

















Reconstruction nail

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Indication of reconstruction nail enables performance of synthesis of concurrent fractures of diaphysis and neck of the same femur. It is even more frequently used for the synthesis of the femur where proximal locking needs to be applied and the proximal fragment is too short or defective in some other way and the protection in the femoral neck has to be done.

The reconstruction nail implant system consists of left and right type of some size, one or two screws, inserted into the neck. The system enables insertion of a plate under the heads of the screws. It is recommended to close the nail with a stopper. The nail is secured with one or two locking screws in the distal part. It is also possible to secure the proximal or the distal screw with an adjusting screw.

Reconstruction nail has a circular section. The proximal length, which is 80 mm (regardless of the size of the nail), is strengthened to 15 mm. The 90 mm proximal part is deflected by 6°30'. This deflection enables insertion of the nail from the top of the greater trochanter. The nail is different for left and right limb. The nail is hollow and can therefore be inserted along the guide wire. MEDIN provides nails in diameters: 10; 11; 12; 13; 14 and 15 mm, in sizes from 320 to 500 mm in 20 mm sequence. MEDIN provides only hollow nails. Neck anteversion is 9° opposite diaphysis.

This brochure should be only considered as an illustrative guideline of reconstruction nail and the instrumentation. The main purpose of this brochure is to provide a quick orientation for surgeons and suture nurses. To show the correct composition and usage of the instrumentation and implants so that the best surgery result would be achieved. If you have any gueries do not hesitate to contact sales people of MEDIN Inc.



RECONSTRUCTION NAIL SURGICAL TECHNIQUE



The positioning of the patient is the same as in the case of the synthesis using a common intramedullary femoral nail. The patient's position on the extension table must ensure that (besides fractured bone and distal locking), both the neck and the head will also be displayed in the full scale and in two basic projections.

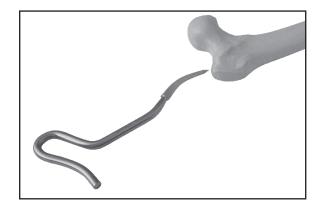
1. Reposition monitored by an x-ray on the traction table in zero rotation and possible abduction - deflection of the body towards the healthy side in the case of obese patients. Unsatisfactory repositioning can be subsequently ended after inserting the nail into the diaphysis by lifting the aiming device against the ventrally dislocated neck or by applying pressure using the Hohmann elevator, raspatories, the Steinman or by inserting reposition forceps from the incision for dynamic screws. This position can be ensured with the help of K-wires that are outside the planned implant, but in most cases this is not necessary.

2. An approximately 5 cm incision cranially from the greater trochanter. Insertion of the **perforator** into the cap of the major trochanter or splintered zone under the angle of 6° to the diaphysis. X-ray control in two projections is required. An opening with a maximum diameter of 14.1 mm is made by using one of the **perforators**. A **manual awl** with a diameter of 5 mm is suitable for making an opening in the spongy part of the femur, followed by insertion of the **introducing wire**. Predrilling to the respective diameters of **nail** is performed. The predrilling procedure is analogous to that for other kinds of nailing.

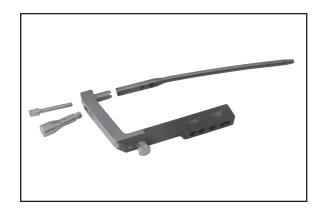
3. It is necessary to predrill the proximal part with a length of 80 mm to make an opening which is 0.5 or 1 mm larger. The diameter of the **reamer** should therefore be 15.5 or 16 mm. The other part of the femur cavity is reamed by using a **reamer** that is maximally 1 mm larger than the size of the **nail**.

4. Exchange predrilling **introducing wire** for the **guide wire** for nail insertion. **Reconstruction nail** has inclination of the screws 135°.

5. After irrigation, the selected **nail** is assembled with one of the **aiming devices**. The **125°/135° aiming device** is used to insert the **nails** with a neck angle 135°. Components are assembled using the **stirrup screw**. Particular sleeves are mounted in the **aiming device** and all openings are checked to see whether the **aiming device** and the particular selected **nail** match. It is recommended to use e.g. a **trocar** for this control. Depending on the nailing method, either the **rod of the guide mallet**, or an **impactor**, is mounted into the **aiming device**. It is recommended to mount the **impactor** since the **nail** should only be inserted by hand or with very careful hammering (for **short reconstruction nail**). Stronger hammering will be needed for inserting **reconstruction nail**.



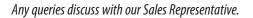


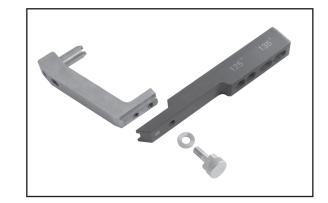


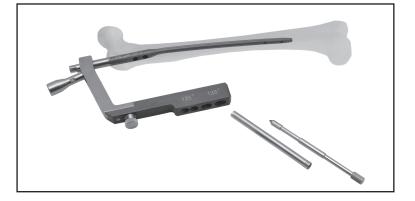


Aiming device enables inserting of two **screws** in neck. **Reconstruction nail** has to be secured by method "freely by hand" in the distal part. All **screws** can be predrilled and inserted through the sleeves of the aiming device. Remove **introducing wire** before drilling the openings.

6. **Aiming device 130°/45°; 125°/135°** is delivered as set of three main parts (two interchangeable shoulders and fixation parts of nails). Their interchange ability is not possible at the further same products.

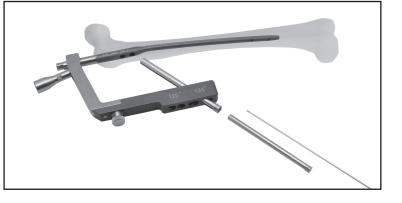


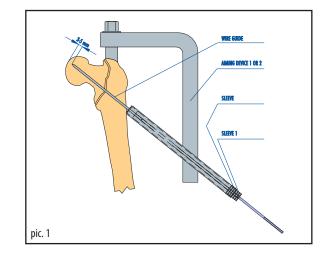




7. The openings in the **nail** are checked to see whether they are directed against the neck and the head. Depending on ante version of the neck, deflection of the **aiming device** by dorsal rotation (or by deflecting the table to the side of the healthy arm). An approximately 4 cm incision on the lateral side in the subtrochanteric region is performed to insert two **screws**.

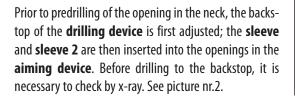
8. The **nail** is adjusted with the help of imaging in two main projections. After incision, the **sleeve** with **sleeve 1** and the **guide rod** are inserted into the openings of the **aiming device**, which aims at the neck. Prior to drilling using the **guide wire**, it is recommended to make an entry dent in the corticalis of the bone using the **trocar**. The **guide rod** may deviate proximally. We recommend exactly locating distal proximal opening. The **wire** in the sagittal projection is placed cca 10 mm above the Adam's arc, while in the lateral projection it passes through the centre of both the neck and the head. The **guide wire** is inserted to the appropriate distance. See picture nr.1. It is also recommended to insert the second **guide wire**.





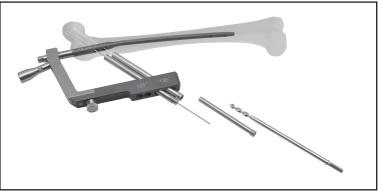
RECONSTRUCTION NAIL SURGICAL TECHNIQUE

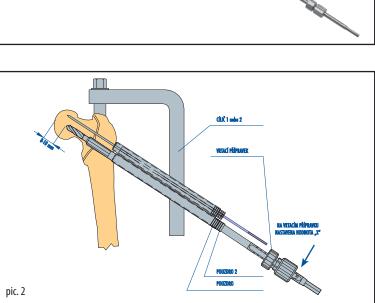
9. The **distal screw** is then inserted in such a manner that the length of the emerging **guide wire** is determined using the **measuring device**. See picture nr.2. This value serves not only for adjustment of the backstop of the **drilling device** but it also defines the length of the **screw**.











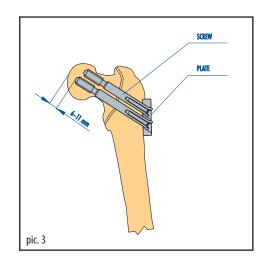






10. The desired **screw** is fixed to the **wrench** and inserted into the neck through the **sleeve**. See picture nr.3. As the **screws** are self-tapping, it is not necessary to make a thread in advance. Caution: the distance between the **screw** and the end of the head introduced in picture is a theoretical value only. Due to approximation and compression of neck fragments, the actual value will be lower. Since the value cannot be determined in advance, it is up to the operator to consider this fact. The values are calculated for cases where the **plate** will be inserted under the head of the screw (see use in the following text). If the **plate** is not used, the **screw** will shift by cca 2 mm to the extremity of the hip joint head.

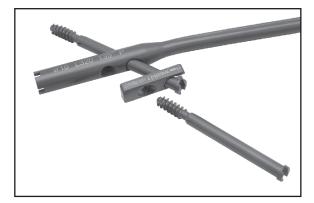


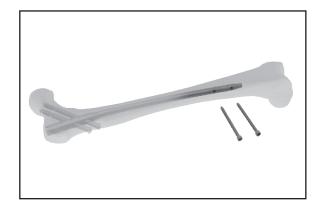


11. If you plan neck compression directly on the operating table, it is possible to insert the **plate** under the heads of the **screws**. Otherwise, damage may result as the edge of the screw's head will be pushed into the bone during drawing up. The recommended procedure is as follows:

- insert the distal screw into the neck in such a manner that it is already inserted into the second fragment (head) but the screw has not yet been drawn up
- during insertion of the proximal screw into the neck, first insert the plate between the aiming device and the patient on distal screw, the proximal screw is pushed through the opening in the plate
- draw up both screws with appropriate compression

12. Distal locking of **reconstruction nail** is performed by method "freely from hand" according to operator's experience. It is necessary to consult this part with Sales Representative and to order needed instrumentation according to the requirements of the work place. Ante version of distal and proximal openings is 9°.





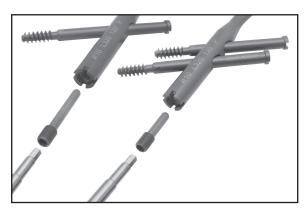
RECONSTRUCTION NAIL SURGICAL TECHNIQUE

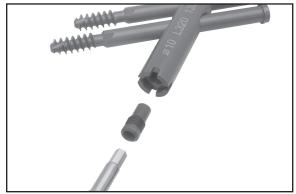
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13. If the neck fracture has to be secured in a revised position, it is possible to secure the **screws** in the neck by **adjusting screws**. Then one of the **adjusting screws** is used to secure proximal or distal **screw** in the neck.

14. The **nail** is closed using a **stopper**, which can be inserted in the following manner: the **screw of the stirrup** is removed from the **aiming device**, the **aiming device** remains mounted on the **nail** and the **stopper** is inserted through the charge of the **aiming device**.

The wounds are sutured after irrigation. A drainage tube is regularly inserted at the point of the nail inserted into the femur. It must not be inserted directly into the medullar cavity. The wound is covered with a soft bandage and x-ray images are taken for documentation.





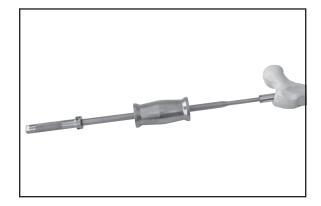
NOTES:

- Prior to nail insertion, it is necessary to check whether all openings in the nail-aiming device assembly to which the screws will be inserted match with the openings in the aiming device.
- Use a mallet during nail insertion only if necessary. The nail should normally be inserted by hand only. This does not apply during reconstruction nail inserting.
- The insertion of a plate under the head of the screw depends only on the decision of the operator. The construction of the implant ensures that the progress of the operation will not be affected either with the use of the plate, or without it. However, a plate should be used if it is desirable to perform compression of the fractured neck directly on the operating table or if the corticalis in the place of contact of screw heads provides no support.
- Implants are made of steel or titanium alloy. They can never be combined on one patient.
- Patient has to be warned that the implant does not bear his/her whole weight. He/she has to use remedial means until the complete heal-up of the fracture.

Recommended procedures for implant extraction

If the distal **screws** were not removed during bone healing, they are removed now together with proximal **screws** in the neck.

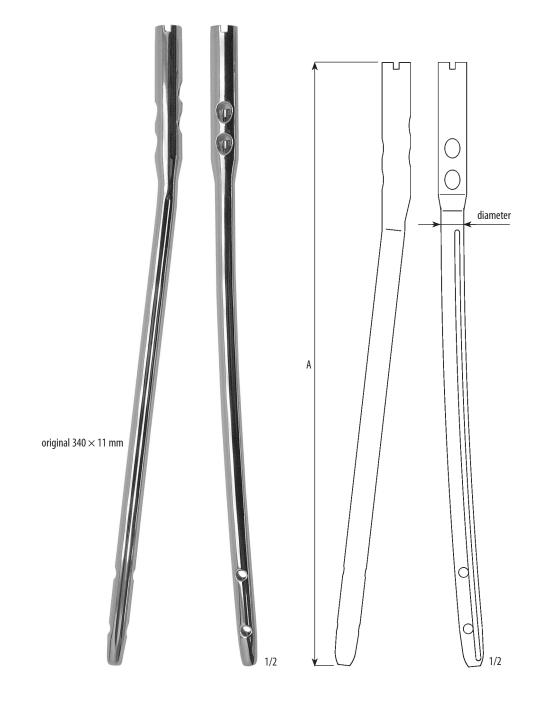
The **stopper** of the nail is removed. The **extraction bar** is inserted into the inner cavity of the nail's proximal extremity. The **handle** is mounted and **weight** is put on the **rod**. The **nail** is hammered out by blows to the **handle**.





RECONSTRUCTION NAIL IMPLANTS

RECONSTRUCTION NAIL – LEFT



RECONSTRUCTION NAIL – LEFT



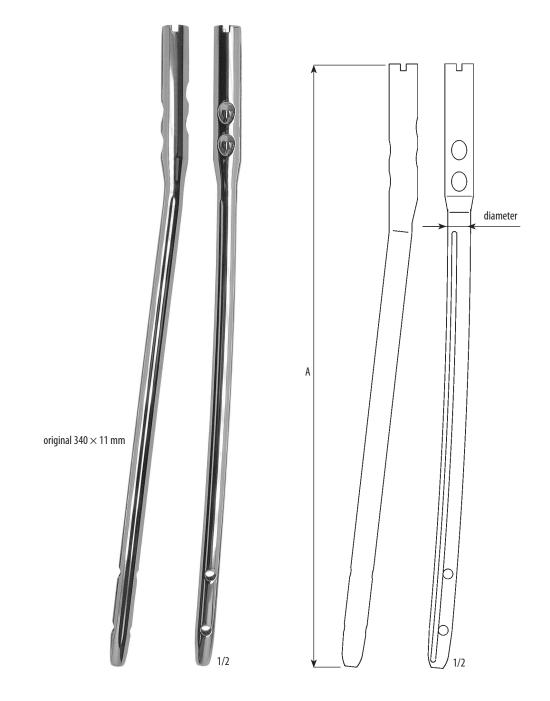
	А	diameter
129 79 0041	320 mm	10 mm
129 79 0061	340 mm	10 mm
129 79 008 1	360 mm	10 mm
129 79 0101	380 mm	10 mm
129 79 0121	400 mm	10 mm
129 79 0141	420 mm	10 mm
129 79 0161	440 mm	10 mm
129 79 0181	460 mm	10 mm
129 79 0201	480 mm	10 mm
129 79 0261	320 mm	11 mm
129 79 0281	340 mm	11 mm
129 79 0301	360 mm	11 mm
129 79 0321	380 mm	11 mm
129 79 0341	400 mm	11 mm
129 79 0361	420 mm	11 mm
129 79 0381	440 mm	11 mm
129 79 0401	460 mm	11 mm
129 79 0421	480 mm	11 mm
129 79 044 1	500 mm	11 mm
129 79 0501	320 mm	12 mm
129 79 0521	340 mm	12 mm
129 79 0541	360 mm	12 mm
129 79 0561	380 mm	12 mm
129 79 0581	400 mm	12 mm
129 79 0601	420 mm	12 mm
129 79 0621	440 mm	12 mm
129 79 0681	220 mm	12
129 79 0001	320 mm 340 mm	13 mm
129 79 0701	340 mm	13 mm 13 mm
129 79 0721	380 mm	13 mm
129 79 0741	400 mm	13 mm
129 79 0701	400 mm	13 mm
129 79 0801	420 mm	13 mm
129 79 0821	460 mm	13 mm
129 79 0841	480 mm	13 mm
129 79 0861	500 mm	13 mm
	500 11111	

	A	diameter
129 79 0921	360 mm	14 mm
129 79 0941	380 mm	14 mm
129 79 0961	400 mm	14 mm
129 79 0981	420 mm	14 mm
129 79 1001	440 mm	14 mm
129 79 1061	320 mm	15 mm
129 79 1081	340 mm	15 mm
129 79 1101	360 mm	15 mm
129 79 1121	380 mm	15 mm
129 79 1141	400 mm	15 mm
129 79 1161	420 mm	15 mm
129 79 1181	440 mm	15 mm
129 79 1201	460 mm	15 mm
129 79 1221	480 mm	15 mm
129 79 1241	500 mm	15 mm



RECONSTRUCTION NAIL – RIGHT





RECONSTRUCTION NAIL – RIGHT



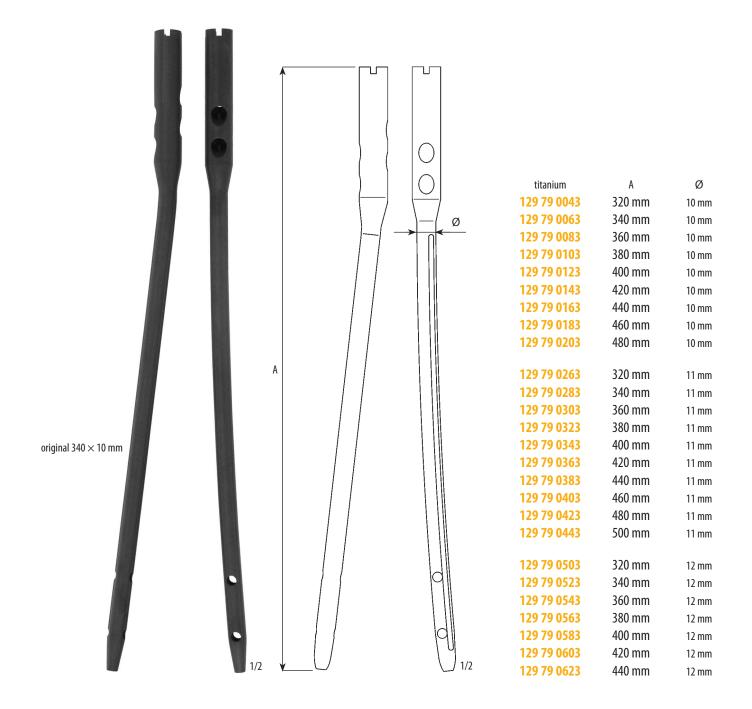
	A	diameter
129 79 0031	320 mm	10 mm
129 79 0051	340 mm	10 mm
129 79 0071	360 mm	10 mm
129 79 0091	380 mm	10 mm
129 79 0111	400 mm	10 mm
129 79 0131	420 mm	10 mm
129 79 0151	440 mm	10 mm
129 79 0171	460 mm	10 mm
129 79 0191	480 mm	10 mm
129 79 0251	320 mm	11 mm
129 79 0271	340 mm	11 mm
129 79 0291	360 mm	11 mm
129 79 0311	380 mm	11 mm
129 79 0331	400 mm	11 mm
129 79 0351	420 mm	11 mm
129 79 0371	440 mm	11 mm
129 79 0391	460 mm	11 mm
129 79 0411	480 mm	11 mm
129 79 0431	500 mm	11 mm
129 79 0491	320 mm	12 mm
129 79 0511	340 mm	12 mm
129 79 0531	360 mm	12 mm
129 79 0551	380 mm	12 mm
129 79 0571	400 mm	12 mm
129 79 0591	420 mm	12 mm
129 79 0611	440 mm	12 mm
129 79 0671	320 mm	13 mm
129 79 0691	340 mm	13 mm
129 79 0711	360 mm	13 mm
129 79 0731	380 mm	13 mm
129 79 0751	400 mm	13 mm
129 79 0771	420 mm	13 mm
129 79 0791	440 mm	13 mm
129 79 0811	460 mm	13 mm
129 79 0831	480 mm	13 mm
129 79 0851	500 mm	13 mm

	А	diameter
129 79 0911	360 mm	14 mm
129 79 0931	380 mm	14 mm
129 79 0951	400 mm	14 mm
129 79 0971	420 mm	14 mm
129 79 0991	440 mm	14 mm
120 70 1051	220	45
129 79 1051	320 mm	15 mm
129 79 1071	340 mm	15 mm
129 79 1091	360 mm	15 mm
129 79 1111	380 mm	15 mm
129 79 1131	400 mm	15 mm
129 79 1151	420 mm	15 mm
129 79 1171	440 mm	15 mm
129 79 1191	460 mm	15 mm
129 79 1211	480 mm	15 mm
129 79 1231	500 mm	15 mm





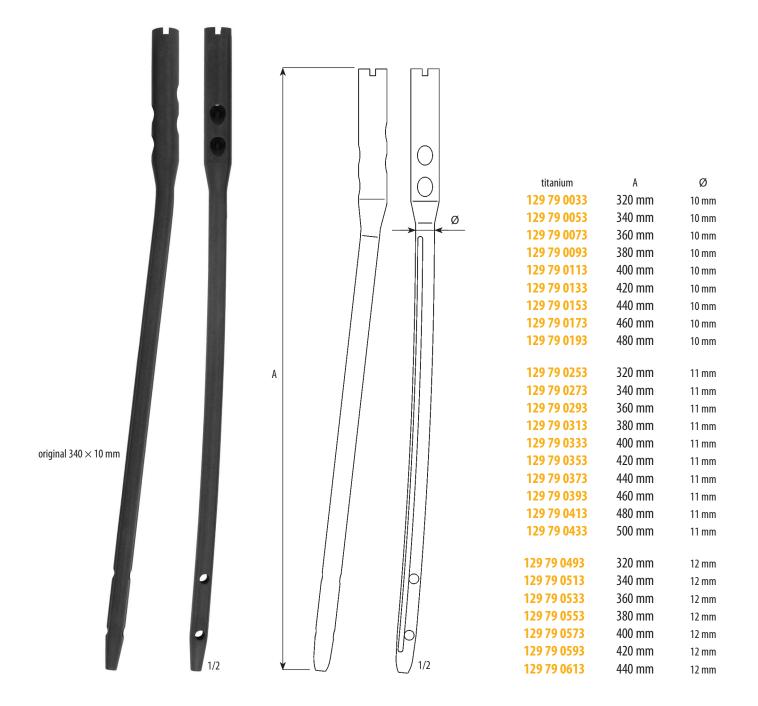
RECONSTRUCTION NAIL – LEFT, TITANIUM



NOTES: TITANIUM version – material: Ti6AI4V ELI, in accordance with ISO 5832-3.

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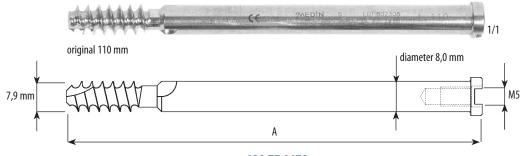
RECONSTRUCTION NAIL – RIGHT, TITANIUM



NOTES: TITANIUM version – material: Ti6AI4V ELI, in accordance with ISO 5832-3.

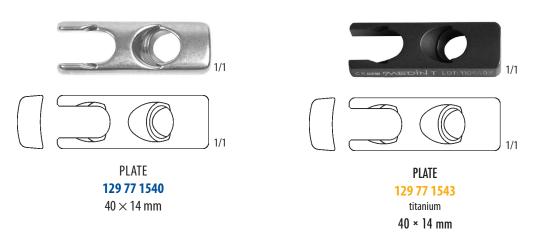


RECONSTRUCTION NAIL - IMPLANTS



129 77 1470 110 mm

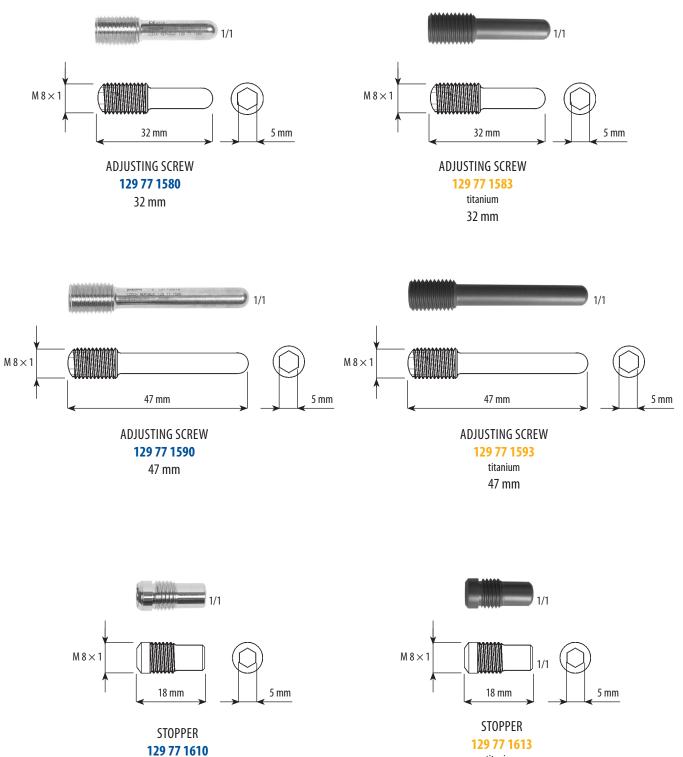
	titanium	А
129 77 1390	129 77 1393	70 mm
129 77 1400	129 77 1403	75 mm
129 77 1410	129 77 1413	80 mm
129 77 1420	129 77 1423	85 mm
129 77 1430	129 77 1433	90 mm
129 77 1440	129 77 1443	95 mm
129 77 1450	129 77 1453	100 mm
129 77 1460	129 77 1463	105 mm
129 77 1470	129 77 1473	110 mm
129 77 1480	129 77 1483	115 mm
129 77 1490	129 77 1493	120 mm
129 77 1500	129 77 1503	125 mm
129 77 1510	129 77 1513	130 mm
129 77 1520	129 77 1523	135 mm



NOTES: TITANIUM version – material: Ti6AI4V ELI, in accordance with ISO 5832-3.



RECONSTRUCTION NAIL – IMPLANTS



18 mm

titanium 18 mm

NOTES: TITANIUM version – material: Ti6AI4V ELI, in accordance with ISO 5832-3.



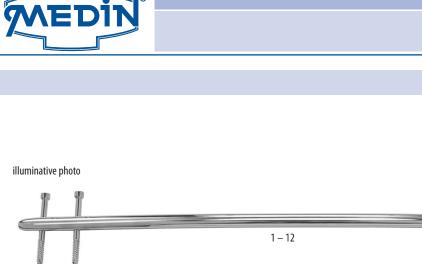
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13 – 26

27

RECOMMENDED LINE-UP

29 28 30



31 – 34

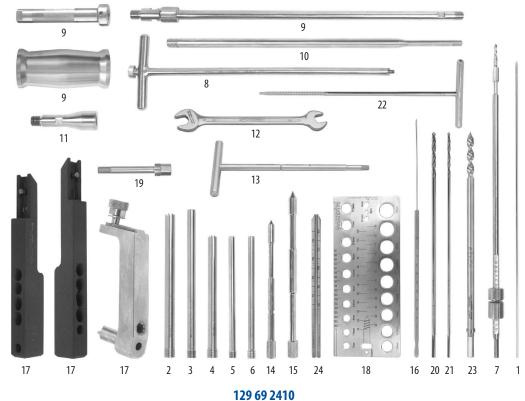
		titanium	
1	129 79 0041 ÷ 0201	129 79 0043 ÷ 0203	RECONSTRUCTION NAIL LEFT; DIAMETER 10 mm
2	129 79 0261 ÷ 0441	129 79 0263 ÷ 0443	RECONSTRUCTION NAIL LEFT; DIAMETER 11 mm
3	129 79 0501 ÷ 0621	129 79 0503 ÷ 0623	RECONSTRUCTION NAIL LEFT; DIAMETER 12 mm
4	129 79 0681 ÷ 0861		RECONSTRUCTION NAIL LEFT; DIAMETER 13 mm
5	129 79 0921 ÷ 1001		RECONSTRUCTION NAIL LEFT; DIAMETER 14 mm
6	129 79 1061 ÷ 1241		RECONSTRUCTION NAIL LEFT; DIAMETER 15 mm
7	129 79 0031 ÷ 0191	129 79 0033 ÷ 0193	RECONSTRUCTION NAIL RIGHT; DIAMETER 10 mm
8	129 79 0251 ÷ 0431	129 79 0253 ÷ 0433	RECONSTRUCTION NAIL RIGHT; DIAMETER 11 mm
9	129 79 0491 ÷ 0611	129 79 0493 ÷ 0613	RECONSTRUCTION NAIL RIGHT; DIAMETER 12 mm
10	129 79 0671 ÷ 0851		RECONSTRUCTION NAIL RIGHT; DIAMETER 13 mm
11	129 79 0911 ÷ 0991		RECONSTRUCTION NAIL RIGHT; DIAMETER 14 mm
12	129 79 1051 ÷ 1231		RECONSTRUCTION NAIL RIGHT; DIAMETER 15 mm
13	129 77 1390	129 77 1393	SCREW; 70 mm
14	129 77 1400	129 77 1403	SCREW; 75 mm
15	129 77 1410	129 77 1413	SCREW; 80 mm
16	129 77 1420	129 77 1423	SCREW; 85 mm
17	129 77 1430	129 77 1433	SCREW; 90 mm
18	129 77 1440	129 77 1443	SCREW 95 mm
19	129 77 1450	129 77 1453	SCREW 100 mm
20	129 77 1460	129 77 1463	SCREW; 105 mm
21	129 77 1470	129 77 1473	SCREW; 110 mm
22	129 77 1480	129 77 1483	SCREW; 115 mm
23	129 77 1490	129 77 1493	SCREW; 120 mm
24	129 77 1500	129 77 1503	SCREW; 125 mm
25	129 77 1510	129 77 1513	SCREW; 130 mm
26	129 77 1520	129 77 1523	SCREW; 135 mm
27	129 77 1540	129 77 1543	PLATE
28	129 77 1580	129 77 1583	ADJUSTING SCREW
29	129 77 1590	129 77 1593	ADJUSTING SCREW
30	129 77 1610	129 77 1613	STOPPER
31	129 79 1510 ÷ 1770	129 79 1513 ÷ 1773	LOCKING SCREW
32	129 79 1500 ÷ 1760	129 79 1503 ÷ 1763	LOCKING SCREW
33	129 79 4810 ÷ 4940	129 79 4813 ÷ 4943	LOCKING SCREW
34	129 79 9631 ÷ 9761	129 79 9634 ÷ 9764	LOCKING SCREW WITH LOWER PROFILE OF THE THREAD

NOTES: TITANIUM version – material: Ti6AI4V ELI, in accordance with ISO 5832-3.

RECONSTRUCTION NAIL INSTRUMENTS



INSTRUMENTATION



set

number	of	pcs
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1	129 09 3160	GUIDE WIRE; diameter 2,5 mm	3
2	129 69 1170	SLEEVE; diameter 10,0 mm	2
3	129 69 1180	SLEEVE 1; diameter 2,55 mm	2
4	129 69 1190	SLEEVE 2; diameter 8,0 mm	1
5	129 69 1200	SLEEVE 3; diameter 5,0 mm	1
6	129 69 1210	SLEEVE 4; diameter 3,5 mm	1
7	129 69 1580	DRILL	1
8	129 69 1590	T-SHAPED WRENCH	1
9	129 69 1600	MALLET	1
10	129 69 1610	EXTRACTION BAR	1
11	129 69 1620	IMPACTOR	1
12	129 69 1630	WRENCH, 10/12	1
13	129 69 1640	SCREWDRIVER; 175 mm	1
14	129 69 1650	TROCAR	1
15	129 69 1810	TROCAR 1	1
16	129 69 2140	DEPTH GAUGE	1
17	129 69 2210	AIMING DEVICE; 130°/45°;125°/135°	1
18	129 79 1920	DIAMETER MEASURING GAUGE 76×181 mm	1
19	129 79 1980	BOLT	1
20	129 79 4980	DRILL 5×250 mm	1
21	129 79 4990	DRILL 3,5×250 mm	1
22	129 99 0850	DRILL WITH A BACKSTOP; diameter 8,0 mm	1
23	129 99 085 3	WIRE GAUGE	1

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RECONSTRUCTION NAIL













