



Surgical Technique

Shoulder Revision System

Aequalis® Reversed Adapter



www.tornier-us.com

TORNIER
SCIENTIFIC VISION. SURGICAL LEADERSHIP.



TABLE OF CONTENTS

●	INTRODUCTION	p. 1
●	SYNOPSIS OF IMPLANTATION	p. 2
●	SURGICAL TECHNIQUE	p. 3
	<ul style="list-style-type: none">1. Removal of the head2. Glenoid preparation3. Determining the neck inclination4. Fitting of trial implants5. Assembly of the definitive implants	
●	EXTRACTION OF THE INSERT	p. 11
	<ul style="list-style-type: none">1. Extraction of the Polyethylene insert2. Unscrewing of the safety assembly3. Extraction of the Aequalis® Reversed Adapter	
●	INSTRUMENTATION	p. 12
●	NOTES	p. 13
●	IMPLANTS	p. 14

INTRODUCTION

The Aequalis® Reversed Adapter has been especially designed to facilitate the revision of the Primary, Press-Fit, Cemented, or Fracture stems.

It allows an Aequalis® anatomical (Cemented, or Press-Fit) Fracture stem to be transformed into an Reversed Prosthesis without removal of the humeral stem if the stem is well-fixed along its length during a revision surgery. The Aequalis® Reversed Adapter restores the inclination angle of the Aequalis® Reversed prosthesis (155°). However, its geometry does not allow the reproduction of the same height as for the Reversed implant. It is therefore essential to ensure the correct tension of the soft tissues and the insertion of the greater tuberosity under the acromion during trials. (Where there is excessive tension on the soft tissues or subacromial impingement, the humeral stem must be removed and replaced by an Aequalis® Reversed humeral stem).

The Aequalis® Reversed Adapter is impacted on the taper of the stem. It is essential that the assembly is secured. If the stem was implanted in Europe before 2001, a different surgical procedure may be necessary. Please contact Tornier directly.

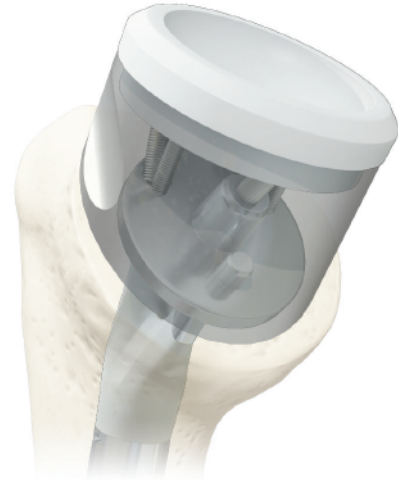
● Two securing methods are possible, dependent upon the type of stem implanted:

- **The Aequalis® Fracture stems** have a hole threaded in the axis of the taper and the marking of the angle of inclination of the collar (fig. A). The choice of the Aequalis® Reversed Adapter is immediate (130°), the securing is done by tightening a safety screw in a threaded hole.

- **The Aequalis® Cemented and Press-Fit stems** have no hole threaded in the axis of the taper (fig. B). The securing is done using a metallic u-clip whose tightening allows the hanging of two hooks underneath the collar.

Some implants do not have the inclination angle marked on the collar system. In these cases, the inclination angle will be measured using a goniometer available in the instrumentation.

Note : Prior to the case, it is preferable to gather information relating to the humeral stem currently in place (model, size, reference, angle of inclination, date of implantation...).



(fig. A)



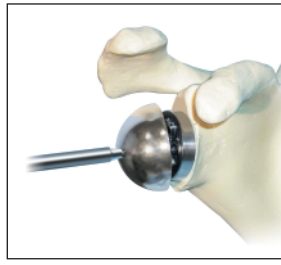
(fig. B)



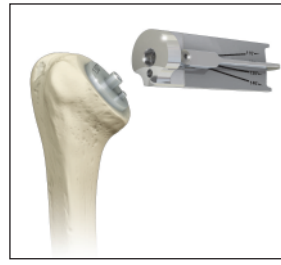
SYNOPSIS OF IMPLANTATION



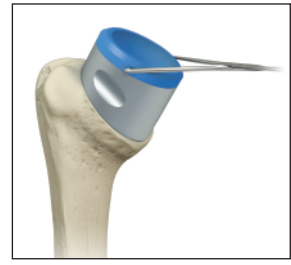
1. Removal of the head



2. Glenoid preparation

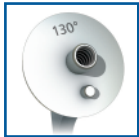


3. Measurement of the inclination of the neck



4. Setting of trial implants

5. Setting of definitive implant



A

Aequalis® Fracture or
Aequalis® Modular stems



1- Impaction of the metal metaphysis



2- Securing the assembly via the central screw



B

Aequalis® Monobloc or
Aequalis® Press-Fit stems



1- Preparation of holes for securing u-clip



2- Impaction of the metal metaphysis



3- Securing of the assembly



6. Impaction of the insert



7. The assembly is finished



SURGICAL TECHNIQUE

● 1. Removal of the head

The head may be removed using an osteotome or with the extraction instrumentation (YKAD44), which is available upon request (fig. 01).

Note :

If the removal of the head proves difficult, it may be secured by a locking screw. The entire stem and head will have to be removed if this is the case.

At this stage, it should be ensured that the stem left is still well fixed and that the taper has not been damaged.

(fig. 01)



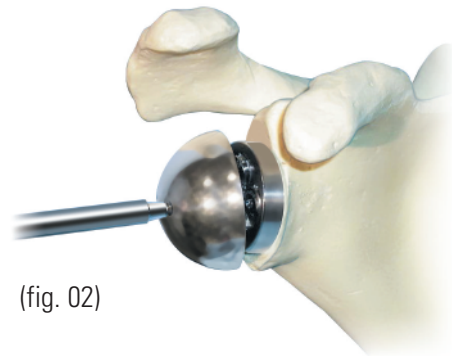
Ensure that the taper is not damaged from the head removal process.

● 2. Glenoid preparation

The fitting of glenoid components requires the use of the Aequalis® Reversed instrumentation.

The surgical technique is identical to the one of Aequalis® Reversed.

The permanent glenoid baseplate, screws and glenoid sphere must be implanted prior (fig. 02).



(fig. 02)

SURGICAL TECHNIQUE

● 3. Determining the neck inclination

In order to restore the geometry of the Aequalis® Reversed Adapter prosthesis, it is necessary to know the inclination angle of the stem previously implanted.

The neck inclination angle can be determined by using the goniometer available in the instrumentation set (fig. 03).

The goniometer is placed over the trunion of the stem in place.

The reading of the inclination is made by aligning the orientation rod on the axis of the humerus (fig. 03b).

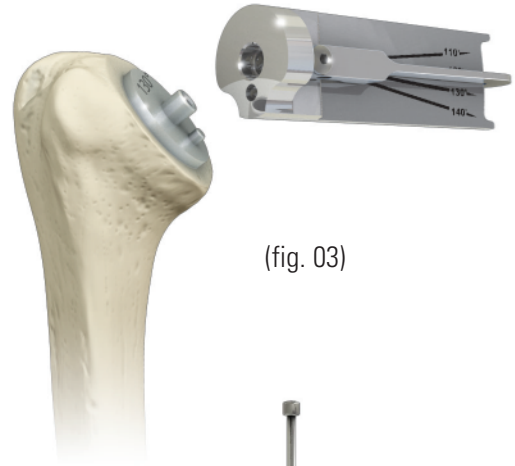
It is important to verify that the little hole of the goniometer is fully engaged onto the antirotational tape of the collar.

● 4. Fitting of trial implants

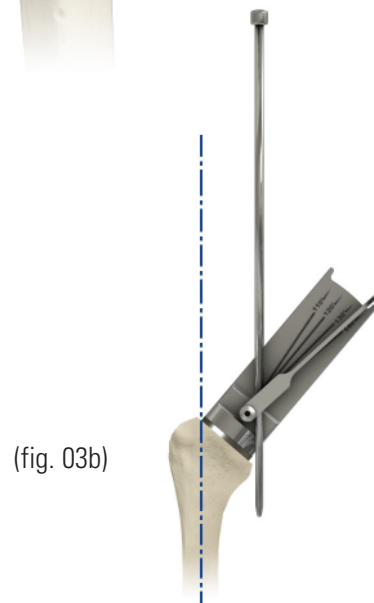
Position the trial implant corresponding to the inclination raised.

Select and position the Aequalis® Reversed Adapter trial implant corresponding to the inclination of the previously implanted stem (fig. 04).

The diameter of the adapter is identical, regardless of the glenoid sphere diameter.



(fig. 03)



(fig. 03b)



(fig. 04)

SURGICAL TECHNIQUE

Inserts are available in two diameters and thus have the ability to adapt to both glenoid diameters (Ø 36 mm and Ø 42 mm).

Several thickness are provided (fig. 05) to determine the proper soft tissue tension:

- Ø 36 mm thickness 6 mm ; 9 mm ; 12 mm
- Ø 42 mm thickness 6 mm ; 9 mm ; 12 mm

A trial insert clamp is available to facilitate the manipulation of the trial inserts once these have been chosen (fig. 06).

A trial reduction and range of motion assessed at this time.

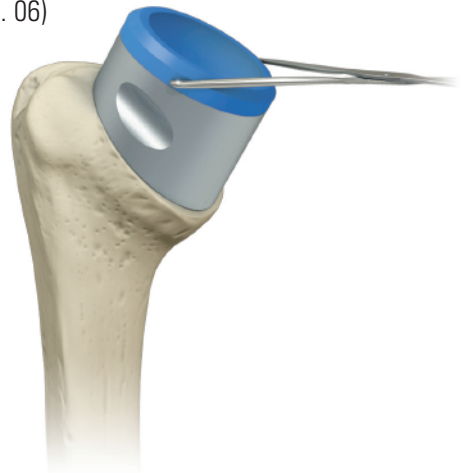
Once the correct trial has been chosen, the final assembly is started.

After trial reduction is complete (fig. 07), final assembly may be started.

(fig. 05)



(fig. 06)



(fig. 07)



SURGICAL TECHNIQUE

● 5. Assembly of the definitive implants

At this stage, the technique differs according to the stem in place :

- Aequalis® Fracture or Aequalis® Modular stems : **A**
- Aequalis® Monobloc Cemented or Aequalis® Press-Fit stems : **B**

● **A** Aequalis® Fracture or Aequalis® Modular stems

N.B. :

Take care to remove the central assembly screw from the packaging (fig. 08).

The structure is secured with a central screw.
The metallic u-clip and the 2 pressure screws must therefore be removed (fig. 09).

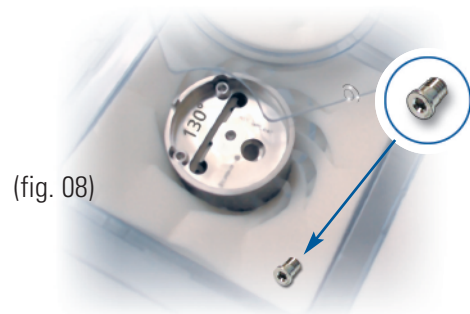
Note :

Prior to implanting the definitive implant, it is advisable to ensure that the taper is in a good state of repair has not been damaged. Cleaning and drying the taper prior to impacting is also recommended.

If the taper is damaged, the humeral stem must be removed and replaced by an Aequalis® Reversed humeral stem.

1 - Impaction of the metal metaphysis adapter

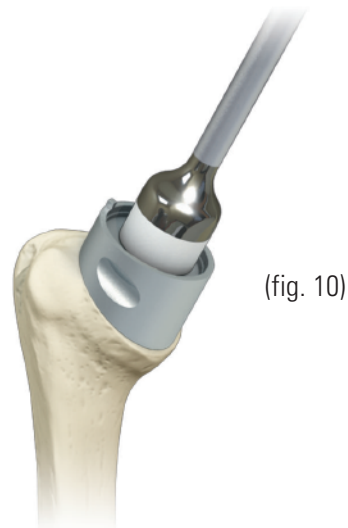
The adapter is positioned on the taper of the collar, then impacted using the specific impactor (fig. 10).



(fig. 08)



(fig. 09)



(fig. 10)

SURGICAL TECHNIQUE

2 - Securing the assembly via the central screw

The assembly screw is inserted into the lower hole ("ASSEMBLY SCREW"), then tightened using a 3.5 mm screwdriver (fig. 11).

The definitive polyethylene insert is positioned, taking care to align its positioning marker with the adapter lug. It is then impacted using the impactor for from the Aequalis® Reversed standard insert (fig. 12).

The assembly is finished (fig. 12b).

● B Aequalis® Monobloc Cemented or Aequalis® Press-Fit stems

Note :

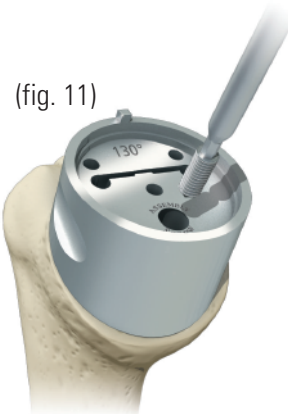
Prior to implanting the definitive implant, it is advisable to ensure that the taper is in a good state of repair has not been damaged. Cleaning and drying the taper prior to impacting is also recommended.

If the taper is damaged, the humeral stem must be removed and replaced by an Aequalis® Reversed humeral stem.

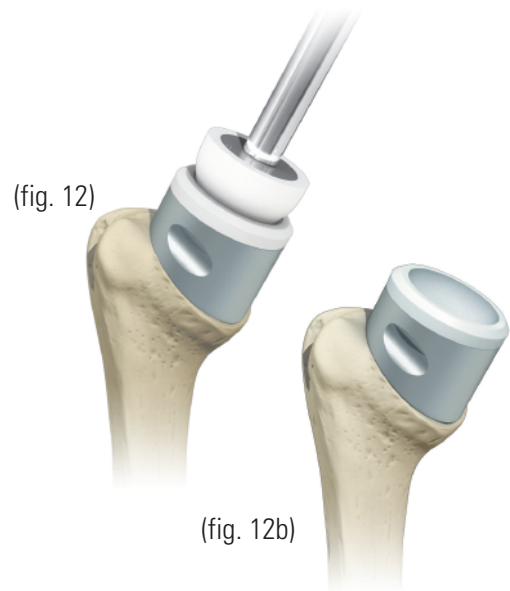
1 - Preparation of holes for the screws of the u-clip

These stems have no hole threaded on the trunion taper of the collar.

The assembly is secured with a posterior u-clip maintained by 2 screws (fig. 13).

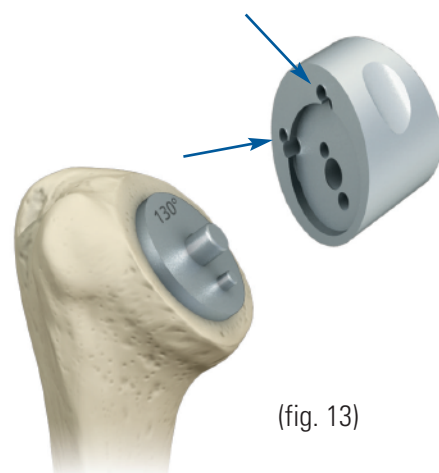


(fig. 11)



(fig. 12)

(fig. 12b)



(fig. 13)

SURGICAL TECHNIQUE

It is thus necessary to prepare a housing for the hooks of the u-clip in cement.

It is necessary to drill two holes tangential to the collar to prepare a housing for the hooks of the u-clip (in cement or bone).

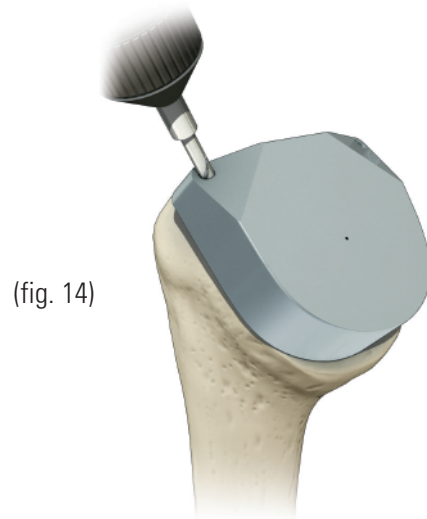
The drill guide is positioned on the collar of the stem (fig. 14). The Holes are made using a Ø5 mm drill bit inserted until it bottoms out on the drill guide.

This drill bit is inserted as far as the end stop on the drill guide.

Before drilling it's up to make sure that the drill guide is positioned flush with the collar.

The final stage of the humeral preparation process consists of passing a curette lightly under the collar (fig. 15) to ensure clearance for the u-clip.

Once the housing under the collar is sufficient for the insertion of the hooks, the adapter may be implanted.



(fig. 14)



(fig. 15)

SURGICAL TECHNIQUE

2 - Impacting of the Aequalis® Reversed Adapter the metal metaphysis

Before the installation of the adapter metal spacer, it is advised to unscrew the 2 screws in order to release the metallic u-clip.

Note :

Before implanting the definitive implant it is advisable to check that the taper has not been damaged and the taper is cleaned and dried prior to impacting.

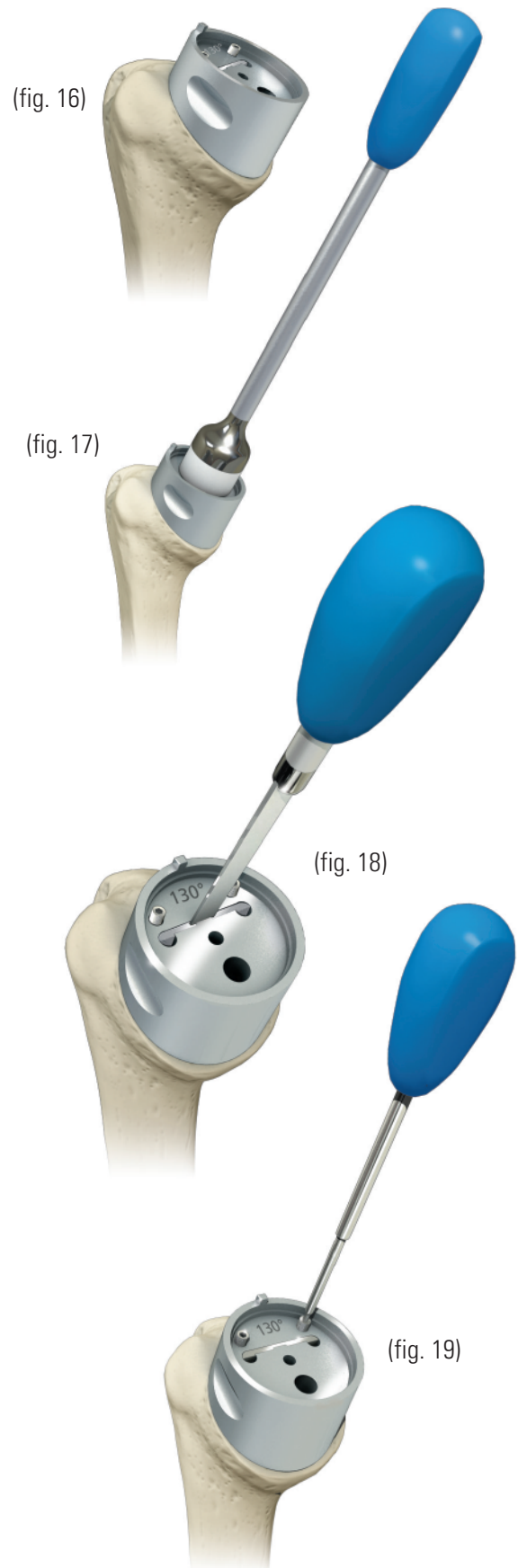
Should the taper be damaged, the humeral stem must be removed and replaced by an Aequalis® Reversed humeral stem.

The adapter is positioned on the taper of the collar (fig. 16), then impacted using the specific impactor, to set the taper lock (fig. 17).

3 - Securing of the assembly

The u-clip is pushed towards the base of the using of the his housing with the assistance of the u-clip pusher (fig. 18).

Alternate tightening (fig. 19) the pressure screws in a progressive manner in order to ensure the correct positioning of the hooks underneath the collar. (Each screw is tightened partially and alternately in order to obtain equivalent pressure and to prevent the u-clip from becoming skewed).



Aequalis® Reversed Adapter

SURGICAL TECHNIQUE

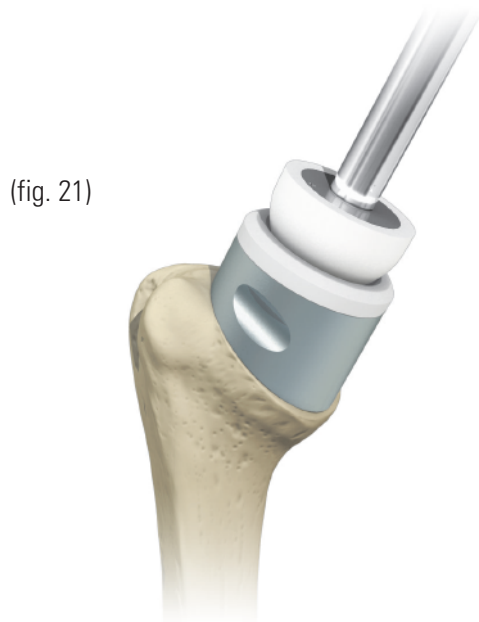
Note : the screws must be flush with perfectly positioned on the base of the their housing in order to ensure complete seating of the guarantee the installation of the polyethylene insert. (The screwhead must not protrude beyond the base of the adapter (fig. 20).

The definitive polyethylene insert is positioned, aligning taking care to align its positioning marker with the adapter lug. It is then impacted using the impactor for of the Aequalis® Reversed instrumentation sets (fig. 21).

Assembly is finished (fig. 22).



(fig. 20)



(fig. 21)



(fig. 22)

EXTRACTION

● 1. Extraction of the Polyethylene insert

The inserts are removed with an extraction clamp slid between the plastic and the metal. It is tightened and lightly maneuvered from top to bottom to remove the insert (fig. 23).



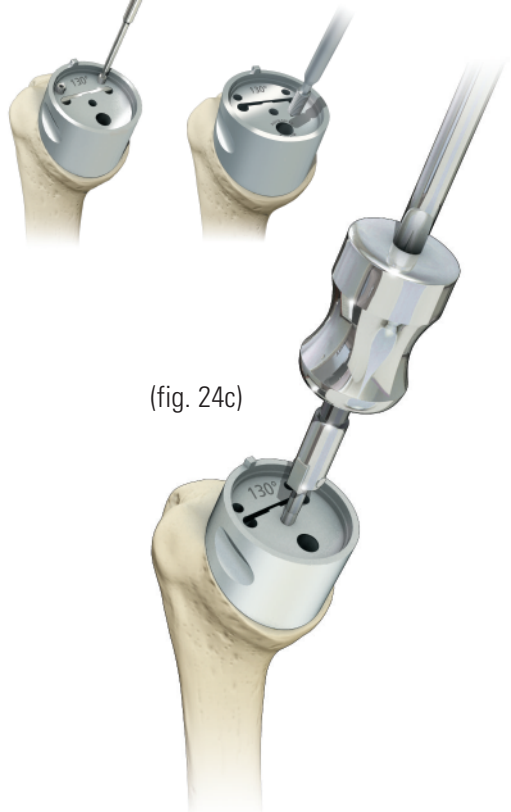
● 2. Unscrewing of the safety assembly

The extraction of the metaphysis begins by:
- either removing the screw of the u-clip (fig. 24a),
- or removing the central screw (fig. 24b).



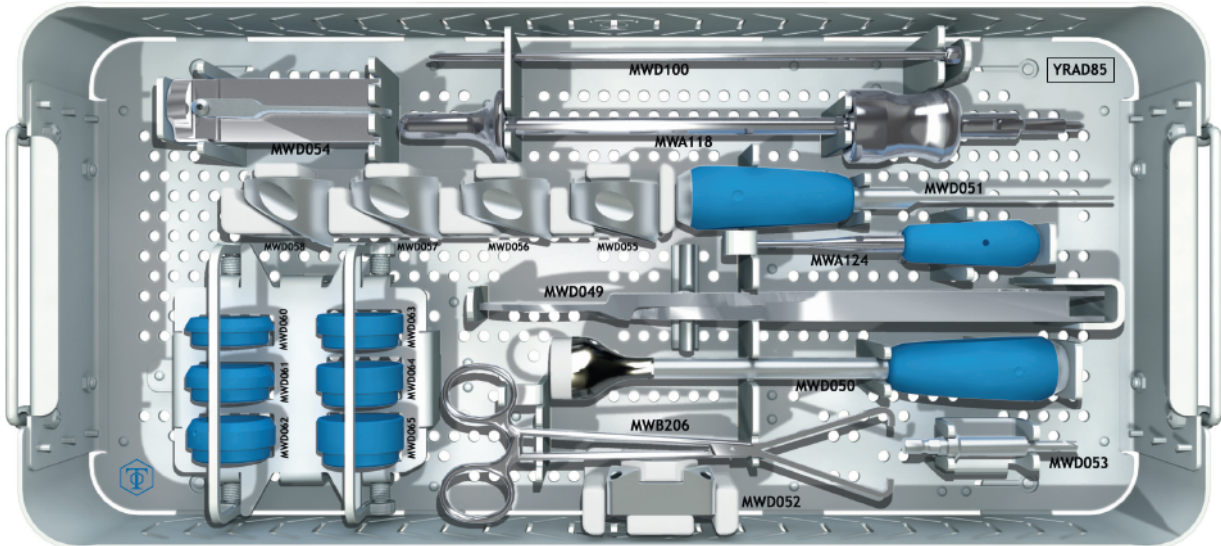
● 3. Extraction of the Aequalis® Reversed Adapter

The Aequalis® Reversed Adapter is extracted using an Aequalis® standard slap hammer extractor threaded in the center hole of the adapter (fig. 24c).



INSTRUMENTATION

Réf. YKAD85



Instruments

Instruments	Reference
Impactor	MWD050
Hexagon Screwdriver 3.5	MWA124
U-Clip Pusher	MWD051
Drill Guide	MWD052
Ø5 mm Drill Bit	MWD053
Goniometer	MWD054
Orientation rod for Goniometer	MWD100
Slap Hammer Extractor	MWA118
Humeral Insert Extractor	MWD049
Humeral Insert Clamp	MWB206

Trial Insert

Sizes	Reference
Ø36 +6mm	MWD060
Ø36 +9mm	MWD061
Ø36 +12mm	MWD062
Ø42 +6mm	MWD063
Ø42 +9mm	MWD064
Ø42 +12mm	MWD065

Trial Adapter

Inclination	Reference
125°	MWD055
130°	MWD056
135°	MWD057
140°	MWD058

NOTES

IMPLANTS

Aequalis® Reversed Adapter metaphysis

Description	Reference
Metal metaphysis 125°	DWD855
Metal metaphysis 130°	DWD856
Metal metaphysis 135°	DWD857
Metal metaphysis 140°	DWD858

Packaged with locking screw DWB060 (CoCr)



Polyethylene insert

Description	Reference
Lateralized Insert Ø36 mm +6 mm	DWD860
Lateralized Insert Ø36 mm +9 mm	DWD861
Lateralized Insert Ø36 mm +12 mm	DWD862
Lateralized Insert Ø42 mm +6 mm	DWD863
Lateralized Insert Ø42 mm +9 mm	DWD864
Lateralized Insert Ø42 mm +12 mm	DWD865

