

MEDIN  
ORTHOPAEDIC  
IMPLANTS



## RIB PLATE

■ STAINLESS STEEL

→ IMPLANT SYSTEM



The technical parameters of the plate allow bending in all directions, facilitating individual contouring with respect to the different anatomical shape of ribs.

The plate is easy to contour while still providing adequate stability. The profile of the plate is adapted to the profile of the rib and can be adjusted according to its curvature. The potential contouring of the plate can be easily done with the help of forceps.

The low profile and rounded edges of the plate minimize the risk of soft tissue irritation.

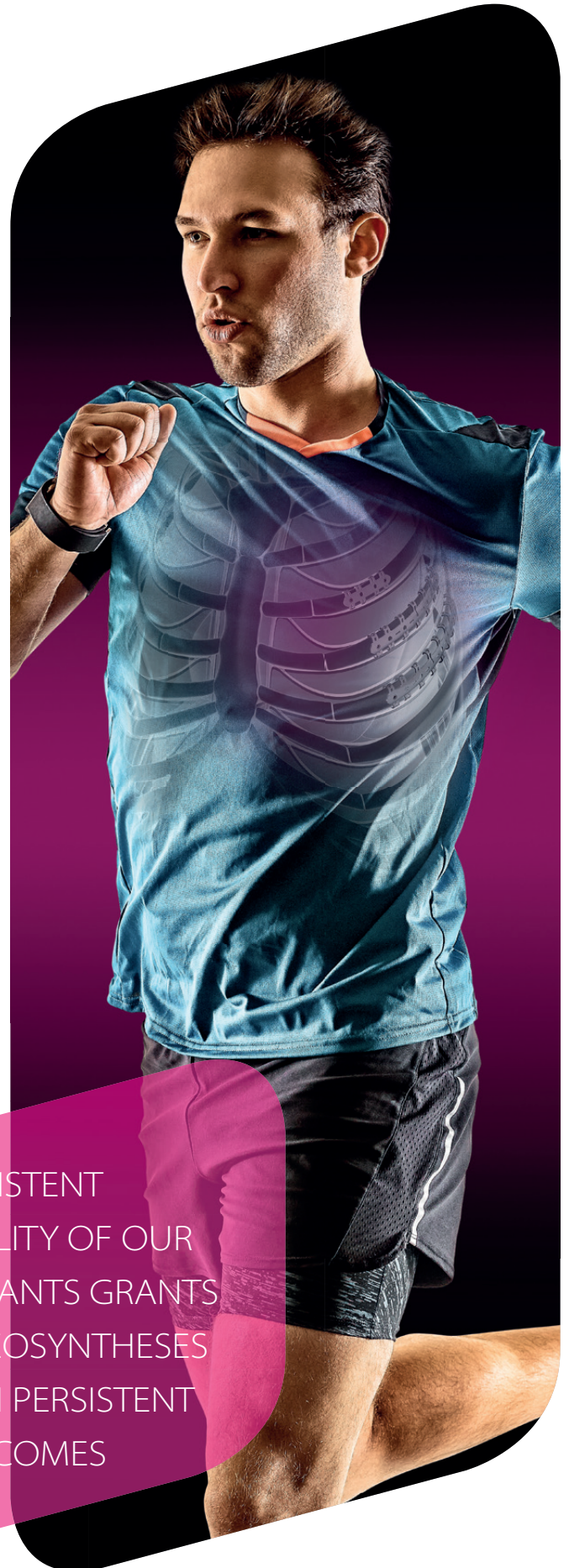
The plates are available in lengths from 40 to 155 mm. The wide range of plate lengths allows biomechanically advantageous bridging of multifragmentary rib fractures with a single implant.

The plate is fitted with pre-shaped fixing arms which, together with cortical locking screws, ensure stable and reliable fixation of fractures.

The design features of the plate allow it to anchor a large number of bone fragments with the help of fixing arms. Fixation of the plate to the rib can be achieved without significant compression of the intercostal nerves.

Surgical stabilization of rib fractures with a rib plate shortens the duration of ventilatory support and leads to reduced morbidity associated with prolonged mechanical ventilation.

Stabilization of the chest wall using a rib plate is an effective and safe method with many benefits for the patient. The benefits include, in particular, a reduction in pain and discomfort and a shorter stay in the intensive care unit.



PERSISTENT  
QUALITY OF OUR  
IMPLANTS GRANTS  
OSTEOSYNTHESSES  
WITH PERSISTENT  
OUTCOMES

# MEDIN IMPLANTS FOR PRECISE CARE

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#### SYMBOL LIST



Caution



NOTE



Instruments



X-ray check

## ↓ IMPLANT SYSTEM FEATURES

- > Universal plate design for left and right side.
- > The system is made of implant steel (ISO 5832-1).
- > Plate lengths: 40, 55, 75, 95, 115, 135 and 155 mm
- > Plate width: 24 mm
- > Plate thickness: 1 mm

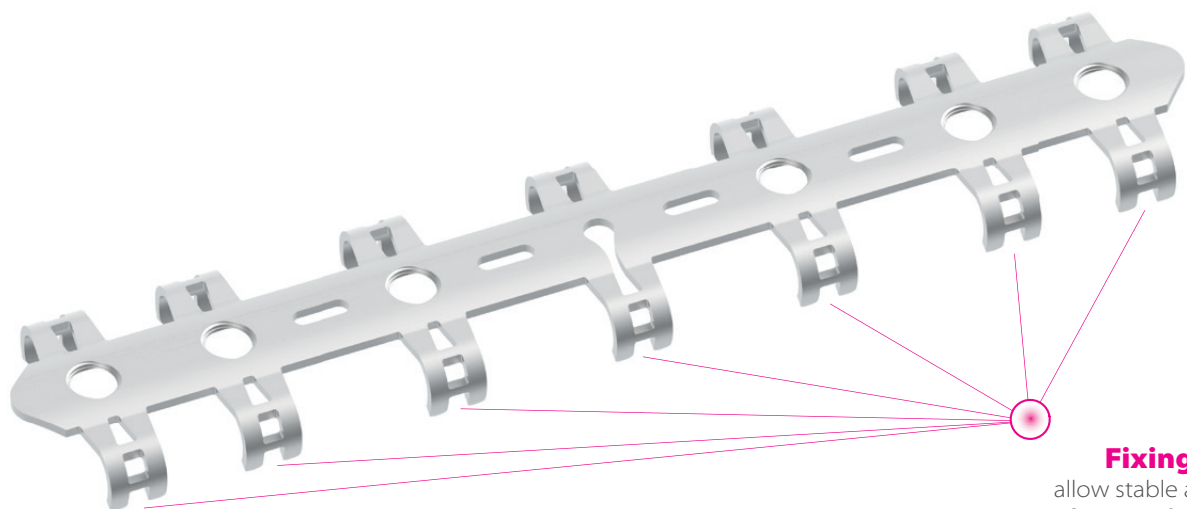
## ↓ INDICATIONS

- > Unstable thoracic wall with paradoxical ventilation.
- > Injury of four and more ribs in thoracic-abdominal injury.
- > Serial inversion fracture of three or more ribs combined with pleural and lung injury caused by rib fragments with increasing heamo and pneumothorax.

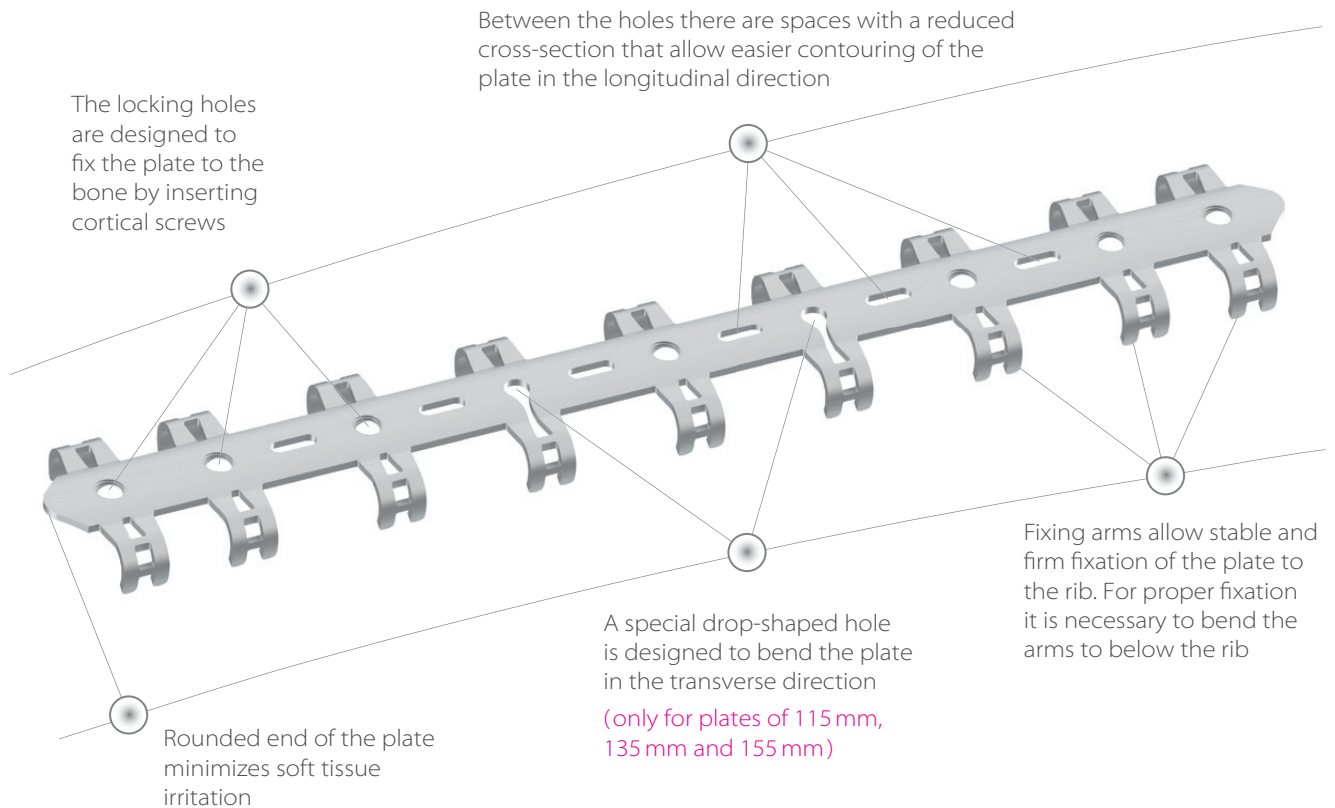
## ↓ CAUTION

1. This Surgical Technique Manual does not contain enough information necessary for immediate use of the implant!  
Always get acquainted with all information on product label and in the Instructions for Use manual supplied by the manufacturer before using any MEDIN, a.s. products.
2. The use of this device is intended exclusively for physicians specialized in traumatology, orthopedy, and surgery, who went through the professional training for the device provided by MEDIN, a.s.

3. The "Rib plate" implant system includes set of instruments for its introduction or extraction. A list of all accessories and instruments, intended for use together with the plate, is provided in the corresponding section of this surgical technique. The compatibility of the individual implants and instruments of the system has been tested and verified. The use of the plate in combination with other implants or instruments is not allowed as this may result in damage to the implants or the patient. MEDIN, a.s. is not responsible for possible complications resulting from non-compliance with this instruction.
4. The individual screws may only be tightened by hand using appropriate force.
5. Implants are supplied non-sterile and are intended to be sterilized before use. Instructions necessary for the preparation of the implants can be found in the Instructions for Use manual.
6. Before using the drills, always check the number of previous uses, the maximum number of which is set at 30. If this number is exceeded, do not use the drill, dispose of it or send it to the manufacturer for sharpening. Failing that creates a risk of prolonging the surgery or making it impossible to insert the screws.
7. Make sure the surface of the instruments is unimpaired, and that they are correctly set and functional. Do not use instruments that are badly damaged, have illegible markings, show signs of corrosion or have dull blades. Dispose of such instruments. Your MEDIN, a.s. sales representative will provide you with further detailed instructions regarding functionality testing. Only the manufacturer is authorized to carry out service maintenance.



**Fixing arms**  
allow stable and firm  
fixation of the plate  
to the rib



## PLATE APPLICATION

The rib plate allows the treatment of severe chest injuries; multiple rib fractures with significant dislocation; unstable chest wall; chest deformities; temporary fixation, correction or stabilization of rib bone fragments. Choose the plate according to the type of fracture:

### → SIMPLE FRACTURE

Fix a simple fracture using 44 mm and 55 mm plates. Select the length of the plate so that it can be firmly fixed with two fixing arms to each side of the fracture to ensure adequate stability.

### → FLAIL CHEST FRACTURE

75 mm rib plates or longer are designed to bridge and stabilize several rib fragments, especially in comminuted and flail chest fractures. Choose the length of the plate so that it extends over the outermost fracture line by two segments on both sides.

If the longest plate cannot bridge all fragments to the recommended extent, it is necessary to use more short plates.

↓ PREOPERATIVE PLANNING

> Multidetector computed tomography (MDCT) and subsequent 3D reconstruction is crucial to determine the number of fractured ribs, the extent of dislocation and to evaluate possible intrathoracic trauma complications. Use the 3D MDCT to locate the site and determine the extent of osteosynthesis.

↓ PLATE CONTOURING

For plate contouring use shaping forceps [Fig. A]. Bending must always be done with two shaping forceps working simultaneously.

→ STEP 1

Hold both ends of the plate firmly in place with the shaping forceps [Fig. B]. Gradually bend the plate to the desired radius.

⚠ Caution

Avoid sharp and/or repeated bends in the same place, and/or bending the plate at the locking holes. Repeatedly bending the plate in the same place can cause its weakening. Bends at the locking holes can damage these holes.

→ STEP 2

(only for plates of 115 mm, 135 mm and 155 mm)

Insert the plate into the widest cut-out in the shaping forceps. Grasp the plate with the shaping forceps on both sides of the drop-shaped hole, perpendicular to the longitudinal axis of the plate [Fig. C]. Use the forceps to bend the plate into the desired shape.

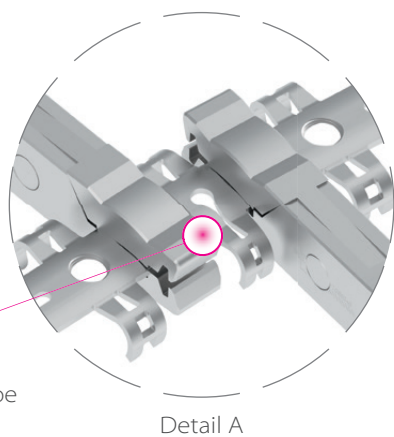
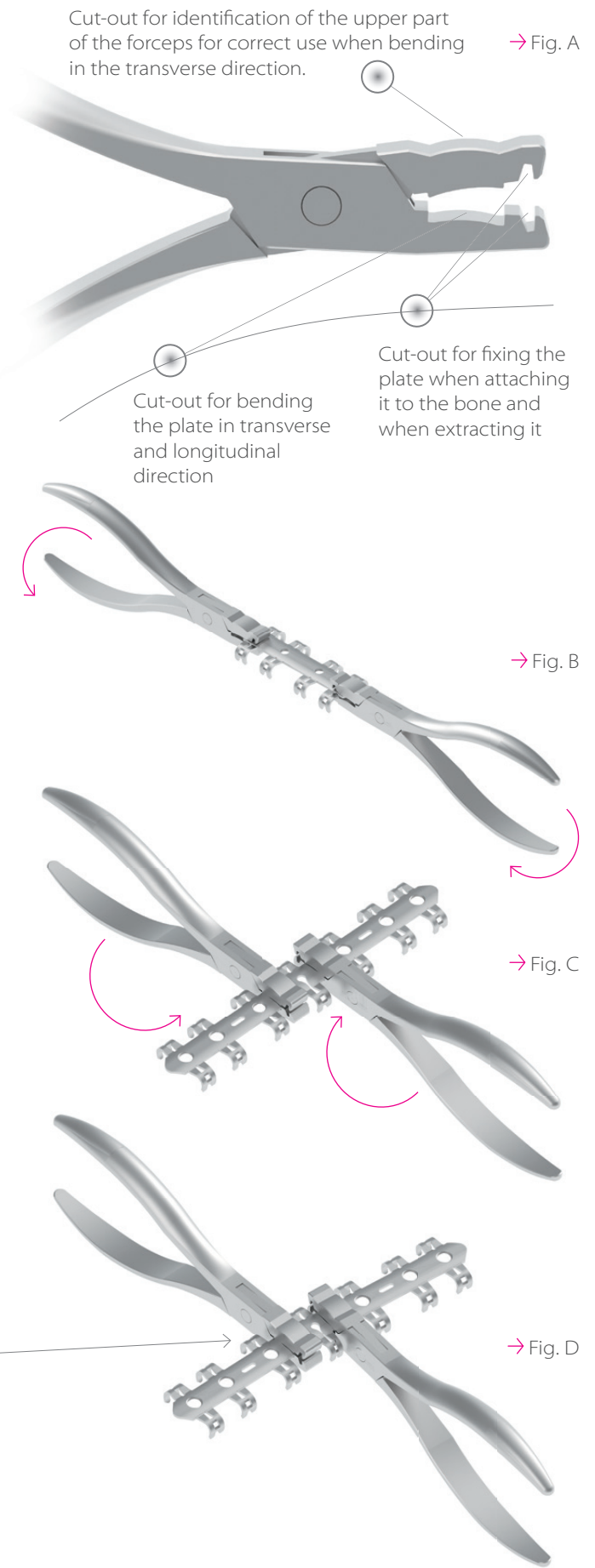
⚠ Caution

The bend can only be made in one direction so that the narrower part of the drop-shaped hole closes during shaping [Fig. D, Detail A].

→ INSTRUMENTS



REF	Name
397 117 06 0040	Rib Plate Forceps; shaping



Bend the plate so that the drop shape becomes smaller

Detail A

## 01

### PATIENT POSITIONING

- > Adjust the position of the injured person on the operating table depending on the location of the fractured ribs and the preferred surgical approach.

## 02

### SURGICAL APPROACH

- > Choose the surgical approach according to the type and location of the fracture. Expose the ribs so that each side of the fracture can be firmly fixed with at least two pairs of fixing arms. Select the correct plate length according to the type of fracture.

## 03

### PLATE PLACEMENT

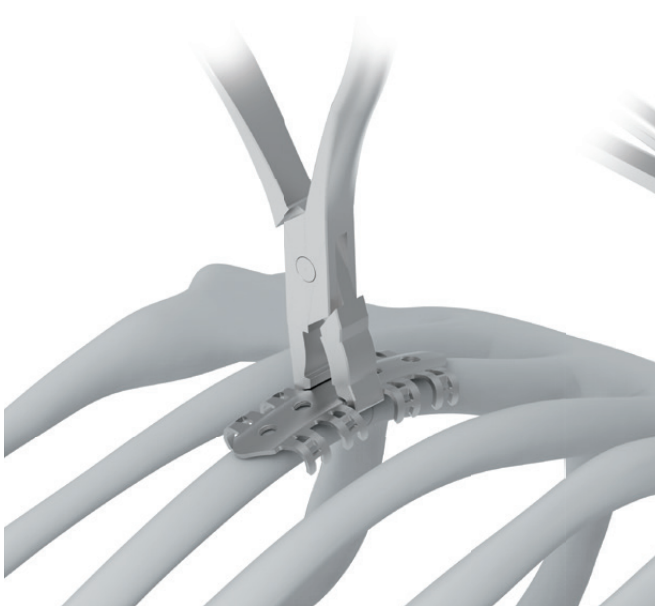
- > The use of each type of plate is described above, in the “plate application” section.
- > For simple fractures with a short fracture line, use shorter plates for fixation. If the fracture line runs obliquely to the longitudinal axis of the rib or if the rib is broken into several parts in a short section of up to 100 mm, use longer plates for fixation.
- > If the rib is fractured into multiple segments over a section longer than 100 mm, fix each fracture separately with shorter plates.
- > Place the plate so that it covers the fracture. Use the shaping forceps to manipulate the plate [Fig. 3.1]. In the case of a simple fracture, perform reduction first. Contour the plate according to the shape of the rib.
- > In case of multifragmentary fractures, first fix the plate to the undamaged part of the rib and then perform the reduction. The fixation technique is described in more detail in the following points.
- > To fix the reduced fragments, you can use the holding forceps [Fig. 3.2].

#### ⚠ Caution

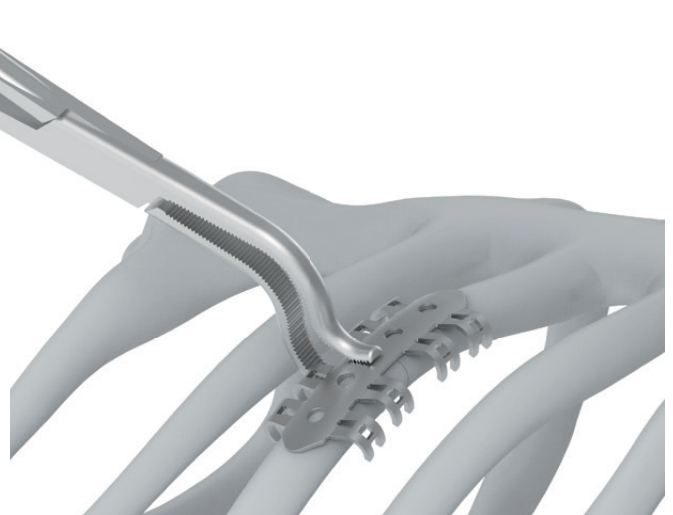
The length of the plate should allow for an overlap of at least 2 holes on each side of the fracture line. The overlap is necessary for achieving a firm fixation.

#### ⚠ Caution

Take extra care not to damage the neurovascular bundle on the underside of the rib.



→ Fig. 3.1



→ Fig. 3.2

### → INSTRUMENTS



REF	Name
397 117 08 3220	Rib Plate Forceps; holding
397 117 06 0040	Rib Plate Forceps; shaping

# 04

## PLATE FIXATION

> Select the length of the sleeve (7/10/13/16 mm) according to the thickness of the rib. The sleeves are equipped with a circular stopper, which ensures the correct position and stability of the sleeve during drilling [Detail 4.1, Fig. 4.2]. The stopper fits into the lockable hole and prevents unwanted movement of the sleeve on the plate during drilling. Graphic and numerical markings on the handles of the sleeves facilitate for easier navigation during the operation. Drill the screw hole using a 2.5x35 mm drill with a drill stop. Drill through both cortices with the drill guided through the sleeve [Fig. 4.1 and 4.2].

**⚠ Caution**

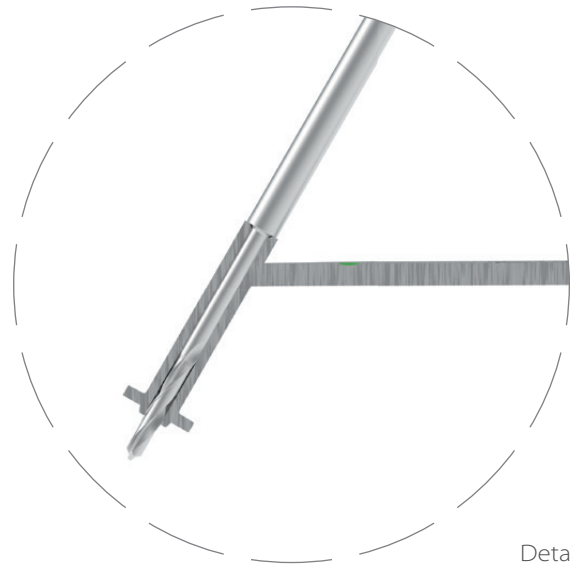
Keep a close eye on the drilling depth. Do not drill deeper than necessary. Risk of injury to intrathoracic organs or soft tissues! [Detail 4.2]

**i Note**

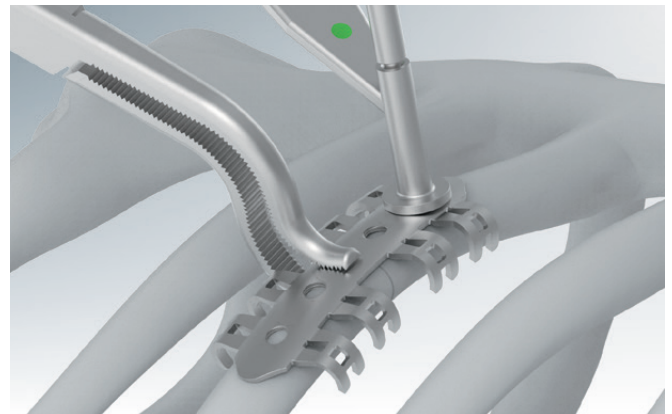
The green mark on the sleeve handle indicates the shorter hole variant, the red mark indicates the longer hole variant.

**i Note**

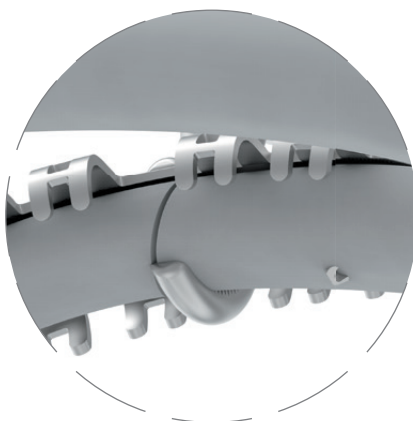
Different sleeve lengths correspond to different drilling depths.



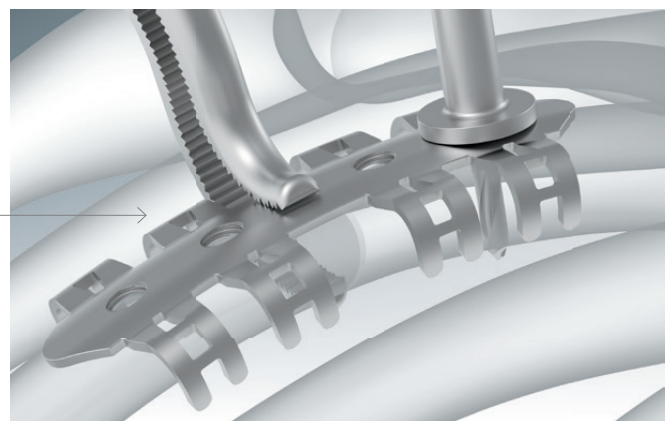
Detail 4.1



→ Fig. 4.1



Detail 4.2



→ Fig. 4.2

→ INSTRUMENTS



REF	Name
397 117 08 3220	Rib Plate Forceps; holding
397 129 68 0060	Drill sleeve; 5/2.5 x 7 mm, 5/2.5 x 10 mm
397 129 68 0070	Drill sleeve; 5/2.5 x 13 mm, 5/2.5 x 16 mm
397 129 68 0050	Drill; 2.5 x 35 mm, AO coupling



> Insert a screw into the prepared hole. Tighten each screw using a hand screwdriver only [Detail 4.3, Fig. 4.3].

**⚠ Caution**

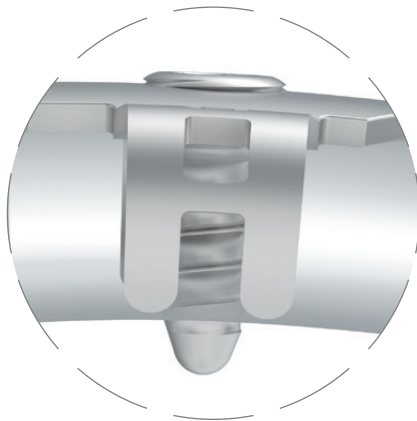
Never fasten the screw too tightly!

**⚠ Caution**

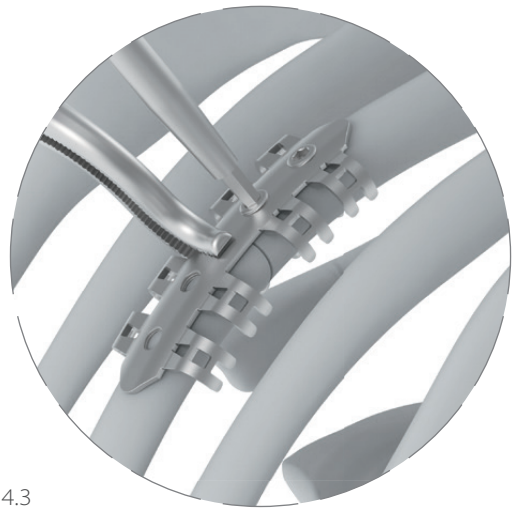
The tip of the screw must not protrude more than 1 mm from the far cortex! [Detail 4.4]

> If one side of the plate is firmly attached (preferably to an undamaged part of the rib), perform a reduction. After the reduction, use the holding forceps. Follow the same procedure for placing the rest of the screws.

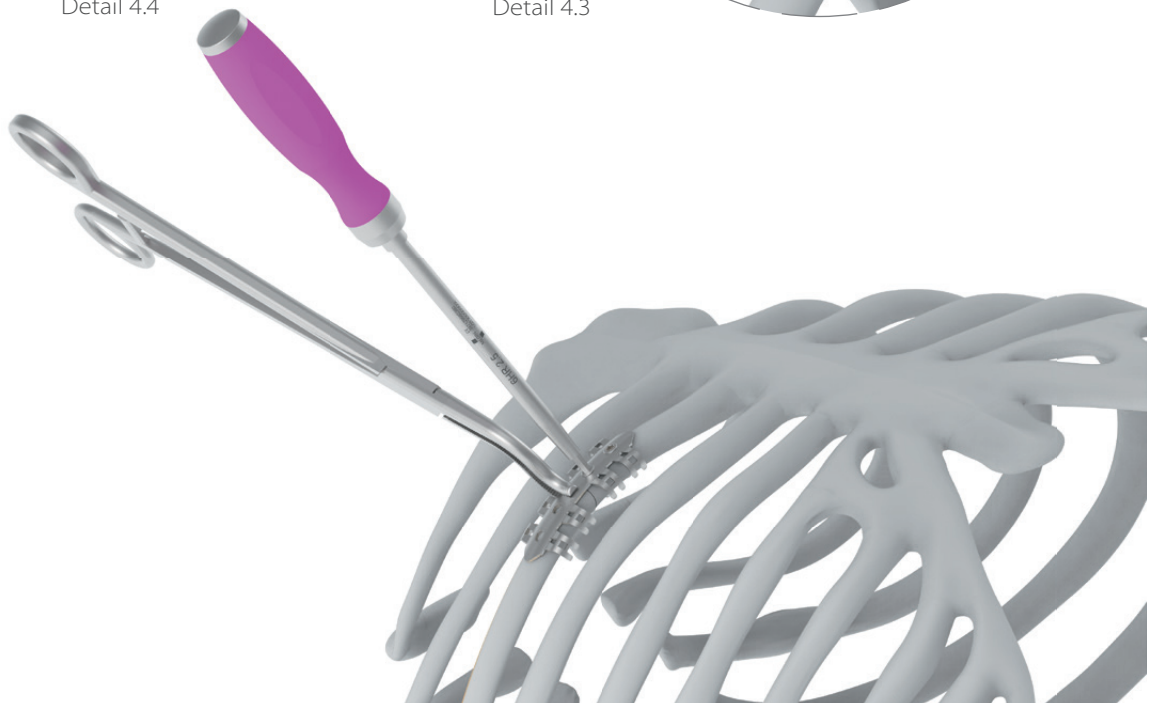
> Check the correct position of the fragments before finishing the surgery. Check that all screws are securely tightened.



Detail 4.4



Detail 4.3



→ Fig. 4.3

→ INSTRUMENTS



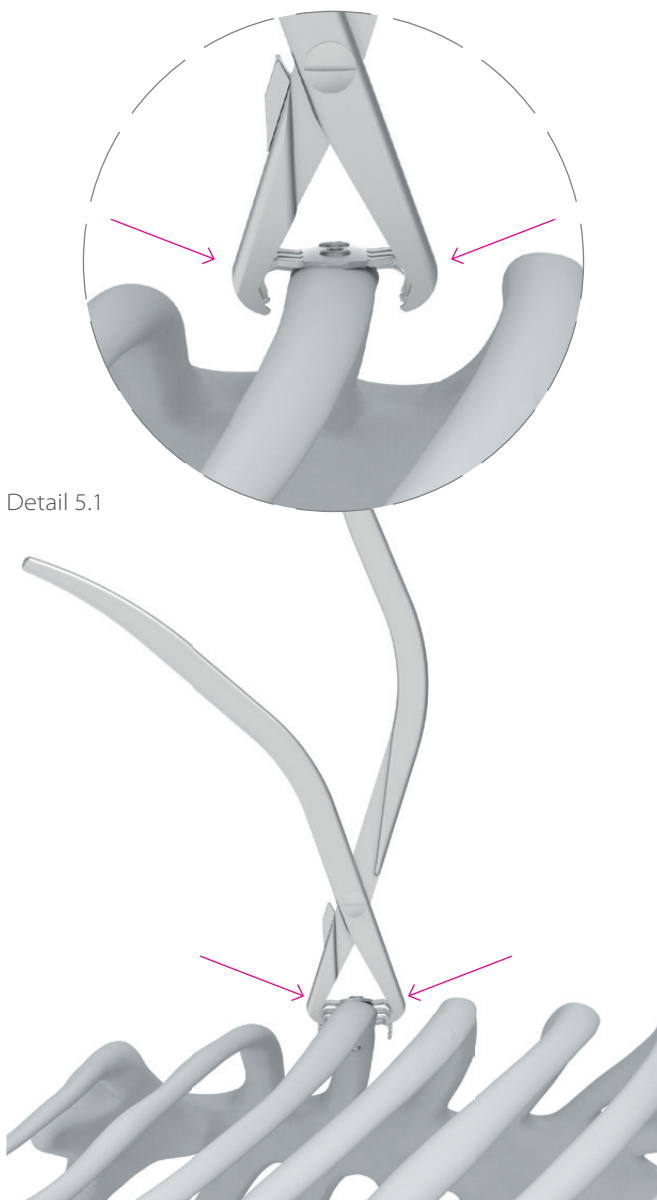
REF	Name
397 117 08 3220	Rib Plate Forceps; holding
397 129 68 0360	Screwdriver; A, hex, 2.5 x 200m, conical

# 05

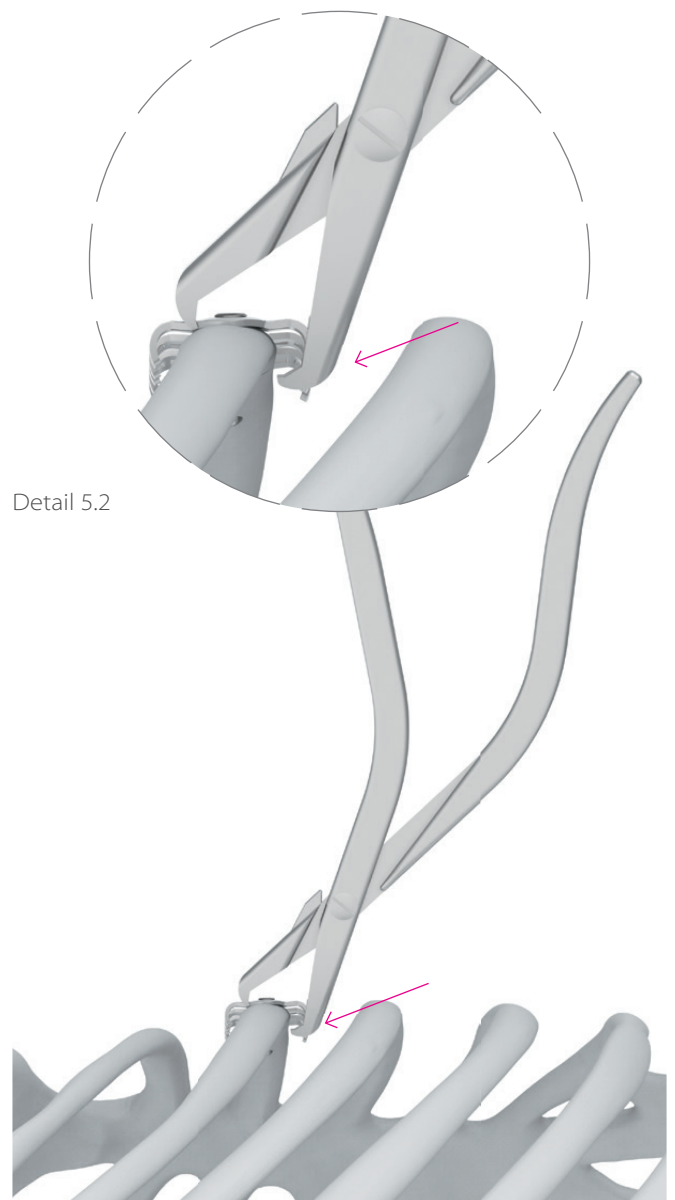
## SECURING PLATE WITH FIXING ARMS

> Use the fixing forceps to secure fixing arms around a rib. The pairs of fixing arms are pre-shaped so that they are easily anchored to the rib when using the forceps without risk of injury to the intercostal anatomical structures. To fix the plate to the rib, use both arms simultaneously [Fig. 5.1, Detail 5.1]. Bend both arms by pressing the forceps towards the rib.

> If the fixing is not sufficiently firm, it is possible to use the procedure of anchoring each fixing arm separately, whereby the ribs are more tightly clamped. For one-side fixation, rest the forceps on the plate body during anchoring [Fig. 5.2, Detail 5.2]. Through this procedure, you will achieve a stronger fixation.



→ Fig. 5.1



→ Fig. 5.2

### → INSTRUMENTS



REF	Name
397 117 06 0030	Rib Plate Forceps; fixing

# 06

## PLATE REMOVAL

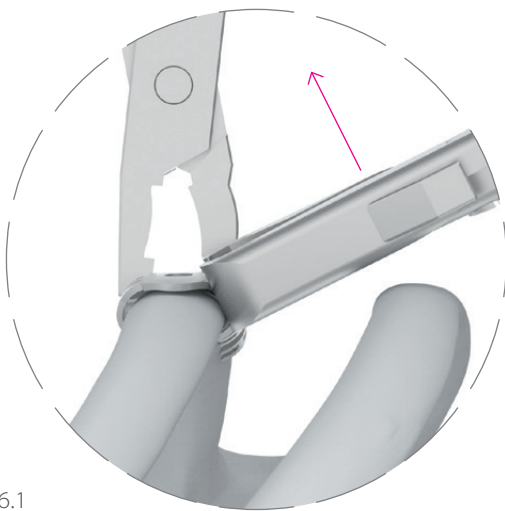
- > During extraction, loosen all locking screws one by one with the conical screwdriver. When all the screws in the plate have been unfastened you may start removing them.
- > After removing all screws, use the shaping forceps to grip the plate as close as possible to the fixing arm you want to release. Use the end teeth of the forceps to undercut the fixing arm [Fig. 6.1, Detail 6.1] and bend the fixing arm away from the bone by moving it against the shaping forceps [Fig. 6.2, Detail 6.2].

**⚠ Caution**

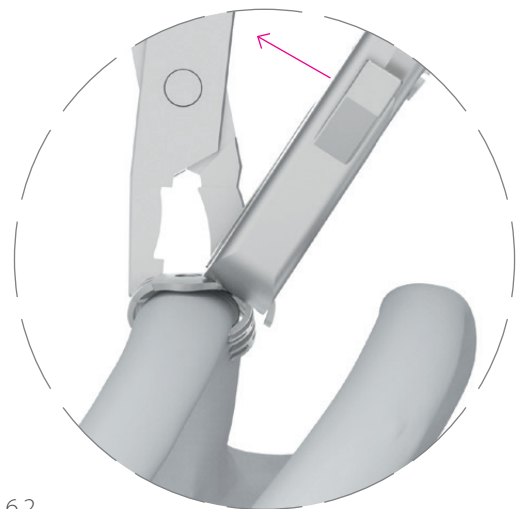
Use only manual screwdriver for unfastening of the screws!

**i Note**

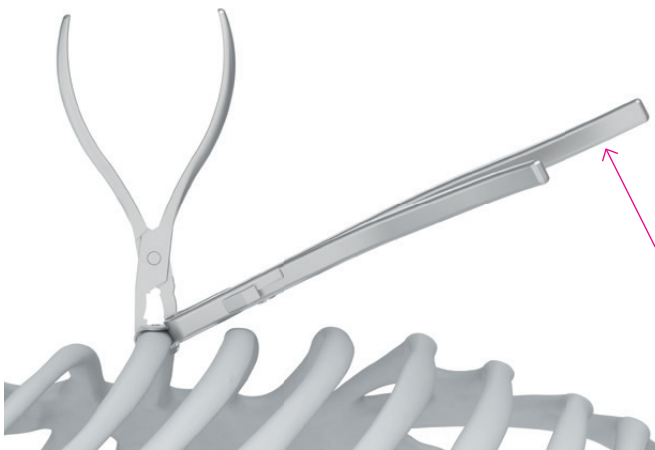
If the screws are damaged, use the "Set for extraction of screws" according to OP027.



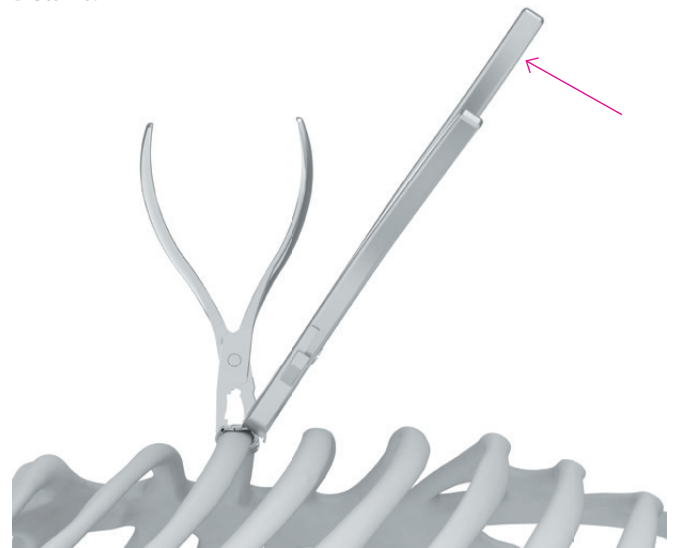
Detail 6.1



Detail 6.2



→ Fig. 6.1



→ Fig. 6.2

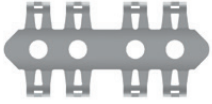
### → INSTRUMENTS



REF	Name
397 129 68 0360	Screwdriver; A, hex, 2.5 x 200 mm, conical
397 117 06 0030	Rib Plate Forceps; fixing
397 117 06 0040	Rib Plate Forceps; shaping

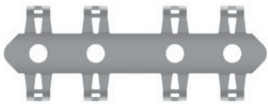


→ RIB PLATES



Rib plate; 40 mm

REF	L [mm]	No. of holes
397 129 70 7310	40	4



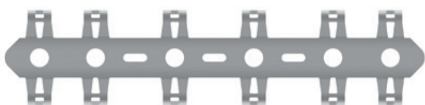
Rib plate; 55 mm

REF	L [mm]	No. of holes
397 129 70 7320	55	4



Rib plate; 75 mm

REF	L [mm]	No. of holes
397 129 70 7330	75	5



Rib plate; 95 mm

REF	L [mm]	No. of holes
397 129 70 7340	95	6



Rib plate; 115 mm

REF	L [mm]	No. of holes
397 129 70 7350	115	7



Rib plate; 135 mm

REF	L [mm]	No. of holes
397 129 70 7360	135	8



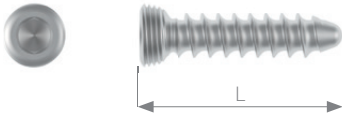
Rib plate; 155 mm

REF	L [mm]	No. of holes
397 129 70 7370	155	9



→ SCREWS

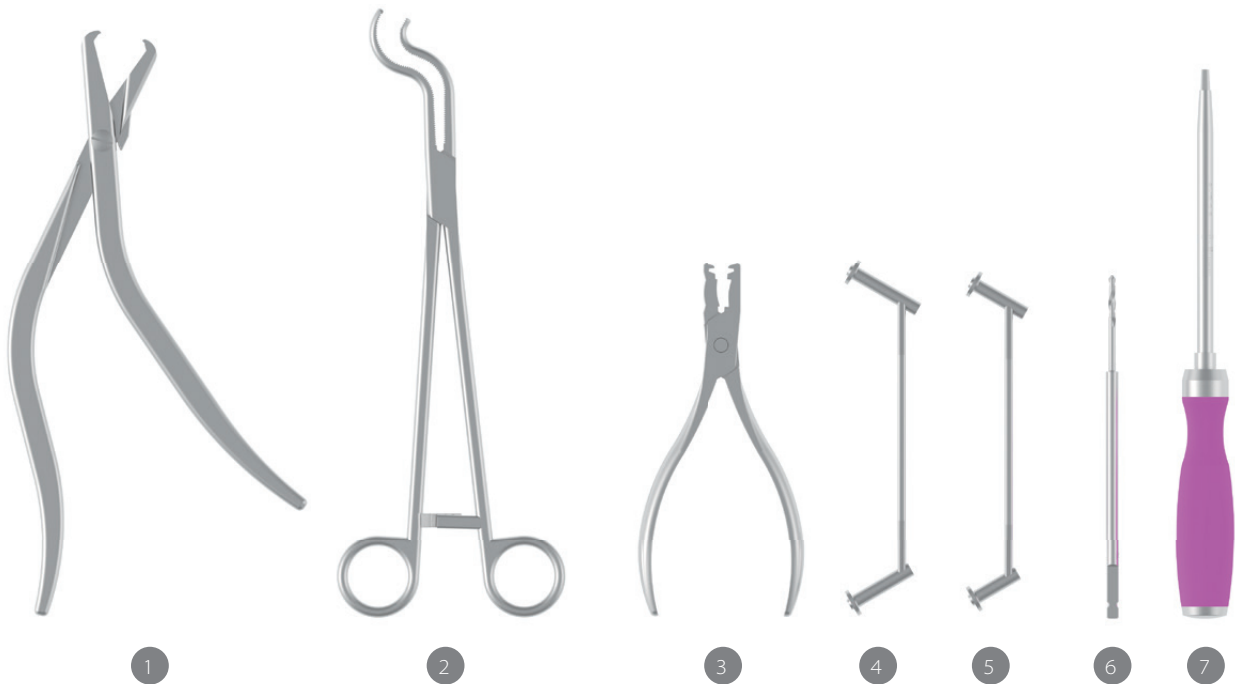
Locking screw; cortical, 3.5×Lmm



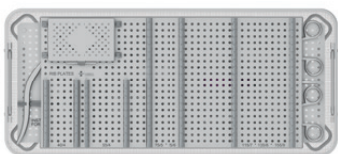
Technical data	Dimension [mm]
Screw thread	Ø 3.5
Screw core	Ø 2.4
Screw head	Ø 5
Drill for thread	Ø2.5
Screwdriver	⊕2.5

REF	L [mm]
397 129 70 7400	7
397 129 70 7410	8
397 129 70 7420	9
397 129 70 7430	10
397 129 70 7440	11
397 129 70 7450	12
397 129 70 7460	13
397 129 70 7470	14
397 129 70 7480	15
397 129 70 7490	16

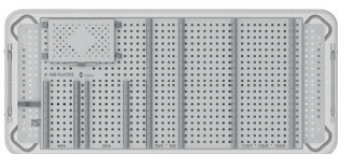
## → INSTRUMENTS FOR RIB PLATES



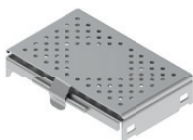
<b>397 139 09 0870</b> Set of instruments for rib plates				<b>1</b>
No.	REF	Name		
1	397 117 06 0030	Rib Plate Forceps; fixing		1
2	397 117 08 3220	Rib Plate Forceps; holding		2
3	397 117 06 0040	Rib Plate Forceps; shaping		2
4	397 129 68 0060	Drill sleeve; 5/2.5 x 7 mm, 5/2.5 x 10 mm		1
5	397 129 68 0070	Drill sleeve; 5/2.5 x 13 mm, 5/2.5 x 16 mm		1
6	397 129 68 0050	Drill; 2.5x35 mm, AO coupling		3
7	397 129 68 0360	Screwdriver; A, hex, 2.5x200m, conical		1



REF	Basket type	pcs
<b>397 139 09 0875</b>	Instruments for rib plates – including instruments, screw stand and tray for rib plates without implants – 540x240x70 mm	1



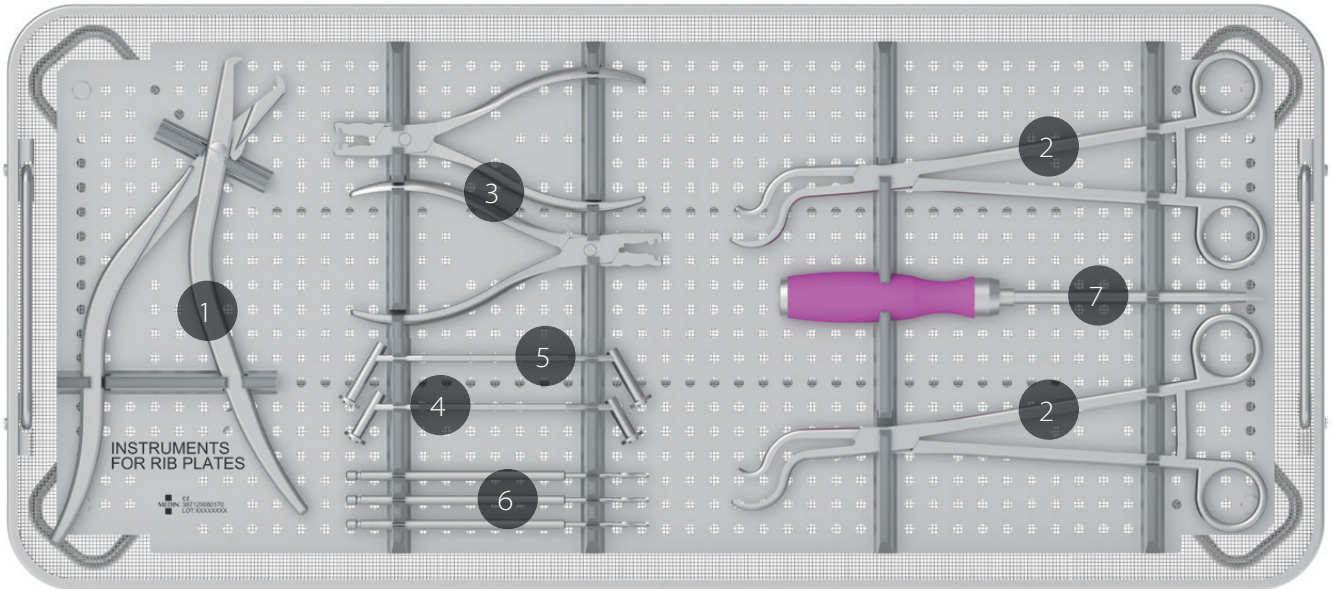
REF	Basket type	pcs
<b>397 129 68 0170</b>	Basket for instruments for rib plates – including screw stand and tray for rib plates without instruments and implants – 540x240x70 mm	1



REF	Basket type	pcs
<b>397 129 68 0080</b>	Stand for 3.5 mm locking cortical screws – without implants – 110x70x22 mm	1

→ INSTRUMENTS DIAGRAM

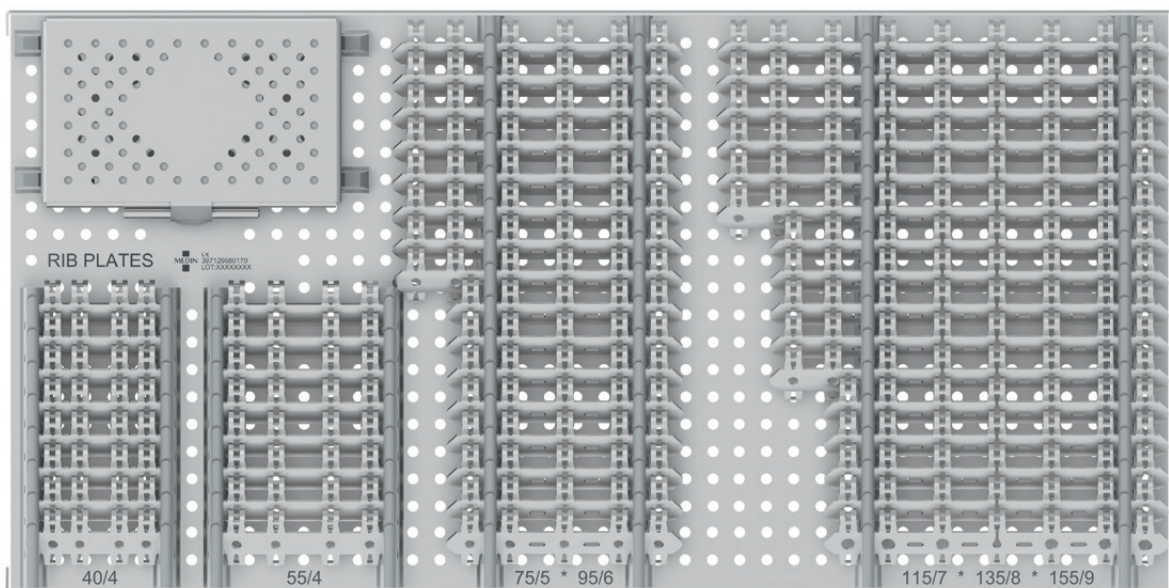
☰ BASKET 1



→ INSTRUMENTS

No.	Name
1	Rib Plate Forceps; fixing
2	Rib Plate Forceps; holding
3	Rib Plate Forceps; shaping
4	Drill sleeve; 5/2.5 x 7 mm, 5/2.5 x 10 mm
5	Drill sleeve; 5/2.5 x 13 mm, 5/2.5 x 16 mm
6	Drill; 2.5 x 35 mm, AO coupling
7	Screwdriver; A, hex, 2.5 x 200m, conical

→ IMPLANT PLACEMENT



REF	UDI-DI	Name
> Rib plate		
397 129 70 7310	8591712289637	40 mm
397 129 70 7320	8591712289644	55 mm
397 129 70 7330	8591712289651	75 mm
397 129 70 7340	8591712289668	95 mm
397 129 70 7350	8591712289675	115 mm
397 129 70 7360	8591712289682	135 mm
397 129 70 7370	8591712289699	155 mm

> Locking screw		
397 129 70 7400	8591712291364	cortical, 3,5×7 mm
397 129 70 7410	8591712290121	cortical, 3,5×8 mm
397 129 70 7420	8591712291333	cortical, 3,5×9 mm
397 129 70 7430	8591712291319	cortical, 3,5×10 mm
397 129 70 7440	8591712291296	cortical, 3,5×11 mm
397 129 70 7450	8591712291272	cortical, 3,5×12 mm
397 129 70 7460	8591712291258	cortical, 3,5×13 mm
397 129 70 7470	8591712291234	cortical, 3,5×14 mm
397 129 70 7480	8591712291210	cortical, 3,5×15 mm
397 129 70 7490	8591712291197	cortical, 3,5×16 mm





A series of horizontal lines for writing, extending from the ruler scale across the page.



A series of horizontal lines for writing notes, corresponding to the ruler scale on the left.



A series of 24 horizontal lines extending across the page, corresponding to the millimeter scale on the left. These lines are intended for drawing or recording data.

# MEDIN ORTHOPAEDIC IMPLANTS



[prodej@medin.cz](mailto:prodej@medin.cz) / [www.medin.cz](http://www.medin.cz)

CE<sub>2460</sub>

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MEDIN, a.s., Vlachovická 619, 592 31 Nové Město na Moravě,  
Česká republika, tel: +420 566 684 327, fax: +420 566 684 384,  
[prodej@medin.cz](mailto:prodej@medin.cz), [www.medin.cz](http://www.medin.cz)

