



Surgical technique

4T Tibial Revision

Conventional Instrumentation



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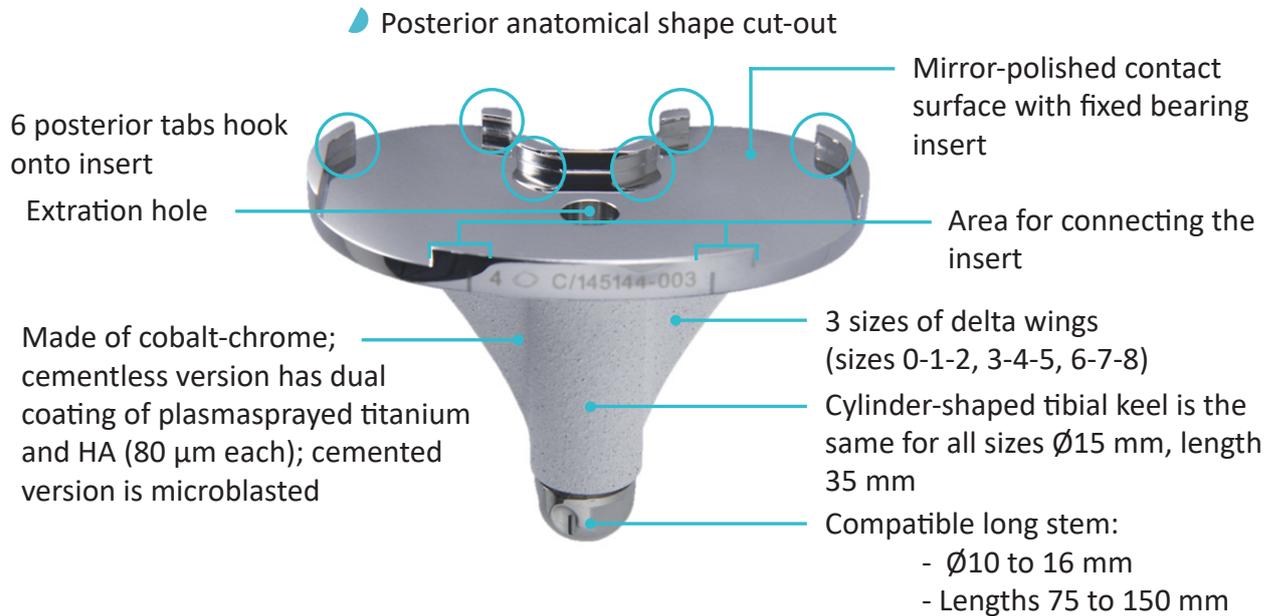
Introduction

- This surgical technique describes the use of the conventional instrumentation for primary TKA.
- The steps below replace the sections on the tibial systems, the tibial cut, the tibial preparation and the tibial trials in the ANATOMIC Surgical Technique documents TO.G.001 and TO.G.002.



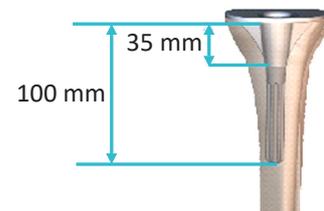
Tibial components

Tibial baseplate :



Possibility of using (e.g. in cases of uni revision, or TKA, or after osteotomy):

- **Tibial extension stems:**
 - Ø 10 to 16 mm
 - Length 75 to 150 mm
- **ANATOMIC Tibial augments:**
 - Thickness 5 mm
 - Thickness 10 mm
 - Thickness 15 mm



Exemple with 100 mm long extension stem

Lengths		Diameters			
75	10	12	14		
100	10	12	14	16	
150	10	12	14	16	

Pre-operative planning

Using X rays and templates, it is possible to determine :

- The tibial slope,
- The height of medial and lateral tibial resections,
- The assessment of the baseplate size,
- The choice of a tibial augment if required,
- The choice of an extension tibial stem, if required (diameters 10/12/14/16 mm, lengths 75/100/150 mm),
- The assessment of the insert thickness.

NOTE

The provided templates have a 1:1 scale.
Make sure the template scale matches the X-ray scale.

REMINDER

This surgical technique describes how to use the instrumentation properly. The surgeon is fully responsible for choosing the surgical approach and technique

1 Intramedullary tibial system

Locating the medullary canal:



- Make a hole in the intramedullary canal with the Intramedullary drill bit.
- Gradually ream the intramedullary canal using Reamers mounted on the T wrench.
- The graduated Reamers are used to estimate the most appropriate extension stem length.
- Use progressively larger Reamers (Ø10/12/14/16 mm) until contact is made with the bone cortex.
- If you are using a stem with cement, the chosen diameter of the stem must be one size smaller than the diameter of the last reamer used to reach a contact with the bone cortex.
If you are using a stem without cement, the chosen diameter of the stem must be equivalent to the diameter of the last reamer used to reach a contact with the bone cortex.

Intramedullary tibial system assembly:

- Insert the 4T tibial bracket on the 4T Aiming with tibial bracket (the 'A' engraving on the 4T Aiming with tibial bracket must be on the anterior side). Screw on the 4T Proximal AP Wheel.
- Assemble the 4T Wheel/Tibial Resection Guide Support with the 4T Aiming with tibial bracket (the 'UP' engraving corresponds to the 4T Wheel/Tibial Resection Guide Support's superior side).
- Assemble the 4T Tibial Resection Guide - Revision with the 4T Wheel/Tibial Resection Guide Support.



NOTE
The instrumentation set contains two rods. Use the longest one with the 4T tibial bracket .

NOTE
Slide the 4T Wheel/Tibial Resection Guide Support from the bottom and press the green wheel to position the support in the graduated area

1 Intramedullary tibial system



Resection height adjustment:

- Put the entire unit onto the Reamer or Intramedullary rod left in the tibia.
- Clip the 4T tibial stylus on the 4T Tibial Resection Guide - Revision (make sure the clip is fully engaged).
- Set the resection height by using the 4T tibial stylus to palpate either the:
 - healthy side (10 mm cut relative to palpated point)
 - worn side (2 mm cut relative to palpated point/exit of saw blade)
- Determine if a tibial augment is needed (Resection gauge place in the half-slots labelled 5/10/15).

NOTE

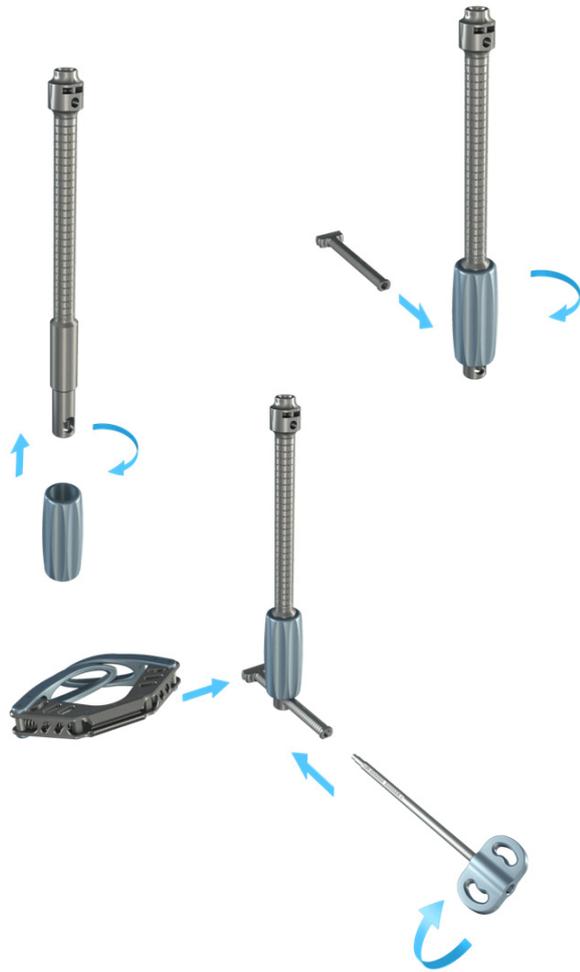
For other resection heights, the adjustment can be made:

- quickly by pressing on the green wheel on the 4T Wheel/Tibial Resection Guide Support (release)
- gradually by turning the green wheel (the 4T aiming has marking every 2 mm).

NOTE

The 4T tibial stylus can be clipped on the lateral side of the 4T Tibial Resection Guide - Revision to palpate the medial plateau (or the reverse) by passing the 4T tibial stylus over the 4T tibial bracket.

2 Combined Intramedullary tibial system



- Insert the 4T tibial bracket on the 4T Aiming with tibial bracket (the 'A' engraving on the 4T Aiming with tibial bracket must be on the anterior side). Screw on the 4T Proximal AP Wheel.
- Assemble the 4T Wheel/Tibial Resection Guide Support with the 4T Aiming with tibial bracket (the 'UP' engraving corresponds to the 4T Wheel/Tibial Resection Guide Support's superior side).
- Assemble the 4T Tibial Resection Guide - Revision with the 4T Wheel/Tibial Resection Guide Support.
- Place all components on the 4T EM Jig. Lock them in place with the 4T Wheel for EM Jig.

NOTE

The instrumentation set contains two rods. Use the longest one with the 4T tibial bracket .

Locating the medullary canal:

- See page 7.

Combined Intramedullary System assembly:

- Screw the 4T Distal AP Wheel on the 4T EM Jig.
- Insert the 4T Rod for bimalleolar clamp into the 4T EM Jig. Lock it in place with the 4T Distal AP Wheel.
- Assemble the 4T malleolar clamp on the 4T Rod for bimalleolar clamp. Lock it in place with the 4T ML wheel for malleolar clamp.



NOTE

Slide the 4T Wheel/Tibial Resection Guide Support from the bottom and press the green wheel to position the support in the graduated area

2

Combined Intramedullary tibial system



Resection height adjustment:

- ▶ Place the 4T malleolar clamp around the ankle (the clamp has a self-opening feature that makes it easier to set up). Position the 4T tibial bracket on the intercondylar eminence.
- ▶ Adjust the rotational and then sagittal alignment by setting the rod parallel to the anterior tibial axis. Impact the tabs.
- ▶ Set the resection height by using the 4T tibial stylus to palpate either the:
 - healthy side (10 mm cut relative to palpated point)
 - worn side (2 mm cut relative to palpated point/exit of saw blade)
- ▶ Determine if a tibial augment is needed (Resection gauge place in the half-slots labelled 5/10/15).

NOTE

For other resection heights, the adjustment can be made:

- quickly by pressing on the green wheel on the 4T Wheel/Tibial Resection Guide Support (release)
- gradually by turning the green wheel (the 4T aiming has marking every 2 mm).

NOTE

The 4T tibial stylus can be clipped on the lateral side of the 4T Tibial Resection Guide - Revision to palpate the medial plateau (or the reverse) by passing the 4T tibial stylus over the 4T tibial bracket.



3 Tibial cut



IMPORTANT

When using the CAS system or the i.M.A.G.E. PSI system, the 4T Tibial Resection Guide - Revision has to be positioned on the 2 holes identified ONAV.

NOTE

Headless pins length 80 mm have to be positioned closed to the main resection slot. In case of a resection for an augment, choose the holes just below for the Headless pins length 80 mm.

NOTE

Use a medium saw blade AMPLITUDE to make the tibial cuts and those of the tibial augments (slots at 5/10/15 mm) if needed.

- ▶ Use a motorised handpiece and the Pin Driver – Zimmer / Hall or Pin Driver AO - Magnetic to drive 2 Headless pins length 80 mm into the 0 landmarks on the 4T Tibial Resection Guide - Revision.
- ▶ Loosen the 4T Proximal AP Wheel.
- ▶ Place the 'T' end of the Slap hammer into the opening on the 4T tibial bracket and then remove the entire assembly.
- ▶ Remove the 4T tibial stylus.
- ▶ Remove the intramedullary or extramedullary assembly by pressing on the two blue buttons on the 4T Wheel/Tibial Resection Guide Support.
- ▶ Place the 4T Tibial Resection Guide - Revision flush with the anterior tibial cortex.
- ▶ Stabilize the 4T Tibial Resection Guide - Revision with 3 Headed pins length 70 mm; the pin holes can be predrilled with the Long Drill bit Ø3.2 length 145 mm.
- ▶ Perform the tibial cut(s).
- ▶ Remove the Headed pins length 70 mm using the Pin extractor.
- ▶ Slide the 4T Tibial Resection Guide - Revision off the Headless pins length 80 mm, but leave the Headless pin length 80 mm in place in case recutting is required (the +2 and +4 holes will be used at that time).
- ▶ Assess the gaps and ligament tension with the knee flexed and extended.

4 Tibial preparation

Positioning of the Trial Baseplate:



NOTE

Remove the two Headless pins length 80 mm that were left in the tibia (after the tibial cut is completed)

NOTE
A Tibial Straight Bushing can be used:
see page 14

- Insert the last reamer used in the tibia.
- Select the ANATOMIC Trial baseplate posterior stabilized that provides the best bone coverage (if needed, a ANATOMIC Trial Tibial Augment of the same size of the ANATOMIC Trial baseplate posterior stabilized can be used). Check the alignment of the Reamer that must be centered in the hole for the keel preparation.
- Secure the unit with 2 Headed pin length 30, 50 or 70 mm (according to the presence or not of a tibial augment and its thickness)
- Remove the Reamer.

Tibial preparation:

- Place the Guide for tibial fin punch onto the ANATOMIC Trial baseplate posterior stabilized and verify that the sizes are compatible.
- With the power tool, drive the Reamer for tibial keel into the Guide for tibial fin punch until it stops.
- Prepare the fins by pushing the appropriately sized Tibial fin punch (assembled with the Universal handle) until it stops.



5 Trials and placement of implants



Trials:

- ▶ Screw the Trial extension stem (length and diameter correspond to final reamer used) into the Delta Wing - Tibial Trial (with the size corresponding to the ANATOMIC Trial baseplate posterior stabilized)
- ▶ Impact the assembly across the ANATOMIC Trial baseplate posterior stabilized until the stop.
- ▶ Screw the Tightening Screw - Delta Wing with the H5 Screwdriver in order to make simulations in the configuration of the final implant.

Placement of final implants:

- ▶ Screw the extension stem to the baseplate using the Tibial stem wrench.
- ▶ Carefully wash and dry the implantation site to clean it out.
- ▶ For the cemented baseplate:
 - Prepare the bone cement and apply it to the tibial cut surface or under the Tibial Baseplate.
 - If using a tibial augment, apply a thin layer of cement between the augment and tibial baseplate.
- ▶ For the cemented and cementless baseplate, impact the final components into the tibia and make sure the augment is perfectly positioned relative to the cemented tibial baseplate and the tibial cut if needed.
- ▶ For the cemented baseplate, remove any excess cement.



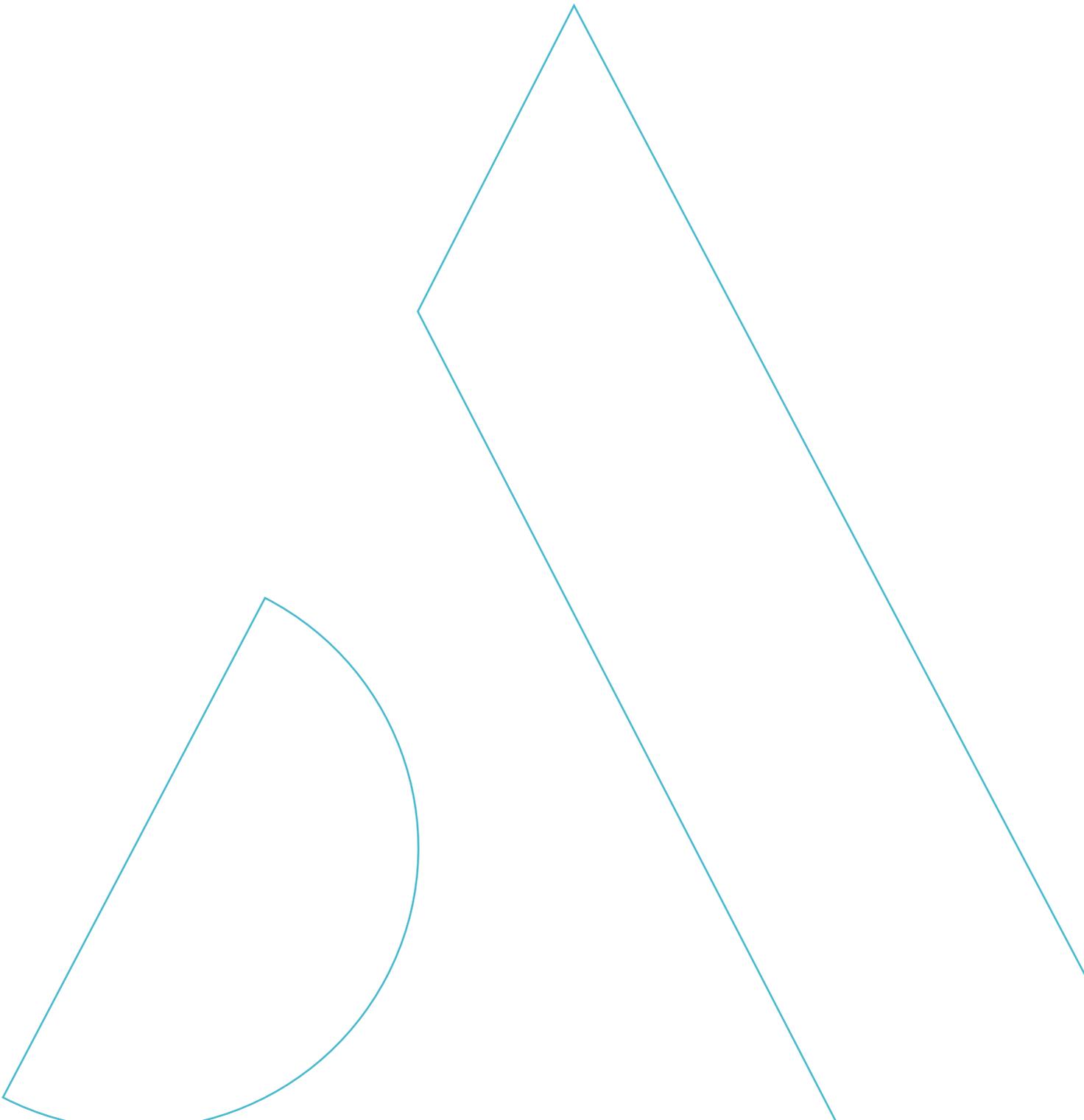
Option: Tibial straight bushing

Following the Preparation of the wings:



- Assemble the Tibial Straight Bushing onto the Reamer (the last reamer that was used to prepare the canal).
- Insert both instruments into the Guide for tibial fin punch until the Tibial Straight Bushing is fully engaged in the Guide for tibial fin punch.
- Ream the canal according to the desired length.
- Remove the Guide for tibial fin punch, the Tibial Straight Bushing and the ANATOMIC Trial baseplate posterior stabilized.
- Read on the Reamer the final length of the stem.





Instrumentation

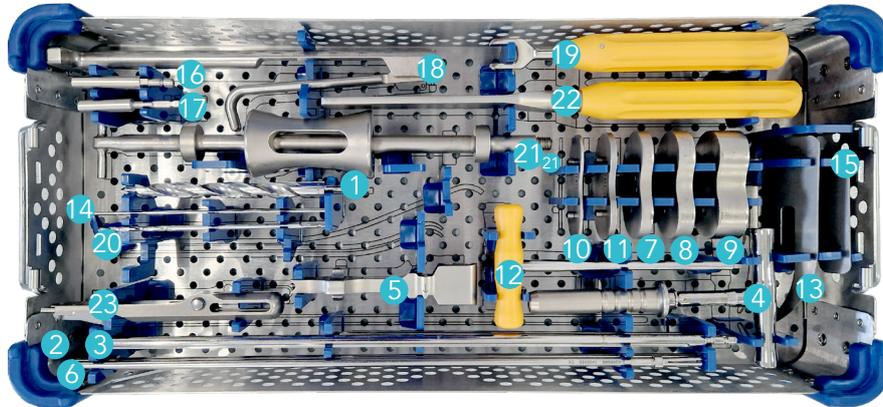
▶ The following trays are required for an anatomic 4T tibial revision:

- ANATOMIC PS Posterior Stabilized common set
- ANATOMIC Tibial Resection - 4T Set
- ANATOMIC Tibial Trials Set
- ANATOMIC Tibial Revision Set

Instrumentation

ANATOMIC PS PS POSTERIOR STABILIZED COMMON SET

2-02999124



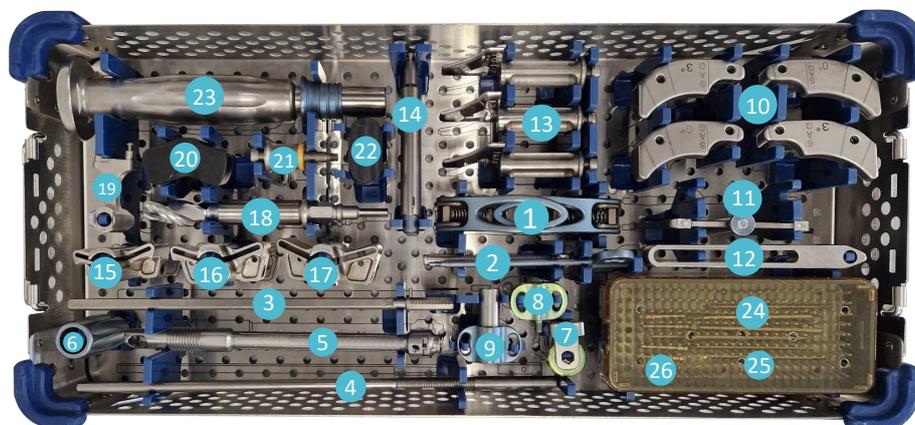
Item	Name	Product No.	Qty
1	Intramedullary drill bit	2-0200100	1
2	Intramedullary rod length 250 mm	2-0200200	1
3	Intramedullary rod length 400 mm	2-0200300	1
4	T wrench	2-0200400	1
5	Universal handle	2-0216400	1
6	Extramedullary alignment rod	2-0200600	1
7	Spacer thickness 7 mm	2-0200707	1
8	Spacer thickness 10 mm	2-0200710	1
9	Spacer thickness 18 mm	2-0200718	1
10	Spacer thickness 2 mm for spacer	2-0207002	1
11	Spacer thickness 4 mm for spacer	2-0207004	1
12	H5 Screwdriver	2-0200800	1
13	Resection gauge	2-0204500	1
14	Alignment Pin \varnothing 2 Length 150 mm	2-0103000	2
15	Alignment gauge	2-0206300	1
16	Universal quick release adaptor for pin	2-0201100	1
17	Pin Driver AO	2-0201200	1
18	Pin extractor	2-0201500	1
19	Tibial stem wrench	2-0205500	1
20	Long Drill bit \varnothing 3.2 length 145 mm	2-0102400	1
21	Slap hammer	2-0206900	1
22	Flat rasp	2-0206800	1
23	Tibial baseplate handle	2-0223500	2

Products availability may vary depending on countries. Please check availability with your local representative.

Instrumentation

ANATOMIC TIBIAL RESECTION - 4T

2-0299978

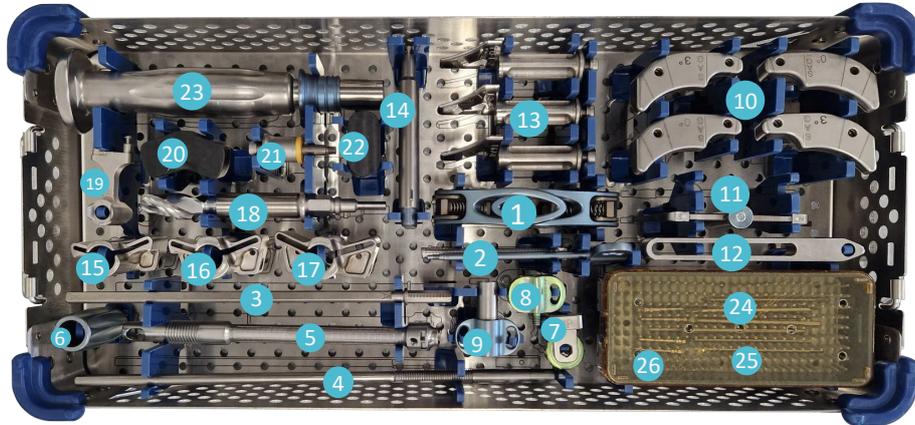


Item	Name	Produc N°	Qty
1	4T malleolar clamp	2-0237500	1
2	4T Rod for bimalleolar clamp	2-0237300	1
2	4T ML wheel for malleolar clamp	2-0237400	1
3	4T Aiming without tibial bracket	2-0239000	1
4	4T Aiming with tibial bracket	2-0236900	1
5	4T EM Jig	2-0237100	1
6	4T Distal AP wheel	2-0237200	1
7	4T Wheel/Tibial Resection Guide Support	2-0236700	1
8	4T Wheel for EM Jig	2-0237000	1
9	4T Proximal AP Wheel	2-0236800	1
10	4T tibial resection guide left - 0°	2-0236400	1
10	4T Tibial resection guide right – 0°	2-0236401	1
10	4T Tibial resection guide left – 3°	2-0237600	1
10	4T tibial resection guide right – 3°	2-0237700	1
11	4T tibial stylus – 2/10	2-0236502	1
12	4T tibial bracket	2-0236600	1
13	Tibial fin punch size 0-1-2	2-0230901	1
13	Tibial fin punch size 3-4-5	2-0230902	1
13	Tibial fin punch size 6-7-8	2-0230903	1

Instrumentation

ANATOMIC TIBIAL RESECTION - 4T

2-0299978



Item	Name	Produc N°	Qty
14	Removable hand holds	2-0226500	2
15	Guide for tibial fin punch Size 0-1-2	2-0230801	1
16	Guide for tibial fin punch Size 3-4-5	2-0230802	1
17	Guide for tibial fin punch Size 6-7-8	2-0230803	1
18	Reamer for tibial keel	2-0231600	1
19	Reference body support for tibial baseplate handle	2-0223600	1
20	Baseplate impactor	2-0233400	1
21	Tibial baseplate extractor	2-0231800	1
22	Tibial impactor	2-0231900	1
23	Universal handle	2-0232100	1
24	Headless pin length 80 mm	2-0201400	6
25	Headed pin length 70 mm	2-0201302	3
26	Headed pin length 30 mm	2-0201301	6
Options :			
	Pin Driver – Zimmer / Hall	2-0246300	1
	Pin Driver AO - Magnetic	2-0246200	1
	4T tibial stylus – 0/10	2-0236500	1
	4T tibial stylus – 2/8	2-0236501	1
	4T tibial resection guide left – 6°	2-0237800	1
	4T right tibial resection guide – 6°	2-0237900	1

Instrumentation

ANATOMIC PS POSTERIOR STABILIZED COMMON SET

2-02999124



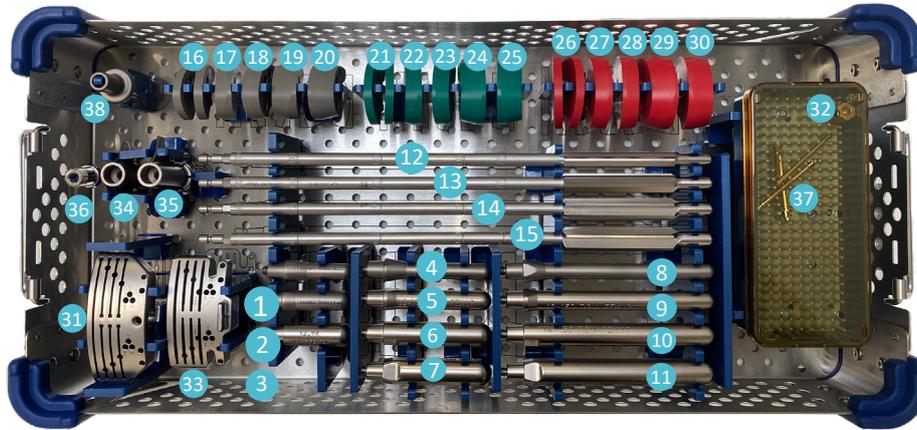
Item	Name	Product No.	Qty
1	ANATOMIC Trial baseplate posterior stabilized Size 1	2-0231001	1
2	ANATOMIC Trial baseplate posterior stabilized Size 2	2-0231002	1
3	ANATOMIC Trial baseplate posterior stabilized Size 3	2-0231003	1
4	ANATOMIC Trial baseplate posterior stabilized Size 4	2-0231004	1
5	ANATOMIC Trial baseplate posterior stabilized Size 5	2-0231005	1
6	ANATOMIC Trial baseplate posterior stabilized Size 6	2-0231006	1
7	ANATOMIC Trial baseplate posterior stabilized Size 7	2-0231007	1
8	ANATOMIC Trial fixed bearing insert, PS - Size 1, Height 10, 12, 14, 16, 18 to 20 mm	2-0230610 to 2-0230615	1
9	ANATOMIC Trial fixed bearing insert, PS - Size 2, Height 11, 12, 14, 16, 18 to 20 mm	2-0230620 to 2-0230625	1
10	ANATOMIC Trial fixed bearing insert, PS - Size 3, Height 10, 12, 14, 16, 18 to 20 mm	2-0230630 to 2-0230635	1
11	ANATOMIC Trial fixed bearing insert, PS - Size 4, Height 10, 12, 14, 16, 18 to 20 mm	2-0230640 to 2-0230645	1
12	ANATOMIC Trial fixed bearing insert, PS - Size 5, Height 10, 12, 14, 16, 18 to 20 mm	2-0230650 to 2-0230655	1
13	ANATOMIC Trial fixed bearing insert, PS - Size 6, Height 10, 12, 14, 16, 18 to 20 mm	2-0230660 to 2-0230665	1
14	ANATOMIC Trial fixed bearing insert, PS - Size 7, Height 10, 12, 14, 16, 18 to 20 mm	2-0230670 to 2-0230675	1



Instrumentation

ANATOMIC : TIBIAL REVISION SET

2-029990

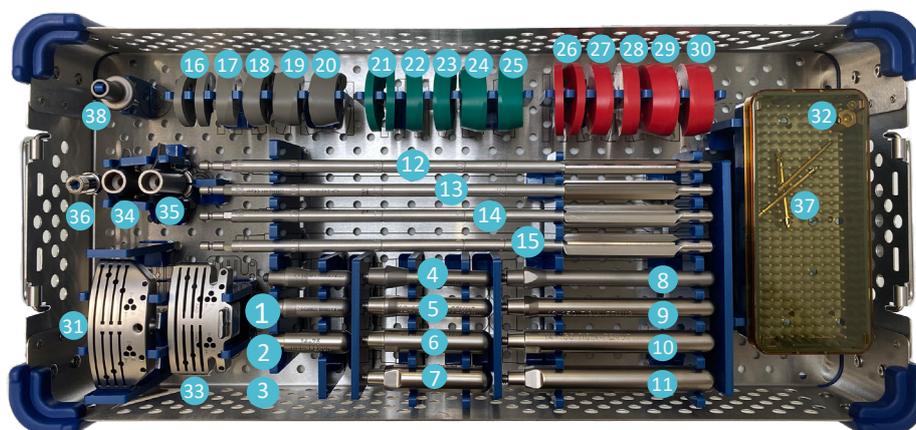


Rep	Designation	Reference	Qty
1	Trial extension stem \varnothing 10 length 75 mm	2-0209021	1
2	Trial extension stem \varnothing 12 length 75 mm	2-0209022	1
3	Trial extension stem \varnothing 14 length 75 mm	2-0209023	1
4	Trial extension stem \varnothing 10 length 100 mm	2-0209013	1
5	Trial extension stem \varnothing 12 length 100 mm	2-0209001	1
6	Trial extension stem \varnothing 14 length 100 mm	2-0209004	1
7	Trial extension stem \varnothing 16 length 100 mm	2-0209007	1
8	Trial extension stem \varnothing 10 length 150 mm	2-0209014	1
9	Trial extension stem \varnothing 12 length 150 mm	2-0209002	1
10	Trial extension stem \varnothing 14 length 150 mm	2-0209005	1
11	Trial extension stem \varnothing 16 length 150 mm	2-0209008	1
12	Reamer \varnothing 10	2-0210510	1
13	Reamer \varnothing 12	2-0210512	1
14	Reamer \varnothing 14	2-0210514	1
15	Reamer \varnothing 16	2-0210516	1
16	ANATOMIC Trial Tibial Augment Size 0/1/2 Thickness 5 mm	2-0255810	2
17	ANATOMIC Trial Tibial Augment Size 0/1/2 Thickness 10 mm RM/LL	2-0255820	1
18	ANATOMIC Trial Tibial Augment Size 0/1/2 Thickness 15 mm RL/LM	2-0255840	1
19	ANATOMIC Trial Tibial Augment Size 0/1/2 Thickness 10 mm RM/LL	2-0255833	1
20	ANATOMIC Trial Tibial Augment Size 0/1/2 Thickness 15 mm RL/LM	2-0255850	1

Instrumentation

ANATOMIC : TIBIAL REVISION SET

2-0299990



Rep	Designation	Reference	Qty
21	ANATOMIC Trial Tibial Augment Size 3/4/5 Thickness 5 mm	2-0255813	2
22	ANATOMIC Trial Tibial Augment Size Taille 3/4/5 Thickness 10 mm RM/LL	2-0255823	1
23	ANATOMIC Trial Tibial Augment Size 3/4/5 Thickness 15 mm RM/LL	2-0255843	1
24	ANATOMIC Trial Tibial Augment Size 3/4/5 Thickness 10 mm RL/LM	2-0255833	1
25	ANATOMIC Trial Tibial Augment Size 0/1/2 Thickness 15 mm RL/LM	2-0255853	1
26	ANATOMIC Trial Tibial Augment Size 6/7/8 Thickness 5 mm	2-0255816	2
27	ANATOMIC Trial Tibial Augment Size 6/7/8 Thickness 10 mm RM/LL	2-0255826	1
28	ANATOMIC Trial Tibial Augment Size 6/7/8 Thickness 15 mm RM/LL	2-0255846	1
29	ANATOMIC Trial Tibial Augment Size 6/7/8 Thickness 10 mm RL/LM	2-0255836	1
30	ANATOMIC Trial Tibial Augment Size 6/7/8 Thickness 15 mm RL/LM	2-0255856	1
31	Revision Tibial Resection Guide	2-0210600	1
32	Wheel for resection guide	2-0203800	1
33	4T Tibial Resection Guide - Revision	2-0253300	1
34	Delta Wing - Tibial Trial S. 0/1/2	2-0253401	1
35	Delta Wing - Tibial Trial S. 3/4/5/6/7/8	2-0253402	1
36	Tightening Screw - Delta Wing	2-0253400	1
37	Headed pin length 50 mm	2-0201303	4
38	Tibial Straight Bushing	2-0255900	1







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