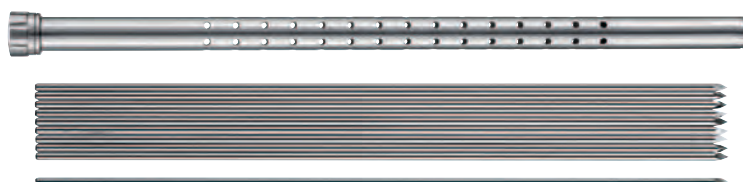


Caddy for K-wire L 250

IC 0006-25

Caddy for K-wire L 250

NK 0020-25



Caddy for K-wire L 200

IC 0006-20

K-wire with trocar point, ø2.5, L 200

NK 0025-20

Unicompartmental lateral gonarthrosis with valgus deformity of the distal femur and pain in the lateral joint

Preoperative



Postoperative



Clinical case and CT images with the kind permission of the Martin-Luther-Krankenhaus Berlin, Germany

Gonarthrosis medial compartment grade 3, tibial malform 10°

Intraoperative



Postoperative



Clinical case and CT images with the kind permission of the Orthopädischen Chirurgie München (OCM), Germany

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