Anterior cervical plate system

VECTRA

Surgical Technique

DePuy Synthes

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Image intensifier control

This description alone does not provide sufficient background for direct use of DePuy Synthes products. Instruction by a surgeon experienced in handling these products is highly recommended.

Processing, Reprocessing, Care and Maintenance
For general guidelines, function control and dismantling of multi-part instruments, as well as processing guidelines for implants, please contact your local sales representative or refer to:
http://emea.depuysynthes.com/hcp/reprocessing-care-maintenance
For general information about reprocessing, care and maintenance of Synthes reusable devices, instrument trays and cases, as well as processing of Synthes non-sterile implants, please consult the Important Information leaflet (SE_023827) or refer to:
http://emea.depuysynthes.com/hcp/reprocessing-care-maintenance

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* For Product Catalog contact your local Depuy Synthes representative

VECTRA – Anterior Cervical Plate System

Plates

- Integrated screw blocking mechanism
- Prelordosed
- 16.5 mm wide and 2.5 mm profile along midline of plate
- Titanium alloy plate (TAN)

Cephalad/caudal angulation

Screws

- Screws are color coded to identify function and diameter[1]
- Regular screw diameter 4.0 mm
- Each screw type is also available with diameter 4.5 mm for revision or where a larger diameter screw is preferred
- Titanium alloy screws (TAN)

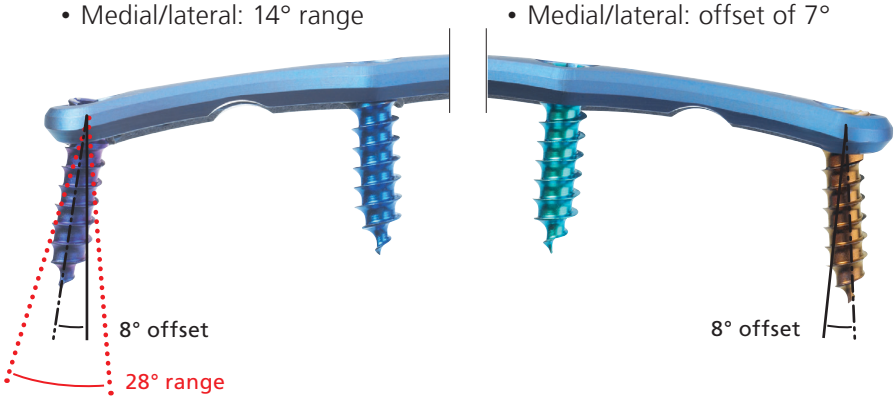
[1] Self-drilling Screws shown, same color code applies to self-tapping screws

Variable angle screws

- Cephalad/caudal: 28° range
- Medial/lateral: 14° range

Fixed angle screws

- Cephalad/caudal: offset of 8°
- Medial/lateral: offset of 7°



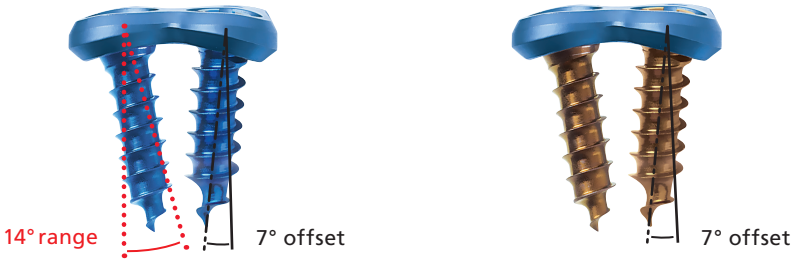
Variable angle screws

purple 4.0 mm blue 4.5 mm

Fixed angle screws

aqua 4.5 mm brown 4.0 mm

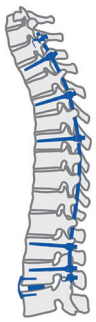
Medial/lateral angulation

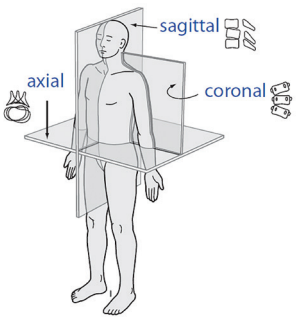


AO Spine Principles

The four principles to be considered as the foundation for proper spine patient management underpin the design and delivery of the Curriculum: Stability – Alignment – Biology – Function.[1,2]

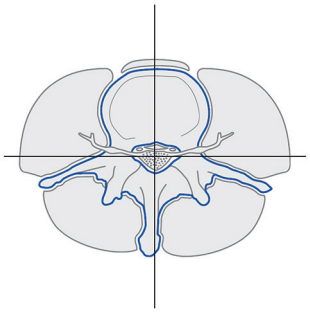
Stability
Stabilization to achieve a specific therapeutic outcome

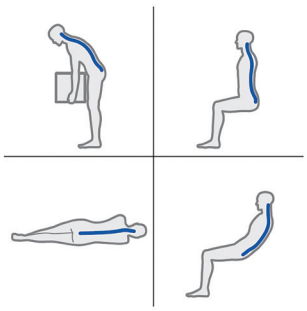




Alignment
Balancing the spine in three dimensions

Biology
Etiology, pathogenesis, neural protection, and tissue healing





Function
Preservations and restoration of function to prevent disability

Surgical Technique

1. Approach

Using the standard surgical approach, expose the vertebral bodies to be fused. Prepare the fusion site as per the appropriate technique for the given indication.

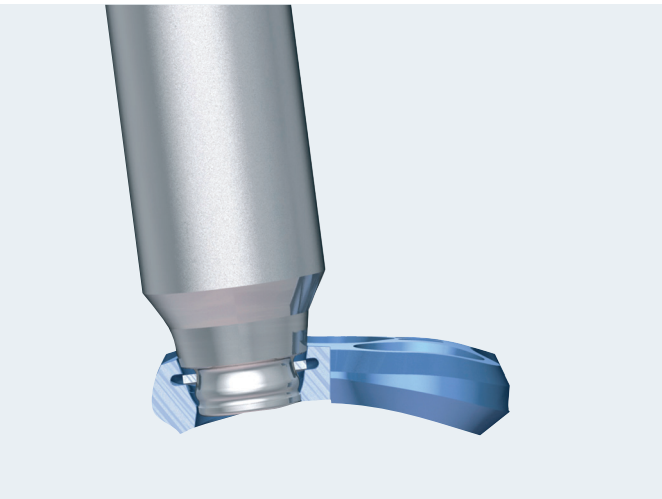
2. Select and bend plate

Optional instruments

03.600.002	Drill Guide 8.0/3.2, with fixed angle, for VECTRA and VECTRA-T
03.600.003	Drill Guide 8.0/3.2, with variable angle, for VECTRA and VECTRA-T
03.600.004	Bending Pliers for VECTRA Plates

Select appropriate plate size.

Plate may be brought in position with the Drill Guide (fixed angle or variable angle).



Tip of Drill Guide snaps into clip in plate hole

Precautions:

- **It must be considered that the intervertebral discs in the neck region are slightly inclined from anterocaudal to posterocranial. Screws should remain in the vertebral body and not penetrate the intervertebral discs. Make sure there will be enough space between the intact adjacent intervertebral discs and the screws.**
- **Only bend the plate at the bending notches or else the holes may distort.**
- **Repeated bending may weaken the plate.**
- **Do not bend the plate at the holes.**

Once the correct plate size has been chosen, determine plate alignment. The Bending Pliers may be used to give the plate its correct lordotic curvature.

Increase lordotic bend

Decrease lordotic bend

3. Secure plate with temporary Fixation Pins

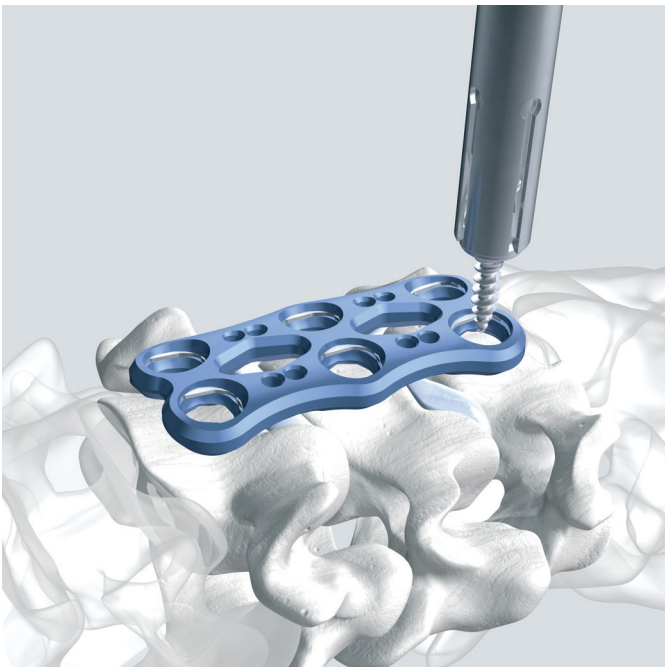
Required instruments

324.101	Fixation Pin for temporary use
324.105	Screwdriver for Insertion, self-holding
352.312	Holding Sleeve, for No. 324.105

After the plate is placed in the appropriate position, it is secured with Fixation Pins. Insert the first Fixation Pin using the Screwdriver for Insertion and the additionally available Holding Sleeve. Screw the pin into the vertebral body. Insert a second pin into the diagonally opposite plate hole.

Additional temporary Fixation Pins may be inserted if desired.

Precaution: **Intraoperative imaging should be used for a lateral view of the position of the fixation pins to indicate the potential positions of the screws.**



Option A
Variable angle, self-drilling screw

A4. Break cortex

Required instrument

324.111	Awl ∅ 2.5 mm with trocar tip

Optional instrument

03.613.001	Drill and Screw Guide, for VECTRA and VECTRA-T

Determine the entry point and trajectory for the screw. Insert the awl at the desired angle into the screw hole and push down while simultaneously twisting the awl handle. Remove the awl maintaining hole and plate alignment.

Precaution: **Intraoperative imaging should be used to verify awl position.**

Optionally the Drill and Screw Guide can be introduced with the alignment post in the diamond window and used as a guide for the following steps.

Insert the tip of the drill guide at an angle, as shown, and rotate the instrument forward until the tip is engaged. The tip of the drill guide snaps into the clip in the plate hole.

A5. Insert variable angle screw

Required instrument

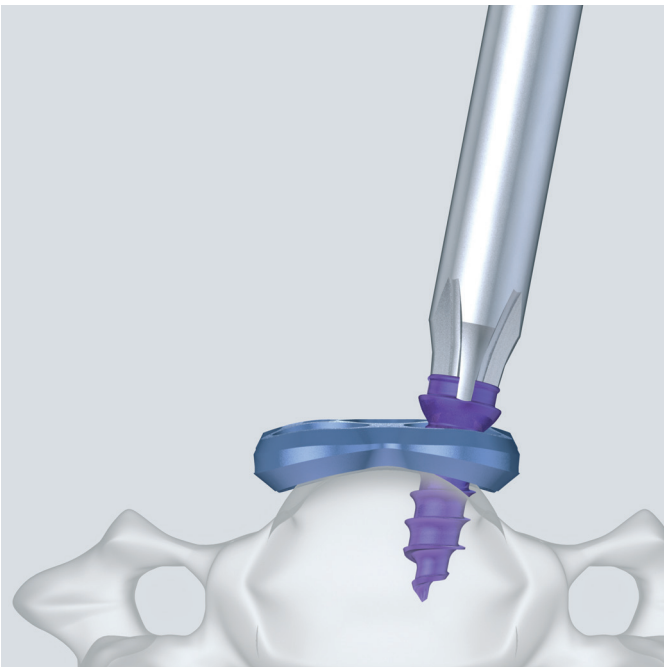
324.105	Screwdriver for Insertion, self-holding

Load a self-drilling variable angle screw of the appropriate length onto the Screwdriver for Insertion. Advance the screw until the head of the screw is fully seated and the plate is lagged to the bone.

Warning: **For long spans or suboptimal bone quality, the surgeon is urged to consider the nature of such cases. The treatment may require the use of screws longer than 16mm, and/or posterior fixation for these kinds of inherently unstable cases.**

Precautions:

- **It must be considered that the intervertebral discs in the neck region are slightly inclined from anterocaudal to posterocranial. Screws should remain in the vertebral body and not penetrate the intervertebral discs. Make sure there will be enough space between the intact adjacent intervertebral discs and the screws.**
- **The 4.5 mm screw may be used as an emergency screw where the 4.0 mm screw has stripped the bone and a larger screw thread is required.**
- **Intraoperative imaging should be used to verify screw position.**



Option B

Fixed angle, self-drilling screw

B4. Break cortex

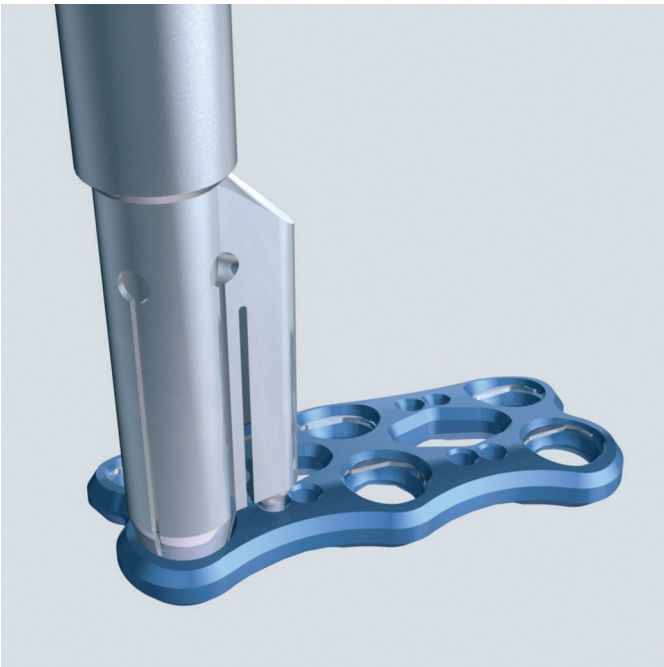
Required instruments

324.111	Awl ∅ 2.5 mm with trocar tip
03.613.001	Drill and Screw Guide, for VECTRA and VECTRA-T

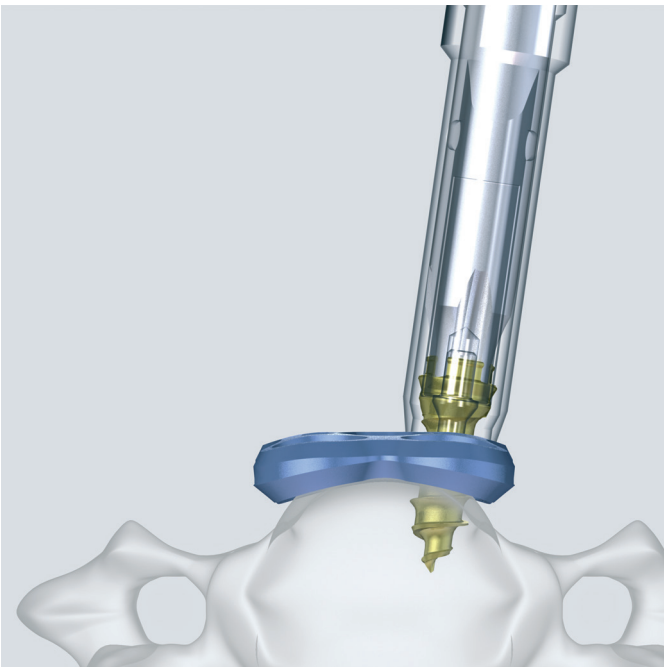
Introduce the Drill and Screw Guide in the small posthole of the plate. Insert the awl in the Drill and Screw Guide and push down while simultaneously twisting the awl handle. Remove the awl maintaining hole and plate alignment.

Precaution: **Intraoperative imaging should be used to verify awl position.**

The Drill and Screw Guide must be introduced with the alignment post in the small hole adjacent to the screw hole and used as a guide for the following steps.



B5. Insert fixed angle screw



Required instruments

324.105	Screwdriver for Insertion, self-holding
03.613.001	Drill and Screw Guide, for Vectra and Vectra-T

Load a self-drilling fixed angle screw of the appropriate length onto the Screwdriver for Insertion. Insert the loaded Screwdriver in the Drill and Screw Guide and advance the screw until the head of the screw is fully seated in the plate.

Warning: **For long spans or suboptimal bone quality, the surgeon is urged to consider the nature of such cases. The treatment may require the use of screws longer than 16mm, and/or posterior fixation for these kinds of inherently unstable cases.**

Precautions:

- **It must be considered that the intervertebral discs in the neck region are slightly inclined from anterocaudal to posterocranial. Screws should remain in the vertebral body and not penetrate the intervertebral discs. Make sure there will be enough space between the intact adjacent intervertebral discs and the screws.**
- **The 4.5 mm screw may be used as an emergency screw where the 4.0 mm screw has stripped the bone and a larger screw thread is required.**
- **Intraoperative imaging should be used to verify screw position.**

Option C
Variable angle, self-tapping screw

C4. Drill pilot hole

Required instruments

03.600.003	Drill Guide 8.0/3.2, with variable angle, for VECTRA and VECTRA-T
324.107	Handle with Quick Coupling
324.151–159	Drill Bit ∅ 2.5 mm, lengths 12–20 mm, 2-flute, for Quick Coupling
03.613.222–226	Drill Bit ∅ 2.5 mm, lengths 22–26 mm, 2-flute, for Quick Coupling

Optional instruments

03.613.001	Drill and Screw Guide, for VECTRA and VECTRA-T
387.292	Screw Length Indicator for Cervical Spine Expansion Head Screws, length up to 50 mm
311.402	Tap for Cancellous Bone Screws ∅ 4 mm, length 220 mm
311.404	Tap for Cancellous Bone Screws ∅ 4.5 mm, length 220 mm

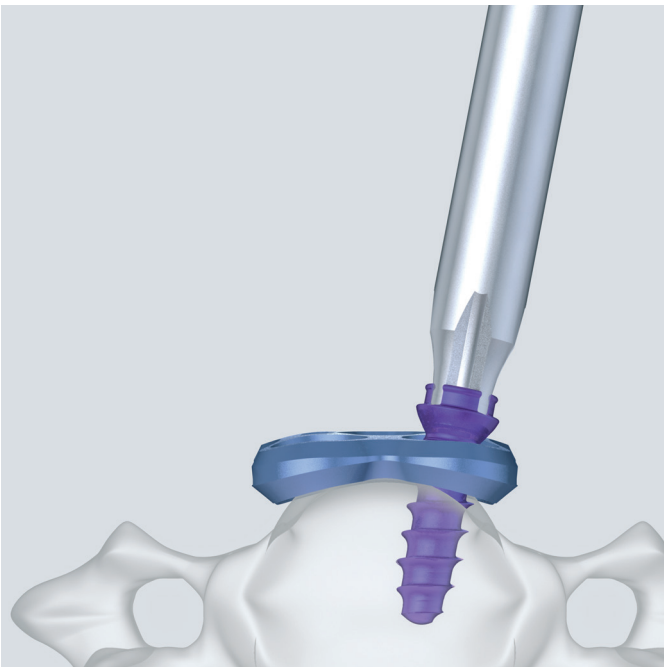
Select a drill bit and screw of appropriate length.

Insert the Drill Guide into the desired hole inclined to the appropriate direction for drilling. Insert the Drill Bit into the Drill Guide and drill to desired depth. The drill will stop at the depth indicated on the drill when the stop contacts the top of the Drill Guide.

Precaution: **Intraoperative imaging should be used to check the drilling operation.**

Remove drill guide and bit.

C5. Insert variable-angle screw



Required instrument

324.105	Screwdriver for Insertion, self-holding

Optional instrument

03.613.001	Drill and Screw Guide, for VECTRA and VECTRA-T

Load a variable angle self-tapping screw of the appropriate length onto the Screwdriver for Insertion. Advance the screw until the head of the screw is fully seated in the plate and the plate is lagged to the bone.

Warning: **For long spans or suboptimal bone quality, the surgeon is urged to consider the nature of such cases. The treatment may require the use of screws longer than 16mm, and/or posterior fixation for these kinds of inherently unstable cases.**

Precautions:
- **It must be considered that the intervertebral discs in the neck region are slightly inclined from anterocaudal to posterocranial. Screws should remain in the vertebral body and not penetrate the intervertebral discs. Make sure there will be enough space between the intact adjacent intervertebral discs and the screws.**
- **The 4.5 mm screw may be used as an emergency screw where the 4.0 mm screw has stripped the bone and a larger screw thread is required.**
- **Intraoperative imaging should be used to verify screw position.**

C6. Optional instrumentation

Optional instruments

311.402	Tap for Cancellous Bone Screws ∅ 4 mm
311.404	Tap for Cancellous Bone Screws ∅ 4.5 mm

Dense bone may be tapped using the Tap for 4.0 mm or 4.5 mm cancellous screws.

Option D

Fixed angle, self-tapping screw

D4. Drill pilot hole

Required instruments

03.600.002	Drill Guide 8.0/3.2, with fixed angle, for VECTRA and VECTRA-T
324.107	Handle with Quick Coupling
324.151–159	Drill Bit ∅ 2.5 mm, lengths 12–20 mm, 2-flute, for Quick Coupling
03.613.222–226	Drill Bit ∅ 2.5 mm, lengths 22–26 mm, 2-flute, for Quick Coupling

Optional instruments

03.613.001	Drill and Screw Guide, for VECTRA and VECTRA-T
387.292	Screw length indicator, depth up to 50 mm
311.402	Tap for Cancellous Bone Screws ∅ 4 mm, length 220 mm
311.404	Tap for Cancellous Bone Screws ∅ 4.5 mm, length 220 mm

Select a drill bit and screw of appropriate length.

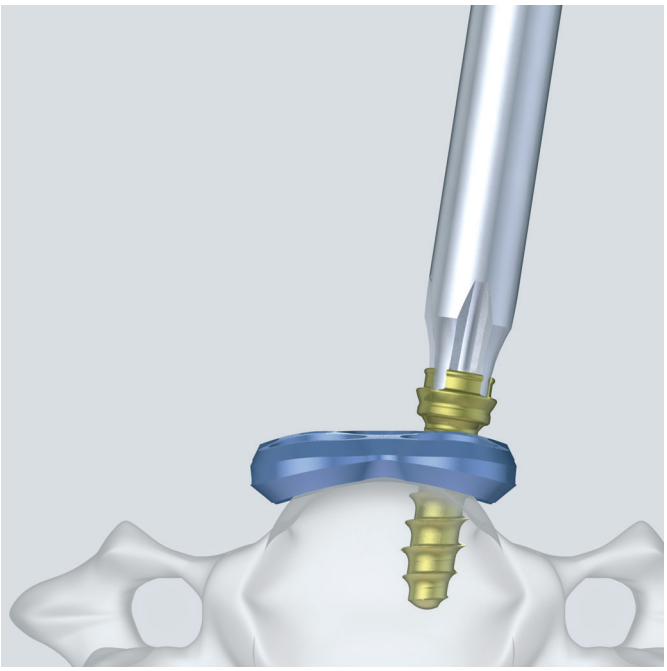
Insert the Drill Guide fully into the desired hole so that the correct fixed angle screw trajectory is given.

Insert the Drill Bit into the Drill Guide and drill to desired depth. The drill will stop at the depth indicated on the drill when the stop contacts the top of the Drill Guide.

Precaution: **Intraoperative imaging should be used to check the drilling operation.**

Remove drill guide and bit.

D5. Insert fixed-angle screw



Required instrument

324.105	Screwdriver for Insertion, self-holding

Optional instrument

03.613.001	Drill and Screw Guide, for VECTRA and VECTRA-T

Load a fixed angle self-tapping screw of the appropriate length onto the Screwdriver for Insertion. Advance the screw until the head of the screw is fully seated in the plate and the plate is lagged to the bone.

Warning: **For long spans or suboptimal bone quality, the surgeon is urged to consider the nature of such cases. The treatment may require the use of screws longer than 16mm, and/or posterior fixation for these kinds of inherently unstable cases.**

Precautions:

- **It must be considered that the intervertebral discs in the neck region are slightly inclined from anterocaudal to posterocranial. Screws should remain in the vertebral body and not penetrate the intervertebral discs. Make sure there will be enough space between the intact adjacent intervertebral discs and the screws.**
- **The 4.5 mm screw may be used as an emergency screw where the 4.0 mm screw has stripped the bone and a larger screw thread is required.**
- **Intraoperative imaging should be used to verify screw position.**

D6. Optional instrumentation

Optional instruments

311.402	Tap for Cancellous Bone Screws ∅ 4 mm
311.404	Tap for Cancellous Bone Screws ∅ 4.5 mm

Dense bone may be tapped using the tap for 4.0 mm or 4.5 mm cancellous screws.

Implant Removal

1. Clean screw head

Required instrument

324.071	Cleaning Instrument for Screw Head

If access to the screw head is blocked by tissue, use the Cleaning Instrument for Screw Head to clean out material. Insert the instrument into the screw head and twist the handle back and forth until material is removed.

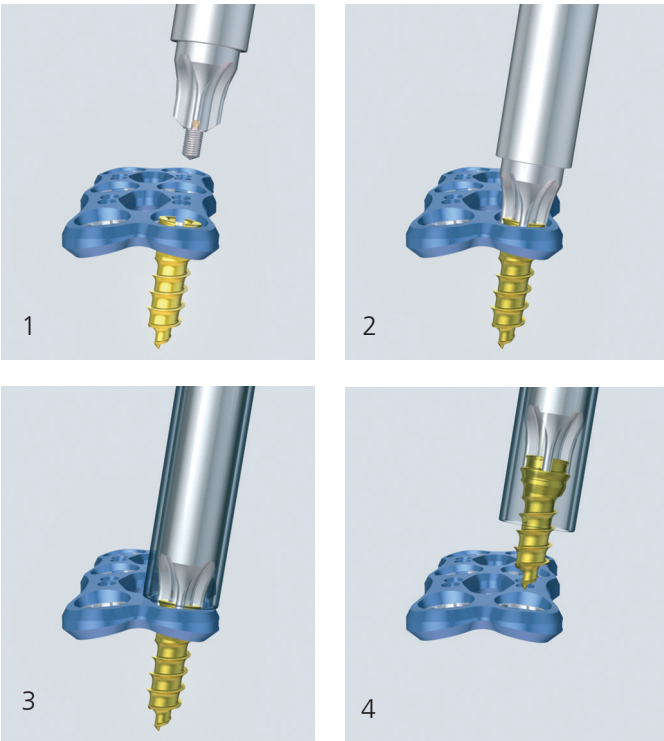
2. Remove screw

Required instrument

352.311	Screwdriver for Extraction

For screw removal the Screwdriver for Extraction must be used.

Insert the driver shaft into the screw head recess. Tighten the knob on the handle to thread the threaded tip of the inner shaft into the mating thread of the screw. Advance the sleeve downward to contact the upper surface of the plate by turning the sleeve clockwise.



Precautions:

- **Do not rotate the sleeve after it has contacted the surface of the plate. While holding the sleeve, turn the handle counterclockwise to extract the screw.**
- **A screw can be inserted and removed two times. If a screw is removed a third time the plate needs to be replaced.**
- **If the inner shaft knob is not fully tightened to the handle, breakage of the driver may occur and could potentially harm the patient.**

Warning: The extraction screwdriver should only be used for screw removal; use of the extraction screwdriver for screw insertion may lead to driver and/or implant breakage.

3. Remove plate

After all the screws have been removed, the plate can then be removed.

Indications and Contraindications

Please refer to the corresponding Instructions for Use for specific information on Intended use, Indications, Contraindications, Warnings and Precautions, Potential Adverse Events, Undesirable Side Effects and Residual Risks. Instructions for Use are available at www.e-ifu.com and/or www.depuysynthes.com/ifu.

Bibliography

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Aebi M, Thalgott JS, Webb JK (1998): AO ASIF Principles in Spine Surgery. Berlin: Springer-Verlag.

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