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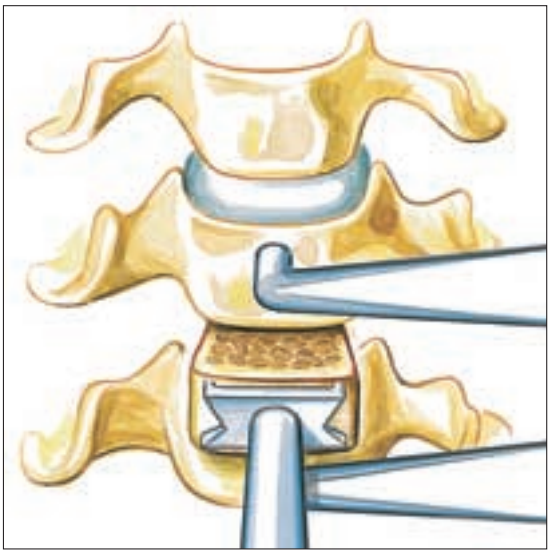

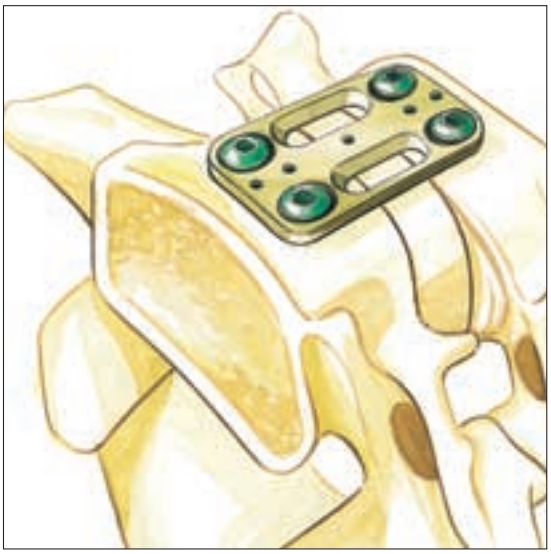

CASPAR evolution -System

Anterior Cervical Plating
Surgical Manual

B BRAUN

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The anterior column of the spine bears approximately 80% of the load under compression, a property which it is essential to preserve or to restore.

A crucial aspect in the emergence of degenerative damage to the cervical spinal column is the resultant high pathology in mobility. It can be deduced from this that the stabilisation or eradication of pathological mobility represents a causal form of treatment at the present time; this is true as presently it is not technically possible to achieve optimum restoration of natural movement.

Tricortical bone graft support is considered the standard treatment. Combined with anterior plate osteosynthesis as a reconstruction of the anterior longitudinal ligament, this technique is a therapy that presents a low level of graft complications such as graft fracture, anterior graft extrusion or graft resorption (under 1%). The recognised later consequences of such complications are for example pseudoarthrosis or misaligned fusion (kyphosis, antero-retrolisthesis) [6, 8, 9].

The advantages of anterior plate osteosynthesis with a tricortical bone graft support apply not only to degenerative instability, but also to

- traumatic
- tumorous
- rheumatic
- bacterial-inflammatory instability (spondylodiscitis)

in cases involving both single and multi-level procedures.

Wolfhard Caspar, M.D., Ph.D.
Homburg/Saar - Germany
October 2000

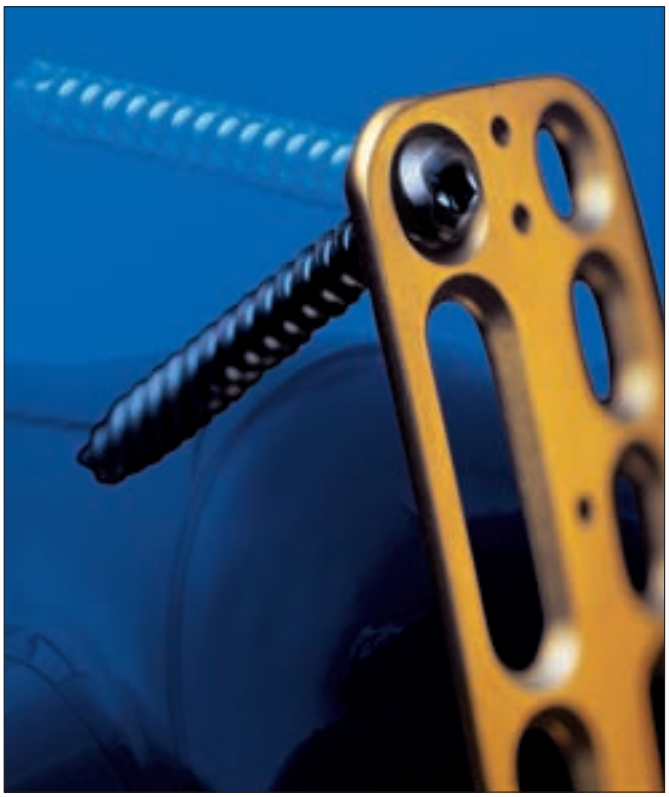
The CASPARevolution system contains surgical instruments and implants for anterior cervical fusion and plate stabilisation. It comprises three functional elements:

- soft tissue retraction to expose the anterior aspect of the spinal column,
- restoration of the natural spine position combined with decompression and fusion,
- stabilisation of the affected spinal segments.

Continuous further development – of both implant materials and technical and surgical procedures, and the putting into practice of many years of experience – are fundamental principles in the CASPARevolution system. The Caspar **cervical system** has been implanted worldwide since 1982, and has been continuously developed right from the start – from practice for practice, as it were. The basic principle of the semi-rigid plate and screw interface has **always** been retained.

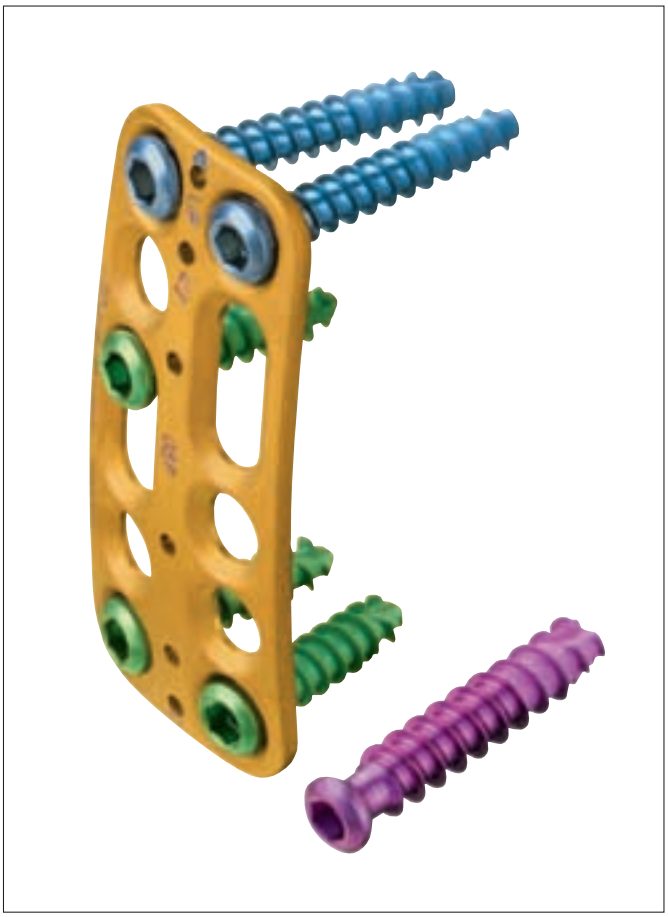
Continuous biomechanical evaluation and further development permit safe application of the system for all indications for anterior cervical decompression, fusion and stabilisation and offer the special aspects of reduced risks and improved results.

All the experiences gained so far have been channelled into the creation of the CASPARevolution **unicortical** screw, which guarantees the same primary stability as the CASPARevolution bicortical screw [7,10]. With this new development, the CASPARevolution system moves another step up the "evolutionary ladder". For evolution means continuous development, with the goal of finding the very best solution. The new unicortical screw generation combines the merits of the Caspar philosophy of the semi-rigid plate and screw interface with the advantages of unicortical fixation.



The CASPARevolution implant system offers numerous advantages:

➤ **Semi-rigid plate and screw interface:**
Semi-rigid interfaces are essentially rigid systems which are in themselves fixed but which are also adaptable under natural loading. The CASPARevolution system semi-rigid plate and screw interface provides a high level of stability [7, 10], which surpasses the stability of the intact segment. At the same time, it adapts to any changes in height of the bone graft and to micro-movements inside the vertebral motion segment. The implant technique allows some force and load transfer onto the bone graft but prevents overloading. This control over the dynamic transfer of force and load onto the anterior spinal column promotes bone integration and therefore fusion. It also greatly reduces the risk of implant breakage through permanent or excessive loading. This is documented by the extremely small incidence of implant dislocation or breakage, pseudarthroses and revision operations [6, 9, 10].

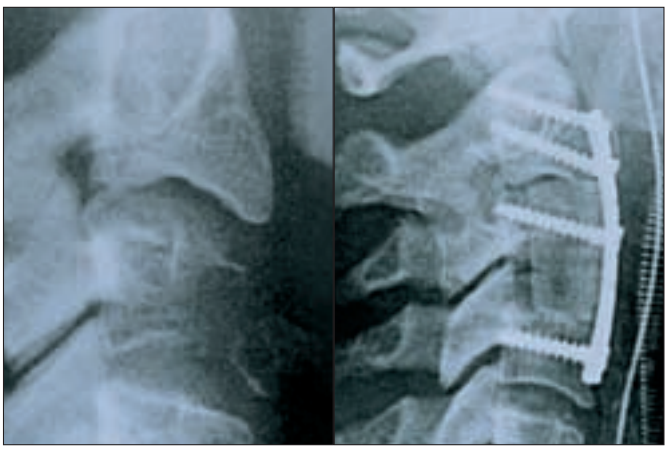


➤ **Comprehensive implant programme:**

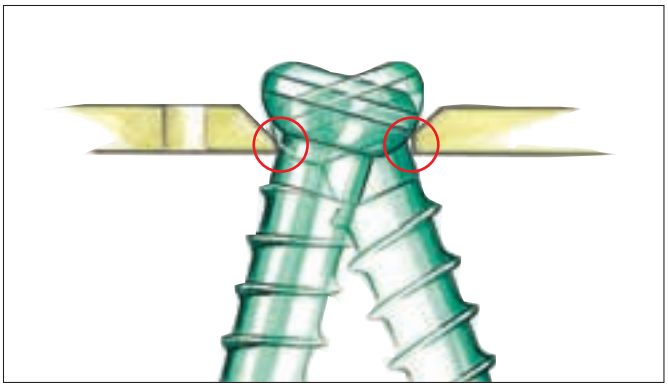
- titanium plates, length 24 – 90 mm
- 4.0 mm self-cutting unicortical screws (overall length 14 – 19 mm)
- 3.5 mm bicortical screws (overall length 10 – 28 mm)
- 4.5 mm revision or osteoporosis screws (overall length 17 – 28 mm).

(The detailed implant programme is shown on Page 18 of this brochure.)

➤ **Variable screw fixation:**
unicortical or bicortical fixation, or even a mix of all screw types can be used in the same surgical procedure. Fast and secure fixation needing no locking mechanism, thus giving a flat implant profile.



➤ **Flat implant profile:**
avoids soft tissue irritation. The small screw head (height 2.2 mm) lies flat in the plate (height 1.5 mm), so that - depending on position - the implant is between 1.5 mm and 2.2 mm high. This is particularly advantageous in patients with delicate cervical soft tissue.



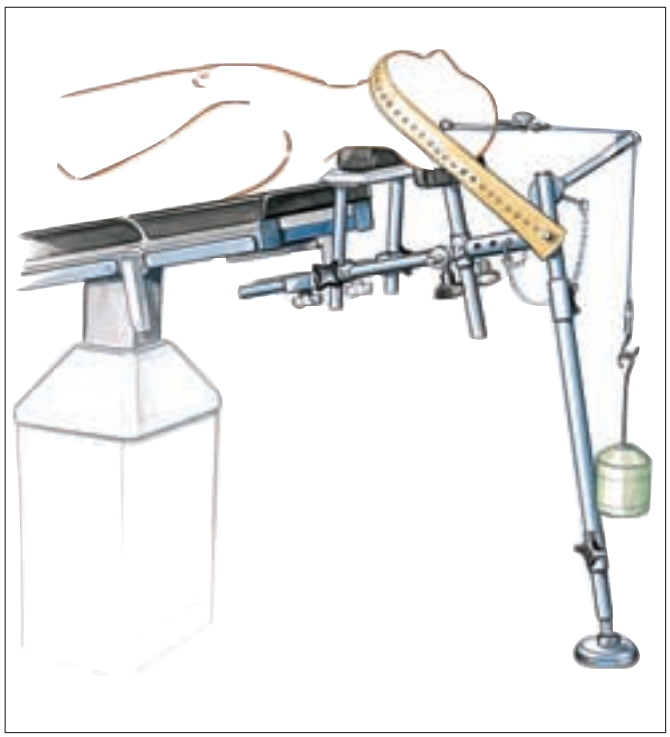
➤ **Smooth, non-threaded screw shaft at the plate-screw interface:**
prevents screw backout.

PATIENT POSITIONING

- Supine
- Lying on the Caspar Neck and Head Rest with lordoric support, slight distraction and external stabilisation by means of skull traction and fixation of the head with elastic band.

! Practical tip:
to prevent pressure marks, gauze compresses or similar should be placed under the elastic band.

- To obtain better x-ray exposure of the affected segments, padding is placed under the shoulders, which is held in place by an arm strap.
- For surgery to the C6/7 and C7/Th1 segments, it is better for the cervical spine to be in a neutral position rather than under lordosis, since this improves x-ray exposure.
- Introduction of the C arm.
- Locate the skin incision with x-ray fluoroscopy.



Patient positioning showing skin incision marking

- Mark the iliac skin incision (1 cm dorsal to the antero-superior iliac spine).
- Sterile covering of the operating area including the C arm.
- Optimum muscle relaxiation.

APPROACH AND EXPOSURE

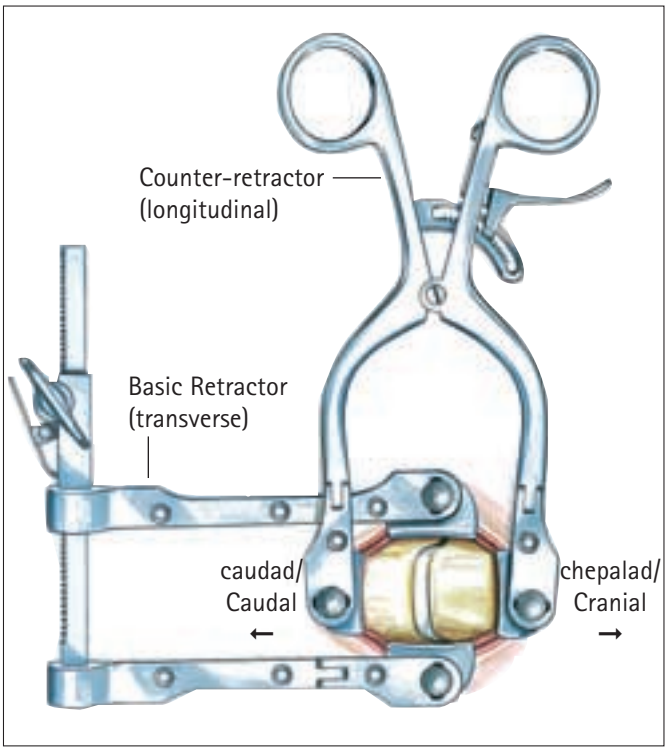
The chosen approach follows the CLOWARD standard approach to the anterior cervical spine, but a collar incision on the left side is preferred by the authors, since this substantially reduces the danger of damaging the laryngeal recurrent nerve from C5/6 downwards. For cosmetic reasons, the authors recommend a diagonal incision along the Langer's lines. However, a longitudinal incision can also be chosen along the anterior edge of the sternocleidomastoid muscle. (This is preferable in tri-segmental and multi-segmental approaches and also in the upper cervical spine area (C2/3) and the cervi-cothoracic transition region).

SOFT TISSUE RETRACTION

After exposure of the anterior aspect of the spine and detachment of the medial insertions of the longus colli muscle on both sides, the CCR (Caspar Cervical Retractor) System is used for soft tissue retraction.

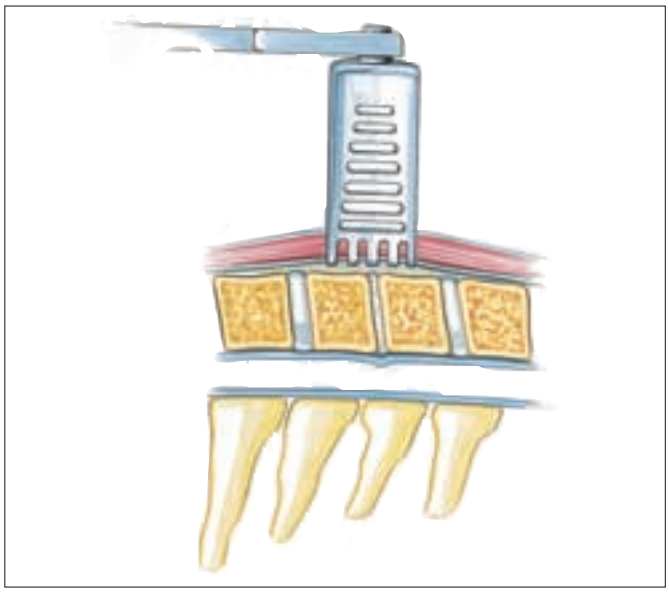
The teeth of the retractor blades must be placed underneath the right and left long cervical muscle, in order to protect both the pressure-sensitive cervical organs (oesophagus, trachea etc.) and also the neurovascular structures (carotid artery, jugular vein, vagus nerve).

This procedure also ensures that the retractor is firmly fixed in the operating site. The x-ray transparency of the titanium retractor blades allows the instrumentation and the spinal column to be clearly seen on the x-ray image. The fenestration on the titanium retractor blades both assists x-ray transparency and prevents the retractors slipping out of place in the operating site.



CCR System in position

Normally the hinged retractor BV 439 R is used for transverse retraction and the counter-retractors BV 491 R or BV 771 R for longitudinal retraction, (BV 771 R is ideally suited for one and two level exposure).



CCR System in position, the teeth of the retractor blades are placed under the longus colli muscle

! **Practical tip:**
where extensive osteosynthesis makes it necessary to retract a larger area, two BV 439 R retractors can be used together (instead of BV 491 R or BV 771 R).

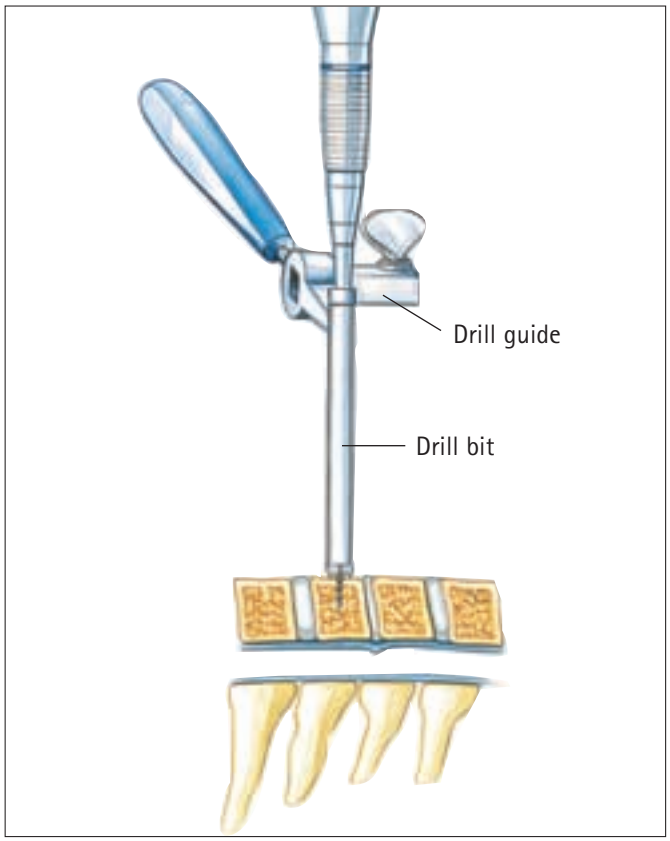
! **NB:**
Each of the following surgical steps must be monitored and performed individually using an image intensifier. This is especially important when working in the intervertebral and epidural space.

DISTRACTION

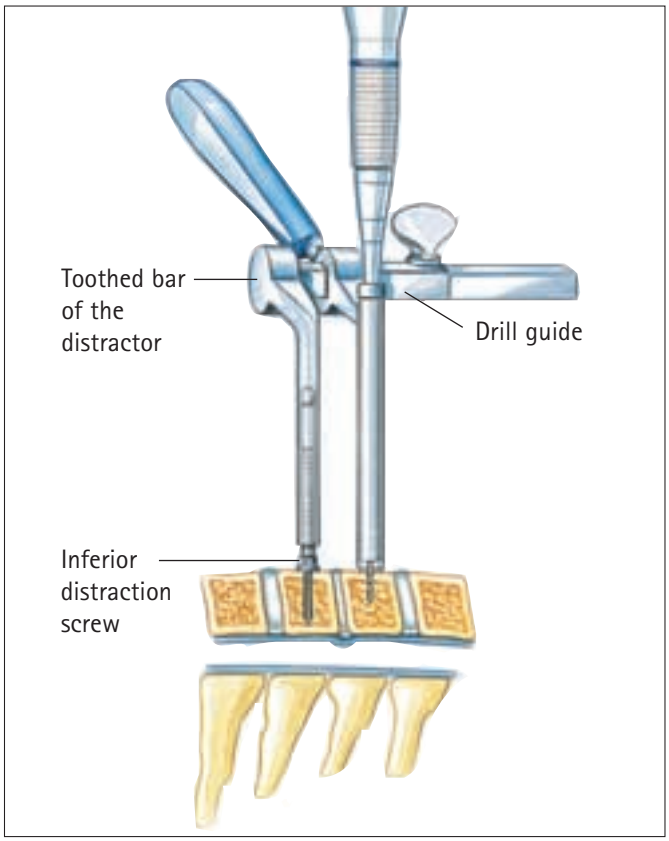
After the intervertebral disc space has been cleaned out as much as possible, the drill guide (FF 907 R / FF 897 R) is used to position the drill hole for the first distraction screw in the middle of the inferior vertebral body. The drilling depth of the drill (FF 908 R) is fixed at 8 mm, in order to exclude the possibility of inadvertant penetration into the spinal canal. The drilling direction usually is orientated approximately parallel to the line of the adjacent vertebral end plates.

Distraction screws are available in various thread lengths (i.e. penetration depths): 12, 14, 16 and 18 mm. They have a self-cutting thread. The correct choice of thread length is determined by the anteroposterior diameter of the vertebral body. The screw should not penetrate the posterior cortex.

! **Practical tip:**
determine the screw length by holding a distraction screw in the cleaned-out intervertebral space and checking it with the image intensifier.



Positioning the first drill hole in the inferior vertebra with the drill guide



Siting the second (superior) distraction screw

The distraction screw is inserted through the drill guide with the screwdriver (FF 906 R). For easier orientation, it is a good idea to leave the drill guide set up on the vertebral body until the distraction screw is screwed in. Moreover, care must be taken to screw in the distraction screw right up to its base plate, in order to embed it firmly in the vertebral body, to prevent screw pull-out during the distraction process.

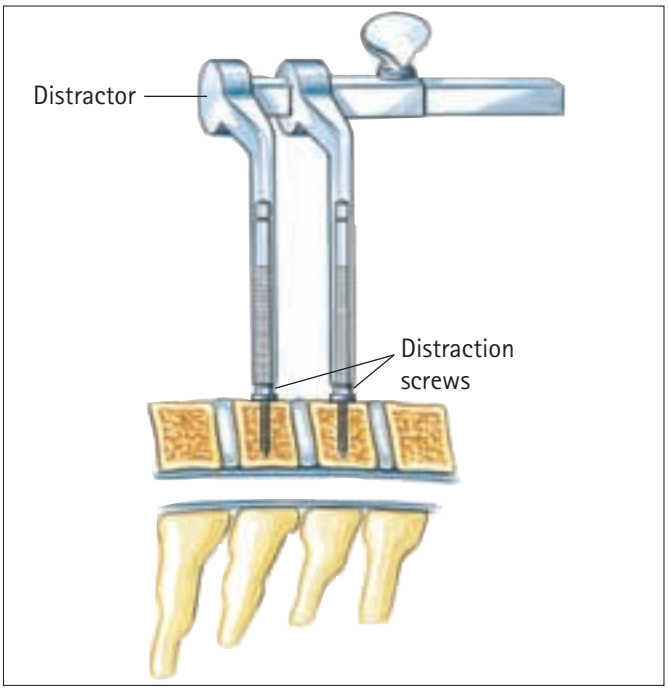
After removing the moveable distractor arm, the drill guide is fitted onto the toothed distractor bar (from BV 891 R / BV 901 R), and this assembly is positioned over the distraction screw which is already in place. This procedure facilitates parallel insertion of the second or any further subsequent (superior) distraction screw.

After drilling in the centre of the vertebral body, the second (superior) distraction screw is screwed in and the drill guide assembly is removed. The drill guide is subsequently taken off the distractor bar and replaced by the moveable distractor arm.

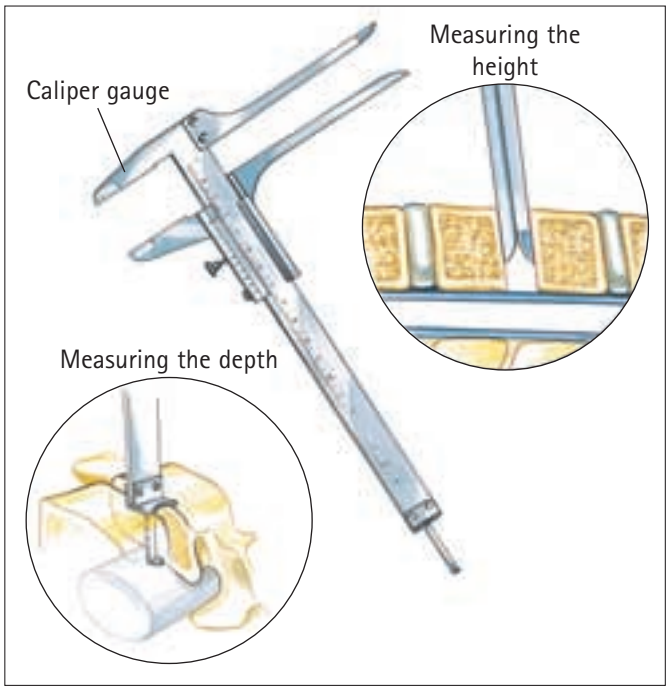
! Practical tip:

in multi-segmental operations, it is advisable to insert a distraction screw in each vertebra, in order to be able to work on the individual segments step by step. By "jumping over" individual distraction screws, it is possible to distract two or more segments simultaneously (e.g. in vertebral resections).

In special cases it may be useful to place the distraction screws not in the centre of the vertebral body, but closer to the endplates in order to obtain more maneuvering space for partial vertebral body resection.



The distraction procedure



Measuring the intervertebral space

The distractor is pushed onto the two distraction screws as far as possible up to the screw base plates. Under distraction, the intervertebral space is now stepwise expanded according to surgical requirements, or restored to the desired height for inserting the fusion graft.

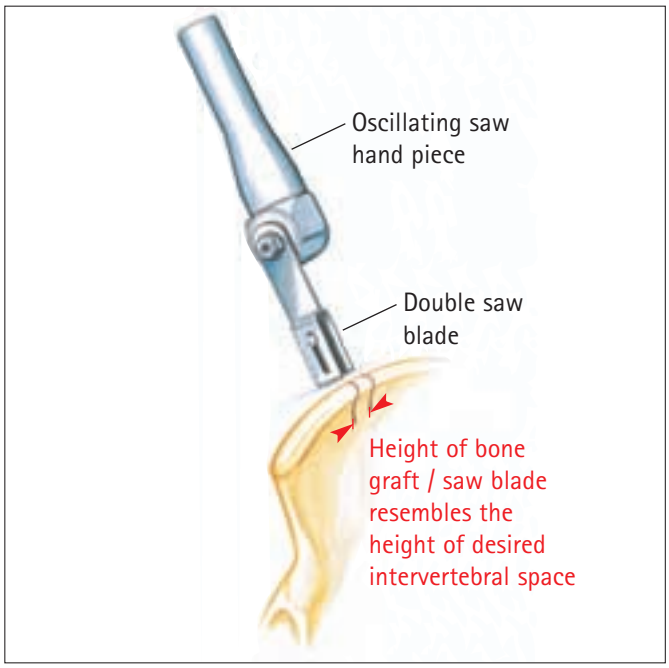
DECOMPRESSION, DISCECTOMY AND PREPARATION OF THE BONE GRAFT SITE

Discectomy is now completed under distraction, and decompression of the neural structures is performed. The posterior longitudinal ligament is normally retrieved and detached with the longitudinal ligament dissector (FF 917 R / FF 918 R) as far as is necessary in order to remove osteophytes. In special cases, where intervertebral disc or bone fragments are present in the spinal canal, or where extensive osteophyte resection is necessary (e.g. in myelopathy patients), the posterior longitudinal ligament must be resected.

The bone graft site is prepared with curettes and burrs, as far as possible plan-parallel. The height and a. p. depth of the intervertebral space are then measured with the caliper gauge (AA 845 R).

BONE GRAFT HARVESTING

A skin incision and muscular detachment (preferably monopolar) is performed over the iliac crest. Using an oscillating saw (GB 129 R) a tricortical bone graft with parallel cut edges is removed. To do this, a double sawblade of the appropriate size for the height of the graft is selected (the graft should be cut 1 mm higher than necessary, to compensate for height loss during fine preparation).

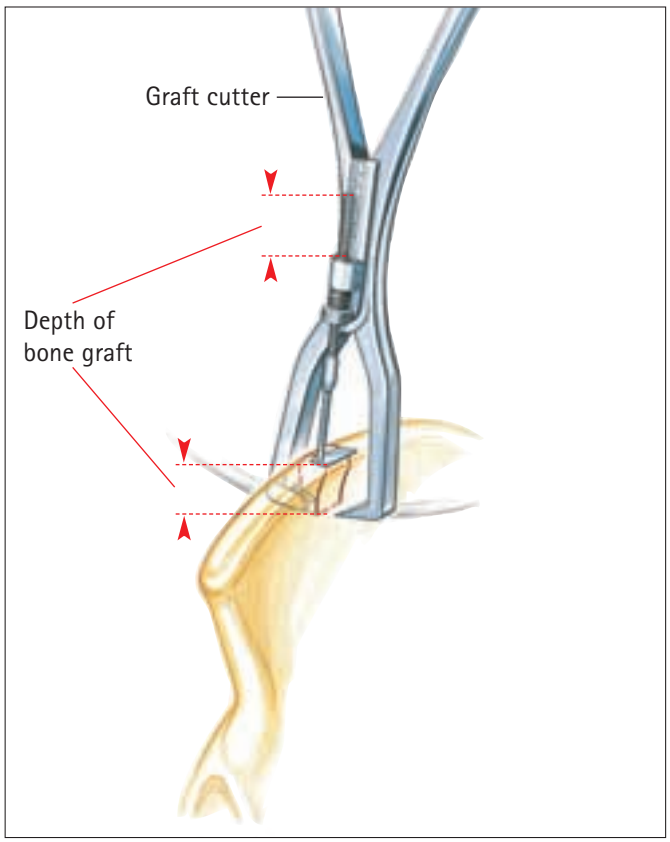


Bone graft harvesting from the iliac crest with the appropriately sized double saw blade

The graft cutter (FF 927 R / FF 928 R) is set to the measured depth of the intervertebral space and the correctly sized bone graft is then cut from the iliac crest. The average depth is around 15 mm.

The graft cutter is available in two sizes:
7 and 10 mm jaw width.

! Practical tip:
for sizes in between and above these jaw widths, the graft is removed by making two "bites" with the graft cutter, turning the cutter through180° for the second bite.

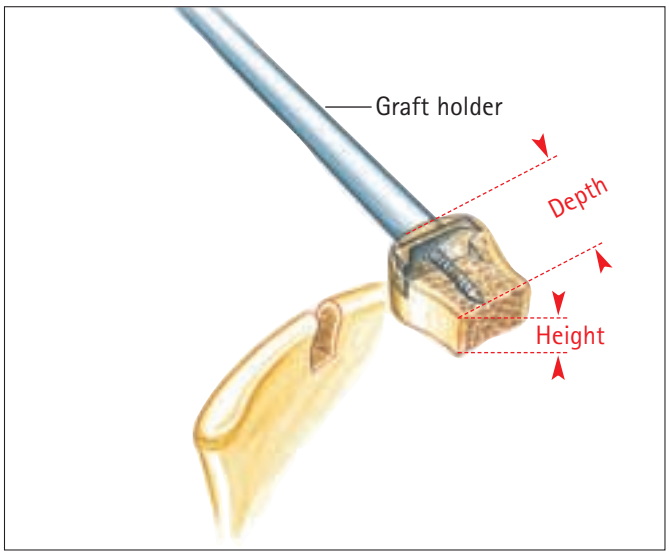


Bone graft harvesting from the iliac crest

This procedure produces a bone graft with the following advantages: the large cancellous bone contact areas provide a good fusion surface for the cleaned vertebral end plates; the three load-bearing cortical edges provide a high degree of stability.

IMPACTING THE BONE GRAFT

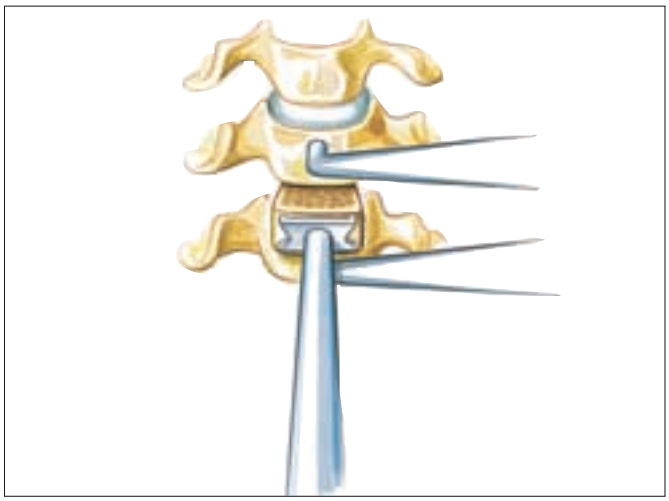
The bone graft is drilled with the FF 908 R drill and then screwed onto the graft holder (FF 911 R).



Screwing the graft onto the graft holder

If the fine preparation to bring the bone graft to its final dimensions is optimally performed, the results are:

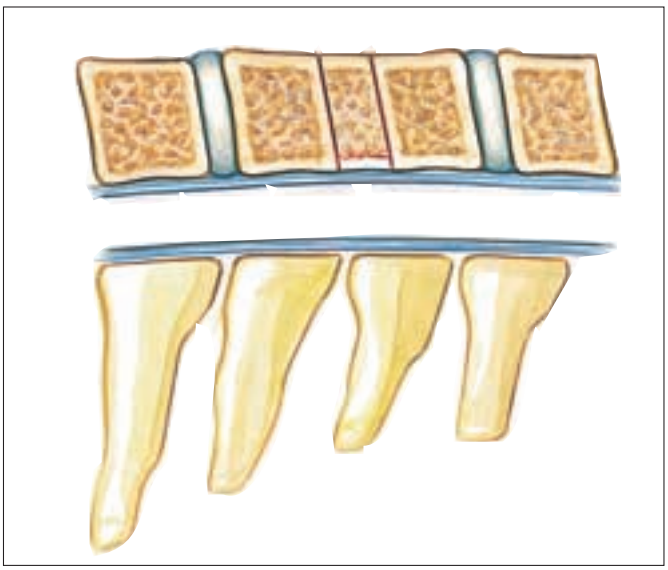
- the required height of the intervertebral disc space is restored,
- the graft lies flush with the front edges of the vertebrae,
- there is a distance of about 2 mm dorsally between the graft and the spinal canal,
- the graft is impacted with slight pressfit under image intensifier guidance.



Impacting the bone graft

! **Practical tip:**
before removing the distractor, we recommend that it is operated in reverse, thus practising a brief compression on the fusion graft to optimize its positioning, i.e. its fit.

The distractor can then be taken away and the distraction screws removed. To provide a good surface for the plate, it is advisable to smooth the anterior aspect of the spine (remove osteophytic growth).

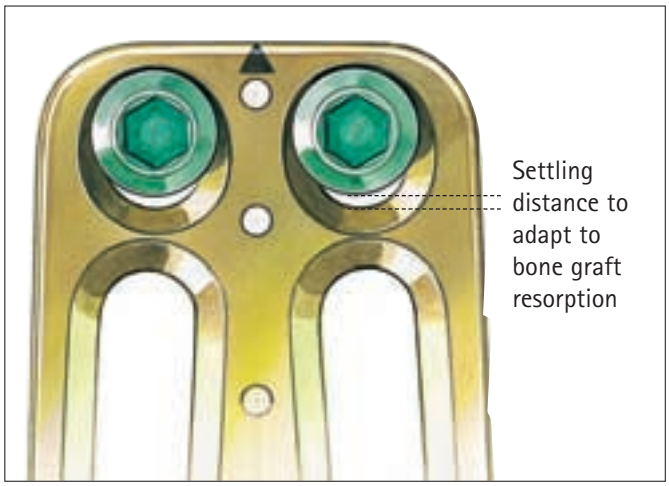


Optimally inserted bone graft after removal of distractor and distraction screws

POSITIONING THE PLATE

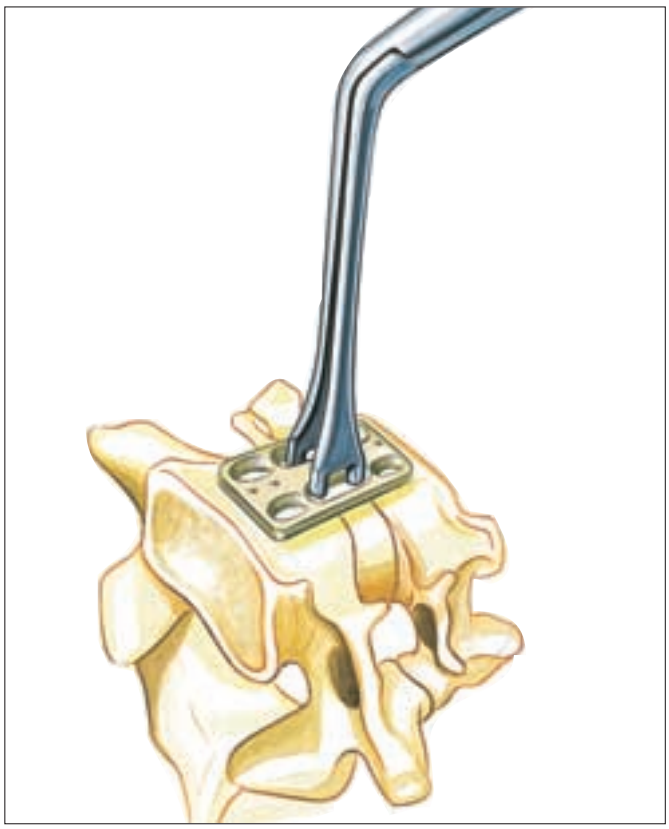
In choosing the plate length, care must be taken that sufficient distance (approx. 2 mm) is allowed between the rim of the plate and the adjoining intervertebral discs both caudally and cranially.

In so doing, this allows for any possible decrease in height of the bone graft (up to 1 mm). The CASPARevolution implant system with its semi-rigid plate-screw interface allows for the adaptation of the intervertebral space to a decrease in the height of the bone graft. This is ensured on the one hand through the screw heads not being fixed in the plate holes, and on the other hand by the oval shape of the plate holes (slide holes).



Semi-rigid screw and plate interface

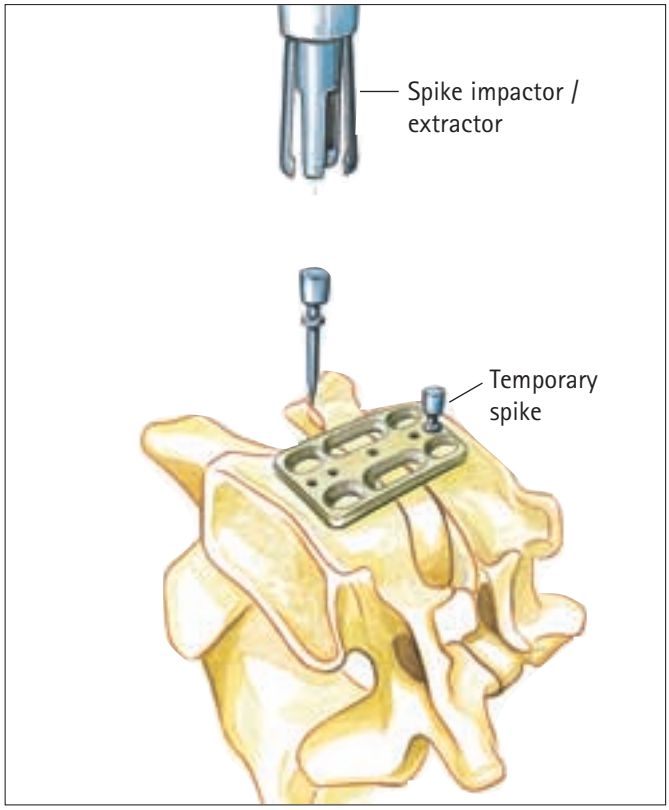
The plate is put into position with the plate holding forceps (FF 969 R), and the length and contour of the implant is checked by lateral image intensifier.

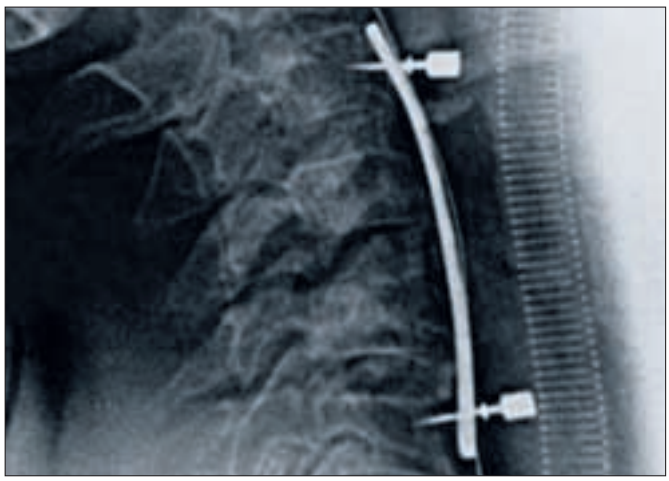


Putting the plate into position with the plate holding forceps

It is easy to alter the lordotic profile of the plate with the contouring forceps. The plate design offers optimum adaptation of the implant to the surface of the individual vertebra, both longitudinally (contouring forceps FF 956 R) and transverse ("Ear bender" contouring forceps FF 966 R).

The plate may be temporarily fixed onto the spine with the help of so-called "spikes" (FG 310 R). These spikes (see x-ray) hold the plate securely in position for the subsequent steps (drilling, tapping, measuring and inserting screws).





Temporary plate fixation (under x-ray monitoring)

The temporary spikes also offer the advantage of a completely unobstructed view and unhindered access. They are inserted and removed with the spike impactor/extractor (FG 315 R).

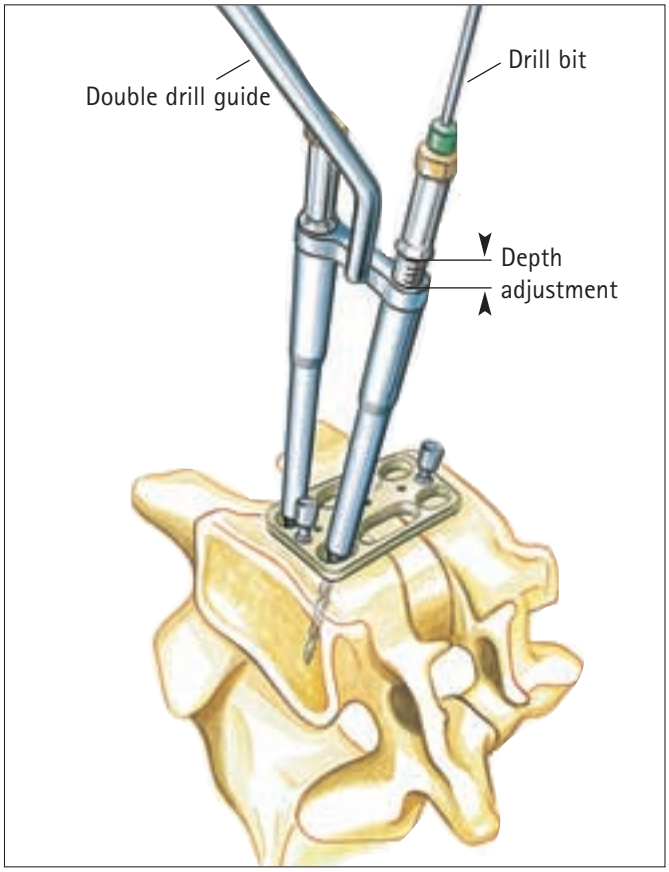
! Practical tip:
when impacting the second spike, an instrument (e.g. tamper) should be used to keep the first spike pressed against the plate and thus prevent it jumping out through a "seesaw effect".

SCREW FIXATION

Various drill guides and drills may be used to drill the screwholes:

- Double drill guides for unicortical and bicortical screws (FF 886 R / FG 415 R),
- A single drill guide (for universal application, FF 885 R), and
- Drill bits for unicortical (FG 414 R) or bicortical screws (FG 412 R).

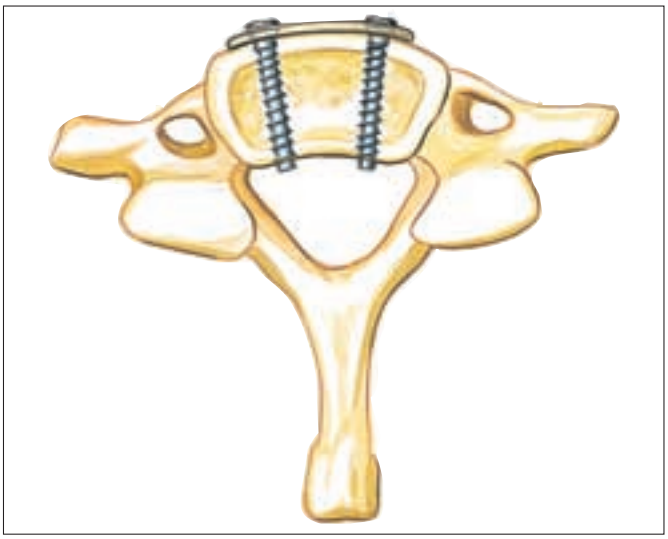
The drilling is performed with the micro-drill handle GD 450 R (with intra-connection).



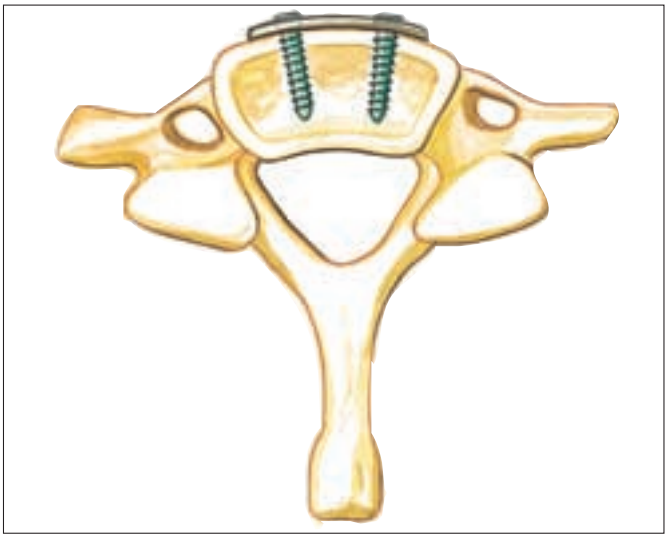
Positioning the drill guide and inserting the drill

All drill guides have a fine depth adjustment, which can be easily re-adjusted while the drill guide is in operating position and without removing the drill bit.

The double drill guide provides the optimum convergence of screw positions for stability, and prevent the screws crossing or coming out through the side of the vertebral body. If necessary, the single drill guide can be used to position the screws in all directions with an individual feeding-in angle of +/- 35° (important if additional screws have to be put in).



Bicortical screw fixation:
penetration of the posterior cortex by maximum 1 thread turn



Unicortical screw fixation:
the screw length should **not be less** *than 75% of the a.p. diameter of the vertebra*

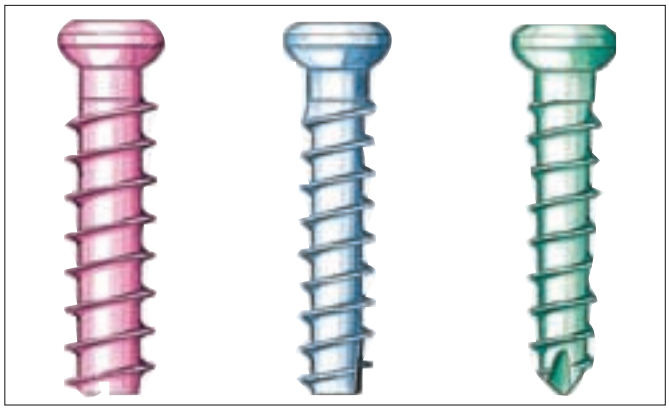
! **NB:** the screw lengths given are the overall length including the screw head (2.2 mm)! Example: a 20 mm screw has a penetration depth of approx. 18 mm.

Self cutting unicortical screws (external diameter 4.0 mm, with conical screw core) are available in 6 lengths from 14 mm to 19 mm.

Bicortical screws (external diameter 3.5 mm, with cylindrical screw core) are available in lengths from 10 mm to 28 mm. Not only does the flat end of the screw provide the best possible contact surface between thread and posterior cortex, but the optimised thread profile also offers a large bone contact area across the entire antero-posterior diameter of the vertebra.

! **NB:** especially when fixing bicortical screws, all dynamic steps should be monitored with an image intensifier, (i.e. C-Arm fluoroscope).

In addition, 4.5 mm screws are available for unicortical or bicortical application in osteoporotic bone or in cases where one of the standard screws does not provide a firm hold or has been over-tightened.



Revision or osteo-porosis screw | *bicortical screw* | *unicortical screw*

Different screw types can be used in one implant assembly as necessary (= mixed fixation / see page 16, clinical examples).

! **Practical tip:**
examples for mixed fixation:

- bisegmental plating:
  - middle vertebra = bicortical
  - top and bottom vertebrae = unicortical
- if a screw has been over-tightened or insufficient torque is obtained, it has to be replaced by a 4.5 mm revision screw.

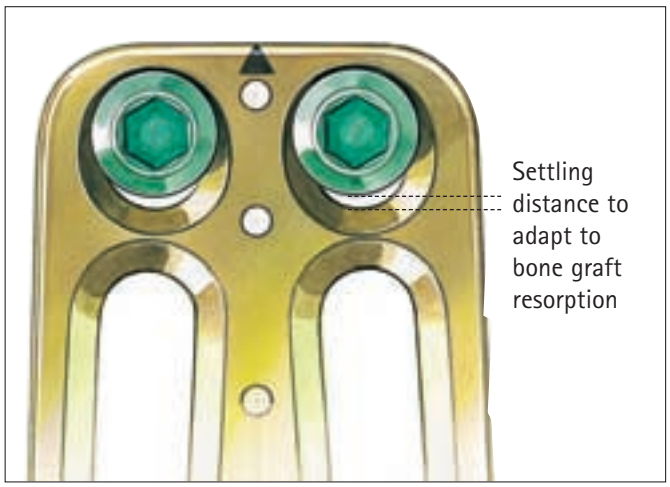
The selection of drill guides and drills depends on the screw fixation technique. If unicortical screws are to be used (colour coded **green**) the FG 414 R drill (diameter 2.2 mm) should be used, with the corresponding double drill guide FG 415 R (**green** handle).
For the bicortical screws (colour coded **blue**), the FG 412 R drill (diameter 2.0 mm) and the double drill guide FF 886 R (**blue** handle) should be used.

The single drill guide can be used with both drills for both types of screw.

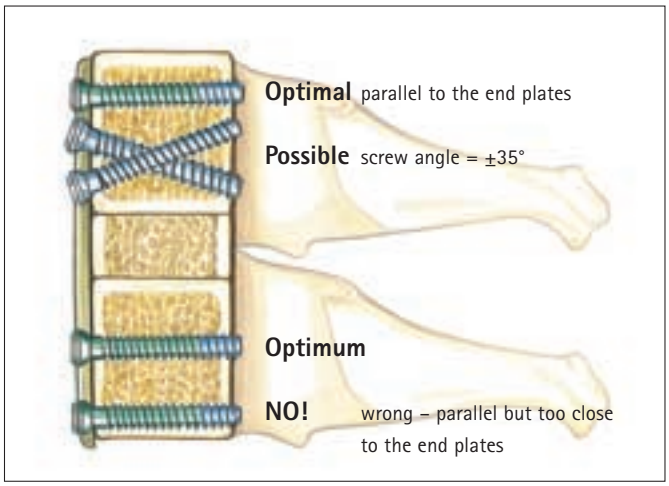
The drill diameter is determined by the core diameter of the corresponding screw type, and the drill bits carry a coloured plastic ring as additional identification
(green ring ➤ green, unicortical screw /
grey ring ➤ blue, bicortical screw).

Before commencing drilling, the desired positions and angles of the screw holes should be checked. Especially for bicortical screw fixation, continuous x-ray observation of the drilling procedure is essential.

The cranio-caudal position of the screw entry point should be as close as possible to the upper or lower inside edge of the plate hole, to make it possible for the screw to sink inside the hole.



The screws are placed as far as possible towards the top or bottom of the plate hole to allow for some movement ("sintering" i.e. constant pressure on the fusion graft).



Possible screw positions

! Practical tip:
it is easier to position the second drill hole in the same vertebra if two drills are used: after making the first hole, the drill bit can be left in the drill guide, and therefore in the drill hole, to fix the position and at the same time to serve as an orientation for drilling the second hole. Instead of a second drill bit, a blunt K-wire can also be used.

If bicortical screws are being used, it is recommendable to pre-cut the thread, setting the depth adjustment on the tap (FG 413 R) to the drill depth. It is normally sufficient just to cut a thread in the anterior cortex, to give the correct orientation for the screw. Threading all the way through, including the posterior cortex, reduces the risk of screw mal-placement for instance up- or downwards or in lateral directions.

The necessary screw length can be taken from the depth setting on the drill guide.

! Practical tip:
a depth gauge (FF 965 R) is also available to give a precise reading of the necessary screw length, and its use is highly recommended by the author.

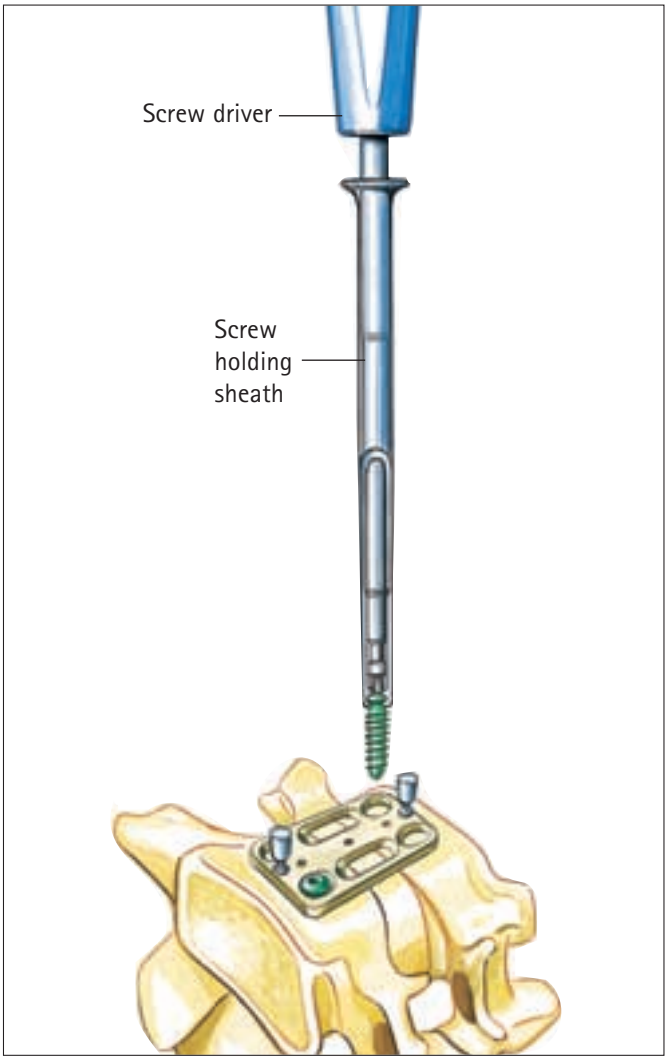
When selecting the length of a bicortical screw, it should be borne in mind that the screw is anchored, or penetrates the posterior cortex by approx. 1 thread turn (i.e. = 1 mm).

When using unicortical screws, it is important that the screw length measures at **least 75%** of the antero-posterior diameter of the vertebral body, in order to achieve sufficient anchorage, respectively stability [10].

In choosing the screw length, the possibility must also be taken into account that screwing in the screws presses the plate further down onto the vertebra and thus reduces the distance, i.e. the required screw length by 1 - 2 mm.

Practical tip:
if a screw has been over-tightened through excessive torque or poor bone quality, it must be exchanged for an appropriate revision screw. This is also valid for screws when the applied torque is insufficient. A clinically proven reliable method is to tighten the screws "2 fingers tight". (or three fingers in cases of high bone density). („oak bone")

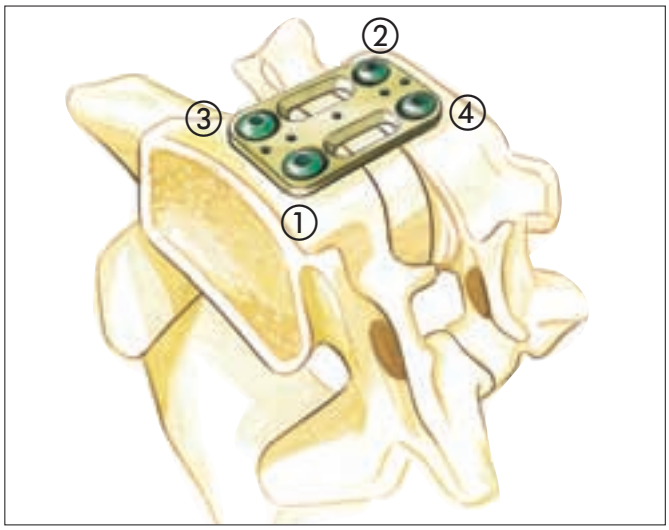
The screws can be taken directly out of their storage tray using the screw-holding sheath (FF 964 R) placed over the screwdriver (FF 954 R).



Screwing in the screws

After screwing in the screws, we recommend that they be tightened in a crosswise sequence ("2 fingers tight"), thereby pressing the plate evenly onto the surface of the vertebrae.

Practical tip:
a proven method in the screw tightening process is, using two screw drivers simultaneously in a crosswise order, thereby pressing the plate evenly onto the surface of the vertebrae.



Tightening the screws in a crosswise sequence

If it is not possible to align the screwdriver exactly onto the screw head, the "ball tip" screwdriver (FF 957 R) may be used. It can be set on the screw head obliquely from approx. 30° in any direction. This is particularly helpful in the upper cervical spine area and in the cervico-thoracic transition area.

The temporary spikes are subsequently removed.

RETREAT

The wound is closed in the usual way: single or double wound drainage in the prevertebral and pretracheal compartments, platysma, subcutaneous and skin suturing or stapling.

➤ monosegmental, unicortical screw fixation

Pre-operative

Post-operative (6 months)

Fusion with autologous bone graft and trapezoidal plate osteosynthesis with unicortical screw fixation in slipped disc and kyphosis in segment C5/6.

➤ bisegmental, bicortical screw fixation with vertebral body replacement of C3

Pre-operative

Intra-operative

Left: carcinoma metastasis of C3 with extensive destruction and instability in the form of kyphosis (here already brought into a neutral position under skull traction) and severe pain.

Right: condition after C3 resection, vertebral body replacement with an autologous bone graft and trapezoidal plate osteosynthesis with bicortical screw fixation. Note the restoration of the natural lordosis.

➤ bisegmental mixed screw fixation

Immediately post-operative

Anterior trapezoidal plate osteosynthesis of C5/6 and C6/7 with mixed screw fixation in cervical radiculopathy.

unicortical: C5 + C7
bicortical: C6

[1] "Die ventrale interkorporale Stabilisierung mit der HWS-Trapez-Osteosyntheseplatte – Indikationen, Technik, Ergebnisse"
W. Caspar – Orthopädische Praxis 12, 20. Jahrgang, 1984

[2] "Anterior Cervical Fusion and Caspar Plate Stabilization for Cervical Trauma"
W. Caspar, D.D. Barbier, P.M. Klara – Neurosurgery, Vol. 24, No. 4, 1989

[3] "Biomechanical evaluation of Caspar and Cervical Spine Locking Plate systems in a cadaveric model"
J.D. Clausen, B.S. Timothy, C. Ryken, V.C. Traynelis, P.D. Sawin, F. Dexter, V.K. Goel – J. Neurosurg. Vol. 84, June 1996

[4] "Operative Therapie von Malignomen der Halswirbelsäule – ein differenziertes Behandlungskonzept"
T. Pitzen, W. Caspar, D. Barbier, W.-J. Steudel – Deutsches Ärzteblatt 94, Heft 39, September 1997

[5] "Anterior cervical fusion using Caspar plating: analysis of results and review of the literature"
B. Bose – Surgical Neurology, January 1998

[6] "Anterior Cervical Plate Stabilization in One- and Two-Level Degenerative Disease: Overtreatment or Benefit?"
W. Caspar, F.H. Geisler, T. Pitzen, T.A. Johnson - J. of Spinal Disorders, Vol. 11, No. 1, pp 1-11, 1998

[7] "Ventrale zervikale Fusionsoperationen mit monokortikaler Plattenfixierung"
W. Caspar, T. Pitzen – Der Orthopäde – Implant-Sonderbeilage 3/98

[8] "Reoperation in Patients After Anterior Cervical Plate Stabilization in Degenerative Disease"
F. H. Geisler, W. Caspar, T. Pitzen, T.A. Johnson - SPINE Vol. 23, No. 8, 1998

[9] "Anterior cervical plating for the treatment of neoplasms in the cervical vertebrae"
W. Caspar, T. Pitzen, L. Papavero, F.H. Geisler, T.A. Johnson - J. Neurosurg (Spine 1), Vol. 90, January 1999

[10] "Evaluation of a new monocortical screw for anterior cervical fusion and plating by a combined biomechanical and clinical study"
T. Pitzen, H.J. Wilke, W. Caspar, L. Claes, W.I. Steudel - European Spine Journal 1999 in press

[11] "Anterior cervical fusion and trapezoidal plate stabilization for re-do surgery"
W. Caspar, T. Pitzen – Surgical Neurology, Vol. 52, No. 4, October 1999

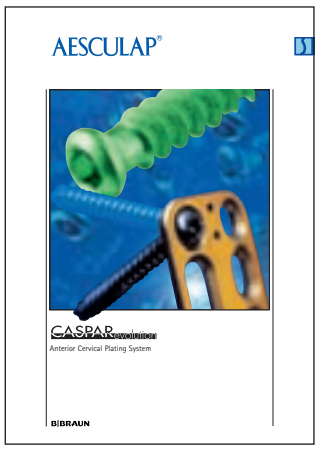
These and further relevant publications are readily available on request.

CASPARevolution Plates (Titanium)

FG 424 T – FG 490 T
Trapezoidal cervical plates for anterior stabilisation

Japan Patent	No. 1 383 842
US Patent	No. 4 503 848
German Patent	No. DE 31 14 136 C2

For further information, please ask for Brochure 0 135 02



Implant material:

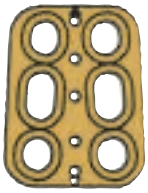
ISOTAN® P

pure titanium according to ISO 5832-2

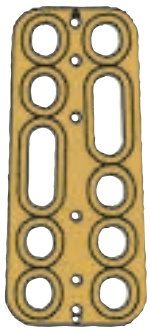
SEM image
scale 100 : 1
(ø 250 µm)

The special rough surface on the underside of the plate ensures a better contact between the implant and the vertebral body.

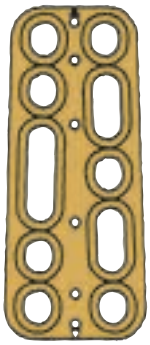
! NB:
all CASPARevolution implants are fully compatible with all previous generations of CASPAR titanium plates and screws.



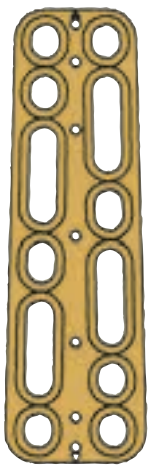
FG 424 T
24 mm



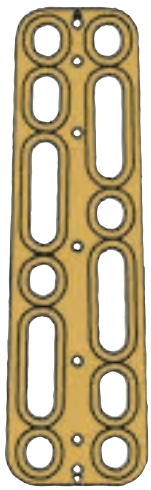
FG 442 T
42 mm



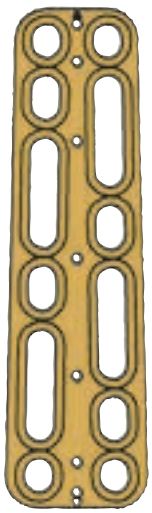
FG 444 T
44 mm



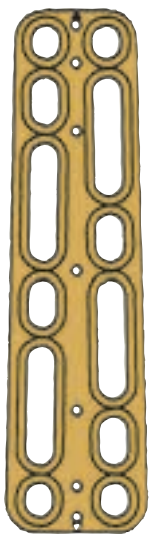
FG 460 T
60 mm



FG 463 T
63 mm



FG 466 T
66 mm



FG 469 T
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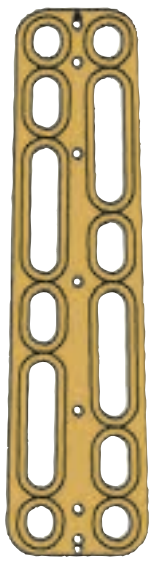
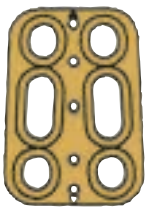
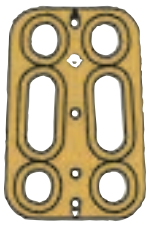


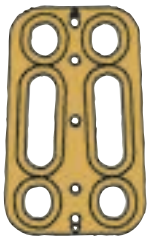
FG 472 T
72 mm



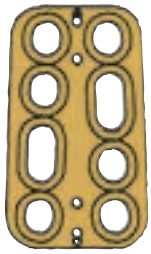
FG 426 T
26 mm



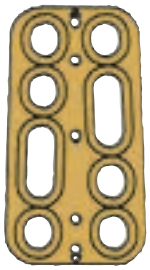
FG 428 T
28 mm



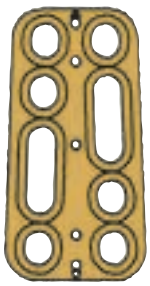
FG 430 T
30 mm



FG 432 T
32 mm



FG 434 T
34 mm



FG 436 T
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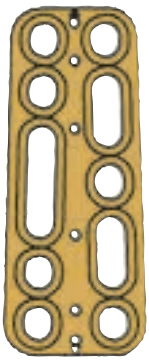
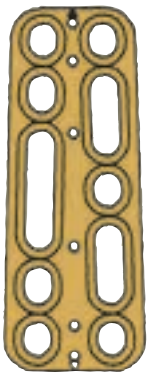
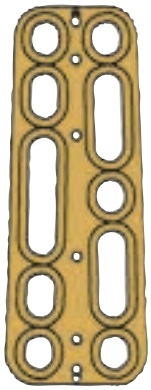


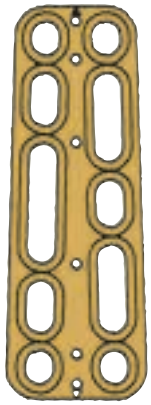
FG 446 T
46 mm



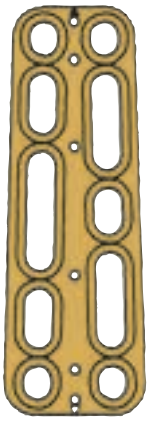
FG 448 T
48 mm



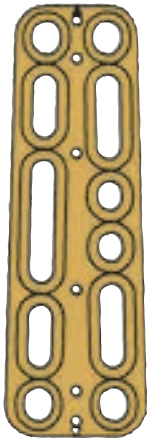
FG 450 T
50 mm



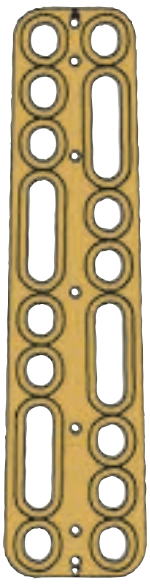
FG 452 T
52 mm



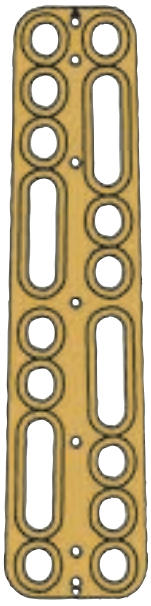
FG 454 T
54 mm



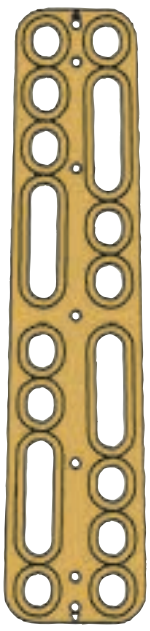
FG 457 T
57 mm



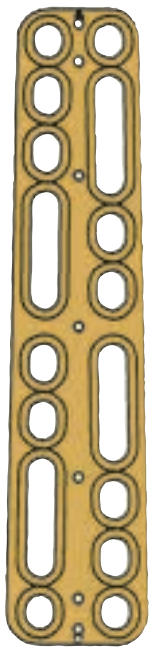
FG 475 T
75 mm



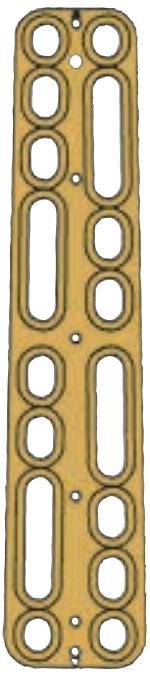
FG 478 T
78 mm



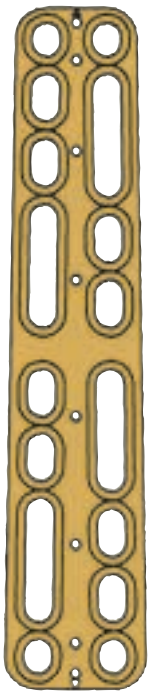
FG 481 T
81 mm



FG 484 T
84 mm



FG 487 T
87 mm

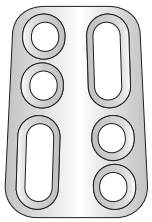


FG 490 T
90 mm

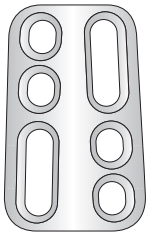
CASPAR Cervical Plates (Implant steel)

FF 930 S – FF 947 S
Trapezoidal cervical plates for anterior stabilisation
Japan Patent No. 1 383 842
US Patent No. 4 503 848
German Patent No. DE 31 14 136 C2

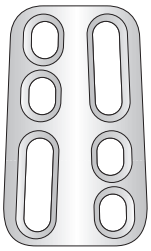
Implant material: implant steel according to DIN 17443 / ISO 5832-1



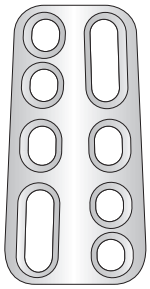
FF 930 S
28 mm



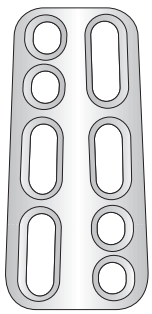
FF 931 S
30 mm



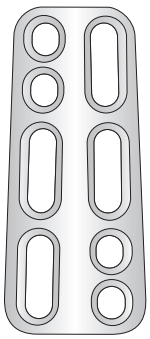
FF 933 S
32 mm



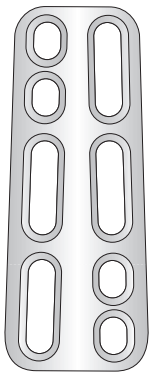
FF 935 S
37 mm



FF 934 S
40 mm



FF 936 S
43 mm



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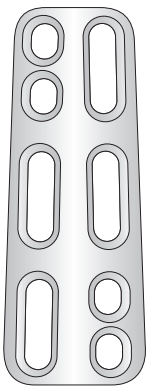
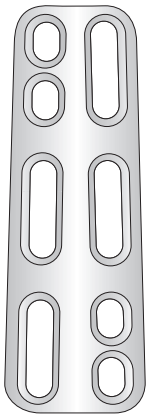
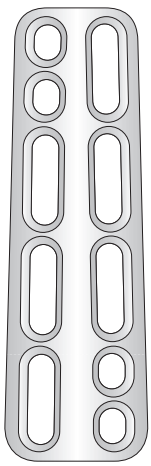
46 mm



FF 939 S
48 mm



FF 940 S
50 mm



FF 942 S
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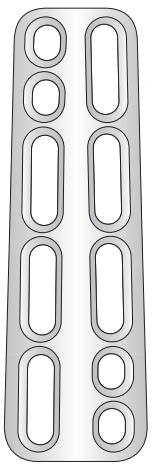

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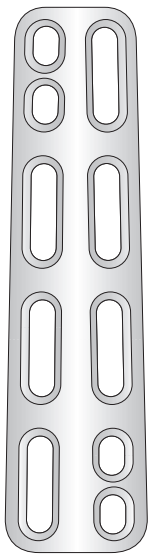
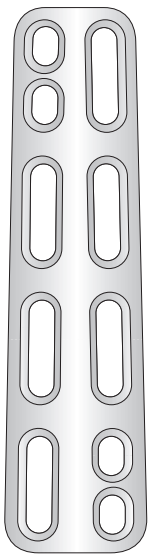


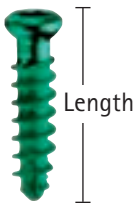
FF 946 S
66 mm



FF 947 S
72 mm

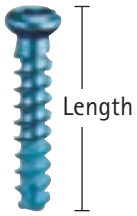
CASPARevolution Screws (Titanium)

Implant material: ISOTAN F
titanium alloy according to
ISO 5832-3 (Ti AL_6V_4)



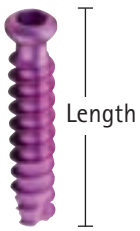
unicortical, self-cutting, Ø 4.0 mm

LB 554 T	14 mm
LB 555 T	15 mm
LB 556 T	16 mm
LB 557 T	17 mm
LB 558 T	18 mm
LB 559 T	19 mm



bicortical, Ø 3.5 mm

LB 450 T	10 mm
LB 452 T	12 mm
LB 454 T	14 mm
LB 456 T	16 mm
LB 457 T	17 mm
LB 458 T	18 mm
LB 459 T	19 mm
LB 460 T	20 mm
LB 461 T	21 mm
LB 462 T	22 mm
LB 463 T	23 mm
LB 464 T	24 mm
LB 465 T	25 mm
LB 466 T	26 mm
LB 467 T	27 mm
LB 468 T	28 mm



revision, Ø 4.5 mm

LA 017 T	17 mm
LA 018 T	18 mm
LA 019 T	19 mm
LA 020 T	20 mm
LA 021 T	21 mm
LA 022 T	22 mm
LA 023 T	23 mm
LA 024 T	24 mm
LA 025 T	25 mm
LA 026 T	26 mm
LA 027 T	27 mm
LA 028 T	28 mm

! NB:

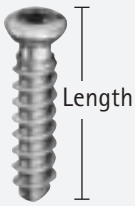
all CASPARevolution implants are fully compatible with all previous generations of CASPAR titanium plates and screws.

CASPAR Cervical Screws (Implant steel)

Implant material:
implant steel according to
DIN 17443 / ISO 5832-1

bicortical, Ø 3.5 mm

LB 050 S	10 mm
LB 052 S	12 mm
LB 054 S	14 mm
LB 056 S	16 mm
LB 057 S	17 mm
LB 058 S	18 mm
LB 059 S	19 mm
LB 060 S	20 mm
LB 061 S	21 mm
LB 062 S	22 mm
LB 063 S	23 mm
LB 064 S	24 mm
LB 065 S	25 mm
LB 066 S	26 mm
LB 067 S	27 mm
LB 068 S	28 mm



revision, Ø 4.5 mm

LA 057 S	17 mm
LA 058 S	18 mm
LA 059 S	19 mm
LA 060 S	20 mm
LA 061 S	21 mm
LA 062 S	22 mm
LA 063 S	23 mm
LA 064 S	24 mm

CASPAR Combined Neck and Head Rest

For all operations with anterior approach. Especially suitable for fusion and plate osteosynthesis procedures.

The stable construction and high versatility of the CASPAR Combined Neck and Head Rest permits adaptation to the individual patient and the best possible access to the surgical site, particularly for intra-operative C-arm fluoroscopy.

FF 140
Combined neck and head rest, consisting of a head and neck cushion (FF 141, FF 143) and an integrated adjustable skull traction device with stand.

FF 141

FF 143

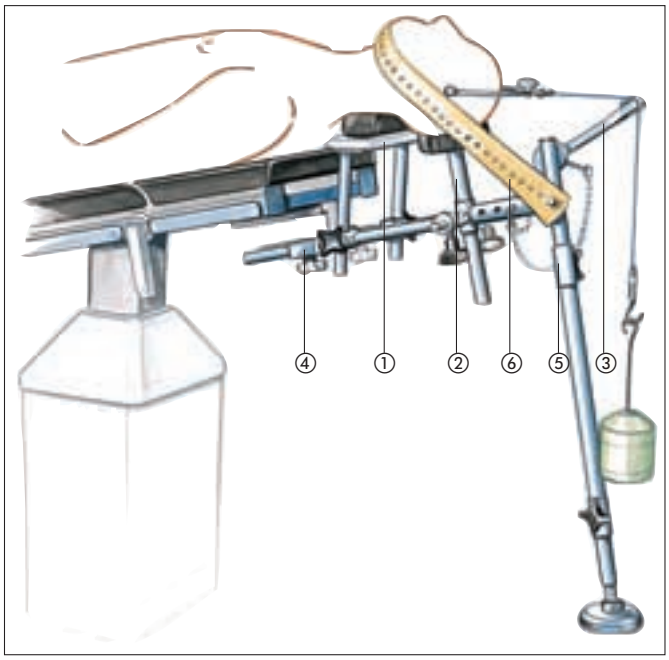
FF 144

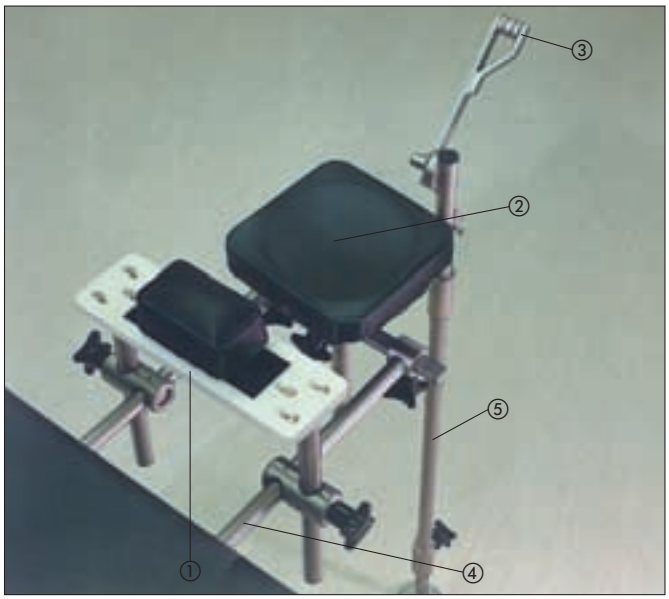
FF 141
Head cushion, attachable to the head support (included in the FF 140 set).

FF 142
Rubber band for elastic head fixation (must be ordered separately).

FF 143
Neck cushion, attachable to the neck support (included in the FF 140 set).

FF 144
Neck support transparent to x-ray, without cushion, 265 x 62 x 75 mm (must be ordered separately).





① Neck support with detachable cushion. Adjustable vertically, horizontally and obliquely. Can be rotated for longitudinal or transverse use. Illustrated here is the version which is transparent to x-ray. This neck support (FF 144), with neck cushion, transparent to x-ray in the sagittal plane, can be adjusted for height and position, and can easily be exchanged for the regular neck support.
② Head support with cushion, adjustable height.
③ Guide pulley for traction rope, adjustable height.
④ Fixation to operating table (if necessary, the MAQUET Universal Adaptor 1005.27 may be used).
⑤ Stand, adjustable height.
⑦ Rubber band for elastic head fixation (FF 142).

Instruments for approach:

GELPI
BV 997 R
Skin retractor
175 mm

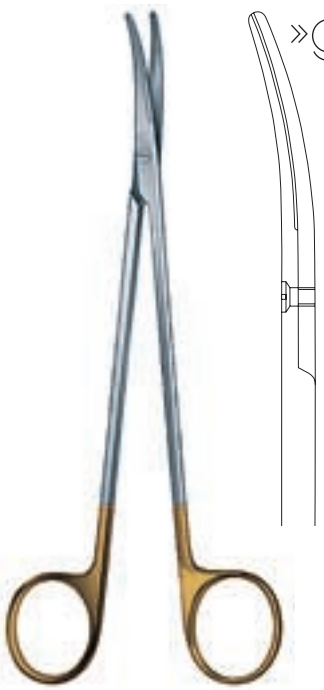
GK 940 R
1.0 mm

GK 950 R
2.0 mm

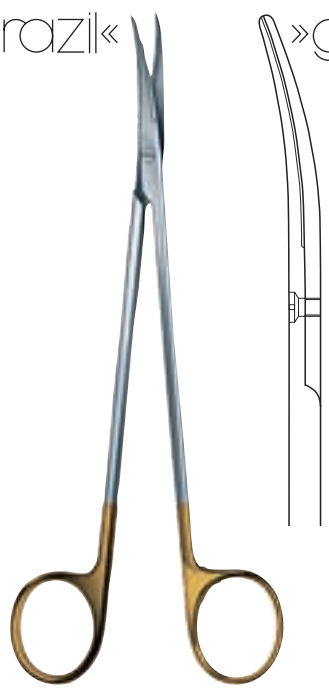
CASPAR
Bipolar coagulation forceps, insulated,
195 mm

GN 073
Two-wire cables, for AESCULAP bipolar coagulation forceps with flat plug, silicon-insulated, steam-sterilizable up to 3 bar (143 °C) 3.5 mm long

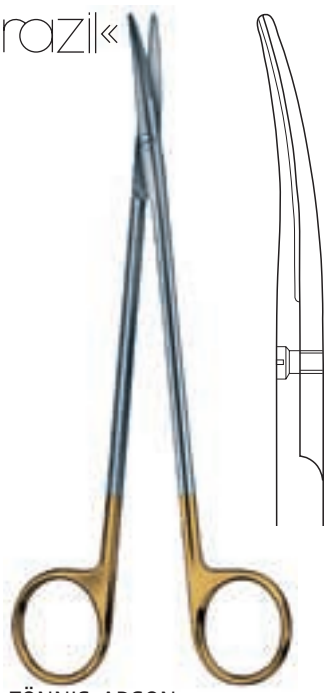
GK 200
for bipolar coagulation units AESCULAP GN 60, GK 50 (with 2 banana plugs)



METZENBAUM
BC 263 ~W
curved
180 mm



METZENBAUM
BC 271 ~W
curved
180 mm



TÖNNIS-ADSON
BC 273 ~W
curved
175 mm

DUROTIP®- Scissors with inserted carbide guarantee permanent cutting edge

~W:
prevents tissue or suture materials from slipping out.

CCR-System:

BV 426
CCR Retractor Set, complete; Content (one of each):

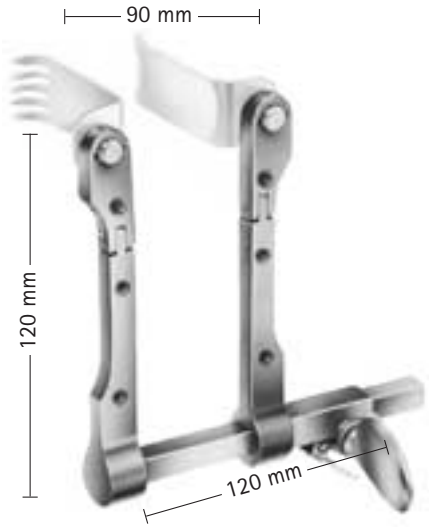
BV 425 P	CCR Instrument tray, only
BV 439 R	CASPAR cervical tissue retractor for transverse retraction
BV 771 R	CASPAR cervical tissue counter retractor for longitudinal retraction
BV 491 R	CASPAR cervical tissue retractor for longitudinal retraction
BV 879 T – BV 888 T	Medial blades fenestrated (Titanium) for transverse retraction
BV 889 T – BV 898 T	Lateral blades fenestrated (Titanium) for transverse retraction
BV 779 T – BV 789 T	Blades for longitudinal retraction (Titanium)
BV 399 R	Forceps for changing the blades with ball snap closure
JF 511	Wrapping drape 140 x 100 cm

Please order separately:

JF 223 R	Perforated basket 540 x 254 x 76 mm

CCR Caspar Cervical Retractor System

Ball snap closure with anti rotation pin



BV 439 R CASPAR cervical retractor (transverse retraction)

BV 460 R
Retractor set, consisting of:
5 medial blades BV 772 R - BV 776 R
5 lateral blades BV 792 R - BV 796 R
and the retractor BV 439 R
By reversing the screw, the retractor can be used from both sides.

BV 771 R CASPAR cervical retractor (longitudinal retraction)

BV 780 R
Retractor set, consisting of:
5 blades BV 783 R – BV 787 T and the retractor BV 771 R.

BV 491 R CASPAR cervical retractor (longitudinal retraction)

BV 490 R
Counter retractor set, consisting of:
5 blades BV 783 R – BV 787 R and the retractor BV 491 R.

CCR
Caspar Cervical Retractor System

BV 879 T 25 x 24 mm
BV 880 T 30 x 24 mm
BV 881 T 35 x 24 mm
BV 882 T 40 x 24 mm
BV 883 T 45 x 24 mm
BV 884 T 50 x 24 mm
BV 885 T 55 x 24 mm
BV 886 T 60 x 24 mm
BV 887 T 65 x 24 mm
BV 888 T 70 x 24 mm
Medial blades
Titanium, fenestrated, semi-transparent to X-ray. To be preferably used for transverse retraction.

BV 889 T 25 x 24 mm
BV 890 T 30 x 24 mm
BV 891 T 35 x 24 mm
BV 892 T 40 x 24 mm
BV 893 T 45 x 24 mm
BV 894 T 50 x 24 mm
BV 895 T 55 x 24 mm
BV 896 T 60 x 24 mm
BV 897 T 65 x 24 mm
BV 898 T 70 x 24 mm
Lateral blades
Titanium, fenestrated, semi-transparent to X-ray. To be preferably used for transverse retraction.

BV 779 T 30 x 24 mm
BV 781 T 35 x 24 mm
BV 782 T 40 x 24 mm
BV 783 T 45 x 24 mm
BV 784 T 50 x 24 mm
BV 785 T 55 x 24 mm
BV 786 T 60 x 24 mm
BV 787 T 65 x 24 mm
BV 788 T 70 x 24 mm
BV 789 T 75 x 24 mm
Blunt blades
Titanium, semi-transparent to X-ray. To be preferably used for longitudinal retraction.

BV 399 R
Forceps for changing blades with ball snap closure
115 mm

BV 772 R 40 x 23 mm
BV 773 R 45 x 23 mm
BV 774 R 50 x 23 mm
BV 775 R 55 x 23 mm
BV 776 R 60 x 23 mm
medial blades
stainless steel

BV 792 R 40 x 23 mm
BV 793 R 45 x 23 mm
BV 794 R 50 x 23 mm
BV 795 R 55 x 23 mm
BV 796 R 60 x 23 mm
lateral blades
stainless steel

BV 783 R 45 x 23 mm
BV 784 R 50 x 23 mm
BV 785 R 55 x 23 mm
BV 786 R 60 x 23 mm
BV 787 R 65 x 23 mm
blunt blades
stainless steel

BV 764 R 50 x 25 mm
BV 766 R 60 x 25 mm
blunt blades, stainless steel
for bone graft, harvesting at iliac crest

Vertebral body distraction:

CASPAR
FF 900 R
Vertebral body distractor, for use in surgical procedures from the left approach for C 5 through T1/2 and from the right approach for the upper cervical spine.

consisting of:

FF 901 R	1 Distractor only
FF 907 R	1 Drill guide
FF 908 R	1 Twist drill
FF 905 S	2 Distraction screws
FF 906 R	1 Screw driver

FF 903 R
Distractor, like FF 901 R, but with elongated toothed bar, for multilevel (more than 2) distraction.

FF 907 R
Drill guide for parallel positioning of the distraction screws, to be used with distractor FF 901 R or FF 903 R.

CASPAR
FF 890 R
Vertebral body distractor, for use in surgical procedures from the right approach for C 5 through T1/2 and from the left approach for the upper cervical spine.

consisting of:

FF 891 R	1 Distractor only
FF 897 R	1 Drill guide
FF 908 R	1 Twist drill
FF 905 S	2 Distraction screws
FF 906 R	1 Screw driver

FF 893 R
Distractor, like FF 891 R, but with elongated toothed bar, for multilevel (more than 2) distraction.

FF 897 R
Drill guide for parallel positioning of the distraction screws, to be used with distractor FF 891 R or FF 593 R.

CASPAR
FF 908 R
Drill bit, Ø 1.7 mm
for pre-drilling holes for distraction screws, drilling depth: 8 mm,
shank Ø 2.35 mm
145 mm, 5 3/4"

Recommendation:
FF 908 R preferably to be used with Intra hand piece GD 450 R and with AESCULAP motor system

CASPAR

FF 912 S	12 mm
FF 904 S	14 mm
FF 905 S	16 mm
FF 909 S	18 mm

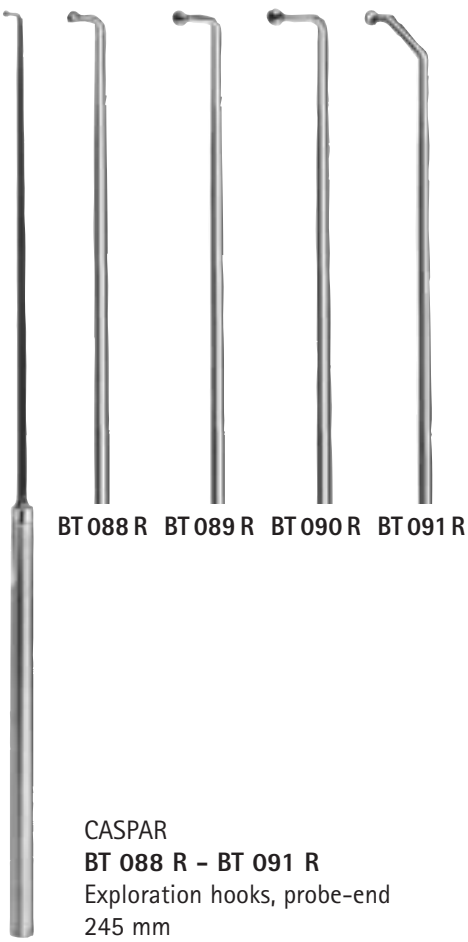
Distraction screws to be used with distractors FF 901 R and FF 891 R, at least 2 each are required. Made of material used for implants acc. to DIN 17443 resp. ISO 5832/1
Sales unit: PR = Package of 1 pair

CASPAR
FF 906 R
Screw driver for distraction screws
200 mm

CASPAR
FK 328 R
Longus colli muscle dissector
180 mm

FF 917 R **FF 918 R**

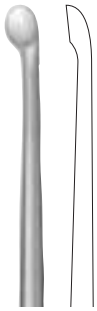
CASPAR
FF 917 R – FF 918 R
Vertebral body dissectors, usable for loosening the posterior longitudinal ligament and removal of disk fragments and osteophytes
205 mm



BT 088 R **BT 089 R** **BT 090 R** **BT 091 R**

CASPAR
BT 088 R – BT 091 R
Exploration hooks, probe-end
245 mm

Preparation of graft site, bone graft harvesting and impaction of bone graft:

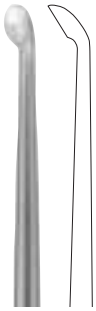


straight

FK 773 R
3.6 x 5 mm

FK 774 R
4.4 x 6.2 mm

FK 775 R
5.2 x 7.3 mm



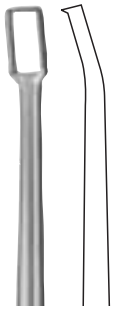
curved

FK 783 R
3.6 x 5 mm

FK 784 R
4.4 x 6.2 mm

FK 785 R
5.2 x 7.3 mm

CASPAR
FK 773 R – FK 785 R
Scoops
220 mm



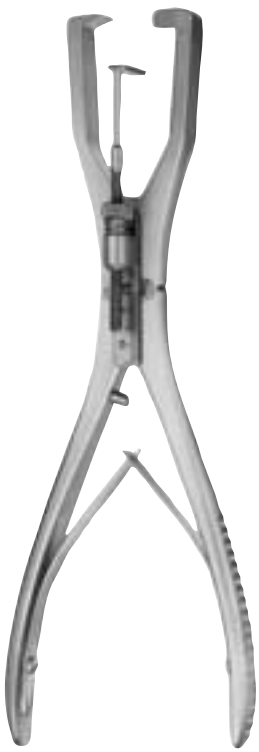
FK 834 R
4 mm

FK 835 R
5 mm

FK 836 R
6 mm

CASPAR
FK 834 R – FK 836 R
curettes, toothed
220 mm

CASPAR
AA 845 R
Caliper, for measurement of the bone graft and graft site
220 mm



CASPAR
FF 927 R
Graft cutter with adjustable depth control, 10 mm width, for graft from 9–12 mm, 220 mm

FF 928 R
Graft cutter with adjustable depth control, 7 mm width, for graft from 6–9 mm, 220 mm

CASPAR	Height
GC 640 R	6 mm
GC 641 R	7 mm
GC 642 R	8 mm
GC 643 R	9 mm
GC 644 R	10 mm
GC 645 R	11 mm
GC 646 R	12 mm

Double oscillating saw blades for harvesting of precisely dimensioned fusion grafts from the iliac crest (for vertical cutting). To be used with osteotomy saw GB 129 R.

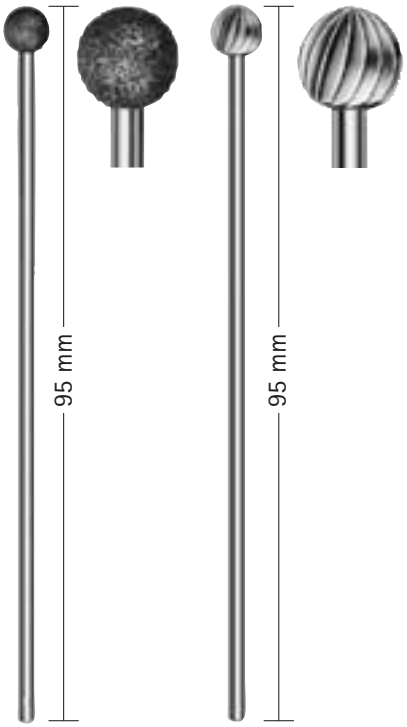
GB 129 R
Osteotomy saw, 18000 oscillations/min., for direct attachment to flexible micro cable GA 176 or GA 173 of the AESCULAP **ELAN®-E** motor system, with key TE 472 for exchanging the saw blades. Can be sterilized in an autoclave up to 143 °C.

CASPAR
FF 911 R
Bone graft holder and impactor
220 mm

FF 913 R	**FF 914 R**	**FF 915 R**
ø 3 mm	ø 5 mm	ø 8 mm

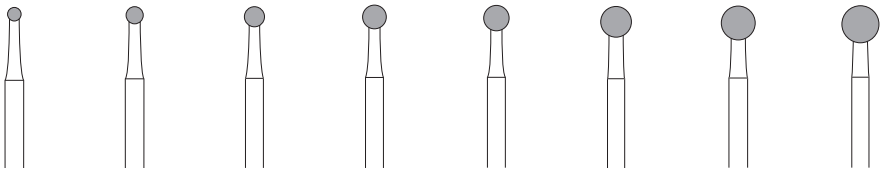
CASPAR
Tapper for the fine positioning of the graft and for cancellous bone plasty
200 mm

Burrs for fine correction of the bone graft and graft site, shank diam. 2.35 mm

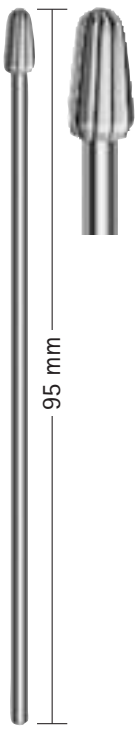


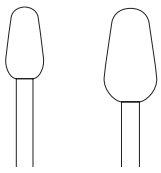
GD 456 R
Intra hand piece, angled,
transmission 1:2

GD 461 R
Spray nozzle,
fitting GD 456 R



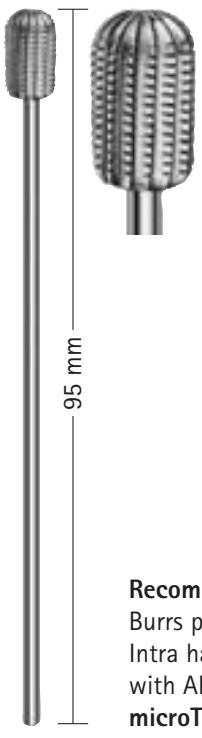
1.80	2.30	2.70	3.10	3.50	4.00	4.50	5.00	mm/diam.
018	023	027	031	035	040	045	050	ISO-No.
6	8	10	12	14	16	18	20	Fig./Size
GD 126 R	**GD 127 R**	**GD 128 R**	**GD 129 R**	**GD 130 R**	**GD 131 R**	**GD 132 R**	**GD 133 R**	Diamond burr
GD 146 R	**GD 147 R**	**GD 148 R**	**GD 149 R**	**GD 150 R**	**GD 151 R**	**GD 152 R**	**GD 153 R**	ROSEN burr

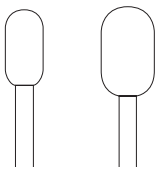




5.00	7.00	mm/diam.
050	070	ISO-No.
20	24	Fig./Size
GD 162 R	**GD 164 R**	

Conical burrs





5.00	7.00	mm/diam.
050	070	ISO-No.
20	24	Fig./Size
GD 182 R	**GD 184 R**	

Barrel reamer

Recommendation:
Burrs preferably to be used with Intra hand piece GD 456 R and with AESCULAP motor system **microTRON®** or **ELAN®-E**.

Plating Instruments

FG 415 R
Dual drill guide for unicortical screws, with fine depth adjustment 13–19 mm, 180 mm

FF 885 R
Single drill guide with fine depth adjustment 10-30 mm, 180 mm

FF 886 R
Dual drill guide for bicortical screws, with fine depth adjustment 10–30 mm, 180 mm

FG 414 R
Drill bit, diam. 2.2 mm for unicortical screws LB 554 T - LB 559 T. To be used with drill guide FG 415 R or FF 886 R, shank diam. 2.35 mm

FG 412 R
Drill bit diam. 2 mm for bicortical screws LB 450 T – LB 468 T resp. LB 050 S – LB 068 S. To be used with drill guide FF 885 R or FF 886 R, shank diam. 2.35 mm

GD 450 R
Intra hand piece, straight, transmission 1:1

GD 460 R
Spray nozzle, fitting GD 450 R

KIRSCHNER
LX 138 S, LX 140 S
K-wires, with trocar point and round shaft. Sales unit: PZ = package of 10 pcs.

Recommendation:
Drill bit FG 412 R, and FG 414 R preferably to be used with Intra hand piece GD 450 R.

CASPAR
FF 975 R
Thread tap for bicortical screws LB 050 S - LB 068 S (Thread pitch 1.75 mm) with adjustable tissue protecting sheath/depth adjustment
225 mm

CASPAR
FG 413 R
Thread tap for 3.5 mm CASPARevolution bicortical titanium screws
225 mm

CASPAR
FF 965 R
Depth gauge for determination of correct screw length
225 mm

⬡ 2.5 mm

FF 964 R

CASPAR
FF 954 R
Screw driver, 210 mm
CASPAR
FF 964 R
Screw holding sheath, fitting FF 954 R

CASPAR
FF 957 R
"Ball" tip screw driver allows 30° of deviation in all directions,
210 mm

CASPAR
FF 956 R
Plate bending pliers,
180 mm

CASPAR
FF 969 R
Plate holding and applying forceps,
190 mm

LX 159 R
Cutting pliers for K-wires,
175 mm

CASPAR
FF 966 R
Plate bending pliers („Ear-bender")
180 mm

CASPAR
FG 310 R
Spikes, for temporary fixation of CASPAR titanium plates FG 424 T – FG 490 T,
Sales unit:
PZ = Package of 10 pieces

CASPAR
FG 315 R
Spike holder, for impacting and removing spikes
FG 310 R, 240 mm

Recommendation for basic CASPAR uni- and bicortical Implants and Plating Instruments

Amount	Reference Number	Description
Implants:		
each 10 x	LB 450 T – LB 468 T	Bicortical HWS Screws 10–28 mm, range of lengthes according the user
each 10 x	LB 554 T – LB 559 T	Unicortical HWS Screws 14–19 mm
each 5 x	LA 017 T – LA 028 T	Uni- or bicortical revision screws, 17–28 mm, range of lengthes according the user
each 1 x	FG 424 T – FG 490 T	HWS Plates, length of 24–90 mm range of lengthes according the user
1	FG 064 P	Rack for unicortical screws with lid (illustration see below)
1	FG 061 P	Implant tray with lid (illustration see below)
Plating Instruments:		
1	FF 956 R	Plate bending pliers, cross and transverse contouring
1	FF 966 R	Plate bending pliers, bending of edges
1	FF 969 R	Plate holding forceps
1	FG 315 R	Spike impactor
1	FG 310 R	Spikes (package with 10 pieces)
1	FF 885 R	Drill guide, depth adjustment 10–30 mm (unicortical and bicortical)
1	FF 886 R	Twin drill guide, depth adjustment 10–30 mm (bicortical)
1	FG 415 R	Twin drill guide, depth adjustment 13–19 mm (unicortical)
2	FG 412 R	Drill, 2.0 mm (bicortical)
2	FG 414 R	Drill, 2.2 mm (unicortical)
1	FG 413 R	Tap for bicortical screws
1	FF 965 R	Depth gauge
1	FF 954 R	Screw driver
1	FF 964 R	Screw holding sheath
1	FF 957 R	Screw driver with ball tip
1	LS 040 S	Screw grasping forceps
1	JF 213 R	Perforated basket 485 x 253 x 76 mm
2	JF 936	Silicone pad

FG 064 P

FG 061 P

Soft Tissue Retraction

Amount	Reference Number	Description
CCR:		
1	BV 426	CCR Retractor Set
2	BV 764 R	Blades for graft harvesting at iliac crest, 50 x 25 mm to be used with BV 491 R or BV 771 R
2	BV 766 R	Blades for graft harvesting at iliac crest, 60 x 25 mm to be used with BV 491 R or BV 771 R
1	JF 223 R	Perforated basket, 540 x 253 x 76 mm

Vertebral Body Distraction

Amount	Reference Number	Description
1	FF 890 R	Vertebral body distractor complete for approach from the right to C5-Th1 respectively the approach of the left C2–C5, consisting of: FF 891 R Distractor FF 897 R Drill guide FF 908 R Drill with drill stop FF 905 S Distraction screw (1 pair), 16 mm FF 906 R Screw driver for distraction screw
1	FF 893 R	Distractor like FF 891 R, but with elongated distraction arm
1	FF 900 R	Vertebral body distractor complete for approach from the left to C5-Th1 respectively the approach of the right C2–C5, consisting of: FF 901 R Distractor FF 907 R Drill guide FF 908 R Drill with drill stop FF 905 S Distraction screw (1 pair), 16 mm FF 906 R Screw driver for distraction screw
1	FF 903 R	Distractor like FF 901 R, but with elongated distraction arm
1	FF 912 S	Distraction screws (pair), 12 mm
1	FF 904 S	Distraction screws (pair), 14 mm
1	FF 909 S	Distraction screws (pair), 18 mm
1	FF 917 R	Vertebral body dissector
1	FF 918 R	Vertebral body dissector, toothed

Graft Harvesting and Graft Insertion:

Amount	Reference Number	Description
1	AA 845 R	Calliper
each 1 x	GC 640 R – GC 646 R	Oscillating saw blade, height of 6-12mm, range of length according the user
1	GB 129	Oscillating saw hand piece with key (TE 472) for changing the saw blades
1	FF 928 R	Graft cutter, 7 mm width of jaw
1	FF 927 R	Graft cutter, 10 mm width of jaw, for bone graft 9–12 mm
1	FF 911 R	Graft holder and impactor
1	FF 913 R	Tapper, Ø 3 mm
1	FF 914 R	Tapper, Ø 5 mm
1	FF 915 R	Tapper, Ø 8 mm
each 1 x	GD 126 R – GD 184 R	Drills and burrs for precise preparation of the bone graft, to be used with the INTRA micro hand piece GD 456 R, range of sizes according the user
1	FK 773 R	Scoop, straight, size of jaw 3,6 x 5 mm
1	FK 774 R	Scoop, straight, size of jaw 4,4 x 6,2 mm
1	FK 775 R	Scoop, straight, size of jaw 5,2 x 7,3 mm
1	FK 783 R	Scoop, curved, size of jaw 3,6 x 5 mm
1	FK 784 R	Scoop, curved, size of jaw 4,4 x 6,2 mm
1	FK 785 R	Scoop, curved, size of jaw 5,2 x 7,3 mm
1	FK 834 R	Curettes, square shaped jaw, toothed, 4 mm
1	FK 835 R	Curettes, square shaped jaw, toothed, 5 mm
1	FK 836 R	Curettes, square shaped jaw, toothed, 6 mm
2	JF 213 R	Perforated basket 485 x 253 x 76 mm
4	JF 936	Silicone pad

CASPARevolution „Economy"- set for short fusions

Amount	Reference Number	Description
Implants:		
5	LB 554 T	4.0 mm CASPARevolution unicortical screw, 14 mm
5	LB 556 T	4.0 mm CASPARevolution unicortical screw, 16 mm
5	LB 558 T	4.0 mm CASPARevolution unicortical screw, 18 mm
5	LB 454 T	3.5 mm CASPARevolution bicortical screw, 14 mm
5	LB 456 T	3.5 mm CASPARevolution bicortical screw, 16 mm
5	LB 457 T	3.5 mm CASPARevolution bicortical screw, 17 mm
5	LB 458 T	3.5 mm CASPARevolution bicortical screw, 18 mm
5	LB 459 T	3.5 mm CASPARevolution bicortical screw, 19 mm
5	LB 460 T	3.5 mm CASPARevolution bicortical screw, 20 mm
5	LB 461 T	3.5 mm CASPARevolution bicortical screw, 21 mm
5	LB 462 T	3.5 mm CASPARevolution bicortical screw, 22 mm
5	LB 463 T	3.5 mm CASPARevolution bicortical screw, 23 mm
5	LB 464 T	3.5 mm CASPARevolution bicortical screw, 24 mm
5	LA 018 T	4.5 mm CASPARevolution oversized screw, 18 mm
5	LA 019 T	4.5 mm CASPARevolution oversized screw, 19 mm
5	LA 020 T	4.5 mm CASPARevolution oversized screw, 20 mm
5	LA 021 T	4.5 mm CASPARevolution oversized screw, 21 mm
5	LA 022 T	4.5 mm CASPARevolution oversized screw, 22 mm
5	LA 023 T	4.5 mm CASPARevolution oversized screw, 23 mm
5	LA 024 T	4.5 mm CASPARevolution oversized screw, 24 mm
1	FG 424 T	CASPARevolution plate, 24 mm
1	FG 426 T	CASPARevolution plate, 26 mm
1	FG 428 T	CASPARevolution plate, 28 mm
1	FG 430 T	CASPARevolution plate, 30 mm
1	FG 432 T	CASPARevolution plate, 32 mm
1	FG 434 T	CASPARevolution plate, 34 mm
1	FG 436 T	CASPARevolution plate, 36 mm
1	FG 442 T	CASPARevolution plate, 42 mm
1	FG 444 T	CASPARevolution plate, 44 mm
1	FG 446 T	CASPARevolution plate, 46 mm
1	FG 448 T	CASPARevolution plate, 48 mm
1	FG 450 T	CASPARevolution plate, 50 mm
1	FG 452 T	CASPARevolution plate, 52 mm
1	FG 454 T	CASPARevolution plate, 54 mm

Please turn

Amount	Reference Number	Description
Orga-Tray:		
1	FG 059 P	Orga-Tray
Instruments:		
1	FF 969 R	Plate holding forceps
1	FF 956 R	Plate holding forceps (cross and transverse bending)
1	FF 966 R	Plate holding forceps ("Ear bender")
1	FG 315 R	Spike-Impactor
1	FG 310 R	Spikes (package with 10 pieces)
1	FF 885 R	Single drill guide
1	FF 886 R alternatively: FG 415 R	Double drill guide (could also be used for unicortical drill bit) Double drill guide, unicortical
2	FG 412 R	Drill bit, 2.0 mm (for bicortical screws)
1	FG 414 R	Drill bit, 2.2 mm (for unicortical screws)
1	FG 413 R	Tap (for bicortical screws)
1	FF 954 R	Screw driver
1	FF 964 R	Screw holding sheath
1	LS 040 S	Screw forceps
optional 1	FF 965 R	Depth gauge
optional 1	FF 957 R	Ball tip screw driver

FG 059 P

NB:
if exclusively unicortical screws are used, the screw rack in the AESCULAP FG 061 P tray can be exchanged later for the unicortical screw rack (FG 064 P). This also applies to the bicortical screw rack (FG 062 P).

The integrated screw rack in the FG 061 P tray is the same size as the screw trays for unicortical screws (FG 064 P) and bicortical screws (FG 062 P) which already exist.

! **Tip:** please also refer to the appropriate usage instructions supplied with the products.

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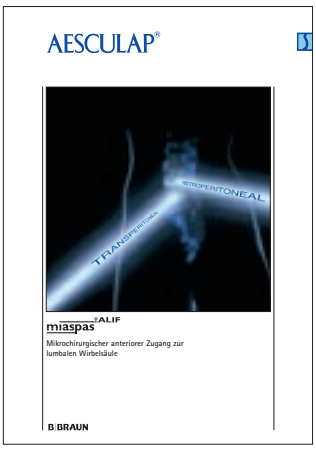

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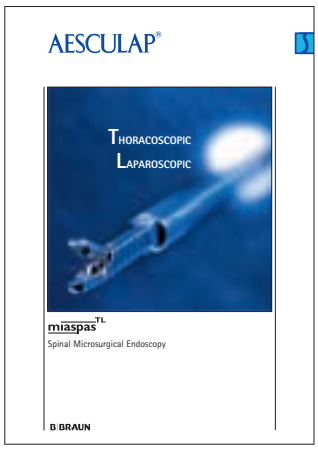

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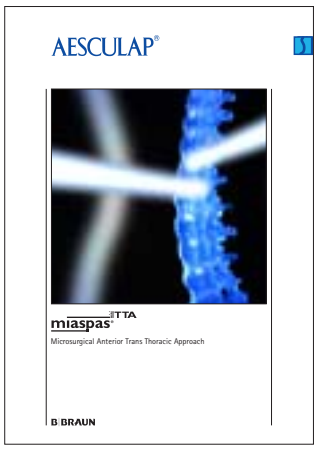

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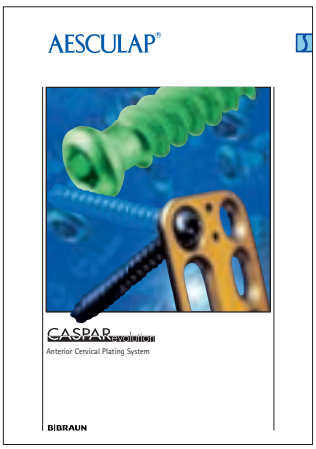

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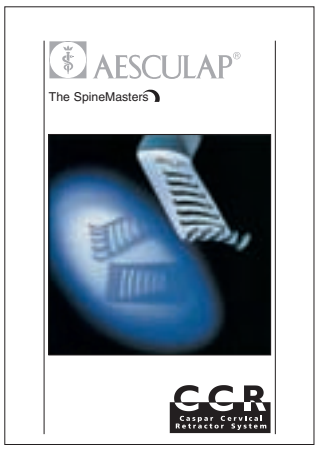

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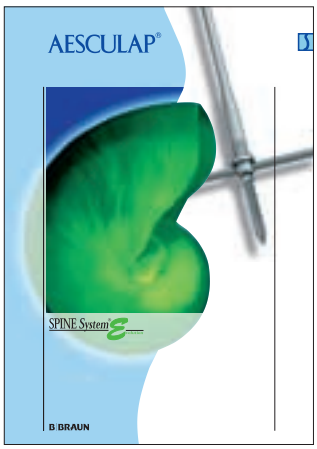

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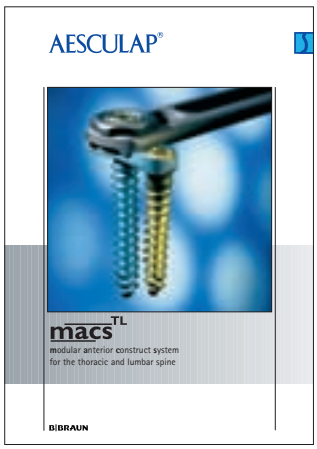

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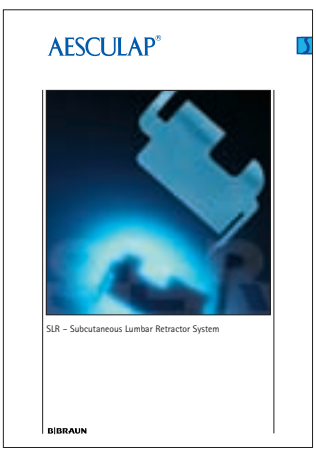

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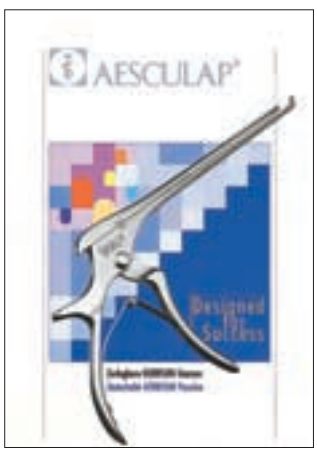

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