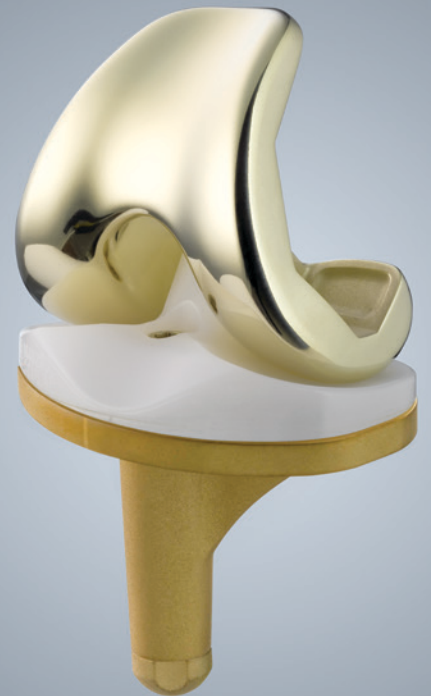


VEGA System[®]

Rx Only

Knee Arthroplasty Surgical Technique



Aesculap Orthopaedics

AESCULAP[®]
Implant Systems

VEGA System[®] Knee System

Surgical Technique

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1. Introduction



The VEGA System® is a posterior-stabilized fixed platform knee endoprosthesis that has been developed to address modern arthroplasty requirements of surgeons and patients from all around the world. An international group of experienced surgeons led by William M. Mihalko, MD, PhD, Professor; and J. R. Hyde, Chair and Director of Biomedical Engineering at the University of Tennessee Campbell Clinic Department of Orthopaedics and Biomedical Engineering; and Khaled J. Saleh, MD, MSc (Epid), FRCS(C), MHCM Emeritus Professor and Chair, Orthopaedic and Rehabilitation Division at Southern Illinois University School of Medicine, Director of Clinical and Translational Research, have collaboratively combined their expertise and knowledge to design the next generation of knee implant systems – the VEGA System.

The VEGA System features the proprietary Advanced Surface Technology and a highly engineered kinematic design, which makes this system a top choice for surgeons and patients alike.

The extensive range of femoral and tibial component sizes allows for over 143 different tibia-femur combinations for ideal gender anatomical matching.

The VEGA System IQ (Intuitive and Quick) instrumentation is designed to streamline the workflow not only for the surgeon, but the entire OR staff, by enhancing ergonomics and operative efficiency. The VEGA System offers multiple options covering different implantation philosophies that allow each surgeon to follow their preferred surgical technique. Precise instruments, quick couplings, ergonomic handles, and color coding are some features that will facilitate a seamless surgical process in the operating room.

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2. Indications for Use and Contraindications

CAUTION: Federal Law (USA) restricts this device to sale by or on the order of a physician. Rx Only



The VEGA System PS is indicated for nearly all patients who are candidates for a primary TKA.

Indications for Use:

The VEGA Knee System is indicated for use in reconstruction of the diseased knee joint caused by osteoarthritis, rheumatoid arthritis, post-traumatic arthritis, the need to revise failed arthroplasties or osteotomies where pain, deformity or dysfunction persist, and for patients suffering from correctable valgus or varus deformity and moderate flexion contracture.

Posterior Stabilized (PS) components are also for absent or non-functioning posterior cruciate ligament and severe anteroposterior instability of the knee joint.

The VEGA Knee System is designed for use with bone cement.

For more information about indications and contraindications, please refer to the instructions for use posted on www.aesculapimplantsystems.com.

Contraindications:

Contraindications include, but are not limited to:

- Joint conditions that can be treated by reconstructive surgery (e.g. osteotomy)
- Acute or chronic infections near the joint, or systemic infections
- Secondary diseases that could influence joint functionality
- Systemic diseases and metabolic disorders
- Severe osteoporosis or osteomalacia
- Severely damaged bone structures that could prevent stable implantation of implant components
- Bone tumors in the region of implant fixation
- Bone malformations, axial misalignments or other bone conditions that rule out implantation of a prosthetic joint
- Predictable overload of the joint implant (e.g. due to adiposity)
- Dependency on pharmaceutical drugs, drug abuse or alcoholism
- Fever, infection or inflammation (systemic or local)
- Pregnancy
- Mental illness
- Severe osteopenia (or any other medical or surgical finding) that would preclude any benefit from the implants
- Combination with implant components from other manufacturers
- Inadequate patient compliance
- Foreign body sensitivity to the implant materials
- All cases not listed under indications

3. Preoperative Planning



For every Total Knee Arthroplasty, careful preoperative X-ray planning is recommended in order to determine precisely the following parameters:

- Varus/Valgus deformity
- Angle between the anatomical and mechanical femoral axes
- Entry point(s) of the intramedullary alignment rods (manual IM technique)
- Joint line level
- Femur resection heights
- Tibia resection heights
- Component sizing
- Implant positioning
- Potential areas of bone losses and location of osteophytes

The following X-ray images are required to conduct the radiographic analysis:

- Knee joint in Anterior/Posterior projection: knee extended, centered over the distal patella
- Knee joint in lateral projection: knee in 30° flexion, centered above the distal patella
- Image of the whole leg (from hip to ankle) in monopodal stance
- Patella-tangential image (Merchant View) with the knee at 30° flexion

The angle between the mechanical and anatomical femur axes is measured with the combination template for axis

measurements. The center of the joint, the joint line and the mechanical femur axis can be measured. To determine the tibia resection, the template showing representations of the tibial components is superimposed over and aligned with the X-ray image. The resection height is given at a 10–20 mm gradation. A complete set of radiographic templates is provided for the preoperative determination of the appropriate implant sizes. The localization of the osteophytes facilitates their removal, improving the mobility of the joint.

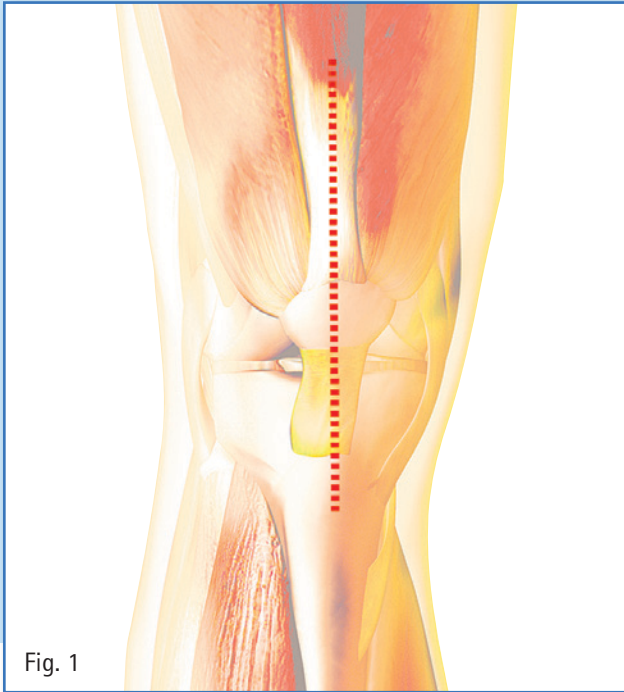
The VEGA System® knee system provides a complete set of radiographic templates.

The results of the preoperative planning should be documented in the patient's file and available during the operative procedure for reference.

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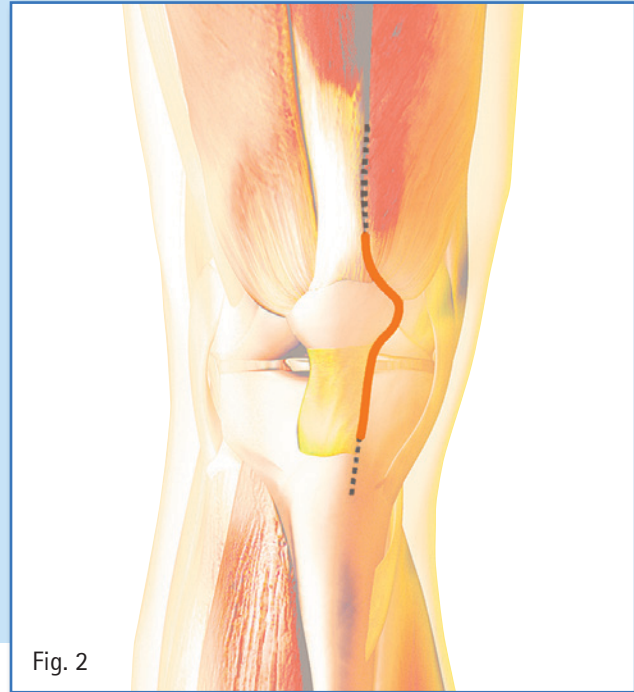
4. Approach



The VEGA System IQ instrumentation is designed for use with or without the OrthoPilot[®] Navigation for both conventional and less invasive approaches to the knee. (Fig. 1)

The initial skin incision is a straight midline or slightly oblique parapatellar skin incision starting 2 to 4 cm proximal to the superior pole of the patella and extending distally to the medial aspect of the tibial tubercle. The surgeon should decide on a patient basis how long of an incision is necessary for proper visualization of the knee anatomy. A parapatellar skin incision is of benefit to patients when attempting to kneel after the operation.

The length range of the incision is generally between 8 and 14 cm symmetrically distributed above and below the joint line. Extension of the skin incision may be necessary during the procedure depending on the patient anatomy, the soft tissues and the skin tension.

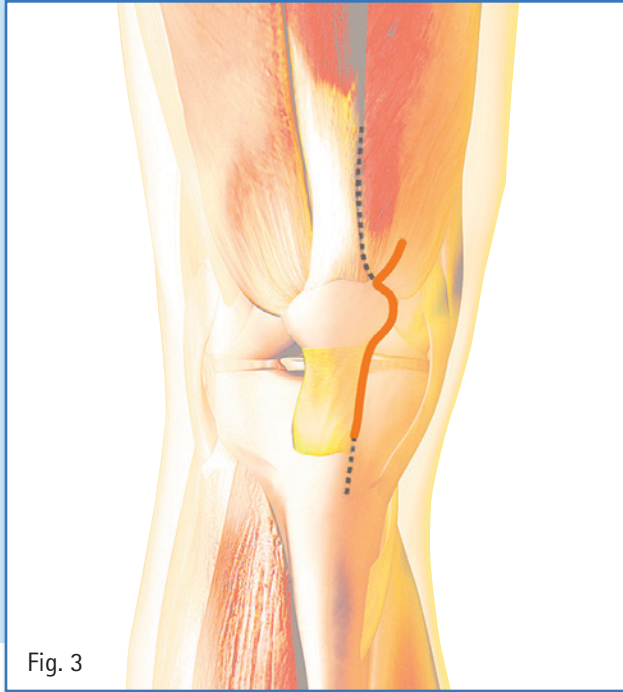


Three basic types of arthrotomies are recommended for use to carry out the intra-articular exposure: the medial parapatellar, the mid-vastus or the sub-vastus.

4.1 Medial Parapatellar Arthrotomy (Fig. 2)

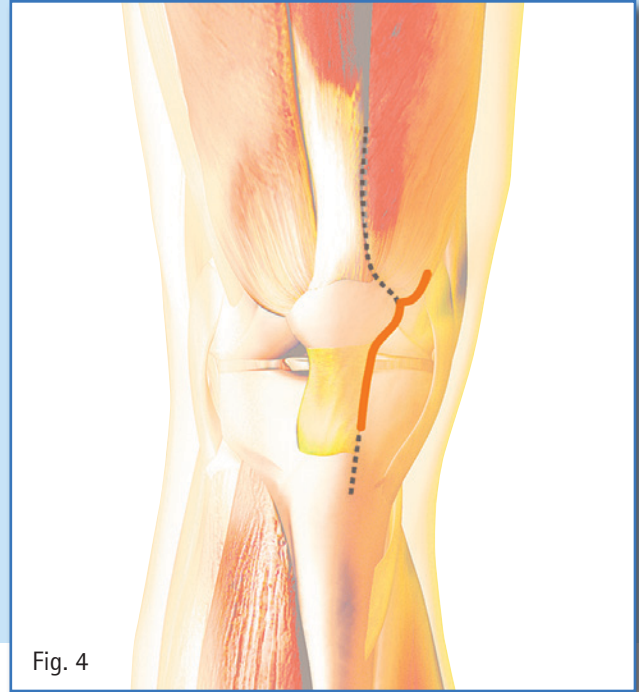
With the knee in flexion or extension, the arthrotomy is performed starting proximal to the superior pole of the patella, incising the rectus femoris tendon longitudinally. Continue the arthrotomy distally around the medial aspect of the patella, and end medial to the tibial tubercle.

4. Approach *(continued)*



4.2 Mid-Vastus Arthrotomy (Fig. 3)

With the knee in flexion, the arthrotomy is performed starting by a split of the fibers from the vastus medialis oblique (VMO), continuing distally around the medial aspect of the patella and ending medial to the tibial tubercle.



4.3 Sub-Vastus Arthrotomy (Fig. 4)

With the knee in flexion, the arthrotomy is performed starting with a 4 to 6 cm incision of the fascia at the inferior border of the VMO, running horizontal to the medial aspect of the patella, continuing and ending distally medial to the tibial tubercle.

4.4 Final Exposure

A fat pad excision is performed in order to facilitate the exposure and to improve the patella mobility. At this time, perform the necessary medial release that corresponds to the deformity. The patella can then be everted or sub-luxated laterally.

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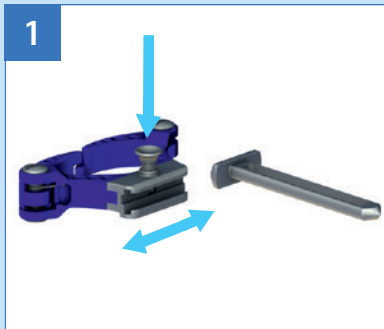
Surgical Technique

5. Instrument Assembly Instructions

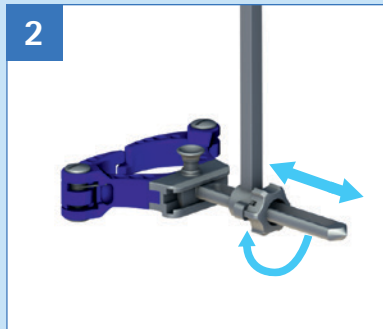


- A** – Tibia Extramedullary Alignment page 9
- B** – Tibia Intramedullary Alignment page 10
- C** – Femur Intramedullary Alignment page 10
- D** – Femur Alignment Block page 11
- E** – Tibial/Distal Cutting Guide page 13

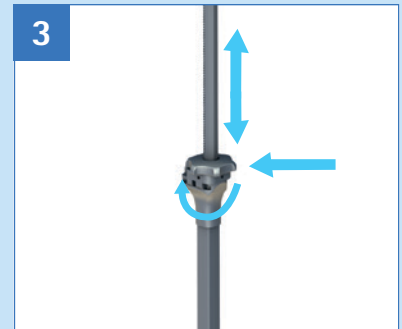
A. Tibia Extramedullary Alignment – Assembly Instructions



- Press the upper button on the bimalleolar clamp.
- Engage the support in the groove.
- When the neutral position is reached, release the button.



- Turn the wheel of the tibial alignment handle to the open position. "OP-EN" will be displayed.
- Engage the handle onto the bimalleolar support.
- Adjust to the neutral position.



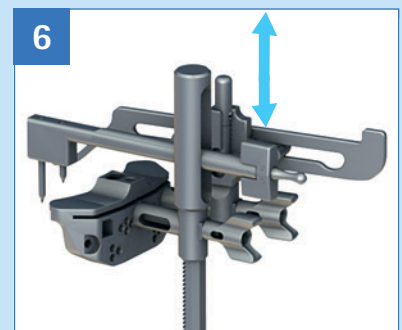
- Push on the adjusting wheel to release the locking mechanism.
- Engage the holding rod in the adjusting wheel.
- Release the wheel when the desired level is reached.
- Turning the wheel will allow micro adjustment to the height.



- Engage the holding rod in one of the connection squares of the tibial cutting guide.
- Lock the assembly by turning the frontal wheel.



- The proximal fixation is set through the proximal opening of the holding rod.
- Turn the tab into a horizontal position to secure the assembly.

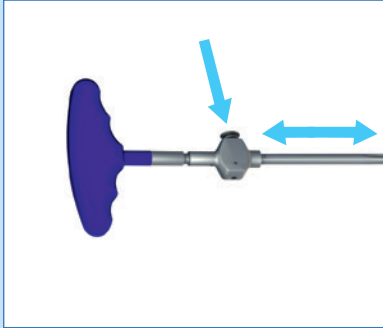


- The connection square of the stylus is engaged in one of the connection squares of the tibial cutting guide.
- The connection is secured by locking the wheel on the stylus.
- The resection height is adjusted to the desired bone cut level.
- The stylus can be placed over the proximal fixation.

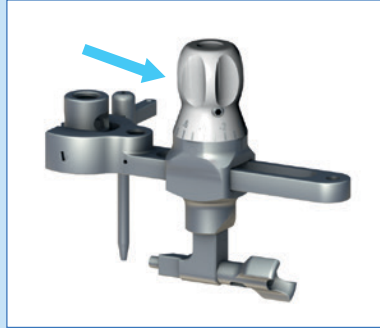
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B. Tibia Intramedullary Alignment Assembly Instructions



- Push on the button of the T-handle to release the locking mechanism.
- Couple the T-handle to the IM rod.
- Release the button to lock the assembly.

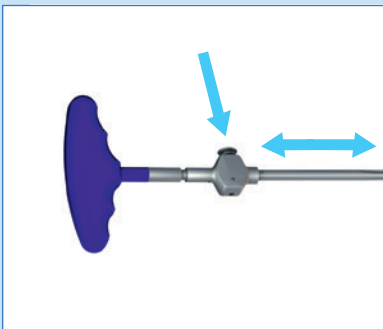


- Choose the IM orientation sleeve corresponding to the desired posterior slope resection of the tibia (default is 0° sleeve; sleeves with 3°, 5° and 7° posterior slope are available).
- Connect the sleeve to the IM alignment system.
- The desired number can be viewed through the window when the bushing is fully engaged.

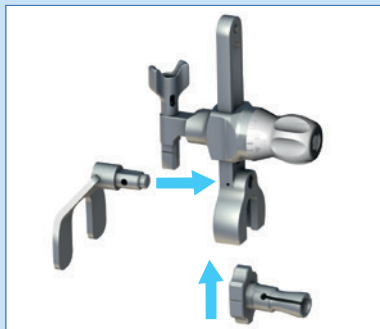


- Mount the assembly into the alignment system.
- Connect the alignment system to the tibia cutting guide in one of the connection squares.
- Tighten the connection by using the locking wheel (locking mechanism).

C. Femur Intramedullary Alignment Assembly Instructions



- Push on the button of the T-handle to release the locking mechanism.
- Couple the T-handle to the IM rod.
- Release the button to lock the assembly.

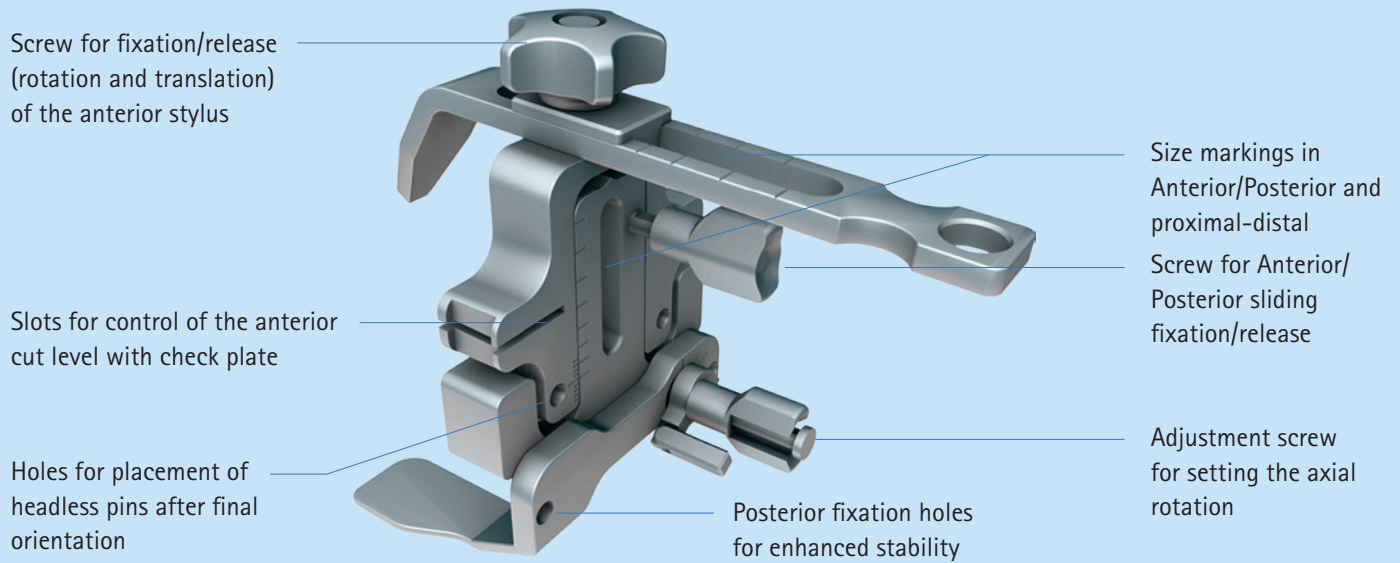


- Choose the IM orientation sleeve corresponding to the desired valgus alignment (standard: 5, 6 or 7°).
- Connect the sleeve to the IM alignment system.
- Connect a distal femur contact plate (small or large).



- Mount the assembly into the alignment system.
- Connect the alignment system to the tibia cutting guide in the central connection square.
- Secure the connection by locking the wheel.

D. Femur Alignment Block Assembly Instructions



- **Option 1:** The rotation is pre-fixed to a desired value before the block is put in place.
- **Option 2:** The rotation is free and the block is placed in contact with the distal femur and the posterior condyles; the rotation can be tuned by turning the posterior wheel and checking the alignment of the Anterior/Posterior window with the femur Anterior/Posterior plane (Whiteside's line).
- Due to the fixed distance between the pin placement holes and the anterior cortex stylus, the placed pins can be used for any femoral size chosen by the surgeon. Oversizing or downsizing the femur is achieved simply by choosing a different 4-in-1 cutting block size and placing on the same previously-placed pins.

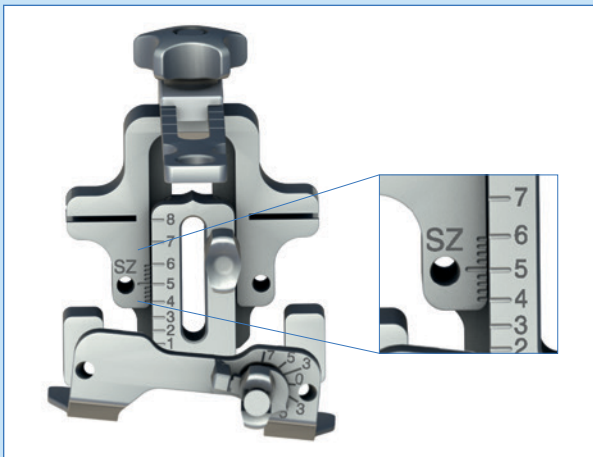
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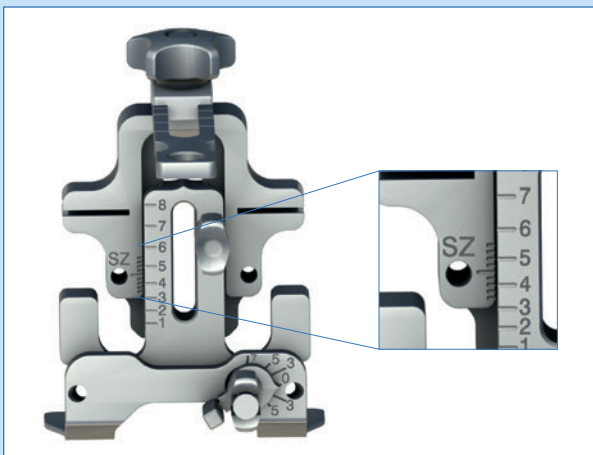
D. Femur Alignment Block *(continued)*



- The anterior point to be palpated is located on the lateral anterior cortex, avoiding the risk of anterior notching.
- If the palpation is done at the middle of the anterior femur, the "grand piano" sign will be bigger, ensuring a larger surface of contact.
- The stylus can be adjusted in the caudal-cranial direction in order to get a congruence between the Anterior/Posterior sizing and the proximal-distal sizing. This is determined by the scale on the upper part of the stylus.



- After defining the right axial rotation of the block, if an exact femoral size is measured (as in the example on the left), fix the Anterior/Posterior sliding by tightening the corresponding screw and placing two headless pins in the placement holes.
- To remove the orientation block loosen the screws, and, if used, remove the posterior enhanced fixation pins.



- After defining the right axial rotation of the block, if the measured size is in between two exact sizes (as in the example on the left), fix the Anterior/Posterior sliding by tightening the corresponding screw and placing two headless pins in the placement holes.
- To remove the orientation block loosen the screws, and, if used, remove the posterior enhanced fixation pins.
- In this case, choose the direct upsize or downsize based on the assessment of the medio-lateral dimension and the flexion-extension gap situation. A smaller size will enlarge the flexion gaps; a bigger size will reduce the flexion gaps.
- Turn the lever clockwise for right knee, counterclockwise for left knee.

E. Tibial/Distal Cutting Guide



Distal resection or tibial resection with a standard approach

- The connection to the alignment system is the central one marked "C", denoted by the green square in the left picture.
- The fixation holes for the headless pins correspond to the groups marked "C", shown by the red circles in the left picture.
- For additional stability, place one or two converging pins in the holes highlighted with the blue circles.



Right knee tibial resection with a less invasive approach

- The connection to the alignment system is the one marked "R", shown by the green square in the left picture.
- The fixation holes for the headless pins correspond to the groups marked "R", shown by the red circles in the left picture.
- For additional stability, place one converging pin in the hole highlighted with the blue circle.



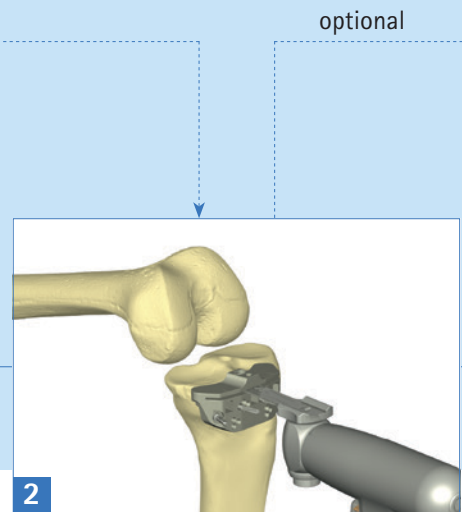
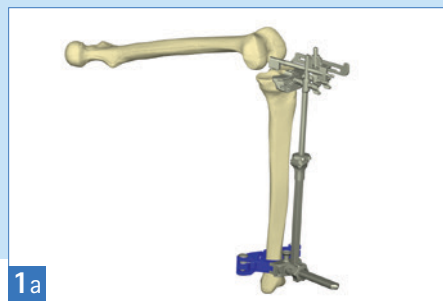
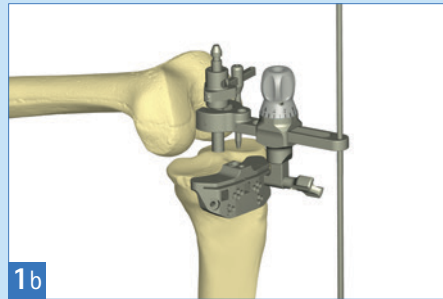
Left knee tibial resection with a less invasive approach

- The connection to the alignment system is the one marked "L", shown by the green square in the left picture.
- The fixation holes for the headless pins correspond to the groups marked "L", shown by the red circles in the left picture.
- For additional stability, place one converging pin in the hole highlighted with the blue circle.

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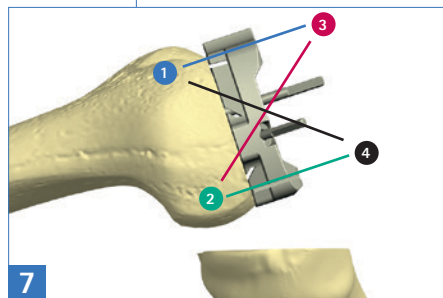
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6. Tibia First Workflow Synopsis

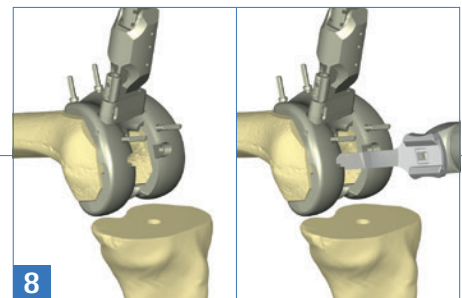


Tibia First

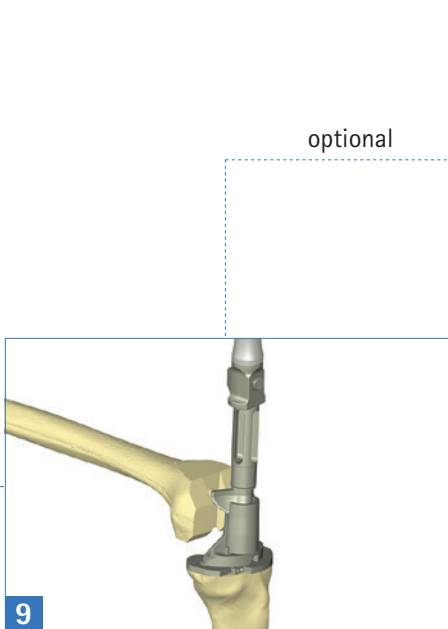
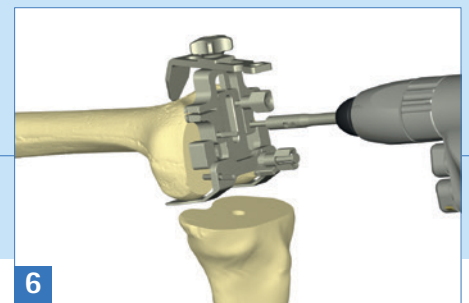
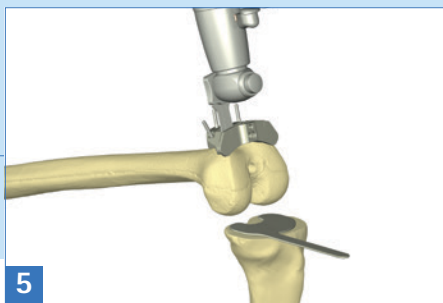
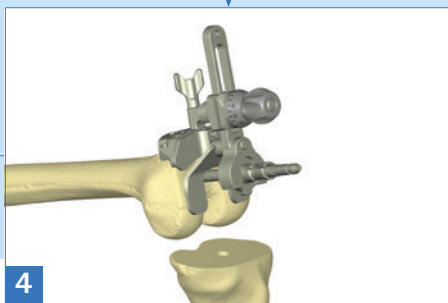
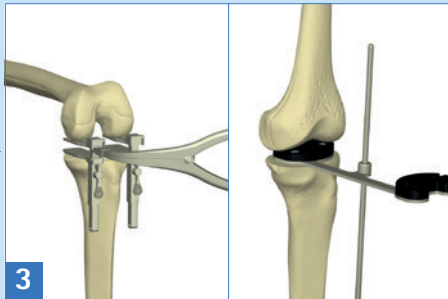
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2. Tibia Resection... page 24
3. Gap Balancing (optional)... page 33
4. Femur IM Alignment... page 25
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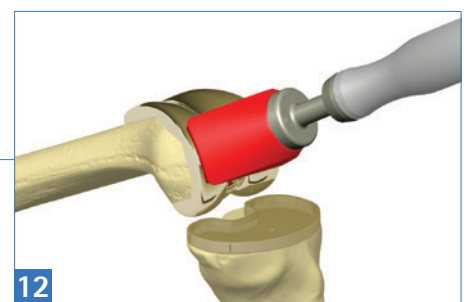
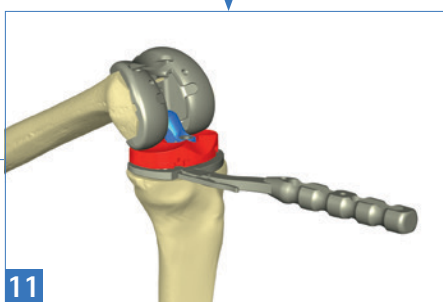
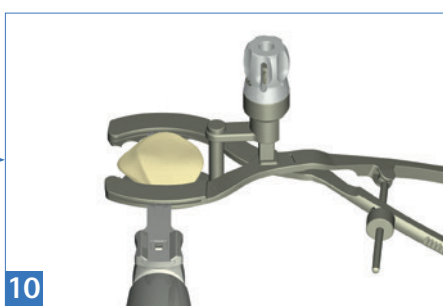
- 1 Anterior
- 2 Posterior
- 3 Posterior Chamfer
- 4 Anterior Chamfer



6. Tibia First Workflow Synopsis *(continued)*



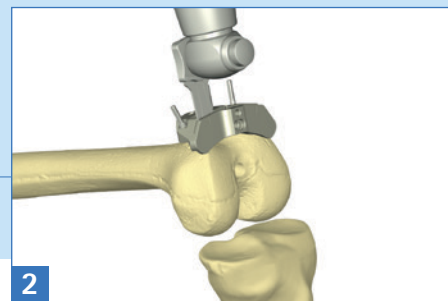
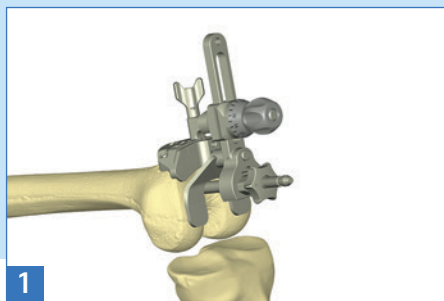
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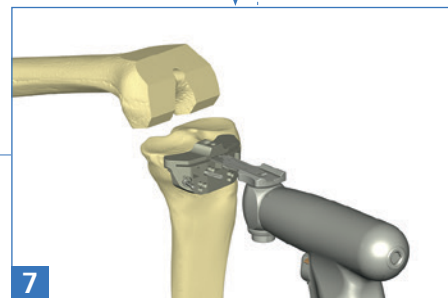
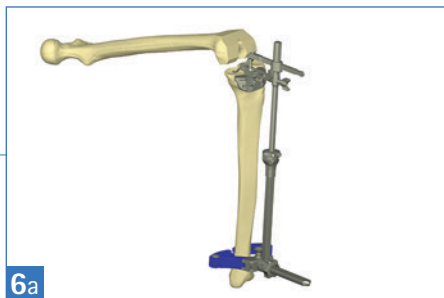
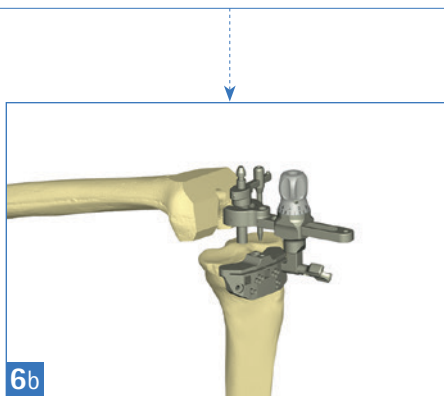
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6. Femur First Workflow Synopsis

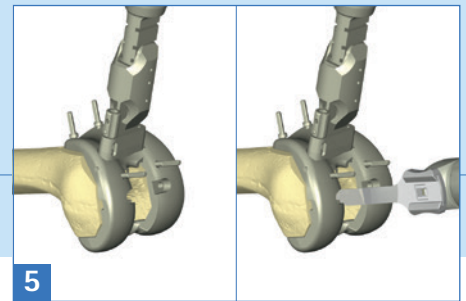
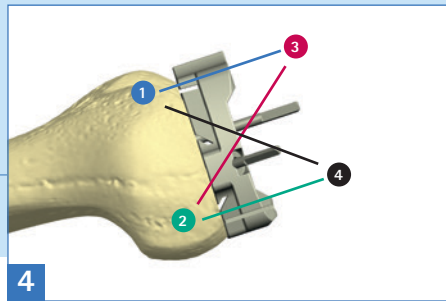
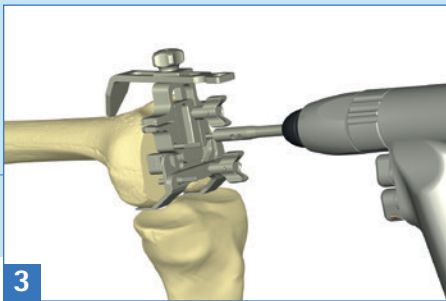


Femur First

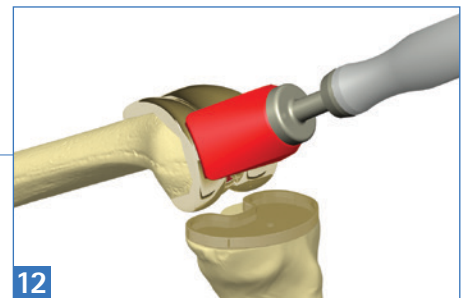
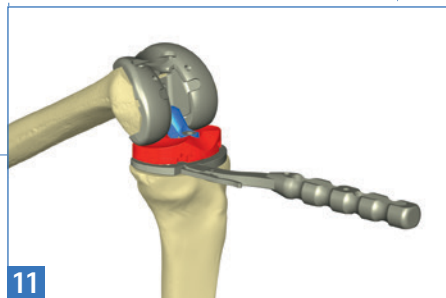
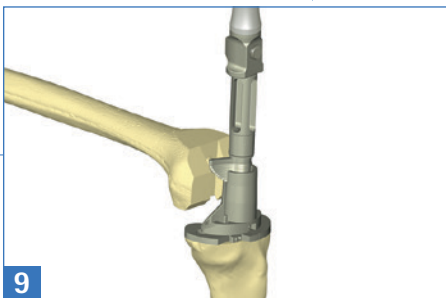
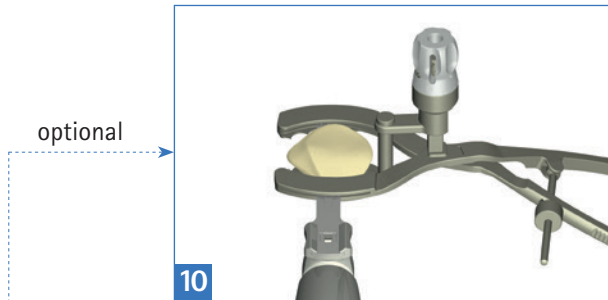
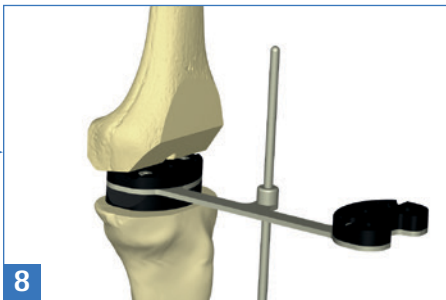
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6. Femur First Workflow Synopsis *(continued)*



- 1 Anterior
- 2 Posterior
- 3 Posterior Chamfer
- 4 Anterior Chamfer



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7. Tibia Preparation

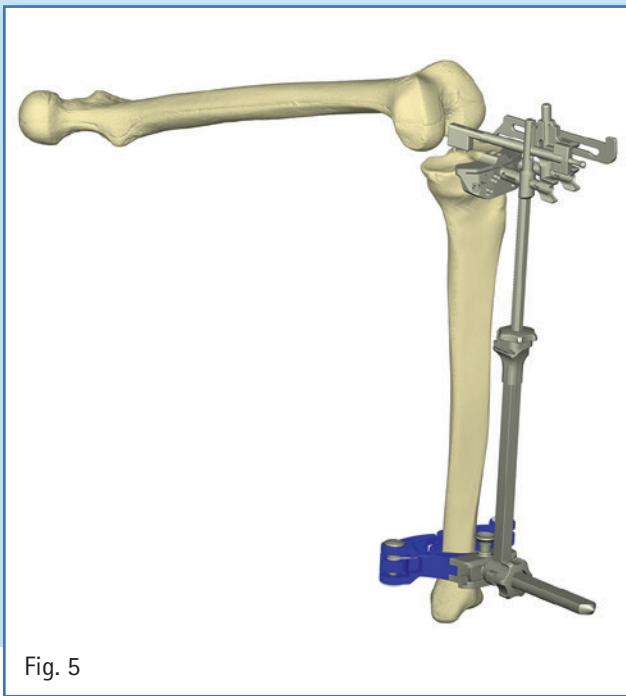


Fig. 5

7.1 Extramedullary Referencing

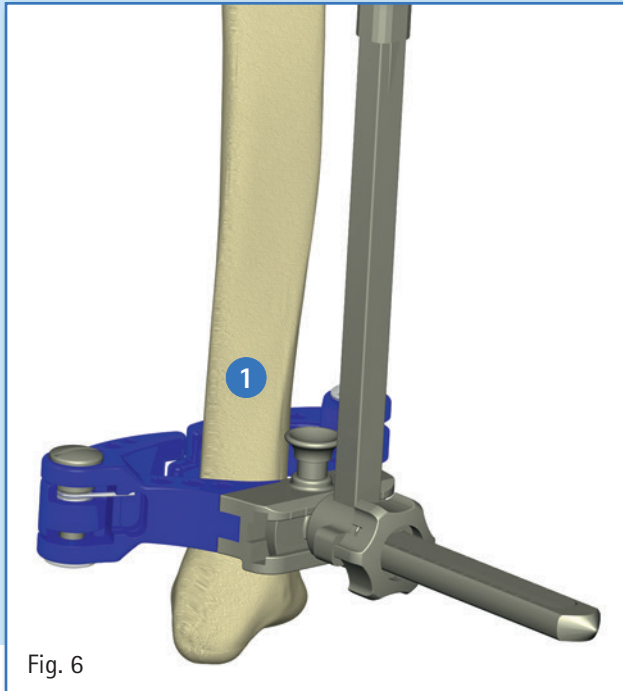
- Place the EM alignment system assembly parallel to the front of the tibia with the leg positioned in flexion.
- The bimalleolar clamp, previously set to neutral is fixed around the lower limb just above the ankle joint and centered on the tibio-tarsian joint.
- Proximally, the EM alignment system can first be stabilized with the proximal fixation by engaging the longest spike between the tibia spines
- When the rotation has been adjusted to the mid-third of the tibial tuberosity and the second toe axis, the second spike can be impacted defining the final tibia rotation.

Note: *If these landmarks are not in line with the mechanical axis of the tibia, the patient's individual anatomy should be used.*



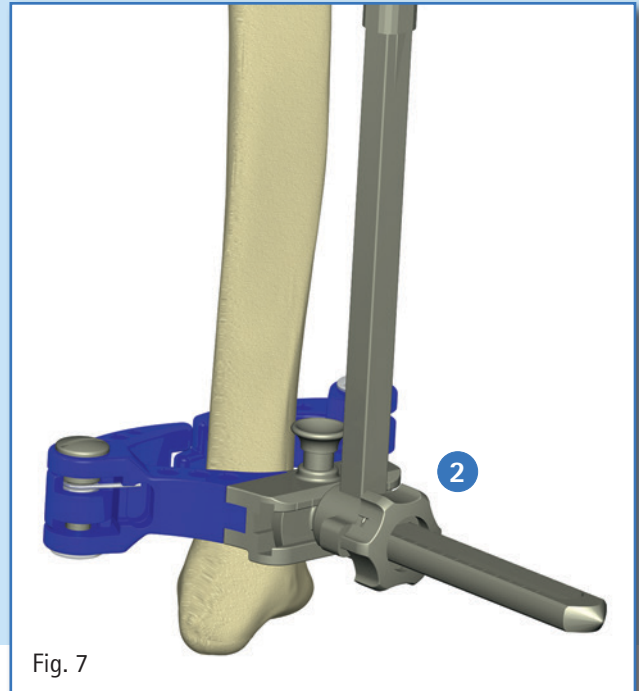
A: Bimalleolar clamp NS345R; B: Bimalleolar clamp support NS344R; C: Alignment system handle NS342R; D: Holding rod for cutting guide NS341R; E: Tibia cutting guide NS334R

7. Tibia Preparation (continued)



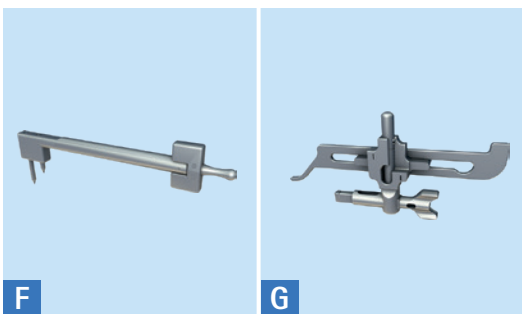
Varus-Valgus Alignment

Push the knob ① at the bimalleolar clamp, and slide the alignment system medially or laterally to adjust the varus/valgus of the proximal tibia resection. The distance between the laser-marked lines on the scale corresponds to a 1° adjustment for a 40 cm long tibia.



Tibia Slope Alignment

By releasing the fixation wheel ② at the bottom part of the alignment system (aligning "OP-EN"), the alignment system can be shifted anteriorly to increase the slope of proximal tibia resection. The distance between the laser-marked lines on the scale corresponds to a 1° adjustment for a 40 cm long tibia.



F: Proximal fixation NS343R; G: Tibia stylus NS347R

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7. Tibia Preparation (continued)

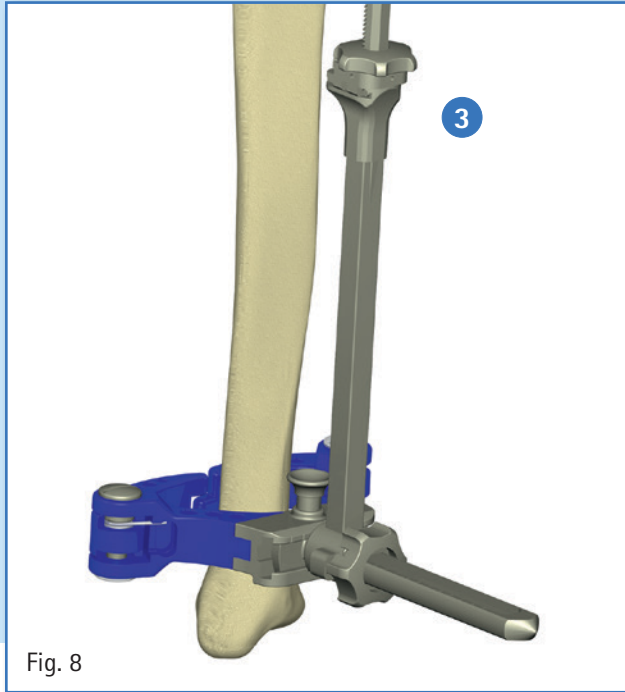


Fig. 8

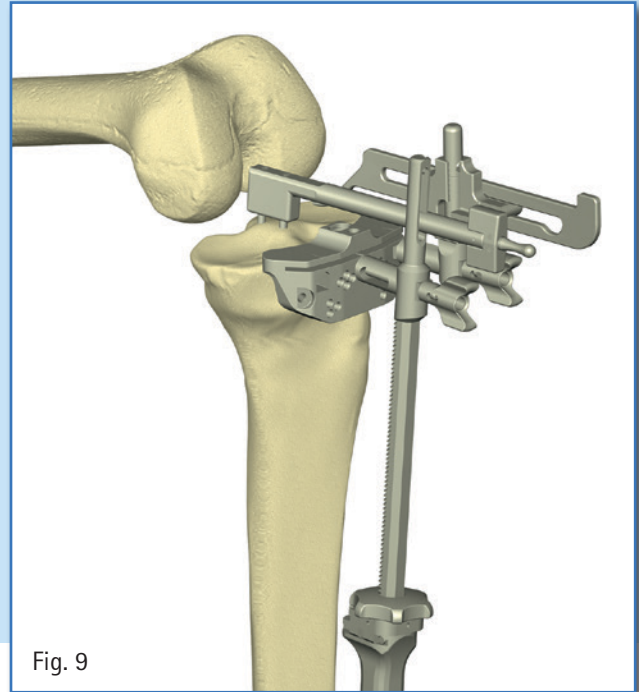


Fig. 9

Height Adjustment ³

- The resection height is determined in preoperative planning. The goal is to remove as much defect on the tibial joint surface to create a surface for the tibia plateau on intact bone for optimal support of the implant.
- The planned value is set on the stylus, which is then mounted into the tibia cutting guide. The extramedullary alignment instrument lower until the stylus comes into contact with the chosen point.
- Referencing the healthy tibia plateau is helpful to determine the level of the joint line. Alternatively, referencing the deepest point of the worn side of the tibia helps to minimize the cut by resecting only 2 mm. Preoperative planning and surgeon preference are used to determine which reference to use.



A: Bimalleolar clamp NS345R; B: Bimalleolar clamp support NS344R; C: Alignment system handle NS342R; D: Holding rod for cutting guide NS341R; E: Tibia cutting guide NS334R

7. Tibia Preparation (continued)

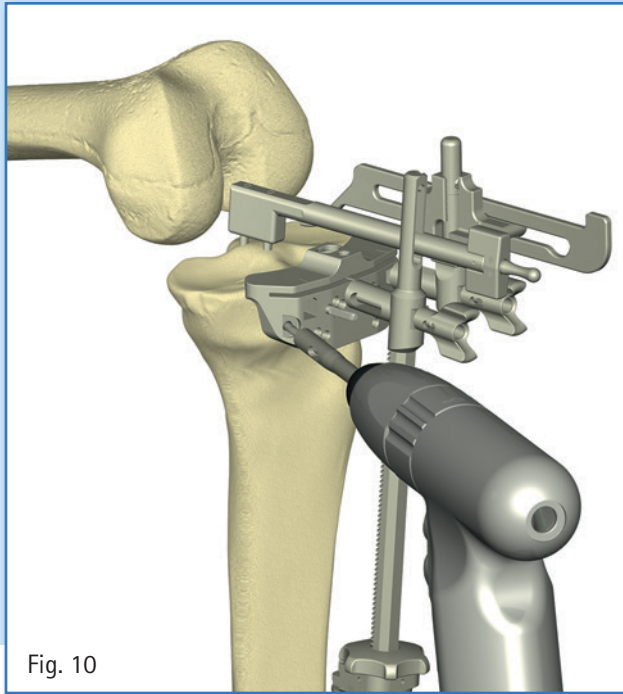


Fig. 10

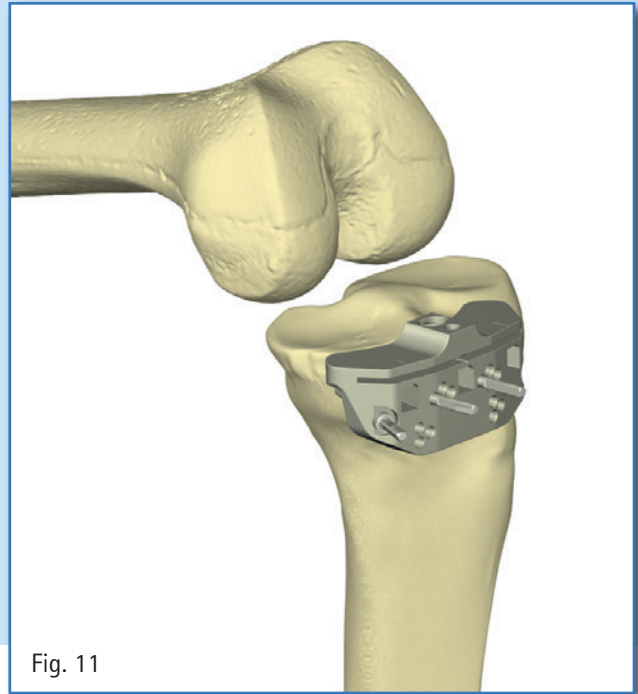
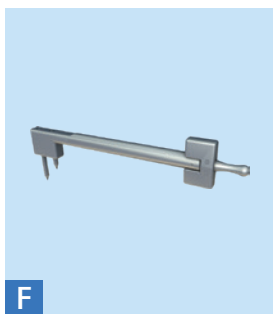


Fig. 11

- The cutting block is fixed with two headless pins in "0" position.
 - The +/-2 mm pinholes are available on the resection blocks to further adjust the resection level if needed.
 - To avoid movements during the resection, additional pins are set in convergent holes as marked.
- After the cutting block is pinned, the EM tibia alignment system is then disconnected. Remove the EM alignment system by turning the connection wheel counterclockwise. The proximal fixation can be removed by disengaging the spike from the tibial spine.



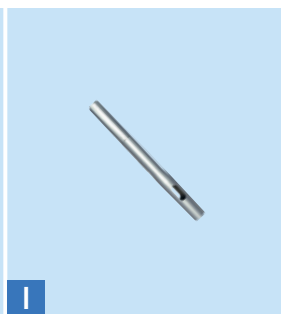
F



G



H



I



J

F: Proximal fixation NS343R; G: Tibia stylus NS347R; H: Headless pins 63 mm NP583R; I: Pin driver NP613R; J: Acculan® drill

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7. Tibia Preparation (continued)

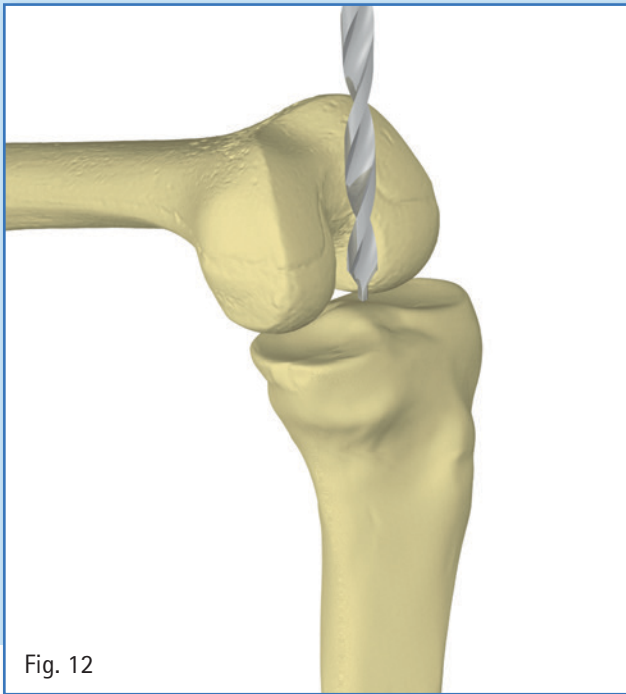


Fig. 12

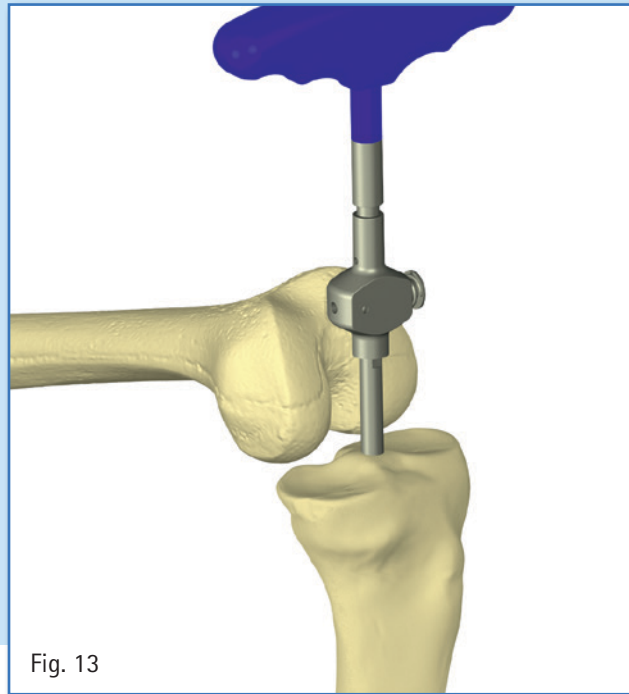


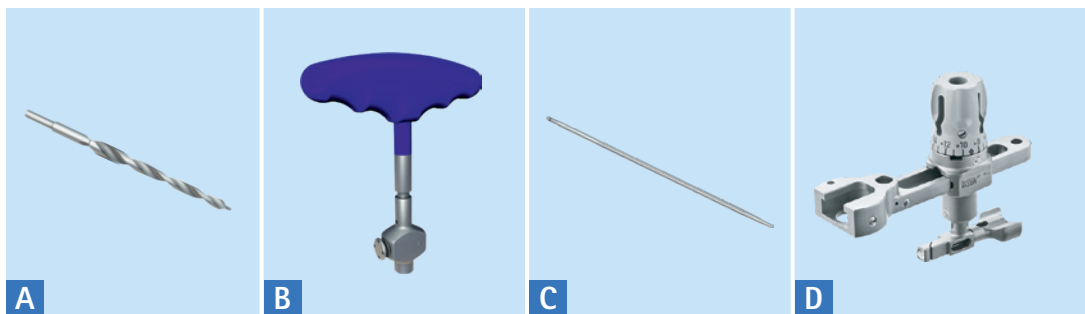
Fig. 13

7.2 Intramedullary Tibia Alignment

- Open the medullary canal of the tibia with the 9 mm diameter drill bit.

Note: Careful attention should be made to the drilling direction to avoid cortical violation of the posterior metaphysis.

- The intramedullary rod is inserted into the prepared canal, after the contents are irrigated and suctioned, with the help of the T-handle.
- Once the T-handle is removed, mount the intramedullary alignment system on the rod with the chosen posterior slope angle sleeve (0, 3, 5 or 7°) and the cutting guide. After the contents are irrigated and suctioned, insert the intramedullary rod into the canal with the help of the T-handle.



A: Drill 9 mm NS330R; B: T-handle NE198R; C: IM alignment rod NS331R; D: IM alignment system NS332R

7. Tibia Preparation (continued)

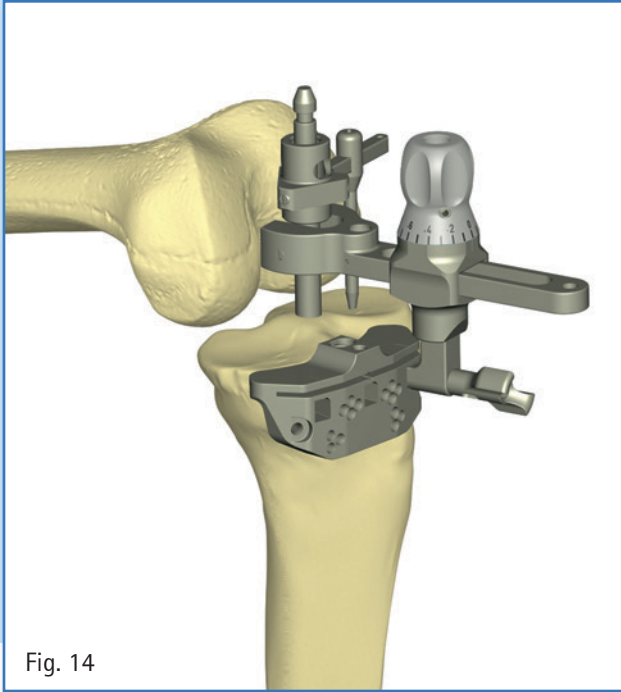


Fig. 14

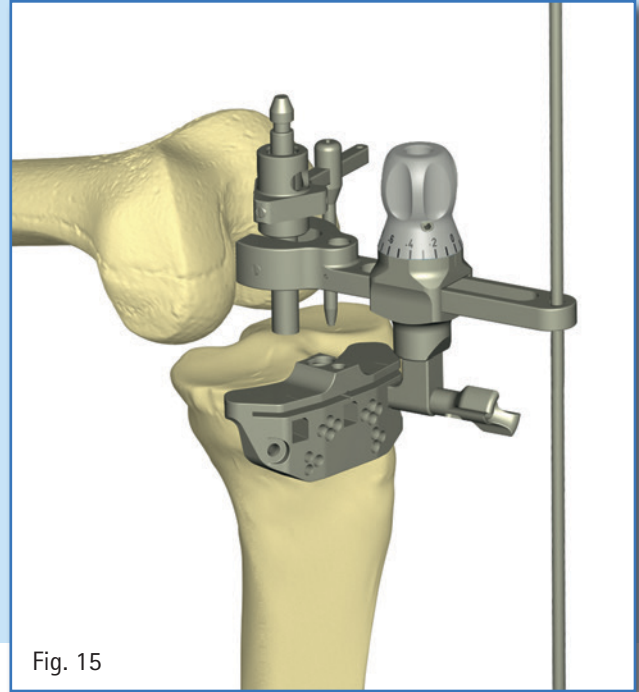
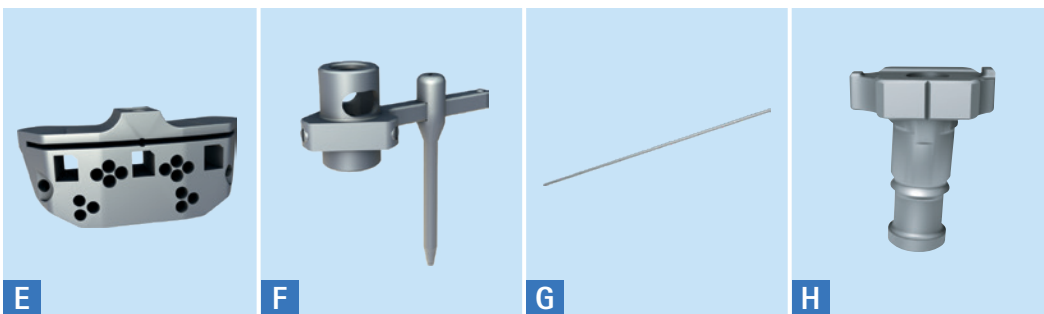


Fig. 15

- Set the stylus on the deepest point on the tibia plateau to define the 0-level cut. Adjust the height of the cut by turning the tuning wheel to the desired amount of resection in millimeters.

- The alignment of the cutting block can be checked with the alignment rod.

Note: Minimum thickness of tibial baseplate with PE (polyethylene) is 10 mm.



E: Tibia cutting guide NS334R; F: Tibia IM stylus for orientation sleeves NS847R; G: Alignment rod long NP471R; H: Orientation sleeve NS843R - NS846R

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7. Tibia Preparation (continued)

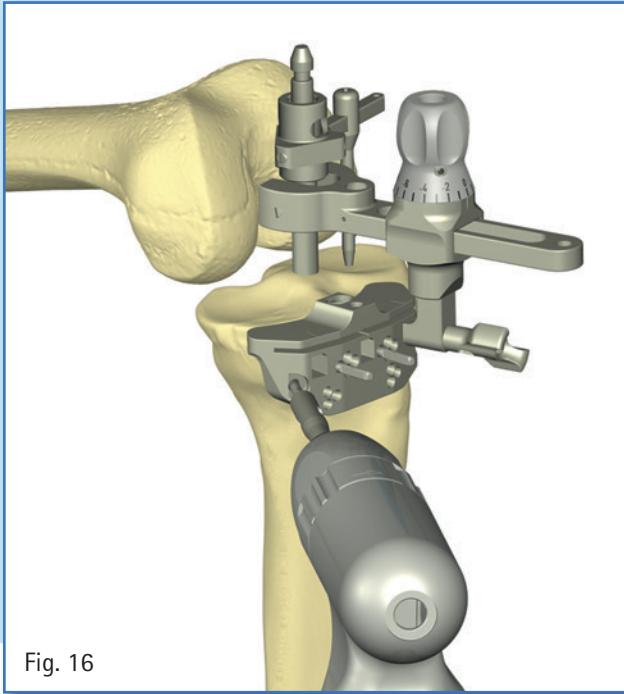


Fig. 16

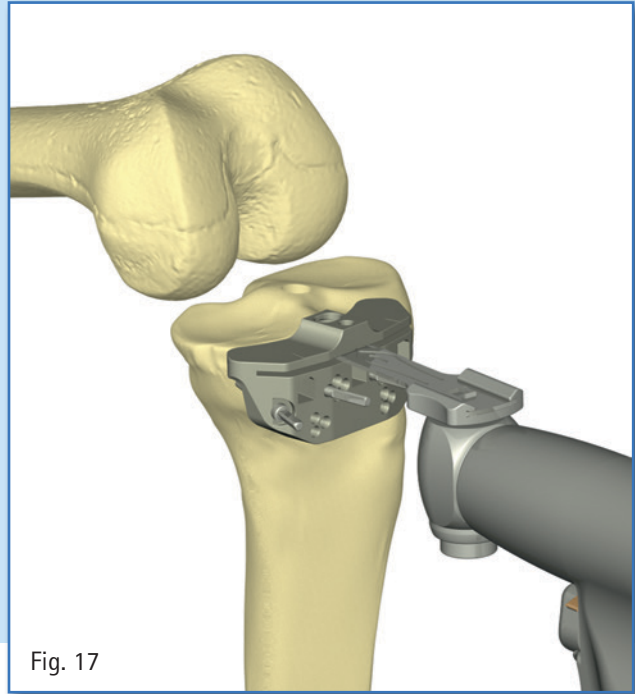


Fig. 17

- The cutting block is fixed with two headless pins in the "0" position. If needed, the +/-2 mm pinholes are available on the resection blocks to further adjust the resection level. To avoid movements during the resection, additional pins are set in convergent holes.
- Remove the IM tibia alignment system using the T-handle. Disengage the cutting block from the alignment system by turning the locking fixation screw counterclockwise.

7.3 Tibia Resection

- Once the cutting block is positioned and fixed, the proximal tibial resection is performed. (See Note)
- After performing the proximal tibial resection, remove the block and take away the resected bone. Carefully inspect the peripheral resection to insure no remaining bone particulate is present. Perform any further removal of meniscal remnants and osteophytes that encroach the posterior capsule.

Note: The protection of the surrounding soft tissue sleeve of the knee joint is important. Use the Hohmann retractors, collaterals retractors and PCL retractor in order to protect soft tissue during the resection.



A: IM alignment rod NS331R; B: IM alignment system NS332R; C: Tibia IM stylus for orientation sleeves NS847R; D: Tibia cutting guide NS334R; E: Headless pins 63 mm NP583R; F: Orientation sleeve NS843R - NS846R

8. Femur Preparation

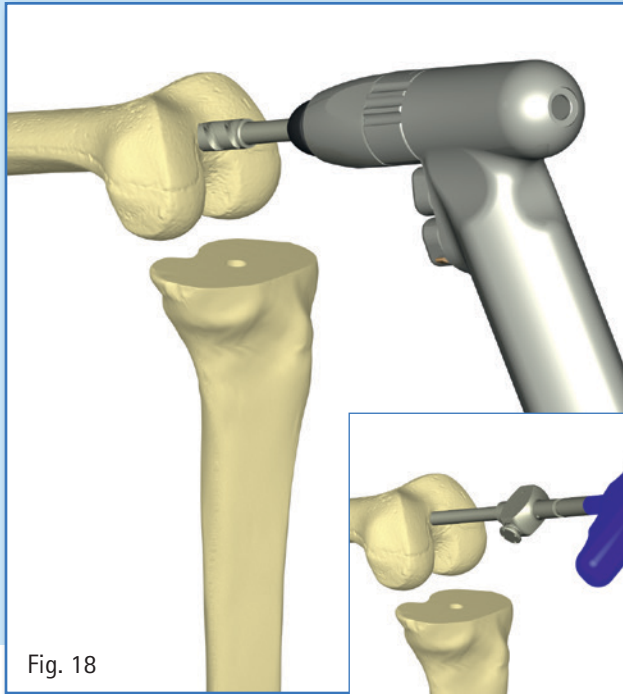


Fig. 18

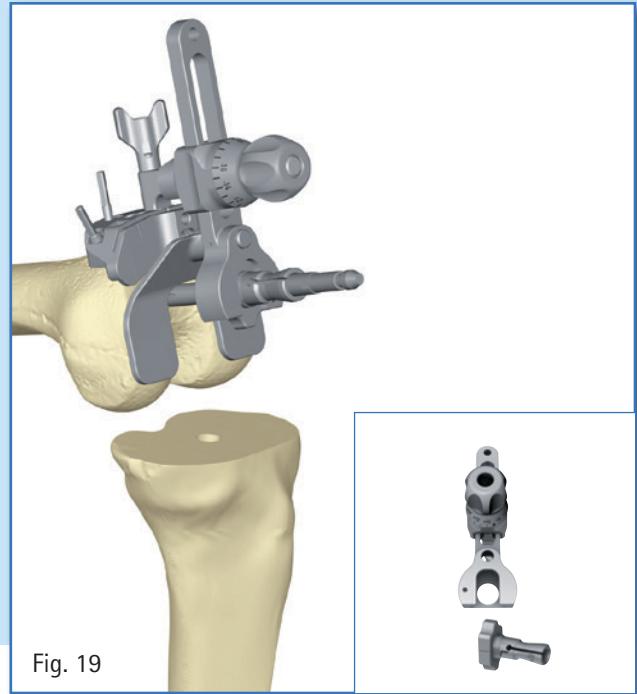
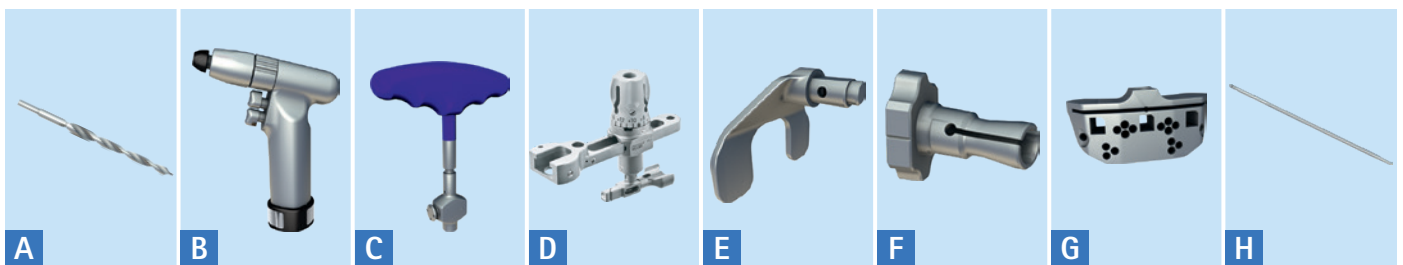


Fig. 19

8.1 Intramedullary Femur Alignment

- Open the medullary canal of the femur according to the preoperative planning (entry point) with the drill 9 mm. Insert the rod into the intramedullary canal using the T-handle. Once the rod is inserted, the T-handle can be removed.
- In order to compensate the anatomical valgus angulation of the femoral bone, set the appropriate angle sleeve 5°, 6° or 7° (according to the preoperative planning) into the intramedullary alignment system. Connect the distal femur contact plate and the cutting block to this system. Place the assembly on the IM rod in contact with at least one distal condyle
- A laser marking on the alignment system shows in which direction the sleeve has to be assembled. For a right leg, the "R" on the sleeve is connected with the laser marking on the alignment system. For a left leg, the "L" on the sleeve is connected with the laser marking.
- Adjust the planned height of the distal resection by turning the wheel until the desired thickness matches the anterior laser marking. The standard resection is 9 mm and corresponds to the distal thickness of the implant.

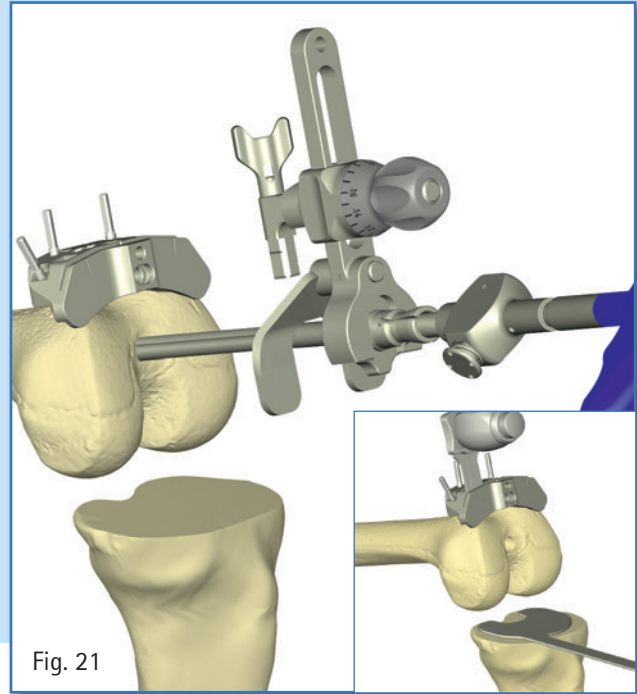
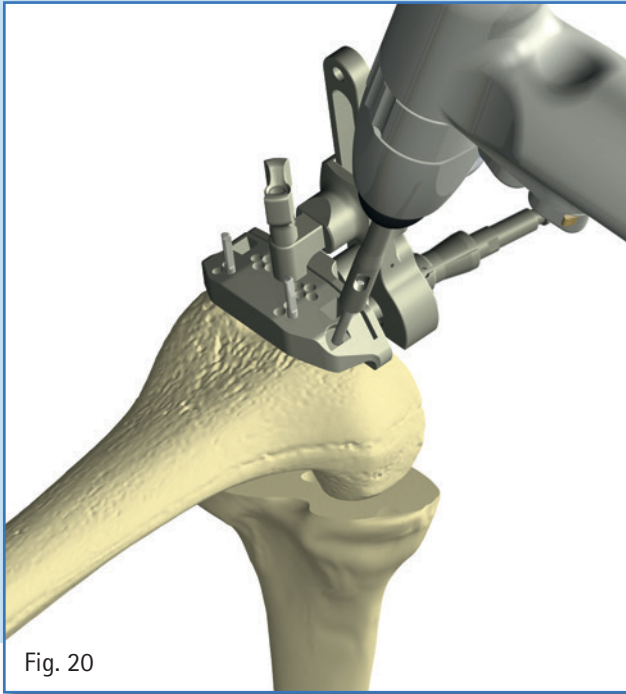


A: Drill 9 mm NS330R; B: Acculan® drill; C: T-handle NE198R; D: Tibia alignment system NS332R; E: Distal femur contact plate NS333R, NS834R, F: Femur orientation sleeve NS335R-NS337R; G: Tibia cutting guide NS334R; H: IM alignment rod NS331R

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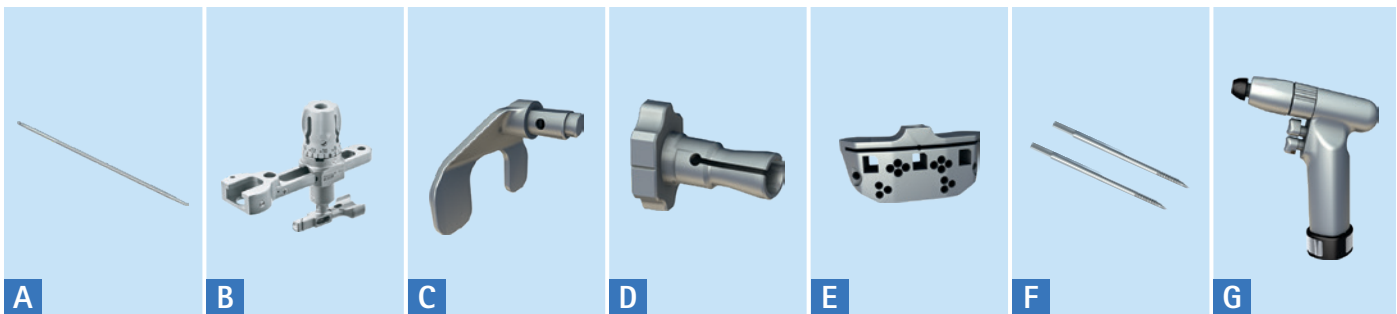
8. Femur Preparation (continued)



8.2 Distal Resection

- The cutting block is fixed with two headless pins in "0" position. To avoid movement during resection, additional pins are set in convergent holes.
- Unlock the connection to the cutting guide, and pull the T-handle to remove the intramedullary alignment system in one step.
- Perform the distal femoral resection by sawing through the slot with a 1.27 mm thick oscillating saw blade. Make sure that the resection is fully complete and that no remaining bone structures are prominent to the resection plane.
- Remove the pins and cutting block.

Caution: Please use Hohmann retractors to protect the lateral soft tissue structures.



A: IM alignment rod NS331R; B: Tibia alignment system NS332R; C: Distal femur contact plate NS333R, NS834R; D: Femur orientation sleeve NS335R-NS337R; E: Tibia cutting guide NS334R; F: Headless pins 63 mm NP583R; G: Acculan[®] drill

8. Femur Preparation *(continued)*

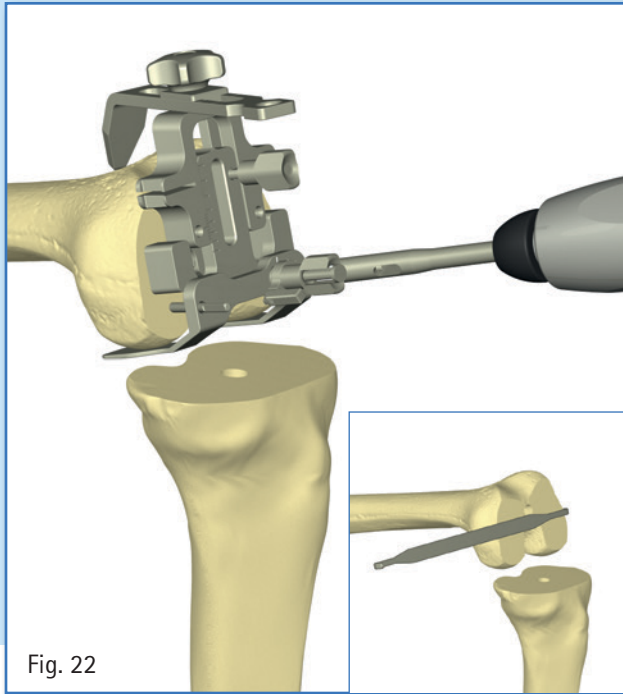


Fig. 22

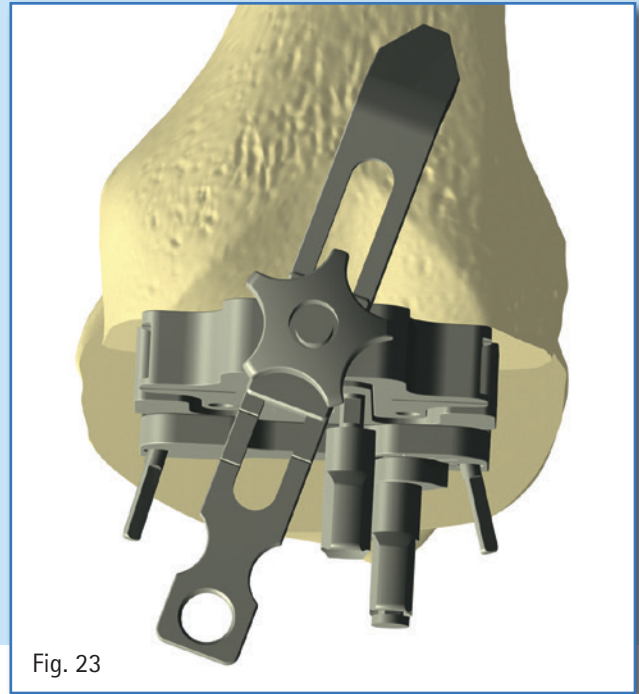
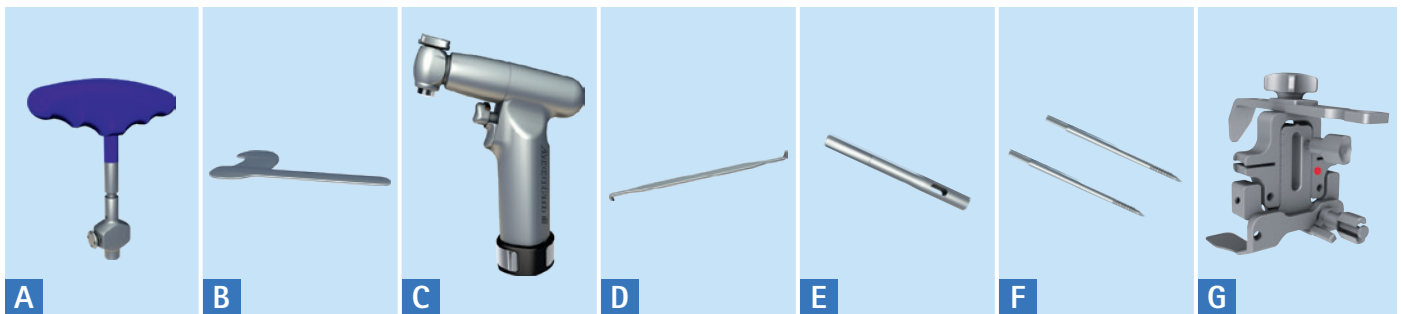


Fig. 23

8.3 Femur AP Sizing and Rotation

- The ML size of the resected femur should be checked with the ML femoral sizing gauge. One side corresponds to standard sizes; the other side corresponds to narrow sizes.
- Place the femur alignment block flush onto the resected distal surface of the femur. The posterior foot plate must be in contact with the posterior condyles. The femoral alignment block is fixed with two headless pins against the distal femur through the posterior holes.
- The femur size is learned by reading the marked size on the scale. Place the stylus tip at the intended exit point of the saw blade on the anterior lateral cortex in order to avoid any notching. A scale on the surface of the stylus indicates the femur size depth. The position can now be fixed by tightening the screw.

Note: For posterior referencing please refer to page 49 for assembly instructions.



A: T-handle NE198R; B: Tibia protection plate NQ377R; C: Acculan® saw; D: ML femoral size gauge NS339R; E: Pin driver NP613R; F: Headless pins 63 mm NP583R; G: Femur alignment block NS340R

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8. Femur Preparation *(continued)*

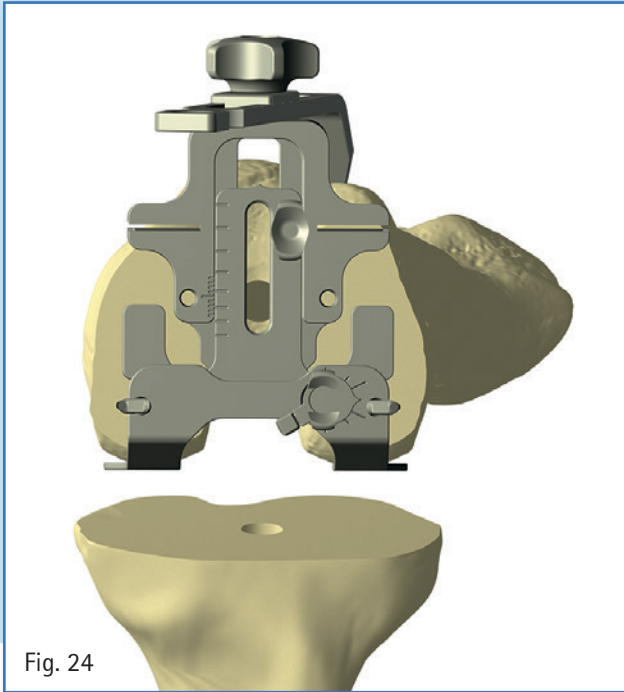


Fig. 24

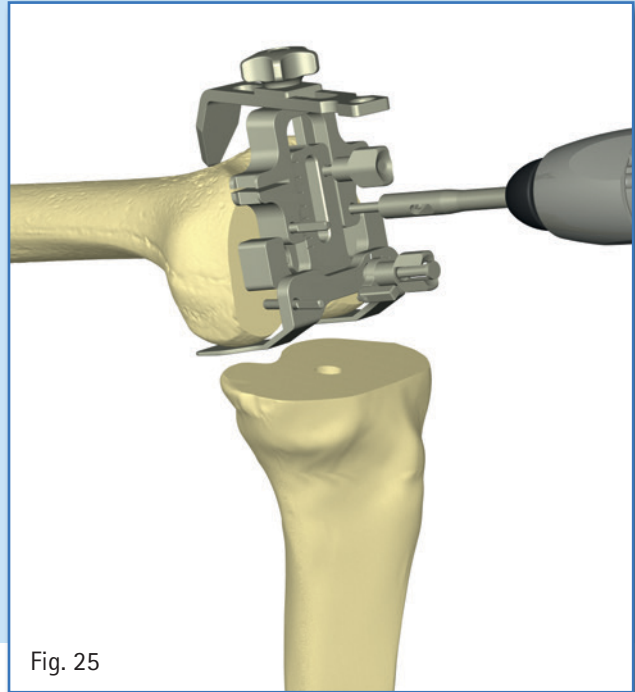


Fig. 25

- Adjust the external rotation by moving the posterior lever arm. The key is moved clockwise for right knees and counterclockwise for left knees. Confirm the rotational position by assessing the trans-epicondylar axis perpendicularity or by checking the Whiteside's line through the slot at the middle of the instrument. Fix size and rotation by tightening the screw at the bottom lever arm.
- Two long headless pins are fixed through the two frontal holes in order to reference the position of the 4-in-1 cutting guide. It is recommended to check the level of the anterior resection by using the check plate in the alignment block slots. Use the scale on the alignment block to determine the size. (see section 5 handling instructions).
- Remove the posterior pins and the block, leaving the headless pins in the two frontal holes.



A



B



C



D

A: Femur alignment block NS340R; B: Headless pins 63 mm NP583R; C: Pin driver NP613R; D: Acculan[®] drill

8. Femur Preparation (continued)

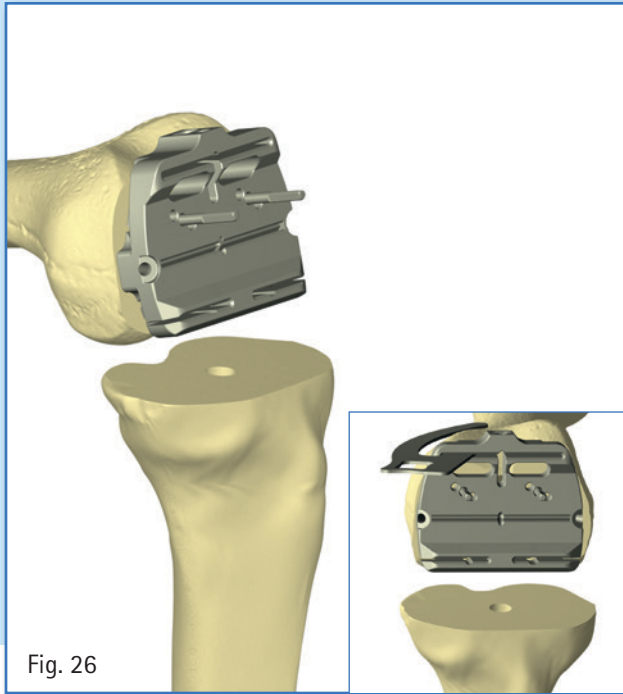


Fig. 26

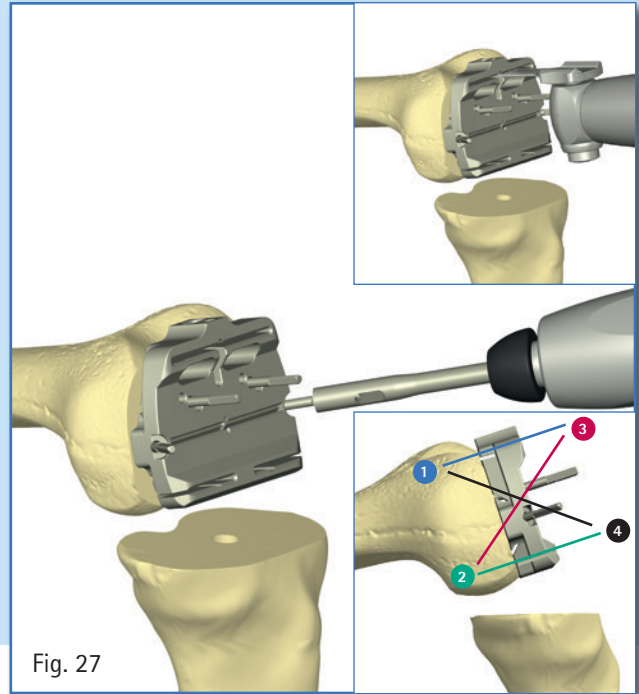
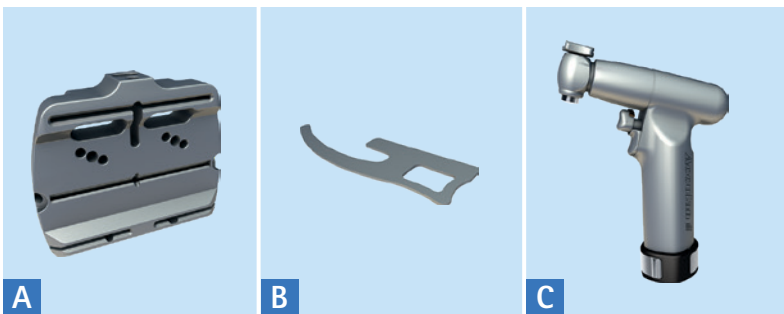


Fig. 27

8.4 Femur Anterior, Posterior and Chamfer Resections

- Place the 4-in-1 cutting guide that matches the chosen femur size over the two headless pins into the marked "0" mm pinhole and press onto the distal resection. Before placing the converging headed pins for fixation check the level of the anterior resection by using the check plate in the alignment block slots.
- You can adjust the AP position by using the holes marked +/- 2 mm, prior to fixating the guide with convergent pins.
- Perform the resections as follows: ① anterior cut, ② posterior cut, removal of sizing pins, ③ posterior chamfer, ④ anterior chamfer. By doing this, the maximum distal contact surface and cutting block fixation is maintained up to the last resection, thereby ensuring stability.
- Remove the convergent pins and cutting guide, and carefully check the resections in order to detect any remaining bone stock.

Note: It is important to remain as close to the anterior cortex as possible without notching it.



A: 4-in-1 femur cutting guide NS321R-NS328R; B: Cutting depth check blade NS850R; C: Acculan® saw

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8. Femur Preparation (continued)

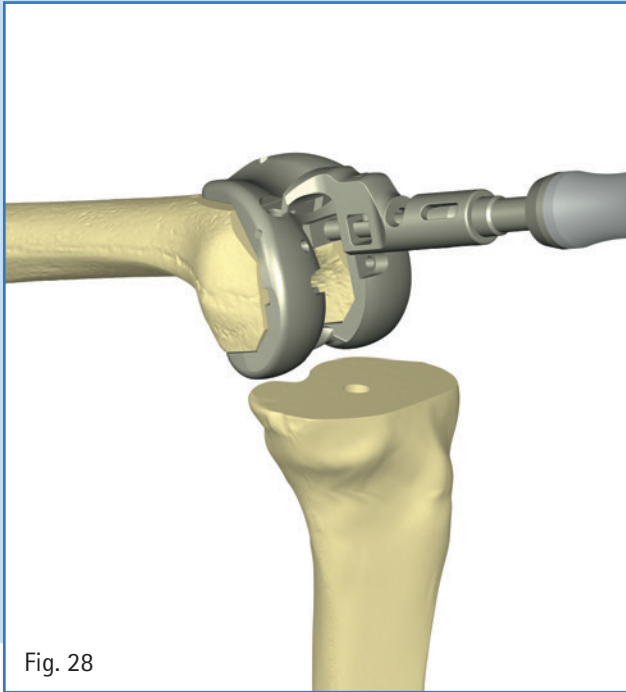


Fig. 28

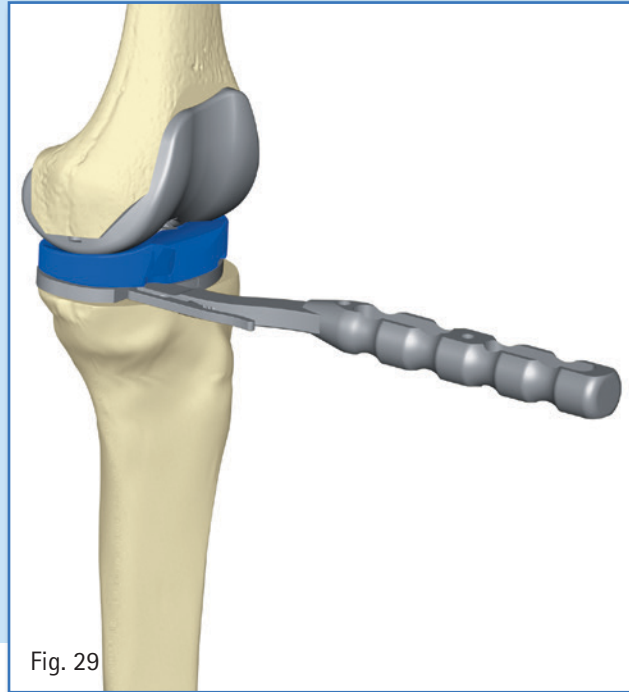


Fig. 29

- Assess the quality of the resections and the fit of the prosthesis by placing the femur trial implant onto the bone preparation. Using the corresponding holder, make sure to apply an extension force anteriorly in order to avoid a flexed position.

Downsize with 4-in-1 Cutting Guide

To downsize the femur, place a smaller 4-in-1 cutting guide directly onto the same anterior headless pins using the same holes previously used (-2/0/+2 mm). Since the reference is anterior, you will achieve the same anterior cut but will recut the posterior condyles, the posterior chamfer, and the anterior chamfer. This will open your posterior gaps correspondingly.

Downsize with the Femoral Trial

When the frontal headless pins have been removed, it is possible to downsize the femur as follows:

- Place the right trial femur onto the bone preparation,
- Replace the two headless pins in the frontal holes.
- Remove the femur trial. Since the position of the holes between the trial femurs and the 4-in-1 cutting guides match perfectly, you can then place a smaller guide onto the pins and recut the femur.



A: Trial femur insertion instrument NS371R; B: Trial femur NS301RM-NS308RM, NS311RM-NS318RM; C: Tibia trial/preparation plateau NS349R-NS359R; D: Tibia trial/prep. plateau holder NQ378R; E: Trial gliding surface NS270-272, NS275-277, NS280-282, NS285-287, NS290-292, NS295-297

8. Femur Preparation (continued)

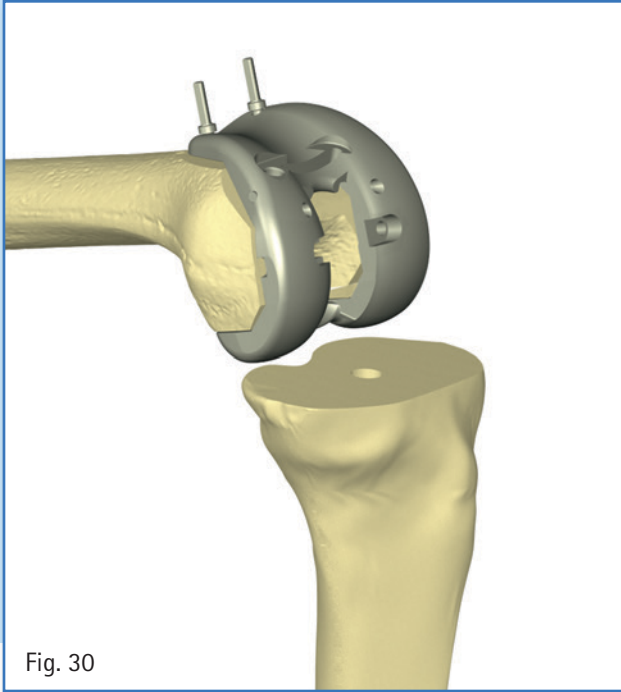


Fig. 30

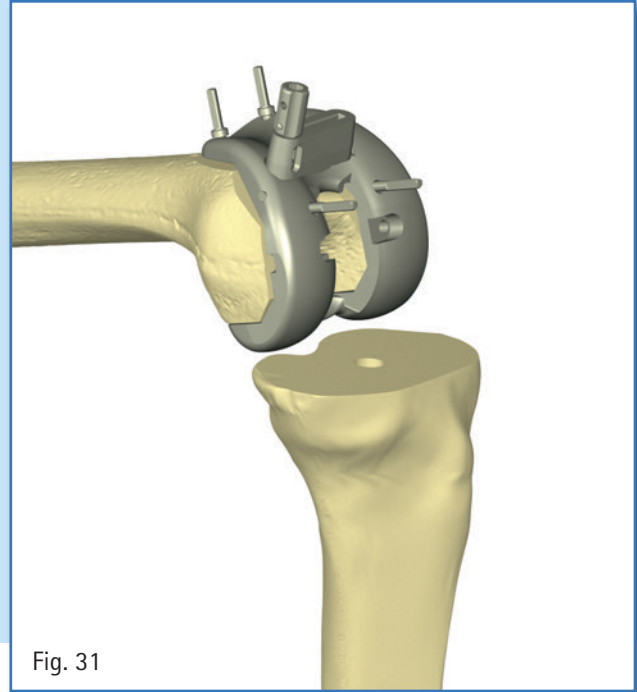


Fig. 31

8.5 PS Box Preparation

- Place the trial femur implant onto the prepared femur using the corresponding holder. Make sure to apply an extension force anteriorly in order to avoid a flexed position. The trial femur implant is fixed along the proximal trochlear groove with two headed pins. Place the box chisel guide for the box resection and screw onto the femur trial.
- For additional fixation, use two long headless pins in the frontal holes on the distal section of the femur trial.
- The box preparation can be performed using the box chisel through the slot.
- It can also be achieved with the help of a reciprocating saw (GC769R or GC771R for Acculan® 3Ti) or an oscillating saw with a 9 mm width blade (GE231SU for Acculan® 3Ti).

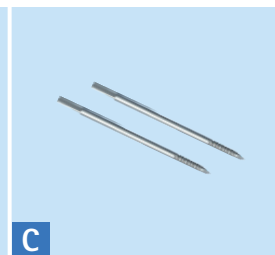
Note: The position of the frontal pin holes corresponds exactly to the holes on the orientation block (see section 8.3) and APC cutting guide (see section 8.4). These holes allow quick repositioning of block for downsizing.



A



B



C



D



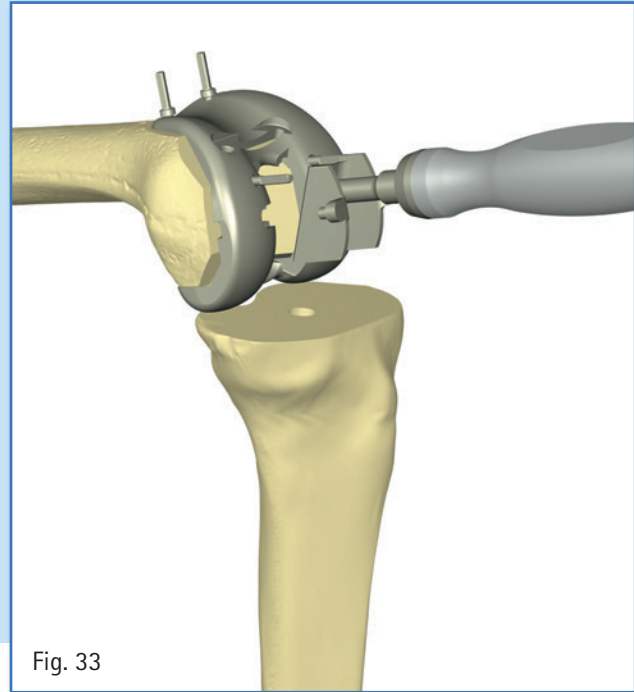
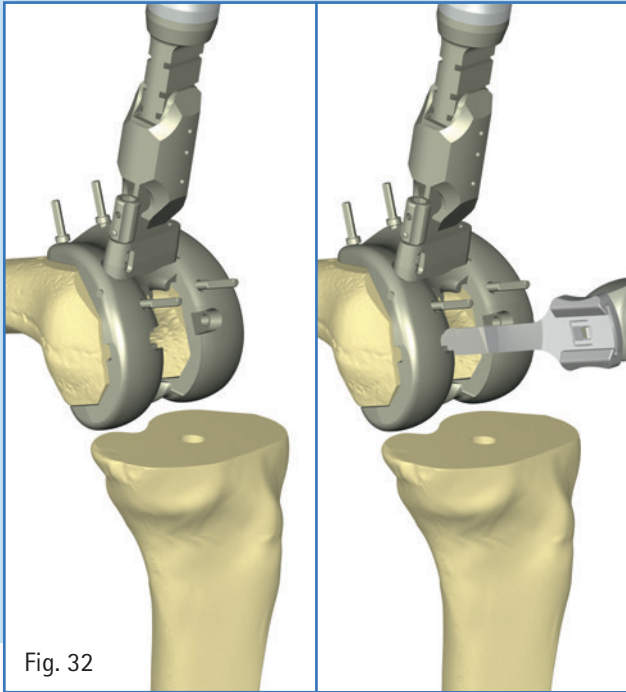
E

A: Headed pins 50 mm NP586R; B: Pin driver NP613R; C: Headless pins 63 mm NP583R; D: Femur box chisel guide NS367R; E: Acculan® drill,

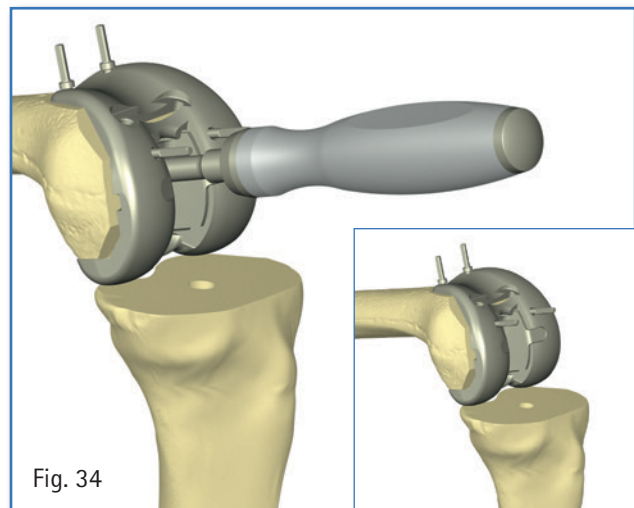
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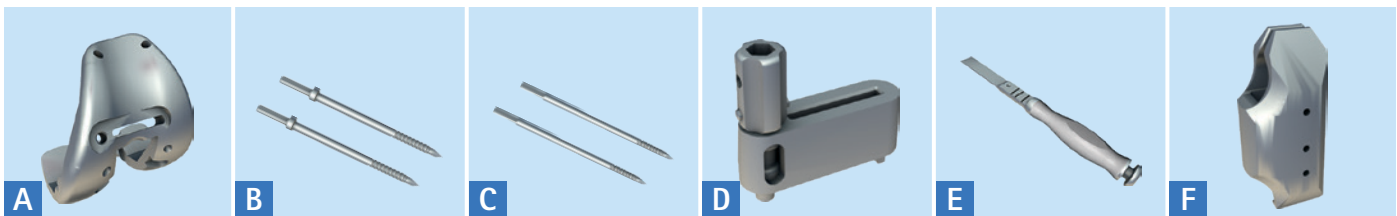
8. Femur Preparation (continued)



- When using the box chisel, the chisel stop must be placed in the slot that corresponds to the size of the femur. This will avoid violation of the posterior capsule by stopping the chisel at the respective depth.
- The medial and lateral inner box wall cuts are performed with a saw blade with the chisel left in place, so that it will stop the saw blade at the appropriate depth.
- After the box preparation, the trial box can be engaged onto the trial femur, referencing the corresponding side guiding ears. If the ears are prominent and not flush with the trial femur articular geometry, then the box cuts must be reworked. Assess the box preparation area for residual bone until the ears are flush with the trial.



- Pins are removed when the trial femur implant is removed or when the knee is trialed for range of motion and stability.



A: Trial femur NS301RM-NS308RM, NS311RM-NS318RM; B: Headed pins 50 mm NP586R; C: Headless pins 63 mm NP583R; D: Femur box chisel guide NS367R; E: Femur box chisel NS368R; F: Femur box chisel stop NS369R

9. Gap Balancing – Tibia First

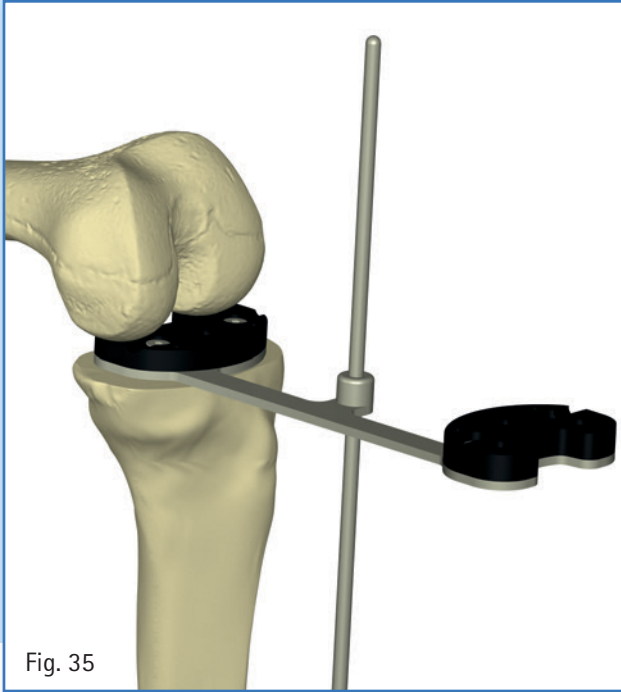


Fig. 35

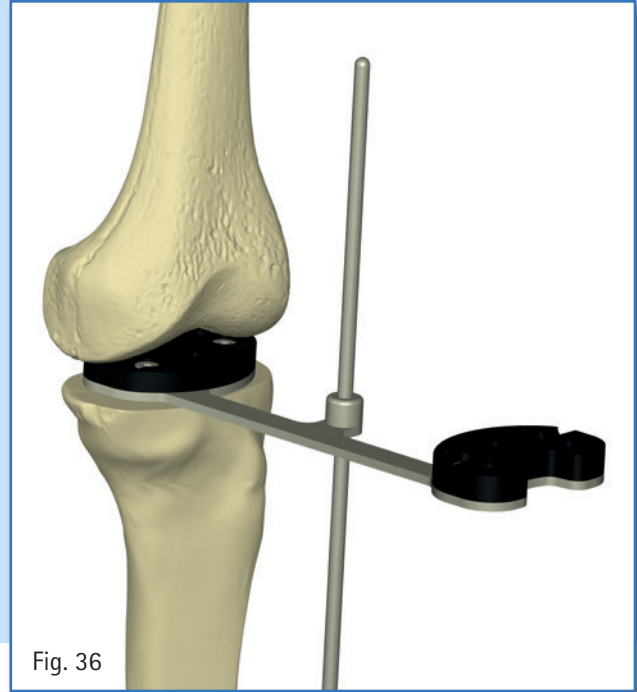


Fig. 36

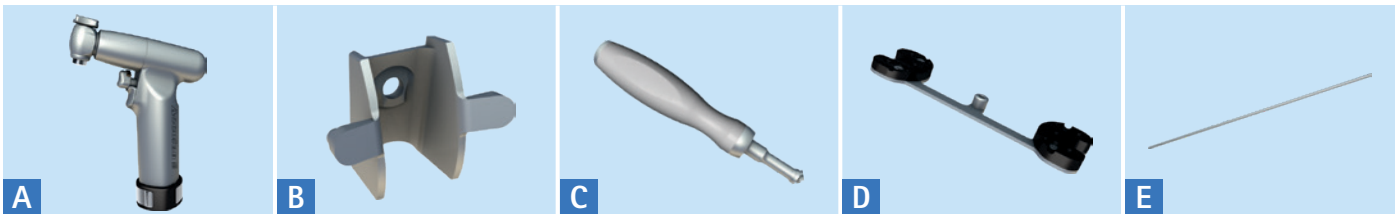
9.1 Tibia First – Measurement with Spacers

- After performing the tibia resection, check the plane of the resection by inserting the thinnest spacer block (10 mm) in the joint. If the resection needs to be corrected, apply the cutting block accordingly and recut the proximal tibia. The soft tissue gaps can be assessed by applying a varus/valgus stress in extension and in flexion. If the joint is too loose, insert the next spacer and repeat the operation until a spacer thickness allows the knee to reach a stable point in flexion and extension.

Note: The PCL must be released and removed prior to assessing gaps in flexion and extension since it will increase the flexion gaps once removed.

- If the medial and lateral gaps are asymmetrical, it is necessary to perform the appropriate release on the contracted side and then repeat the gap measurements with the spacers until stability is reached.

- If the flexion and extension gaps are incongruent, please refer to section 9.4 strategies and define the appropriate corrective action.
- The thickness of the last spacer that allows good balance and stability of the knee corresponds to the polyethylene thickness that should be used.
- At each step, the leg axis can be checked by inserting the alignment rod through the spacer handle. The rod should point respectively at the femoral head center and the ankle joint center.
- The measurements can also be done after the distal resection is performed by adding the distal cut spacer for the extension measurement.



A: Acculan® saw; B: Trial femur box NS821R-NS828R; C: Femur box holder/extractor NS428R; D: Tibia cut spacer NS852R-NS854R; E: Alignment rod long NP471R

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9. Gap Balancing – Tibia First *(continued)*

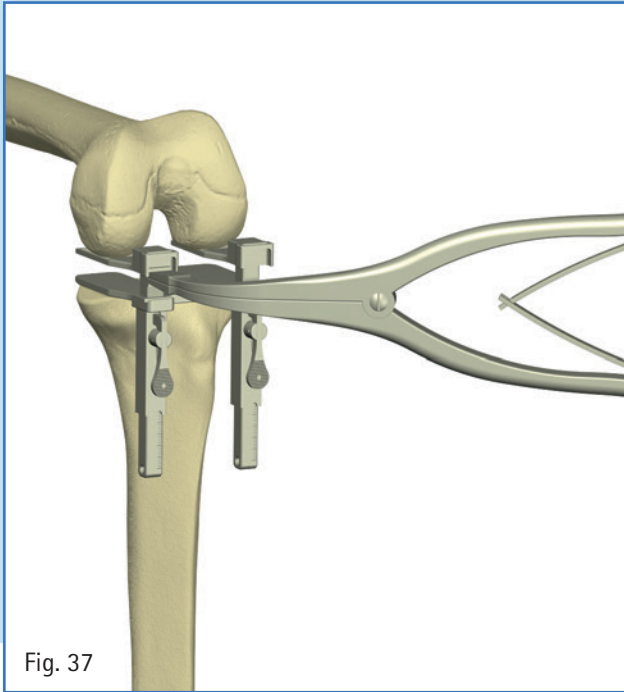


Fig. 37

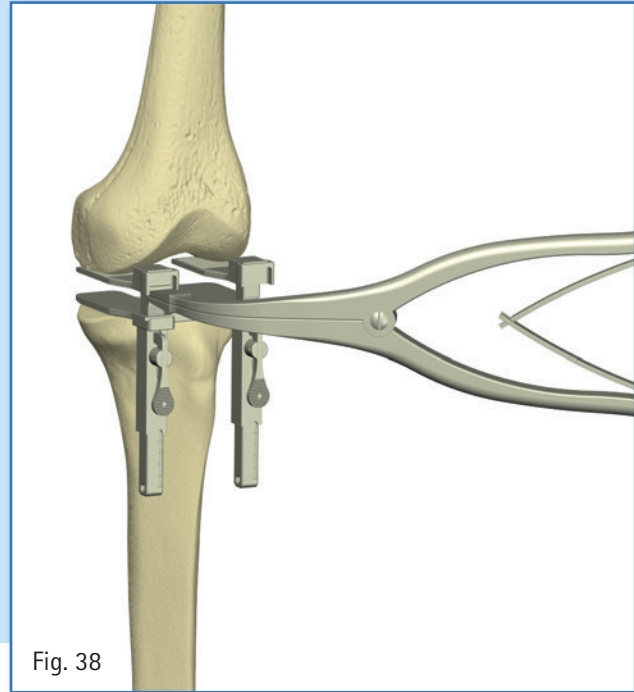


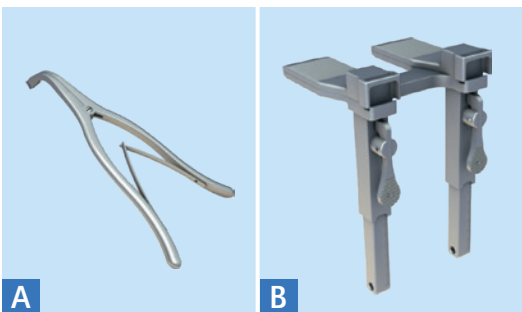
Fig. 38

9.2 Optional Tibia First – Measurement with Distractor

- After performing the tibia resection, check the plane of the resection so that it corresponds with the mechanical axis of the tibia. Insert the distractor into the joint and use the clamp to distract sequentially the medial and lateral gaps in extension.
- If the medial and lateral gaps are asymmetrical, it is necessary to perform an appropriate release on the contracted side and then repeat the gap measurements.

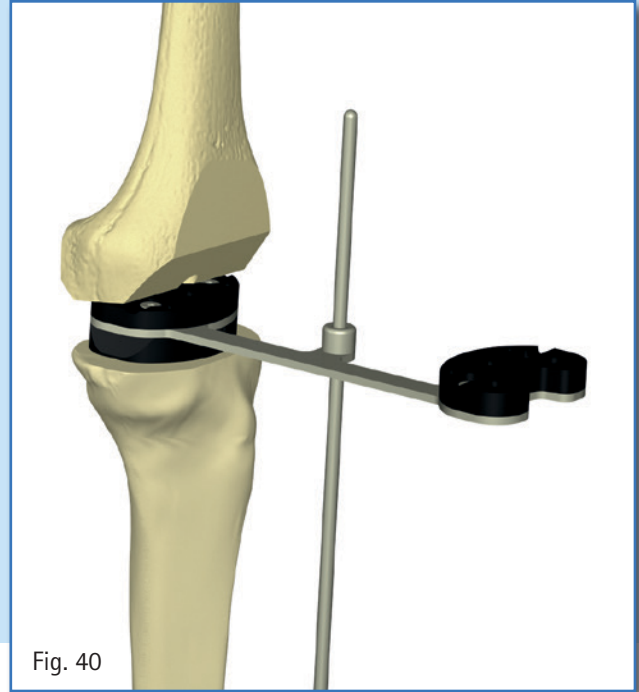
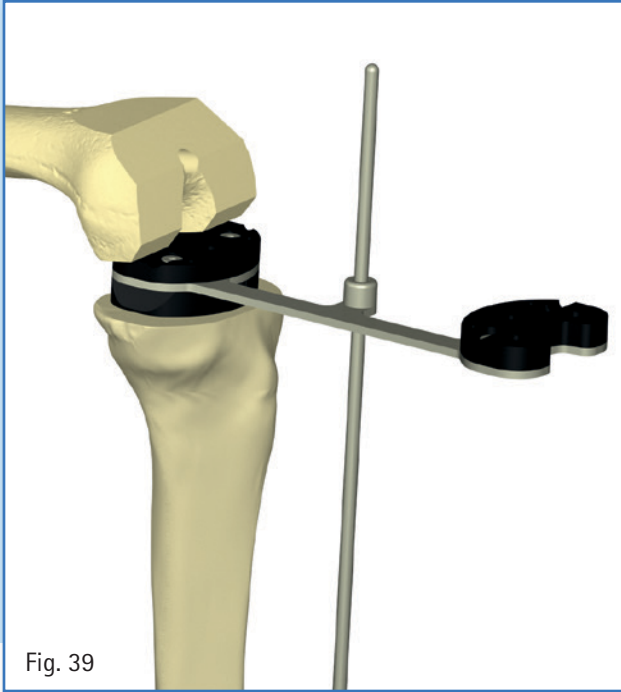
- When the joint is balanced in extension, note the thickness of the gaps, move to the flexion gap measurement and repeat the same operation. When in flexion, future rotation of the femoral component should be taken into account, if required.
- When the flexion gaps (FG) differ from the extension gaps (EG), calculate the needed thickness of the distal resection in order to equalize flexion and extension: $\text{distal resection height} = 9 \text{ mm} - \text{EG} + \text{FG}$.

Note: The PCL must be released and removed prior to this step since the flexion gaps will increase once removed.



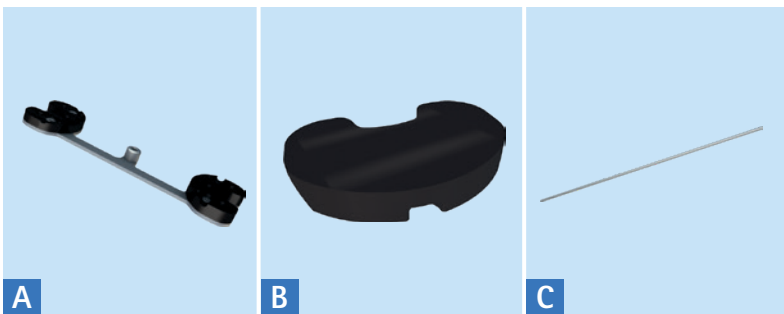
A: Distraction clamp NP609R; B: Femur-tibia distractor NP604R

9. Gap Balancing – Femur First



9.3 Femur First – Measurement with Spacers

- After completion of the femoral and tibial resections, place the trial femur implant on the femur. The height of the resection and flexion/extension gaps can be checked by inserting the spacers as in section 8.2.



A: Tibia cut spacer NS852R-NS854; B: Added femur cut spacer NS329; C: Alignment rod long NP471R

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9. Gap Balancing *(continued)*

		Flexion gap		
		optimal	tight	wide
Extension gap	optimal		<ul style="list-style-type: none"> ⌋ increase tibia slope ⌋ downsize the femur 	<ul style="list-style-type: none"> ⌋ posterior capsule release and thicker insert ⌋ increase distal cut and thicker insert ⌋ increase femur size
	tight	<ul style="list-style-type: none"> ⌋ posterior capsule release ⌋ increase distal cut 	<ul style="list-style-type: none"> ⌋ thinner insert ⌋ increase tibia cut 	<ul style="list-style-type: none"> ⌋ increase distal cut, release posterior capsule and thicker insert ⌋ upsize femur and increase distal ⌋ upsize femur and release posterior capsule
	wide	<ul style="list-style-type: none"> ⌋ decrease distal cut ⌋ downsize femur and thicker insert 	<ul style="list-style-type: none"> ⌋ downsize femur and thicker insert ⌋ downsize femur and decrease distal cut ⌋ decrease distal cut 	<ul style="list-style-type: none"> ⌋ thicker insert

Fig. 41

9.4 Strategies

When the flexion and extension gaps are incongruent, an individualized strategy must be defined in order to correct it.

The table presents some possible options to follow in order to correct a situation where the flexion and extension gaps are not both equal but either tight or wide.

This is not intended to be an exhaustive and systematic solution matrix. The surgeon must make his or her own choices depending on the clinical evaluation, the surgical situation, patient specific issues, and/or his or her own experience.

10. Tibia Keel Preparation

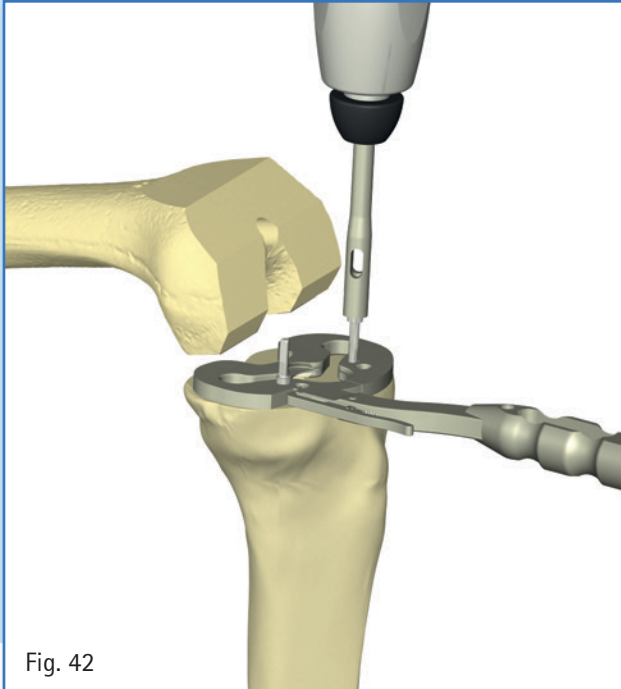


Fig. 42

10.1 Tibia Keel Preparation

- Determine the size of the tibia by superposing the different tibia preparation plateau sizes onto the created surface. The goal is to reach the optimal bony coverage with the proper transverse rotational alignment of the trial baseplate while avoiding ML and AP overhang.
- Place the chosen tibia trial preparation flush onto the tibia resection and assess the rotation with the help of the EM rod placed through the holder. References for the rotation are the mid-third of the anterior tuberosity and the second toe axis of the leg. These two landmarks sometimes do not coincide with mechanical axis of the tibia, and the surgeon should consider the rotation with respect to the tubercle to maintain extensor mechanism alignment. The plateau is fixed by two short headed pins in the marked holes.

The VEGA System® has a symmetric tibia plateau. 100 percent coverage cannot be reached if the correct tibial rotation is considered. An internal rotation of the tibia plateau should be avoided.

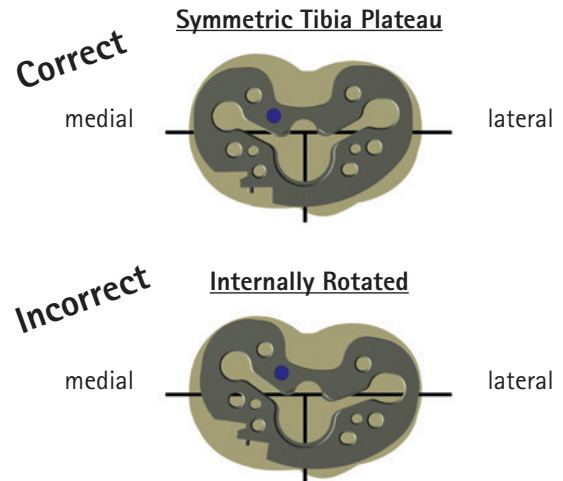
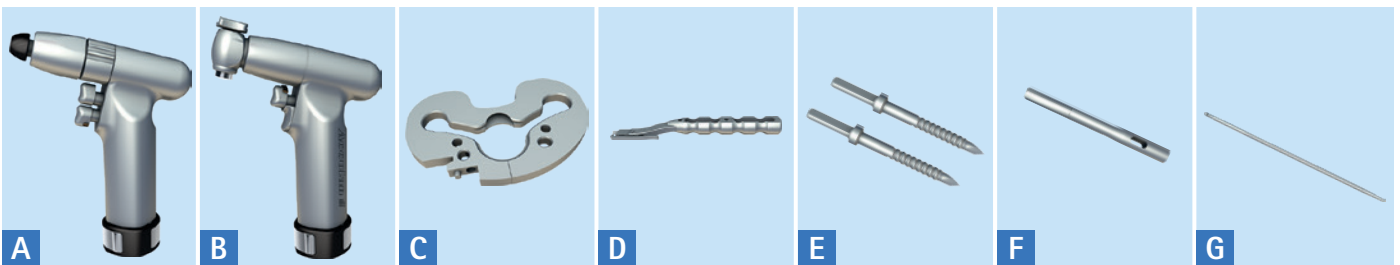


Fig. 43

- Another option consists of building the tibia and femur trial implant with the adequate trial gliding surface. By exercising flexion extension movements combined with slight rotational stresses, the tibia plateau will find a natural position under the femur trial. This position is marked anteriorly using the electric cautery exactly where the plateau has a central anterior laser marking. Care should be taken to assess the stability of the extensor mechanism before accepting this "free float" alignment of the tibial baseplate.



A: Acculan® drill; B: Acculan saw; C: Tibia trial/preparation plateau NS349R-NS359R; D: Tibia trial/prep. plateau holder NQ378R; E: Headed pins 30 mm NP585R; F: Pin driver NP613R; G: IM alignment rod NS331R

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10. Tibia Keel Preparation *(continued)*

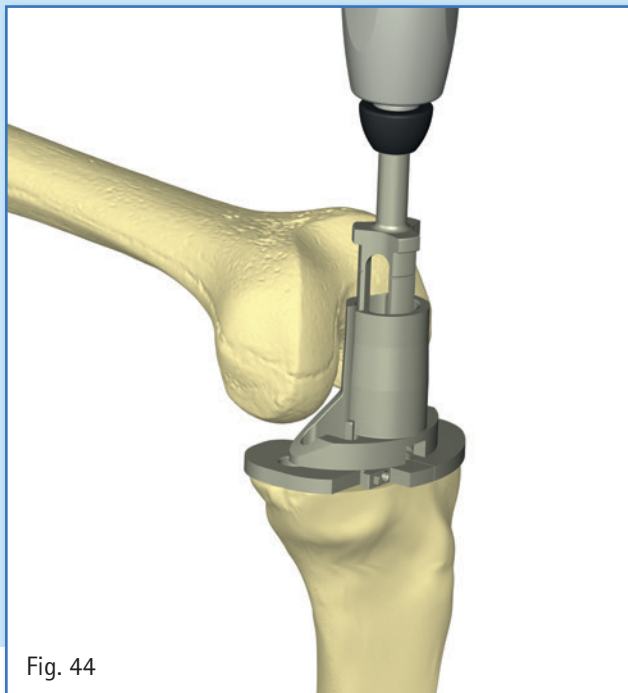


Fig. 44

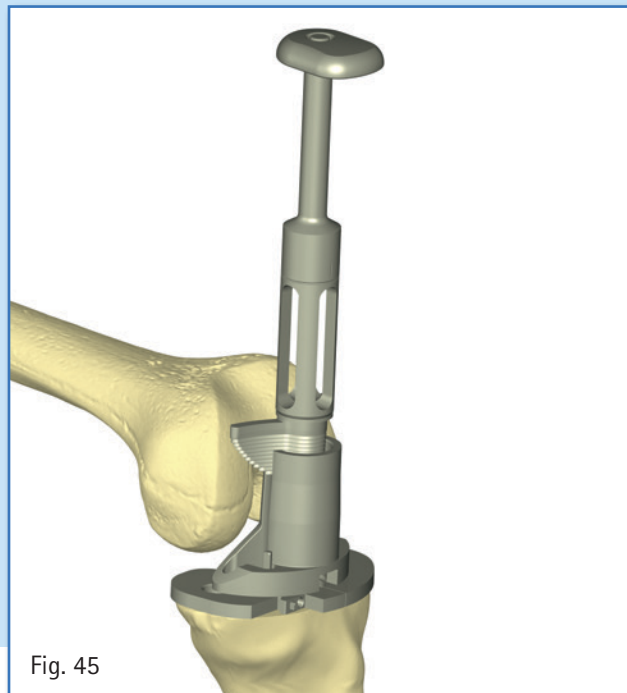
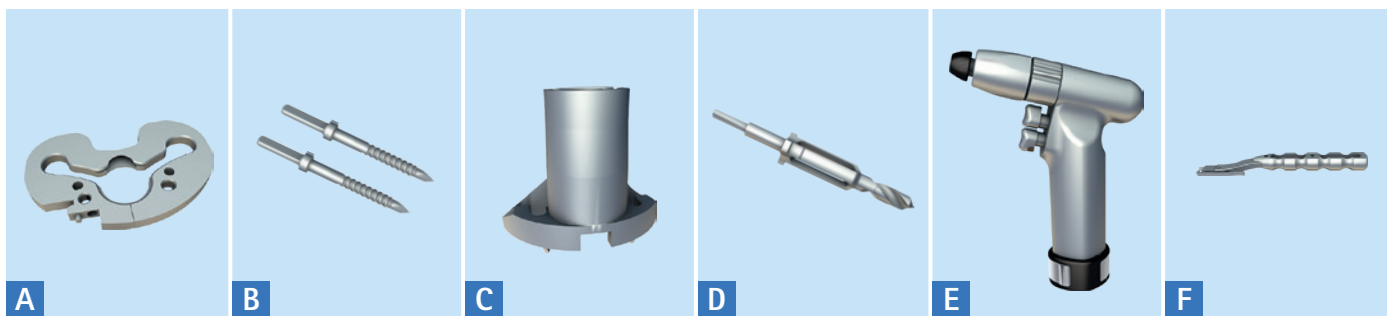


Fig. 45

- Remove the holder. Place the guiding tower on the tibia plateau by engaging the posterior teeth first. The anterior part can be stabilized by replacing and locking the holder back in place.
- The 12 mm drill with stop is first used to prepare the bone for the winglet chisel.
- Perform the wing stem preparation by using the winglet chisel connected to its handle through the guiding tower and secured to the stop. If necessary, remove using the slap hammer or, if no stem preparation is utilized, the handle is removed by rotating it counterclockwise.



A: Tibia trial/preparation plateau NS349R-NS359R; B: Headed pins 30 mm NP585R; C: Guide for winglet chisel NS364R; D: Drill with stop 12 mm NS379R; E: Acculan[®] drill; F: Tibia trial/prep. plateau holder NQ378R

10. Tibia Keel Preparation *(continued)*

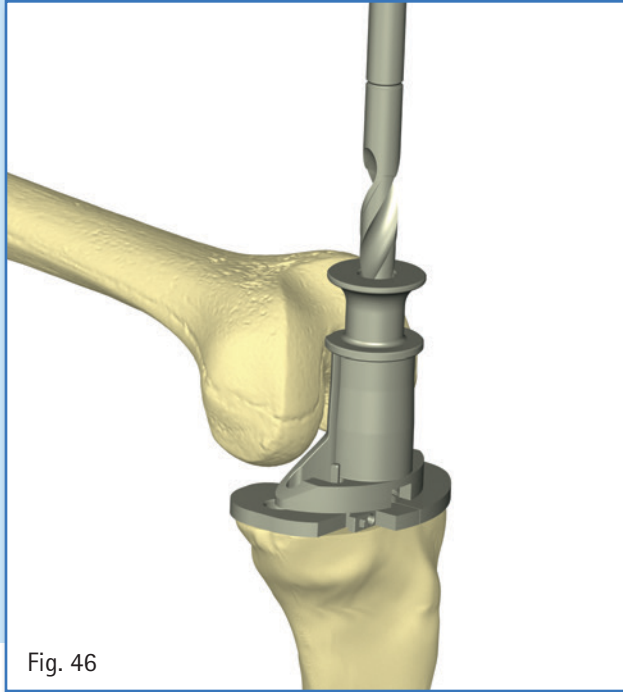


Fig. 46

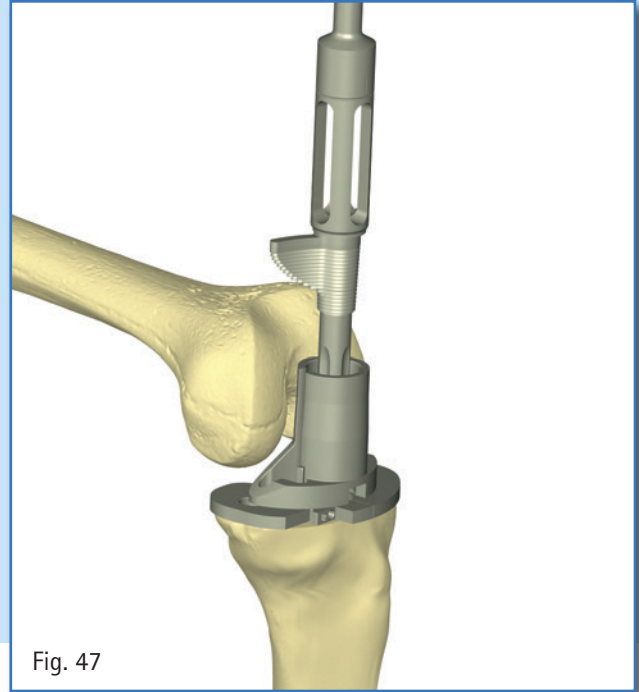


Fig. 47

10.2 Tibia Stem Preparation

- In case of poor bone quality, the additional primary fixation can be added by using a stem extension. A cemented stem or a pressfit stem can be chosen based on the surgeon's philosophy.

Option 1: Prior to the Tibia Resection

In this case, the tibia preparation is performed following the steps described previously (8.1 to 8.4). At the last stage, instead of using the standard 12 mm drill, use a long drill to prepare the site of the future stem.

Assess length and diameter of this long drill on the pre-operative X-rays. Perform the drilling through inserts for the guiding tower. The diameter of the drill is 2 mm larger than the diameter of the cemented stem. There are two laser markings on the drill, which correlate to the correct depth for short or long stems. For the winglet preparation, connect the corresponding trial tibia stem to the winglet chisel for the final preparation.

Note: *This option is indicated for cemented stems. The implant stems have diameters 12 and 14 mm in order to manage a 1 mm cement mantle thickness around the stems.*



A: Winglet chisel/Trial keel NS361R-NS362R; B: Winglet chisel/Trial keel holder NS360R; C: Tibia drill sleeve for cemented stem NS381R-NS383R; D: Drill for cemented stem NS376R-NS377R, NS380R; E: Trial stem cemented NS384T-NS386T, NS387T-NS389T

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11. Optional Extension Stem Fixation

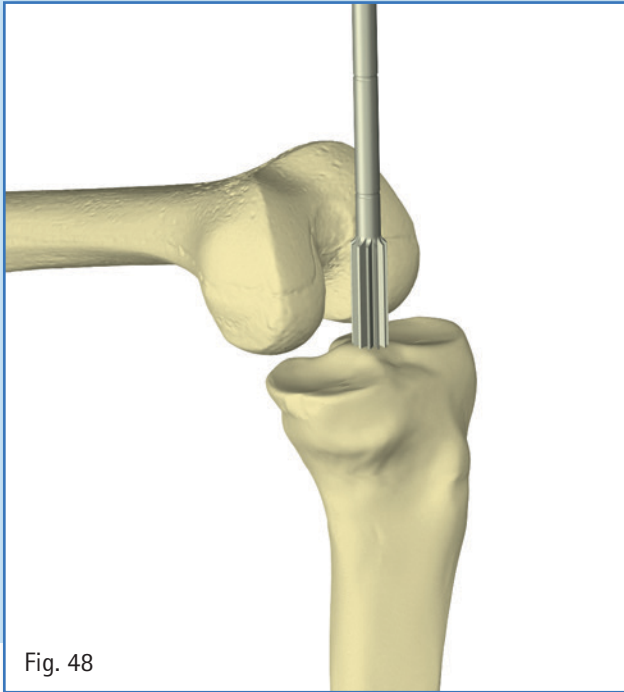


Fig. 48

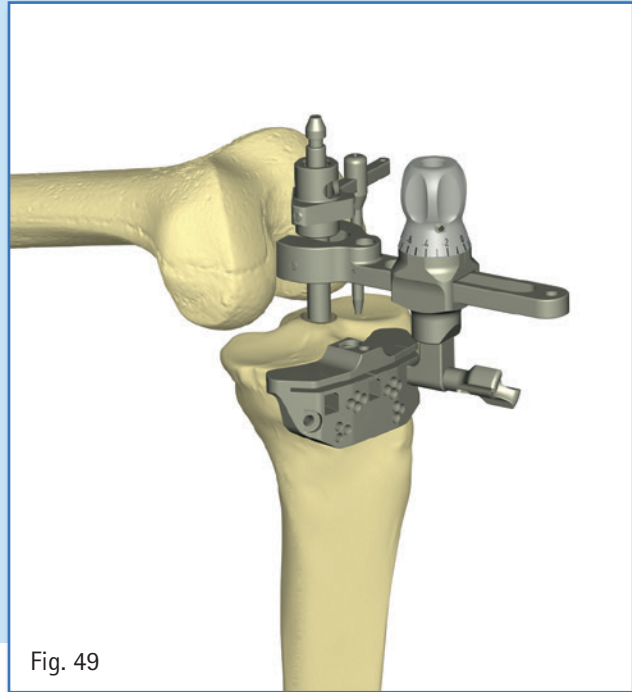


Fig. 49

Option 2: Prior to the Extension Stem Fixation

In this option, open the medullary canal of the tibia according to the preoperative planning (entry point) with the 9 mm drill. The thinnest reamer is then connected to the T-handle and inserted into the tibia medullary canal as deeply as possible until a primary stability is achieved and a depth laser marking reaches the estimated level of the tibia resection (short or long stem). If not, a thicker diameter is used until stability is achieved. Once the T-handle is removed, the intramedullary alignment system is mounted on the reamer with the 0° angle sleeve (angled sleeve for slope is not possible here) and the cutting guide. Set the stylus on the deepest point or the tibia plateau to define the 0-level cut.

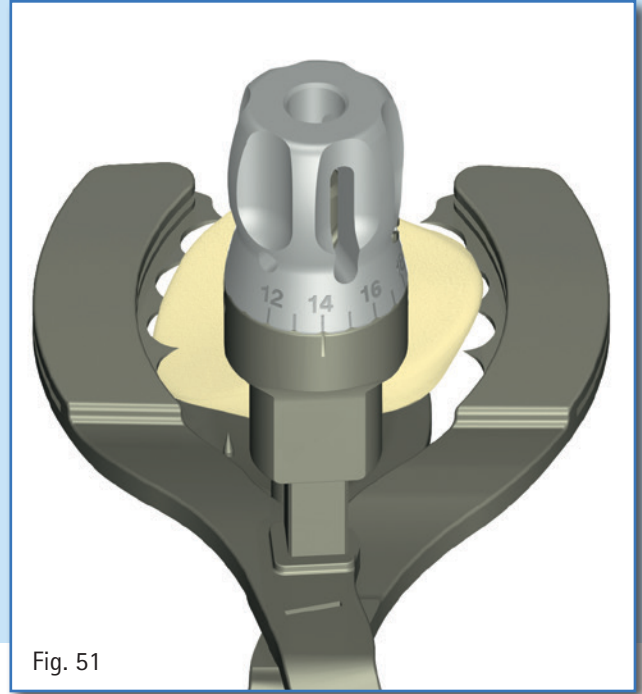
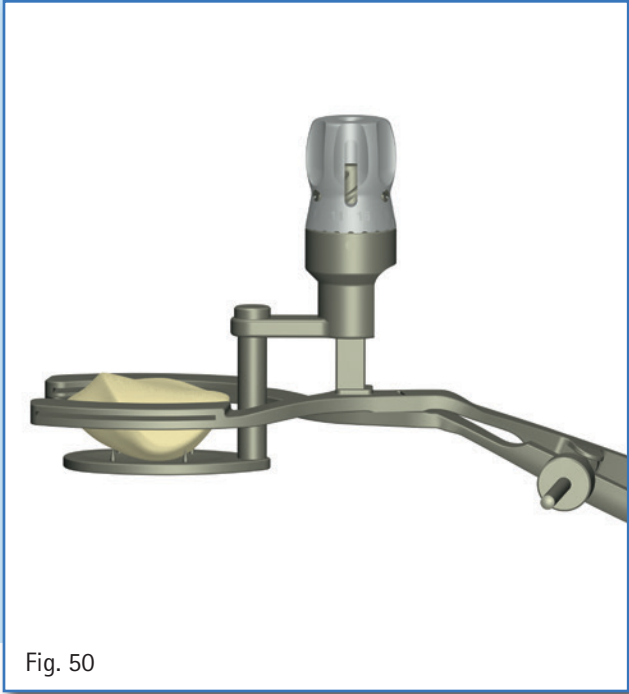
Adjust the height of the cut by turning the wheel. The alignment of the cutting block can be checked with the EM alignment rod. The cutting block is fixed with two headless pins at "0" position. The +/-2 mm pinholes are available on the resection blocks to further adjust the resection level if needed. In order to avoid movements during the resection, additional pins are set in convergent holes. Remove the IM tibia alignment system with the T-handle after unlocking the cutting block from the alignment system.

Note: Please note that this option is indicated for pressfit stems, and the surgeon must take into account the alignment of the tibia as directed by the pressfit stem since it may not coincide with the mechanical axis of the tibia.

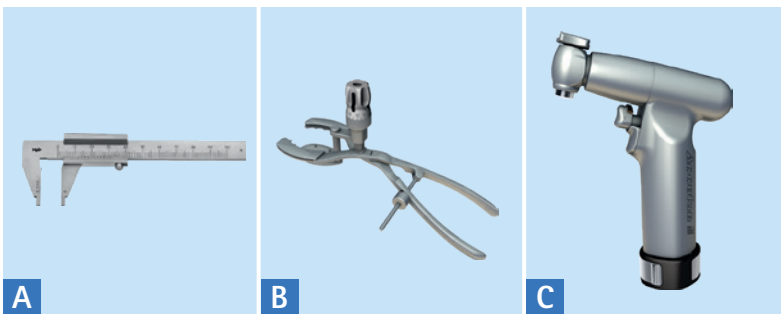
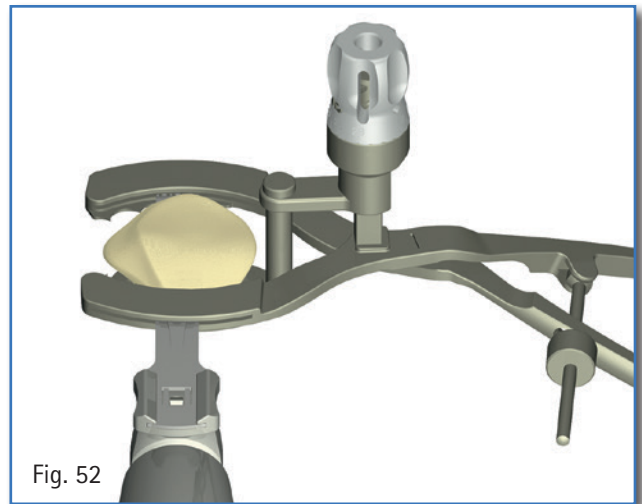


A: IM alignment rod NS331R; B: IM alignment system NS332R; C: Tibia IM stylus for orientation sleeves NS847R; D: Tibia cutting guide NS334R; E: Headless pins 63 mm NP583R; F: Tibia orientation sleeve 0° NS843R

12. Patella Preparation



- The thickness of the patella is measured using the caliper. This thickness should not be exceeded after implantation of the patella implant. A minimum thickness of the remaining patella bone should be no less than 12 mm. The level of bone resection is calculated.
- Clamp the patella and adjust the level of the resection by turning the resection depth wheel to the planned level of remaining patellar bone thickness.
- Perform the resection through the cutting slot with a 1.27 mm thick saw blade.



A: Caliper AA847R; B: Patella resection clamp NS840R; C: Acculan® saw

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12. Patella Preparation (continued)

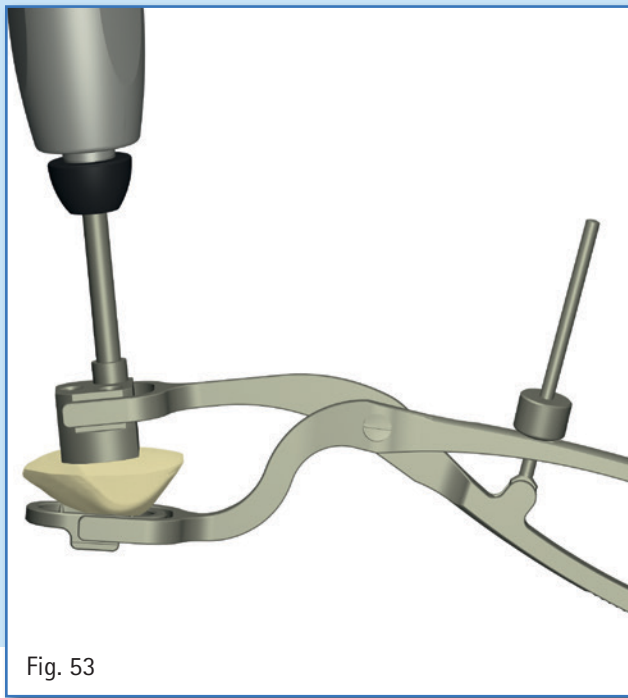


Fig. 53

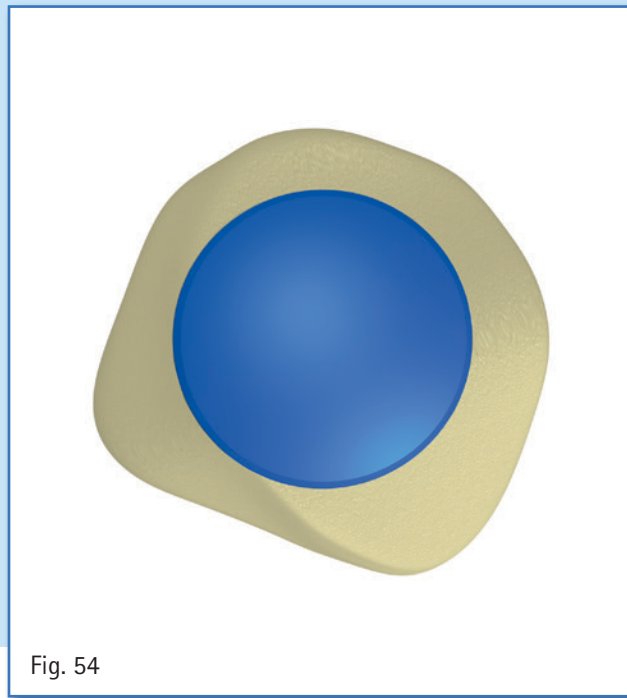


Fig. 54

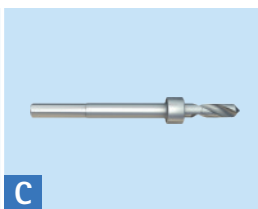
- Remove the patella resection clamp. Set the patella drill/impaction clamp onto the resected patellar surface choosing a medialized position to recreate the resected apex of the articular surface. The trial patella can be placed on top of the drill guide in order to check its position to the medial rim and appropriate positioning in the superior and inferior direction.
- Drill the pegs of the implant through the holes with the 6 mm drill until the stop is reached. The size of the patella is established with the corresponding trial patella implant.



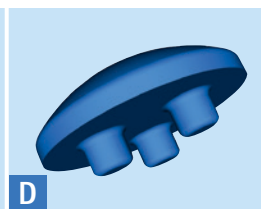
A



B



C



D

A: Patella drill/impaction clamp NS841R; B: Acculan® drill; C: Drill with stop 6 mm NQ449R; D: Trial Patella NQ281-NQ285

13. Trial Reduction

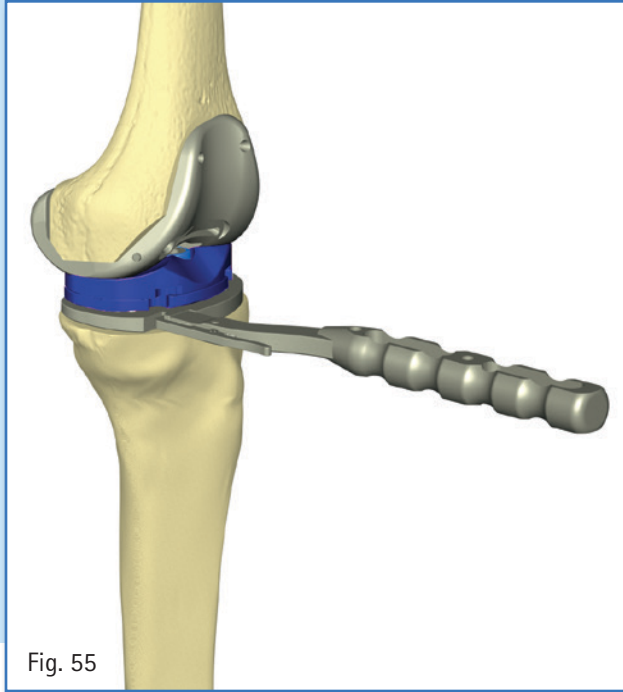


Fig. 55

- Place the trial femoral and tibial implants onto the prepared bony surfaces.
- Place the polyethylene trial corresponding to the gap measurements with the spacer or the distractor between both trial implants. These modular trials range in thicknesses from 10 mm to 20 mm. The trials range from sizes 10 mm through 14 mm with a 6 mm modular attachment to reach heights up to 20 mm.
- Insert the trial PS peg onto the tibia through the gliding surface.
- Assess the stability of the joint by applying varus/valgus stresses in extension and flexion. If the joint appears to be loose (opening of gaps under stress), then test a thicker trial gliding surface.



A: Tibia trial/preparation plateau NS349R-NS359R; B: Tibia trial/plateau holder NQ378R; C: Trial gliding surface NS270-272, NS275-277, NS280-282, NS285-287, NS290-292, NS295-297; D: Trial spacer 6 mm NS274, NS279, NS284, NS289, NS294, NS299; E: Tibia PE Peg NS365R, NS348R; F: Trial femur NS301RM-NS308RM, NS311RM-NS318RM; G: Osteotome NS366R

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13. Trial Reduction (continued)

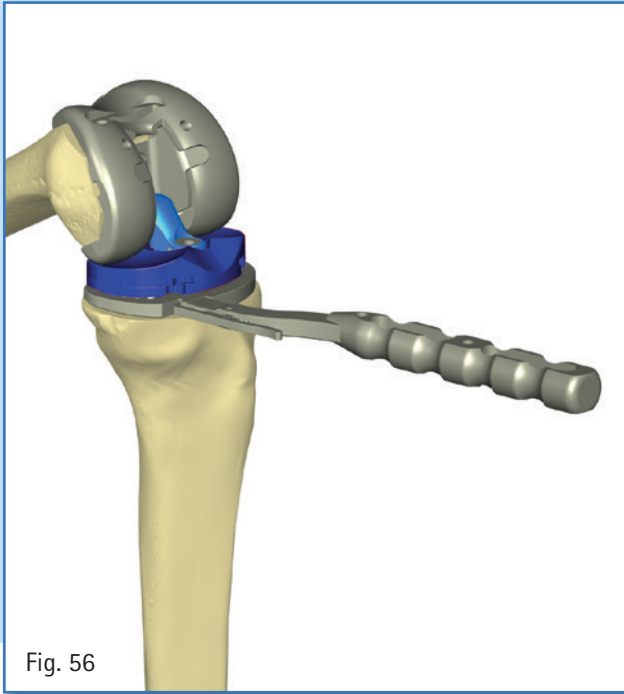


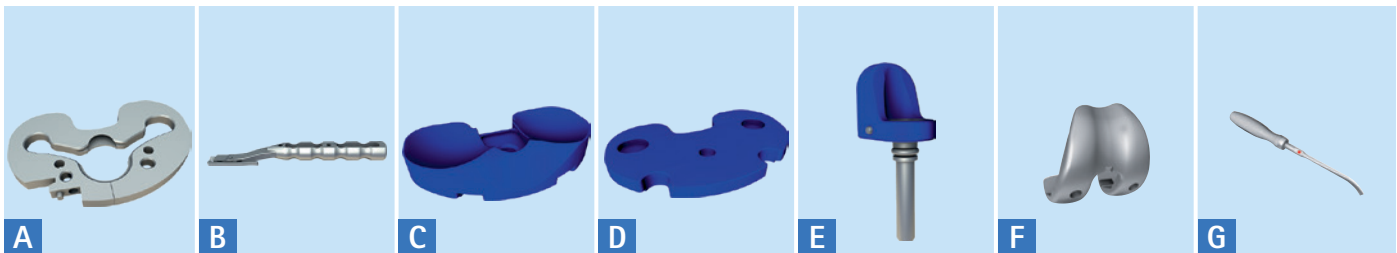
Fig. 56

- If the medial or lateral soft tissue structures are questionable for adequate support, the surgeon has the option of trialing with the PS+ peg. If this is carried out, the trial box must be inserted into the femoral trial, or the peg will interface with the bone on the sides of the box when varus and valgus stress is applied to the knee.
- The range of motion is assessed. Intra-operative limited extension and flexion and marked hyper extension must be avoided.

Note: Bone rests in the dorsal region of the femur have to be removed with a curved osteotome to avoid implant-bone conflicts in flexion (Fig. 56).

The following sequence is recommended for trial prosthesis removal:

- PS peg
 - Trial gliding surface
 - Trial femoral prosthesis
 - Trial tibia wing stem with/without extension stem
 - Trial tibia plateau
- The stability of the joint is assessed by applying varus/valgus stresses in extension and flexion. If the joint appears to be lax (opening of gaps under stress), then a thicker trial gliding surface is tested.
 - The range of motion is assessed. Intra-operative limited extension and flexion and marked hyperextension must be avoided.



A: Tibia trial/preparation plateau NS349R-NS359R; B: Tibia trial/prep. plateau holder NQ378R; C: Trial gliding surface NS270-272, NS275-277, NS280-282, NS285-287, NS290-292, NS295-297; D: Trial spacer 6 mm NS274, NS279, NS284, NS289, NS294, NS299; E: Tibia PE Peg NS365R, NS348R; F: Trial femur NQ451R-NQ458R, NQ461R-NQ468R, NQ1052R-NQ1057R, NQ1062R-NQ1067R; G: Osteotome NS366R

14. Component Implantation

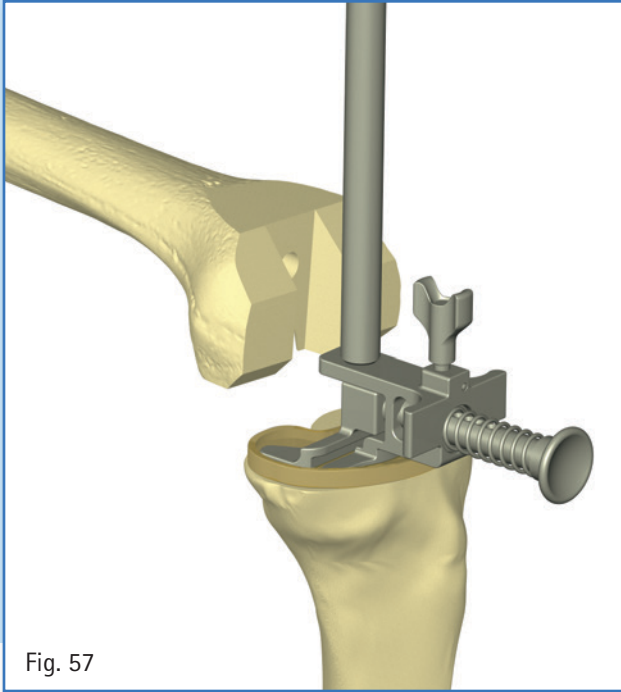


Fig. 57

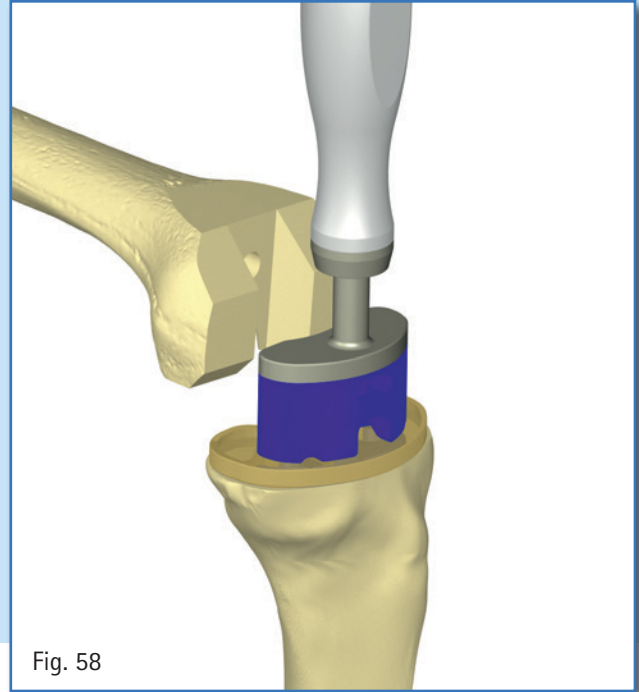


Fig. 58

For the assembly of the tibia plateau holder to the final implant, it is recommended to fasten the implant to the tibial plateau holder prior to placing on the tibia.

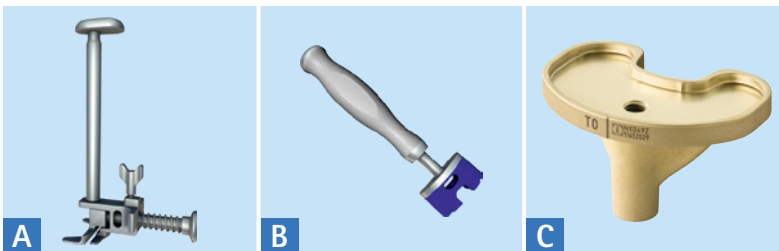
The following implant sequence is recommended:

- Tibia implant
- Femur implant
- Gliding surface
- Patella implant
- The final tibia implant is connected to the tibia holder/impactor and brought precisely into the predefined position. The final positioning is achieved with the help of the tibia impactor.

Note: *Obturator Screws*

12 mm: T0 - T2+

14 mm: T3 - T5



A: Tibia plateau holder NS374R; B: Tibia plateau impactor NS425; C: Tibia implant NX049Z-NX059Z

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14. Component Implantation *(continued)*

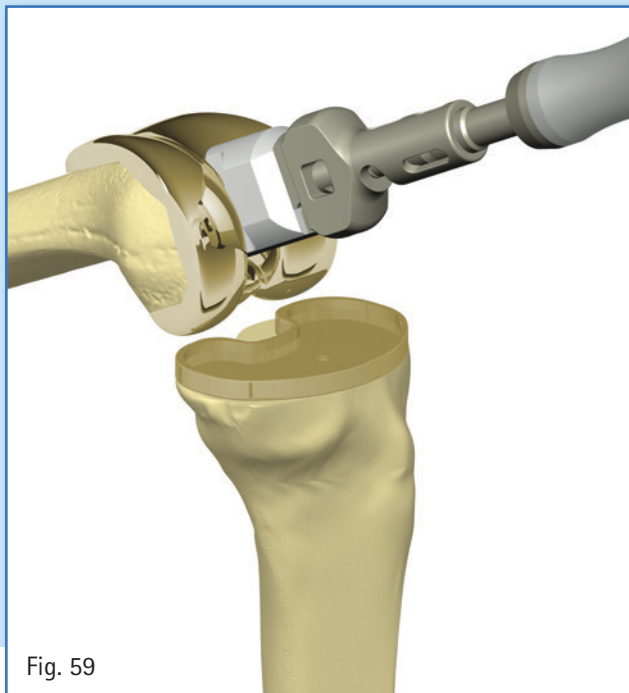


Fig. 59

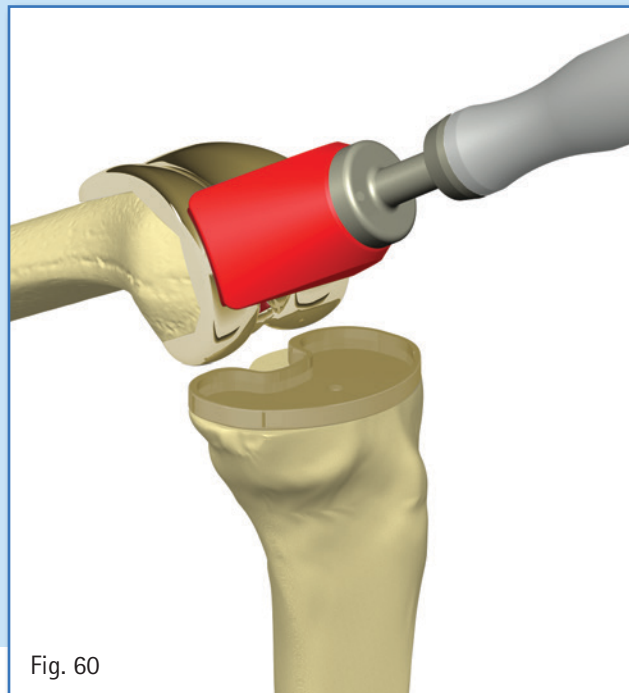


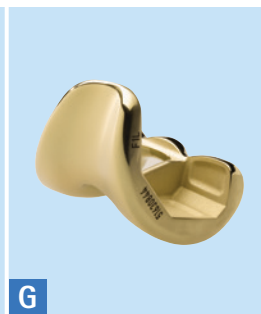
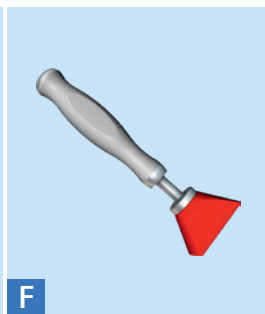
Fig. 60

- Using the femur holder and its insert, the final femur implant is brought into alignment and implanted. Be cautious to insure the holder is properly seated and attached to the femoral implant so that it does not dislodge during cementing.

Note: Use a trial insert and recheck joint motion and stability after the cement has cured.

Note: When placing the final cemented implants, it is recommended that, after inserting the polyethylene gliding surface into the tibia baseplate, the bone cement should be allowed to fully harden before inserting the fixation screw.

- The femoral impactor is used to ensure the final implant is seated securely against the prepared bone.



D: Implant holding/insertion instrument NS836R; E: Femur insert to NS836R, NS837; F: Femur impactor NS424; G: Femur implant NX004Z-NX018Z, NX024Z-NX038Z

14. Component Implantation *(continued)*

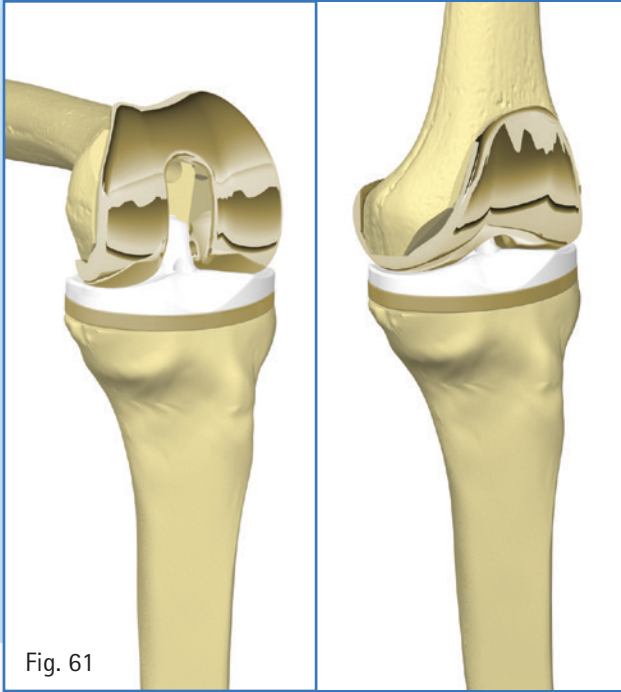


Fig. 61

- Place the gliding surface into position by inserting the posterior part in the tibia plateau first and impacting the anterior part with the help of the tibia impactor NS425.

Note: Use a trial insert and recheck joint motion and stability after the cement has cured.

Note: When placing the final cemented implants, it is recommended that, after inserting the polyethylene gliding surface into the tibia baseplate, the bone cement should be allowed to fully harden before inserting the fixation screw.

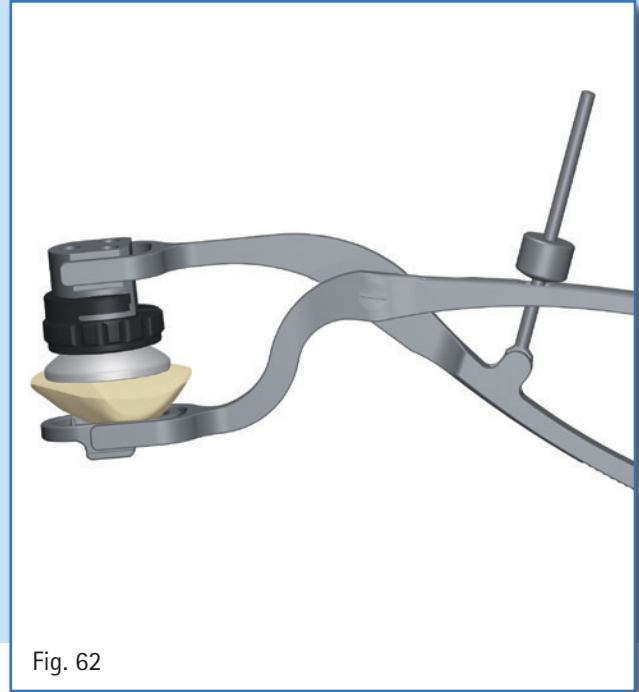
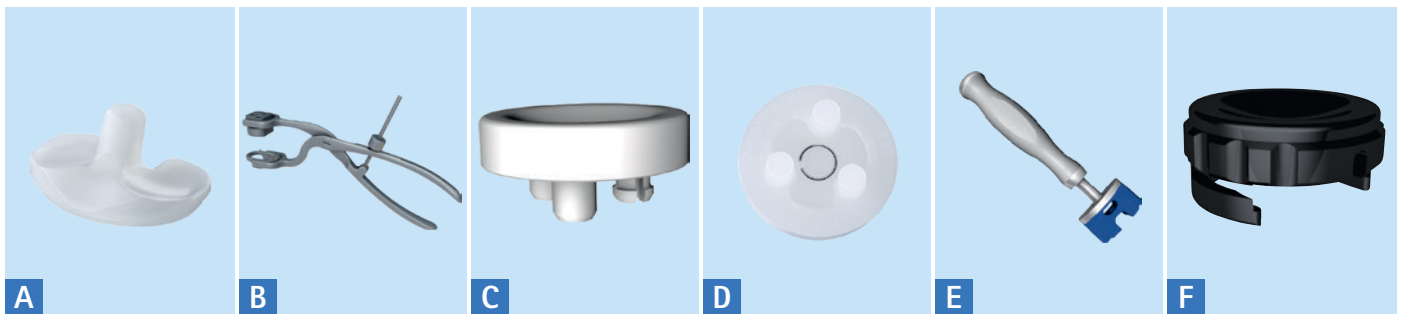


Fig. 62

- The patella is implanted using the patella drill/impaction clamp and the concave plastic cap, which allows good transmission of forces during the cement hardening process.



A: Gliding surface NX100–NX105, NX110–NX115, NX120–NX125, NX130–NX135, NX140–NX145, NX150–NX155;

B: Patella drill/impaction clamp NS841R; C: Inlay for NS841R, NS842; D: Patella implant NX041–NX045; E: Tibia plateau impactor NS425; F: Inlay for NS841R, NS842

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15. Cementing Technique

- Regardless of what fixation method is utilized, it is critical that correct techniques are employed to help avoid complications and early failure. Even with accurate resection, it is important to ensure that components are fully seated, as it is easy for this to be obscured when cementing is taking place. Varus-valgus alignment can be significantly affected by unequal medial-lateral cement mantles and poorly seated components. There can be a tendency to place femoral components in relatively flexed positions if specific care is not taken.
- It should also be noted that when definitive components are cemented in, they may prove more stable and seat better than the trials, which are often a little loose. It is therefore worthwhile to recheck the balancing and stability at this point so that further adjustments can be made if necessary. It has been possible to relate poor cementing techniques to early and continuous component migration. This in turn is of positive prognostic significance when predicting aseptic loosening, so proper attention to the cementation steps must be taken.
- Preparation of the bony surfaces and cancellous bone should be performed with pulsatile-type lavage with the knee under a pressure tourniquet. This step allows for optimal cement penetration and interlocking to the bony prepared surfaces and also removes bone debris that can serve as third body particles that increase polyethylene wear after surgery.

The surfaces should be properly dried prior to cementation and appropriate exposure of all bony surfaces achieved. All of the surfaces should be pressurized for optimal cement penetration. Emphasizing the importance of effective cementation of the posterior femoral condylar surfaces is also recommended since it can have a significant effect on the longevity of the fixation of the femoral implant. A further point worth noting is that holding the knee out in full extension while cement is hardening is used to compress components down and possibly improve cement intrusion.

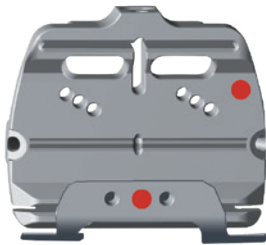
- Care should be taken to completely remove all excess cement that protrudes from the implant bone interface. Any remnants of overhanging cement can impinge on surrounding soft tissue or can provide a source of debris that can serve as a generator of third body wear and may contribute to the demise of the fixation earlier than expected.

16. Closure

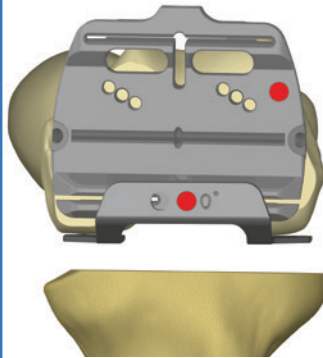
After cement polymerization and removal of all cement excess, thoroughly irrigate the joint. If a tourniquet is used, hemostasis is achieved after its deflation.

Close soft tissue in the normal layered fashion.

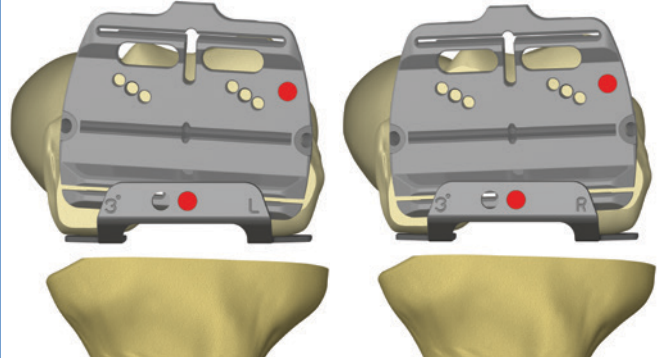
17. Assembly Instructions – Posterior Referencing Feet



Inserting the plate onto the cutting block



Neutral orientation:
The plate has to be in contact with the posterior condyles.



3° external rotation for left and right knee

Fig. 63

- The femur plate is inserted into the bottom of the previously selected 4-in-1 cutting block (NS321R - NS328R).
- The feet should lie flush against posterior condyles like displayed in the figure 63 above.
- For use with ST0561.

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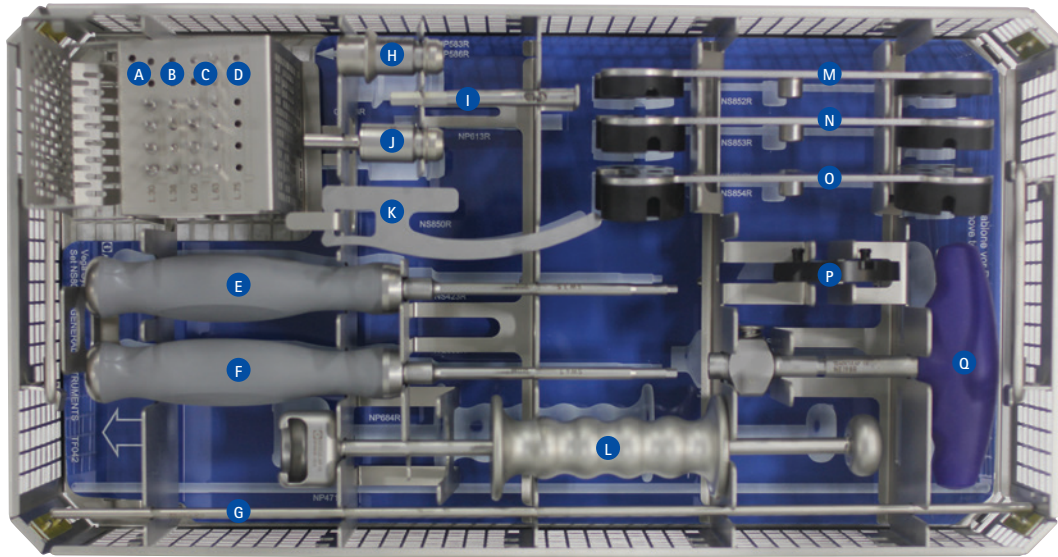
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18. Instruments

Instrument Trays page 51
Optional Instruments..... page 56
Instrument Sets and Implant Banks
Available for Sale..... page 61

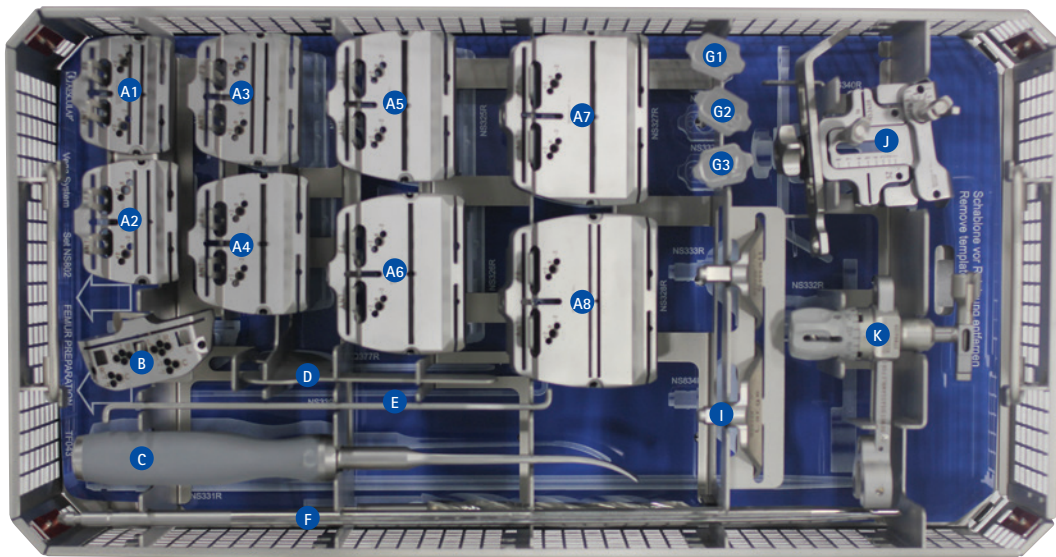
ST0468 - VEGA System Manual Instrument Set

Item No.	Description
NS801	VEGA IQ Set General Instruments
NS802	VEGA IQ Set Femur Preparation
NS803	VEGA IQ Set Tibia Preparation
NS804	VEGA IQ Set Trial Implants Femur 1
NS805	VEGA IQ Set Trial Implants Femur 2
NS806	VEGA IQ Set Trial Instruments
NS808	IQ Set Tibia Stem Extensions
NS809	IQ Set Patella



NS801 – General Instruments

Index	Qty.	Item No.	Description	Index	Qty.	Item No.	Description
A	4	NP582R	Headless Pin 3.2 x 38 mm	J	1	GB414R	Hexagonal Chuck Triangle Shank
B	6	NP583R	Headless Pin 3.2 x 63 mm	K	1	NS850R	Cutting Depth Check Blade
C	4	NP585R	Headed Pin 3.2 x 30 mm	L	1	NP684R	Slap Hammer
D	4	NP586R	Headed Pin 3.2 x 50 mm	M	1	NS852R	Tibia Cut Spacer 10+12 mm
E	1	NS423R	Screwdriver SW 3.5	N	1	NS853R	Tibia Cut Spacer 14+16 mm
F	1	NQ660R	Screwdriver SW 4.5	O	1	NS854R	Tibia Cut Spacer 18+20 mm
G	1	NP471R	Alignment Rod, Long	P	1	NS329	Added Femur Cuts Spacer
H	1	GB413R	Hexagonal Chuck	Q	1	NE198R	T-Handle Navigated
I	1	NP613R	Threaded Pin Driver Attachment		1	TF042	Graphic Template for General Instruments

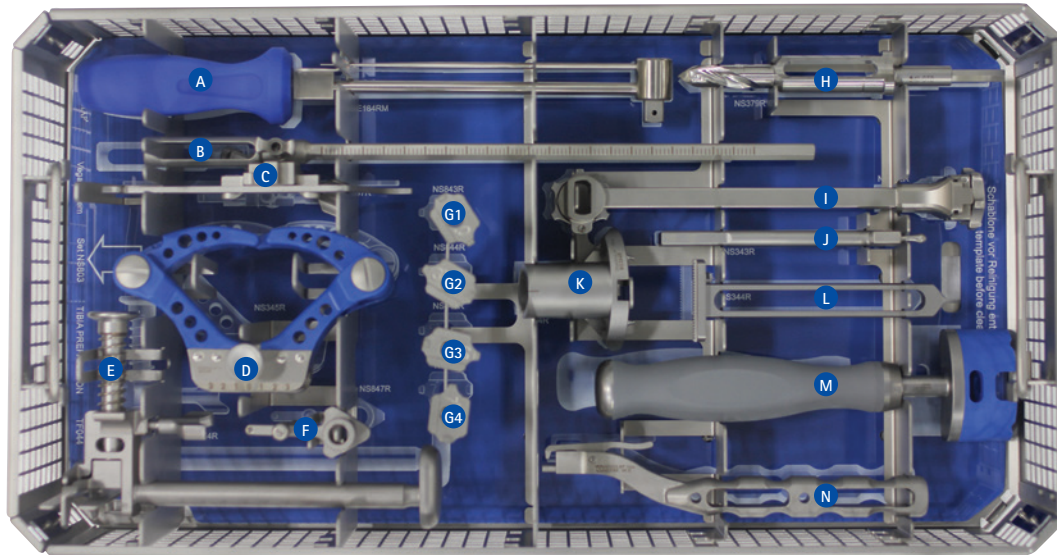


NS802 – Femur Preparation Instruments

Index	Qty.	Item No.	Description	Index	Qty.	Item No.	Description
A1-8	1 ea.	NS321R-NS328R	4-in-1 Femur Cutting Guide F1-F8	H	1	NS333R	Distal Femur Contact Plate
B	1	NS334R	Tibio-Distal Femur Cutting Guide	I	1	NS834R	Distal Femur Contact Plate Large
C	1	NS366R	Osteotome 20/205 mm		1	NS331R	IM Alignment Rod 8 mm (<i>hidden</i>)
D	1	NQ377R	Tibia Protection Plate Asym	J	1	NS340R	Femur Alignment Block Man.
E	1	NS339R	ML Femoral Size Gauge	K	1	NS332R	IM Alignment System
F	1	NS330R	IM Rod Drill 9x200 mm		1	TF043	Graphic Template for Femur Preparations
G1-3	1 ea.	NS335R-NS337R	Femur Orientation Sleeve 5°, 6°, 7°				

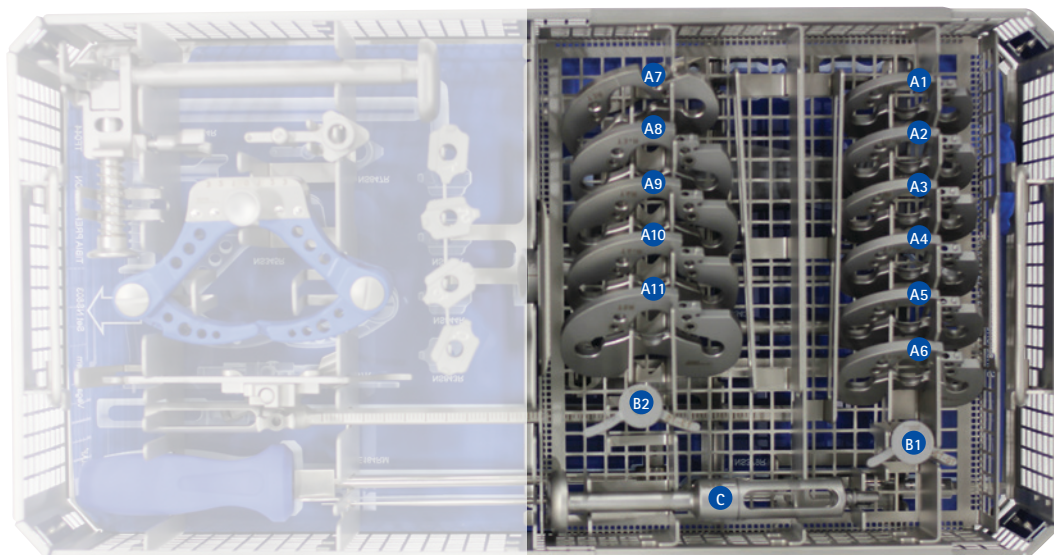
VEGA System® Knee System

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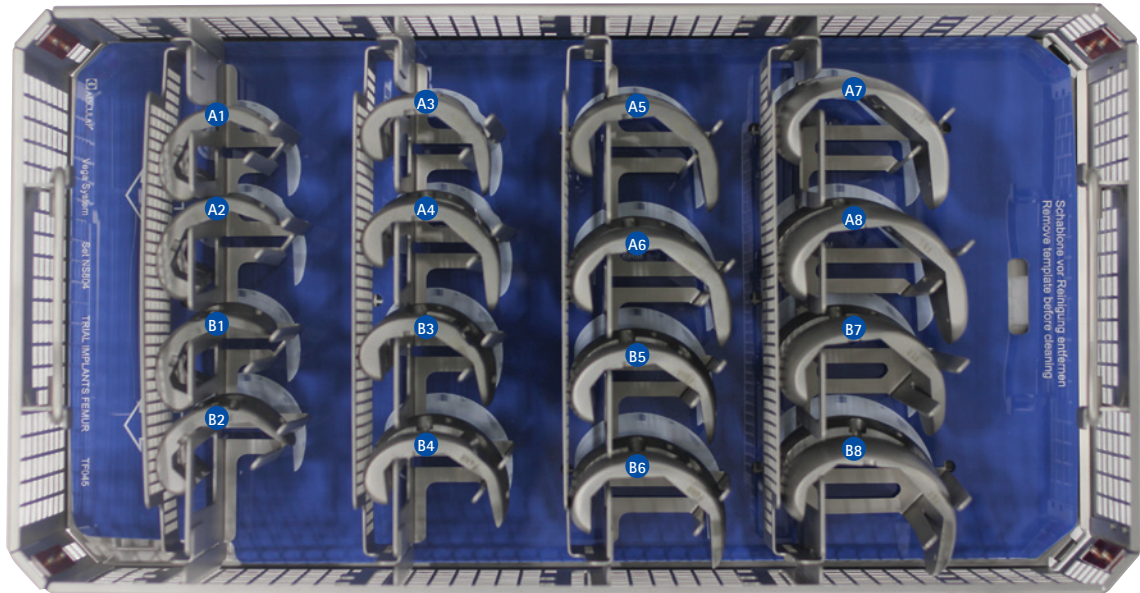
NS803 - Tibia Preparation Instruments - Bottom Tray

Index	Qty	Item No.	Description	Index	Qty	Item No.	Description
A	1	NE184RM	Torque Wrench	I	1	NS342R	Tibia Alignment System Handle
B	1	NS341R	Holding Rod for Tibia Cutting Guide	J	1	NS343R	Proximal Fixation
C	1	NS347R	Tibia Stylus	K	1	NS364R	Guide for Winglet Chisel
D	1	NS345R	Bimalleolar Clamp	L	1	NS344R	Support for Bimalleolar Clamp
E	1	NS374R	Tibia Plateau Holder	M	1	NS425	Tibia Plateau Impactor
F	1	NS847R	Tibia IM Stylus for Orientation Sleeves	N	1	NQ378R	Tibia Trial/Prep Plateau Holder
G1-G4	1 ea.	NS843R-NS846R	Tibia IM Orientation Sleeve 0°, 3°, 5°, 7°		1	TF044	Graphic Template for Tibia Preparations
H	1	NS379R	Drill with Stop 12 mm				



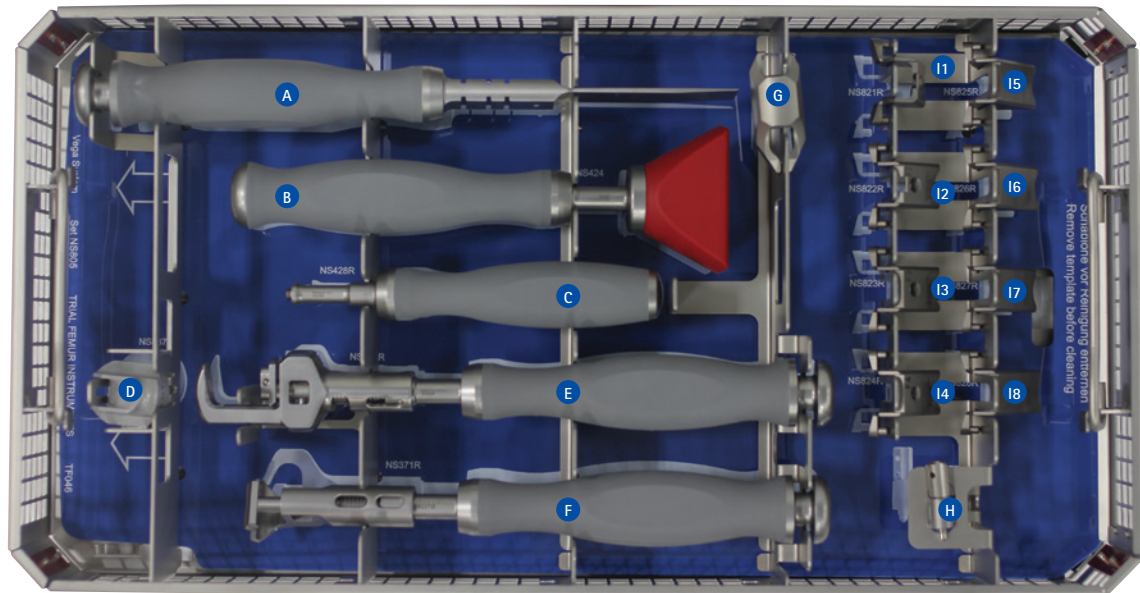
NS803 - Tibia Preparation Instruments - Top Insert

Index	Qty	Item No.	Description	Index	Qty	Item No.	Description
A1-11	1 ea.	NS349R-NS359R	Tibia Trial/Preparation Plateau T0, T0+, T1, T1+, T2, T2+, T3, T3+, T4, T4+, T5	B1-2	1 ea.	NS361R-NS362R	Winglet Chisel/Trial Keel T0-T2+, T3-T5
				C	1	NS360R	PS Holder / Winglet Rasp



NS804 – Femur Trials

Index	Qty.	Item No.	Description	Index	Qty.	Item No.	Description
A1-8	1 ea.	NS301RM-NS308RM	Trial Femur Component Left F1-F8		1	TF045	Graphic Template for Femur Trials
B1-8	1 ea.	NS311RM-NS318RM	Trial Femur Component Right F1-F8				

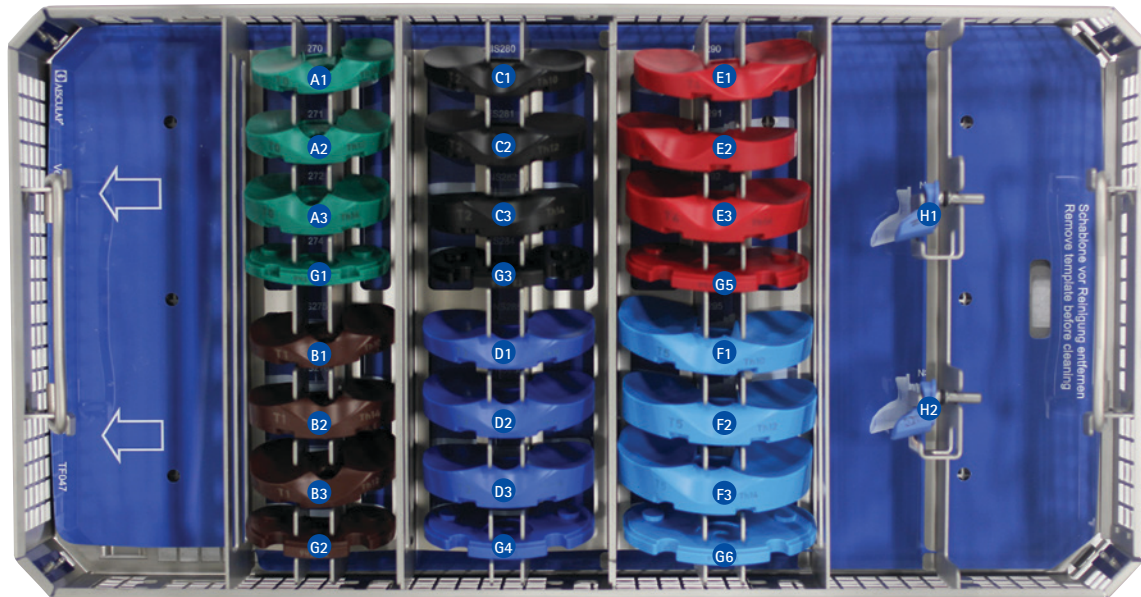


NS805 – Femur Trial Instruments

Index	Qty.	Item No.	Description	Index	Qty.	Item No.	Description
A	1	NS368R	Femur Box Chisel	F	1	NS371R	Trial Femur Insertion Instrument
B	1	NS424	Femur Component Impactor	G	1	NS369R	Femur Box Chisel Stop
C	1	NS428R	Femur Box Holder/Extractor	H	1	NS367R	Femur Box Chisel Guide
D	1	NS837	Femur Insert to NS836R	I1-8	1 ea.	NS821R-NS828R	Trial Femur Box F1-F8
E	1	NS836R	Implant Holding/Insertion Instrument		1	TF046	Graphic Template for Femur Trial Instruments

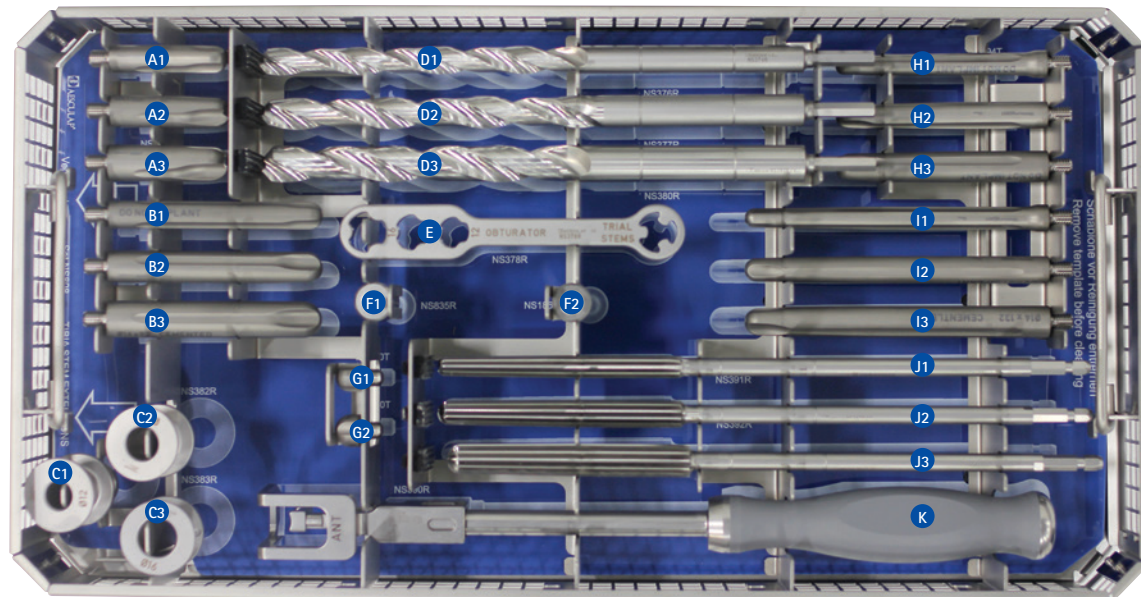
VEGA System® Knee System

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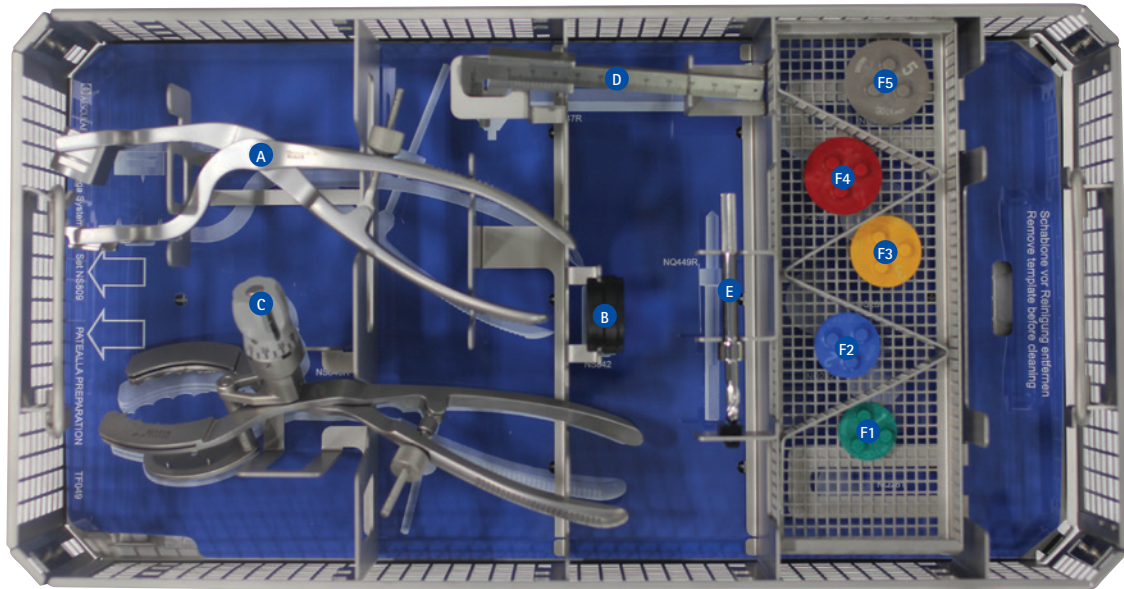
NS806 – PE Trials

Index	Qty.	Item No.	Description	Index	Qty.	Item No.	Description
A1-3	1 ea.	NS270-NS272	Trial Gliding Surface T0/0+ 10 mm, 12 mm, 14 mm	F1-3	1 ea.	NS295-NS297	Trial Gliding Surface T5 10 mm, 12 mm, 14 mm
B1-3	1 ea.	NS275-NS277	Trial Gliding Surface T1/1+ 10 mm, 12 mm, 14 mm	G1-6	1 ea.	NS274, NS279, NS284, NS289, NS294, NS299	Trial Spacer 6mm T0/0+, T1/1+, T2/2+, T3/3+, T4/4+, T5
C1-3	1 ea.	NS280-NS282	Trial Gliding Surface T2/2+ 10 mm, 12 mm, 14 mm	H1-2	1 ea.	NS365R, NS348R	Removable Trial Post PE, PE+
D1-3	1 ea.	NS285-NS287	Trial Gliding Surface T3/3+ 10 mm, 12 mm, 14 mm		1	TF047	Graphic Template for PE Trials
E1-3	1 ea.	NS290-NS292	Trial Gliding Surface T4/4+ 10 mm, 12 mm, 14mm				



NS808 – Tibia Extension Stem Instruments

Index	Qty.	Item No.	Description	Index	Qty.	Item No.	Description
A1-3	1 ea.	NS384T-NS386T	Trial Stems Cemented Short 12 mm, 14 mm, 16 mm	F1-2	1 ea.	NE185R, NS835R	Stem Adapter for NE184RM SW 6 mm, 5 mm
B1-3	1 ea.	NS387T-NS389T	Trial Stems Cemented Long 12 mm, 14 mm, 16 mm	G1-2	1 ea.	NE090T, NE100T	Trial Stems Mini 12 mm, 14 mm
C1-3	1 ea.	NS381R-NS383R	Tibia Drill Sleeve for Cemented Stem 12 mm, 14 mm, 16 mm	H1-3	1 ea.	NS394T-NS396T	Tr. Stems Pressfit S 10 mm, 12 mm, 14 mm
D1-3	1 ea.	NS376R, NS377R, NS380R	Drill for Cemented Stem 12 mm, 14 mm, 16 mm	I1-3	1 ea.	NS397T-NS399T	Tr. Stems Pressfit L 10 mm, 12 mm, 14 mm
E	1	NS378R	Stem Tightening Key	J1-3	1 ea.	NS391R-NS393R	Reamer for Pressfit Stem 10 mm, 12 mm, 14 mm
				K	1	NS390R	Tibia Holder for Stem Torque Fixation
					1	TF048	Graphic Template for Tibia Extension Stems



NS809 - Patella Preparation

Index	Qty.	Item No.	Description	Index	Qty.	Item No.	Description
A	1	NS841R	Patella Drill/Impaction Clamp	E	1	NQ449R	Drill with Stop 6 x 28 mm
B	1	NS842	Inlay for NS841R	F1-5	1 ea.	NQ281-NQ286	Trial Patella 3 Pegs P1, P2, P3, P4, P5
C	1	NS840R	Patella Resection Clamp		1	TF049	Graphic Template for Patella Preparation
D	1	AA847R	Caliper				

VEGA System[®] Knee System

Surgical Technique

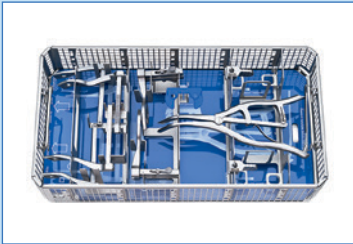
Optional Instruments



ST0089 Distractor set



ST0561 VEGA System Posterior Referencing Set



ST0413 Force controlled spreader set

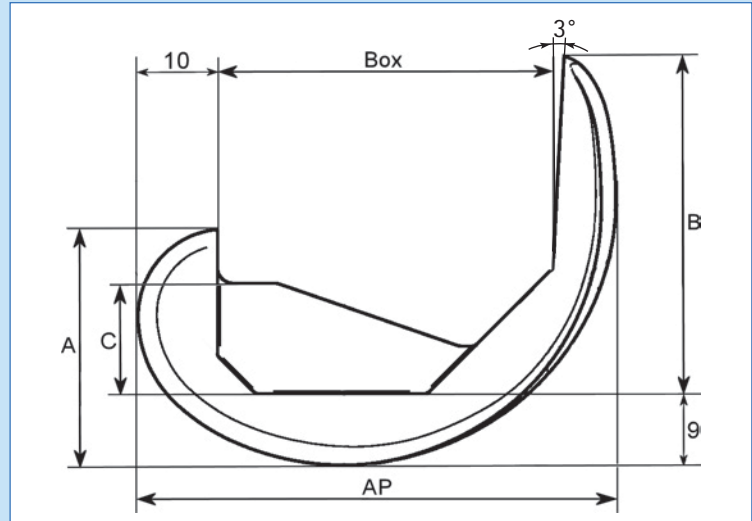
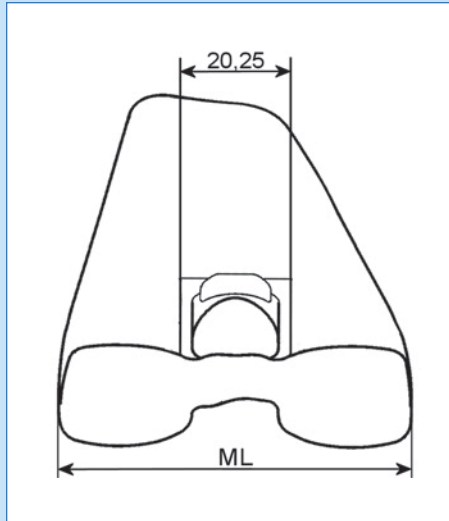


ST0310 Leg positioner for TKA and Fixation frame



Smooth Pin set (NP742R, NP743R, NP748R, NP749R, NP750R)

Dimensions



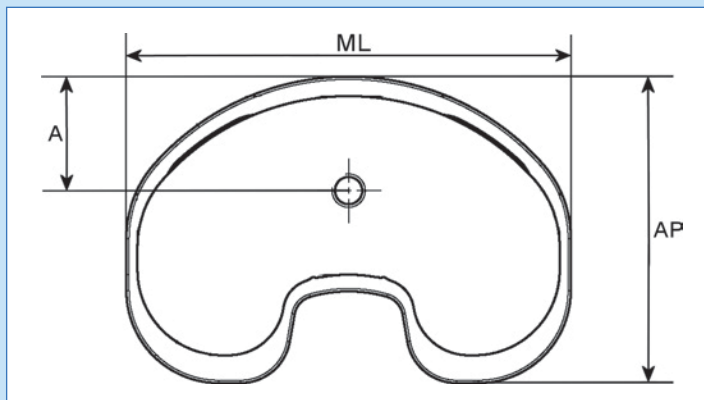
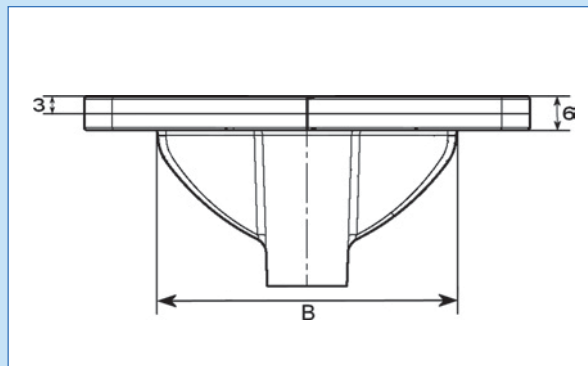
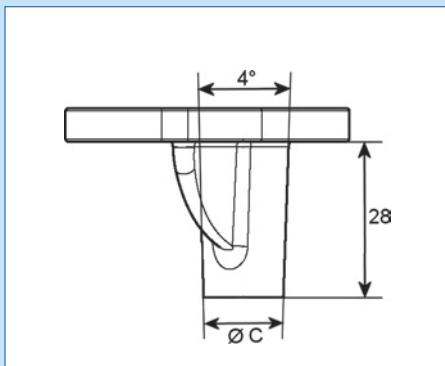
Dimensions in mm

	AP	ML	BOX	A	B	C
F1	49.5	56	32	24.2	33.9	10.8
F2N	52.2	56	35	26	36.4	12.2
F2	52.3	59	35	26	36.4	12.2
F3N	55.6	59	38	27.8	39.2	13.5
F3	55.8	62.5	38	27.8	39.4	13.5
F4N	60.3	62.5	41.5	29.7	42.4	13.9
F4	60.3	66.5	41.5	29.7	42.4	13.9
F5N	64.8	66.5	45.5	32.9	45.9	16.1
F5	64.8	71	45.5	32.9	45.9	16.1
F6N	69.9	71	50	35.2	49.4	17.4
F6	69.9	76	50	35.2	49.4	17.4
F7	75.5	82	55	37.4	53.4	17.9
F8	81	82	60	39.6	57.9	19.4

VEGA System[®] Knee System

Surgical Technique

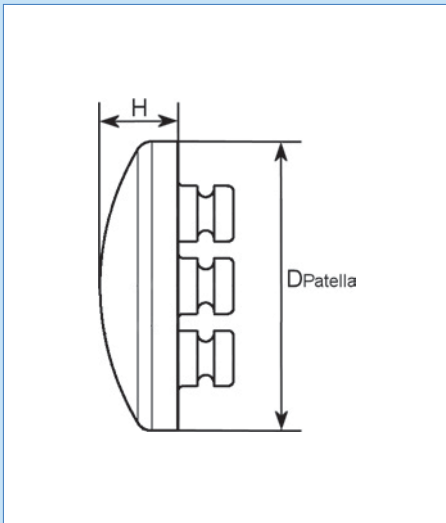
Dimensions



Dimensions in mm

	T0	T0+	T1	T1+	T2	T2+	T3	T3+	T4	T4+	T5
AP	41	44	43	46	45	49	48	52	51	55	56
ML	62	62	65	65	70	70	75	75	80	80	85
A	14	14.5	15	16	16	17.5	17.5	19	19	20.5	20.5
B	42	42	42	42	42	42	53.6	53.6	53.6	53.6	53.6
Ø C	12.3	12.3	12.3	12.3	12.3	12.3	14.3	14.3	14.3	14.3	14.3

Overview of Patella Sizes



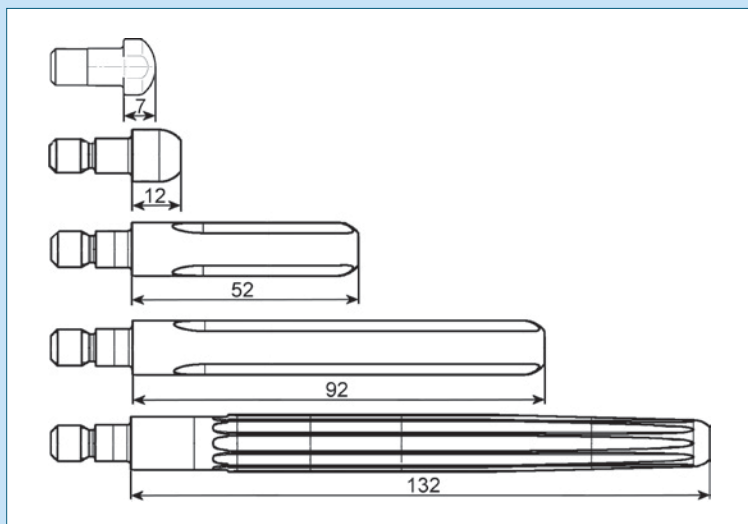
Dimensions in mm

	Patella x H
Patella P1	Ø 26 x 7
Patella P2	Ø 29 x 8
Patella P3	Ø 32 x 9
Patella P4	Ø 35 x 10
Patella P5	Ø 38 x 11

VEGA System® Knee System

Surgical Technique

Overview of Extension Stem Lengths



The overall length of the tibia plateau with the respective extension stem is given by the tibia keel length 28 mm and the obturator 7 mm or the stem length 12 mm, 52 mm, 92 mm or 132 mm.

Dimensions in mm

	T0	T0+	T1	T1+	T2	T2+	T3	T3+	T4	T4+	T5
Tibia keel length	28	28	28	28	28	28	28	28	28	28	28
Tibia keel + obturator	35	35	35	35	35	35	35	35	35	35	35
Tibia keel + stem 12 mm	40	40	40	40	40	40	40	40	40	40	40
Tibia keel + stem 52 mm	80	80	80	80	80	80	80	80	80	80	80
Tibia keel + stem 92 mm	120	120	120	120	120	120	120	120	120	120	120
Tibia keel + stem 132 mm	160	160	160	160	160	160	160	160	160	160	160

Instrument Sets and Implant Banks Available for Sale

Item No.	Description
ST0468	VEGA System® Instrument Set
ST0477	VEGA System Navigation Instrument Set
ST0399	AS VEGA Femur and PE Implant Bank
ST0400	AS VEGA Tibia and Patella Implant Bank
ST0401	VEGA PS+ PE Implant Bank
ST0402	AS VEGA T0 Implant Bank
ST0403	VEGA Tibia Stem Pressfit Implant Bank
ST0404	VEGA Tibia Stem Cemented Implant Bank

VEGA System® Knee System

Surgical Technique

Femur PS, Cemented Implants

Description	Item No. AS-Version
VEGA System PS Femur F1L	NX004Z
VEGA System PS Femur F2N L	NX005Z
VEGA System PS Femur F2L	NX006Z
VEGA System PS Femur F3N L	NX007Z
VEGA System PS Femur F3L	NX008Z
VEGA System PS Femur F4N L	NX009Z
VEGA System PS Femur F4L	NX010Z
VEGA System PS Femur F5N L	NX011Z
VEGA System PS Femur F5L	NX012Z
VEGA System PS Femur F6N L	NX013Z
VEGA System PS Femur F6L	NX014Z
VEGA System PS Femur F7L	NX016Z
VEGA System PS Femur F8L	NX018Z
VEGA System PS Femur F1R	NX024Z
VEGA System PS Femur F2N R	NX025Z
VEGA System PS Femur F2R	NX026Z
VEGA System PS Femur F3N R	NX027Z
VEGA System PS Femur F3R	NX028Z
VEGA System PS Femur F4N R	NX029Z
VEGA System PS Femur F4R	NX030Z
VEGA System PS Femur F5N R	NX031Z
VEGA System PS Femur F5R	NX032Z
VEGA System PS Femur F6N R	NX033Z
VEGA System PS Femur F6R	NX034Z
VEGA System PS Femur F7R	NX036Z
VEGA System PS Femur F8R	NX038Z

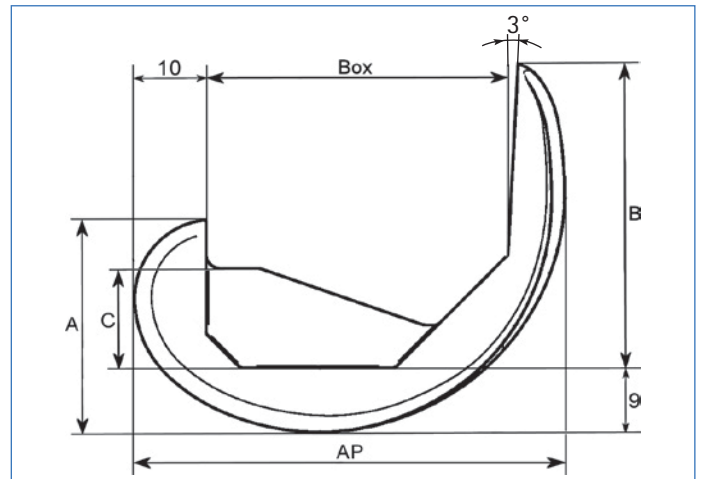
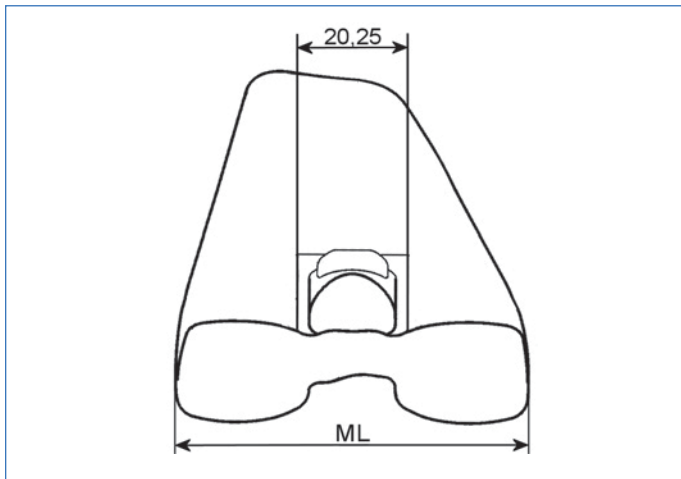


Dimension Overview

Overview of the most important dimensions of the VEGA System® Implants

Measurements in [mm]

Femur Dimensions



	AP	ML	BOX	A	B	C
F1	49.5	56	32	24.2	33.9	10.8
F2/F2N	52.2	59/56	35	26	36.4	12.2
F3/F3N	55.6	62.5/59	38	27.8	39.2	13.5
F4/F4N	60.3	66.5/62.5	41.5	29.7	42.4	13.9
F5/F5N	64.8	71/66.5	45.5	32.9	45.9	16.1
F6/F6N	69.9	76/71	50	35.2	49.4	17.4
F7	75.5	82	55	37.4	53.4	17.9
F8	81	82	60	39.6	57.9	19.4

Femur / Tibia Compatibility Chart

Size	F1	F2	F3	F4	F5	F6	F7	F8
T0	Green	Green	Green	Yellow	Red	Red	Red	Red
T1	Green	Green	Green	Green	Yellow	Red	Red	Red
T2	Yellow	Green	Green	Green	Green	Yellow	Red	Red
T3	Red	Yellow	Green	Green	Green	Green	Yellow	Red
T4	Red	Red	Yellow	Green	Green	Green	Green	Red
T5	Red	Red	Red	Yellow	Green	Green	Green	Green

Green: Ideal combination for optimum performance

Yellow: Possible, but not recommended

Red: Not compatible

VEGA System® Knee System

Surgical Technique

Tibia Plateau PS, Cemented Implants

Description	Item No. AS-Version
VEGA System PS Tibia Plateau T0	NX049Z
VEGA System PS Tibia Plateau T0+	NX050Z
VEGA System PS Tibia Plateau T1	NX051Z
VEGA System PS Tibia Plateau T1+	NX052Z
VEGA System PS Tibia Plateau T2	NX053Z
VEGA System PS Tibia Plateau T2+	NX054Z
VEGA System PS Tibia Plateau T3	NX055Z
VEGA System PS Tibia Plateau T3+	NX056Z
VEGA System PS Tibia Plateau T4	NX057Z
VEGA System PS Tibia Plateau T4+	NX058Z
VEGA System PS Tibia Plateau T5	NX059Z



Femur / Tibia Compatibility Chart

Size	F1	F2	F3	F4	F5	F6	F7	F8
T0	Green	Green	Green	Yellow	Red	Red	Red	Red
T1	Green	Green	Green	Green	Yellow	Red	Red	Red
T2	Yellow	Green	Green	Green	Green	Yellow	Red	Red
T3	Red	Yellow	Green	Green	Green	Green	Yellow	Red
T4	Red	Red	Yellow	Green	Green	Green	Green	Red
T5	Red	Red	Red	Yellow	Green	Green	Green	Green

■ Ideal combination for optimum performance

■ Possible, but not recommended

■ Not compatible

Gliding Surface PS Implants

Item No.	Description	Item No.
10 mm		
NX100	VEGA System® PS Gliding Surface T0/T0+	NX101
NX110	VEGA System PS Gliding Surface T1/T1+	NX111
NX120	VEGA System PS Gliding Surface T2/T2+	NX121
NX130	VEGA System PS Gliding Surface T3/T3+	NX131
NX140	VEGA System PS Gliding Surface T4/T4+	NX141
NX150	VEGA System PS Gliding Surface T5	NX151
14 mm		
NX102	VEGA System PS Gliding Surface T0/T0+	NX103
NX112	VEGA System PS Gliding Surface T1/T1+	NX113
NX122	VEGA System PS Gliding Surface T2/T2+	NX123
NX132	VEGA System PS Gliding Surface T3/T3+	NX133
NX142	VEGA System PS Gliding Surface T4/T4+	NX143
NX152	VEGA System PS Gliding Surface T5	NX153
18 mm		
NX104	VEGA System PS Gliding Surface T0/T0+	NX105
NX114	VEGA System PS Gliding Surface T1/T1+	NX115
NX124	VEGA System PS Gliding Surface T2/T2+	NX125
NX134	VEGA System PS Gliding Surface T3/T3+	NX135
NX144	VEGA System PS Gliding Surface T4/T4+	NX145
NX154	VEGA System PS Gliding Surface T5	NX155



VEGA System® Knee System

Surgical Technique

Gliding Surface PS+ Implants

Gliding Surface PS+

Item No.	Description	Item No.
10 mm		
NX200	VEGA System PS+ Gliding Surface T0/T0+	NX201
NX210	VEGA System PS+ Gliding Surface T1/T1+	NX211
NX220	VEGA System PS+ Gliding Surface T2/T2+	NX221
NX230	VEGA System PS+ Gliding Surface T3/T3+	NX231
NX240	VEGA System PS+ Gliding Surface T4/T4+	NX241
NX250	VEGA System PS+ Gliding Surface T5	NX251
14 mm		
NX202	VEGA System PS+ Gliding Surface T0/T0+	NX203
NX212	VEGA System PS+ Gliding Surface T1/T1+	NX213
NX222	VEGA System PS+ Gliding Surface T2/T2+	NX223
NX232	VEGA System PS+ Gliding Surface T3/T3+	NX233
NX242	VEGA System PS+ Gliding Surface T4/T4+	NX243
NX252	VEGA System PS+ Gliding Surface T5	NX253
18 mm		
NX204	VEGA System PS+ Gliding Surface T0/T0+	NX205
NX214	VEGA System PS+ Gliding Surface T1/T1+	NX215
NX224	VEGA System PS+ Gliding Surface T2/T2+	NX225
NX234	VEGA System PS+ Gliding Surface T3/T3+	NX235
NX244	VEGA System PS+ Gliding Surface T4/T4+	NX245
NX254	VEGA System PS+ Gliding Surface T5	NX255



Implants Gliding Surface PS+ *(continued)*

Tibia Obturator

Description	Item No. AS-Version
VEGA System® Obturator 12 mm T1-T3+	NN261Z
VEGA System Obturator 14 mm T4-T5	NN264Z



Peek Plug

Item No.	Description
NN260P	VEGA System Peek Plug T1-T5



Tibia Stems cemented

Description	Item No. AS-Version
VEGA System Tibia Stem, L 52 mm, 10 mm	NX060Z
VEGA System Tibia Stem, L 52 mm, 12 mm	NX062Z
VEGA System Tibia Stem, L 52 mm, 14 mm	NX063Z
VEGA System Tibia Stem, L 92 mm, 10 mm	NX061Z
VEGA System Tibia Stem, L 92 mm, 12 mm	NX064Z
VEGA System Tibia Stem, L 92 mm, 14 mm	NX065Z



Optional*

Plugs/Obtrudators

Description	Item No.
L12 mm, 12 mm	NB090Z
L12 mm, 14 mm	NB100Z



*For use only with VEGA

VEGA System® Knee System

Surgical Technique

Implants Gliding Surface PS+ *(continued)*

Tibia Stems, Pressfit

Description	Item No. AS-Version
VEGA System Tibia Stem, L 92 mm, 10 mm	NX082Z
VEGA System Tibia Stem, L 132 mm, 10 mm	NX083Z
VEGA System Tibia Stem, L 92 mm, 12 mm	NX084Z
VEGA System Tibia Stem, L 92 mm, 14 mm	NX085Z
VEGA System Tibia Stem, L 132 mm, 12 mm	NX086Z
VEGA System Tibia Stem, L 132 mm, 14 mm	NX087Z



Patella 3-Peg

Item No.	Description
NX041	VEGA System Patella Size P1, 26 x 7 mm
NX042	VEGA System Patella Size P2, 29 x 8 mm
NX043	VEGA System Patella Size P3, 32 x 9 mm
NX044	VEGA System Patella Size P4, 35 x 10 mm
NX045	VEGA System Patella Size P5, 38 x 11 mm



VEGA System® Implant Quick Reference

Tibia cemented



Types:	T0	T0+	T1	T1+	T2	T2+	T3	T3+	T4	T4+	T5
	NX049Z	NX050Z	NX051Z	NX052Z	NX053Z	NX054Z	NX055Z	NX056Z	NX057Z	NX058Z	NX059Z

Obturator



Types:	12 mm	14 mm
T0-T2+	NN261Z	
T3-T5		NN264Z

PEEK Plug



Types:	T1-T5	NN260P

Tibia stems cemented



Types:	12 mm		14 mm	
	52 mm	92 mm	52 mm	92 mm
T0-T5	NX062Z	NX064Z	NX063Z	NX065Z

Patella Three-Peg



Types:	P1	P2	P3	P4	P5
F1-F8	NX041	NX042	NX043	NX044	NX045

Tibia stems Pressfit



Types:	12 mm		14 mm	
	92 mm	132 mm	92 mm	132 mm
T0-T5	NX084Z	NX086Z	NX085Z	NX087Z

PS Gliding Surface



Types:	10 mm	12 mm	14 mm	16 mm	18 mm	20 mm
T0/T0+	NX100	NX101	NX102	NX103	NX104	NX105
T1/T1+	NX110	NX111	NX112	NX113	NX114	NX115
T2/T2+	NX120	NX121	NX122	NX123	NX124	NX125
T3/T3+	NX130	NX131	NX132	NX133	NX134	NX135
T4/T4+	NX140	NX141	NX142	NX143	NX144	NX145
T5	NX150	NX151	NX152	NX153	NX154	NX155

PS+ Gliding Surface



Types:	10 mm	12 mm	14 mm	16 mm	18 mm	20 mm
T0/T0+	NX200	NX201	NX202	NX203	NX204	NX205
T1/T1+	NX210	NX211	NX212	NX213	NX214	NX215
T2/T2+	NX220	NX221	NX222	NX223	NX224	NX225
T3/T3+	NX230	NX231	NX232	NX233	NX234	NX235
T4/T4+	NX240	NX241	NX242	NX243	NX244	NX245
T5	NX250	NX251	NX252	NX253	NX254	NX255

Femur, cemented



Types:	F1	F2N	F2	F3N	F3	F4N	F4	F5N	F5	F6N	F6	F7	F8
Left	NX004Z	NX005Z	NX006Z	NX007Z	NX008Z	NX009Z	NX010Z	NX011Z	NX012Z	NX013Z	NX014Z	NX016Z	NX018Z
Right	NX024Z	NX025Z	NX026Z	NX027Z	NX028Z	NX029Z	NX030Z	NX031Z	NX032Z	NX033Z	NX034Z	NX036Z	NX038Z

Notes

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