



TRIAL COMPONENTS SURGICAL TECHNIQUE

CLINICAL INDICATION

This technique is indicated in the case of revisions with significant bone loss when minimal or any resection of bone is required.

PRIMARY IMPLANT REMOVAL

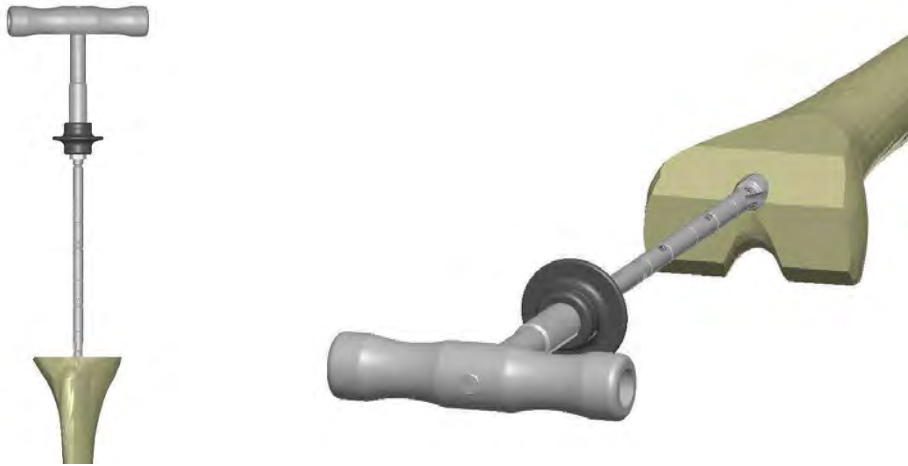
Please refer to the conventional GMK REVISION surgical technique (ref. 99.27.12US or 99.27.12)

REAMING THE TIBIAL AND FEMORAL INTRAMEDULLARY CANAL

- Open the tibial and femoral canal with the 9 mm drill bit, defining the entry point according to the correction of the axis desired (see preoperative planning).

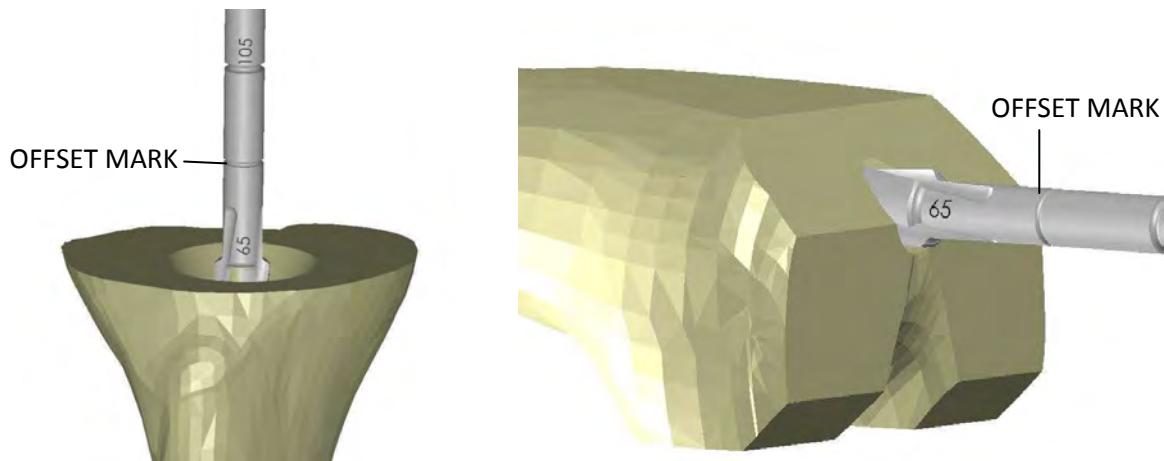


- Enlarge the tibial and femoral canal with the manual reamers connected to the T-handle.



- When the stability in both the femur and tibia canal is reached, note the diameter and the depth marked on the reamer corresponding to the level of the existing resection.

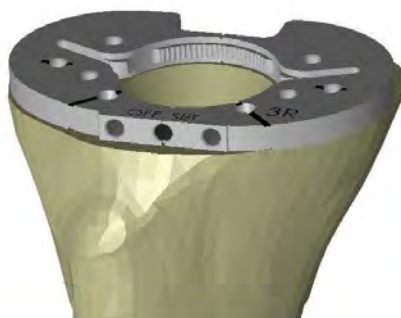
NOTICE: Always ream until the corresponding offset mark is reached



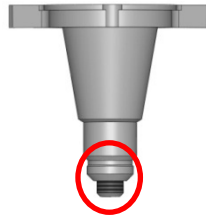
TIBIAL STAGE

NO OFFSET OPTION:

- CAUTION: Check that there is enough room to accommodate the provisional keel and the head of the stem, otherwise create more space by using the 15.5 mm diameter reamer.
- Estimate the tibial size by superimposing the trial baseplate on the existing resection.



- **CAUTION:** Check that the provisional puncher is endowed with the internal screw to afterwards block the offset position



- Insert the appropriate size of the provisional keel into the trial baseplate, screw the trial extension stem which corresponds to the last reamer used onto the provisional keel and finally impact the trial implant on the tibia.



- Check the coverage of the existing tibial cut, avoiding any overhang of the tibial baseplate. If the position is deemed satisfactory, fix it with two headed pins.

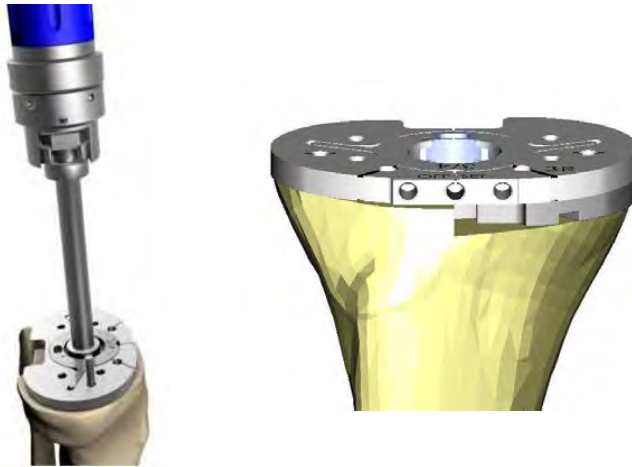


OPTION: If there is evidence to cut for tibial augments, please refer to Appendix 1.

- Screw the tibial impactor handle on the provisional keel and remove the provisional keel together with the stem by using the slap hammer.

- Screw the tibial impactor handle on the trial keel (the one endowed with fins) and the same stem, then finish the preparation by punching the tibia to create room for the final keel.

OPTION: Clip possible tibial augment on the bottom of the trial baseplate, if needed.

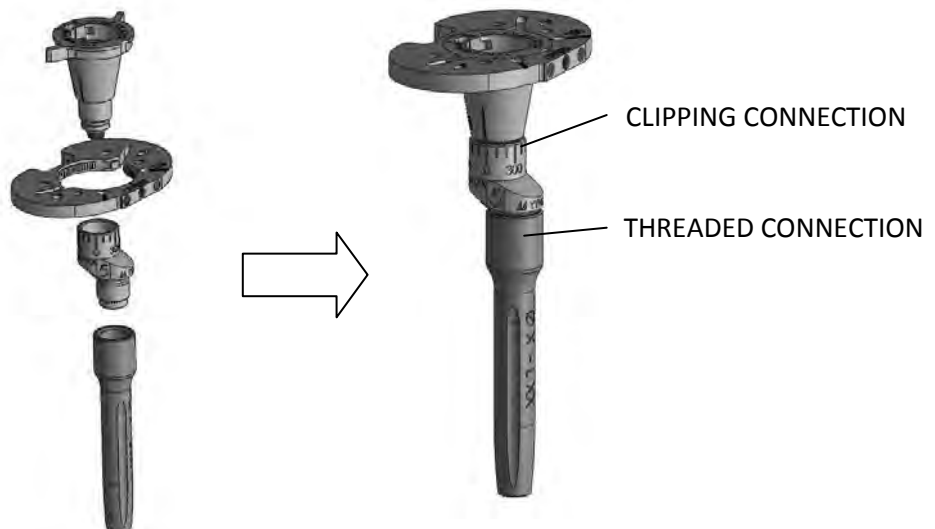


NOTICE: In case of sclerotic bone it is suggested to use the saw blade inserted in the tibial tray slots in order to refine the keel preparation.

- Finally remove the two headed pins.

OFFSET OPTION:

- If a good coverage of the tibial resection cannot be reached, 3 mm or 5 mm offset options are available. In such a case, remove the trial implant from the bone and re-assemble it provided with the offset adapter as shown in the picture below.



CAUTION: Check that there is enough room to accommodate the provisional keel, the trial offset and the head of the stem, otherwise create more space by using the 15.5 mm diameter reamer.

- Align the tip of the stem to the tibial canal and rotate the tibial tray to optimize the bone coverage by utilizing the rotational degree of freedom provided by the provisional offset.

NOTICE: Adjust the tibial tray position before the stem is engaged in the intramedullary canal.



- Impact the trial implant on the tibia
- If the coverage is not satisfactory, repeat the procedure by changing the offset orientation or by passing to another offset option.
- When the position is deemed satisfactory, tighten the locking screw to fix the offset position.



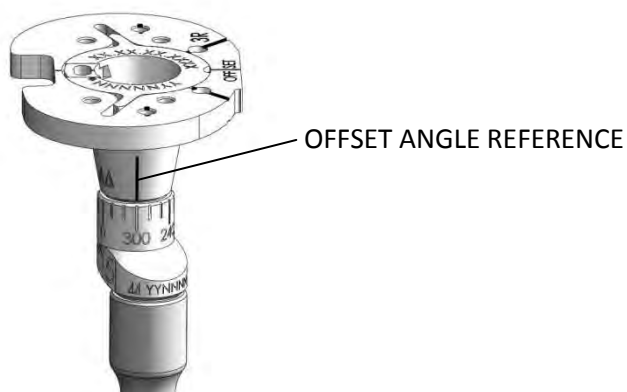
OPTION: If there is evidence to cut for tibial augments, please refer to Appendix 1.

- Screw the tibial impactor handle on the provisional keel and remove the trials by using the slap hammer.

CAUTION: If the connection between the provisional puncher and the trial offset fails (i.e. due to the screw not being tight), an extractor is provided to remove the trial offset and the trial stem from the intramedullary canal.



NOTICE: Note the offset value and read the angle on the sundial marking. Both must be reproduced on the trial and final tibial components.

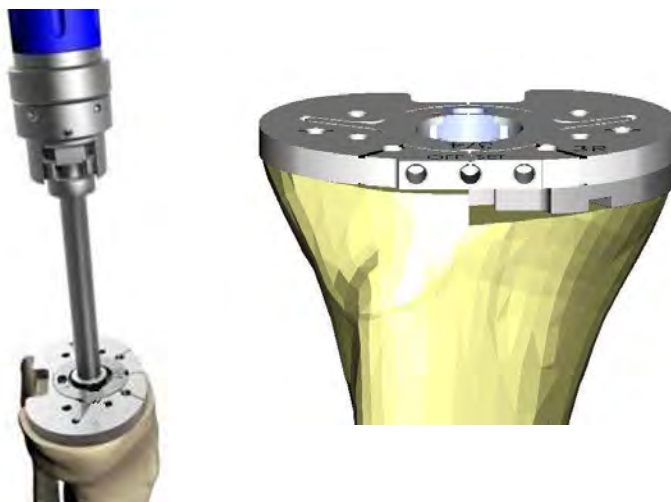


- Replace the provisional keel with the puncher and reproduce the offset according to the conventional technique, lastly screw the same stem onto the offset.

CAUTION: Check that the puncher is endowed with the internal screw to afterwards block the offset position



- Re-impact the trial component on the tibia, creating the room for the final keel by punching the tibia.

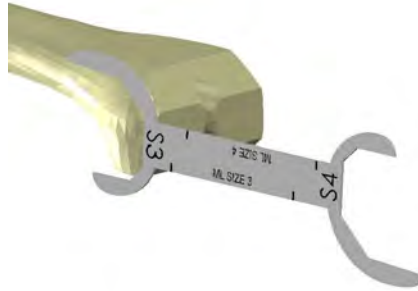


NOTICE: In case of sclerotic bone it is suggested to use the saw blade inserted in the tibial tray slots in order to refine the keel preparation.

FEMORAL STAGE

NO OFFSET OPTION:

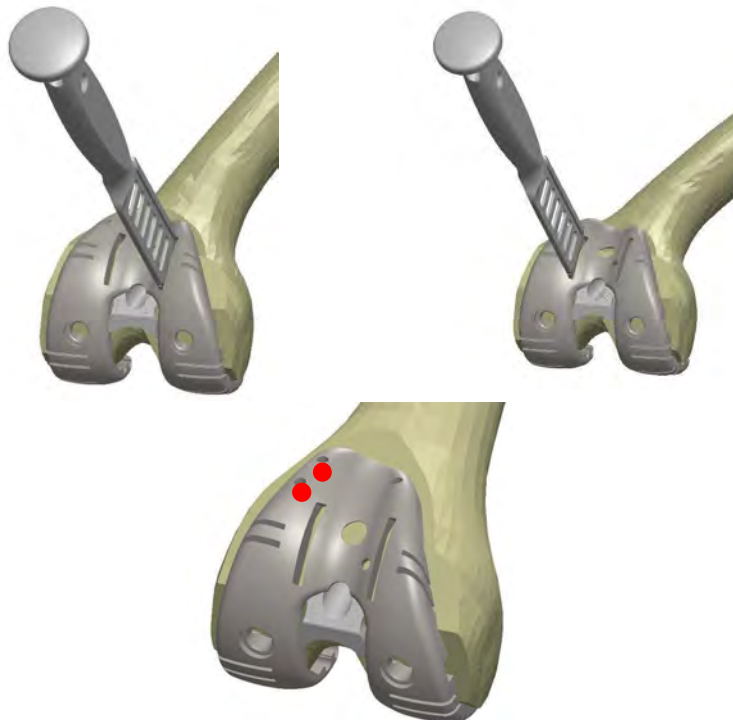
- **CAUTION:** Check that there is enough room to accommodate the provisional box and the head of the stem otherwise create more space by using the 15.5 mm diameter reamer.
- Estimate the femoral size with the dedicated templates or by superimposing the trial component.



- Screw the provisional box of the correct size and side (left or right) onto the corresponding trial femur, then screw the trial extension stem which corresponds to the last reamer used onto the provisional box.

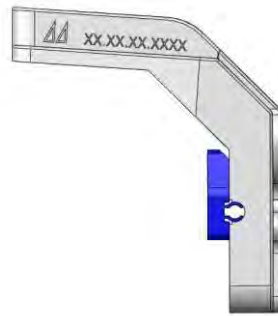
OPTION: Clip possible trial wedges on the trial femoral component, if needed.

- Impact the femoral component on the femur and check the medial-lateral and anterior/posterior position. If the position is deemed satisfactory, mark the medial/lateral side of the femoral box with the osteotome or the saw blade and drill the anterior pins of the trial femur indicated with red spots with a 3.2 mm diameter drill bit.

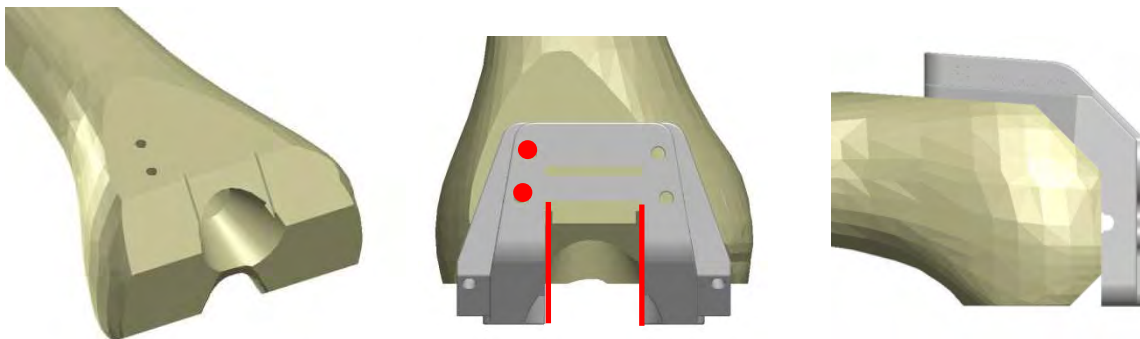


OPTION: if there is evidence to cut for femoral augments, please refer to Appendix 2.

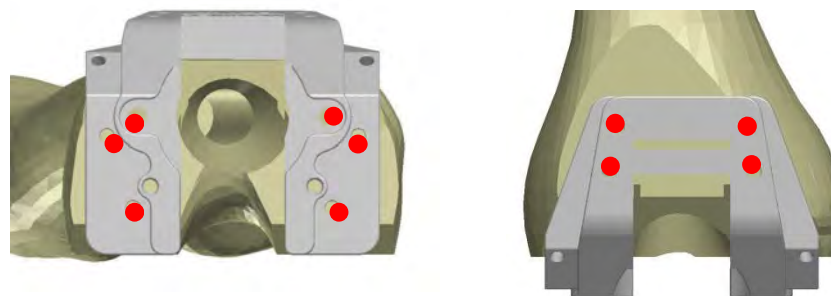
OPTION: Clip possible femoral distal augments onto the back of the box cutter guide, if validated during previous steps.



- Remove the trials and rest the guide on the femoral resections, centering it onto the femoral box marks and on the anterior pins holes.



- Pin the guide anteriorly and distally (use headless pins) and perform the box resection by using the osteotome or the saw blade.

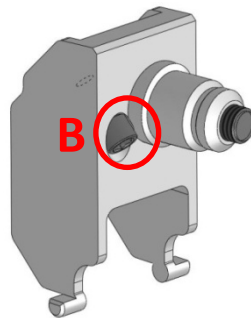


NOTICE: The medial/lateral dimension of the box cutter corresponds to the medial/lateral dimension of the same size femur

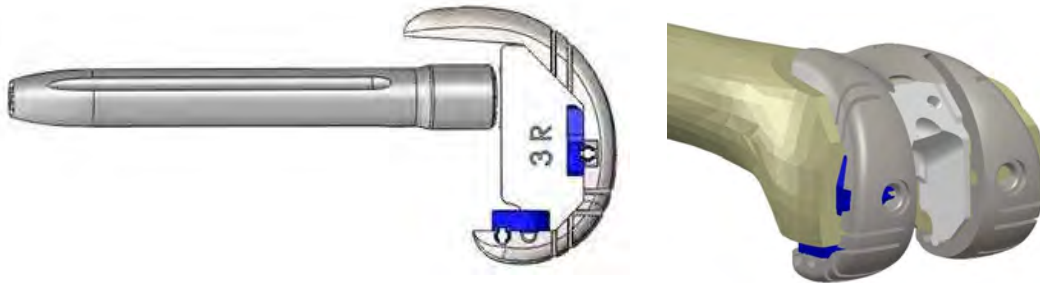
- Finally remove the box cutter guide.

- Unscrew the trial stem and replace the provisional box with the trial box.

CAUTION: Check that the trial box is endowed with the internal screw to afterwards fix it to the trial femur (B)



OPTION: Clip possible femoral distal/posterior augments on the trial femur and finally impact the trial component on the femur.

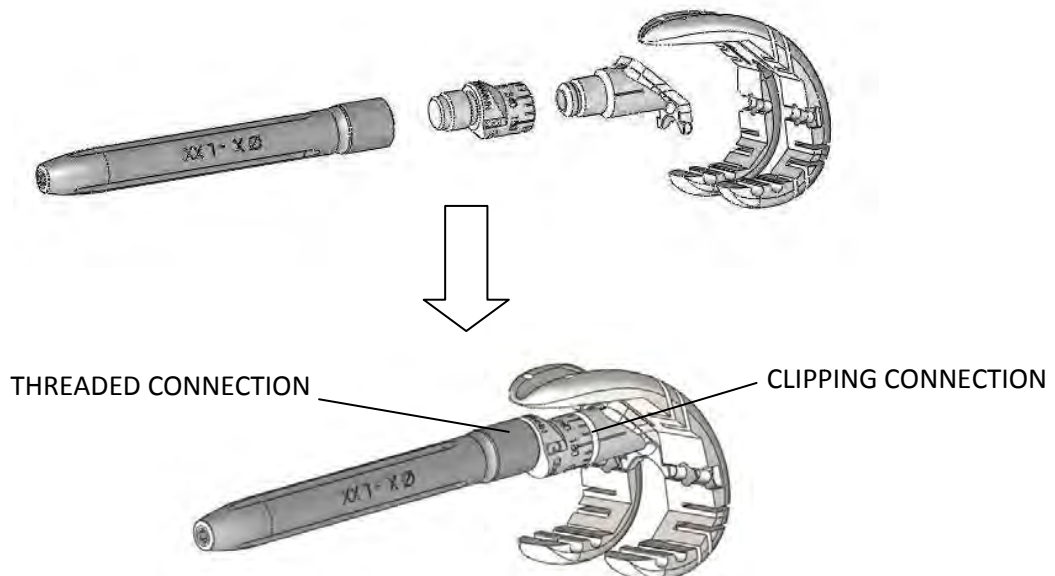


OFFSET OPTION:

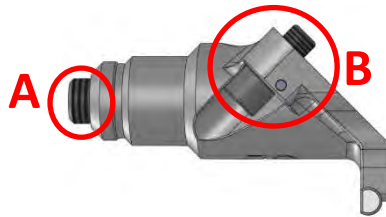
- If a good medial-lateral and anterior/posterior positioning cannot be reached, 3 mm offset option is available.

CAUTION: 5 mm offset option is not allowed on the femur

In such a case, remove the trial implant from the bone and re-assemble it provided with the offset adapter as shown in the picture below



CAUTION: Check that the provisional box is endowed with the internal screw (A) to afterwards block the offset and the screw to fix it to the trial femur (B)



OPTION: Clip possible trial wedges on the trial femoral component, if needed.

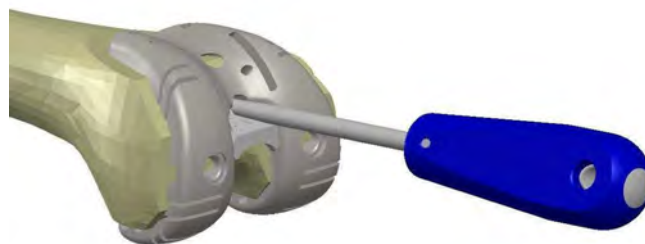
CAUTION: Check that there is enough room to accommodate the provisional box, the trial offset and the head of the stem otherwise create more space by using the 15.5 mm diameter reamer.

- Align the tip of the stem to the femoral canal and rotate the femoral component by utilizing the rotational degree of freedom provided by the trial offset in order to optimize the anterior/posterior and medial/lateral position.

NOTICE: Adjust the femoral component position before the stem is engaged in the intramedullary canal

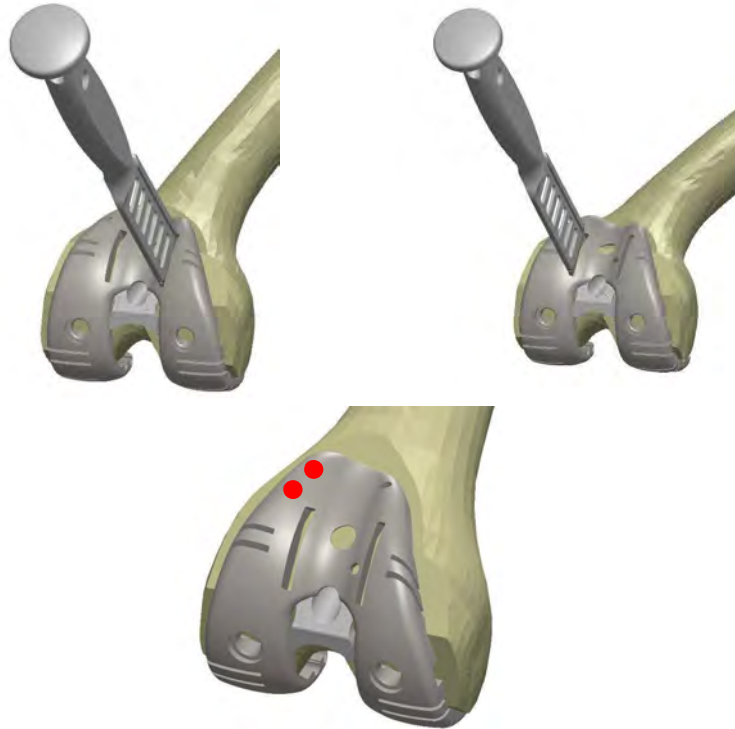


- Impact the trial implant on the femur. if the position is not deemed satisfactory, extract the trials and repeat the procedure by changing the offset rotation.
- When the position is deemed satisfactory, tighten the locking screw to fix the offset position.



OPTION: If there is evidence to cut for femoral augments, please refer to Appendix 2.

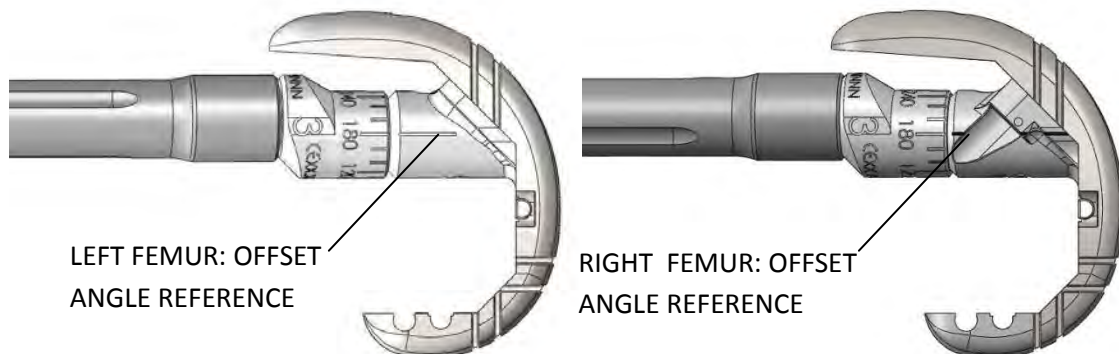
- Mark the medial/lateral side of the femoral box with the osteotome or the saw blade and drill the anterior pins of on the trial femur indicated with red spots with a 3.2 mm diameter drill bit.



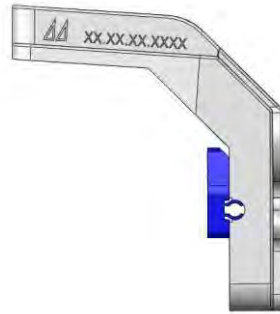
- Remove the trial femur with the slap hammer and the adapter provided
CAUTION: If the connection between the provisional puncher and the trial offset fails (i.e. due to the screw not being tight), an extractor is provided to remove the trial offset and the trial stem from the intramedullary canal.



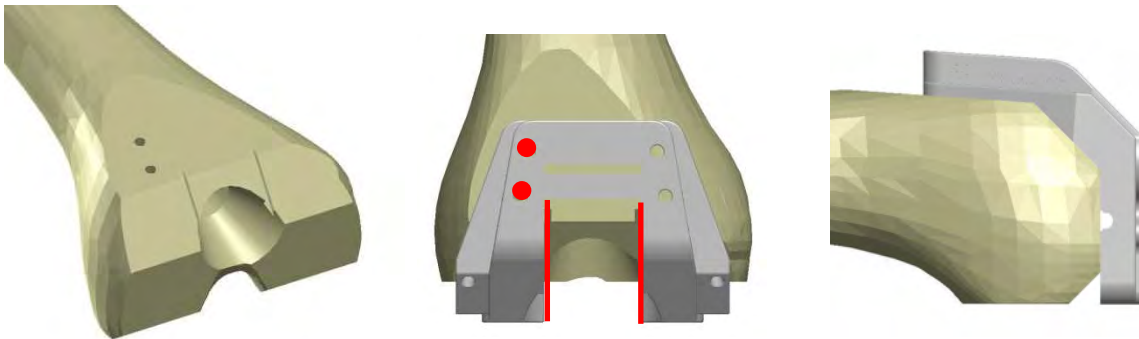
NOTICE: Note the offset value and read the angle on the sundial marking. Both must be reproduced on the trial and final femoral components.



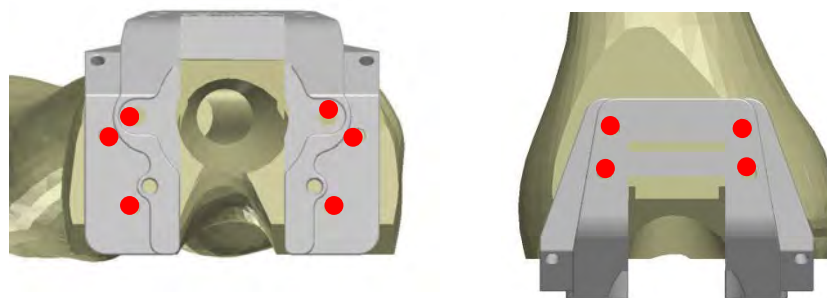
OPTION: Clip possible femoral distal augments onto the back of the box cutter, if validated during previous steps.



- Rest the guide on the femoral resections, centering it onto the femoral box marks and on the anterior pins holes



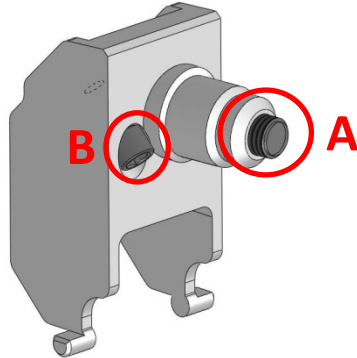
- Pin the guide anteriorly and distally (use headless pins) and perform the box resection by using the osteotome or the saw blade.



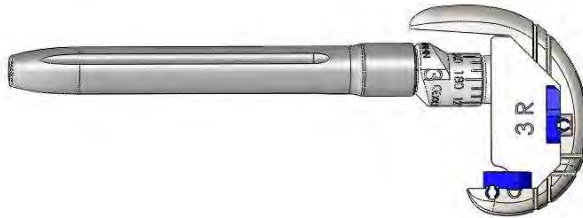
NOTICE: The medial/lateral dimension of the box cutter corresponds to the medial/lateral dimension of the same size femur

- Finally remove the box cutter guide.

- Unscrew the trial stem from the offset, replace the provisional box with the trial box, reproduce the offset according to the conventional technique and lastly screw the same stem onto the offset
- **CAUTION:** Check that the trial box is endowed with the internal screw to afterwards block the offset (A) and with the screw to fix it to the trial femur (B)



OPTION: Clip possible femoral distal/posterior augments on the trial femur



- Re-impact the trial component on the femur



PATELLA STAGE

Please refer to the conventional GMK REVISION surgical technique (ref. 99.27.12US or 99.27.12)

TRIAL IMPLANT

Please refer to the conventional GMK REVISION surgical technique (ref. 99.27.12US or 99.27.12)

FINAL IMPLANT

Please refer to the conventional GMK REVISION surgical technique (ref. 99.27.12US or 99.27.12)

INSTRUMENTATION LIST

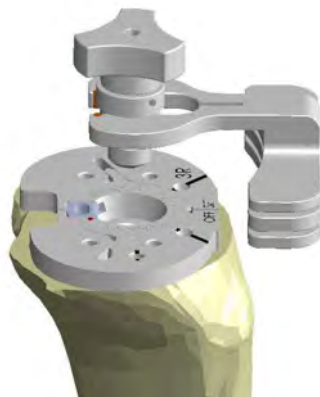
Ref. no.	Description
02.07S.500	GMK REVISION GENERAL
02.07S.501	GMK REVISION TIBIAL
02.07S.502	GMK REVISION FEMORAL
02.07S.503	GMK REVISION EXTENSION AND REAMERS D=10-14 mm
02.07S.504	GMK REVISION EXTENSION AND REAMERS D=15-22 mm
02.07S.505	GMK REVISION TIBIAL AND FEMORAL FINISHING
02.07S.506	GMK REVISION IMPLANT ASSEMBLY
02.07S.507	GMK REVISION SEMICONSTRAINED FIXED INSERTS
02.07S.509	GMK REVISION TECHNIQUE THROUGH TRIAL COMPONENTS

02.07S.509		REVISION THROUGH TRIAL COMPONENTS TECHNIQUE
REF. NO.	DESCRIPTION	Q.TY
02.07.10.9852	Bush for offset 3 mm hole 8 mm	1
02.07.10.9853	Bush for offset 3 mm hole 15.5 mm	1
02.07.10.9854	Bush for offset 5 mm hole 8 mm	1
02.07.10.9855	Bush for offset 5 mm hole 15.5 mm	1
02.07.10.9885	Bush for offset 0 mm hole 8 mm	1
02.07.10.9886	Bush for offset 0 mm hole 15.5 mm	1
02.07.10.9872	Puncher for revision by trial	1
02.07.10.9873	Femoral box for revision by trial Size 1L	1
02.07.10.9874	Femoral box for revision by trial Size 2L	1
02.07.10.9875	Femoral box for revision by trial Size 3L	1
02.07.10.9876	Femoral box for revision by trial Size 4L	1
02.07.10.9877	Femoral box for revision by trial Size 5L	1
02.07.10.9878	Femoral box for revision by trial Size 6L	1
02.07.10.9879	Femoral box for revision by trial Size 1R	1
02.07.10.9880	Femoral box for revision by trial Size 2R	1
02.07.10.9881	Femoral box for revision by trial Size 3R	1
02.07.10.9882	Femoral box for revision by trial Size 4R	1
02.07.10.9883	Femoral box for revision by trial Size 5R	1
02.07.10.9884	Femoral box for revision by trial Size 6R	1
02.07.10.9856	Revision/Hinge Femoral box cutting guide size1	1
02.07.10.9857	Revision/Hinge Femoral box cutting guide size2	1
02.07.10.9858	Revision/Hinge Femoral box cutting guide size3	1
02.07.10.9859	Revision/Hinge Femoral box cutting guide size4	1
02.07.10.9860	Revision/Hinge Femoral box cutting guide size5	1
02.07.10.9861	Revision/Hinge Femoral box cutting guide size6	1
02.07.10.9890	Tibial augments cutting guide	1
02.07.10.9894	Trial offset extractor	1
02.07.10.3508	Trial offset 3mm	2
02.07.10.3509	Trial offset 5mm	1
02.07.10.8035	Trial components technique complement tray	1

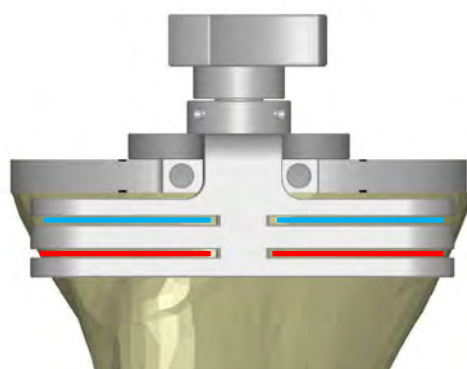
APPENDIX 1


TIBIAL AUGMENTS RESECTIONS


- After the trial tibial component being impacted on the tibia, insert and screw the provided tibial cutting block to the provisional keel, then adjust the anterior/posterior position by sliding the block on its support



- Check with the stylus if any tibial augment is needed



 5 mm augment

 10 mm augment

- Perform the resections according to the planning

NOTICE: Stabilize the tibial baseplate with two headed pins, if needed.

CAUTION: The augment resections can interfere with the provisional keel. The cuts, including the vertical one, can be finished after the trials removal.

- Finally unscrew and remove the tibial augments cutting block.

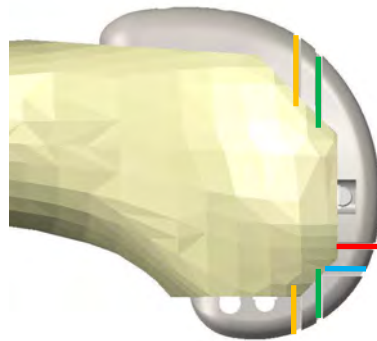
APPENDIX 2





FEMORAL AUGMENTS RESECTIONS

- After trial femoral component being impacted on the femur, check with the stylus if any distal or posterior augment is needed

NOTICE: If a 12 mm distal augment is needed, the conventional distal cut block is require. Please refer to the conventional GMK REVISION surgical technique (ref. 99.27.12US or 99.27.12)

- Perform the resections according to the planning



-  5 mm posterior augment
-  10 mm posterior augment
-  4 mm distal augment
-  8 mm distal augment



CAUTION: Accurately check the joint line position before cutting for the femoral wedges.

APPENDIX 3

ADDITIONAL FEMORAL RESECTIONS

- Remove the trial femur with the slap hammer and the adapter provided
- To recut the distal femur, the conventional system referring to the intramedullary canal is needed.
For further information, please refer to the conventional GMK REVISION surgical technique (ref. 99.27.12US or 99.27.12)
- To recut the anterior/posterior femur and the chamfers, two holes on the box cutter guide (red spots) allow the positioning of the 4in1 revision cutting guide without the need for any conventional instrument.

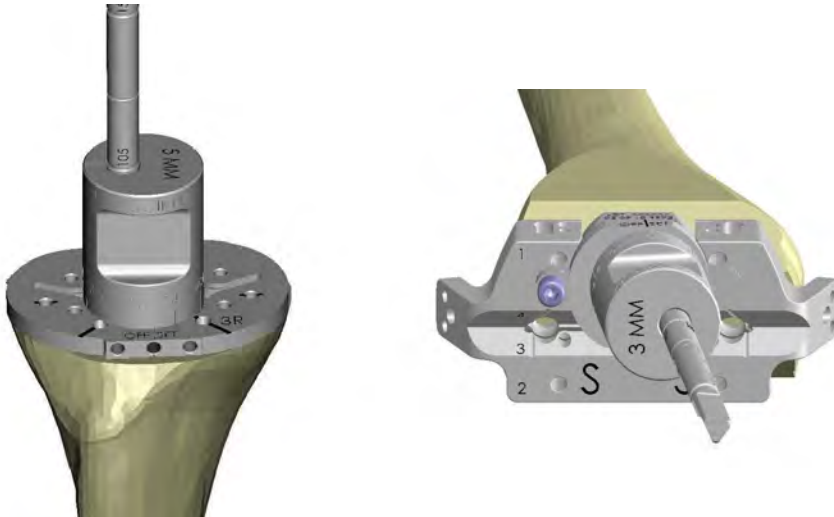


- Then pin the 4in1 cutting guide and perform the resections as described in the conventional GMK REVISION surgical technique (ref. 99.27.12US or 99.27.12).

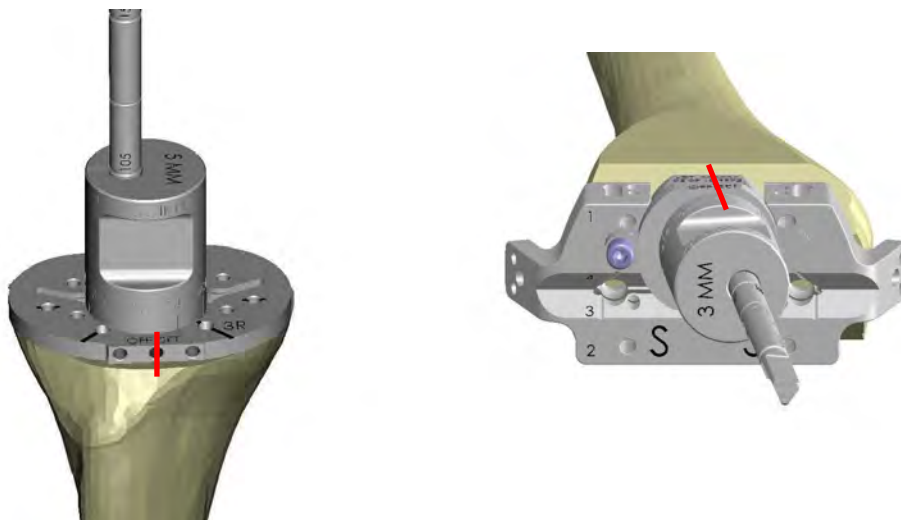
APPENDIX 4

OFFSET SYSTEM

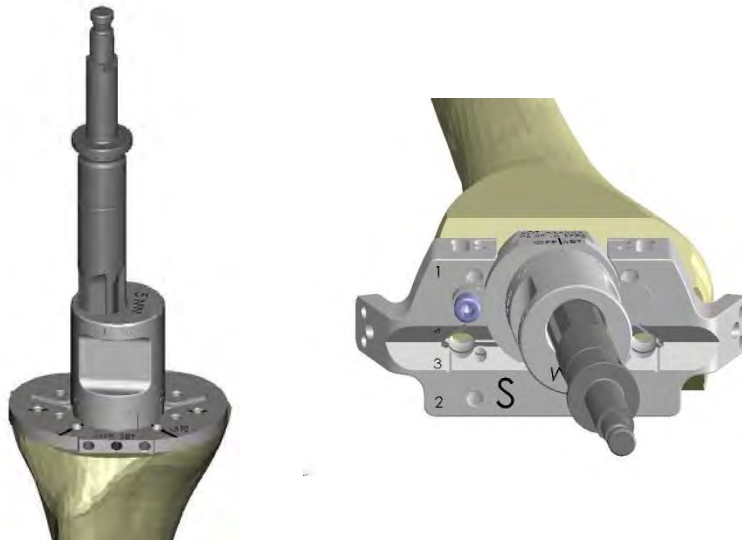
The system described herein is an alternative to the multifunction offset positioner (ref. 02.07.10.3556). The bushes with 8 mm internal hole work off the reamer and are meant to be used as centralizers when adjusting the offset on the tibia or on the femur.



These bushes are available on 3 different versions: neutral (i.e. 0 mm), 3 mm and 5 mm offset. To read the final offset angle, refer to the reference line marked in the middle of the tibial baseplate and the offset tapered bush (red lines).



The bushes with 15.5 mm internal hole are meant to finish the preparation of the tibia or the femur when an offset or an extension stem with diameter smaller than 16 mm are used.



These bushes are available on 3 different versions: neutral (i.e. 0 mm), 3 mm and 5 mm offset.
Before reaming, slip the ring spacer onto the 15.5 mm diameter reamer when no offset is used.

For any additional details, please refer to the conventional GMK REVISION surgical technique (ref. 99.27.12US or 99.27.12).