SMR

MODULAR SHOULDER REPLACEMENT

TT METAL BACK GLENOID BONE GRAFTING

SURGICAL TECHNIQUE

Lima Corporate
Orthopaedic motion

GLENOID BONE GRAFTING SURGICAL TECHNIQUE
Index

Limacorporate S.p.A., as manufacturer of prosthetic devices, does not practice medicine. This surgical technique brochure has been developed in consultation with an experienced surgeon team and provides the surgeon with general guidance when implanting SMR® TT Metal Back. Proper surgical procedures and techniques are necessarily the responsibility of the medical professional. Each surgeon must evaluate the appropriateness of the surgical technique used based on personal medical training, experience and clinical evaluation of each individual patient.

SMR

MODULAR SHOULDER REPLACEMENT

SMR®

The clinically proven SMR® System evolves with the pathology,

allowing the surgeon to choose the most appropriate solution in resurfacing,

fracture replacement, total shoulder, reverse shoulder or revision surgeries[1,2,3,4,5,6,7].

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TT METAL BACK

Based on clinical heritage of the SMR® System [1,2,3,4,5,6,7], TT Metal Back glenoid breaks new ground in glenoid replacement [8,9], combining unique implant design with the exclusive Trabecular Titanium structure. The material, the structure, the mechanical properties and the enhanced initial fixation are the premises for significantly greater primary fixation followed by an improved biologic integration of the implants [10,11,12,13].

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GLENOID BONE GRAFTING SURGICAL TECHNIQUE
Indications, Contraindications and Warnings

Please follow the instructions for use enclosed in the product packaging.

INDICATIONS

The SMR® Shoulder System is intended for partial or total, primary or revision shoulder joint replacement.
The SMR® Anatomic Shoulder System is indicated for partial or total, primary or revision shoulder joint replacement in patients suffering from disability due to:

- non-inflammatory degenerative joint disease including osteoarthritis and avascular necrosis;
- inflammatory degenerative joint disease such as rheumatoid arthritis;
- treatment of acute fractures of the humeral head that cannot be treated with other fracture fixation methods;
- revision of a failed primary implant;
- cuff tear arthropathy (CTA Heads only).

The Large Resection Stems are indicated for oncology applications.

The SMR® Reverse Shoulder System is indicated for primary, fracture or revision total shoulder replacement in a grossly rotator cuff deficient joint with severe arthropathy (disabling shoulder).
The patient's joint must be anatomically and structurally suited to receive the selected implants and a functional deltoid muscle is necessary to use the device.
The Modular SMR® Shoulder System allows the assembly of components in various humeral and glenoid constructs.
The constructs are intended for cemented and uncemented use as specified in the following table.
In the Anatomic shoulder the humeral construct consists of the humeral stem, the humeral body, the adaptor taper and the humeral head.
In the Reverse shoulder the humeral construct consists of the humeral stem, the reverse humeral body and the reverse liner.
On the humeral side the fixation of the humeral stem determines if the construct is cemented or uncemented.
The Anatomic glenoid construct consists of an all polyethylene glenoid or a metal back assembled with a liner while the Reverse glenoid construct consists of the metal back, the connector and the glenosphere. On the glenoid side, the fixation of the all polyethylene glenoid or the metal back determines if the construct is cemented or uncemented.
The intended use of the Glenoid Bone Graft Instruments is to enable the preparation of the bone graft to restore the glenoid anatomy in case of glenoid deficiency (e.g. glenoid type B2 or C according to Walch's classification).

The Glenoid Bone Graft Instruments are intended to be used only with TT Metal Back.

Indications, Contraindications and Warnings

System				Use	
Anatomic	Reverse	Components	Material	Cem.	Not Cem.
•	•	SMR® Stems (Cemented, Cemented Revision)	Ti6Al4V	X	
•	•	SMR® Stems (Cementless Finned, Cementless Revision)	Ti6Al4V		X
•	•	SMR® Large Resection stems	Ti6Al4V	X	
•	•	SMR® Modular Augments	Ti6Al4V	X	
•		SMR® Humeral Bodies (Trauma, Finned)	Ti6Al4V	X	X
•	•	SMR® Reverse Humeral Body	Ti6Al4V	X	X
	•	SMR® Reverse HA Coated Humeral Body	Ti6Al4V+HA		X
	•	SMR® Humeral Extension	Ti6Al4V	X	X
•		SMR® Humeral Heads (Standard, CTA)	CoCrMo	X	X
			Ti6Al4V	X	X
•		SMR® Adaptor Tapers (Neutral, Eccentric)	Ti6Al4V	X	X
•		SMR® CTA Head Adaptor for Reverse Humeral Body	Ti6Al4V	X	X
	•	SMR® Glenospheres	CoCrMo		X
			Ti6Al4V		X
			UHMWPE X-Lima +Ti6Al4V		X
	•	SMR® Connectors	Ti6Al4V		X
	•	Reverse Liners	UHMWPE X-Lima	X	X
			CoCrMo	X	X
			Alumina	X	X
•		SMR® Cemented Glenoids	UHMWPE	X	
•		SMR® 3 Pegs Cemented Glenoids	UHMWPE X-Lima	X	
•	•	SMR® Metal Back Glenoids	Ti6Al4V+PoroTi+HA		X
•	•	SMR® TT Metal Back Baseplate	Ti6Al4V		X
•	•	SMR® TT Metal Back Peg	Ti6Al4V		X
•		SMR® Metal Back Liner	UHMWPE		X
•	•	SMR® Bone screws	Ti6Al4V		X
	•	SMR® Glenoid Plates	Ti		X

Material Standards

Ti6Al4V (ISO 5832-3 - ASTM F1472) - CoCrMo (ISO 5832-12 - ASTM F1537) – Ti (ASTM F67) - UHMWPE (ISO 5834-2 - ASTM F648) Alumina (ISO 6474) – PoroTi Titanium Coating (ASTM F1580) – HA Hyroxyapatite Coating (ISO 13779)

WARNINGS

In selecting patients for surgery, the following factors can be critical to the success of the procedure:

- **Partial Shoulder Replacement:** In cases with a deficient and unreconstructable rotator cuff, a CTA-head is indicated.
- **Total Shoulder Replacement:** The rotator cuff must be intact or reconstructable. In cases with a deficient and unreconstructable rotator cuff, a hemiprosthesis with a CTA head or a Reverse Total Shoulder Arthroplasty is indicated.
- **Reverse Shoulder Replacement:** The bone stock of the glenoid and humerus must be able to support the implant. In cases with significant bone loss and in which adequate fixation on the glenoid side cannot be obtained, a hemiarthroplasty with a CTA-head should be performed.
- **Bone Grafting:** Once removed the graft should be inspected to ensure the bone quality is adequate for use with the glenoid bone grafting technique. The glenoid bone grafting technique should never be used with poor quality bone, as it may compromise bone healing.

Note. *With CTA Heads the use of Trauma Humeral Bodies is recommended to avoid possible impingement between the head and the body when using the Finned Humeral Body.*

Note. *The metal back size "Large" is not suitable for coupling with 36 mm glenospheres.*

CONTRAINDICATIONS

Absolute contraindications include:

- local or systemic infection;
- septicaemia;
- persistent acute or chronic osteomyelitis;
- confirmed nerve lesion compromising shoulder joint function;
- deltoid muscle insufficiency.

Relative contraindications include:

- vascular or nerve diseases affecting the concerned limb;
- poor bone stock (for example due to osteoporosis or extended previous revision surgery) compromising the stability of the implant;
- metabolic disorders which may impair fixation and stability of the implant;
- any concomitant disease and dependence that might affect the implanted prosthesis;
- metal hypersensitivity to implant materials.

In cases of bone tumors, use an appropriate system designed to treat cases requiring large bone resections (SMR® Large Resections Stems). The use of primary or revision implants not designed and intended for use in cases of bone resection may result in a poor outcome and / or failure of the implant or implant fixation.

RISK FACTORS

The following risk factors may result in poor results with this prosthesis:

- overweight;
- strenuous physical activities (active sports, heavy physical work);
- fretting of modular junctions;
- incorrect implant positioning;
- muscle deficiencies;
- multiple joint disabilities;
- refusal to modify postoperative physical activities;
- patient history of infections or falls;
- systemic diseases and metabolic disorders;
- local or disseminated neoplastic diseases;
- drug therapies that adversely affect bone quality, healing, or resistance to infection;
- drug use or alcoholism;
- marked osteoporosis or osteomalacia;
- patient's resistance to disease generally weakened (HIV, tumour, infections);
- severe deformity leading to impaired anchorage or improper positioning of implants;
- osteolysis.

PREOPERATIVE PLANNING

Standard X-rays are used to assist with planning of the operation. It is recommended to use a normal AP-view in internal and external rotation as well as an axillary view, Bernageau or Morrison view. It is recommended to use a CT-Scan in fractures cases and for planning the glenoid insertion.
If required an MRI can be used for clear examination of the extent of the bone deficiency and to see the muscle/capsule quality.
In post-traumatic cases, such as in special cases of disabling shoulder, a neurological exam is helpful for decision making.
Templates are used in all osteoarthritic cases; they can also be used in fracture cases but often in a limited mode, depending on the type of fracture.
The X-ray templates provided for SMR® have a 105% scale; digital templates are available as well.

ANAESTHESIA

Shoulder surgery is one of the areas in which an understanding of the surgery and participation by the anaesthesiologist is especially important for the outcome of the surgery. This applies to accurate preoperative evaluation of the patient as well as intra op techniques.
They should have a good understanding of positioning on the operating table and postoperative pain management.

Shoulder prosthetic replacement can be performed with regional (scalenus) anaesthesia combined with sedation and/or with general anaesthesia.

The modern technique of interscalenic block was introduced by Winnie in 1970 and soon became the standard for anaesthesia and postoperative pain management in shoulder surgery.
Requested surgical positioning (beach chair position) must be accurately followed by the anaesthetic staff to avoid hypotension and consecutive brain hypoperfusion.

Postoperative analgesia is important and can be performed by intravenous, single injection or “on demand” application of analgesics. Patient-controlled analgesia (PCA) is recommended.

POSITIONING

Shoulder arthroplasty is normally performed in a “beach-chair” position; the surgeon needs complete access to the shoulder joint. The arm is free or stabilized by arm-holders. The shoulder must be positioned off the edge of the table to afford unobstructed arm extension.

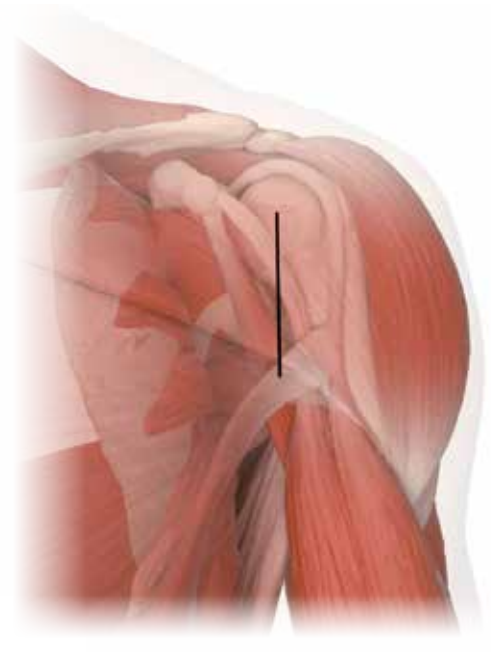
The patient’s head must be supported and stabilized in the neutral position. Nerve injury due to brachial plexus traction during positioning and surgery must be avoided.
If possible, one assistant should stay behind the shoulder, the second on the opposite side of the patient, so that the surgeon has a complete anterior view of the shoulder and can move the joint without any obstacle.

ACCESS

We recommend two types of surgical approaches to the shoulder joint. As in every surgical procedure, the access depends not only on diagnosis and planned surgical treatment but also on the experience of the surgeon.

Ranges of glenohumeral motion are evaluated with the patient under anaesthesia to confirm the preoperative assessment and the extent of capsular release needed to restore the ROM postoperatively.

DELTO-PECTORAL APPROACH



Anterior vertical incision, starting 1 cm laterally of the coracoid bone, slanting towards the axillary's pouch.
If there is a metaphysal fracture, slanting laterally towards the deltoid insertion at the humerus. The cephalic vein is retracted laterally with the deltoid muscle. The clavipectoral fascia is incised along the lateral edge of the conjoined tendon up to the coracoacromial ligament.

With the clavipectoral fascia incised, a retractor can easily be placed over the superolateral aspect of the humeral head to retract the deltoid. The conjoined tendon is retracted medially.
The musculocutaneous nerve penetrates the lateral coracobrachialis muscle 3 to 8 cm distally of the tip of the coracoid process. The position of the axillary nerve should be identified along the anterior surface of the subscapularis muscle, below the conjoined tendon. The axillary nerve crosses the inferolateral border of the subscapularis 3 to 5 mm medially of its musculotendinous junction and has an intimate anatomic relation with the inferior capsule of the shoulder joint.
The anterior humeral circumflex artery and veins are visualized, ligated and divided.
The subscapularis tendon is released, divided 1 cm medially to its attachment or with some bone chip of the lesser tuberosity. Separation of the subscapularis from the capsule and incision of the capsule is performed to the inferior border of the glenoid rim, protecting the axillary nerve with a blunt retractor. Release of the subscapularis and 360° capsular release.

Closure: In fracture cases, accurate reconstruction of the minor and major tubercles by suture, bone anchors or cerclage is mandatory.
If the long head of the biceps tendon is intact, reconstruct also the biceps groove to avoid impingement. Closure of delto-pectoral groove.

LATERAL (DELTOID SPLITTING) APPROACH

Begin the incision at the anterolateral tip of the acromion and carry it distally over the deltoid muscle about 5 cm. Define the tendinous interval on 4 to 5 cm between the anterior and middle thirds of the deltoid; splitting the muscle here provides an avascular approach to underlying structures.

Incise the thin wall of the subdeltoid bursa and explore the rotator cuff as desired by rotating and abducting the arm to bring different parts of it into view.

Figure 1

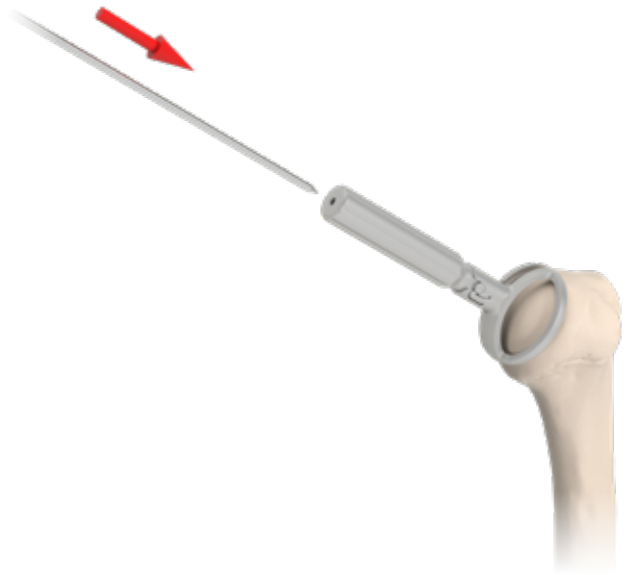


Figure 2

Note. *The glenoid bone graft instruments are intended to be used only with TT Metal Back. In bone grafting technique, using autograft from the patient is preferable whenever available. When using allograft, please follow the instructions provided by the processor. This surgical technique is suitable for structural bone graft only.*

For glenoid bone grafting techniques it is important to use a peg size Medium, Long or X-Long in order to enable a minimum section of the peg into the native bone, providing component stability. The following table identifies the allowed (✓) / not allowed (X) combinations between the bone graft thickness and the pegs dimensions:

		TT METAL-BACK - PEG SIZE							
		SMALL-R				SMALL / STD			
		Short	Medium	Long	X-Long	Short	Medium	Long	X-Long
BONE GRAFT THICKNESS	5 mm GRAFT	x	✓	✓	✓	x	✓	✓	✓
	10 mm GRAFT	x	x	✓	✓	x	✓	✓	✓
	15 mm GRAFT	x	x	✓	✓	x	x	✓	✓
	15° SLOPED GRAFT	x	✓	✓	✓	x	✓	✓	✓
	20° SLOPED GRAFT	x	✓	✓	✓	x	✓	✓	✓

HUMERAL PREPARATION

The humeral head preparation is guided using a 2.5 mm K-wire. The K-wire shall be inserted into an area of the humeral head with enough bone stock in order to ensure that the subsequently obtained bone graft has sufficient thickness to achieve the desired bone-offset from the glenoid. Connect the head K-wire handle (E36) to the head K-wire positioner (D36) *(Figure 1)* and position it on the humeral head *(Figure 2)*, then introduce the 2.5 mm K-wire.

Humeral Preparation

Figure 3

Figure 5

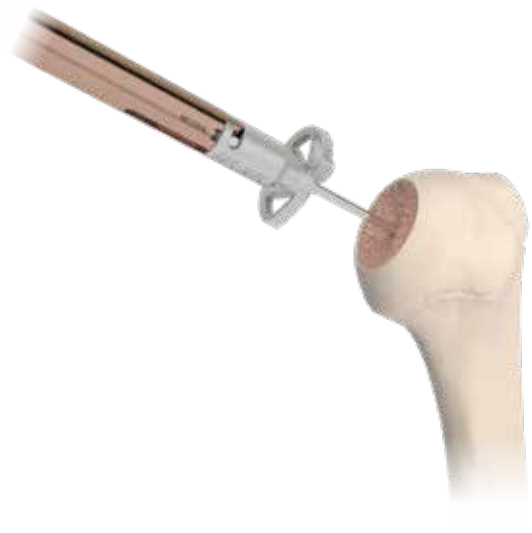


Figure 4

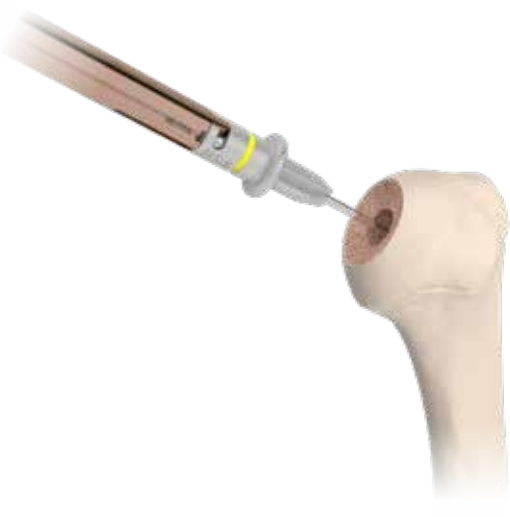


Figure 6

Once the K-Wire has been inserted, connect the glenoid reamer (E33) of the proper size (Small or STD) to the reamers shaft (J33) *(Figure 3)* and to power tool and ream the bone surface *(Figure 4)*. The aim of this operation is just to remove the cartilage and expose the subchondral bone rather than excessive bone removal.

Remove the reamer leaving the K-wire in place and prepare the central hole. The TT Metal Back reamer of the proper size (B35) is assembled with the reamer shaft (A35) and power tool *(Figure 5)*, then passed over the K-wire. The reamer is advanced until the stopper is in contact with the surface of the prepared bone *(Figure 6)*.

Once drilling is complete the TT Metal Back reamer and K-wire can be removed.

The instruments feature colour coding to support the surgical team during implantation. The colour code is yellow for Small-R size and orange for Small/STD size.

Humeral Preparation

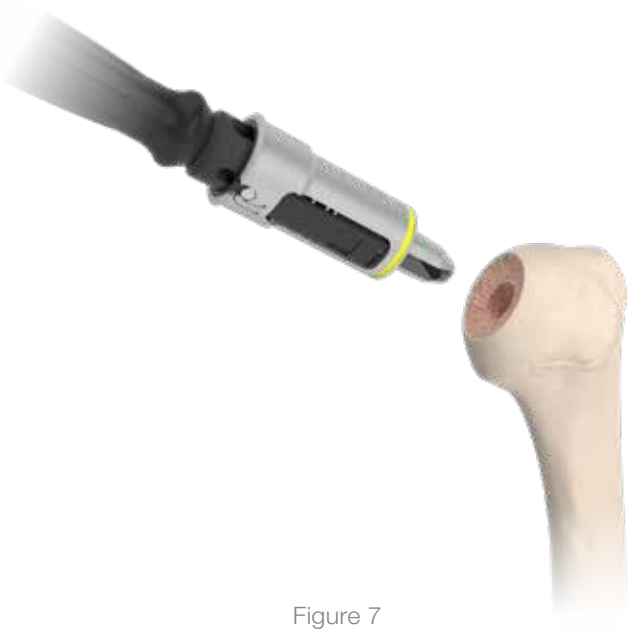


Figure 7

Figure 8

Select the proper size of the adaptor for graft cutter (F36 or H36) in function of the size of the TT Metal Back peg (Small-R or Small/STD) and in function of the required thickness of the bone graft. The adaptors for graft cutters are available in two diameters (Small-R and Small/STD), according to the sizes of TT Metal Back peg, and in three lengths (5, 10 and 15 mm) for producing the bone graft.

Connect the graft cutter (G36) to the power tool and insert it into the prepared hole in the humeral head *(Figure 7)*. When the stopper of the adaptor for graft cutter is in contact with the humerus bone, the hook of the graft cutter will come out to cut the bottom part of the graft by applying pressure *(Figure 8)*. Please note that this operation must be performed gradually while reaming in order to allow a progressive and precise cut of the graft, so do not force the hook to come out if the graft cutter is not rotating but push instead gently the instrument while reaming.
Ensure the graft is fully in contact with the humerus bone before starting the cutting operation. Once the cut has been performed, remove the graft cutter.

Note. *The graft cutter is for preparing cancellous bone grafts only.*

Assembling of the Final Implant

Figure 9

Figure 10

ASSEMBLING OF THE FINAL IMPLANT

Remove the TT Metal Back baseplate and peg of the chosen sizes from the sterile packaging.

Warning. *Peg size must match the baseplate size as described in the warning label on the packaging.*

Apply the peg to the baseplate *(Figure 9)* and secure the connections using the TT Metal Back press (H35) and the torque wrench *(Figure 10)*.

Turn clockwise the torque wrench to achieve “one click” to confirm the proper tightening. Do not exceed recommended torque as excessive tightening may damage the instrument or implant.

Figure 11

Figure 12

Figure 13

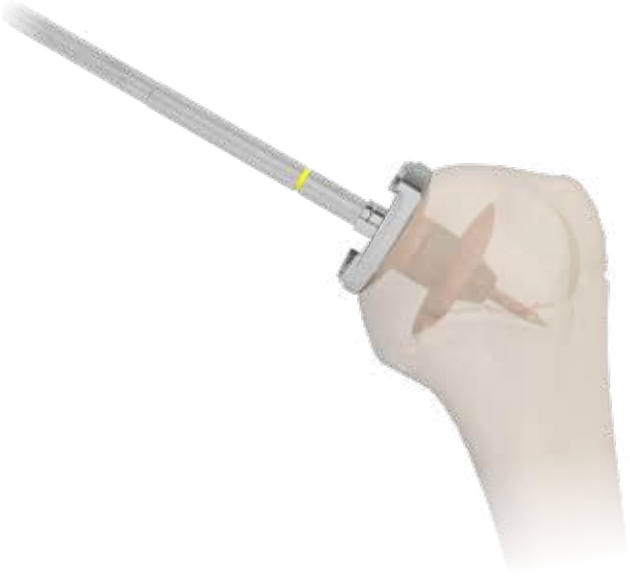


Figure 14

INSERTION OF FINAL TT METAL BACK

Screw the appropriate guide (L36 or O36) (SMALL-R or SMALL/STD) to the final implant and apply the impactor (E35) *(Figures 11-12)*.

Introduce the TT Metal Back into the prepared humeral head by tapping it in with the impactor until there is complete contact with the humerus surface *(Figure 13)*. Then remove the impactor by pressing the release button from the implanted TT Metal Back *(Figure 14)*.

Graft Reaming

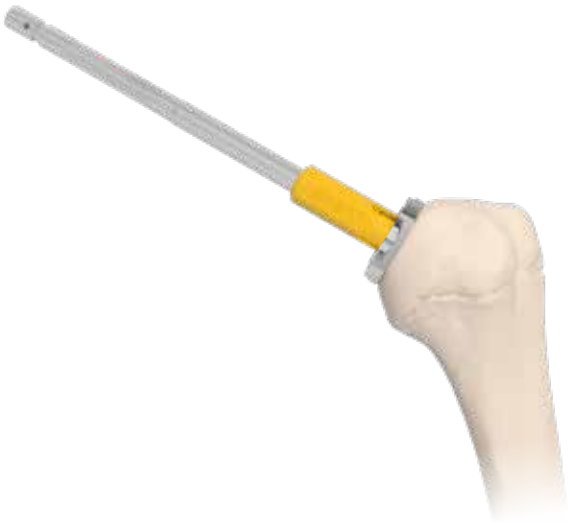


Figure 15

Figure 16

GRAFT REAMING

Choose the stopper (K36 or N36) that should be assembled to the guide according to the chosen thickness of graft (5, 10 or 15 mm) *(Figure 15)*.

Take care to choose properly the stopper as this will determine the progression of the graft reamer.

Connect the proper size of the graft reamer (J36 or M36) to the power tool and position it on the TT Metal Back, using the stopper as a guide *(Figure 16)*.

Ream until the graft reamer stops onto the plastic part of the stopper and then remove the reamer and its guide. Reaming will be completed once the coloured plastic is visible in the middle of the eyelet of the reamer *(Figure 16)*. In this way the bone graft cut is completed also on the diameter.

Figure 17

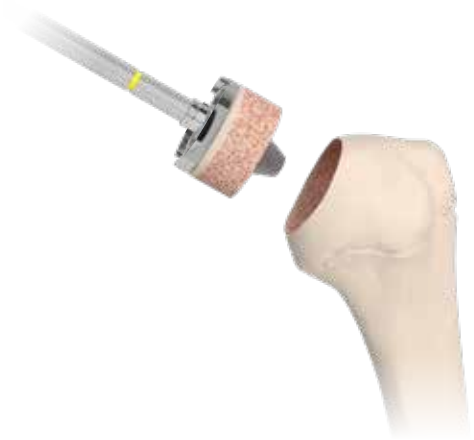


Figure 18

Figure 19

GRAFT EXTRACTION

Use the guide to remove the TT Metal Back with the graft from the humeral head *(Figures 17-18)*.

If necessary a graft pusher (I36) could be used to extract the TT Metal Back and graft from the reamer *(Figure 19)*.

Once removed the graft should be inspected to ensure the bone quality is adequate for use with the glenoid bone grafting technique. The glenoid bone grafting technique should never be used with poor quality bone, as it may compromise bone healing.

Graft Preparation

Figure 20

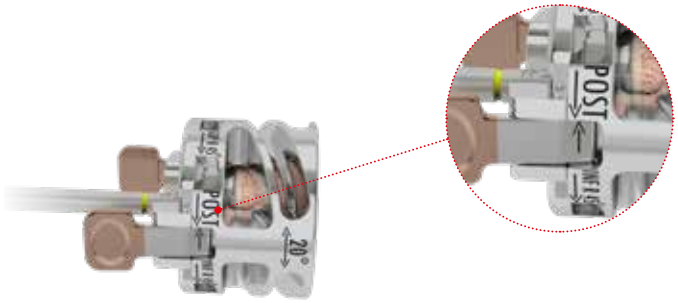


Figure 21

Figure 22

Figure 23

Figure 24

GRAFT PREPARATION

In case a straight bone graft is required move to the section "Glenoid preparation".

If a sloped bone graft is required, choose the graft shaper (Q36) with the proper inclination according to the glenoid deficiency (15° or 20°). Introduce the assembly composed by the guide (L36 or O36) and TT Metal Back with bone graft into the connector for graft shaping (P36) *(Figure 20)*.

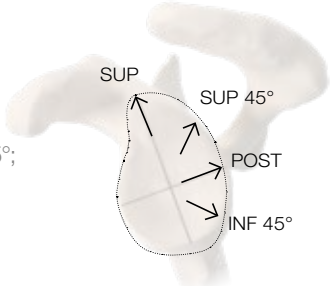
The TT Metal Back should be positioned in the way that the longer axis of the baseplate corresponds with the longer axis of the connector.

Make sure that the TT Metal Back is in the right position before proceeding to the next step.

Align the arrows of the graft shaper and the connector according to the glenoid defect *(Figure 21)*.

By rotating the shaper, the sloped graft (15° or 20°) could be positioned in the following directions as marked on the instrument:

- POST: Posterior;
- SUP: Superior;
- SUP R 45°: Superior Right 45°;
- SUP L 45°: Superior Left 45°;
- INF R 45°: Inferior Right 45°;
- INF L 45°: Inferior Left 45°.



Finally secure the components by means of the Metal Back impactor *(Figure 22)*. Insert the headed pins into the dedicated holes of the graft shaper. The pins will be enable to keep the graft in place. Connect the reamer for graft shaping (R36) to the high-speed power tool and cut the bone graft guided by the graft shaper *(Figure 23)*. After completing the cutting phase, remove the headed pins with the extracting pliers (V36) and the TT Metal Back from the graft shaper *(Figure 24)*.

Figure 25

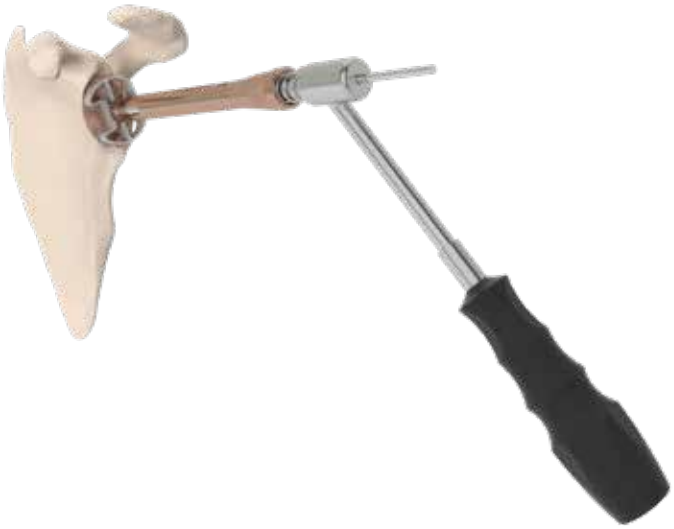


Figure 26

GLENOID PREPARATION

For the glenoid preparation use a 2.5 mm K-wire.
The glenoid preparation will determine the final version of the glenoid component. All corrections should be made at this stage as no corrections can be made when impacting the implant.

The K-wire positioning jigs (A36) are used to obtain the optimal metaglene position. Choose the K-wire positioning jig according to the clinical case and the surgical technique *(Figure 25)*. The jigs are available in two sizes (Small and STD) and with different inclinations (0°, 15° and 20° Anterior, 15° and 20° Inferior). In case of sloped bone graft, the K-wire should be positioned perpendicular to the surface of the eroded glenoid to achieve minimal bone removal.
In case of straight bone graft, the K-wire should have the same direction of the final implant.
Introduce the K-wire with the proper inclination by using the K-wire positioning jigs connected to the K-wire positioning handle *(Figure 26)*.

Glenoid reaming is performed to achieve intimate contact between the glenoid and the undersurface of the bone graft. Connect the glenoid flat reamer (B36) to the reamers shaft (A35), slide the assembly on the k-wire and ream.

In case of sloped bone graft, after the surface reaming phase, the K-wire should be repositioned perpendicular to the final intended glenoid version by using the proper K-wire positioning jig and handle.

GLENOID BONE GRAFTING SURGICAL TECHNIQUE
Glenoid Preparation

Figure 27

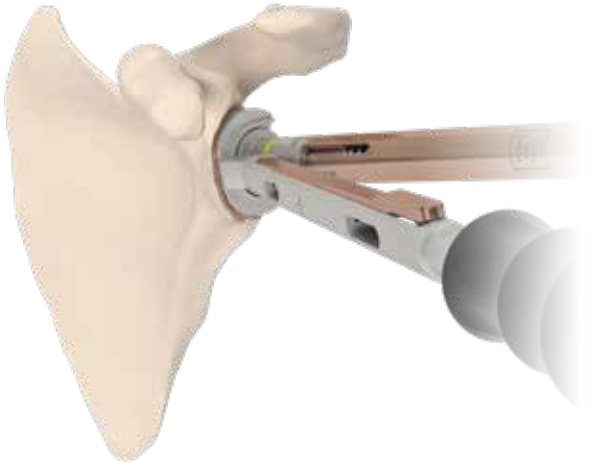


Figure 28

The central hole is prepared using the TT Metal Back reamers (B35) connected to the reamer shaft (A35).

During this phase, use the glenoid stopper jig (C36) of the proper size (5, 10, 15 mm or 15°, 20° Posterior and Superior) connected to the quick connection handle (S36) *(Figure 27)*.

The position of the stopper onto the glenoid shall reproduce the intended orientation for the final implant. Slide the assembly onto the K-wire and drill the central hole until the stop contacts the jig *(Figure 28)*. In this way the glenoid cavity is prepared according to the thickness and the inclination of the bone graft.

Figure 29

Figure 30

FINAL IMPLANT INSERTION

Apply the impactor (E35) to the final implant with guide.

Introduce the TT Metal Back with the bone graft into the glenoid cavity by tapping it in with the impactor *(Figure 29)* until there is complete contact with the glenoid surface *(Figure 30)*.

The long axis of the TT Metal Back should coincide with the larger axis of the glenoid.

Remove the impactor by pressing the release button and unscrew the impactor guide from the implanted TT Metal Back.

Option - The impactor can be used as a counter torque during the removal phase: first unscrew the guide using the screwdriver (L30) on the top of the assembly, then remove the impactor and the guide together. Press the release button to separate the guide from the impactor.

GLENOID BONE GRAFTING SURGICAL TECHNIQUE
Final Implant Insertion

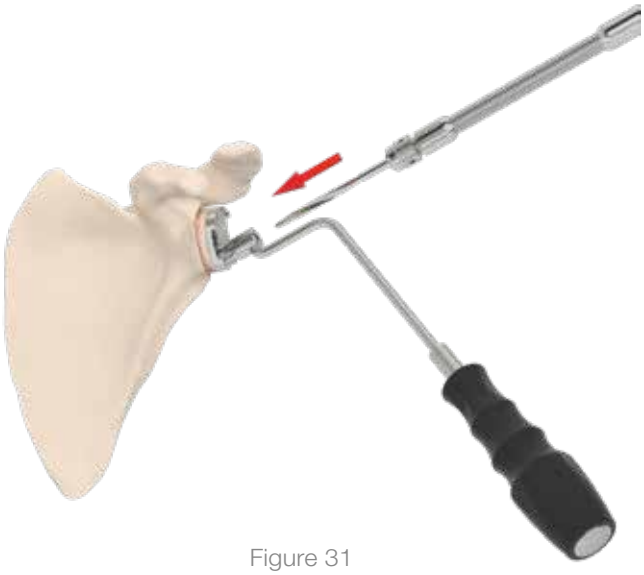


Figure 31

Figure 32

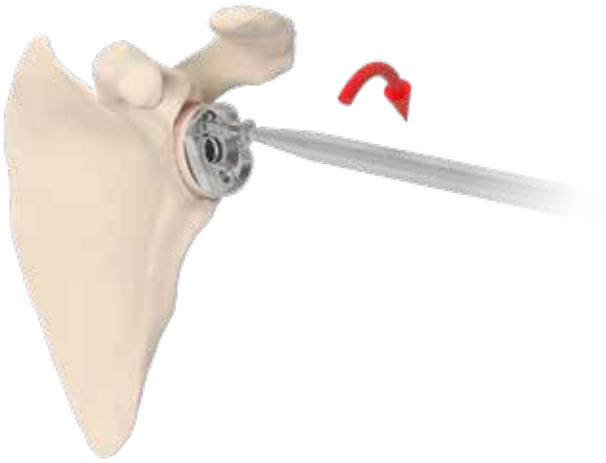


Figure 33

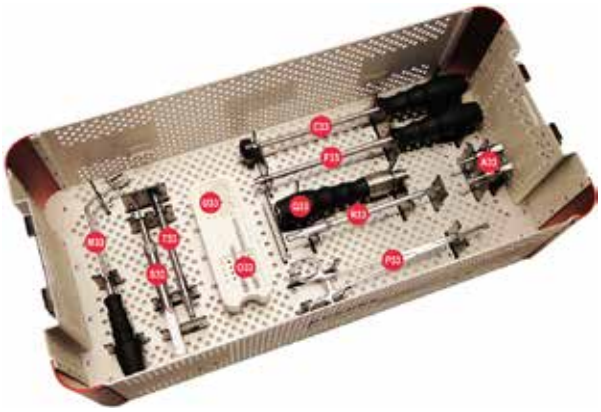
Once the TT Metal Back glenoid has been positioned, drill the sites for the fixation screw using the flexible drill shaft (T33) attached to the 3.5 mm drill (O33) and the drill guide (M33) *(Figure 31)*.
A 4 mm drill (U36) could be used to prepare the sites of the screws into the graft portion.
After having prepared the seating of the screw, complete the holes preparation by means of the tap drill (T36) *(Figure 32)*.

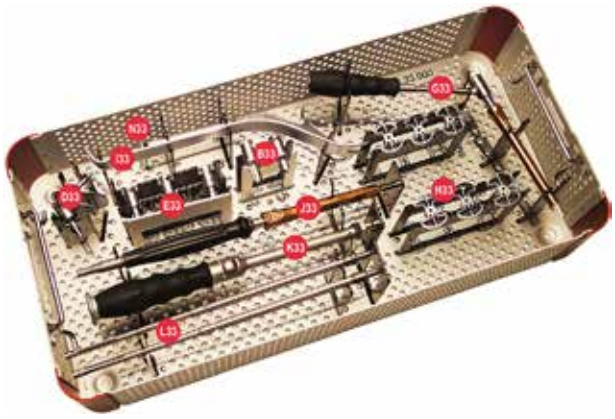
Finally tighten the two screws using the screwdriver (L30) *(Figure 33)* at the same time in order to guarantee the best fit of the TT Metal Back into the prepared glenoid.

Verify that the screws enable the proper graft fixation into the native glenoid bone and are properly oriented to avoid the protrusion through the outside walls of the graft.
Finally, it is important to ensure that the bone graft and TT Metal Back are fully seated against the native glenoid and to check the proper stability of the implant.

Once the TT Metal Back has been inserted, the choice of using a reverse or an anatomic prosthesis can be made thanks to the implant modularity. Both cases are described in the standard surgical technique of the SMR® System.

9013.33.000 Glenoid Instrument Set for SMR® Shoulder Prosthesis





Ref.	CODE	DESCRIPTION	Qty.
A33	9013.02.305	Extractor for Small-R MB Glenoid	1
A33	9013.02.310	Extractor for MB Glenoid	1
B33	9013.75.125	Glenoid Drill - Small-R	1
B33	9013.75.130	Glenoid Drill - Small/STD/Large	1
C33	9013.75.140	Cemented Glenoid Pusher	1
D33	9013.75.150	Humeral Cover Small	1
D33	9013.75.151	Humeral Cover Large	1
E33	9013.75.160	Glenoid Reamer Small	1
E33	9013.75.165	Glenoid Reamer STD	1
E33	9013.75.170	Glenoid Reamer Large	1
F33	9013.75.180	Liner Inserter	1
G33	9013.75.301	K-Wire Positioning Handle	1
H33	9013.75.315	K-Wire Positioning Jig S 0°	1
H33	9013.75.316	K-Wire Positioning Jig S 10°	1
H33	9013.75.317	K-Wire Positioning Jig S 10° ANT	1
H33	9013.75.325	K-Wire Positioning Jig STD 0°	1
H33	9013.75.326	K-Wire Positioning Jig STD 10°	1
H33	9013.75.327	K-Wire Positioning Jig STD 10° ANT	1
I33	9013.75.330	Glenoid Retractor	1
J33	9013.75.350	Reamers and Drills Shaft	1
K33	9013.75.385	Metal Back Impactor	1
L33	9013.75.386	Guide for Metal Back Impactor - Small-R	1
L33	9013.75.387	Guide for Metal Back Impactor - Small/ STD/Large	1
M33	9013.75.400	Drill Guide	1
N33	9075.10.281	Fukuda	1
O33	9084.20.081	Helix Drill Dia. 3.5mm	1
O33	9084.20.086	Long Helix Drill Dia 3.5mm x 79mm	1
P33	9095.10.115	Screw Pliers	1
Q33	9095.10.227	Ratchet Handle with Zimmer Connection	1
R33	9095.10.228	Screwdriver Shaft	1
S33	9095.11.301	Depth Gauge	1
T33	9095.11.700	Flexible Mandrel	1
U33	9013.75.181	Suction Cup for Liner Inserter	2
	9013.33.990	Instrument Tray	1

GLENOID BONE GRAFTING SURGICAL TECHNIQUE
Instrument Set

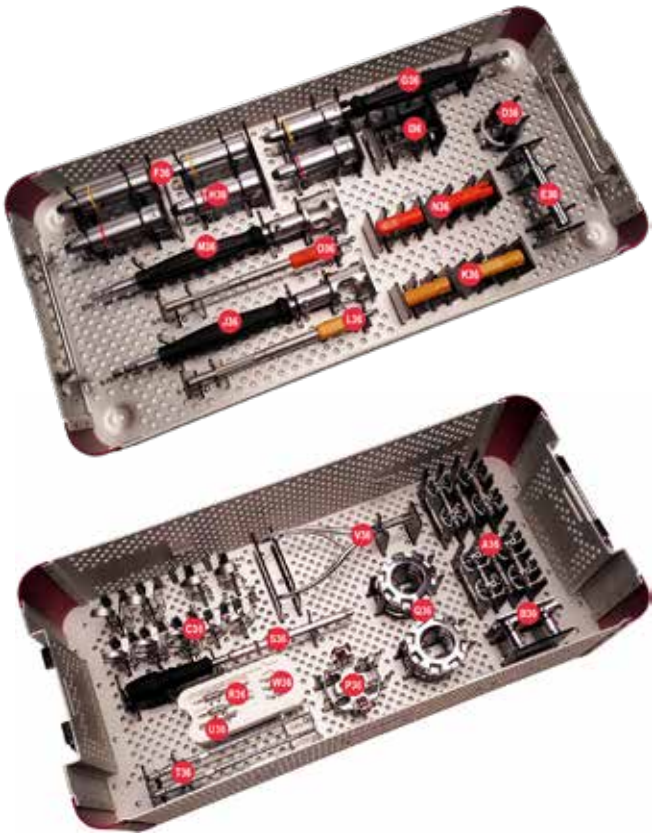
9013.35.000 TT Metal Back Set

Ref.	CODE	DESCRIPTION	Qty.
A35	9013.75.350	Glenoid Reamer Shaft	1
B35	9013.75.351	SMALL-R # SHORT Reamer	1
B35	9013.75.352	SMALL-R # MEDIUM Reamer	1
B35	9013.75.353	SMALL-R # LONG Reamer	1
B35	9013.75.354	SMALL-R # X-LONG Reamer	1
B35	9013.75.361	# SHORT Reamer	1
B35	9013.75.362	# MEDIUM Reamer	1
B35	9013.75.363	# LONG Reamer	1
B35	9013.75.364	# X-LONG Reamer	1
C35	9013.75.370	Compactor Handle	1
D35	9013.75.371	SMALL-R # SHORT Compactor	1
D35	9013.75.372	SMALL-R # MEDIUM Compactor	1
D35	9013.75.373	SMALL-R # LONG Compactor	1
D35	9013.75.374	SMALL-R # X-LONG Compactor	1
D35	9013.75.381	# SHORT Compactor	1
D35	9013.75.382	# MEDIUM Compactor	1
D35	9013.75.383	# LONG Compactor	1
D35	9013.75.384	# X-LONG Compactor	1
E35	9013.75.385	Impactor	1
F35	9013.75.386	SMALL-R Impactor Guide	1
F35	9013.75.387	Impactor Guide	1
G35	9095.11.200	T Handle with Zimmer Connection	1
H35	9013.75.390	TT Metal Back Press	1
I35	9013.75.391	SMALL-R Baseplate Extractor	1
I35	9013.75.392	Baseplate Extractor	1
J35	9095.11.251	Multipurpose Handle	1
K35	9013.75.395	SMALL-R Canulated Reamer	1
K35	9013.75.396	Canulated Reamer	1
	9013.35.990	Sterilizable Box	1

9095.11.750 Torque Wrench

CODE	DESCRIPTION
9095.11.750	Torque Wrench

9013.36.000 Glenoid Bone Graft Instrument Set



Ref.	CODE	DESCRIPTION	Qty.
A36	9013.75.312	K-Wire Positionig Jig S 15° ANT	1
A36	9013.75.319	K-Wire Positionig Jig S 20° ANT	1
A36	9013.75.322	K-Wire Positionig Jig STD 15° ANT	1
A36	9013.75.329	K-Wire Positionig Jig STD 20° ANT	1
A36	9013.75.308	K-Wire Positionig Jig S 15° INF	1
A36	9013.75.318	K-Wire Positionig Jig S 20° INF	1
A36	9013.75.309	K-Wire Positionig Jig STD 15° INF	1
A36	9013.75.328	K-Wire Positionig Jig STD 20° INF	1
B36	9013.75.401	SMALL-R/SMALL Glenoid Flat Reamer	1
B36	9013.75.405	STD Glenoid Flat Reamer	1
C36	9013.75.431	5 mm Glenoid Stopper Jig	1
C36	9013.75.432	10 mm Glenoid Stopper Jig	1
C36	9013.75.433	15 mm Glenoid Stopper Jig	1
C36	9013.75.435	Posterior 15° Glenoid Stopper Jig	1
C36	9013.75.436	Posterior 20° Glenoid Stopper Jig	1
C36	9013.75.423	Superior Left 15° Glenoid Stopper Jig	1
C36	9013.75.424	Superior Left 20° Glenoid Stopper Jig	1
C36	9013.75.425	Superior Right 15° Glenoid Stopper Jig	1
C36	9013.75.426	Superior Right 20° Glenoid Stopper Jig	1
D36	9013.75.438	Head K-Wire Positioner	1
E36	9013.75.440	Head K-Wire Handle	1
F36	9013.75.441	SMALL-R 5mm Adaptor for Graft Cutter	1
F36	9013.75.442	SMALL-R 10mm Adaptor for Graft Cutter	1
G36	9013.75.443	Graft Cutter	1
H36	9013.75.451	5mm Adaptor for Graft Cutter	1
H36	9013.75.452	10mm Adaptor for Graft Cutter	1
H36	9013.75.453	15mm Adaptor for Graft Cutter	1
I36	9013.75.455	Graft Pusher	1
J36	9013.75.460	SMALL-R/SMALL Graft Reamer	1
K36	9013.75.462	5mm Stopper for SMALL-R Guide	1
K36	9013.75.463	10mm Stopper for SMALL-R Guide	1
L36	9013.75.464	SMALL-R Guide	1
M36	9013.75.465	STD Graft Reamer	1
N36	9013.75.467	5mm Stopper for Guide	1
N36	9013.75.468	10mm Stopper for Guide	1
O36	9013.75.469	Guide	1
P36	9013.75.470	Connector for Graft Shaper	1
Q36	9013.75.471	15° Graft Shaper	1
Q36	9013.75.472	20° Graft Shaper	1
R36	9013.75.474	Reamer for Graft Shaping	2
S36	9013.75.481	Quick Connection Handle	1
T36	9013.75.485	Tap Drill for Cortical Screw	1
T36	9013.75.486	Tap Drill for Bone Screw	1
U36	9084.20.084	Dia. 4 L40mm Helix Drill	1
V36	9066.22.180	Exctracting Pliers (for Headed Pin)	1
W36	9095.11.C18	Headed Pin Ø2,5x18mm for Graft Shaper	3
	9013.36.990	Sterilizable Box	1

GLENOID BONE GRAFTING SURGICAL TECHNIQUE
Product Codes

TT METAL BACK GLENOID

Ti6Al4V	1375.15.605	Baseplate Small-R
	1375.15.620	Baseplate Small
	1375.15.610	Baseplate Standard
	1375.14.651	Peg S-R Short
	1375.14.652	Peg S-R Medium
	1375.14.653	Peg S-R Long
	1375.14.654	Peg S-R X-Long
	1375.14.661	Peg S/STD Short
	1375.14.662	Peg S/STD Medium
	1375.14.663	Peg S/STD Long
	1375.14.664	Peg S/STD X-Long

BONE SCREWS

Ti6Al4V		DIA. 6.5 mm
	8420.15.010	L. 20 mm
	8420.15.020	L. 25 mm
	8420.15.030	L. 30 mm
	8420.15.040	L. 35 mm
	8420.15.050	L. 40 mm

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