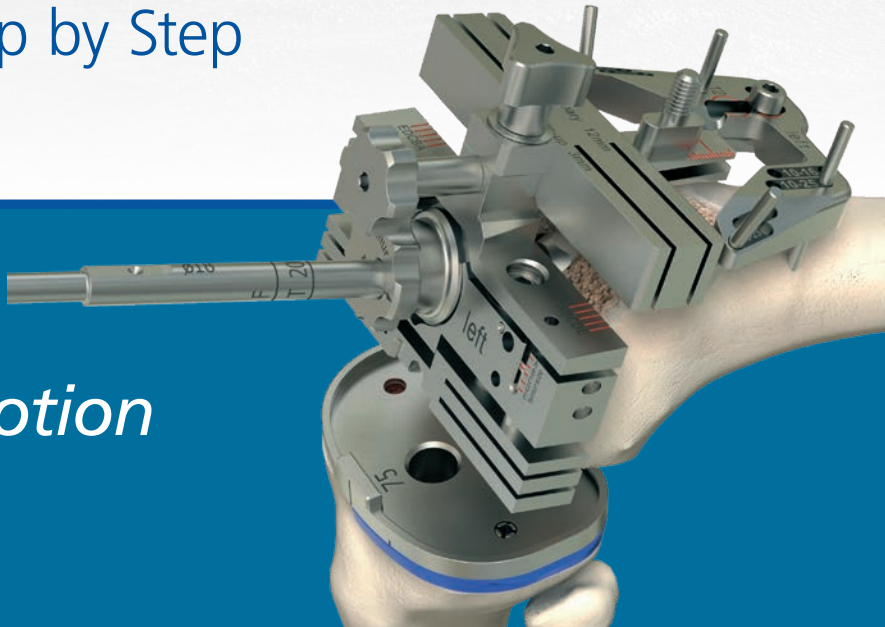
MATHYS
European Orthopaedics

Surgical technique

balanSys REV

Flexion Gap First: Step by Step



***Preservation** in motion*

Building on our heritage
Moving technology forward
Step by step with our clinical partners
Towards a goal of preserving mobility

***Preservation** in motion*

As a Swiss company, Mathys is committed to this guiding principle and pursues a product portfolio with the goal of further developing traditional philosophies with respect to materials or design in order to address existing clinical challenges. This is reflected in our imagery: traditional Swiss activities in conjunction with continuously evolving sporting equipment.

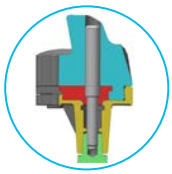
Table of contents

Remark
Please make yourself familiar with the handling of the instruments, the product-related surgical technique and the warnings, the safety notes as well as the recommendations of the instruction leaflet before using an implant manufactured by Mathys Ltd Bettlach. Make use of the Mathys user training and proceed according to the recommended surgical technique.

Introduction

Proven articulation
balanSys REV Femur
- Identical articulation as balanSys BICONDYLAR
- **Compatible** to balanSys PS Inlays for complex primary TKA
- **Compatible** to all balanSys Patellas
- 5 sizes A/B/C/D/E
- Left and right

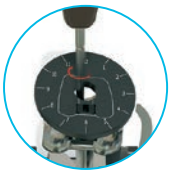
Bone defect management
balanSys REV Augmentation
- Femur: Distal and Dorsal
- Tibia: Half size blocks with 8° inclination
- Thickness: 5 mm and 10 mm



Stability
balanSys REV Inlays
- Up to ±4° rotational freedom
- Post to shaft connection **reinforced by metal**
- **Jumping height** 21 mm
- Composition up to 33 mm (incl. augment)
- 6 heights 10.5/13/15.5/18/20.5/23

Proven geometry
balanSys REV Tibia Plateau
- **Compatible** to balanSys PS, CR, UC Inlays for complex primary TKA
- 5 sizes 64/70/75/80/85

Variability
balanSys REV Stem
- **Identical** stems for tibia and femur
- With morse taper connection
- **Straight** and 4 mm **offset**
- 12 diameters: 10 to 24 mm
- 3 lengths: 80, 140 and 200 mm



Precision
balanSys REV Instruments
- Reproducible orientation of stems
- All cuts guided

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Intended use

The balanSys REV prosthesis is intended for treating degenerative joint diseases of the knee joint in skeletally mature patients.

Indications and contraindications

Indications
- Painful and/or disabling joint disease of the knee resulting from osteoarthritis, avascular necrosis, inflammatory arthritis or posttraumatic arthritis
- Failure of previous surgery or medical device including knee arthroplasty

Contraindications
- Local or general infection
- Any soft tissue, ligament, nerve or vessel insufficiency which may create an unacceptable risk of prosthesis instability, prosthesis fixation failure and/or complications in post-operative care
- Compromised bone stock due to bone loss or bone defects and/or insufficient bone substance, which cannot provide adequate support and/or fixation for the prosthesis
- Hypersensitivity to materials used
- Skeletal immaturity
- Genu recurvatum
- Insufficiency of the extensor mechanism
- Progressive neoplastic disease

For further information, please refer to the instructions for use or ask your Mathys representative.

Optional combination possibilities with balanSys BICONDYLAR

balanSys patella can be used in combination with balanSys REV implants. For instructions to prepare and implant a balanSys patella, please refer to one of the surgical techniques balanSys BICONDYLAR.

In case of larger bone loss in primary surgeries the REV tibia implants can be used in combination with BICONDYLAR inlays CR, UC and PS and the appropriate BICONDYLAR Femur. Furthermore the REV femur implants can be used in combination with a BICONDYLAR PS inlay. Refer to appendix 2 for a detailed description of combination possibilities.

Additional instruments are required for such combinations.
For instructions to prepare and implant a balanSys BICONDYLAR femur, inlay or tibia, please refer to one of the surgical techniques balanSys BICONDYLAR ‹Bone Oriented› or ‹LIS›. With a tibia or trial tibia in place, use the REV Spacer Blocks for assessment of extension and flexion gap. The BICONDYLAR Spacer Blocks and the Ligament Tensor are not suitable for gap assessment with a tibia or trial tibia in place. Surgical techniques for balanSys are available on the website or from your Mathys representative.

For further information, please refer to the instructions for use or ask your Mathys representative.

Preoperative planning

A complete history and physical examination of the failed knee arthroplasty is necessary before revision surgery. It is necessary to understand and to determine the cause of a failed implant preoperatively in order to maximize the probability of postoperative success. Preoperative radiographies are essential for surgical planning. Radiographies of the knee in two views are recommended: A single-leg stance radiography in the anterior-posterior (A-P) plane, and a lateral radiography of the knee joint in 90° flexion or in extension. In addition, a long-leg radiography with loading of both legs is needed. It is useful to have a ‹skyline› or ‹sunrise› view of the patella in 40° flexion as well.

Radiographies are needed to identify and quantify deformities and bone defects as well as osteophytes. Using planning templates, the size of the femoral and tibial prosthesis can be initially determined. Long-leg radiographies help to detect deviations of the axis and deformities in the diaphyseal area of the femur and the tibia. Long-leg radiographies help also to determine whether intramedullary alignment can be performed. If bone defects exist preoperatively, the surgeon performing the procedure must understand the implications of this bone loss as well as the techniques required to manage them. In a revision situation, the balanSys REV Measuring Template should be used to estimate the size of the femoral component by templating from a true lateral x-ray of the contralateral knee. Intraoperative restoration of the appropriate A/P dimension of the femur will yield the most appropriate flexion gap which can then be used to help determine the extension gap. Estimate the need for posterior femoral augmentation by overlaying the appropriate size femoral template on the lateral x-ray of a failed knee implant. Templating the proximal/distal position of the femoral component on an A/P x-ray is often difficult. Use the inferior pole of the patella to help determine the appropriate position of the joint line. Templating the tibial component can produce similar information. Determine the level of bone resection and the possible need for augmentation or an offset stem by centering the tibial stem within the tibial canal on the x-ray.

For the use of balanSys REV implants in a complex primary situation the alignment and sizing of the components follows the same landmarks as balanSys BICONDYLAR.

Exposure of the revision total knee

Exposure of the revision total knee can be complicated by previous incisions, stiffness or a fibrotic soft tissue envelope. Usually, greater exposure is required for a revision total knee arthroplasty as compared with that of a primary TKA.

Proper tissue planes medially and laterally must be elevated and fasciocutaneous flaps must be maintained in order to minimize wound healing complications.

Extraction of primary components

After adequate exposure of all components has been achieved, attention is turned to component removal. If known, the manufacturer of the components to be removed should be referred for explantation. Usually, the removal of the components is achieved through dissection of the interface between the prosthesis and the cement or at the prosthetic/bone interface. Most surgeons prefer to remove the femoral component first in order to improve visualization of the posterior tibial component. A thin, flexible osteotome or a thin oscillating or reciprocating saw should be used to cut the prosthetic interface in order to allow removal with minimal bone loss. Angled osteotomes can be helpful in loosening and freeing the condylar portions of the femoral components. Providing the interfaces have been adequately freed, only minimal force will be required to remove the femoral component. Removal of the tibial component is then carried out in a similar fashion. As bone cement fails most easily in tension, a controlled, well-placed blow will generally dislodge the tibial component.

Excessive force to remove the components can lead to femoral fracture or extensive bone loss.

In case the patella was resurfaced previously with a balanSys Patella, special attention should be given to the patella implant: if the patella implant is securely fixed, well-positioned and does not show excessive wear then it may be left and protected for the remainder of the case. If the patellar implant should be revised, removal is most easily performed with an oscillating saw at the cement interface. Residual cement and polyethylene plugs from the component may then be removed with a small, high-speed burr. Great care must be taken during this stage of the procedure in order to ensure that adequate patellar bone stock remains for revision component placement so that fracture is prevented.

Once components have been removed, the remaining cement must be removed with curettes, cement osteotomes or other appropriate instruments. The wounds can be irrigated using pulse lavage to remove loose debris and attention can then be turned to the reconstructive portion of the procedure.

In cases you prefer retaining a stable balanSys BICONDYLAR component, make sure to protect all articulation surfaces against damage.
Any wear, scratch or mark on an articulating implant surface must result in removal of that component.

Surgical technique

Tibial preparation

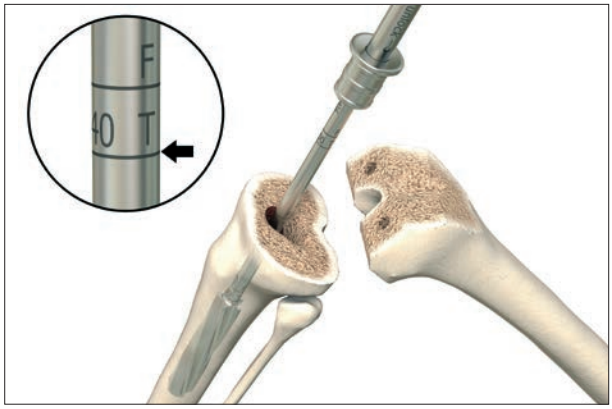


Fig. 1

If necessary, drill a pilot hole with the 8.5 mm intramedullary Drill Bit (71.02.3009).

Insert the intramedullary Reamer (79.02.0310 to 79.02.0325) and hand-ream the tibial canal until cortical contact is achieved using progressively larger diameter reamers.

The markings on the reamer shaft indicate the depth of the reamer: 80 mm, 140 mm, 200 mm
- T for Tibia
- F for Femur

The markings correspond to the resection plane. In a revision situation, the markings should be just below the refresh cut when the reamer is in the final position. In a primary situation, the markings should be app. 8 mm below the surface.

Remark
Be very careful when reaming. The balanSys Reamers are sharp. Special attention must be given when contact is made with cortical bone to avoid perforation.

Diameters stem / reamers
80 mm straight and offset stems:
- Diameter 10 to 24 mm: in 2 mm steps

140 mm straight and offset stems:
- Diameter 10 to 18 mm: in 1 mm steps
- Diameter 20 to 24 mm: in 2 mm steps

200 mm straight and offset stems:
- Diameter 10 to 18 mm: in 1 mm steps

		Diameter														
	mm	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
Length	**80**	✓		✓		✓		✓		✓		✓		✓		✓
	140	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓		✓
	200	✓	✓	✓	✓	✓	✓	✓	✓	✓						

Leave the last reamer with the best fit in the intramedullary canal. It will be used to align the Tibial Reference System.

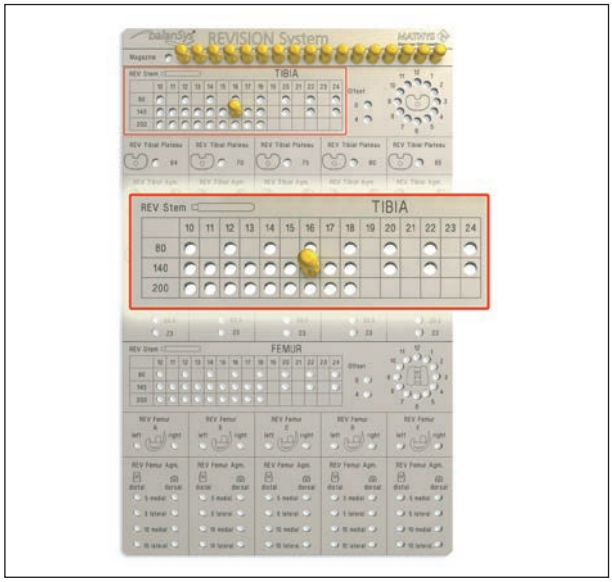


Fig. 2

Use the Memory Board (79.02.0637) with the Plug-In Pegs (79.02.0638) to record the diameter of the last reamer (in this example: diameter 16 mm, length 140 mm).

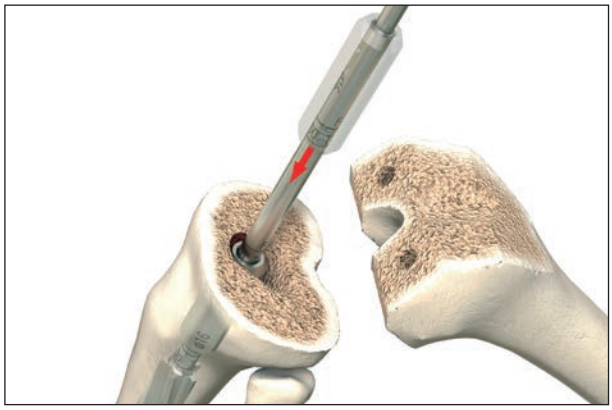


Fig. 3

For stabilization of the Reamer, slide the Guide Sleeve (79.02.0510 to 79.02.0525) which fits best over the shaft until it reaches the level of the tibial osteotomy (only required for the 140 and 200 mm reamers).
Use the Positioning Fork (79.02.0029) to hold down the Guide Sleeve.

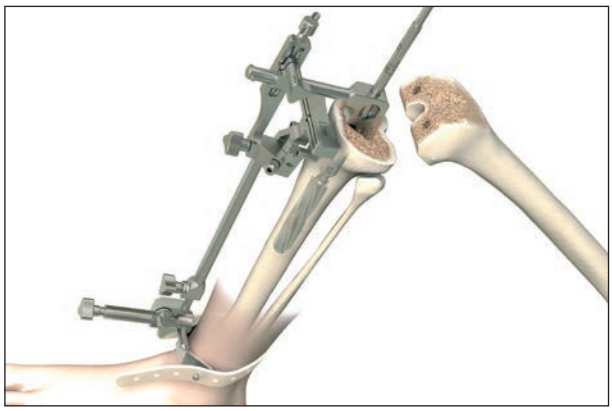


Fig. 4

The Tibial Reference System will be guided by the intramedullary Reamer (79.02.0310 to 79.02.0325).

Remark
The assembly of the Tibial Reference System is explained in Appendix 7.

Slide the assembled Tibial Reference System over the shaft of the last used Reamer (79.02.0310 to 79.02.0325).

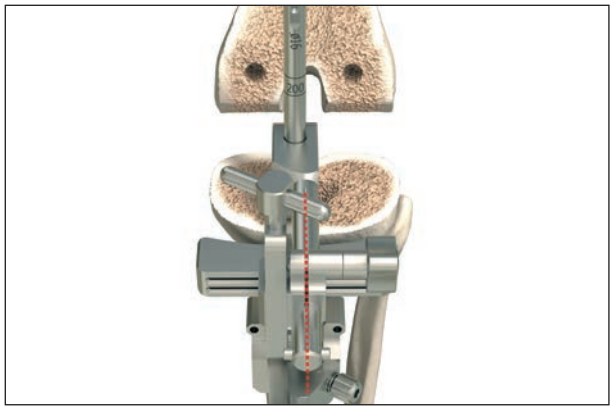


Fig. 5

Set the varus-valgus orientation to a neutral position (the groove of the bracket must be aligned with the open slot of the adjusting screw).

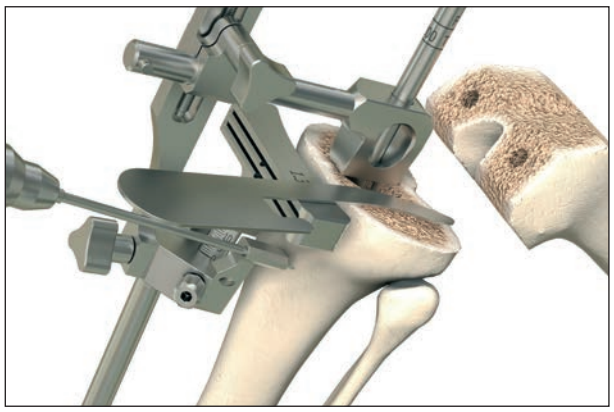


Fig. 6

In a revision case or situation with huge bone loss, set the superior surface of the Tibial Cutting Guide (79.02.0290) at the level of the proximal tibia. Check with the Reference Plate (77.02.0031).

In a primary case, use the Reference Plate (77.02.0031) to determine the original joint line.

Affix the Tibial Reference System proximally with at least two Pins (71.02.3054) in the specified holes (oblique and straight). The holes should be pre-drilled with the Drill Bit (315.310).

Remark
Tibia shaft axis is orientated 90° to tibia plateau (0° posterior slope). Hence rotational alignment does not influence the slope orientation.

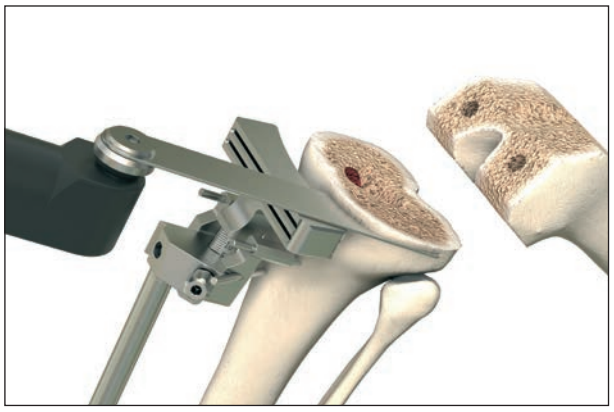


Fig. 7

Revision case = Refresh cut: Lower the Tibial Cutting Guide (79.02.0290) to the required level and perform the cut.
Primary case = Tibia cut: Lower the Tibial Cutting Block 6–8 mm to set the resection height.

Description of the Tibial Cutting Block:
- Superior surface of the Tibial Cutting Block for the refresh cut
- 1st Slot: 5 mm below superior surface of Tibial Cutting Block (for a 5 mm augmentation)
- 2nd Slot: 10 mm below superior surface of Tibial Cutting Block (for a 10 mm augmentation)

After performing the refresh-cut, remove the Tibial Cutting Guide (79.02.0290) to have better access to the cut surface.

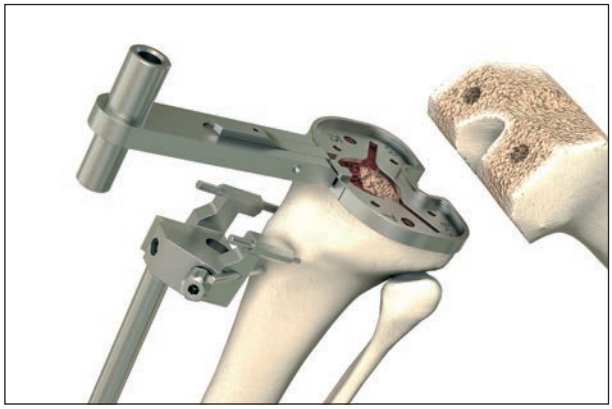


Fig. 8

Determine the tibial prosthesis size with the Tibial Template (79.02.0291 to 79.02.0295), taking the rotational alignment into account.

Remark
It must be ensured that the chosen template provides the desired tibial coverage. Check if the chosen tibial size is compatible with the probable femur size (Appendix 1 – Size Compatibility of the balanSys REV Implants).

Fig. 9

Use the Memory Board (79.02.0637) to record the tibial size (in this example: REV Tibial Plateau 75).
After the refresh-cut, an augmentation might be necessary.

Insert the Tibial Cutting Guide (79.02.0290) again into the Aiming Device Proximal.

Depending on the thickness (5 or 10 mm), the correct slot needs to be chosen:

- 1st Slot: 5 mm below superior surface of cutting block (for a 5 mm augmentation)
- 2nd Slot: 10 mm below superior surface of cutting block (for a 10 mm augmentation)

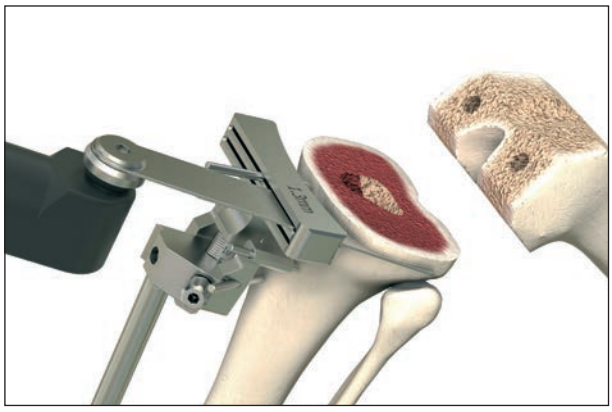


Fig. 10

For different augmentation heights medial and lateral, a Pin (71.02.3054) should be inserted into the central hole of the cutting guide. It will guide the saw blade and act as a barrier.

Remark
The tibial augments are 8° chamfered.

Remark
Place bone retractors to protect the ligaments during tibial resection.

Remark
To reduce heat and the risk of osteonecrosis, it is recommended to cool the saw blades during sawing.

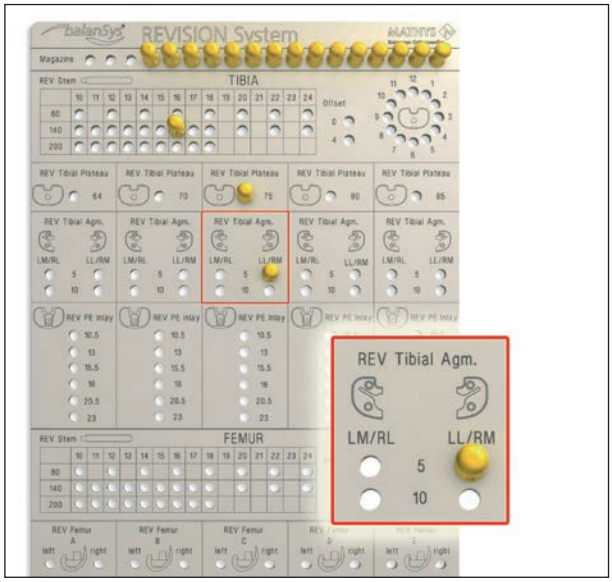


Fig. 11

Use the Memory Board (79.02.0637) to record the necessary augmentation (in this example: REV Tibial Augmentation LL/RM 5 mm).

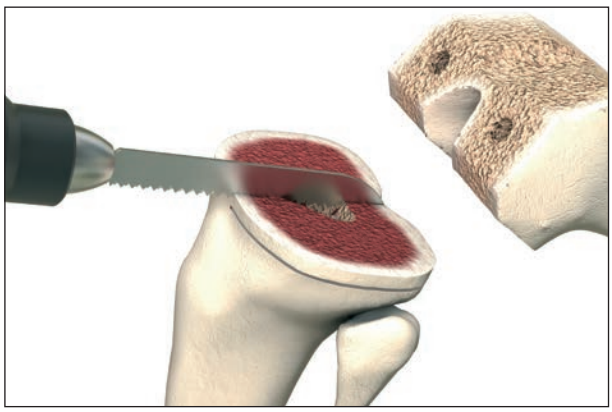


Fig. 12

If the medial and lateral augments have different heights, use a saw or chisel in order to perform the central cut and to remove the bone block.

Surgical technique

Tibial offset determination and preparation

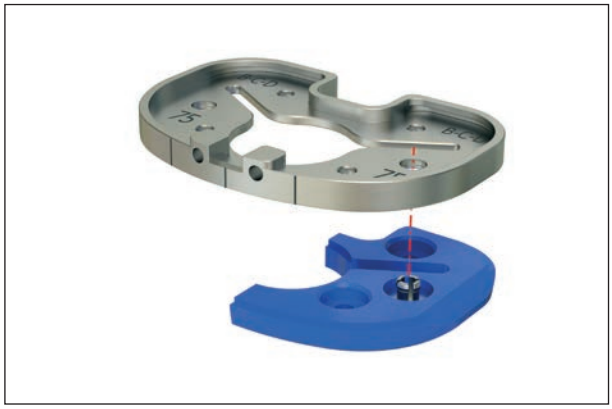


Fig. 13

Assemble the Tibial Template (79.02.0291 to 79.02.0295) with the necessary Trial Tibia Augmentation (79.02.0160 to 79.02.0187). This is achieved with a click-on mechanism.

In this example (left knee), a 5 mm tibial augmentation for the lateral compartment has been chosen.

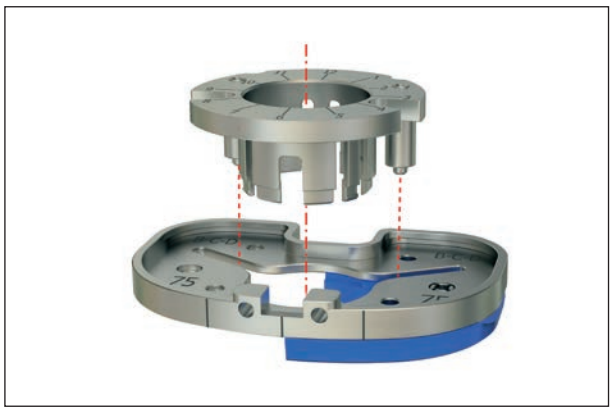


Fig. 14

Click on the Offset Graduated Collar (79.02.0258) onto the Tibial Template (79.02.0291 to 79.02.0295).

Remark

Scale can be read by the operator, 12 o'clock = posterior.

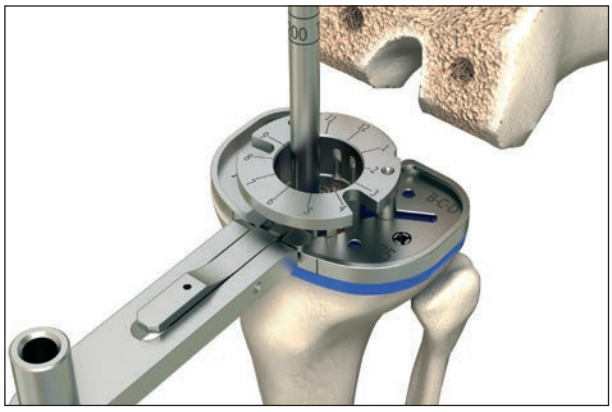


Fig. 15

Insert the last used Reamer and check the depths. The marking must be at least equal with the lower side of the Tibial Template. If the Reamer is not inserted deep enough, it is necessary to re-ream.

Put the entire configuration (Tibial Template with the Offset Graduated Collar and Tibial Augmentation) with the aid of the Holder Tibial Template (71.34.0196) over the reamer shaft onto the tibial osteotomy.

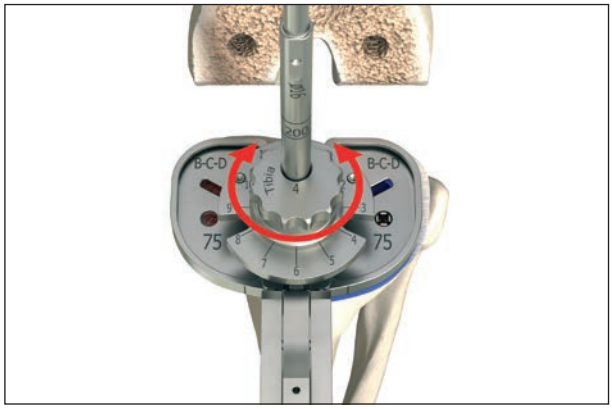


Fig. 16

The balanSys REV System features straight stems and stems with 4 mm offset.

Insert the Offset Tibial Guide (Without offset: 79.02.0541 or with 4 mm offset: 79.02.0543) over the reamer into the Offset Graduated Collar (79.02.0258).

Find the best coverage with the Tibial Template by rotating the Offset Tibial Guide (in case of no offset, this step is obsolete).

In this example, the 4 mm Offset Tibial Guide (79.02.0543) is used.

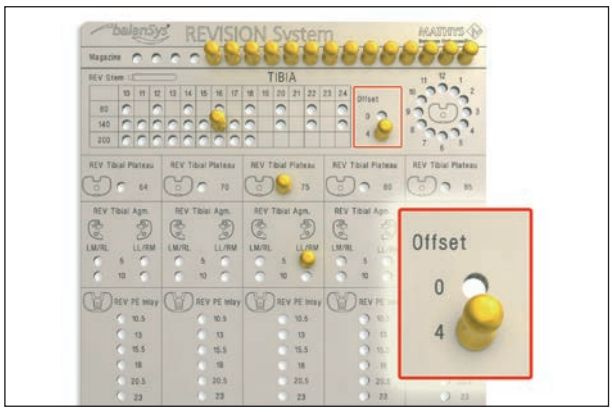


Fig. 17

Use the Memory Board (79.02.0637) to record the required offset (in this example: a 4 mm offset is required).

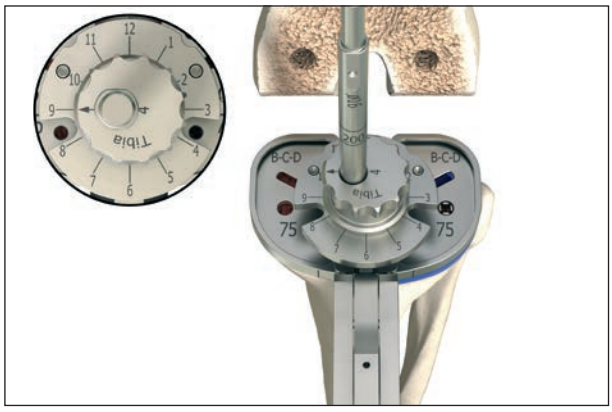


Fig. 18

Special attention must be given to the rotation of the tibia.

Read the information from the Offset Graduated Collar (79.02.0258): the small arrow on the Offset Tibial Guide (4 mm offset: 79.02.0543) points to the appropriate position. This number represents the orientation of the offset (in this example: 9 o'clock).

The number references the position of the tibial plateau trial and/or final implant when connected to the trial stem and/or final implant.

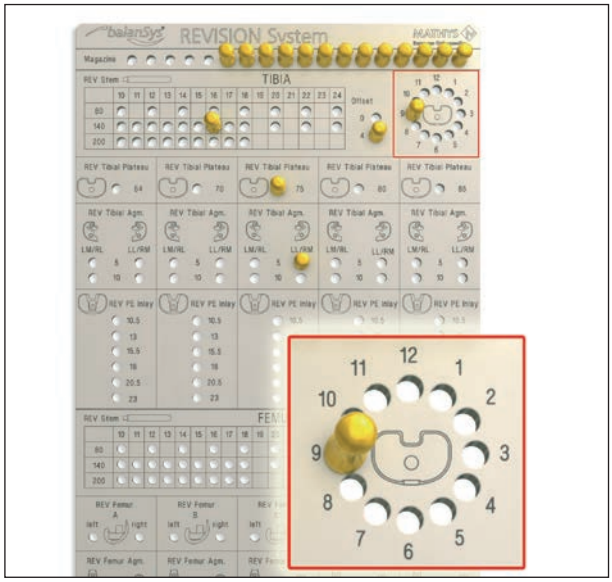


Fig. 19

Use the Memory Board (79.02.0637) to record the required rotation (in this example: 9 o'clock).

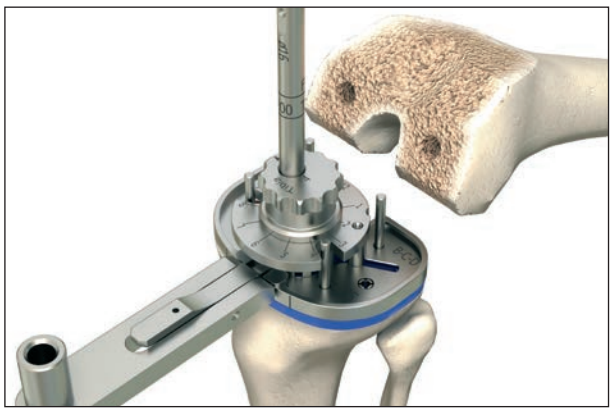


Fig. 20

Fix the Tibial Template with 4 Pins (71.02.3054).

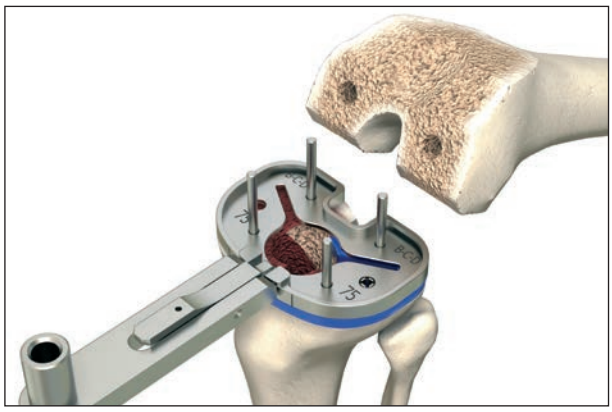


Fig. 21

Remove all of the following instruments:
1. Offset Tibial Guide (79.02.0541 or 79.02.0543)
2. Offset Graduated Collar (79.02.0258)
3. Reamer (79.02.0310 to 79.02.0325) and Guide Sleeve (79.02.0510 to 79.02.0525)
4. Holder Tibial Template (71.34.0196)

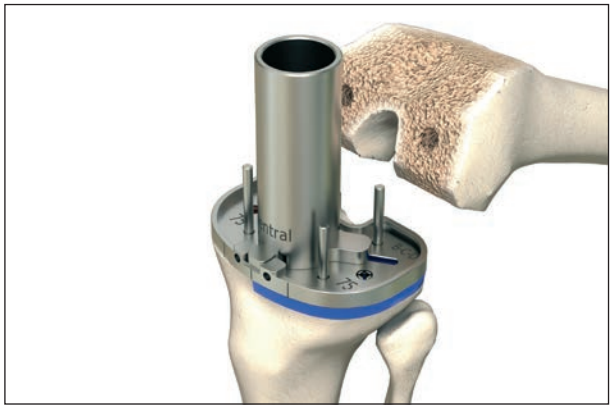


Fig. 22

The PS Reamer (79.02.0281) must be connected to the Machine Coupling (79.02.0021) and connected to a power drill.

Position the Reamer Guide (79.02.0286) onto the Tibial Template and drill out of the tibial medullary space.

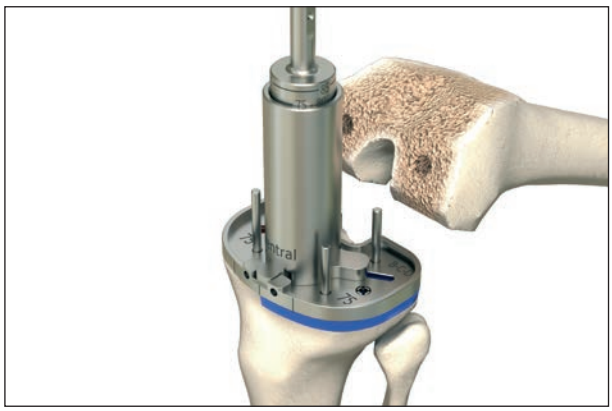


Fig. 23

The depth must correspond to the appropriate length of the anchorage stem of the predetermined balanSys REV Tibial Plateau. Size markings are etched onto the Reamer (marking must be flush with the end of the Reamer Guide).

After completing the preparation for the anchorage stem, the PS Reamer and the Reamer Guide must be removed.

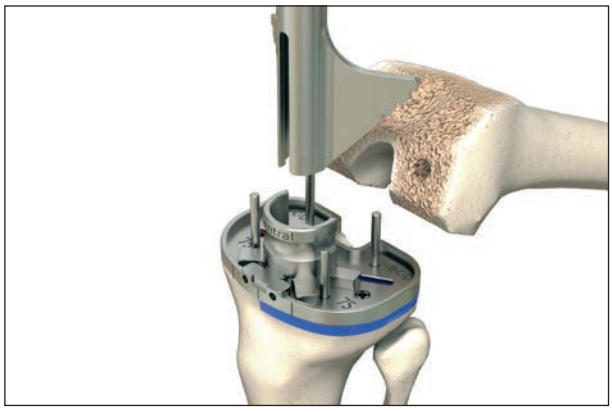


Fig. 24

The Fin Chisel (71.34.0198) must be connected to the Handle (71.34.0700).

The Chisel Centring Guide (79.02.0257) must be positioned onto the Tibial Template.

The Fin Chisel assembly should be impacted with care to prevent fracture of the tibia to prepare the fins for the balanSys REV Tibial Plateau.

Remark
In case of sclerotic bone, it might be advisable to pre-cut the fins with a saw.

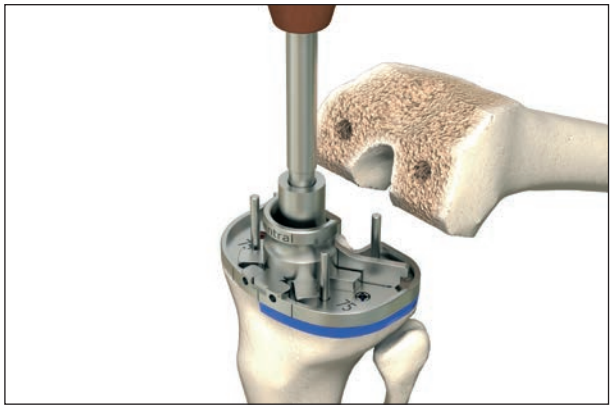


Fig. 25

During introduction of the Fin Chisel care has to be taken to protect the lateral collateral ligament and the popliteal tendon.

Impact until the instrument bottoms out on the Tibial Template. The depths of the fins are defined by the size of the Tibial Template.

Remove all remaining instruments, except the Pins.

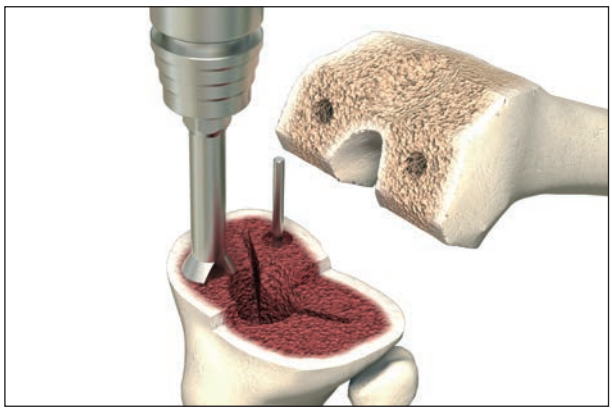


Fig. 26

This steps are required if no or only one augmentation is selected:

- Guide the Tibia Reamer 10 (79.02.0279) over the Pins and mill the required number of cavities.
- These recesses will accommodate the screw-sockets on the lower surface of the balanSys REV Tibial Plateau (in this example: required on the medial side, since a 5 mm augmentation on the lateral side is chosen).

After completion, remove all remaining pins.

Surgical technique

Trial tibial implant assembly

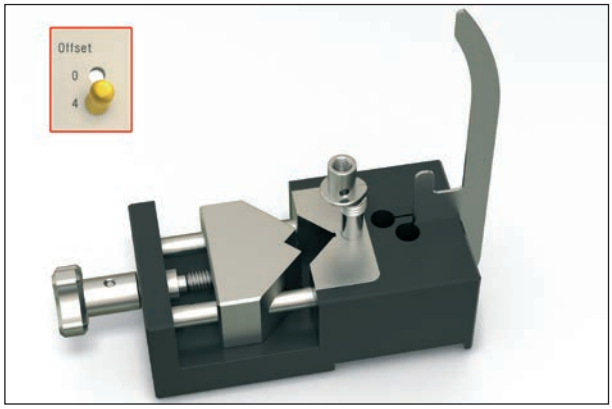


Fig. 27

Insert the Reference Plate (77.02.0031) in the slot of the black Assembly Device (79.02.0271). Insert the Test Stem Core straight (79.02.0668) or with offset (79.02.0669) into the hole.

Remark

The orientation of the Test Stem Core is correct when it can no longer be rotated. The laser marking is orientated towards the Reference Plate.

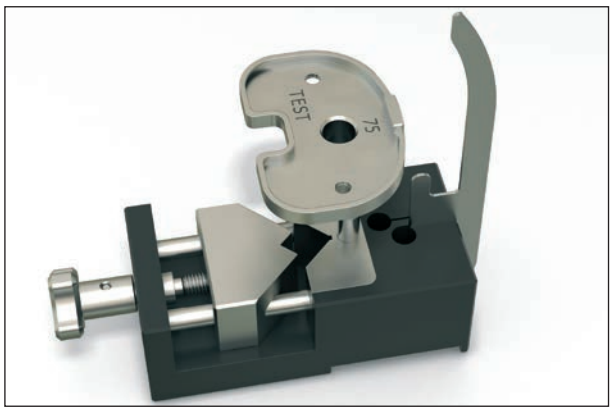


Fig. 28

Position the Trial Tibial Plateau (79.02.0060 to 79.02.0064) onto the Test Stem Core.

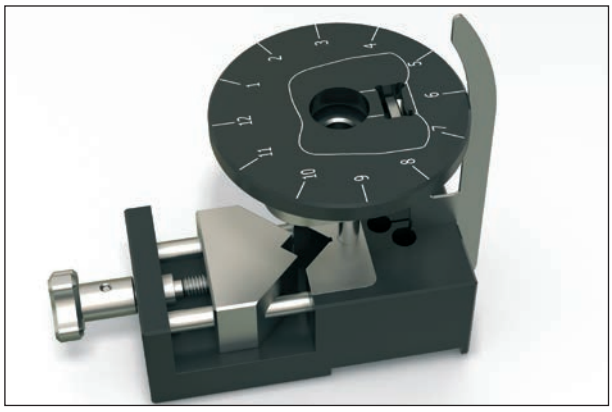


Fig. 29

Put the Offset Alignment Disk (79.02.0287) onto the Trial Tibial Plateau (put the open rectangle window over the anterior nose of the Trial Tibial Plateau).

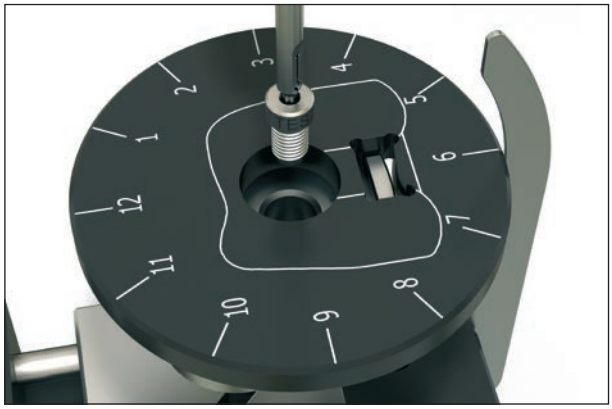


Fig. 30

Snap-in the Trial Stem Screw (79.02.0071) onto the Screw Positioner (79.02.0270) and insert the screw into the hole, but do not tighten it yet!

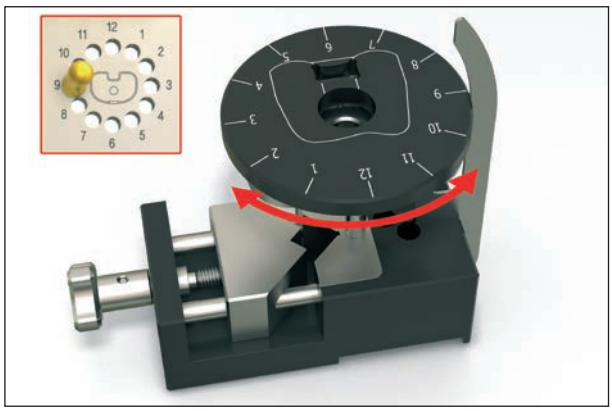


Fig. 31

Rotate the Offset Alignment Disk (79.02.0287) until the Reference Plate (77.02.0031) corresponds with the predetermined position (in this example: 9 o'clock).

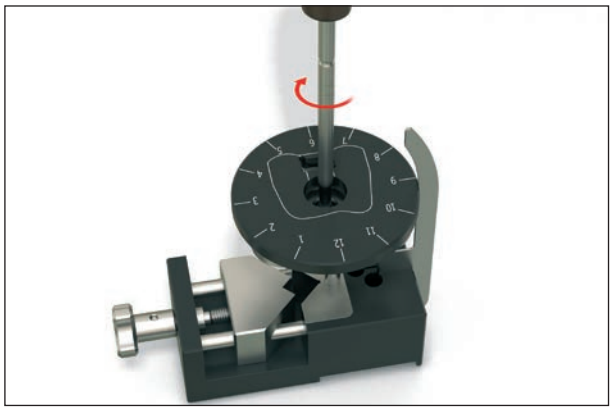


Fig. 32

Tighten the Trial Stem Screw (79.02.0071) with the Hexagonal Screwdriver (314.270).

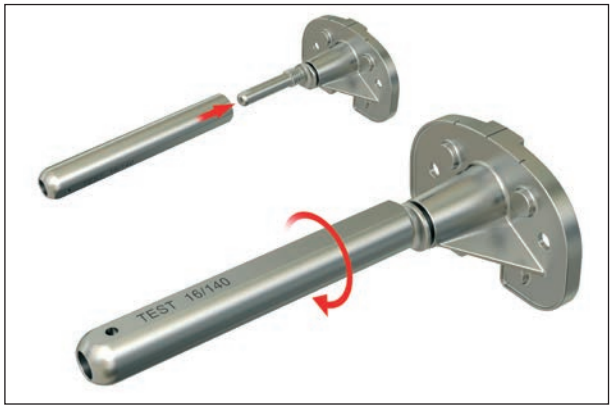


Fig. 33

Put the appropriate Trial Stem Sleeve (predetermined diameter and length, view Memory Board) onto the Trial Stem Core and tighten the sleeve by hand in a clockwise direction.

Remark

To release the Trial Stem Sleeve, insert a Pin through the hole at the distal end and turn in the appropriate direction.

Fig. 34

Click the Test Augmentations onto the lower surface of the Trial Tibial Plateau.

Remark

The Reference Plate can be used to remove the Trial Tibia Augmentation. Insert the tip into the gap between Trial Tibial Plateau and Augmentation and push.

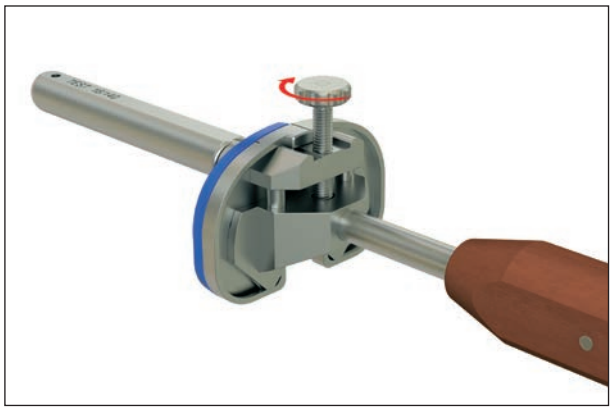


Fig. 35

Connect the Positioner (79.02.0272) to the test assembly. Tighten the screw to secure the assembly.

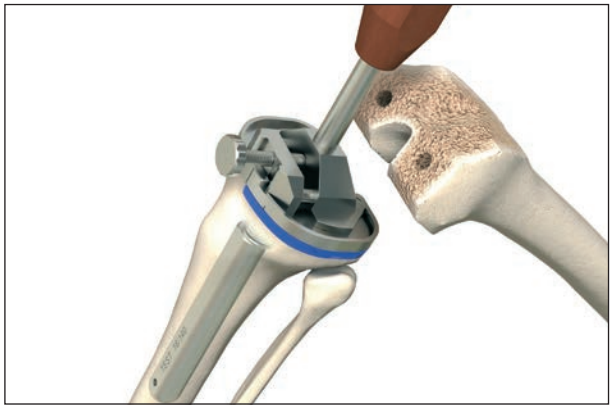


Fig. 36

Insert the test assembly with the aid of the Positioner into the intramedullary canal of the tibia and onto the tibial surface.

Remark
Pay particular attention to rotational stability if using medial and lateral Augmentations.

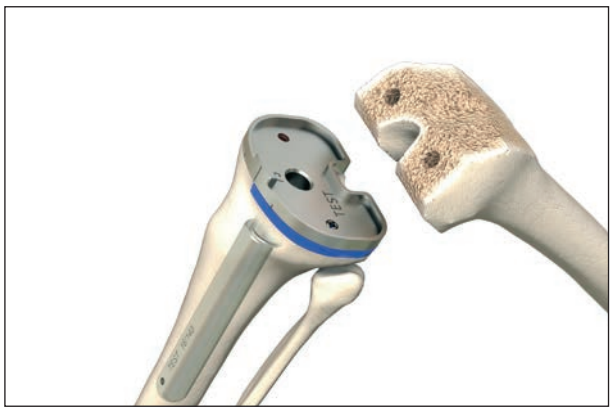


Fig. 37

Open the screw and remove the Positioner.

Remark
Leaving the test assembly in place during the femur preparation is recommended.

In case of using a REV Tibia in combination with a BICONDYLAR CR or PS Femur: When measuring the extension gap using spacer blocks, consider that the distal femoral resection is done with 7° slope while the tibial cut is done without slope.

Surgical technique

Femoral preparation

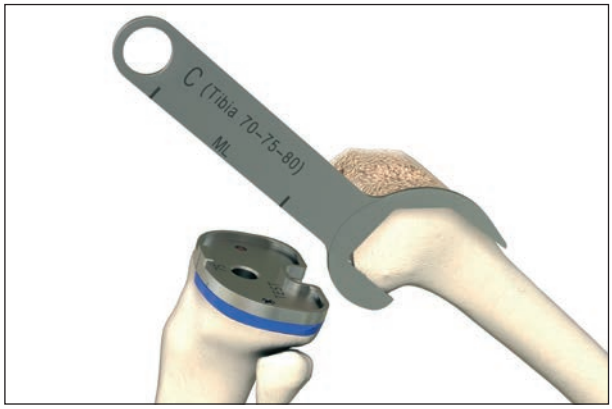


Fig. 38

Assess the correct femur size:

- Check the size of the primary femur implant – both in ML and AP
- And/or use the Femoral Sizing Guide (79.02.0530 to 79.02.534) to assess the correct size
- Check if the assessed femur size is compatible with the determined tibia size (Appendix 1 – Size Compatibility of the balanSys REV Implants)

Remark

The Medical advisors recommend using a larger size, if in doubt.

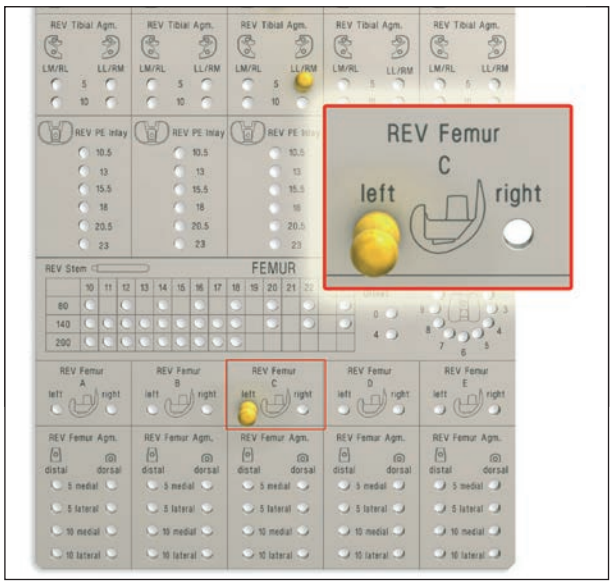


Fig. 39

Use the Memory Board (79.02.0637) to record the suggested size and side (in this example: REV Femur size C, left leg).

Fig. 40

If necessary, drill a pilot-hole with the 8.5 mm intramedullary Drill Bit (71.02.3009).

Fig. 41

Insert the intramedullary Reamer (79.02.0310 to 79.02.0325) and hand-ream the femoral canal until cortical contact is achieved using progressively larger diameter reamers.

The markings on the reamer shaft indicate the depth of reamer: 80 mm, 140 mm, 200 mm
- T for Tibia
- F for Femur

Remark
Be very careful when reaming. The balanSys Reamers are sharp. Special attention must be given when contact is made with cortical bone.

The markings correspond to the resection plane. In a revision situation, the markings should be just below the refresh cut when the reamer is in the final position. In a primary situation, the markings should be app. 12 mm below the joint line.

Slide the Guide Sleeve (79.02.0510 to 79.02.0525) which fits best for stabilization of the Reamer over the shaft. Use the Positioning Fork (79.02.0029) to hold down the Guide Sleeve.

Diameters stem / reamers
80 mm straight and offset stems:
- Diameter 10 to 24 mm: in 2 mm steps

140 mm straight and offset stems:
- Diameter 10 to 18 mm: in 1 mm steps
- Diameter 20 to 24 mm: in 2 mm steps

200 mm straight and offset stems:
- Diameter 10 to 18 mm: in 1 mm steps

		Diameter														
Length	mm	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	80	✓		✓		✓		✓		✓		✓		✓		✓
	140	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓		✓
	200	✓	✓	✓	✓	✓	✓	✓	✓	✓						

Leave the last reamer with the best fit in the intramedullary canal.

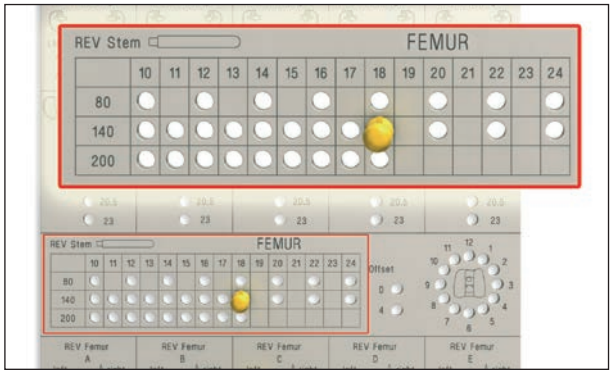


Fig. 42

Use the Memory Board (79.02.0637) to record the diameter of the last reamer (in this example: diameter 18 mm and length 140 mm).

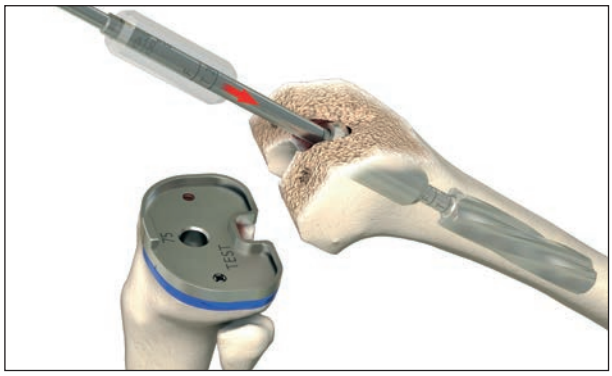


Fig. 43

Slide the Guide Sleeve (79.02.0510 to 79.02.0525) which fits best for stabilization of the Reamer over the shaft.
Use the Positioning Fork (79.02.0029) to hold down the Guide Sleeve.

Fig. 44

The AP Cutting Block (Right 79.02.0600/Left 79.02.0601) allows various settings.

Set a preliminary femur size on the AP Cutting Block (Right 79.02.0600/Left 79.02.0601). The size may be based on the information provided by the Femoral Sizing Guide (or any other chosen method, see section «Preoperative planning»).

The final size will be decided once the AP Cutting Block is inserted onto the Reamer.

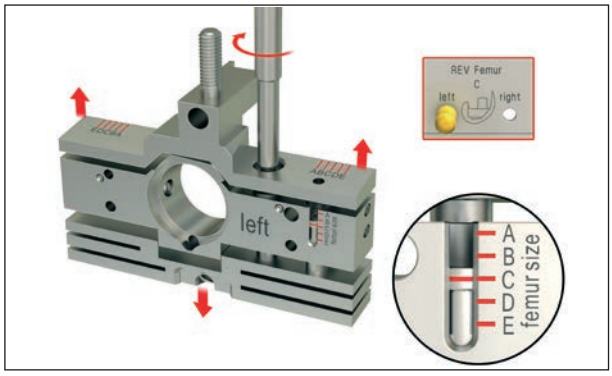


Fig. 45

Turning the screw changes the anterior and posterior dimension of the AP Cutting Block (it widens or closes the AP-dimension).

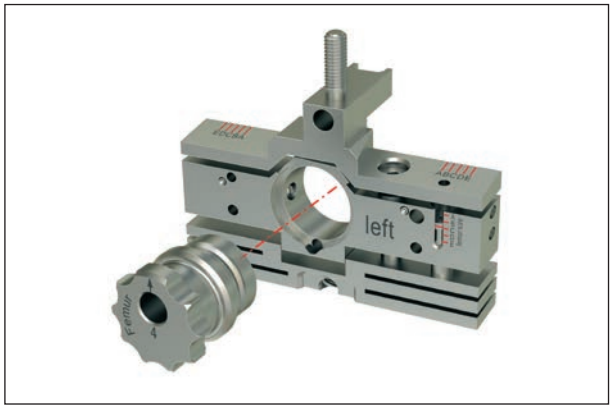


Fig. 46

The balanSys REV System features straight stems and stems with 4 mm offset.

Insert the Offset Femur Guide into the round opening in the middle of the AP Cutting Block. (Without offset: 79.02.0615 or with 4 mm offset: 79.02.0617). The exact position will be defined at a later stage.

In this example the Offset Femur Guide 4 (79.02.0617) is used.

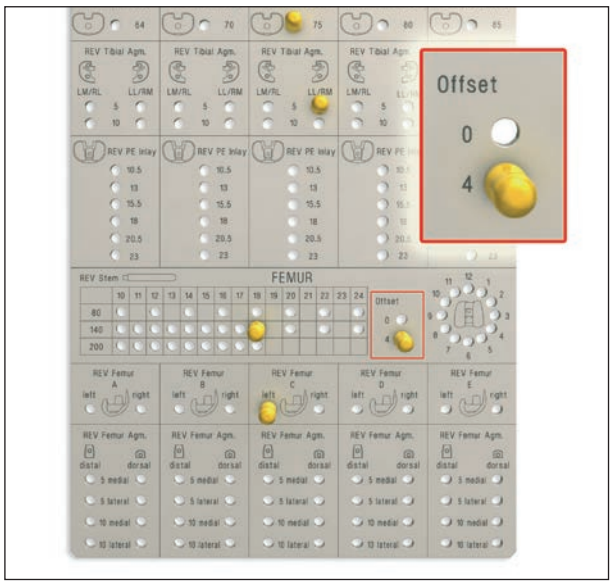


Fig. 47

Use the Memory Board (79.02.0637) to record the required offset (in this example: a 4 mm offset is required).

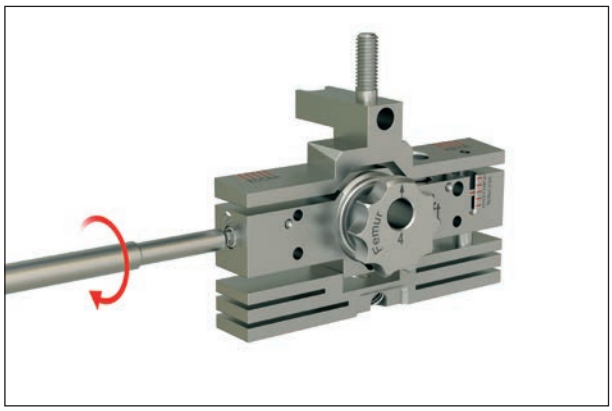


Fig. 48

To prepare the AP Cutting Block (Right 79.02.0600 / Left 79.02.0601), secure the Offset Femur Guide by tightening the lateral screw followed by loosening it about half a turn. The Offset Femur Guide must be able to turn.

Fig. 49

A 3 mm refresh cut on the distal femur surface might be necessary.

In this case use the Cutting Block Distal 3/12 (79.02.0602) assembled with the AP Cutting Block (Right 79.02.0600/Left 79.02.0601)

The slots must face the posterior part of the AP Cutting Block. Tighten it with the Screw Cutting Block Distal (79.02.0609).

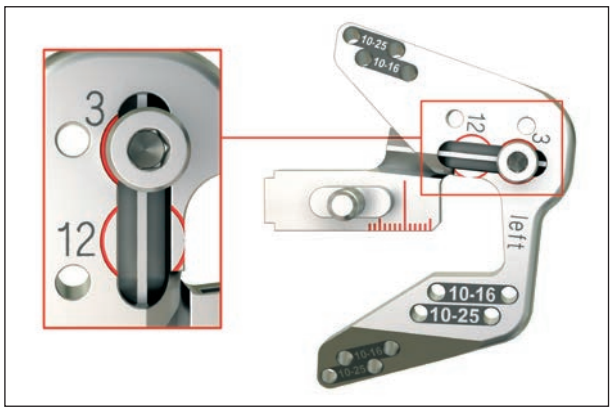


Fig. 50

Choose the left or right Anchor (right 79.02.0751V or left 79.02.0752V), position the screw-head (1) in the middle of the markings (2) and fix the screw with the Hexagonal Screwdriver (314.270).

Red ring markings:
- 3 mm ring: to be used if a 3 mm refresh cut on the distal femur surface is necessary
- 12 mm ring: to be used if the balanSys REV Femur is used in a «primary» case

Pin-hole markings for Reamer:
- 10 – 16: to be used with 10 – 16 mm Reamers
- 10 – 25: to be used with all reamers up to 25 mm

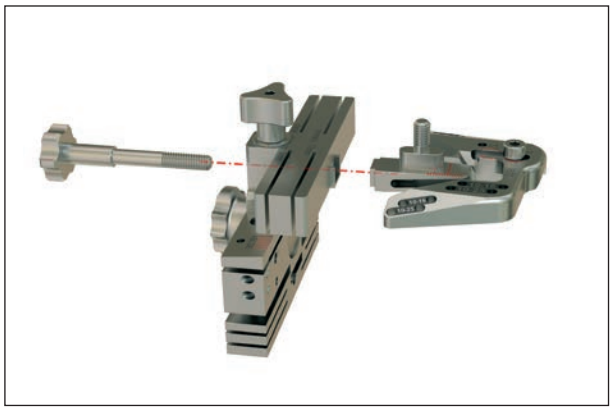


Fig. 51

Connect the chosen Anchor (right 79.02.0751V or left 79.02.0752V) with the AP Cutting Block and fix it with the Screw Cutting Block AP (79.02.0608).

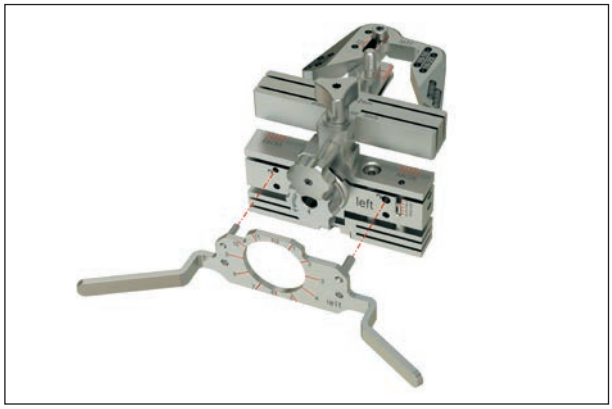


Fig. 52

Choose the appropriate Rotation Guide (Rotation Guide right 79.02.0604 and left 79.02.0605) and connect it with the AP Cutting Block. Push the pins of the Rotation Guide into the guiding-holes.

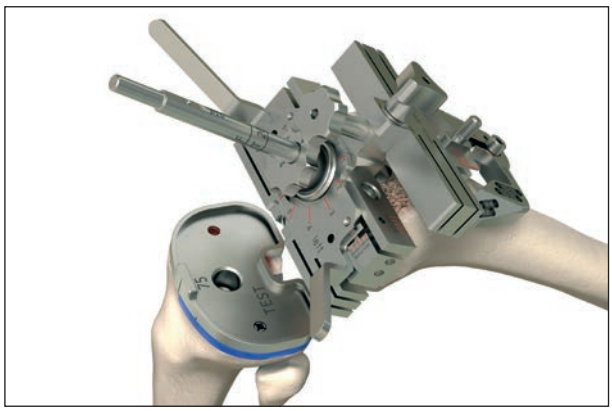


Fig. 53

Put the assembled configuration (AP Cutting Block with Cutting Block Distal, Rotation Guide, etc.) over the reamer shaft.

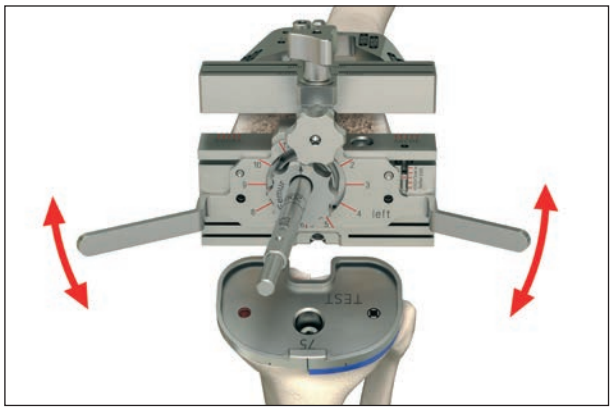


Fig. 54

With this configuration in place, various settings can be performed simultaneously:

- Offset of femur stem
- Femoral rotation
- AP and ML position of femur implant
- Size of femur implant
- Check of flexion gap

The femoral rotation can be defined by turning the entire configuration. The rotation can be defined by the following landmarks:

- By adjusting it to the epycondylar axis
- By creating a rectangular flexion gap

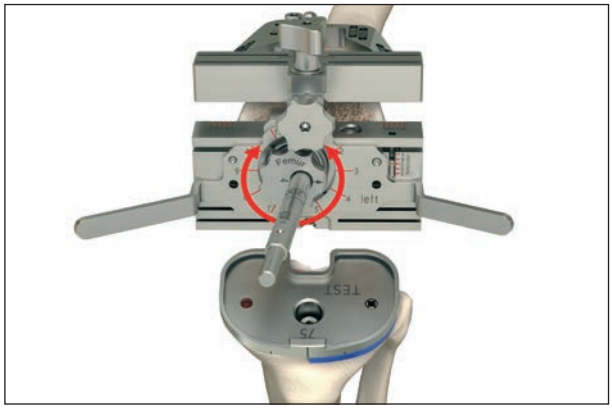


Fig. 55

Find the best AP and ML position of the femur by rotating the Offset Femur Guide (in case of no offset, this step is obsolete).

By turning the Offset Femur Guide, the AP position changes, this in turn affects the flexion gap. Furthermore, any adjustments will also affect the ML position of the implant.

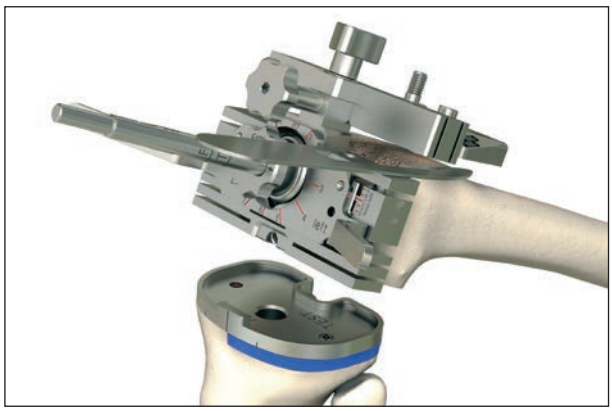


Fig. 56

Defining the size of the femoral implant is done with the aid of the Reference Plate (77.02.0031).

1. Put the Reference Plate on the superior surface of the AP Cutting Block to check the correct anterior cut
2. By turning the Offset Femur Guide, the required position of the AP Cutting Block can be reached

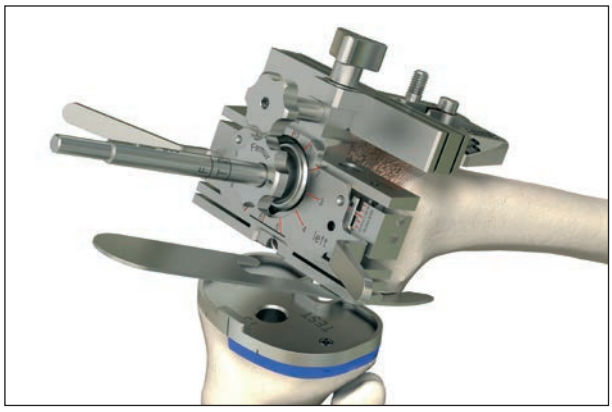


Fig. 57

Switch to the posterior part of the AP Cutting Block to finalize the sizing-procedure:

3. Check the level of the posterior osteotomy with the Reference Plate
4. And fine-tune the AP position by turning the Offset Femur Guide slightly

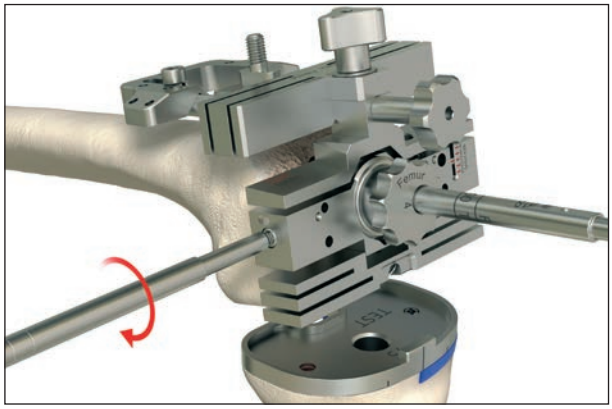


Fig. 58

To fix the AP Cutting Block (Right 79.02.0600/Left 79.02.0601) tighten the lateral screw.

The femur rotation is defined.

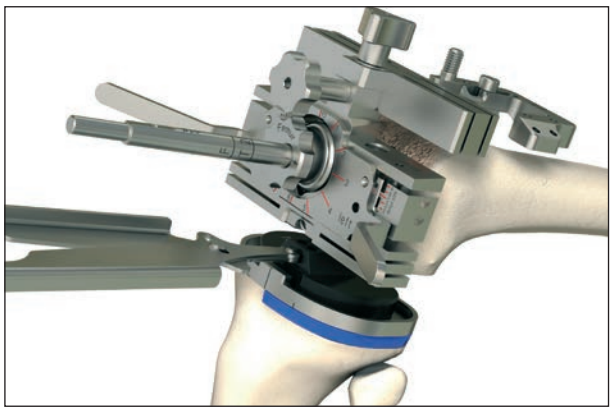


Fig. 59

Checking the flexion gap is done with the Spacer Trial Inlay (79.02.0731 to 79.02.0736). Grab the trial inlay with the Holder (77.02.0185) and insert the chosen PE thickness into the gap.

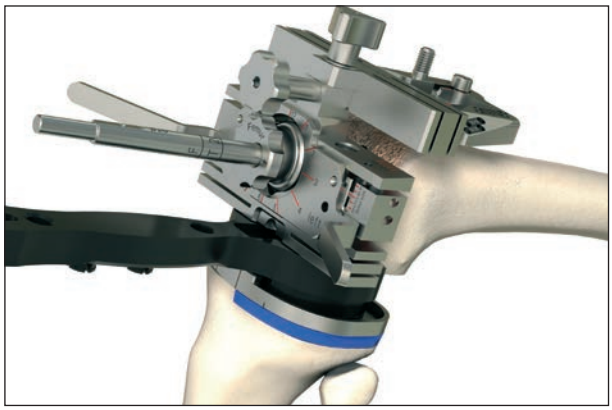


Fig. 60

Slide the Spacer Block Femur 12 (79.02.0652) in the gap in-between the trial inlay and the posterior plane of the AP Cutting Block

- If ligaments are too tight: choose a thinner Spacer Trial Inlay or a smaller femur component (if possible)
- If ligaments are too loose: choose a thicker Spacer Trial Inlay or a larger femur component (if possible)

Finally, the flexion gap is defined.

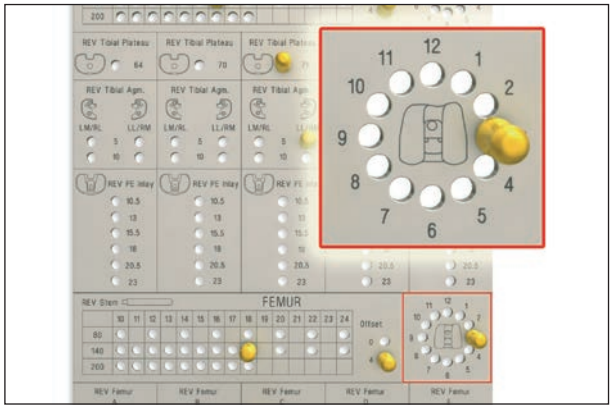


Fig. 61

At this stage, all parameters should be defined:

- Offset of femur stem
- Femoral rotation
- AP and ML position of femur implant
- Size of femur implant
- Flexion gap

Use the Memory Board (79.02.0637) to record the required offset position (in this example: 3 o'clock).

Remark

After all settings are decided, re-check the previously chosen size of the femur component.

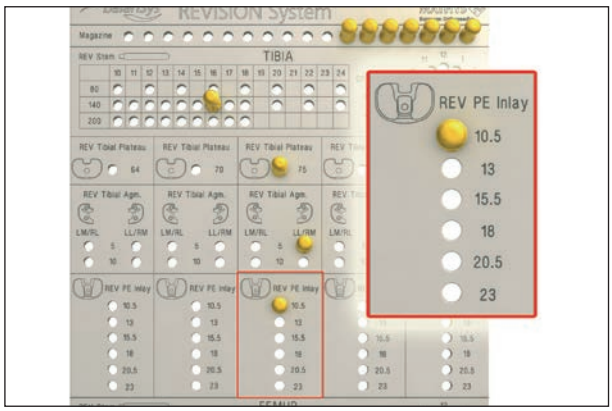


Fig. 62

Use the Memory Board (79.02.0637) to record the measured Inlay thickness (in this example: 10.5).

Remark

At this stage, a surgeon can turn to an abbreviated workflow. Gap management, flexion / extension management and bone-loss management (augmentations) are done with the femur and stem test-components. The workflow is described in the Section «Alternative workflow».

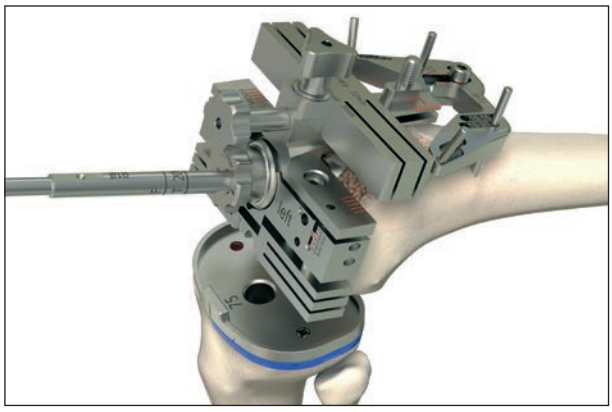


Fig. 63

In order to secure the cutting block configuration in place, Pins (71.02.3054) need to be placed. Fix the Anchor (right 79.02.0751V or left 79.02.0752V) with two straight and at least one oblique pin.

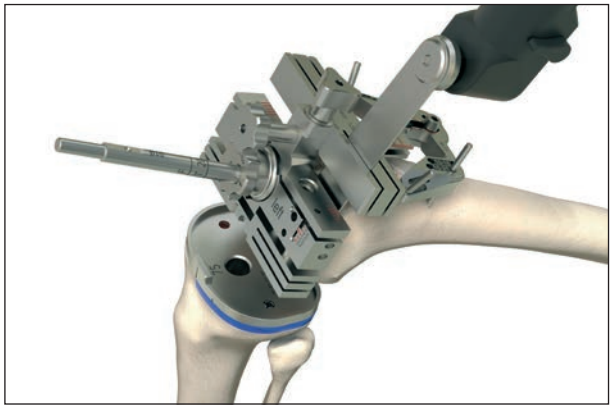


Fig. 64

If necessary, perform the distal refresh-cut of 3 mm through the 3 mm slot.

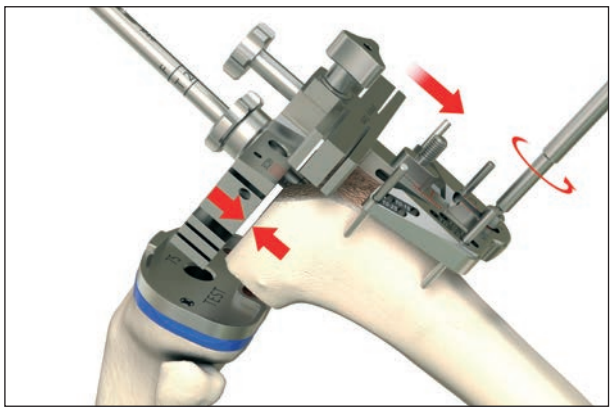


Fig. 65

Loosening of the Anchor Screw allows removal of the cut bone parts.

After removal of the bone parts shift the AP Cutting Block proximal flush onto the distal osteotomy and tighten the Anchor Screw.

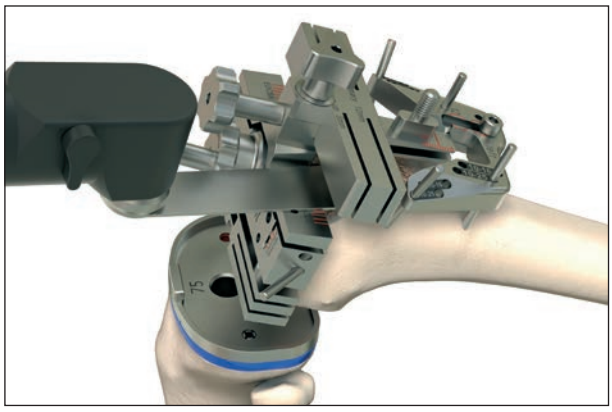


Fig. 66

Fix the AP Cutting Block with additional oblique Pins (71.02.3054) on the medial and lateral side. After fixation, perform the anterior osteotomy.

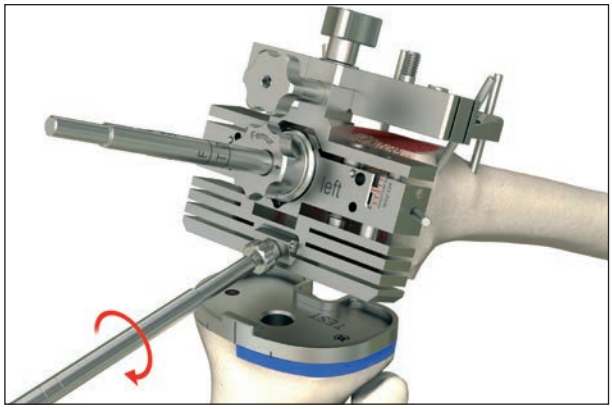


Fig. 67

In order to perform the dorsal/posterior cut within a guided slot, fit the Cutting Bridge Dorsal (79.02.0603) onto the AP Cutting Block and secure the screw with the Hexagonal Screwdriver (314.207).

Description of the posterior part of the AP Cutting Block:

- 1st Slot: for a 10 mm augmentation
- 2nd Slot: for a 5 mm augmentation
- 3rd and lowermost slot of the AP Cutting Block is for the regular posterior cut

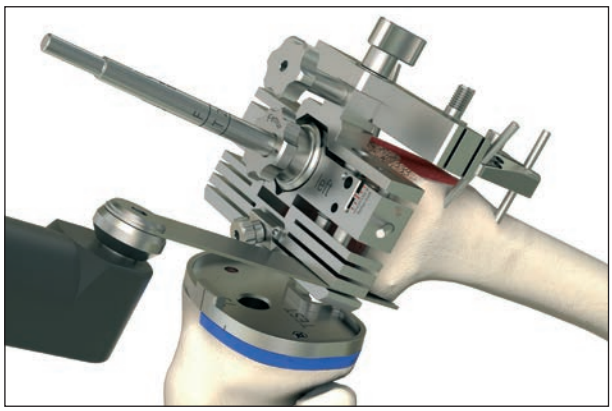


Fig. 68

Perform the posterior cut.

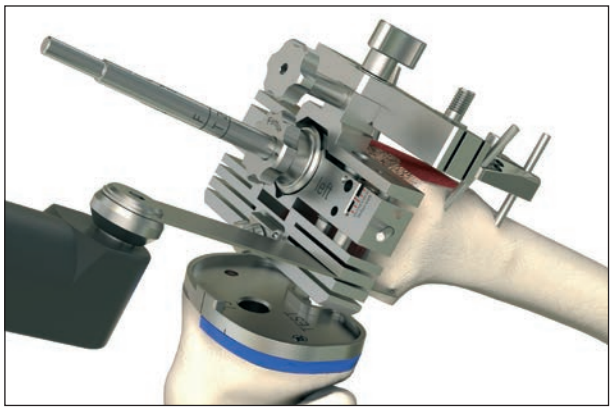


Fig. 69

If an augmentation is required to fill bone defects on the posterior surface of the femur, choose the appropriate slot to cut it.

In this example, a 5 mm augmentation will be necessary. The cut is performed through the second slot.

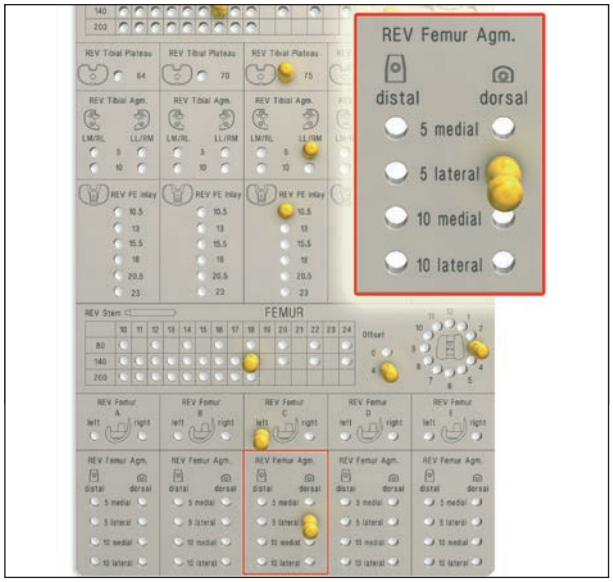


Fig. 70

Use the Memory Board (79.02.0637) to record the necessary dorsal/posterior augmentation (in this example: REV Femur Augmentation C/5 dorsal, lateral).

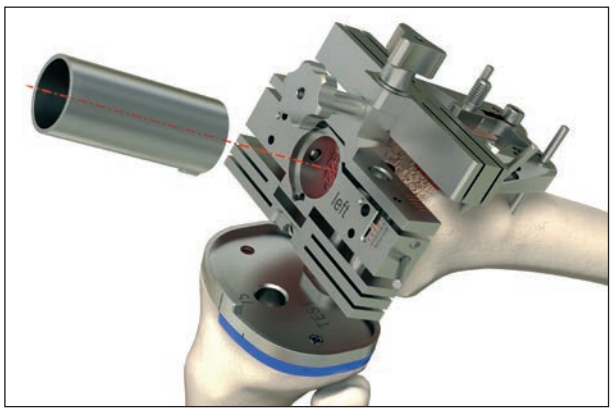


Fig. 71

Remove all of the following instruments:
1. Reamer (79.02.0310 to 79.02.0325) and Guide Sleeve (79.02.0510 to 79.02.0525)
2. Offset Femur Guide (79.02.0615 or 79.02.0617)

In order to create space for the stem-box of the femur implant, bone substance needs to be removed. Insert the femoral Reamer Guide (79.02.0607) into the round opening in the middle of the AP Cutting Block. A little nose on the underside of the instrument will guide the exact position.

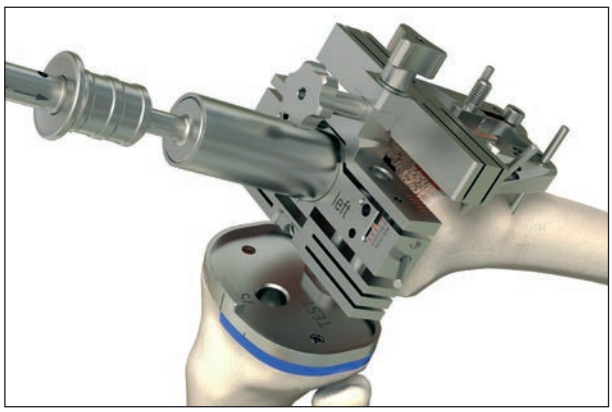


Fig. 72

The PS Reamer (79.02.0281) must be connected to the Machine Coupling (79.02.0021) and connected to a power drill.

The size markings on the PS Reamer must be ignored, since they are for tibial use only. Ream until the distal end/surface of the PS Reamer is flush with the distal end of the femoral Reamer Guide (identical for all femur sizes).

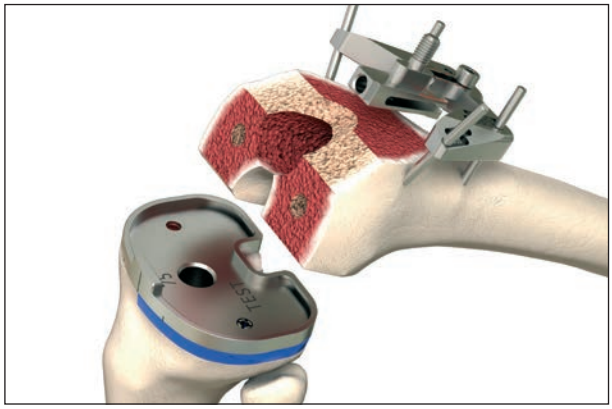


Fig. 73

At this stage, all flexion-relevant osteotomies have been performed.

After completing the preparation for the femoral stem-box, all instruments – except the Anchor – must be removed to prepare for the remaining osteotomies (final distal cut, anterior chamfer and box).

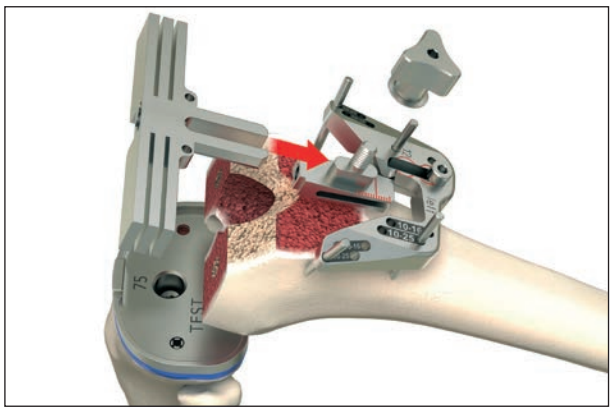


Fig. 74

Connect the Cutting Block Distal (79.02.0606) onto the remaining Anchor and fix it with the Screw Cutting Block Distal (79.02.0609).

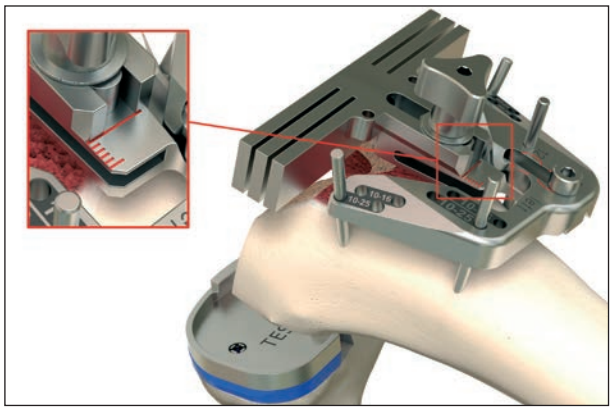


Fig. 75

Position the Cutting Block Distal in a way, that the proximal end of the guide rail is in line with the long reference-marking on the Anchor (see picture).

Tighten the Screw Cutting Block Distal.

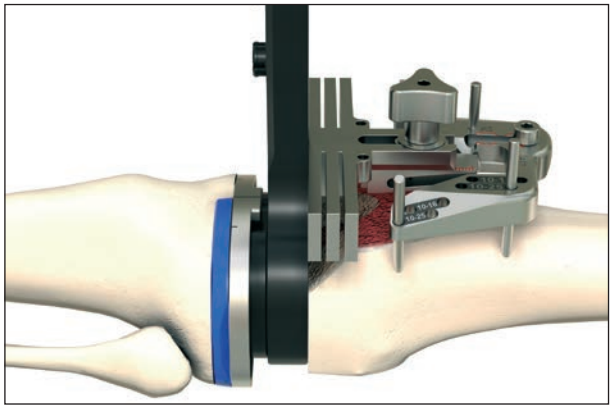


Fig. 76

Determine the position of the femur component in longitudinal axis. Check ligament tension in extension with the Spacer Trial Inlay (79.02.0730 to 79.02.736) which corresponds to the flexion gap and the Spacer Block Femur 12 (79.02.0652).

In case of using a BICONDYLAR PS Tibia, the tibial resection may be done with posterior slope resulting in a mild flexion situation for the distal gap measurement.

In this example, the tension with the chosen trials is suitable.

No distal augmentation is necessary.

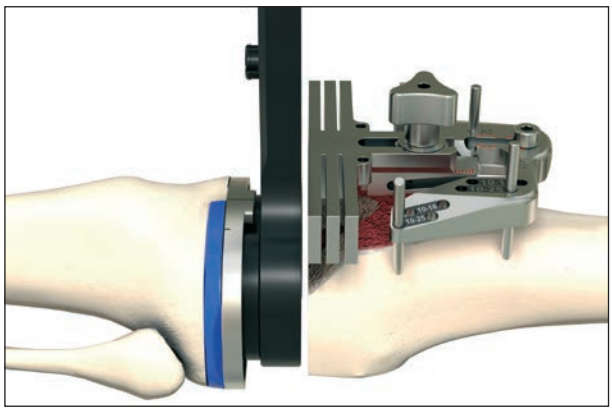


Fig. 77

Extension gap is too loose:

1. The Spacer Block Femur 12 (79.02.0652) is loose when inserted into the gap.

Remark

Since the PE Inlay thickness was already decided in flexion, the distal femur osteotomy needs to be adapted accordingly. That means that the femur component has to be distalized.

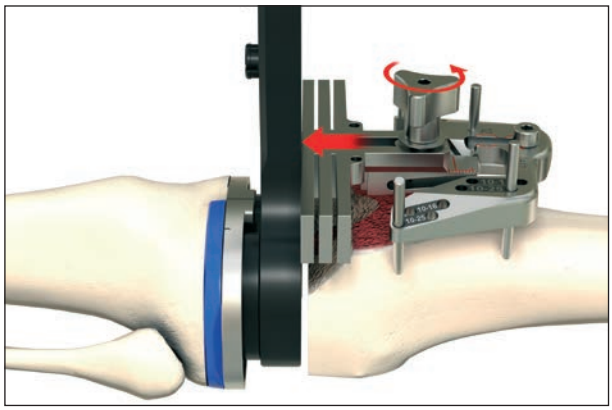


Fig. 78

2. Open the Screw Cutting Block Distal (79.02.0609) slightly and move the Cutting Block Distal (79.02.0606) distally until the Distal Cutting Block touches the Spacer Block Femur 12 (79.02.0652) and until the ligament tension is correct.

Re-fix the Screw Cutting Block Distal (79.02.0609).

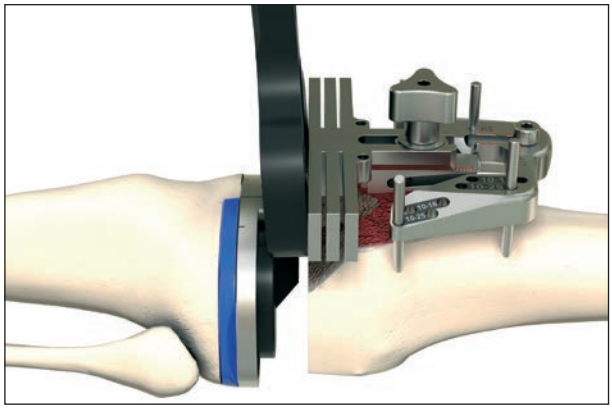


Fig. 79

Extension gap is too tight:

1. The Spacer Block Femur 12 (79.02.0652) can not be inserted into the gap.

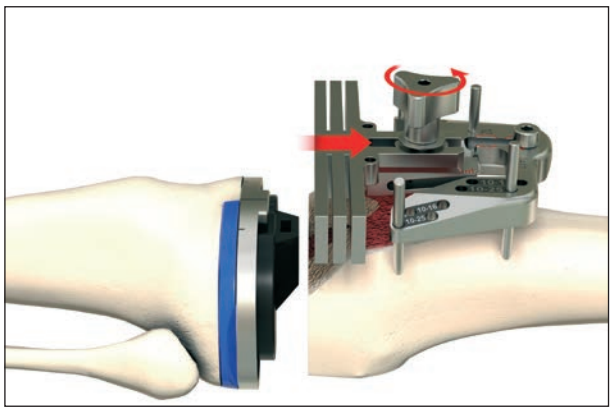


Fig. 80

2. Open the Screw Cutting Block Distal (79.02.0609) slightly and move the Cutting Block Distal (79.02.0606) proximally.

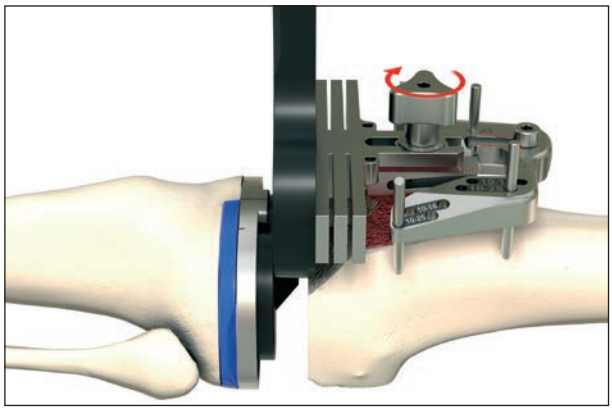


Fig. 81

3. Move the Cutting Block Distal (79.02.0606) distally until the Distal Cutting Block touches the Spacer Block Femur 12 (79.02.0652) and until the ligament tension is correct.

Re-fix the Screw Cutting Block Distal (79.02.0609).

Remark

Be aware, that the extension gap should be tighter than the flexion gap.

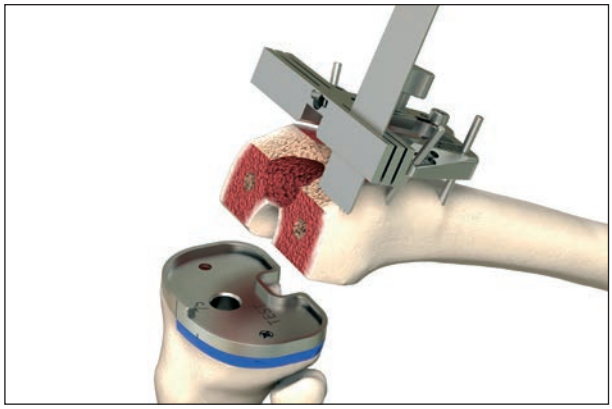


Fig. 82

Perform the required distal osteotomy.

Remark
The distal femur needs to be re-cut if the extension gap is too tight. Augmentations are required, if the extension gap is too loose.

Remove bone for augmentation if necessary.

Description of Cutting Block Distal:
- Distal surface equals the zero position: for the distal re-cut
- 1st Slot: for a 5 mm augmentation
- 2nd Slot: for a 10 mm augmentation

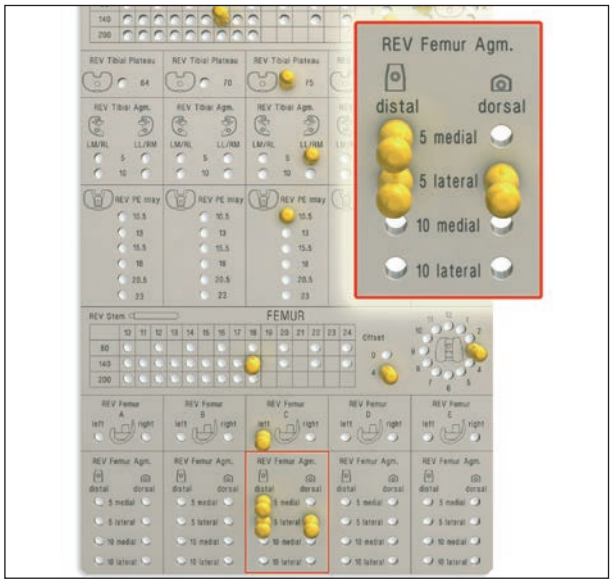


Fig. 83

Leave the Cutting Block Distal in place, regardless if an augmentation was necessary or not.

In this example, a 5 mm augmentation on both sides will be necessary. The cut is performed through the first slot.

Use the Memory Board (79.02.0637) to record the necessary distal augmentation (in this example: REV Femur Augmentation C / 5 distal, lateral and medial).

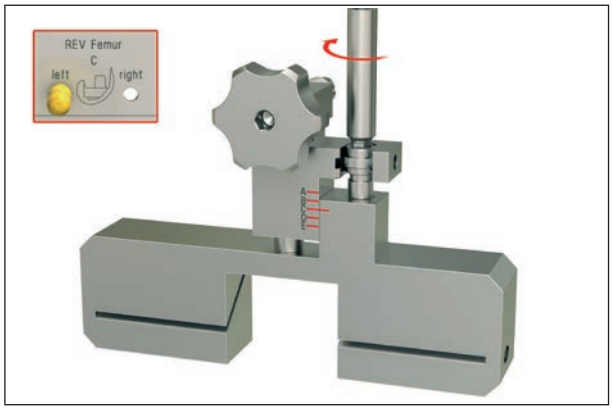


Fig. 84

Depending on the size of the femoral implant, adjust the Anterior Chamfer Cutting Block (79.02.0611) accordingly. Use the Hexagonal Screwdriver (314.270) to set the correct femur component size.

In this example, femur size C has been chosen.

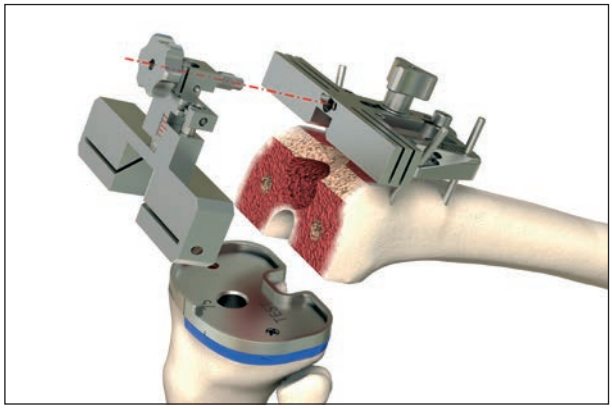


Fig. 85

Affix the Anterior Chamfer Cutting Block with the screw to the Cutting Block Distal.

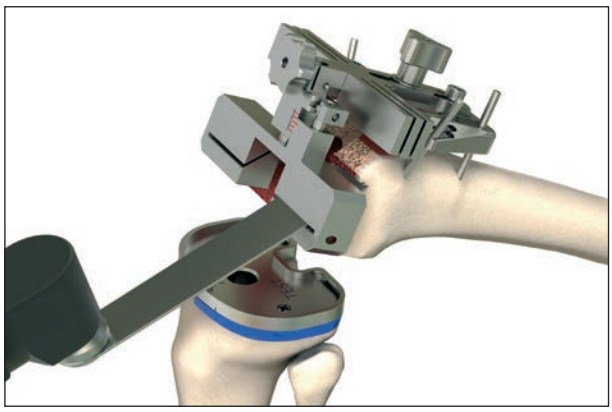


Fig. 86

Perform the anterior chamfer cut.

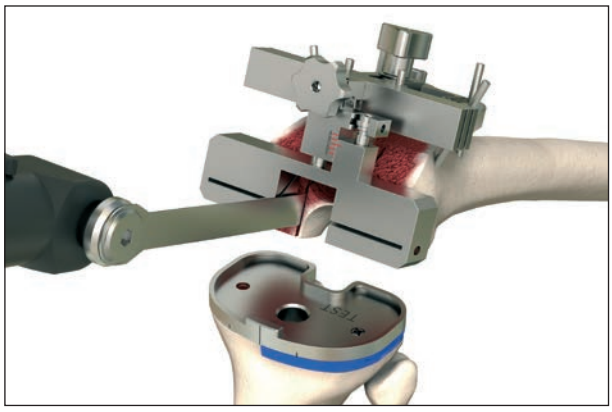


Fig. 87

The box cut is guided by the Anterior Chamfer Cutting Block.

In order to limit the cut to the correct depth, insert two Pins (71.02.3054) into the holes on the anterior part of the Cutting Block Distal (79.02.0606).

A narrow saw blade should be used. The saw blade must be guided along the sagittal surfaces of the block. Cut until the saw touches the two pins.

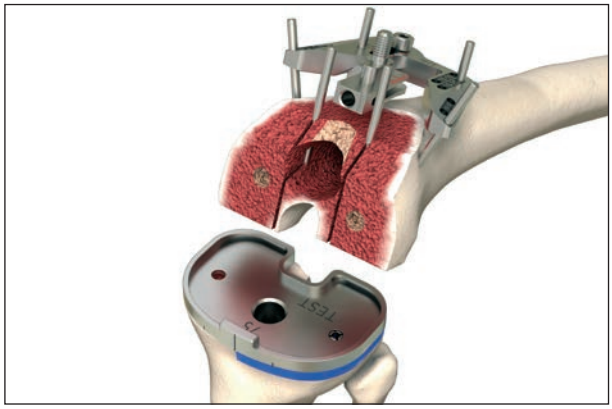


Fig. 88

Remove all instruments except the two pins that serve as a stop for the saw blade.

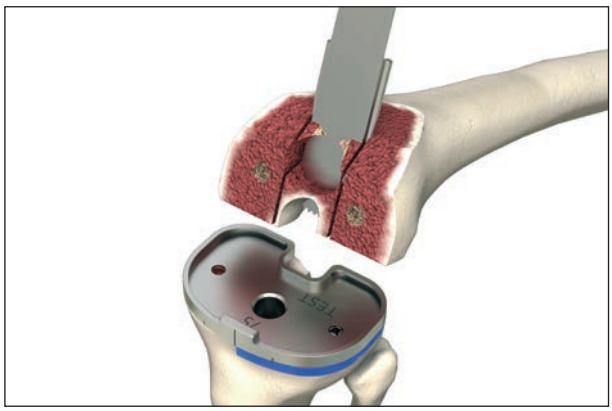


Fig. 89

Perform the transversal cut, guided by the two remaining pins. After completion, remove the bone block and the pins.

Surgical technique

Trial femur implant assembly and trial reduction

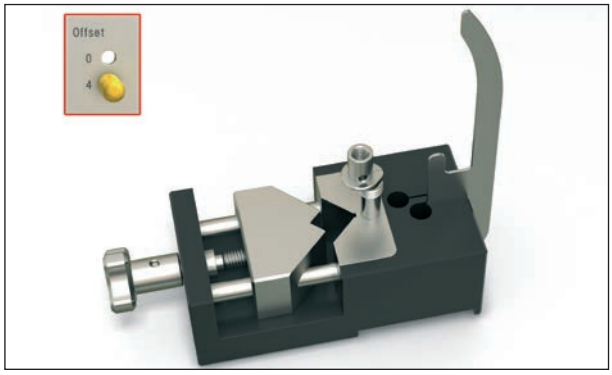


Fig. 90

Insert the Reference Plate (77.02.0031) in the slot of the black Assembly Device (79.02.0271). Insert the Test Stem Core straight (79.02.0668) or with offset (79.02.0669) into the hole.

In this example, a stem with 4 mm offset has been chosen.

Remark
The orientation of the Test Stem Core is correct when it can not be rotated any more. The laser marking is orientated towards the Reference Plate.

Fig. 91

Click the Test Augmentations onto the Trial Femur (79.02.0330 to 79.02.0339).

In this example, femur-size C has been chosen.

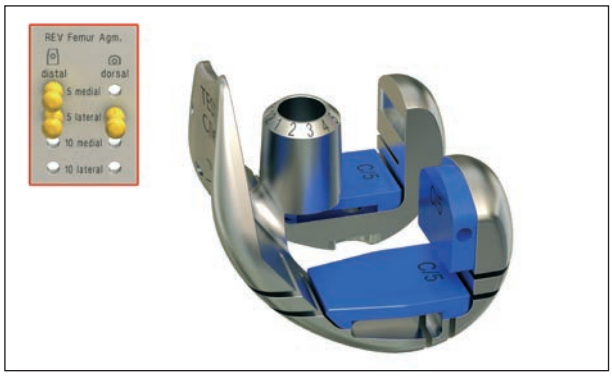


Fig. 92

In this example, two 5 mm augmentations distal and one 5 mm augmentation posterior lateral have been chosen.

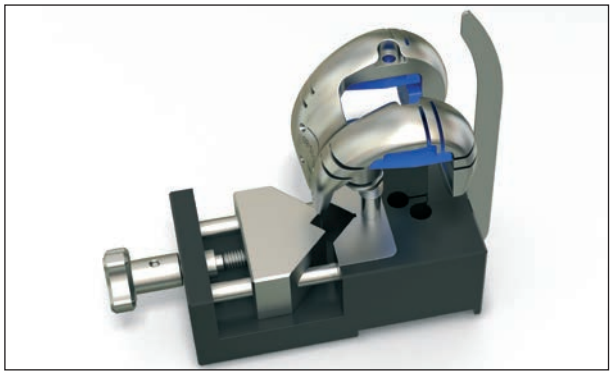


Fig. 93

Position the Trial Femur onto the Test Stem Core.

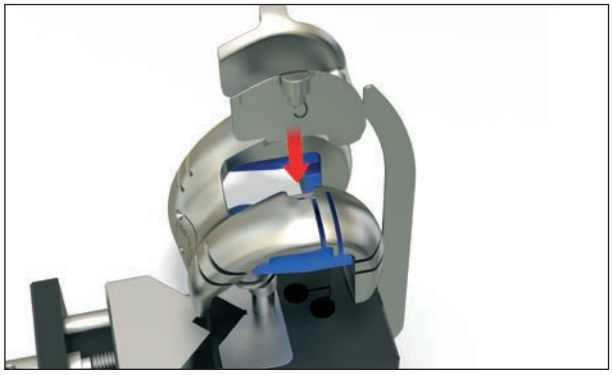


Fig. 94

Press the corresponding Femur Box Inlay (79.02.0470 to 79.02.0474) into the opening of the Trial Femur. The cam of the box should face towards posterior.

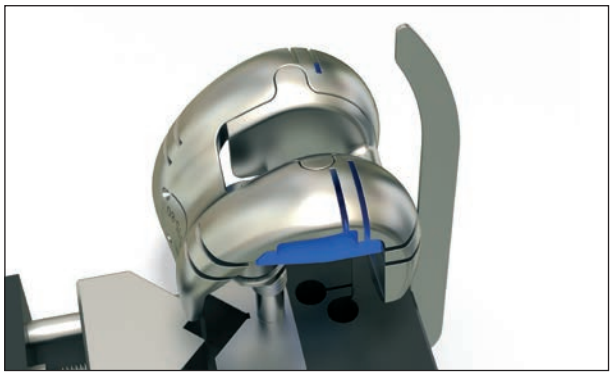


Fig. 95

The surface of the Trial Femur and the Femur Box Inlay must align smoothly.

Fig. 96

Assemble the Offset Alignment Disk (79.02.0287) and the Box Adapter (79.02.0288). The pictogram on the lower surface of the disk highlights the exact position of the adapter.

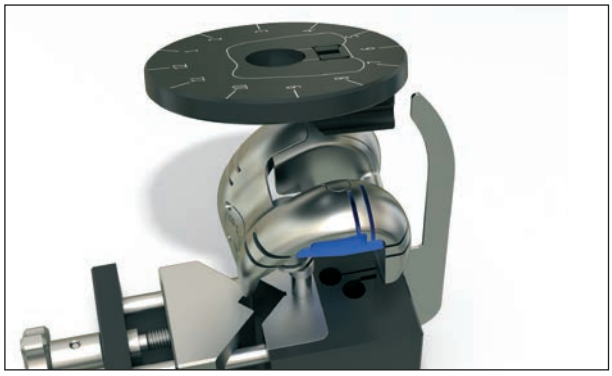


Fig. 97

Fit the Box Adapter into the box of the Trial Femur.

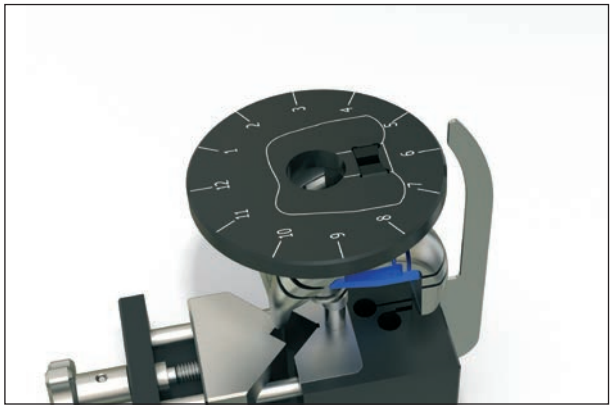


Fig. 98

The pictogram on the upper surface highlights the exact position. The 12 o'clock position must face towards anterior.

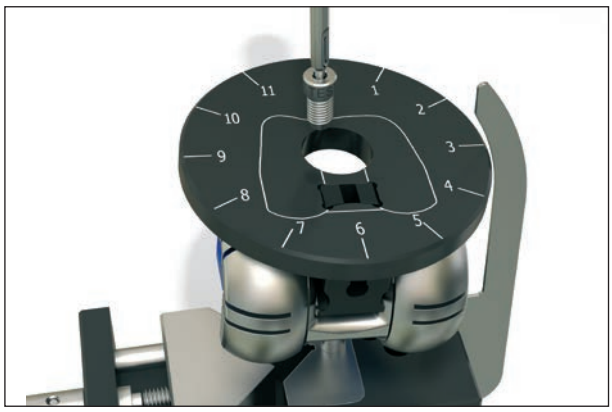


Fig. 99

Snap-in the Trial Stem Screw (79.02.0071) onto the Screw Positioner (79.02.0270) and insert the screw into the hole, but do not tighten it yet!

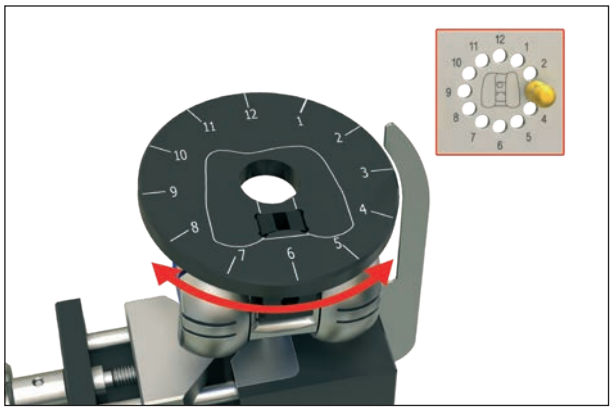


Fig. 100

Rotate the Offset Alignment Disk with the Trial Femur until the Reference Plate corresponds with the predetermined position.

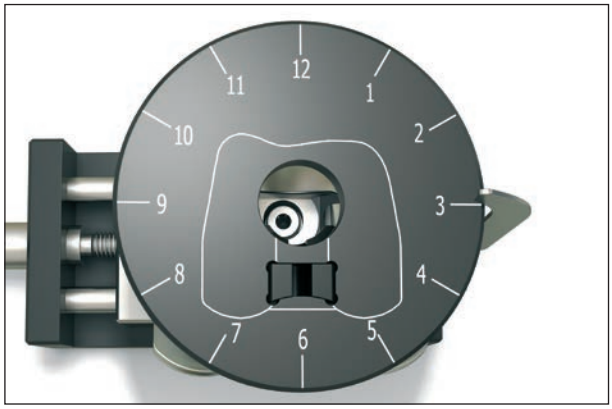


Fig. 101

In this example, the 3 o'clock position was measured.

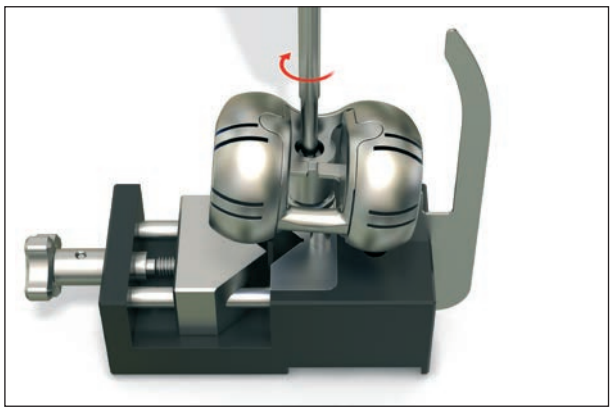


Fig. 102

Remove the Offset Alignment Disk.

Tighten the Trial Stem Screw with the Hexagonal Screwdriver (314.270).

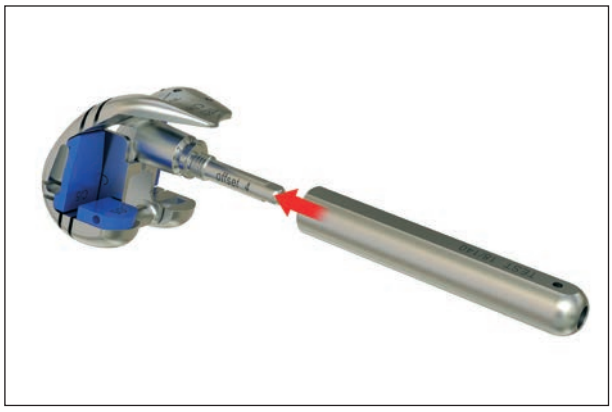


Fig. 103

Put the appropriate Trial Stem Sleeve (predetermined diameter and length) onto the Trial Stem Core.

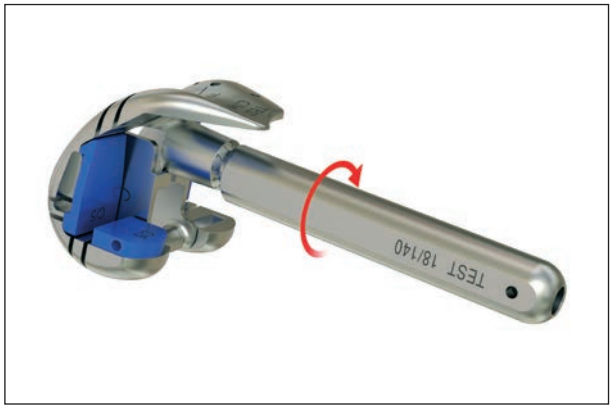


Fig. 104

Tighten the sleeve by hand in a clockwise direction.

Remark
To release the Trial Stem Sleeve, insert a Pin through the hole at the distal end and turn in the appropriate direction.

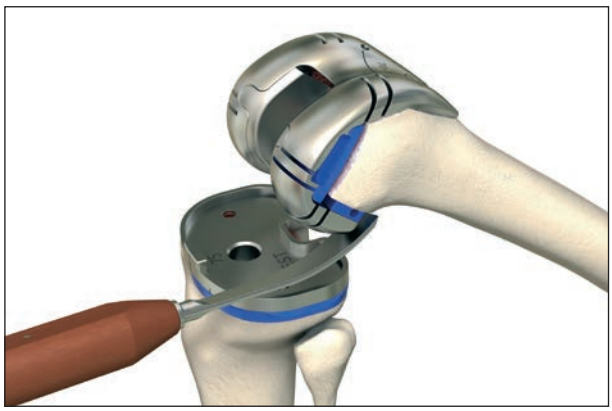


Fig. 105

Insert the trial-femur assembly with the aid of the Femur Holder (71.02.3016) and impact it with the Femoral Impactor (71.34.0699).

Check and remove – if necessary – bony overhang and osteophytes with the Osteophyte Chisel (71.02.3007).

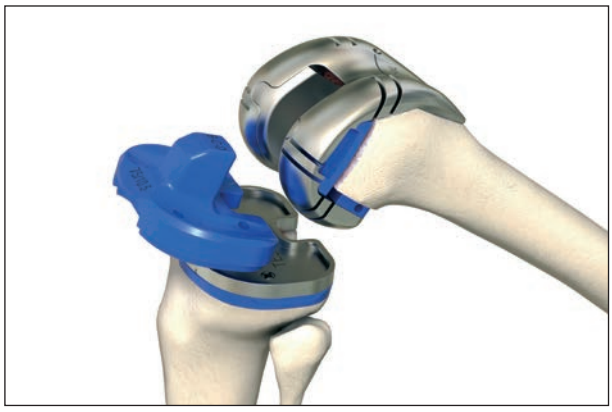


Fig. 106

Insert the predetermined Trial Inlay (79.02.0351 to 79.02.0396).

Depending on ligament stability, a REV Trial Inlay or a PS Trial Inlay can be used.

Remark
It might be advisable to ventralize the tibia as much as possible with Hohmann retractors in order to facilitate the insertion of the Trial Inlay.

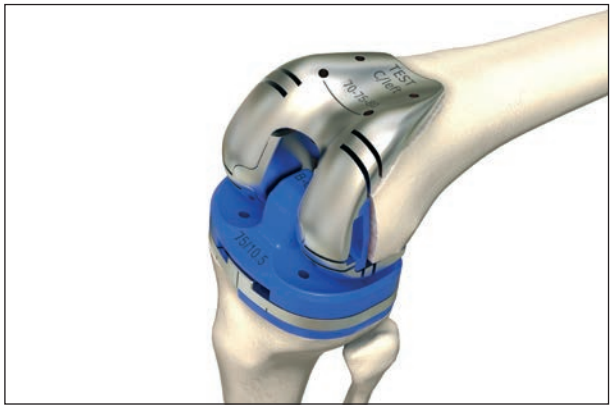


Fig. 107

The extension apparatus must be repositioned.

Remark
If the patella is replaced, it is recommended to perform the patellar osteotomy and to position the patellar trial component before the knee is tested!

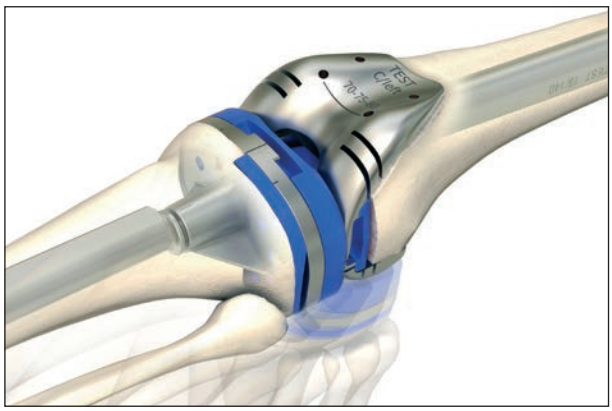


Fig. 108

With all the trial revision components in place, the knee is tested with respect to range of motion, stability, kinematics and mobility.

Remove all trial implants and clean the osteotomy surfaces thoroughly from blood, fat and debris (e. g. with a pulse lavage).

Surgical technique

Tibial implant assembly

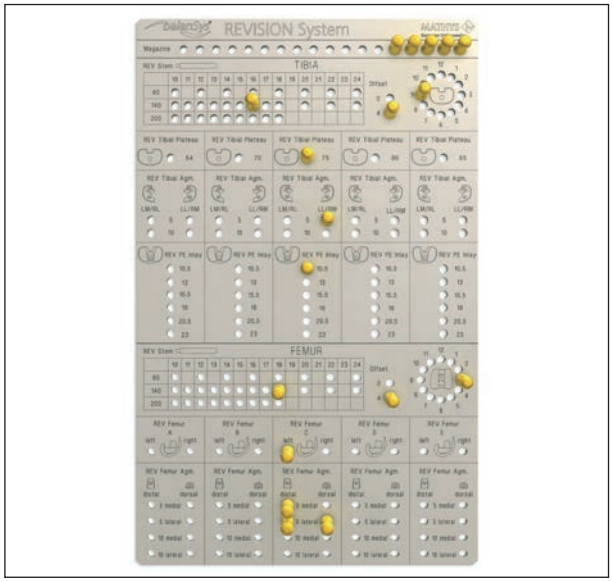


Fig. 109

The information on the Memory Board (79.02.0637) can assist in collecting and assembling the correct implants.

In this example, the following implants have been chosen:

- balanSys REV Tibial Plateau 75
- balanSys REV Tibia Augmentation 75/5 LL/RM
- balanSys REV Stem 16/140 off. 4 uncemented

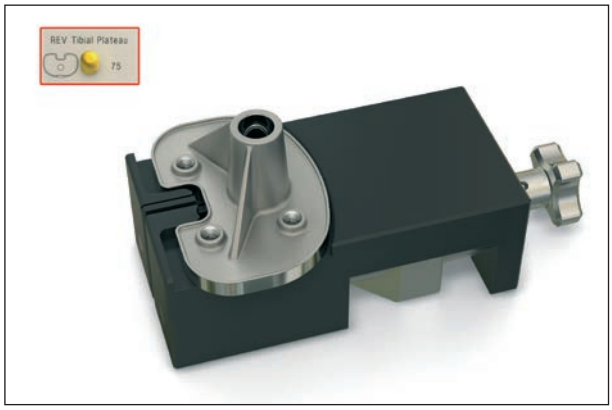


Fig. 110

Position the chosen balanSys REV Tibial Plateau onto the Assembly Device (reverse side).

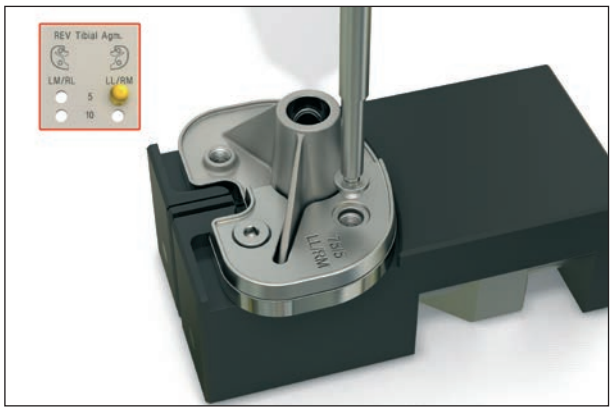


Fig. 111

Unpack the chosen balanSys REV Augmentations and screw the implants to the lower surface of the balanSys REV Tibial Plateau.

Snap-in the augmentation screws onto the Screw Positioner (79.02.0270). Use it to place the screws into the correct thread and tighten the screws with the Hexagonal Screwdriver (314.270).

Remark
Two augmentation screws are packed together with each implant.

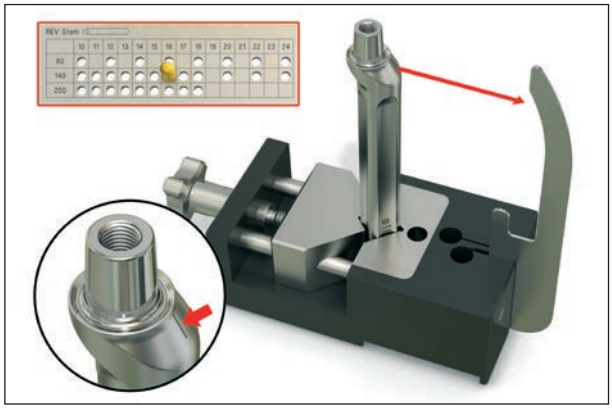


Fig. 112

After fixing the augmentation, turn the Assembly Device (79.02.0271) around.

Insert the Reference Plate (77.02.0031) in the slot of the black Assembly Device and insert the distal end of the chosen balanSys REV Stem into it. Tighten the fixation screw of the black Assembly Device.

Remark
There is a marking on the stem – this marking must be orientated towards the Reference Plate (see picture).

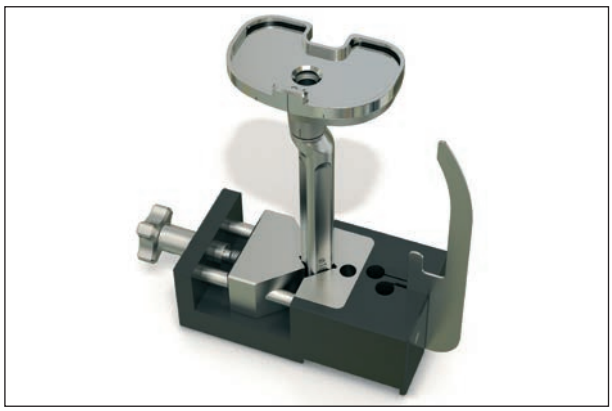


Fig. 113

Put the balanSys REV Tibial Plateau on top of the tapered cone of the stem.

Remark
The taper needs to be dry and free of any foreign matter before assembling.

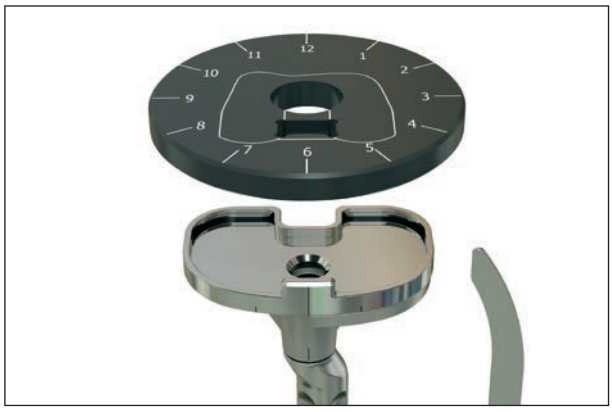


Fig. 114

Use the Offset Alignment Disk (79.02.0287) to set the determined rotation.

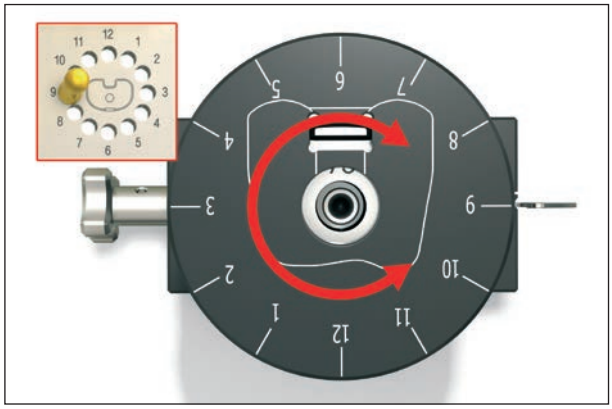


Fig. 115

Turn the Offset Alignment Disk to the determined position.

In this example, the 9 o'clock position was measured.

Remove the Offset Alignment Disk.

Fig. 116

The instrument to implant the tibia-stem configuration needs to be assembled first. The instrument consists of 3 parts:

- Positioner Handle (79.02.0301)
- Positioner Rod (79.02.0302)
- Sizing Ring Positioner (79.02.0303)

Fig. 117

The necessity to use and the side of the Sizing Ring Positioner is defined by the chosen tibial plateau sizes.

- balanSys REV Tibial Plateau 64 and 70: 64–70
- balanSys REV Tibial Plateau 75 and 80: 75–80
- balanSys REV Tibial Plateau 85: ring is not needed

In this example, a size 75 balanSys REV Tibial Plateau is chosen (information from the Memory Board). Therefore the markings read 75–80.

Fig. 118

Put the Sizing Ring Positioner on top of the Positioner Handle (depending on the chosen implant size) and snap the Positioner Rod through the hole.

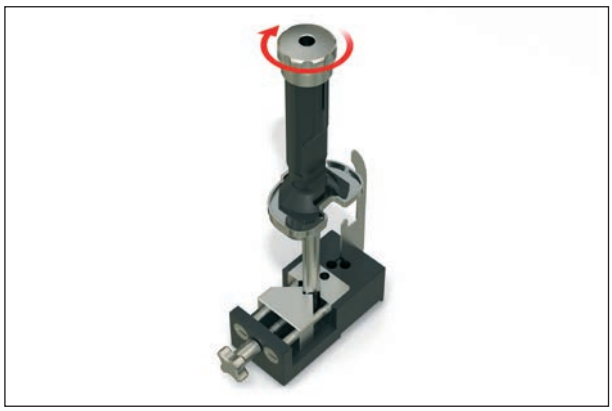


Fig. 119

Insert the Positioner Rod with the thread into the opening of the tibial plateau and turn the positioner device in a clockwise direction.

The threads of the Positioner Rod will fix the stem to the tibial plateau. This will secure the whole implant assembly.

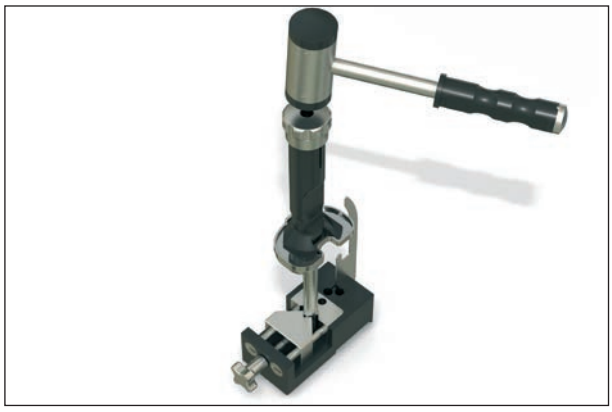


Fig. 120

Hit the whole implant assembly once with a hammer on the top.

Fig. 121

Turn it clockwise again to re-tighten the rod.

Fig. 122

Remove the tibial implant from the Assembly Device. The balanSys REV Tibial Plateau is ready for cementing.

Remark
The positioner (handle) stays connected to the tibial implant for implantation.

For CR, UC or PS Inlays

Optional usage of CR, UC or PS Inlays
In case of using balanSys BICONDYLAR CR, UC or PS Inlays, the positioner must be removed and the stem screw must be used. Tighten the stem screw with the Torque Wrench (18.410-RAL5002) with 2 clicks.

For implantation use the Positioner for Tibial Plateau (71.34.1052 or 71.34.0240) in the BICONDYLAR instrument set.

Remark
When using CR, UC or PS Inlays, adequate soft tissue structures are required.

After implantation, the stem screw must be re-tightened since the screw can loosen during impaction!

Surgical technique

Femur implant assembly

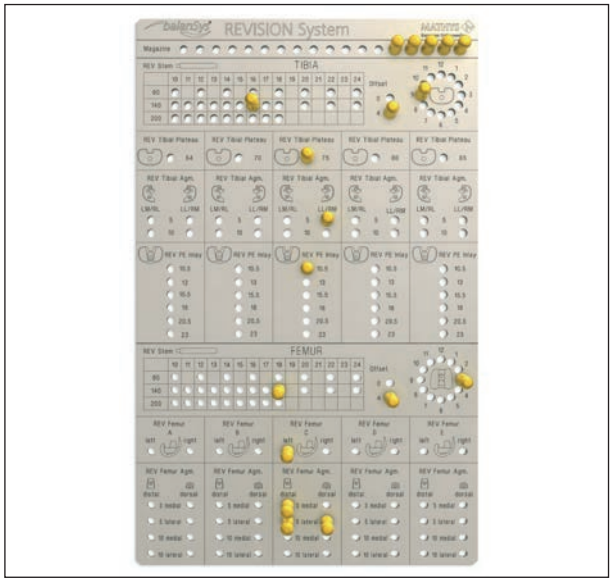


Fig. 123

The information on the Memory Board (79.02.0637) can assist in collecting and assembling the correct implants.

In this example, the following implants have been chosen:

- balanSys REV Femur C left
- balanSys REV Stem 18/140 off. 4 uncem.
- balanSys REV Femur Augmentation C/5 distal medial and lateral
- balanSys REV Femur Augmentation C/5 dorsal

Fig. 124

Position the chosen balanSys REV Femur onto the Femur Assembly Block (79.02.0540).

Fig. 125

Unpack the chosen balanSys REV Augmentations and screw the implants to the distal surface of the balanSys REV Femur.

Snap-in the augmentation screws onto the Screw Positioner (79.02.0270). Use it to place the screws into the correct thread and tighten the screws with the Hexagonal Screwdriver (314.270).

Remark

One augmentation screw is packed together with each implant.

Fig. 126

In order to screw the dorsal/posterior augmentation onto the femur implant, turn the Femur Assembly Block.

Place the augmentation screws into the correct thread and tighten it with the Allen Key (314.140).

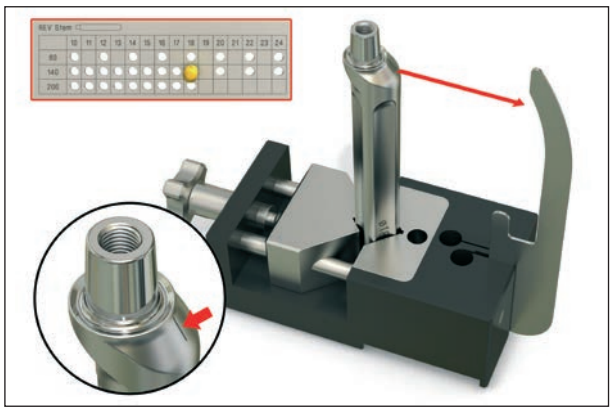


Fig. 127

Switch to the Assembly Device. Insert the Reference Plate (77.02.0031) in the slot of the black Assembly Device and insert the distal end of the chosen balanSys REV Stem into it. Tighten the fixation screw of the black Assembly Device.

Remark
There is a marking on the stem – this marking must be orientated towards the Reference Plate (see picture).

Fig. 128

Put the balanSys REV Femur on top of the tapered cone of the stem.

Remark
The taper needs to be dry and free of any foreign matter before assembling.

Fig. 129

Assemble the Offset Alignment Disk (79.02.0287) and the Box Adapter (79.02.0288). Fit the Box Adapter into the box of the femur component.

The pictogram on the upper surface highlights the exact position. The 12 o'clock position must face towards anterior.

Use the Offset Alignment Disk to set the measured rotation.

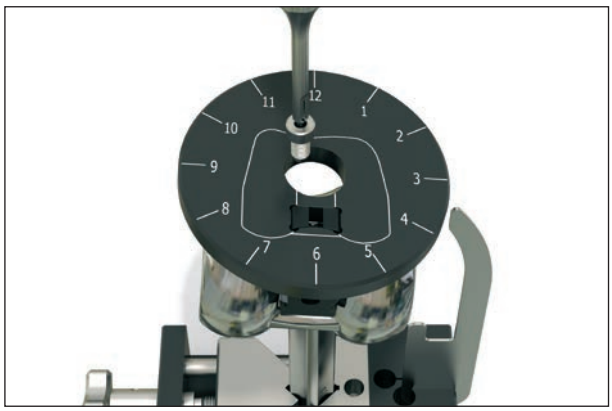


Fig. 130

Insert the stem screw onto the Screw Positioner (79.02.0270) and insert the screw into the hole, but do not tighten it yet!

Remark
One stem screw is packed together with each implant. The screw is partially turned into the thread of the stem.

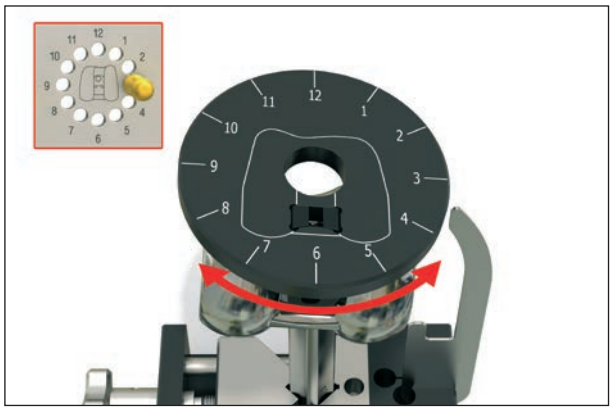


Fig. 131

Rotate the Offset Alignment Disk until the Reference Plate corresponds with the predetermined rotation.

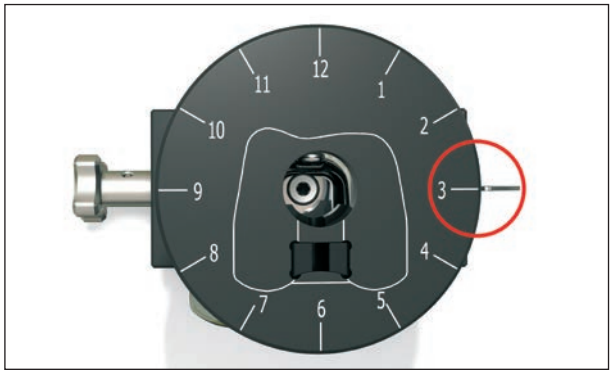


Fig. 132

In this example, the 3 o'clock position was determined.

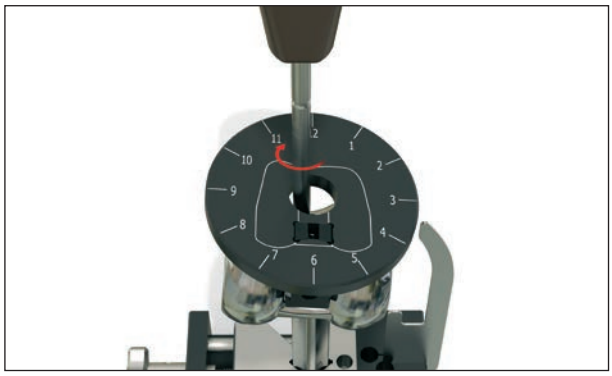


Fig. 133

Tighten the stem screw with the Hexagonal Screwdriver (314.270).

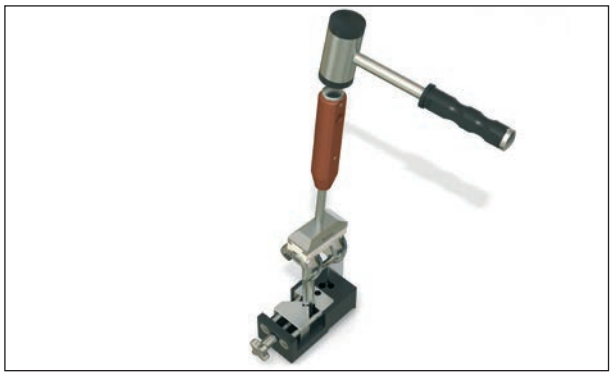


Fig. 134

Remove the Offset Alignment Disk (79.02.0287). Use the Femoral Impactor (71.34.0699) to hit the femur only once.

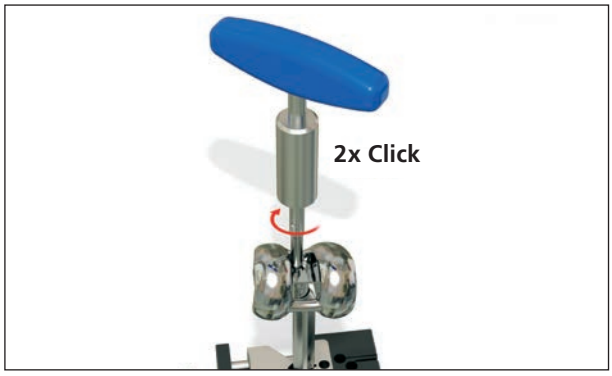


Fig. 135

Tighten the stem screw with the Torque Wrench (18.410-RAL5002) with 2 clicks.

After implantation, the stem screw must be re-tightened since the screw can loosen during impaction!

Surgical technique

Implantation

Fig. 136

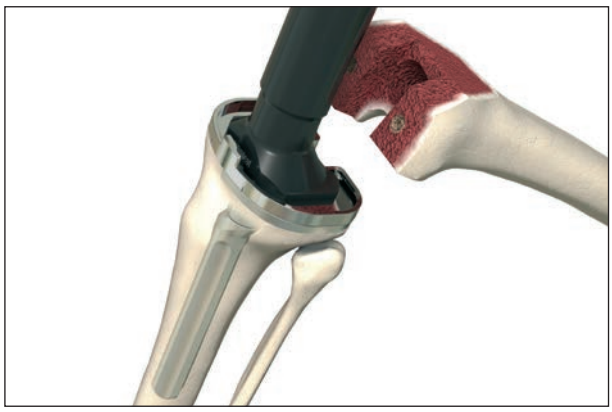


Fig. 137

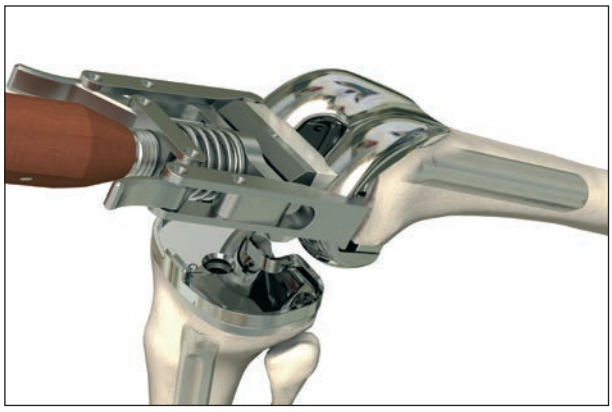


Fig. 138

The balanSys REV femur and tibial components (with or without augmentations) need to be cemented. Follow the instructions for use of the specific bone cement.

After the implants have been chosen, one last check is recommended to ensure that all components match.

Use the Femur Holder (71.02.3016) to insert the femur-stem assembly.

Remark
Careful application of the cement must be ensured in order to avoid an excess in the posterior region of the femur and the Femoral Component, since the cement is difficult to remove later.

After application of cement, insert the tibial implant onto the tibia. Impact it with a hammer.

Remove excess cement carefully.

In case of using a balanSys BICONDYLAR Inlay, remove the Positioner after implantation and re-tighten the stem screw with the Torque Wrench (18.410-RAL5002) with 2 clicks.
Use the Neck Stopper Straight (79.02.0027) in the anterior window of the tibial plateau during tightening of the stabilization screw. It will counteract against the applied torque.

After application of cement, insert the balanSys REV Femur with the aid of the Femur Holder (71.02.3016) and impact it with the Femoral Impactor (71.34.0699).

The femoral condyles of the balanSys REV Femur must be protected to prevent any scratching.

Remove excess cement carefully. It is strongly recommended to give extra care to remove cement along the proximal portion of the femoral component and the femoral box.

Fig. 139

The surface of the tibial plateau needs to be free of any foreign matter (e. g. tissue fragments, bone or cement particles) before inserting the inlay. Snap-in the balanSys REV Inlay into the tibial plateau.

Remark

Instead of inserting the final Inlay, a suitable Trial Inlay may be inserted during the hardening of the bone cement. After hardening, the Trial Inlay must be removed. Afterwards, the correct balanSys REV Inlay must be inserted.

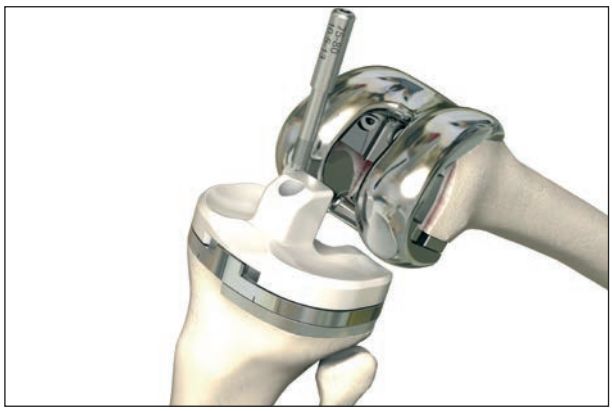


Fig. 140

Insert the stabilization screw (packed together with the balanSys REV Inlay).

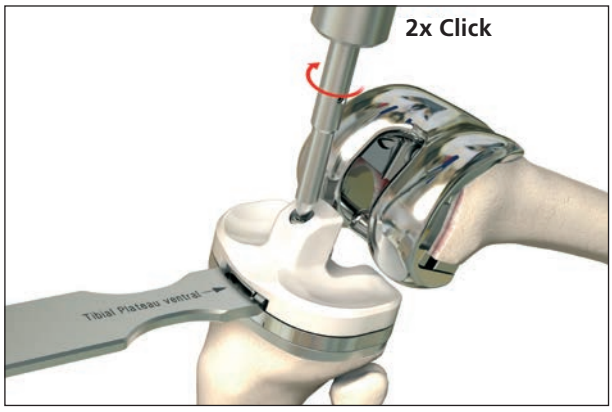


Fig. 141

Insert the Neck Stopper Straight (79.02.0027) into the anterior window of the tibial plateau during tightening of the stabilization screw. It will counteract against the applied torque.

Tighten the stabilization screw with the Torque Wrench (18.410-RAL5002) with 2 clicks.

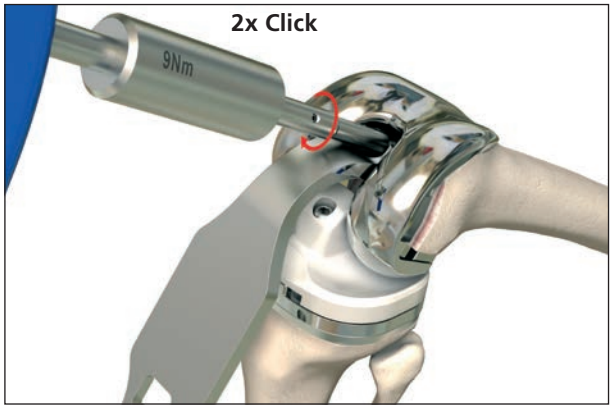


Fig. 142

Insert the Neck Stopper Curved (79.02.0750) into the box of the femur component.

Tighten the stem screw of the component with the Torque Wrench 3.5 with 2 clicks while counteracting the torque with the Neck Stopper Curved (79.02.0750).

After implantation, the stem screw must be re-tightened with the Torque Wrench (18.410-RAL5002) with 2 clicks.

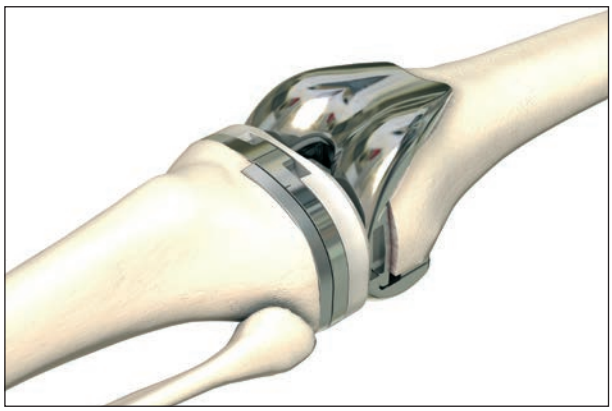


Fig. 143

The leg should be in extension during hardening of the bone cement.
Avoid hyperextension during curing of the bone cement.

Surgical technique

Alternative workflow

The abbreviated workflow focuses on gap management, flexion/extension management and bone-loss management (augmentations). It is done with the femur and stem test-components. The AP cuts have to be done beforehand.

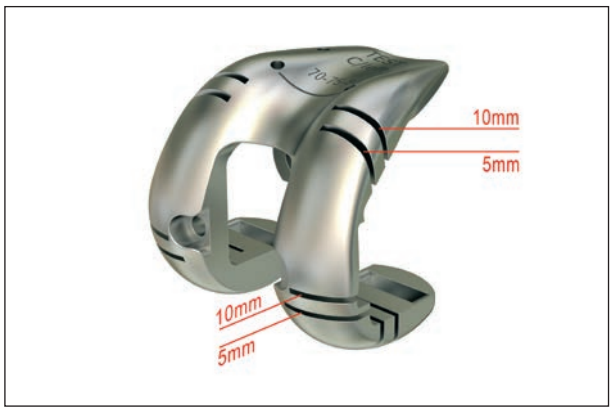


Fig. 144

The final distal osteotomy and the cuts for the distal and dorsal/posterior augmentations can be performed directly through the designated slots of the Trial Femur (79.02.0330 to 79.02.0339) if the Trial Femur already fits to the distal femur.

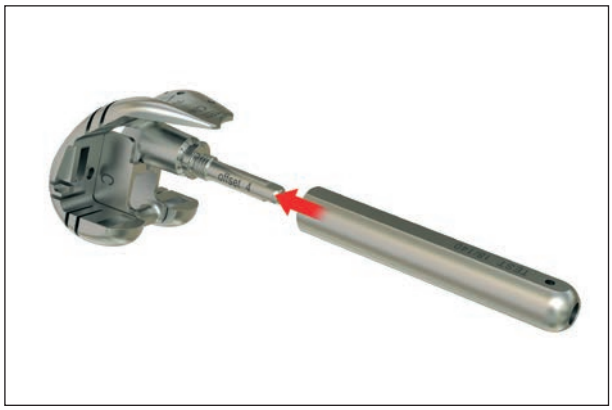


Fig. 145

Prepare and assemble the determined Trial Femur, Trial Stem Core and Trial Stem Sleeve. The exact femur rotation has been decided previously.

Insert the Trial Femur and perform the box cut. The box cut is guided by the sagittal surfaces of the Trial Femur.

In order to limit the cut to the correct depth, insert two Pins (71.02.3054) through the distal holes in the anterior surface of the Trial Femur (the distal pins are connected with a laser marking).

A narrow saw blade should be used. The saw blade must be guided along the sagittal surfaces of the Trial Femur. Cut until the saw touches the two pins.

After performing the box cut, fix the Femur Box Inlay (79.02.470 to 79.02.0474) to the Trial Femur.

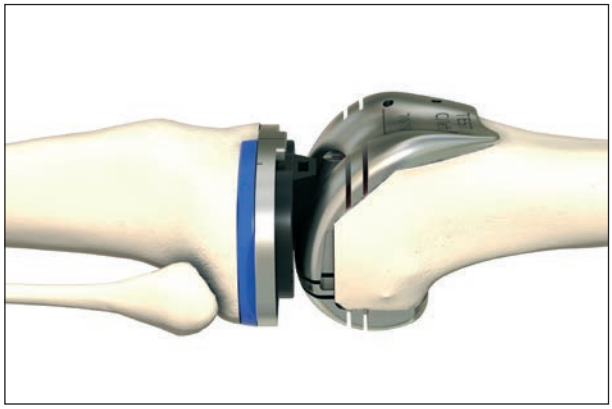


Fig. 146

Determine the position of the femur in longitudinal axis. Check the ligament tension with the Spacer Trial Inlay (79.02.0730 to 79.02.736) in flexion and extension.

In this example, the tension with the chosen trials is suitable.

Once the longitudinal position of the femur has been determined, insert two Pins (71.02.3054) through the proximal holes in the anterior surface of the Trial Femur. This is necessary to stabilize the trial implant in the determined position.

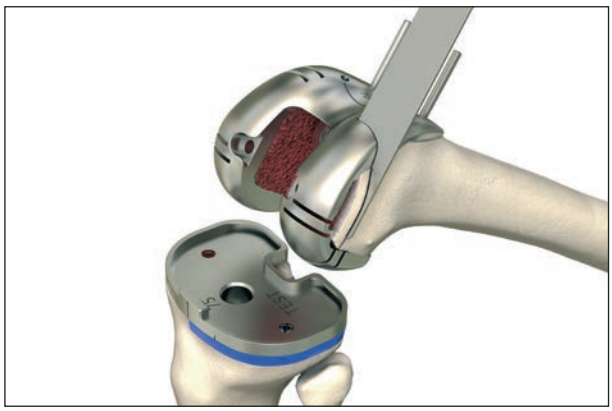


Fig. 147

If a distal or dorsal/posterior augmentation is necessary, the cut can be performed through the respective slots.

In this example, the cut is performed for a 5 mm distal augmentation on the lateral side.

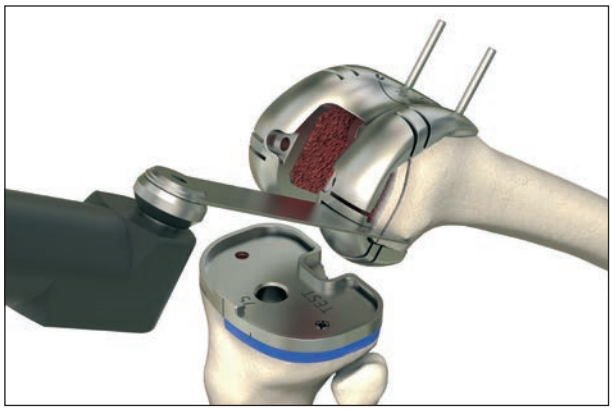


Fig. 148

In this example, the cut is performed for a 5 mm dorsal/posterior augmentation on the lateral side.

Appendix

Appendix

1 – Size compatibility of the balanSys REV Implants

balanSys REV Femur with REV Inlay and Tibia

REV Tibia/Inlay	REV Femur A	B	C	D	E
64/45	✓	✓			
70/48	✓	✓	✓		
75/51		✓	✓	✓	
80/53			✓	✓	✓
85/55				✓	✓

The REV Inlay may only be used in combination with cortically supported stems on both sides, femoral and tibial.

2.1 – Optional combination balanSys REV Inlay

The balanSys REV Inlay cannot be used in combination with any balanSys BICONDYLAR Femur or Tibia.

balanSys REV Inlays may only be used in combination with a balanSys REV Femur with stem and a balanSys REV Tibia with stem.

Appendix

2.2 – Optional combination balanSys REV Femur with balanSys BICONDYLAR PS Inlay

The balanSys REV Femur can be used in combination with the balanSys BICONDYLAR PS Inlay (PE or vitamys).

balanSys REV Femurs must not be used in combination with balanSys BICONDYLAR CR, UC or RP Inlays.

balanSys REV Inlays may only be used in combination with balanSys REV Femurs and balanSys REV Tibias.

balanSys REV Femur with BICONDYLAR PS Inlay and PS Tibia or REV Tibia

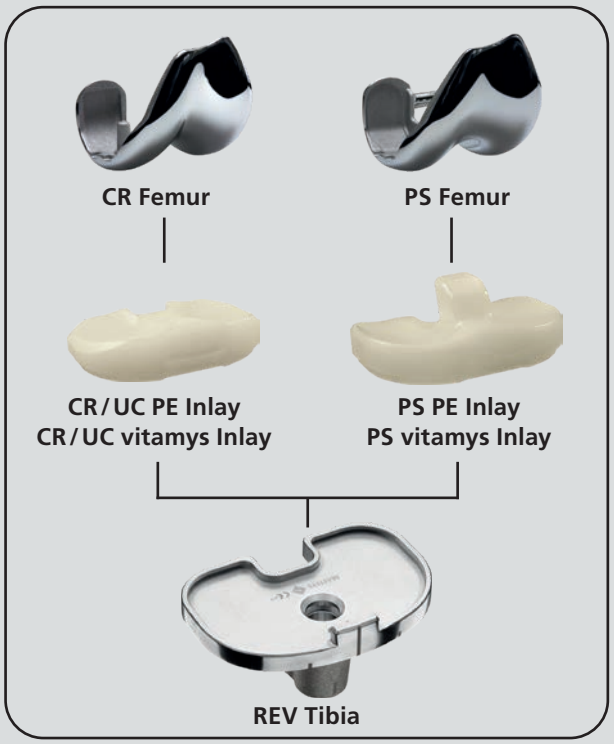
PS/REV Tibia/PS Inlay	REV Femur A	B	C	D	E
59/40*					
62/42*	✓				
64/45	✓	✓			
67/46*	✓	✓			
70/48	✓	✓	✓		
75/51		✓	✓	✓	
80/53			✓	✓	✓
85/55				✓	✓

* Tibia sizes 59, 62 and 67 are available for the PS Tibia only.

Remark
balanSys BICONDYLAR PS Tibias of size 59 cannot be used in combination with a balanSys REV Femur.

Not all implant sizes are available in all countries.

2.3 – Optional combination balanSys REV Tibia with balanSys BICONDYLAR Inlays



The balanSys REV Tibia can be used in combination with the balanSys BICONDYLAR CR, UC or PS Inlay (PE or vitamys).

balanSys REV Femurs must not be used in combination with balanSys BICONDYLAR CR, UC or RP Inlays.

balanSys REV Inlays may only be used in combination with balanSys REV Femurs and balanSys REV Tibias.

balanSys REV Tibia with BICONDYLAR CR / UC Inlay and CR Femur

REV Tibia CR/UC Inlay	CR Femur XS	S	A	B	C	D	E	F
64/45		✓	✓	✓				
70/48			✓	✓	✓			
75/51				✓	✓	✓		
80/53					✓	✓	✓	✓
85/55						✓	✓	✓

balanSys REV Tibia with BICONDYLAR PS Inlay and PS Femur

REV Tibia PS Inlay	PS Femur XS	S	A	B	C	D	E	F
64/45		✓	✓	✓				
70/48			✓	✓	✓			
75/51				✓	✓	✓		
80/53					✓	✓	✓	✓
85/55						✓	✓	✓

Remark

balanSys BICONDYLAR CR and PS Femurs of size ‹XS› cannot be used in combination with a balanSys REV Tibia.

Not all implant sizes are available in all countries.

Appendix

3 – Item numbers of the balanSys REV Implants

balanSys REV Femur, cemented

Item no.	Mediolat.	Size
79.15.0021	60 mm	A right
79.15.0022	64 mm	B right
79.15.0023	68 mm	C right
79.15.0024	72 mm	D right
79.15.0025	76 mm	E right
79.15.0031	60 mm	A left
79.15.0032	64 mm	B left
79.15.0033	68 mm	C left
79.15.0034	72 mm	D left
79.15.0035	76 mm	E left

Material: CoCrMo

balanSys REV Femur Augmentation*, distal

Item no.	Size
79.15.0221	A/5
79.15.0222	A/10
79.15.0231	B/5
79.15.0232	B/10
79.15.0241	C/5

Item no.	Size
79.15.0242	C/10
79.15.0251	D/5
79.15.0252	D/10
79.15.0261	E/5
79.15.0262	E/10

Material: CoCrMo

* The Augmentations are packed with the fixation screw.

balanSys REV Femur Augmentation*, dorsal / posterior

Item no.	Size
79.15.0225	A/5
79.15.0226	A/10
79.15.0235	B/5
79.15.0236	B/10
79.15.0245	C/5

Item no.	Size
79.15.0246	C/10
79.15.0255	D/5
79.15.0256	D/10
79.15.0265	E/5
79.15.0266	E/10

Material: CoCrMo

* The Augmentations are packed with the fixation screw.

balanSys REV Inlay*

Item no.	Mediolat.	Thickness
79.30.0101	64 mm	10.5 mm
79.30.0102	64 mm	13 mm
79.30.0103	64 mm	15.5 mm
79.30.0104	64 mm	18 mm
79.30.0105	64 mm	20.5 mm
79.30.0106	64 mm	23 mm
79.30.0111	70 mm	10.5 mm
79.30.0112	70 mm	13 mm
79.30.0113	70 mm	15.5 mm
79.30.0114	70 mm	18 mm
79.30.0115	70 mm	20.5 mm
79.30.0116	70 mm	23 mm
79.30.0121	75 mm	10.5 mm
79.30.0122	75 mm	13 mm
79.30.0123	75 mm	15.5 mm

Item no.	Mediolat.	Thickness
79.30.0124	75 mm	18 mm
79.30.0125	75 mm	20.5 mm
79.30.0126	75 mm	23 mm
79.30.0131	80 mm	10.5 mm
79.30.0132	80 mm	13 mm
79.30.0133	80 mm	15.5 mm
79.30.0134	80 mm	18 mm
79.30.0135	80 mm	20.5 mm
79.30.0136	80 mm	23 mm
79.30.0141	85 mm	10.5 mm
79.30.0142	85 mm	13 mm
79.30.0143	85 mm	15.5 mm
79.30.0144	85 mm	18 mm
79.30.0145	85 mm	20.5 mm
79.30.0146	85 mm	23 mm

Material: UHMWPE / CoCrMo

* The Inlays are packed with the matching stabilization screw.

balanSys REV Tibial Plateau, cemented

Item no.	Mediolat.
79.15.0051	64 mm
79.15.0052	70 mm
79.15.0053	75 mm
79.15.0054	80 mm
79.15.0055	85 mm

Material: CoCrMo

balanSys REV Tibial Augmentation*

Item no.	Size	Side
79.15.0151	64/5	LM/RL
79.15.0152	64/5	LL/RM
79.15.0153	64/10	LM/RL
79.15.0154	64/10	LL/RM
79.15.0161	70/5	LM/RL
79.15.0162	70/5	LL/RM
79.15.0163	70/10	LM/RL
79.15.0164	70/10	LL/RM
79.15.0171	75/5	LM/RL
79.15.0172	75/5	LL/RM

Item no.	Size	Side
79.15.0173	75/10	LM/RL
79.15.0174	75/10	LL/RM
79.15.0181	80/5	LM/RL
79.15.0182	80/5	LL/RM
79.15.0183	80/10	LM/RL
79.15.0184	80/10	LL/RM
79.15.0191	85/5	LM/RL
79.15.0192	85/5	LL/RM
79.15.0193	85/10	LM/RL
79.15.0194	85/10	LL/RM

Material: CoCrMo

* The Augmentations are packed with the matching number of screws.

Item no.	Description
79.15.0061	balanSys REV Sealing Cap*

* The Sealing Cap is packed with the Stem screw.

balanSys REV Stem*, uncemented, straight

Length	Diameter mm	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	80	✓		✓		✓		✓		✓		✓		✓		✓
	140	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓		✓
	200	✓	✓	✓	✓	✓	✓	✓	✓	✓						

* The Stems are packed with the Stem screw.

balanSys REV Stem 80 mm, uncemented, straight

Item no.	Diameter	Length
79.15.0071	10 mm	80 mm
79.15.0072	12 mm	80 mm
79.15.0073	14 mm	80 mm
79.15.0074	16 mm	80 mm

Item no.	Diameter	Length
79.15.0075	18 mm	80 mm
79.15.0076	20 mm	80 mm
79.15.0077	22 mm	80 mm
79.15.0078	24 mm	80 mm

Material: CoCrMo

balanSys REV Stem 140 mm, uncemented, straight

Item no.	Diameter	Length
79.15.0081	10 mm	140 mm
79.15.0082	11 mm	140 mm
79.15.0083	12 mm	140 mm
79.15.0084	13 mm	140 mm
79.15.0085	14 mm	140 mm
79.15.0086	15 mm	140 mm

Item no.	Diameter	Length
79.15.0087	16 mm	140 mm
79.15.0088	17 mm	140 mm
79.15.0089	18 mm	140 mm
79.15.0090	20 mm	140 mm
79.15.0091	22 mm	140 mm
79.15.0092	24 mm	140 mm

Material: CoCrMo

balanSys REV Stem 200 mm, uncemented, straight

Item no.	Diameter	Length
79.15.0101	10 mm	200 mm
79.15.0102	11 mm	200 mm
79.15.0103	12 mm	200 mm
79.15.0104	13 mm	200 mm
79.15.0105	14 mm	200 mm

Item no.	Diameter	Length
79.15.0106	15 mm	200 mm
79.15.0107	16 mm	200 mm
79.15.0108	17 mm	200 mm
79.15.0109	18 mm	200 mm

Material: CoCrMo

balanSys REV Stem*, uncemented, offset 4 mm

Length	Diameter mm	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	80	✓		✓		✓		✓		✓		✓		✓		✓
	140	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓		✓
	200	✓	✓	✓	✓	✓	✓	✓	✓	✓						

* The Stems are packed with the Stem screw.

balanSys REV Stem 80 mm, uncemented, offset 4 mm

Item no.	Diameter	Length
79.15.0280	10 mm	80 mm
79.15.0282	12 mm	80 mm
79.15.0284	14 mm	80 mm
79.15.0286	16 mm	80 mm

Item no.	Diameter	Length
79.15.0288	18 mm	80 mm
79.15.0290	20 mm	80 mm
79.15.0292	22 mm	80 mm
79.15.0294	24 mm	80 mm

Material: CoCrMo

balanSys REV Stem 140 mm, uncemented, offset 4 mm

Item no.	Diameter	Length
79.15.0131	10 mm	140 mm
79.15.0132	11 mm	140 mm
79.15.0133	12 mm	140 mm
79.15.0134	13 mm	140 mm
79.15.0135	14 mm	140 mm
79.15.0136	15 mm	140 mm

Item no.	Diameter	Length
79.15.0137	16 mm	140 mm
79.15.0138	17 mm	140 mm
79.15.0139	18 mm	140 mm
79.15.0140	20 mm	140 mm
79.15.0141	22 mm	140 mm
79.15.0142	24 mm	140 mm

Material: CoCrMo

balanSys REV Stem 200 mm, uncemented, offset 4 mm

Item no.	Diameter	Length
79.15.0300	10 mm	200 mm
79.15.0301	11 mm	200 mm
79.15.0302	12 mm	200 mm
79.15.0303	13 mm	200 mm
79.15.0304	14 mm	200 mm

Item no.	Diameter	Length
79.15.0305	15 mm	200 mm
79.15.0306	16 mm	200 mm
79.15.0307	17 mm	200 mm
79.15.0308	18 mm	200 mm

Material: CoCrMo

balanSys 3-Peg Patella FLAT components

Item no.	Diameter
72.34.0049	26 mm
72.34.0050	28 mm
72.34.0051	31 mm
72.34.0052	34 mm
72.34.0053	37 mm

Material: UHMWPE, FeCrNiMoMn
(Contrast balls)

balanSys 3-Peg Patella components

Item no.	Diameter
72.30.0128	28 mm
72.30.0131	31 mm
72.30.0134	34 mm
72.30.0137	37 mm

Material: UHMWPE, FeCrNiMoMn
(Contrast balls)

Not all products are available in all countries.

Appendix

4 – Packaging of screws for the balanSys REV Implants

The matching screws are packed together with the individual implants.

Tibial Augmentations

Description	Qty
Packed with 2 Augmentation Screws. The Screws are packed in an extra pouch.	2

Femoral Augmentations

Description	Qty
Packed with 1 Augmentation Screw. The screw is packed in an extra pouch.	1

Stems

Description	Qty
Packed with 1 Stem Screw. The screw is partially screwed onto the stem. *In case of use of a REV Inlay, this Stem Screw must be discarded, since the fixation is achieved with the Stabilization Screw.*	1

Inlay

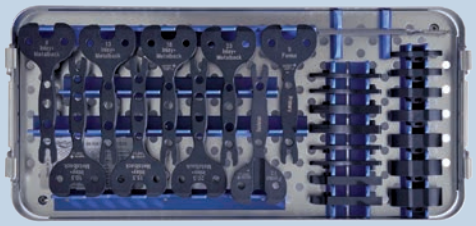
Description	Qty
Packed with 1 Stabilization Screw. The screw is packed in an extra pouch. *The dimension of the Stabilization Screw depends on size & thickness of the REV Inlay! The dimensions are marked onto the screws itself. In case you must discard a screw and need a replacement screw, read the size-information from the screw and open a corresponding Inlay.*	1

Appendix

5 – Item numbers of the balanSys REV Instruments

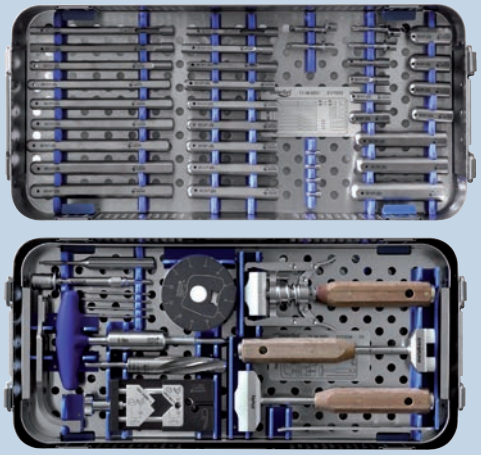
The Set Number is 71.01.0340A, it consists of the following 7 Trays and the Memory Board:

balanSys REV Tray Basic No. 1, *page 74*



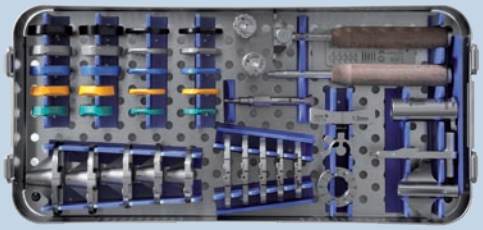
balanSys REV Tray Basic No. 2, *page 76*

balanSys REV Tray Basic No. 3 with Insert, *page 78, 80*

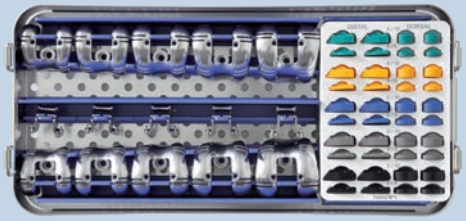


balanSys REV Tray Basic No. 4, *page 82*

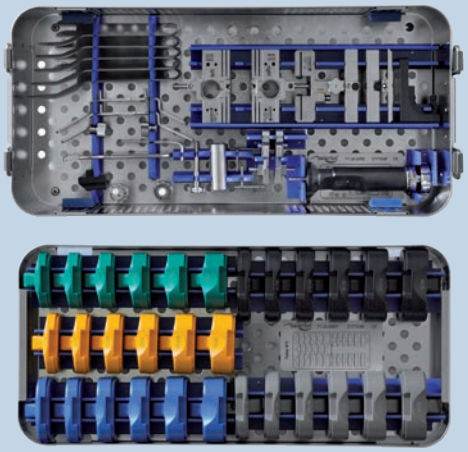
balanSys REV Tray Tibia, *page 85*



balanSys REV Tray Femur No. 1, *page 88*



balanSys REV 3in1 Tray Femur No. 2 with Insert, *page 90, 93*

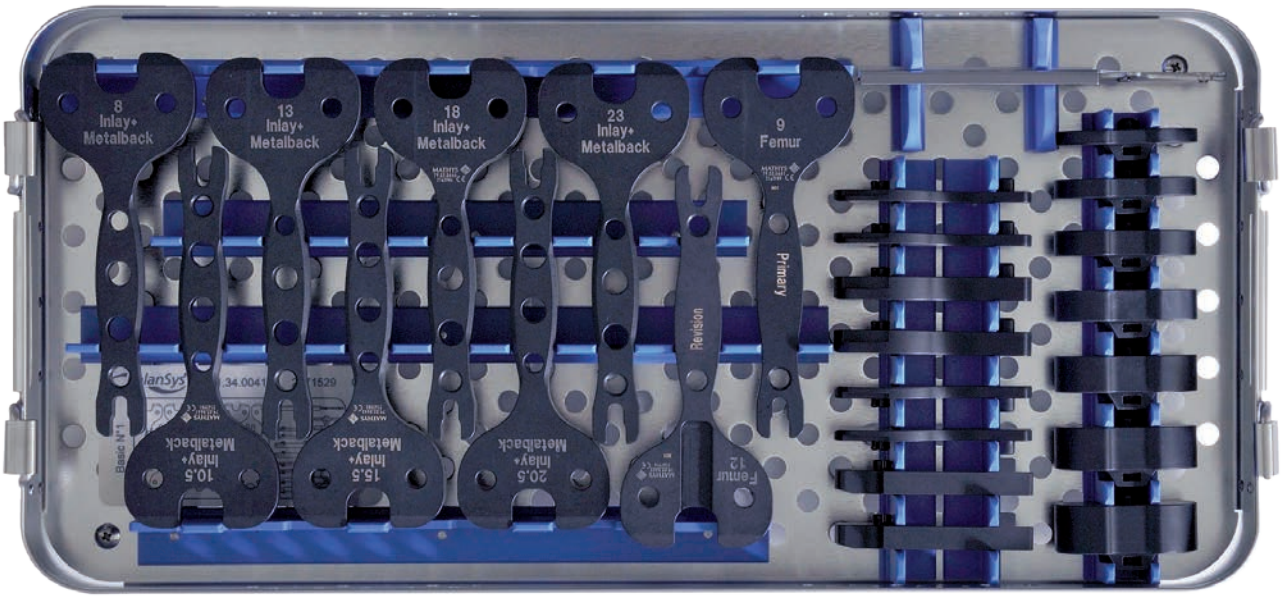


Before each surgery, instruments should be checked for damage or deformation.
Use only undamaged instruments. Do not use trial components with marks or scratches.

balanSys REV instruments are compatible with 1.27 mm (0.05 inch) saw blades. For saw blades distributed by Mathys refer to the brochure 336.030.032 «Sterile Sawblades».

balanSys REV Instrumentation Set 71.01.0340A

Basic No. 1
No Picture / 71.34.0042 **balanSys REV Lid Basic No. 1**



71.34.0041 **balanSys REV Tray Basic No. 1**

Item no.	Description	Qty
79.02.0640	balanSys Spacer block tibia 8	1
79.02.0641	balanSys Spacer block tibia 10.5	1
79.02.0642	balanSys Spacer block tibia 13	1
79.02.0643	balanSys Spacer block tibia 15.5	1
79.02.0644	balanSys Spacer block tibia 18	1
79.02.0645	balanSys Spacer block tibia 20.5	1
79.02.0646	balanSys Spacer block tibia 23	1

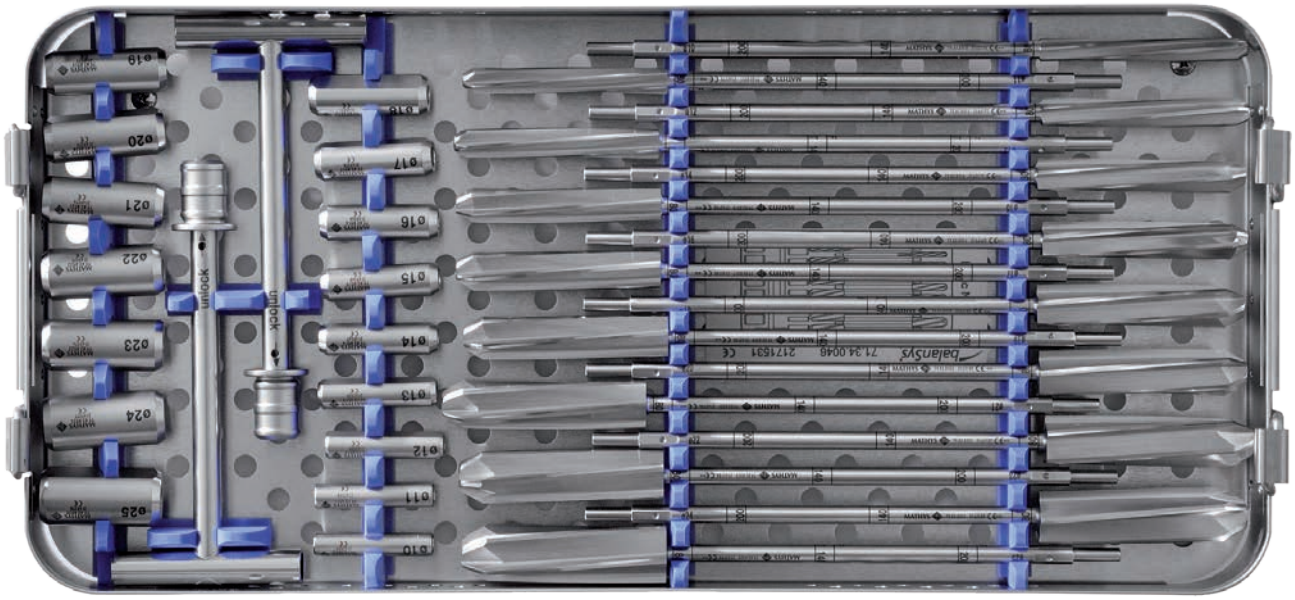
Item no.	Description	Qty
79.02.0651	balanSys Spacer block femur 9	1
79.02.0652	balanSys REV spacer block femur 12	1

Item no.	Description	Qty
79.02.0660	balanSys REV Spacer block agm. L/5	2
79.02.0661	balanSys REV Spacer block agm. R/5	2
79.02.0662	balanSys REV Spacer block agm. L/10	2
79.02.0663	balanSys REV Spacer block agm. R/10	2

Item no.	Description	Qty
79.02.0730	balanSys REV Spacer PE trial inlay 8	1
79.02.0731	balanSys REV Spacer PE trial inlay 10.5	1
79.02.0732	balanSys REV Spacer PE trial inlay 13	1
79.02.0733	balanSys REV Spacer PE trial inlay 15.5	1
79.02.0734	balanSys REV Spacer PE trial inlay 18	1
79.02.0735	balanSys REV Spacer PE trial inlay 20.5	1
79.02.0736	balanSys REV Spacer PE trial inlay 23	1

Item no.	Description	Qty
77.02.0185	balanSys UNI Holder tibia trial prosth.	1

Basic No. 2
No Picture / 71.34.0047 **balanSys REV Lid Basic No. 2**



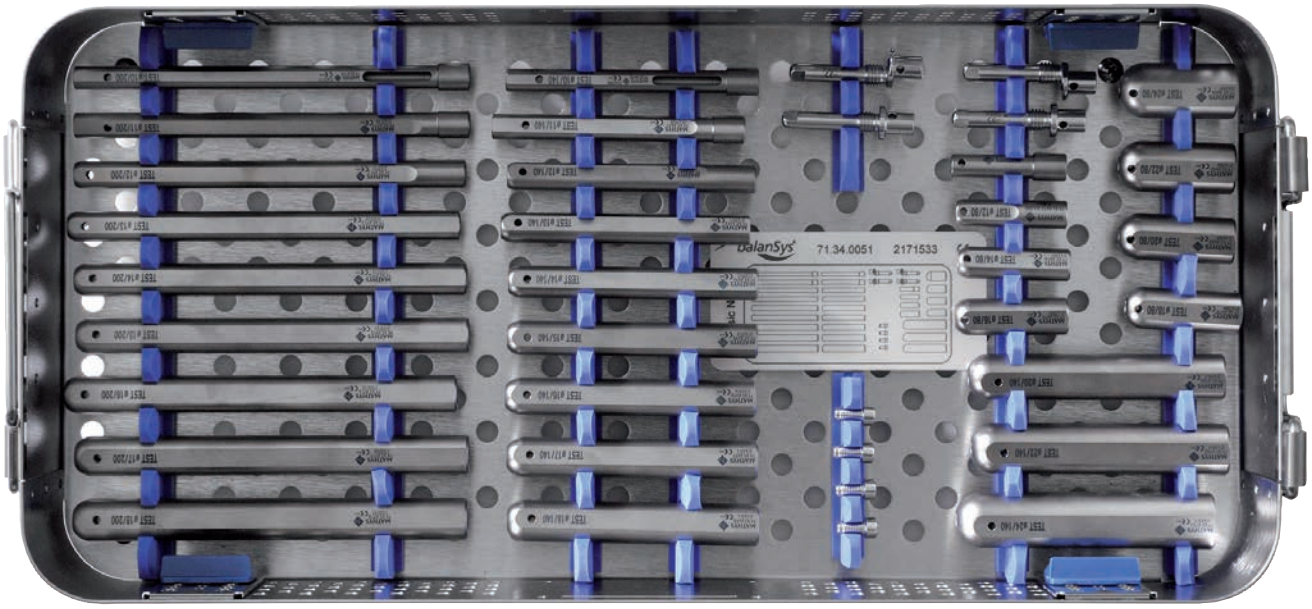
71.34.0046 **balanSys REV Tray Basic No. 2**

Item no.	Description	Qty
79.02.0310	balanSys REV reamer 10	1
79.02.0311	balanSys REV reamer 11	1
79.02.0312	balanSys REV reamer 12	1
79.02.0313	balanSys REV reamer 13	1
79.02.0314	balanSys REV reamer 14	1
79.02.0315	balanSys REV reamer 15	1
79.02.0316	balanSys REV reamer 16	1
79.02.0317	balanSys REV reamer 17	1
79.02.0318	balanSys REV reamer 18	1
79.02.0319	balanSys REV reamer 19	1
79.02.0320	balanSys REV reamer 20	1
79.02.0321	balanSys REV reamer 21	1
79.02.0322	balanSys REV reamer 22	1
79.02.0323	balanSys REV reamer 23	1
79.02.0324	balanSys REV reamer 24	1
79.02.0325	balanSys REV reamer 25	1

Item no.	Description	Qty
79.02.0510	balanSys REV Guide sleeve 10	1
79.02.0511	balanSys REV Guide sleeve 11	1
79.02.0512	balanSys REV Guide sleeve 12	1
79.02.0513	balanSys REV Guide sleeve 13	1
79.02.0514	balanSys REV Guide sleeve 14	1
79.02.0515	balanSys REV Guide sleeve 15	1
79.02.0516	balanSys REV Guide sleeve 16	1
79.02.0517	balanSys REV Guide sleeve 17	1
79.02.0518	balanSys REV Guide sleeve 18	1
79.02.0519	balanSys REV Guide sleeve 19	1
79.02.0520	balanSys REV Guide sleeve 20	1
79.02.0521	balanSys REV Guide sleeve 21	1
79.02.0522	balanSys REV Guide sleeve 22	1
79.02.0523	balanSys REV Guide sleeve 23	1
79.02.0524	balanSys REV Guide sleeve 24	1
79.02.0525	balanSys REV Guide sleeve 25	1

Item no.	Description	Qty
79.02.0023	balanSys REV handle with coupling	2

Basic No. 3
No Picture / 71.34.0053 **balanSys REV Lid Basic No. 3**



71.34.0051 **balanSys REV Tray Basic No. 3**

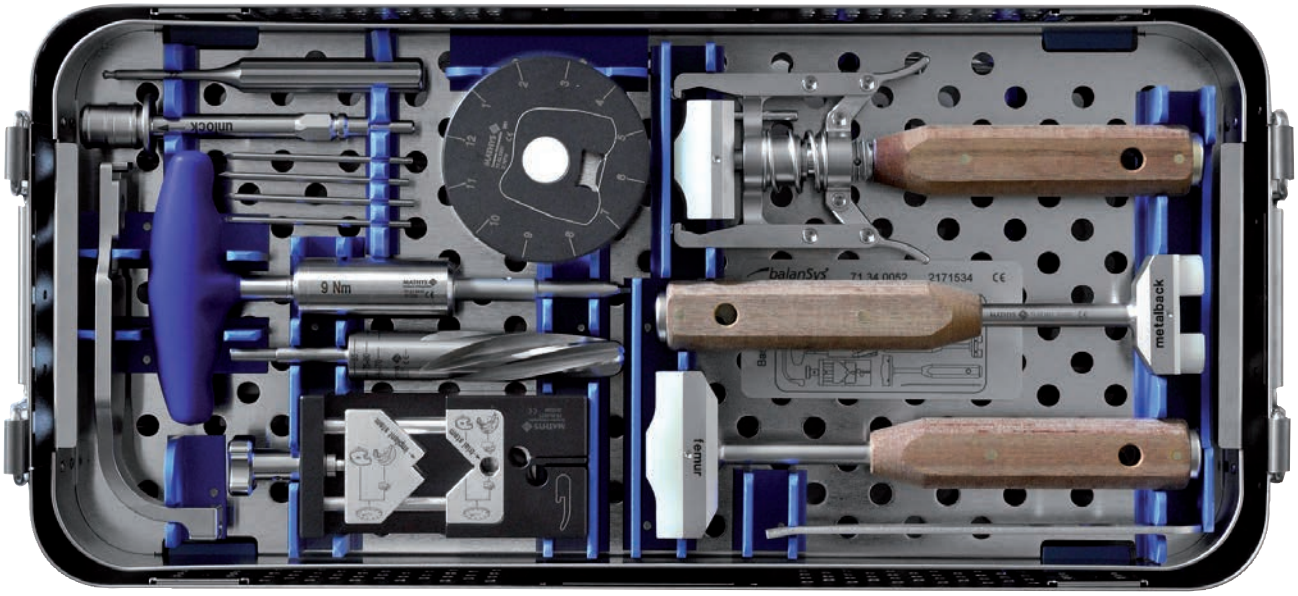
Item no.	Description	Qty
79.02.0668	balanSys REV Trial stem core 80	2

Item no.	Description	Qty
79.02.0669	balanSys REV Trial stem core 80 off. 4	2

Item no.	Description	Qty
79.02.0670	balanSys REV Trial stem sleeve 10/80	1
79.02.0672	balanSys REV Trial stem sleeve 12/80	1
79.02.0674	balanSys REV Trial stem sleeve 14/80	1
79.02.0676	balanSys REV Trial stem sleeve 16/80	1
79.02.0678	balanSys REV Trial stem sleeve 18/80	1
79.02.0680	balanSys REV Trial stem sleeve 20/80	1
79.02.0682	balanSys REV Trial stem sleeve 22/80	1
79.02.0684	balanSys REV Trial stem sleeve 24/80	1
79.02.0690	balanSys REV Trial stem sleeve 10/140	1
79.02.0691	balanSys REV Trial stem sleeve 11/140	1
79.02.0692	balanSys REV Trial stem sleeve 12/140	1
79.02.0693	balanSys REV Trial stem sleeve 13/140	1
79.02.0694	balanSys REV Trial stem sleeve 14/140	1
79.02.0695	balanSys REV Trial stem sleeve 15/140	1
79.02.0696	balanSys REV Trial stem sleeve 16/140	1
79.02.0697	balanSys REV Trial stem sleeve 17/140	1
79.02.0698	balanSys REV Trial stem sleeve 18/140	1
79.02.0700	balanSys REV Trial stem sleeve 20/140	1
79.02.0702	balanSys REV Trial stem sleeve 22/140	1
79.02.0704	balanSys REV Trial stem sleeve 24/140	1
79.02.0710	balanSys REV Trial stem sleeve 10/200	1
79.02.0711	balanSys REV Trial stem sleeve 11/200	1
79.02.0712	balanSys REV Trial stem sleeve 12/200	1
79.02.0713	balanSys REV Trial stem sleeve 13/200	1
79.02.0714	balanSys REV Trial stem sleeve 14/200	1
79.02.0715	balanSys REV Trial stem sleeve 15/200	1
79.02.0716	balanSys REV Trial stem sleeve 16/200	1
79.02.0717	balanSys REV Trial stem sleeve 17/200	1
79.02.0718	balanSys REV Trial stem sleeve 18/200	1

Item no.	Description	Qty
79.02.0071	balanSys REV Trial Stem Screw	4

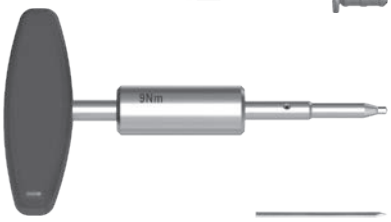
Basic No. 3



71.34.0052 **balanSys REV Tray Insert Basic No. 3**

Item no.	Description	Qty
79.02.0270	balanSys REV screw positioner 3.5	1

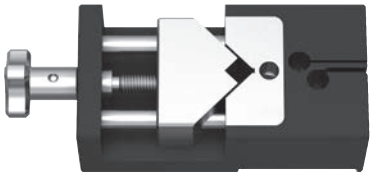
Item no.	Description	Qty
79.02.0021	balanSys PS machine coupling f/reamer	1



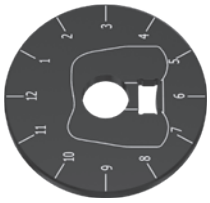
Item no.	Description	Qty
18.410-RAL5002	Torque wrench	1

Item no.	Description	Qty
71.02.3054	balanSys pin 3.2/80	4

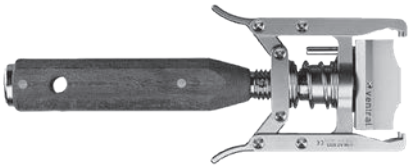
Item no.	Description	Qty
79.02.0281	balanSys PS reamer	1



Item no.	Description	Qty
79.02.0271	balanSys REV assembly device	1



Item no.	Description	Qty
79.02.0287	balanSys REV Offset alignment disk	1



Item no.	Description	Qty
71.02.3016	balanSys femur holder	1

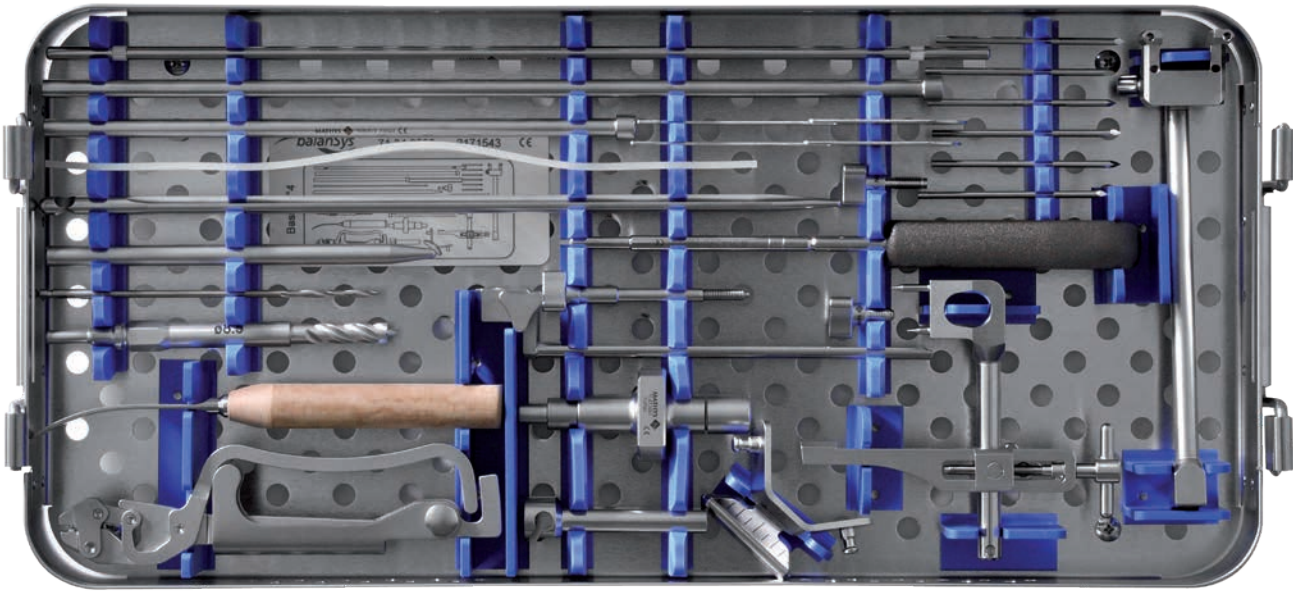
Item no.	Description	Qty
71.34.0699	balanSys femoral impactor	1

Item no.	Description	Qty
71.34.0698	balanSys tibial impactor	1

Item no.	Description	Qty
79.02.0750	balanSys REV Neck stopper curved	1

Item no.	Description	Qty
79.02.0029	balanSys REV positioning fork	1

Basic No. 4
No Picture / 71.34.0039 **balanSys REV Lid Basic No. 4**



71.34.0038 **balanSys REV Tray Basic No. 4**

Item no.	Description	Qty
70.04.0109	balanSys alignment rod centre piece	1

Item no.	Description	Qty
70.04.0110	balanSys alignment rod short	1

Item no.	Description	Qty
70.04.0111	balanSys alignment rod long	1

Item no.	Description	Qty
71.02.3006	balanSys pliers	1

Item no.	Description	Qty
71.02.3007	balanSys osteophyte chisel, curved	1

Item no.	Description	Qty
71.02.3009	balanSys drill bit 8.5	1

Item no.	Description	Qty
71.02.3014	balanSys impaction/extraction rod	1

Item no.	Description	Qty
314.270	Screwdriver, hex., 3.5	1

Item no.	Description	Qty
315.310	AO Drill bit 3.2	1

Item no.	Description	Qty
71.02.3043	balanSys Trs. handle f/intramedullary rod	1

Item no.	Description	Qty
71.02.3042	balanSys Trs. intramedullary rod	1

Item no.	Description	Qty
71.02.3054	balanSys pin 3.2/80	10

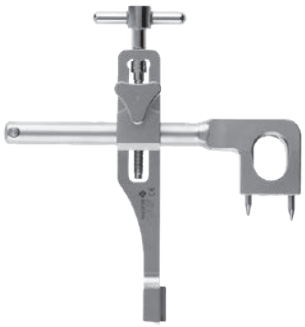
Item no.	Description	Qty
77.02.0031	balanSys reference plate 1.3	2

Item no.	Description	Qty
71.02.3032	balanSys Trs. aiming device proximal	1

Item no.	Description	Qty
71.02.3034	balanSys Trs. aiming device distal	1

Item no.	Description	Qty
71.02.3035	balanSys Trs. ankle holder	1

Item no.	Description	Qty
71.02.3036	balanSys Trs. distal connector	1



Item no.	Description	Qty
71.02.3041	balanSys Trs. intramedullary shackle	1

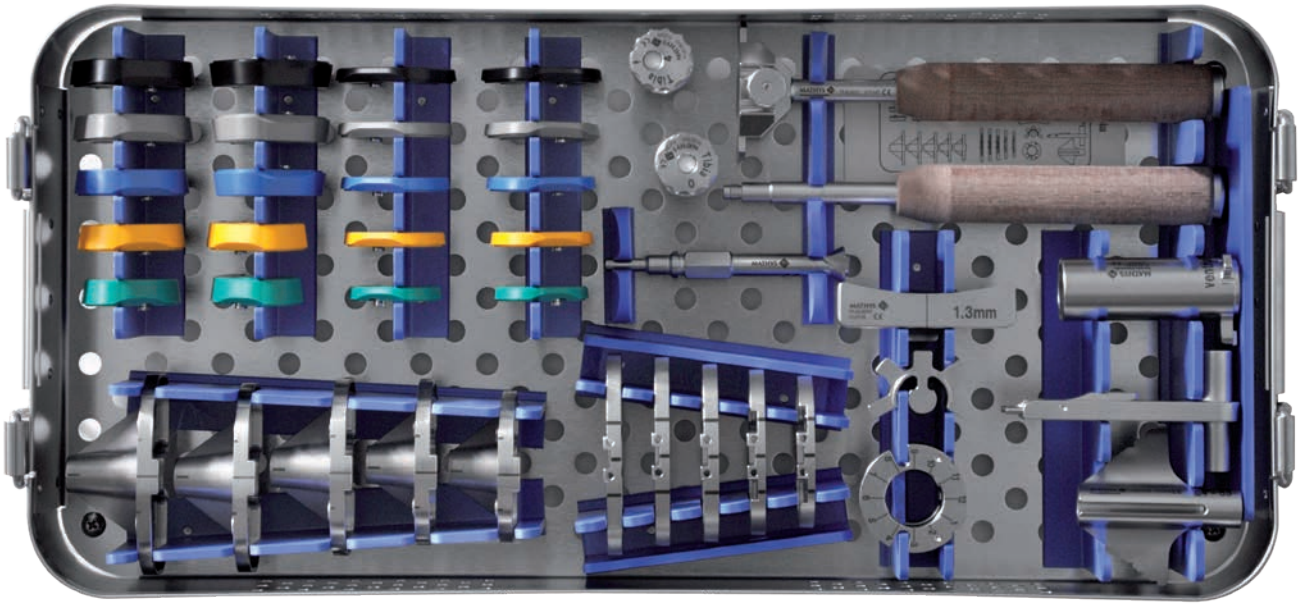
Item no.	Description	Qty
77.02.0019	balanSys Trs. screw	1

Item no.	Description	Qty
77.02.0041	balanSys Trs. connecting screw	1

Item no.	Description	Qty
77.02.0043	balanSys Trs. locking bolt	1

Item no.	Description	Qty
71.02.1005	balanSys Trs. rubber band 3x25x300	1

Tibia
No Picture / 71.34.0057 **balanSys REV Lid Tibia**



71.34.0056 **balanSys REV Tray Tibia**

Item no.	Description	Qty
71.34.0198	balanSys Fin Chisel 59–85	1

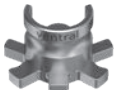
Item no.	Description	Qty
71.34.0196	balanSys holder tibial template	1

Item no.	Description	Qty
79.02.0286	balanSys PS reamer guide	1

Item no.	Description	Qty
71.34.0700	balanSys handle for tib. cutting chisel	1

Item no.	Description	Qty
71.34.0240	balanSys positioner for tibial plateau	1

Item no.	Description	Qty
79.02.0258	balanSys REV Offset graduated collar	1



Item no.	Description	Qty
79.02.0257	balanSys PS chisel centring guide	1

Item no.	Description	Qty
79.02.0290	balanSys REV tibial cutting guide	1

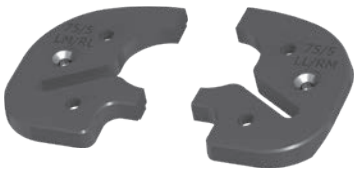
Item no.	Description	Qty
79.02.0291	balanSys REV Tibial Template 64	1
79.02.0292	balanSys REV Tibial Template 70	1
79.02.0293	balanSys REV Tibial Template 75	1
79.02.0294	balanSys REV Tibial Template 80	1
79.02.0295	balanSys REV Tibial Template 85	1

Item no.	Description	Qty
79.02.0279	balanSys REV Tibia reamer 10	1

Item no.	Description	Qty
79.02.0541	balanSys REV offset tibial guide 0	1

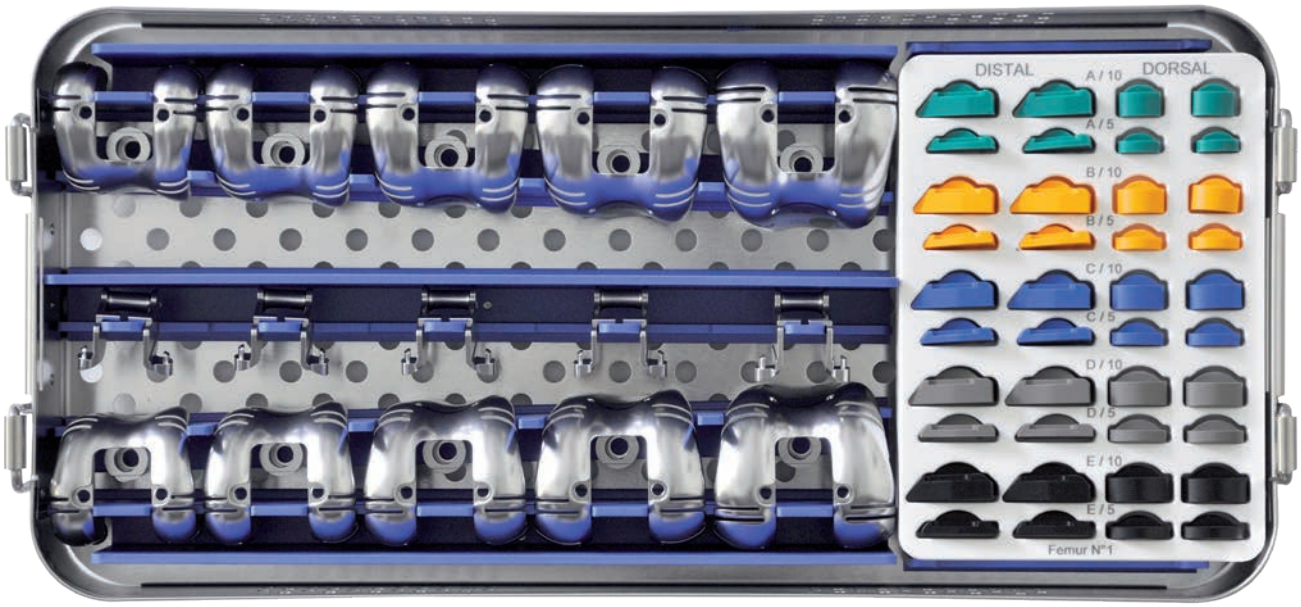
Item no.	Description	Qty
79.02.0543	balanSys REV offset tibial guide 4	1

Item no.	Description	Qty
79.02.0060	balanSys REV Trial tibial plateau 64	1
79.02.0061	balanSys REV Trial tibial plateau 70	1
79.02.0062	balanSys REV Trial tibial plateau 75	1
79.02.0063	balanSys REV Trial tibial plateau 80	1
79.02.0064	balanSys REV Trial tibial plateau 85	1



Item no.	Description	Qty
79.02.0160	balanSys REV trial tibia agm. 64/5 LM/RL	1
79.02.0161	balanSys REV trial tibia agm. 64/5 LL/RM	1
79.02.0162	balanSys REV trial tibia agm. 64/10 LM/RL	1
79.02.0163	balanSys REV trial tibia agm. 64/10 LL/RM	1
79.02.0166	balanSys REV trial tibia agm. 70/5 LM/RL	1
79.02.0167	balanSys REV trial tibia agm. 70/5 LL/RM	1
79.02.0168	balanSys REV trial tibia agm. 70/10 LM/RL	1
79.02.0169	balanSys REV trial tibia agm. 70/10 LL/RM	1
79.02.0172	balanSys REV trial tibia agm. 75/5 LM/RL	1
79.02.0173	balanSys REV trial tibia agm. 75/5 LL/RM	1
79.02.0174	balanSys REV trial tibia agm. 75/10 LM/RL	1
79.02.0175	balanSys REV trial tibia agm. 75/10 LL/RM	1
79.02.0178	balanSys REV trial tibia agm. 80/5 LM/RL	1
79.02.0179	balanSys REV trial tibia agm. 80/5 LL/RM	1
79.02.0180	balanSys REV trial tibia agm. 80/10 LM/RL	1
79.02.0181	balanSys REV trial tibia agm. 80/10 LL/RM	1
79.02.0184	balanSys REV trial tibia agm. 85/5 LM/RL	1
79.02.0185	balanSys REV trial tibia agm. 85/5 LL/RM	1
79.02.0186	balanSys REV trial tibia agm. 85/10 LM/RL	1
79.02.0187	balanSys REV trial tibia agm. 85/10 LL/RM	1

Femur No. 1
No Picture / 71.34.0062 **balanSys REV Lid Femur No. 1**



71.34.0061 **balanSys REV Case Femur No. 1**

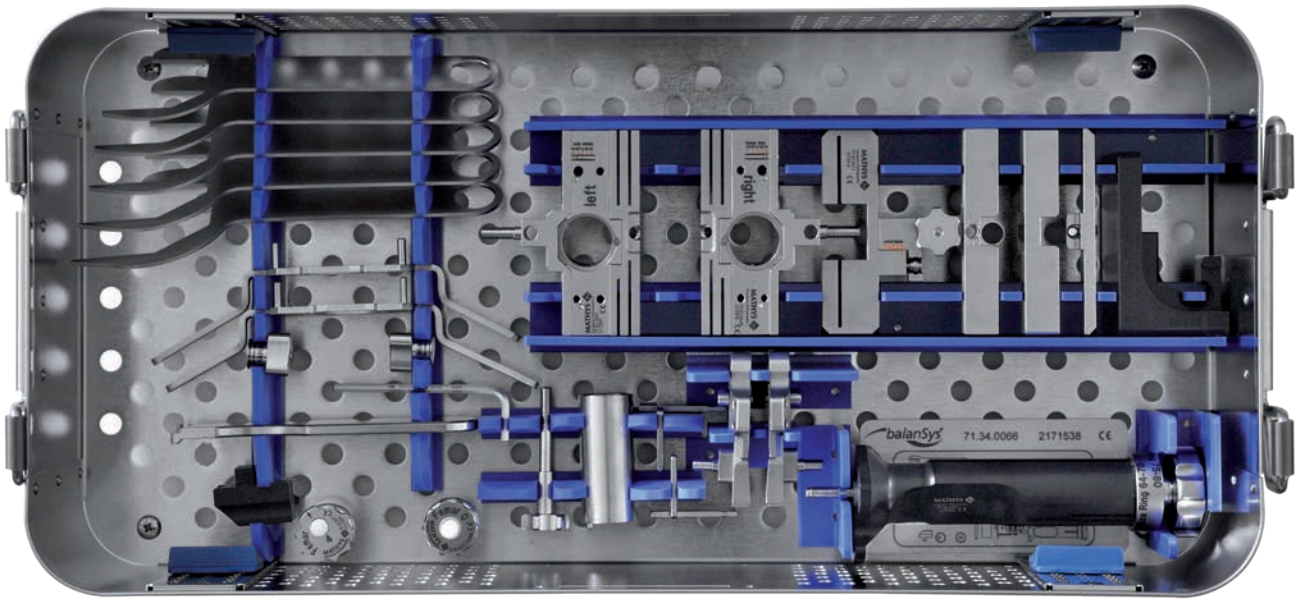
Item no.	Description	Qty
79.02.0330	balanSys REV trial femur A right	1
79.02.0331	balanSys REV trial femur A left	1
79.02.0332	balanSys REV trial femur B right	1
79.02.0333	balanSys REV trial femur B left	1
79.02.0334	balanSys REV trial femur C right	1
79.02.0335	balanSys REV trial femur C left	1
79.02.0336	balanSys REV trial femur D right	1
79.02.0337	balanSys REV trial femur D left	1
79.02.0338	balanSys REV trial femur E right	1
79.02.0339	balanSys REV trial femur E left	1

Item no.	Description	Qty
79.02.0470	balanSys REV femur box inlay A	1
79.02.0471	balanSys REV femur box inlay B	1
79.02.0472	balanSys REV femur box inlay C	1
79.02.0473	balanSys REV femur box inlay D	1
79.02.0474	balanSys REV femur box inlay E	1

Item no.	Description	Qty
79.02.0421	balanSys REV distal trial agm. femur A 5	2
79.02.0422	balanSys REV distal trial agm. femur A 10	2
79.02.0431	balanSys REV distal trial agm. femur B 5	2
79.02.0432	balanSys REV distal trial agm. femur B 10	2
79.02.0441	balanSys REV distal trial agm. femur C 5	2
79.02.0442	balanSys REV distal trial agm. femur C 10	2
79.02.0451	balanSys REV distal trial agm. femur D 5	2
79.02.0452	balanSys REV distal trial agm. femur D 10	2
79.02.0461	balanSys REV distal trial agm. femur E 5	2
79.02.0462	balanSys REV distal trial agm. femur E 10	2

Item no.	Description	Qty
79.02.0425	balanSys REV dorsal trial agm. femur A 5	2
79.02.0426	balanSys REV dorsal trial agm. femur A 10	2
79.02.0435	balanSys REV dorsal trial agm. femur B 5	2
79.02.0436	balanSys REV dorsal trial agm. femur B 10	2
79.02.0445	balanSys REV dorsal trial agm. femur C 5	2
79.02.0446	balanSys REV dorsal trial agm. femur C 10	2
79.02.0455	balanSys REV dorsal trial agm. femur D 5	2
79.02.0456	balanSys REV dorsal trial agm. femur D 10	2
79.02.0465	balanSys REV dorsal trial agm. femur E 5	2
79.02.0466	balanSys REV dorsal trial agm. femur E 10	2

Femur No. 2
No Picture / 71.34.0068 **balanSys REV Lid Femur No. 2**



71.34.0066 **balanSys REV Tray Femur No. 2**

Item no.	Description	Qty
79.02.0530	balanSys REV femoral sizing guide A	1
79.02.0531	balanSys REV femoral sizing guide B	1
79.02.0532	balanSys REV femoral sizing guide C	1
79.02.0533	balanSys REV femoral sizing guide D	1
79.02.0534	balanSys REV femoral sizing guide E	1

Item no.	Description	Qty
79.02.0604	balanSys REV Rotation Guide Right	1
79.02.0605	balanSys REV Rotation Guide Left	1

Item no.	Description	Qty
79.02.0027	balanSys REV Neck stopper straight	1

Item no.	Description	Qty
79.02.0615	balanSys REV offset femur guide 0	1

Item no.	Description	Qty
79.02.0617	balanSys REV offset femur guide 4	1

Item no.	Description	Qty
79.02.0609	balanSys REV screw cutting block dist.	2

Item no.	Description	Qty
79.02.0288	balanSys REV box adapter	1

Item no.	Description	Qty
79.02.0607	balanSys REV reamer guide	1

Item no.	Description	Qty
79.02.0608	balanSys REV screw cutting block AP	1

Item no.	Description	Qty
79.02.0301	balanSys REV positioner handle	1

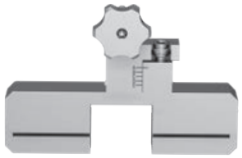
Item no.	Description	Qty
79.02.0302	balanSys REV positioner rod	1

Item no.	Description	Qty
79.02.0303	balanSys REV sizing ring positioner	1

Item no.	Description	Qty
79.02.0751V	balanSys REV Anchor right 10–25	1
79.02.0752V	balanSys REV Anchor left 10–25	1

Item no.	Description	Qty
79.02.0600	balanSys REV AP Cutting Block right	1
79.02.0601	balanSys REV AP Cutting Block left	1

Item no.	Description	Qty
314.140	Allen Key, angled, L 80 mm	2



Item no.	Description	Qty
79.02.0611	balanSys REV Ante. chamfer cutting block	1

Item no.	Description	Qty
79.02.0606	balanSys REV cutting block distal	1

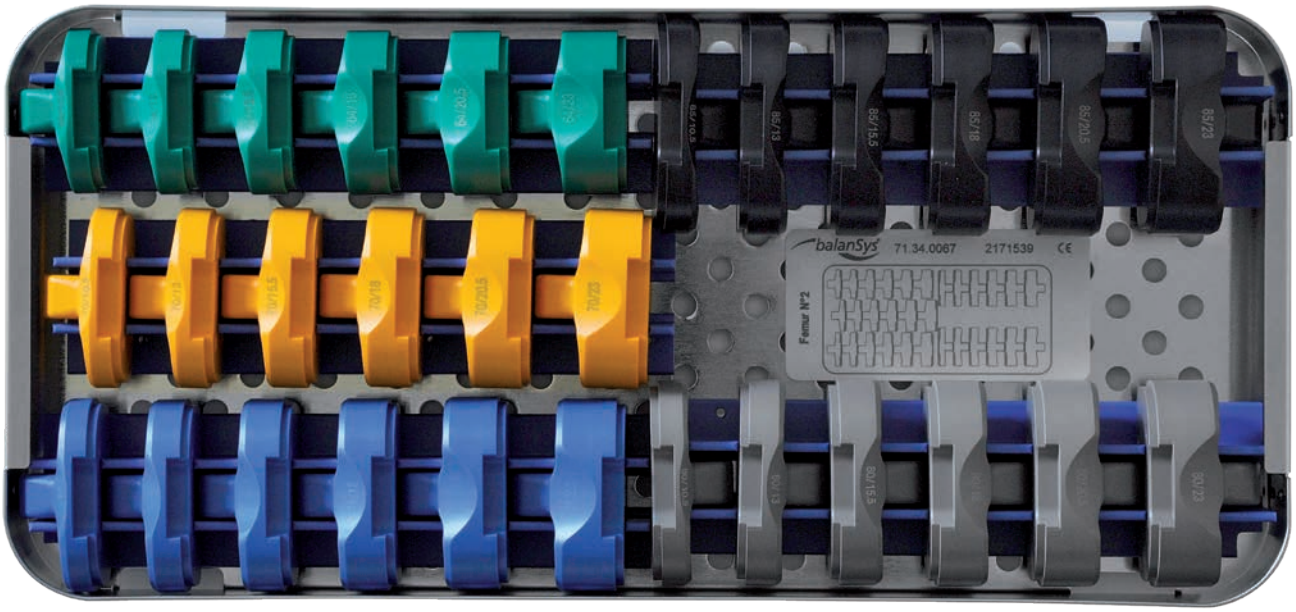
Item no.	Description	Qty
79.02.0602	balanSys REV cutting block distal 3/12	1

Item no.	Description	Qty
79.02.0603	balanSys REV cutting bridge dorsal	1

Item no.	Description	Qty
79.02.0540	balanSys REV femur assembly block	1

Item no.	Description	Qty
79.02.0610	balanSys REV Anterior Stylus right	1
79.02.0614	balanSys REV Anterior Stylus left	1

Femur No. 2



71.34.0067 **balanSys REV Tray Insert Femur No. 2**

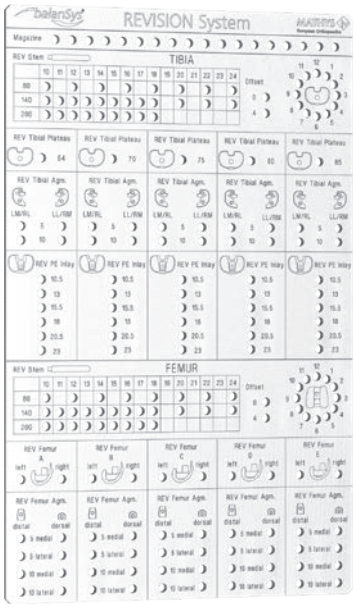
Item no.	Description	Qty
79.02.0351	balanSys REV PE trial inlay 64/10.5	1
79.02.0352	balanSys REV PE trial inlay 64/13	1
79.02.0353	balanSys REV PE trial inlay 64/15.5	1
79.02.0354	balanSys REV PE trial inlay 64/18	1
79.02.0355	balanSys REV PE trial inlay 64/20.5	1
79.02.0356	balanSys REV PE trial inlay 64/23	1
79.02.0361	balanSys REV PE trial inlay 70/10.5	1
79.02.0362	balanSys REV PE trial inlay 70/13	1
79.02.0363	balanSys REV PE trial inlay 70/15.5	1
79.02.0364	balanSys REV PE trial inlay 70/18	1
79.02.0365	balanSys REV PE trial inlay 70/20.5	1
79.02.0366	balanSys REV PE trial inlay 70/23	1
79.02.0371	balanSys REV PE trial inlay 75/10.5	1
79.02.0372	balanSys REV PE trial inlay 75/13	1
79.02.0373	balanSys REV PE trial inlay 75/15.5	1
79.02.0374	balanSys REV PE trial inlay 75/18	1
79.02.0375	balanSys REV PE trial inlay 75/20.5	1
79.02.0376	balanSys REV PE trial inlay 75/23	1

Item no.	Description	Qty
79.02.0381	balanSys REV PE trial inlay 80/10.5	1
79.02.0382	balanSys REV PE trial inlay 80/13	1
79.02.0383	balanSys REV PE trial inlay 80/15.5	1
79.02.0384	balanSys REV PE trial inlay 80/18	1
79.02.0385	balanSys REV PE trial inlay 80/20.5	1
79.02.0386	balanSys REV PE trial inlay 80/23	1
79.02.0391	balanSys REV PE trial inlay 85/10.5	1
79.02.0392	balanSys REV PE trial inlay 85/13	1
79.02.0393	balanSys REV PE trial inlay 85/15.5	1
79.02.0394	balanSys REV PE trial inlay 85/18	1
79.02.0395	balanSys REV PE trial inlay 85/20.5	1
79.02.0396	balanSys REV PE trial inlay 85/23	1

balanSys REV Memory Board

The Memory Board may serve as a means to record implant component sizes, implant component types and other information determined during surgery.

The balanSys REV Instrument Set includes 2 Memory Boards. The idea is to use one in the sterile area to record and to transfer the information to the one in the non-sterile area. The non-sterile one may serve as a «note-pad» to remember and find all required components quickly.



Item no.	Description	Qty
79.02.0637	balanSys REV Memory Board	2

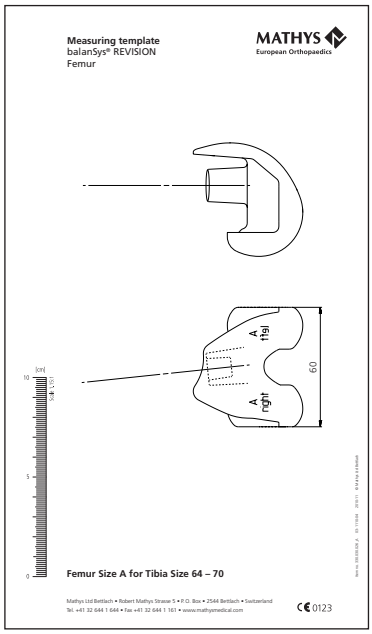
Item no.	Description	Qty
79.02.0638	balanSys REV plug-in peg	36

Appendix

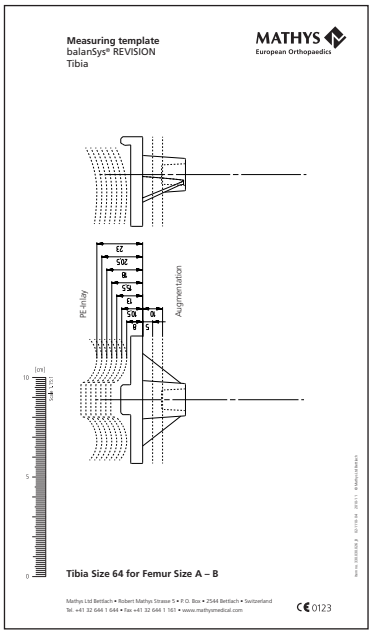
6 – Item numbers of the balanSys REV measuring template

The item code for the balanSys REV Measuring Template is 330.030.026 and consists of 4 parts:

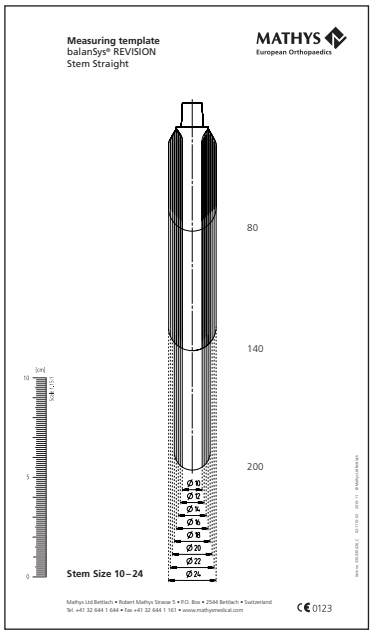
balanSys REVISION Femur
330.030.026_A



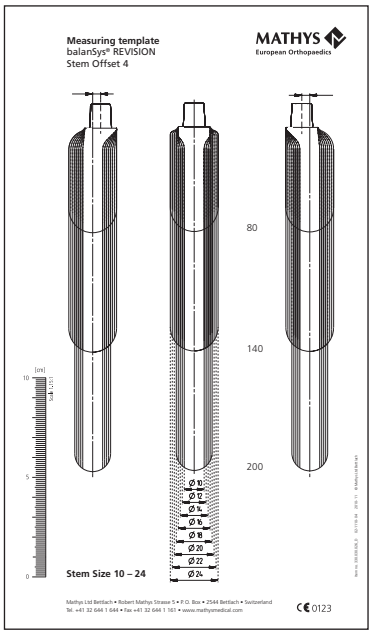
balanSys REVISION Tibia
330.030.026_B



balanSys REVISION Stem Straight
330.030.026_C



balanSys REVISION Stem Offset 4
330.030.026_D



Appendix

7 – Assembly of the Tibial Reference System

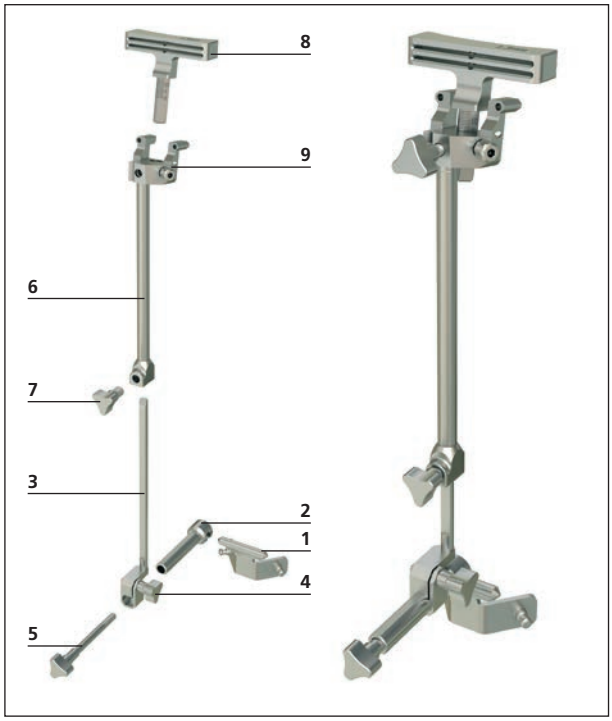


Fig. 149

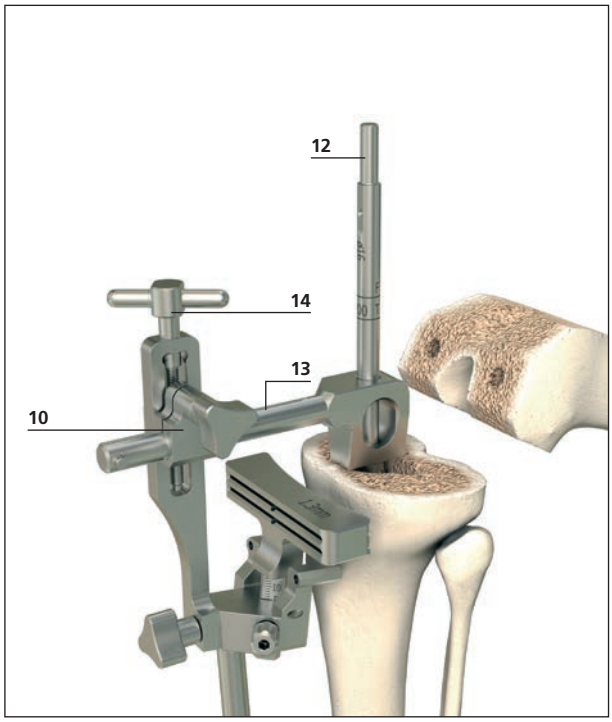


Fig. 150

Assembly of the extramedullary Tibial Reference System:

1. Move the Ankle Holder (71.02.3035/1) onto the Tibial Distal Connector (71.02.3036/2).
2. Move the Aiming Device Distal (71.02.3034/3) onto the Tibial Distal Connector (71.02.3036/2).
3. Fix the Ankle Holder (71.02.3035/1) with the Tibial Locking Bolt (77.02.0043/5).
4. Leave the screw (4) slightly open.
5. Join the Aiming Device Distal (71.02.3034/3) with the Aiming Device Proximal (71.02.3032/6).
6. Affix it with the connecting screw (77.02.0041/7).
7. Insert the Tibial Cutting Guide (79.02.0290/8) onto the Aiming Device Proximal (71.02.3032/6).
8. Set the REV Tibial Cutting Guide (79.02.0290/8) to zero and tighten the screw (9) with the Hexagonal Screwdriver (314.270).

Assembly of the intramedullary Tibial Reference System:

9. Connect the extramedullary Tibial Reference System with the Intramedullary Shackle (71.02.3041/10).
10. Fix it with the Screw (77.02.0019/11).
11. Slide the assembled Tibia Reference System over the shaft of the chosen Reamer (79.02.0310 to 79.02.0325/12).
12. Align the Tibial Reference System distally to the second metatarsophalangeal bone.
13. Impact on the bracket (13).
14. The adjustment of the cut level is made with the aid of the T-screw (14). Use the Reference Plate (77.02.0031) to check the correct level.

Symbols


Manufacturer


Caution

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Item no. 336.030.049 03-0120-01 2020-01

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