The total solution for simple and complex spine pathology.

MATRIX Spine System – Deformity

Surgical Technique

DePuy Synthes

PART OF THE Johnson&Johnson FAMILY OF COMPANIES

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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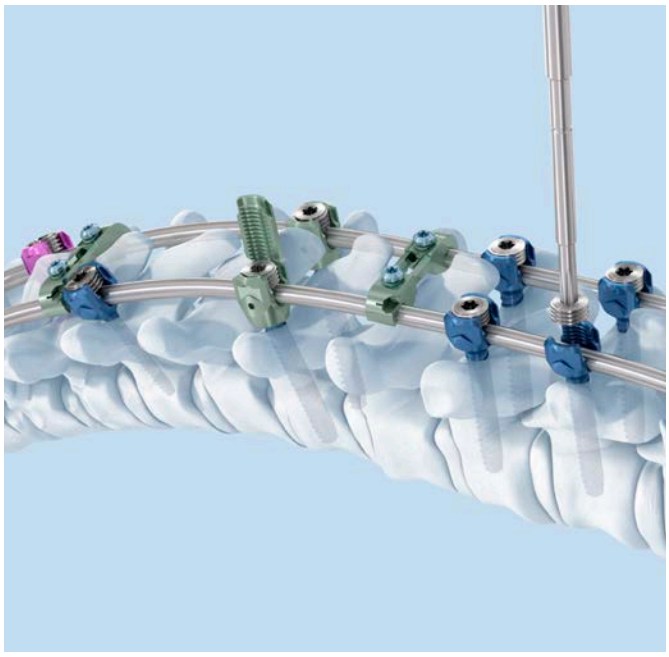
MATRIX Spine System – Deformity

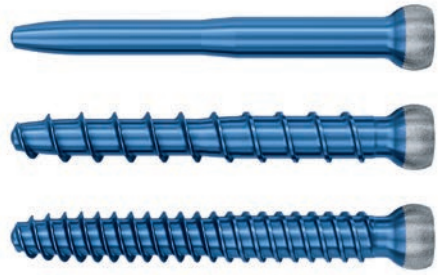
The total solution for simple and complex spine pathology

The Synthes MATRIX Spine System is a universal set of instruments and implants that cover degenerative, deformity, MIS and Trauma indications.



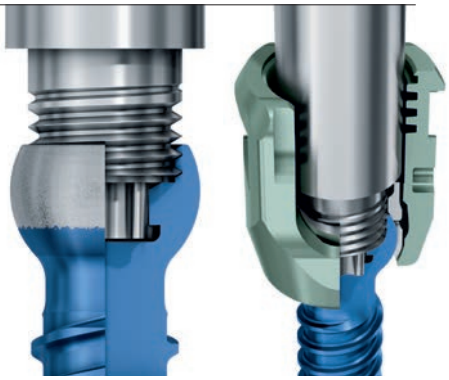
Unique Dual Core/Double Lead Screw Design

- Fast and controlled insertion
- Increased pull-out resistance due to optimal bone purchase
- Improved handling thanks to atraumatic tip and self tapping thread



PrimeLock – Screwdriver – Screw Interlock

- Toggle free screw insertion
- Precise and controlled screw placement
- Direction of screw insertion possible

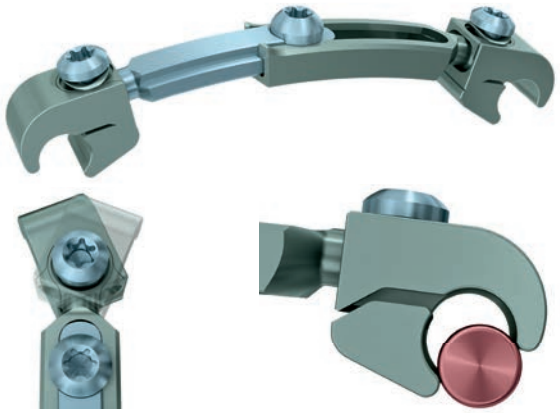


Modularity – Click-on and Preassembled Screws

- Customized inventory possible
- For better visualization of the anatomical structure
- Multiple screw head removal and replacement without removing the bone screw from the pedicle

Snap-on Swiveling Transverse Connector

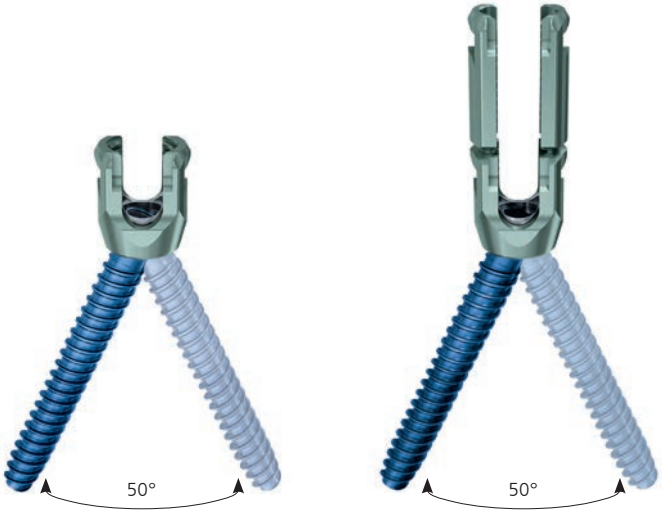
- Offers fast and simple in-situ placement
- Simple anatomical adjustment possible



Implants

Preassembled Polyaxial and Reduction Pedicle Screw

- Allows up to 50° of angulation to ease in situ connection to the longitudinal rod
- The rod reduction features are located at the top of the polyaxial head.
- Dual Core/Double Lead thread designed to securely anchor the screw in cortical and cancellous bone
- Threaded T25 Stardrive recess designed to deliver torque effectively

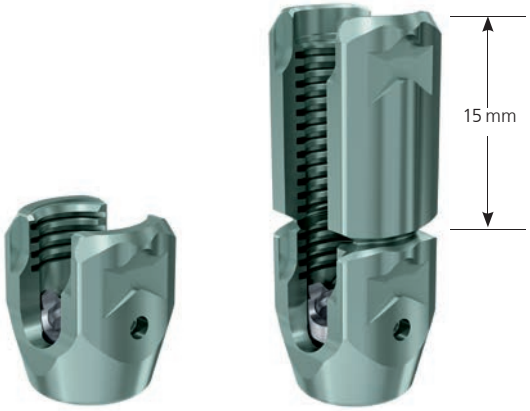


Pedicle Screw

- Increased visual access to the anatomical structures
- Allows for improved access to the surgical field
- Dual Core/Double Lead thread designed to securely anchor the screw in cortical and cancellous bone
- Threaded T25 Stardrive recess designed to deliver torque effectively

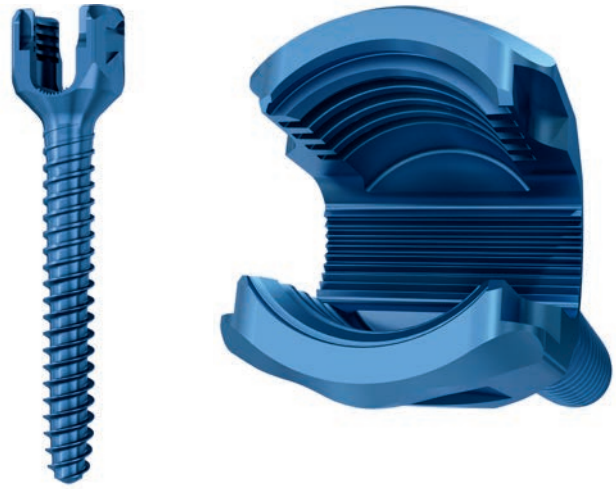
Click-on Polyaxial and Reduction Screw Head

- The polyaxial head of the implant is designed for rod reduction
- To ease intraoperative planning, the polyaxial heads can be removed and replaced without removing the pedicle screw from the pedicle
- The reduction head allows for 15 mm rod reduction



Monoaxial Pedicle Screw

- The rod reduction features are raised to the top of the monoaxial head, allowing instruments to be easily attached and removed from the implant
- The low-profile head minimizes the implant height above the bony anatomy
- Longitudinal grooves at the bottom of the screw head prevent the rod from derotating

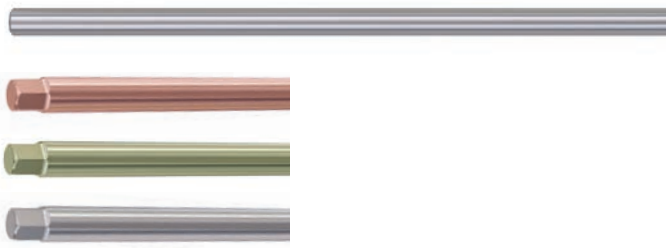


Hooks

- Wide array of hooks for various patient anatomy
- The low-profile head minimizes the implant height above the bony anatomy
- The rod reduction features are raised to the top of the head, allowing instruments to be easily attached and removed from the implant
- Longitudinal grooves at the bottom of the screw head prevent the rod from derotating

Rods

- 5.5 mm diameter in pure titanium, titanium alloy and cobalt chrome
- A choice of straight, curved, and hex-end options to help ease intraoperative construct assembly and technique maneuvers
- Offered in a variety of lengths from 30 mm to 500 mm

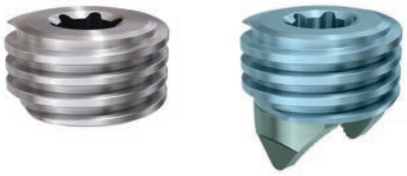


Connecting Rods

- 6.0 mm diameter tapered to 5.5 mm diameter
- 5.5 mm diameter tapered to 4.0 mm diameter (titanium alloy only)
- 5.5 mm diameter tapered to 3.5 mm diameter (titanium alloy only)
- Offered in titanium alloy (Ti-6AI-7Nb), titanium or cobalt-chrome alloy (CoCrMo)
- Available in 500 mm length

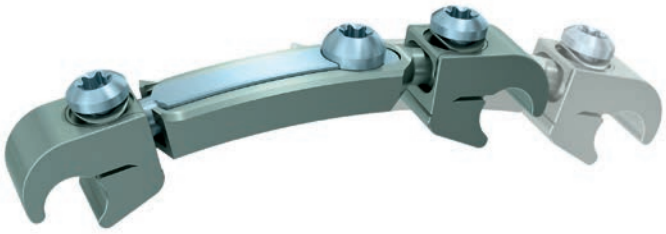
Locking Caps

- Square thread design minimizes cross threading under high reduction loads
- T25 Stardrive recess designed to reduce the risk of damage at high loads
- 1-step locking cap allows for complete fixation in one step (polyaxiality and run on rod)
- Available flat or with guidance



Transverse Connector

- The snap-on transverse connector is preassembled and requires only final positioning and tightening
- The jaws of the transverse connector swivel and are spring loaded
- Telescoping body is arched to accommodate grafts and anatomical structures and is available in a range of lengths
- The locking screws use a T15 Stardrive which minimizes drive stripping while final tightening



Open Titanium Transverse Bars

- Provide a lateral extension from the longitudinal rod to the monoaxial screw
- Available in lengths of 15 mm, 20 mm, 25 mm and 30 mm
- Eliminate the need for severe rod contours which might otherwise be required for direct hook and screw-to-rod connection

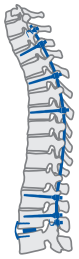
Instruments

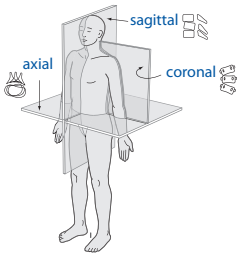
- Ergonomically designed handles
- Intuitive, easy to use
- Convenient, interchangeable options

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]

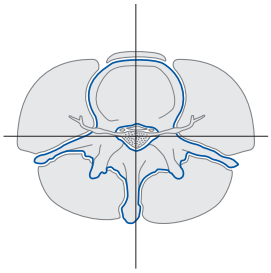
Stability
Stabilization to achieve a specific therapeutic outcome

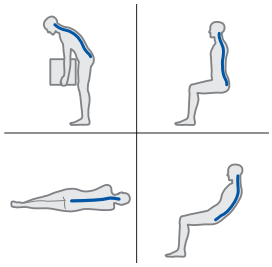




Alignment
Balancing the spine in three dimensions

Biology
Etiology, pathogenesis, neural protection, and tissue healing





Function
Preservations and restoration of function to prevent disability

[1] Aebi et al (1998)
[2] Aebi et al (2007)

Indications and Contraindications

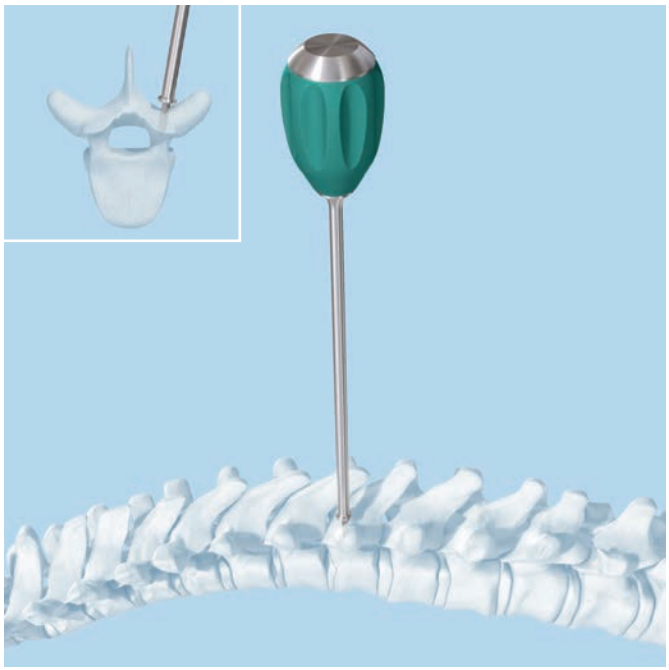
The MATRIX Spine System is a posterior pedicle screw and hook fixation system (T1–S2) intended to provide precise and segmental stabilization of the spine for use in skeletally mature patients.

Indications
- Deformities (i.e. scoliosis, kyphosis and/or lordosis)
- Degenerative disc disease
- Spondylolisthesis
- Trauma (i.e. fracture or dislocation)
- Tumor
- Stenosis
- Pseudarthrosis
- Failed previous fusion

Contraindications
- Osteoporosis
- In fractures and tumors with severe anterior vertebral body disruption, an additional anterior support or column reconstruction is required

1. Prepare pedicles and determine screw lengths

Instruments	
388.655	Pedicle Probe ∅ 3.7 mm with Silicone Handle, length 240 mm, for Pedicle Screws ∅ 5.0 to 7.0 mm
388.656	Pedicle Awl ∅ 4.0 mm with Silicone Handle, length 255 mm, for Pedicle Screws ∅ 5.0 to 7.0 mm

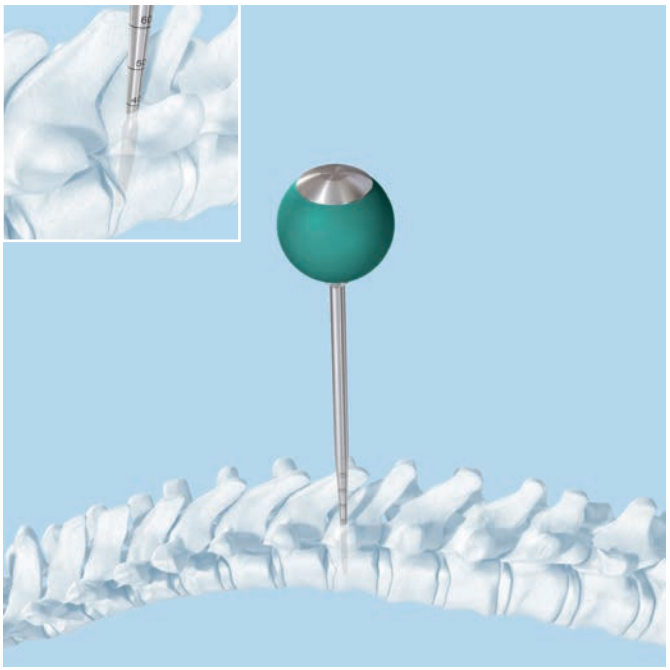


Locate pedicles and use the awl to perforate the cortex. Use the probe to open the pedicle canal. Using radiographic imaging, confirm pedicle location, orientation and depth by inserting the probe. When selecting the appropriate length screw, use the markings on the probe to determine the pedicle depth.

All MATRIX pedicle screws are self-tapping; however, if tapping is preferred, use the appropriate tap and tap handle.

Optional instruments

03.622.005	Pedicle Probe, thoracic
03.632.054	Pedicle Probe, thoracic, small
03.632.057	Pedicle Marker for Matrix
03.632.058	Inserter for Pedicle Marker, for Matrix
03.632.103 – 03.632.109	Taps, for Pedicle Screws, 6 mm hex coupling (3.5 mm–9.0 mm), length 180 mm
388.654	Ratchet with Handle, with Hexagonal Quick Coupling 6.0 mm
388.536	Pedicle Probe for Screws ∅ 4.2 mm, length 240 mm
388.545	Feeler for Screw Channel, straight, ∅ 2.3 mm, length 275 mm
388.546	Feeler for Screw Channel, curved, ∅ 2.3 mm, length 275 mm
388.549	Feeler, straight, with rounded tip
388.657	Pedicle Probe ∅ 3.8 mm, curved, with Silicone Handle, length 290 mm, for Pedicle Screws ∅ 5.0 to 7.0 mm
388.551	Pedicle Awl ∅ 3.0 mm, length 230 mm, for Screws ∅ 4.0 and 4.2 mm



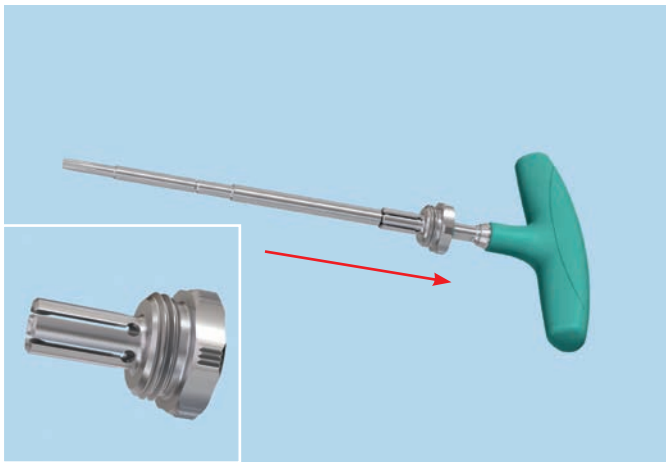
2. Assemble screwdriver for monoaxial screws

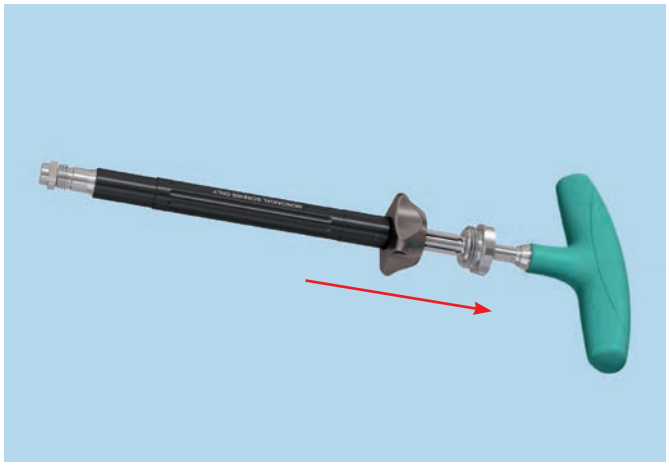
Instruments	
03.632.004	Screwdriver Stardrive, with T-Handle, standard, for Matrix 5.5
03.632.024	Retaining Sleeve, for Monoaxial Screws, standard, for Matrix 5.5

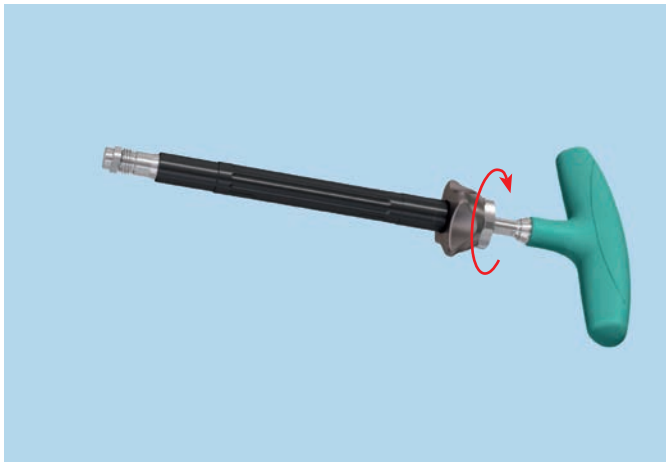
To assemble the monoaxial screwdriver, slide the finger spring (etched part C) onto the T25 Stardrive shaft. Next, slide the retaining sleeve onto the T25 Stardrive shaft. Turn the finger spring clockwise to engage the thread within the gray knob.

Note: **Remove the finger sleeve and retract the tube and tip for cleaning and sterilization.**

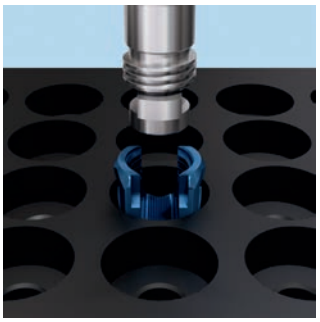
Optional instruments	
03.632.002	Screwdriver Shaft Stardrive, T25, standard, for Matrix 5.5
03.632.005	Screwdriver Stardrive, T25, with straight handle, standard, for Matrix 5.5
03.632.028	Retaining Sleeve for Monoaxial Screws, for Matrix
03.632.072	Screwdriver Shaft Stardrive, T25, long, for Matrix
03.632.074	Screwdriver Stardrive, T25, long, with T-Handle, for Matrix
03.632.075	Screwdriver Stardrive, T25, long, with straight handle, for Matrix
03.632.090	T-Handle with Ratchet Wrench, with Hexagonal Coupling 6.0 mm
03.632.091	Handle with Ratchet Wrench, straight, with Hexagonal Coupling 6.0 mm

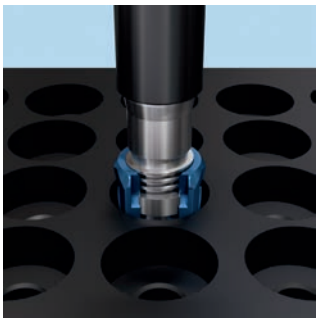






3. Pick up screw





Option A: Monoaxial pedicle screws

Instruments	
03.632.004	Screwdriver Stardrive, with T-Handle, standard, for Matrix 5.5
03.632.024	Retaining Sleeve, for Monoaxial Screws, standard, for Matrix 5.5

Choose the appropriate screw diameter and length based on pedicle probe feedback.

Insert the screwdriver tip into the recess of the monoaxial pedicle screw and rotate the gray knob of the retaining sleeve clockwise until the tip of the sleeve is firmly attached to the pedicle screw.

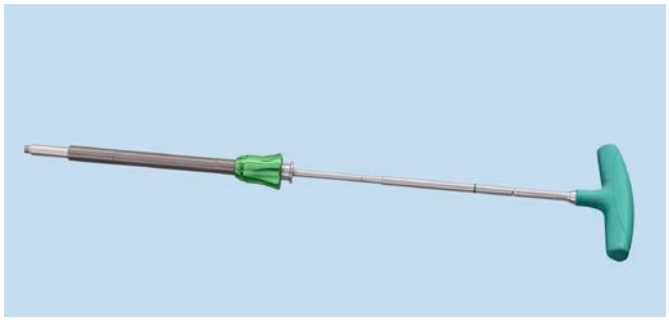
Verify the screw length with the template provided in the screw module.

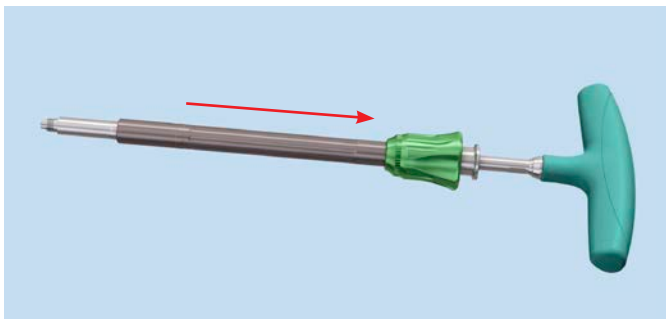
Optional instruments	
03.632.002	Screwdriver Shaft Stardrive, T25, standard, for Matrix 5.5
03.632.005	Screwdriver Stardrive, T25, with straight handle, standard, for Matrix 5.5
03.632.028	Retaining Sleeve for Monoaxial Screws, for Matrix
03.632.072	Screwdriver Shaft Stardrive, T25, long, for Matrix
03.632.074	Screwdriver Stardrive, T25, long, with T-Handle, for Matrix
03.632.075	Screwdriver Stardrive, T25, long, with straight handle, for Matrix
03.632.090	T-Handle with Ratchet Wrench, with Hexagonal Coupling 6.0 mm
03.632.091	Handle with Ratchet Wrench, straight, with Hexagonal Coupling 6.0 mm

Option B: Polyaxial pedicle screws

Option B1: Polyaxial pedicle screws with retaining sleeve

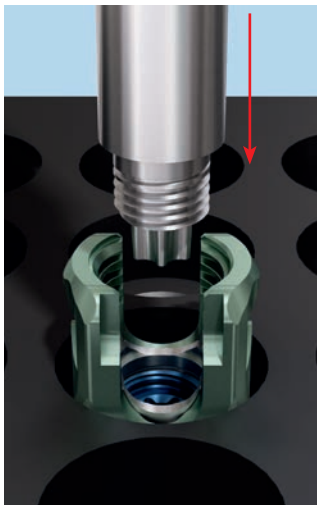
Instruments	
03.632.074	Screwdriver Stardrive, T25, long, with T-Handle, for Matrix
03.632.036	Retaining Sleeve, long, for Matrix 5.5

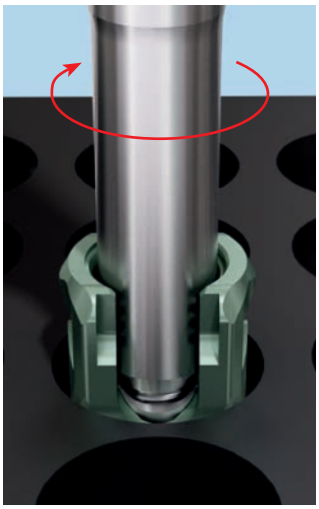




To assemble the screwdriver and the retaining sleeve, hold the green knob only and slide the retaining sleeve over the screwdriver. To load a pedicle screw, retract the green knob distally, then slide the sleeve toward the handle of the screwdriver shaft until it stops.

Insert the screwdriver tip into the recess of the polyaxial pedicle screw and rotate the green knob of the retaining sleeve clockwise until the tip of the sleeve is firmly attached to the polyaxial pedicle screw.





Verify the screw length with the template provided in the screw module.

Notes:

- **Disassemble completely for cleaning and sterilization.**
- **Do not grasp the green knob during screw insertion as this will cause the retaining sleeve to disengage from the screw.**
- **Ensure that the polyaxial screw head remains free to adapt its position and is not restricted by, or does not rest on, bony structures. If necessary, adjust the screw height and/or ream space for the screw head.**

Optional instruments

03.632.002	Screwdriver Shaft Stardrive, T25, standard, for Matrix 5.5
03.632.004	Screwdriver Stardrive, with T-Handle, standard, for Matrix 5.5
03.632.005	Screwdriver Stardrive, T25, with straight handle, standard, for Matrix 5.5
03.632.001	Retaining Sleeve, standard, for Matrix 5.5
03.632.072	Screwdriver Shaft Stardrive, T25, long, for Matrix
03.632.075	Screwdriver Stardrive, T25, long, with straight handle, for Matrix
03.632.090	T-Handle with Ratchet Wrench, with Hexagonal Coupling 6.0 mm
03.632.091	Handle with Ratchet Wrench, straight, with Hexagonal Coupling 6.0 mm

Option B2: Polyaxial pedicle screws with retaining sleeve, locking

Instruments	
03.632.074	Screwdriver Stardrive, T25, long, with T-Handle, for Matrix
03.616.043	Retaining Sleeve, locking, long

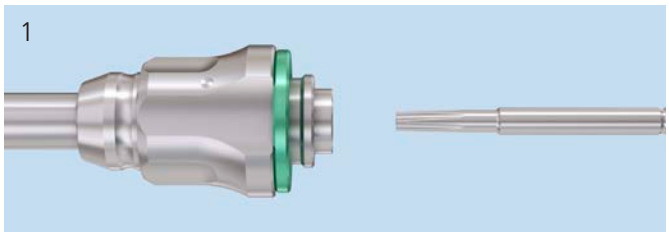
To assemble the screwdriver and the retaining sleeve, depress the loading collar on the proximal end of the holding sleeve (1).

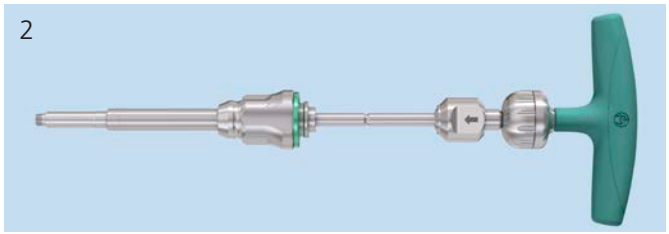
Then slide the sleeve toward the handle on the shaft until it stops (2).

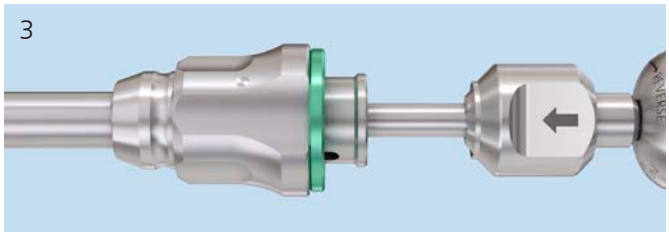
Release the loading collar and verify that the holding sleeve is firmly attached to the screwdriver (3).

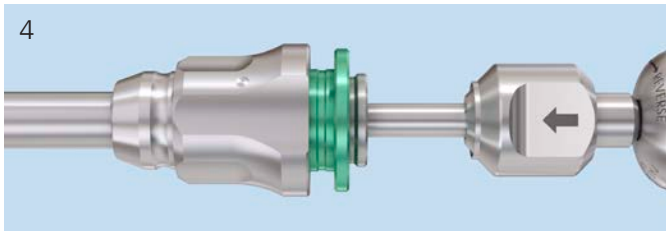
Retract the green locking ring towards the handle (4).

Place the screwdriver tip securely into the T25 StarDrive recess of the polyaxial pedicle screw or bone screw (5).









Rotate the grey knob of the holding sleeve clockwise, using the handle as countertorque. Firmly tighten to secure the implant (6).

Push the green locking ring toward the grey knob (7). If required, set the ratchet handle to the forward setting to insert the screw.

To release the sleeve, retract the green locking ring towards the handle, rotate the silver knob counterclockwise and remove the screwdriver (8)

Precautions:

- **Polyaxial screwheads need to remain free and mobile after insertion to allow accurate alignment to the rod during locking cap insertion and final tightening. The mobility of the screwhead cannot be assessed while the holding sleeve is attached.**
- **Disassemble completely for cleaning.**

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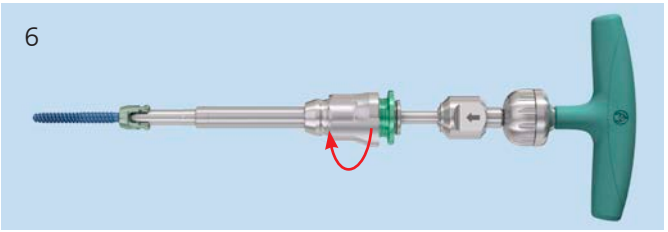

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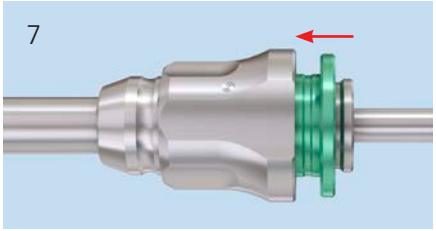

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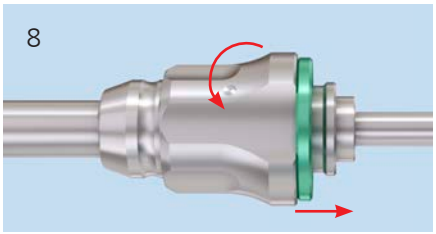


Optional instruments

03.632.002	Screwdriver Shaft Stardrive, T25, standard, for Matrix 5.5
03.632.004	Screwdriver Stardrive, with T-Handle, standard, for Matrix 5.5
03.632.005	Screwdriver Stardrive, T25, with straight handle, standard, for Matrix 5.5
03.616.042	Retaining Sleeve, locking
03.632.072	Screwdriver Shaft Stardrive, T25, long, for Matrix
03.632.075	Screwdriver Stardrive, T25, long, with straight handle, for Matrix
03.632.090	T-Handle with Ratchet Wrench, with Hexagonal Coupling 6.0 mm
03.632.091	Handle with Ratchet Wrench, straight, with Hexagonal Coupling 6.0 mm

4. Insert screw

Option A: Monoaxial pedicle screws

Instruments	
03.632.004	Screwdriver Stardrive, with T-Handle, standard, for Matrix 5.5
03.632.024	Retaining Sleeve, for Monoaxial Screws, standard, for Matrix 5.5

Insert the screw. Hold the black part of the retaining sleeve during screw insertion.

To disengage the retaining sleeve, turn the gray knob counterclockwise and remove the screwdriver.

Note: **Do not grasp the gray knob during screw insertion as this will cause the retaining sleeve to disengage from the screw.**

Optional instruments	
03.632.002	Screwdriver Shaft Stardrive, T25, standard, for Matrix 5.5
03.632.005	Screwdriver Stardrive, T25, with straight handle, standard, for Matrix 5.5
03.632.028	Retaining Sleeve for Monoaxial Screws, for Matrix
03.632.072	Screwdriver Shaft Stardrive, T25, long, for Matrix
03.632.074	Screwdriver Stardrive, T25, long, with T-Handle, for Matrix
03.632.075	Screwdriver Stardrive, T25, long, with straight handle, for Matrix
03.632.090	T-Handle with Ratchet Wrench, with Hexagonal Coupling 6.0 mm
03.632.091	Handle with Ratchet Wrench, straight, with Hexagonal Coupling 6.0 mm

Option B: Polyaxial pedicle screws

Option B1: Polyaxial pedicle screws using Screwdriver with retaining sleeve

Instruments	
03.632.074	Screwdriver Stardrive, T25, long, with T-Handle, for Matrix
03.632.036	Retaining Sleeve, long, for Matrix 5.5

Insert the screw. Hold the black part of the retaining sleeve during screw insertion.

To disengage the retaining sleeve, rotate the green knob counterclockwise and remove screwdriver

Note: **Do not grasp the green knob during screw insertion as this will cause the retaining sleeve to disengage from the screw.**

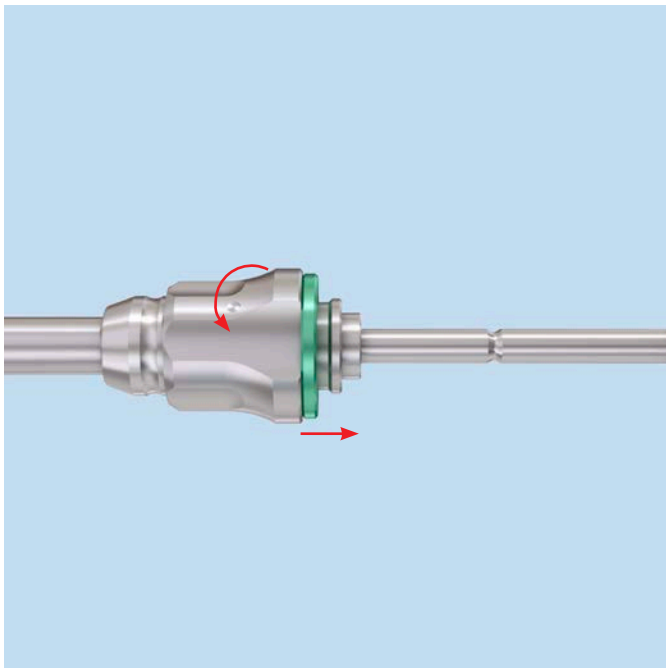
Optional instruments	
03.632.002	Screwdriver Shaft Stardrive, T25, standard, for Matrix 5.5
03.632.004	Screwdriver Stardrive, with T-Handle, standard, for Matrix 5.5
03.632.005	Screwdriver Stardrive, T25, with straight handle, standard, for Matrix 5.5
03.632.001	Retaining Sleeve, standard, for Matrix 5.5
03.632.072	Screwdriver Shaft Stardrive, T25, long, for Matrix
03.632.075	Screwdriver Stardrive, T25, long, with straight handle, for Matrix
03.632.090	T-Handle with Ratchet Wrench, with Hexagonal Coupling 6.0 mm
03.632.091	Handle with Ratchet Wrench, straight, with Hexagonal Coupling 6.0 mm

Option B2: Polyaxial pedicle screws with retaining sleeve, locking

Instruments	
03.632.074	Screwdriver Stardrive, T25, long, with T-Handle, for Matrix
03.616.043	Retaining Sleeve, locking, long

Insert the screw.

To release the sleeve, retract the green locking ring towards the handle, rotate the grey knob counterclockwise and remove the screwdriver.



Optional instruments

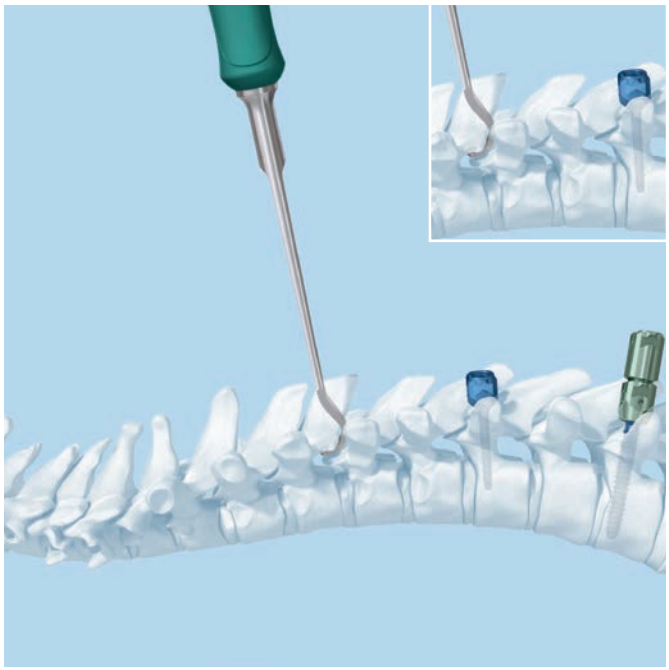
03.632.002	Screwdriver Shaft Stardrive, T25, standard, for Matrix 5.5
03.632.004	Screwdriver Stardrive, with T-Handle, standard, for Matrix 5.5
03.632.005	Screwdriver Stardrive, T25, with straight handle, standard, for Matrix 5.5
03.616.042	Retaining Sleeve, locking
03.632.072	Screwdriver Shaft Stardrive, T25, long, for Matrix
03.632.075	Screwdriver Stardrive, T25, long, with straight handle, for Matrix
03.632.090	T-Handle with Ratchet Wrench, with Hexagonal Coupling 6.0 mm
03.632.091	Handle with Ratchet Wrench, straight, with Hexagonal Coupling 6.0 mm

5. Prepare for hook

Option A: Prepare lamina for lamina hook

Instruments	
03.632.013	Lamina Feeler, small, for Matrix
03.632.014	Lamina Feeler, large, for Matrix

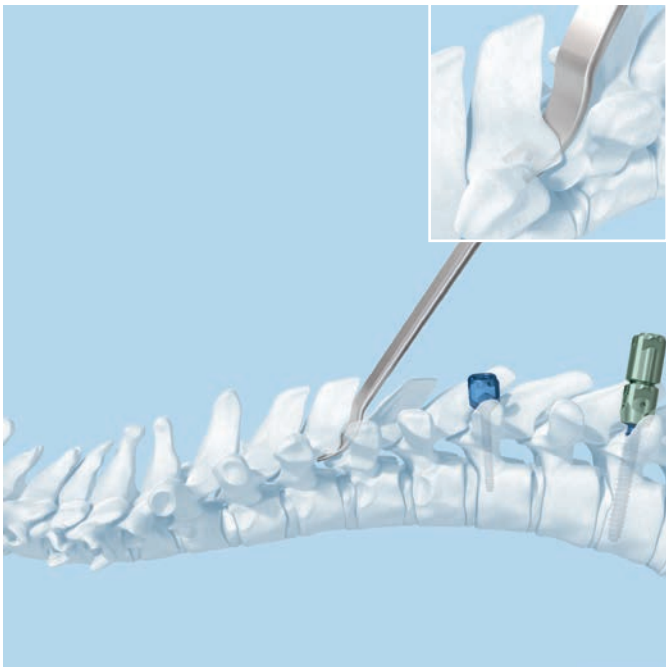
Using the appropriate lamina feeler, separate the ligamentum flavum from the underside of the lamina to ensure good bony contact with the lamina hook.



Option B: Prepare pedicle for pedicle hook

Instrument	
03.632.100	Pedicle Feeler, for Matrix

Using the pedicle feeler, open the facet capsule and locate the pedicle. Remove a small piece of the inferior articular process to ensure proper seating of the pedicle hook. Pedicle hooks should be placed in an up-going direction only.



Option C: Prepare transverse process for transverse process hook

Instrument	
03.632.163	Transverse Process Finder for Matrix

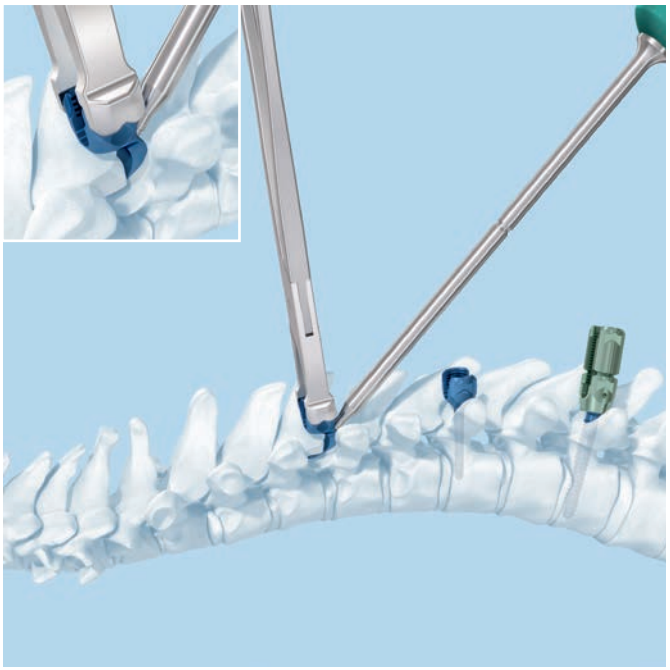
Use the transverse process finder to separate the ligamentum flavum from the underside of the transverse process.

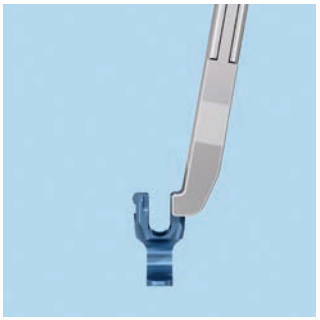
6. Insert hook

Instruments	
03.632.021	Holding Forceps, lateral, for Hooks, for Matrix 5.5
03.632.022	Holding Forceps, straight, for Hooks, for Matrix 5.5
03.632.023	Holding Forceps, curved, for Hooks, for Matrix 5.5
03.632.044	Hook Positioner, for Matrix

Attach the desired hook to the appropriate MATRIX hook holding forceps. Place the hook in the desired location. The MATRIX hook positioner may also be used to facilitate placement of the hook.

Place remaining hooks by repeating Steps 5 and 6 as determined in the preoperative plan.





7. Determine rod contour and length

Instruments	
388.906	Trial Rod ∅ 5.0 mm, length 150 mm
388.907	Trial Rod ∅ 5.0 mm, length 500 mm
03.632.007	Alignment Tool for polyaxial Screw Head, for Matrix 5.5

Use the trial rod to determine contour and length of the rod. The rod template has graduations in 10 mm increments to determine the desired length.

To adjust the alignment of the screw heads, use the polyaxial head alignment tool.

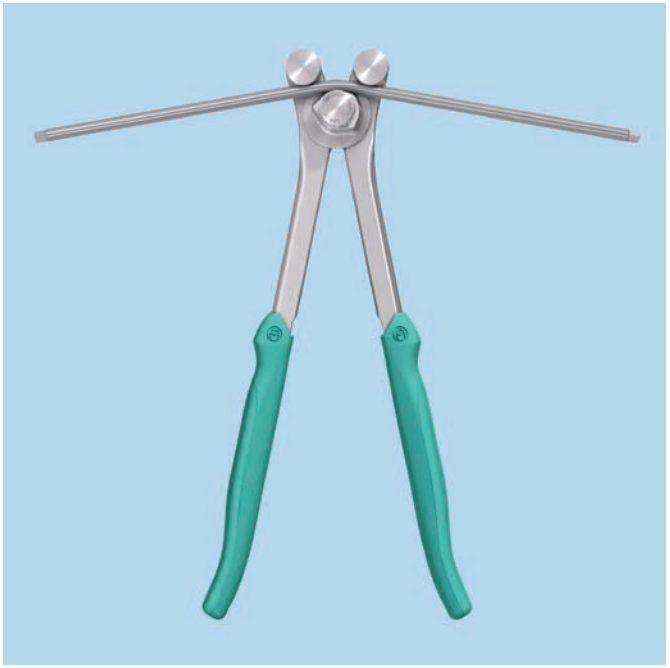
Note: **Ensure the polyaxial head alignment tool is seated into the head. Use tool to confirm that the head is still mobile and free from surrounding anatomy prior to inserting the rod.**

Select rod.

Note on use of connecting rods: **When connecting rods 3.5 mm/5.5 mm and 4.0 mm/5.5 mm are used, MATRIX can be linked to the Synapse, Axon and CerviFix 3.5 mm and 4.0 mm system, respectively. When 5.5 mm/6.0 mm connecting rods are used, the Synthes 6.0 mm rod systems can be linked to the MATRIX System.**

8. Contour and cut rod

Instrument	
03.632.017	Rod Bender with Silicone Handle
Optional instruments	
03.632.038	In-situ Bender for Rods ∅ 5.5 mm, right
03.632.039	In-situ Bender for Rods ∅ 5.5 mm, left
03.632.040	Bending Iron for Rods ∅ 5.5 mm, left, for Coronal Plane
03.632.041	Bending Iron for Rods ∅ 5.5 mm, right, for Coronal Plane
388.750	USS Rod Cutting and Bending Device
388.720	Bolt Cutter



Contour the rod to match the rod template, using the rod bender. Alternatively, in-situ benders or bending irons for the coronal plane may be used to contour the rod.

Precautions:

- **The USS rod cutting and bending device must be used to cut cobalt chromium rods.**
- **Do not reverse bend rods. Reverse bending may produce internal stresses which may become the focal point for eventual breakage of the implant.**

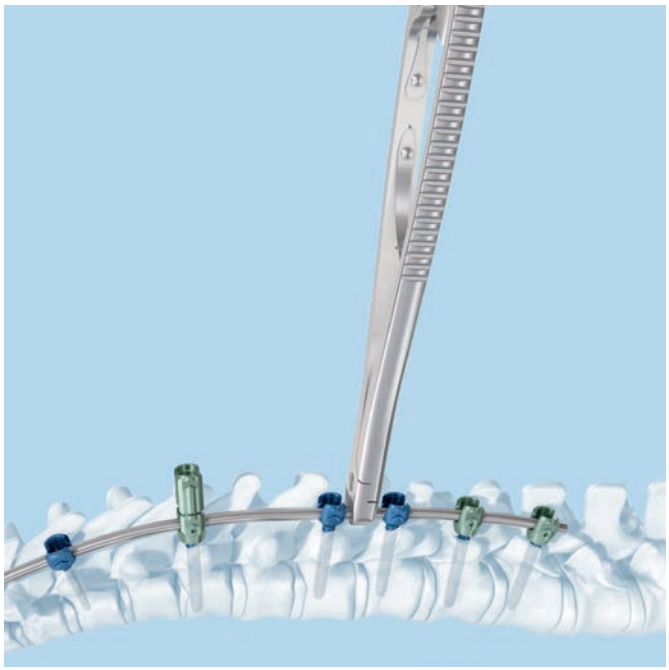
9. Rod placement and reduction

Instrument	
03.632.202	Holding Forceps for Rods ∅ 5.5 and ∅ 6.0 mm

Use the rod holder to insert the rod into the openings of the top-loading screws or hooks. If necessary, the following instruments can aid with rod reduction.

Optional instrument	
03.632.081	Rod Holding Forceps for Rods ∅ 5.5 mm

Note on use of connecting rods: **When using a connecting rod, it is important not to position the transition taper within the head of a screw or hook.**



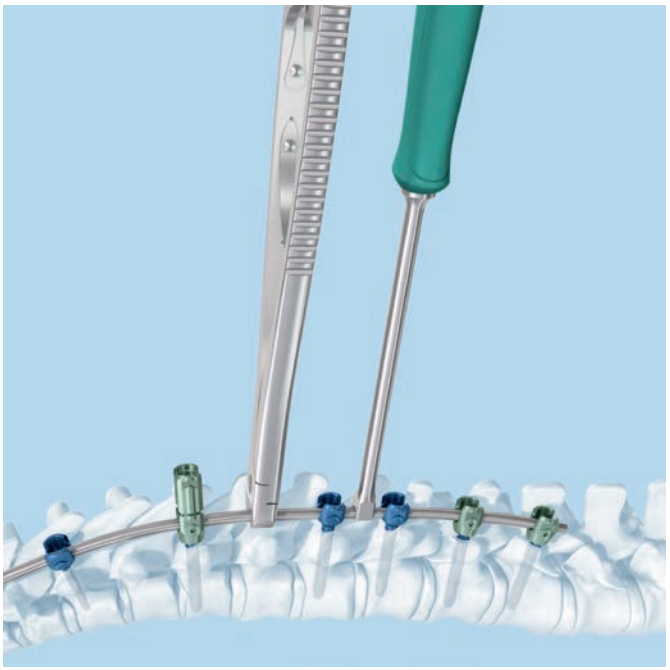
Option A: Rod reduction with a rod pusher

Instruments	
03.632.006	Rod Pusher/Counter Torque, standard, for Matrix 5.5
03.632.080	Handle, detachable, for Matrix
03.632.169	Rod Pusher for Rods ∅ 5.5/6.0 mm, for Matrix

Place the rod into the screw or hook, using the rod pusher for 5.5 mm/6.0 mm rods or the standard rod pusher/ counter torque. The detachable handle connects easily to the octagonal end of the rod pusher counter torque, providing an adjustable L-handle to apply downward force on the rod.

Optional instrument	
03.632.076	Rod Pusher/Counter Torque, long, for Matrix 5.5

Precaution: **If significant reduction forces are encountered, consider:**
- **screw height adjustments**
- **rod placement to minimize muscle entrapment.**



Option B: Rod reduction with a rocker fork

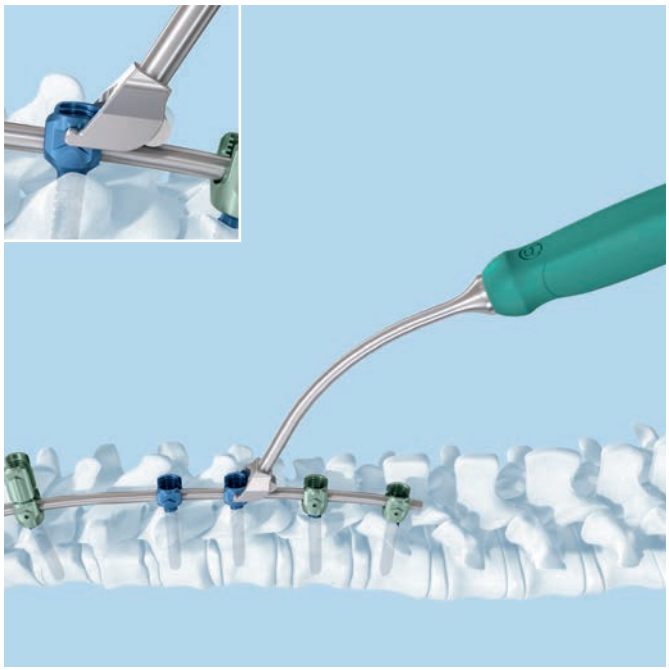
Instruments	
03.632.010	Rocker Fork, small, for Matrix 5.5
03.632.011	Rocker Fork, footed, for Matrix 5.5
03.632.012	Rocker Fork, medium, for Matrix 5.5

Use a medium rocker fork to lever the rod into the head of the pedicle screw or hook.

Technique tip: **Use the footed MATRIX rocker fork to aid in reducing the rod into adjacent screw heads.**

Reduction travels:
Small MATRIX Rocker Fork = 8.5 mm
Footed MATRIX Rocker Fork = 7.5 mm
Medium MATRIX Rocker Fork = 13 mm

Precaution: **If significant reduction forces are encountered, consider:**
- **screw height adjustments**
- **rod placement to minimize muscle entrapment.**



Option C: Rod reduction with a rod persuader

Instrument	
03.632.009	Rod Persuader, standard, for Matrix 5.5

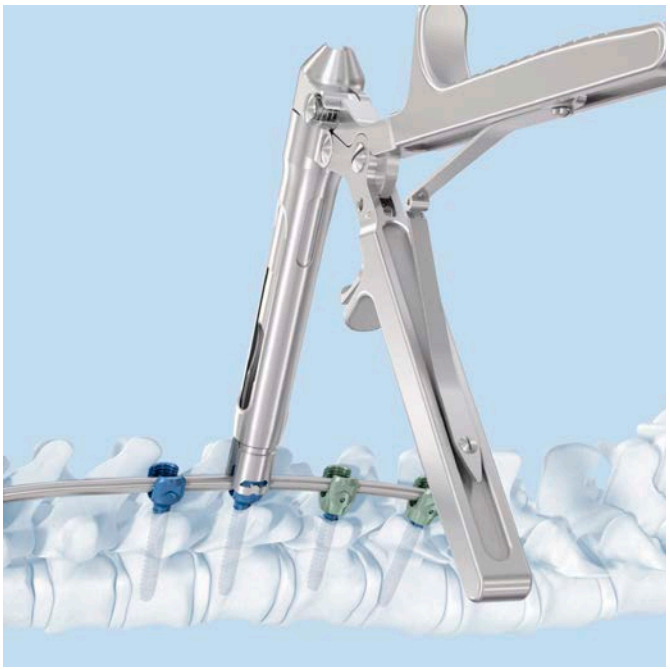
Ensure that the ratchet handle is fully open. Place the rod persuader over rod and onto the screw head. Press down firmly until the tips engage the head of the screw. Squeeze the handle to seat the rod into the head of the pedicle screw.

Optional instrument	
03.632.079	Rod Introduction Pliers, long, for Matrix 5.5

Reduction travel:
15 mm

Note: **The rod persuader can be used as counter torque for final tightening of the locking cap.**

Precaution: **If significant reduction forces are encountered, consider:**
- **screw height adjustments**
- **rod placement to minimize muscle entrapment.**



Option D: Rod reduction with a reduction instrument for Spondylolisthesis

Instruments	
03.620.091	Socket, hexagonal 6.0 mm
03.632.408	Reduction Instrument for Spondylolisthesis, standard, for Matrix 5.5
388.654	Ratchet with Handle, with Hexagonal Quick Coupling 6.0 mm

To assemble the instrument, slide the inner tube through the outer tube. Insert the cream nut and press down firmly until audible feedback. Push the inner tube up towards the cream nut and turn the cream nut clockwise until the black line is visible at the 30 line.

Place the reduction instrument over the screw head. Press down firmly until the tips engage. Load the hexagonal socket into the ratchet handle and insert it into the top of the reduction instrument.

Rotate the ratchet handle clockwise to reduce the rod into the screw head. Full reduction is achieved when the black line on the side of the instrument is visible at the 0 line.

Remove the hexagonal socket to insert a locking cap through the instrument.

To remove the instrument from the screw head, turn the palm handle counter-clockwise until the line on the side of the instrument is visible at the 30 line.

Note: **The reduction instrument for spondylolisthesis can be used as counter torque for final tightening of the locking cap.**

Reduction travel:
30 mm

Optional instrument

03.632.078	Reduction Instrument for Spondylolisthesis, long, for Matrix 5.5

Precaution: **If significant reduction forces are encountered, consider:**
- **screw height adjustments**
- **rod placement to minimize muscle entrapment.**

10. Insert 1-step locking cap

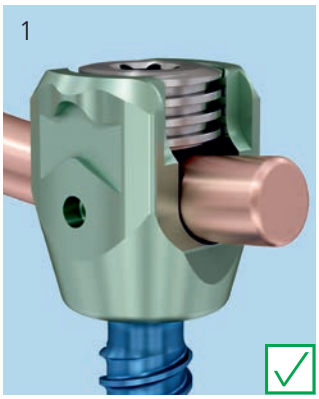
Instruments	
03.632.004	Screwdriver Stardrive, with T-Handle, standard, for Matrix 5.5
03.632.006	Rod Pusher/Counter Torque, standard, for Matrix 5.5
03.632.080	Handle, detachable, for Matrix

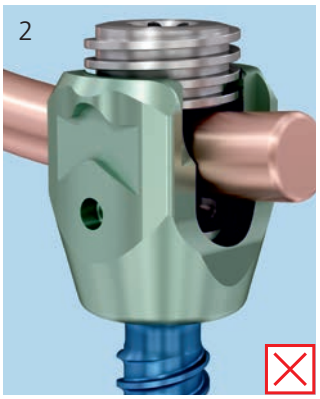
Insert the tip of the screwdriver shaft into the T25 recess of the locking cap. Press down firmly. The screwdriver shaft is self-retaining.

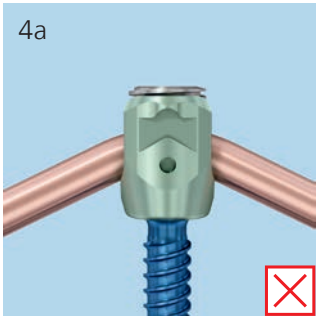
To ensure optimal cap alignment, insert the locking cap through the rod pusher/counter torque. Thread the locking cap clockwise into the implant head.

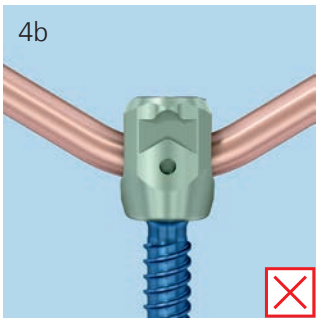
Precaution: Confirm that the rod is fully aligned to the polyaxial head. Improper alignment of the rod with respect to the MATRIX implant heads could lead to construct loosening. (1)
Examples of misalignment:

- The rod is sitting high in the polyaxial head. (2)
- The rod is not perpendicular to the polyaxial head. (3)
- A severe bend is positioned within the polyaxial head. (4a, 4b)









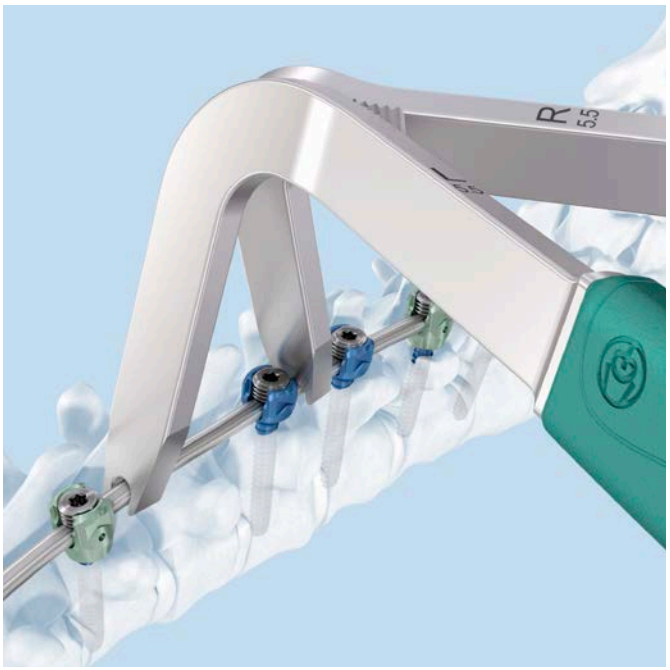
Optional instruments

03.632.002	Screwdriver Shaft Stardrive, T25, standard, for Matrix 5.5
03.632.005	Screwdriver Stardrive, T25, with straight handle, standard, for Matrix 5.5
03.632.072	Screwdriver Shaft Stardrive, T25, long, for Matrix
03.632.074	Screwdriver Stardrive, T25, long, with T-Handle, for Matrix
03.632.075	Screwdriver Stardrive, T25, long, with straight handle, for Matrix
03.632.076	Rod Pusher/Counter Torque, long, for Matrix 5.5
03.632.090	T-Handle with Ratchet Wrench, with Hexagonal Coupling 6.0 mm
03.632.091	Handle with Ratchet Wrench, straight, with Hexagonal Coupling 6.0 mm

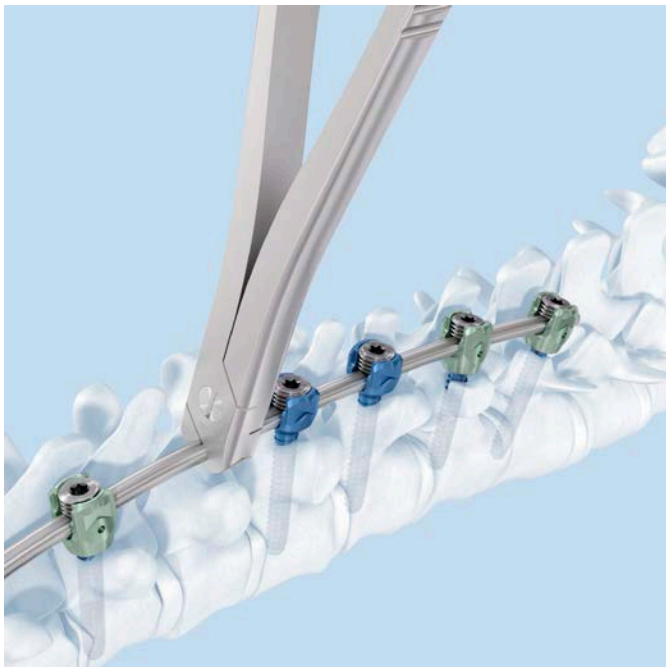
11. Correct deformity with in-situ bending (optional)

Instruments	
03.632.038	In-situ Bender for Rods ∅ 5.5 mm, right
03.632.039	In-situ Bender for Rods ∅ 5.5 mm, left
03.632.040	Bending Iron for Rods ∅ 5.5 mm, left, for Coronal Plane
03.632.041	Bending Iron for Rods ∅ 5.5 mm, right, for Coronal Plane

Use the in-situ benders, right and left, to contour the rod in the sagittal plane. The bending irons, right and left, can also be used to contour the rod in the coronal plane.



12. Correct deformity with rod rotation (optional)



If rod rotation is desired, the following options may be used. Ensure that the rod is captured with the locking cap, but is free to rotate within the head of the pedicle screw or hook.

Option A: Rod holder for 5.5 mm/6.0 mm rods

Instruments	
03.632.004	Screwdriver Stardrive, with T-Handle, standard, for Matrix 5.5
03.632.005	Screwdriver Stardrive, T25, with straight handle, standard, for Matrix 5.5
03.632.202	Holding Forceps for Rods ∅ 5.5 and ∅ 6.0 mm

Use the holding forceps for 5.5 mm/6.0 mm rods to grasp the rod and slowly rotate it in the proper direction. Use either the T-handle or straight handle shaft to tighten the locking caps after achieving the desired rod rotation.

Option B: Hex-end rods and rod rotation wrench

Instruments	
03.632.004	Screwdriver Stardrive, with T-Handle, standard, for Matrix 5.5
03.632.005	Screwdriver Stardrive, T25, with straight handle, standard, for Matrix 5.5
03.632.020	Wrench, hexagonal for Rods ∅ 5.5/6.0 mm, for Matrix

If hex-end rods are used in the construct, the rod rotation wrench for 5.5 mm/6.0 mm hex-end rods can be applied to the hex end of the rod to rotate. Use either the T-handle straight handle shaft to tighten the locking caps after achieving the desired rod rotation.

13. Correct deformity with derotation instruments (optional)

Instruments	
03.632.004	Screwdriver Stardrive, with T-Handle, standard, for Matrix 5.5
03.632.060	Derotation Instrument for Matrix 5.5
03.632.075	Screwdriver Stardrive, T25, long, with straight handle, for Matrix

If a derotation maneuver is desired, ensure that the locking caps are not tightened.

Place a derotation instrument over each selected screw. Use the instruments as leverage to maneuver the vertebral bodies. Insert either the T-handle or straight handle shaft through the derotation instruments to tighten the locking caps.

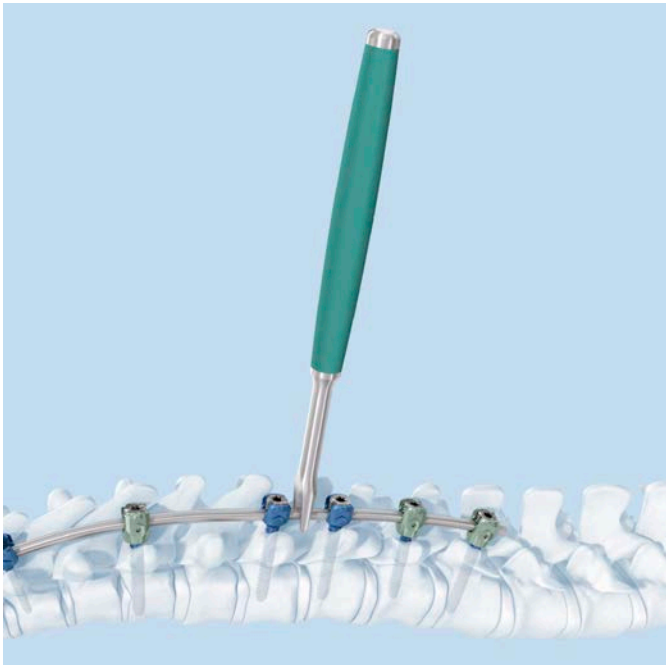
14. Distract

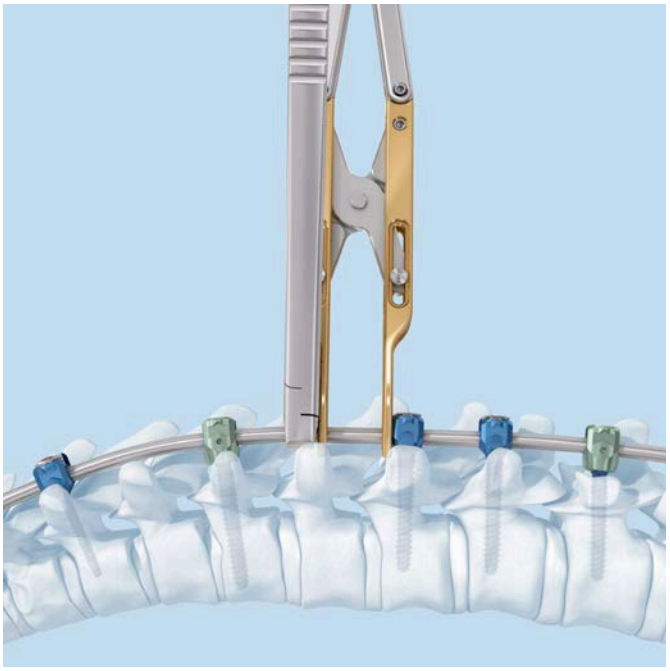
Instruments	
03.632.000	Distraction Fork
03.632.004	Screwdriver Stardrive, with T-Handle, standard, for Matrix 5.5
03.632.005	Screwdriver Stardrive, T25, with straight handle, standard, for Matrix 5.5
03.632.201	Spreader Forceps, parallel, for Rods ∅ 5.5 and ∅ 6.0 mm
03.632.202	Holding Forceps for Rods ∅ 5.5 and ∅ 6.0 mm

When implants are too close together, the distraction fork can be used to open space between the screw heads to begin distraction.

Use the holding forceps for 5.5 mm/6.0 mm rods as a point of fixation against which to distract.

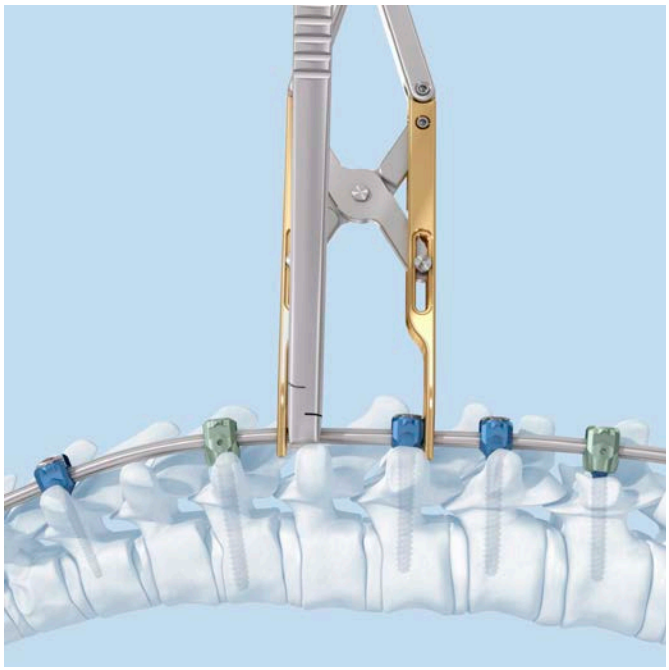
Use the parallel spreader forceps for 5.5 mm/6.0 mm rods to distract the construct. Once in the desired position, tighten the locking caps with either the T-handle or straight handle shaft.





15. Compress

Instruments	
03.632.004	Screwdriver Stardrive, with T-Handle, standard, for Matrix 5.5
03.632.005	Screwdriver Stardrive, T25, with straight handle, standard, for Matrix 5.5
03.632.200	Compression Forceps, parallel, for Rods ∅ 5.5 and ∅ 6.0 mm
03.632.202	Holding Forceps for Rods ∅ 5.5 and ∅ 6.0 mm
03.632.203	Compression Forceps, parallel, for Rods ∅ 5.5 and ∅ 6.0 mm, for 2 Levels



Use the holding forceps for 5.5 mm/6.0 mm rods as a fixed point on the rod to compress the construct. Once in the desired position, tighten the locking screws with either the T-handle or straight handle shaft.

Use the two level parallel compression forceps if compression is required across multiple levels.

16. Perform final tightening

Instruments	
03.620.061	T-Handle with Ratchet Wrench and with Torque Limiter, 10 Nm
03.632.400	Screwdriver Shaft Stardrive, T25, standard, straight tip, with Hexagonal Coupling, for Matrix
03.632.080	Handle, detachable, for Matrix
03.632.049	Counter Torque, standard, for Matrix 5.5

Place the counter torque over the head of the screw or hook. Attach the screwdriver shaft T-handle with ratchet wrench and with torque limiter. Insert the instrument through the counter torque cannula into the drive recess of the locking cap. Tighten until there is a tactile release. This indicates that the required 10 Nm of torque has been applied. Repeat for all locking caps.

Warning: **Final tightening of the locking caps should only be performed with a calibrated, Synthes 10 Nm torque handle. MATRIX screw implants achieve performance standard only when tightened to the required 10 Nm tightening torque.**

Notes:

- **Always fully seat the rod pusher/counter torque on the rod. The instrument must be perpendicular to the rod during final tightening.**
- **The Straight Tip T25 Stardrive is intended for final tightening of locking caps only and not initial locking cap insertion.**
- **The Straight Tip T25 Stardrive will not retain locking caps.**

Note: **The handle of the counter torque must be oriented laterally or medially. Do not orient the handle of the countertorque in line with the rod. This action could cause misalignment of the rod with the implant.**

Correct

Incorrect

Optional instruments

03.632.002	Screwdriver Shaft Stardrive, T25, standard for Matrix 5.5
03.632.006	Rod Pusher/Counter Torque, standard, for Matrix 5.5
03.632.008	Reduction Instrument for Spondylolisthesis, standard, for Matrix 5.5
03.632.009	Rod Persuader, standard, for Matrix 5.5
03.632.401	Screwdriver Shaft Stardrive, T25, long, straight tip, with Hexagonal Coupling, for Matrix
03.632.072	Screwdriver Shaft Stardrive, T25, long, for Matrix
03.632.076	Rod Pusher/Counter Torque, long, for Matrix 5.5
03.632.099	Counter Torque, long, for Matrix 5.5
03.632.078	Reduction Instrument for Spondylolisthesis, long, for Matrix 5.5
03.632.079	Rod Introduction Pliers, long, for Matrix 5.5

Note: **Alternatively, the reduction instrument for spondylolisthesis and the rod persuader can be used as counter torque for final tightening of the locking cap.**

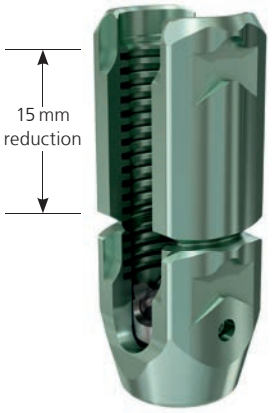
Insert reduction screws

Instruments

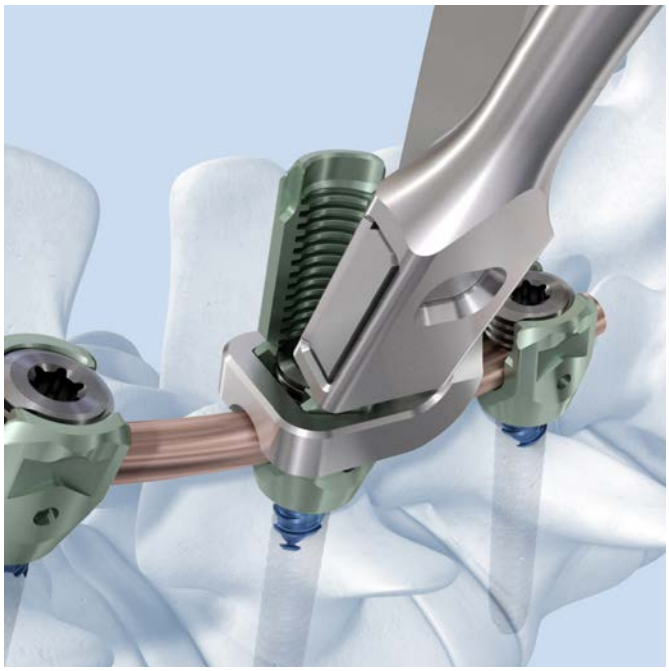
03.632.004	Screwdriver Stardrive, with T-Handle, standard, for Matrix 5.5
03.632.042	Rod Pusher/Counter Torque for Reduction Screw, for Matrix 5.5
03.620.061	T-Handle with Ratchet Wrench and with Torque Limiter, 10 Nm
03.632.001	Retaining Sleeve, standard, for Matrix 5.5
03.632.030	Tab Remover for Reduction Screws, for Matrix
03.632.026	Rod Pusher/Counter Torque for Reduction Screws, for Matrix 5.5

Follow the technique for preassembled polyaxial screw (page 14) or unassembled pedicle screw (page 47) to insert screw.

Place the counter torque over the screw head. Insert the locking cap through the counter torque. Turning the locking cap will reduce the rod into the screw head.



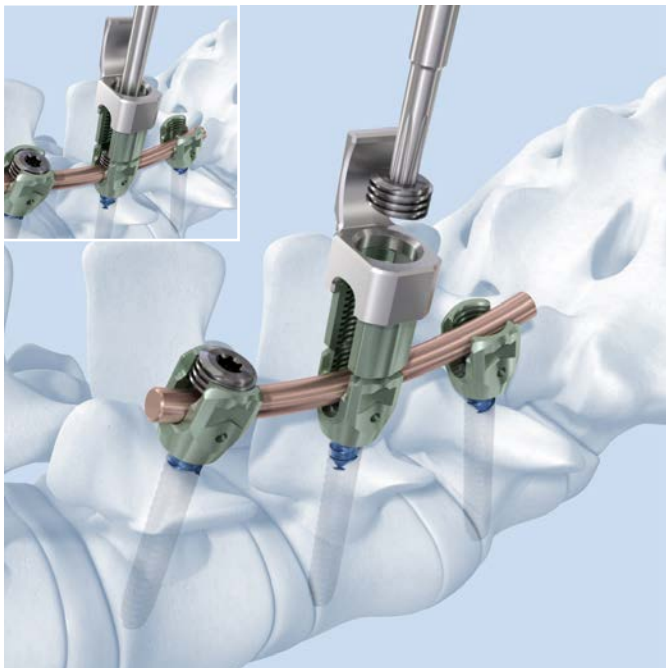
To break off the reduction screw tabs, slide the tab removal tool over one side wall of the reduction head. Gently rock the tab removal tool medial then lateral to break the tab wall free from the polyaxial head.



Alternative technique for locking cap insertion

Instrument	
03.632.029	Holding Crown for Reduction Screws, for Matrix 5.5

The holding crown for reduction screws can be used instead of the counter torque to provide guidance for the locking cap insertion.



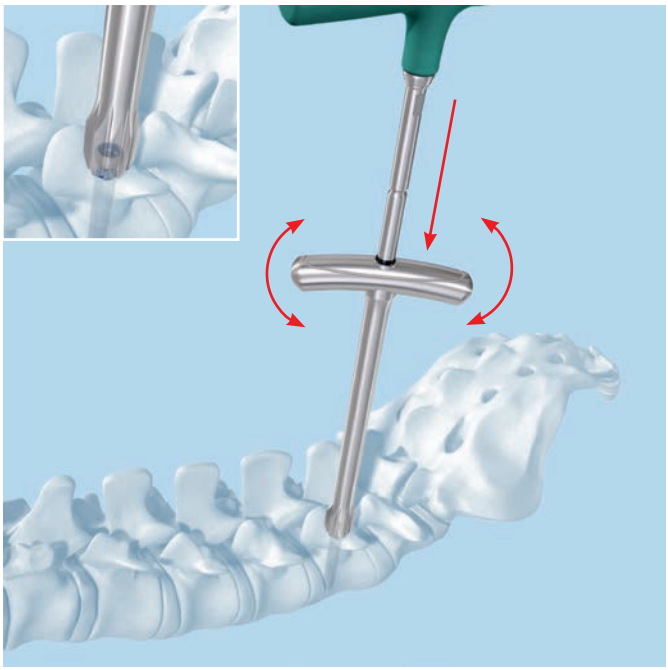
Insert unassembled pedicle screw

1. Unassembled pedicle screw insertion

Instruments	
03.632.074	Screwdriver Stardrive, T25, long, with T-Handle, for Matrix
03.632.046	Reamer for Pedicle Screws, for Matrix

Prepare the pedicle and insert pedicle screws as recommended in Steps 1 to 2 of the surgical technique.

Slide reamer over screwdriver shaft. Engage tip of screwdriver in unassembled pedicle screw. Ream until the black line is visible on the shaft. This indicates that there is enough room for the implant head.



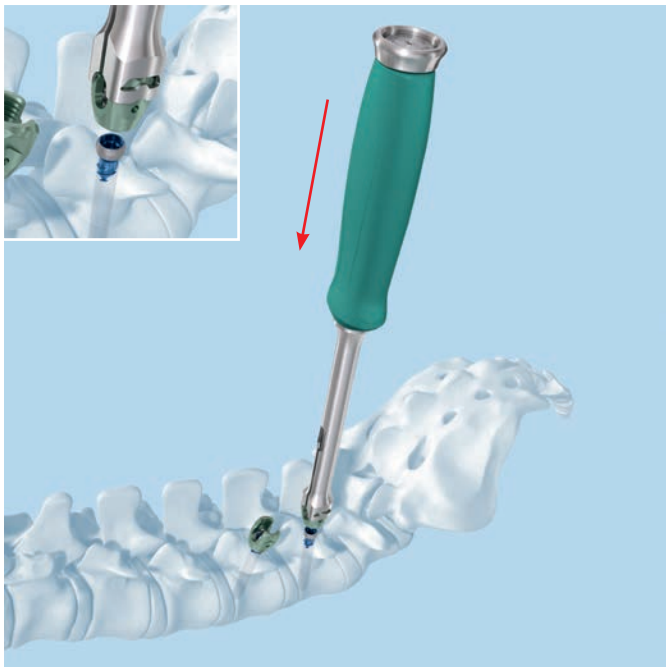
2. Polyaxial head assembly

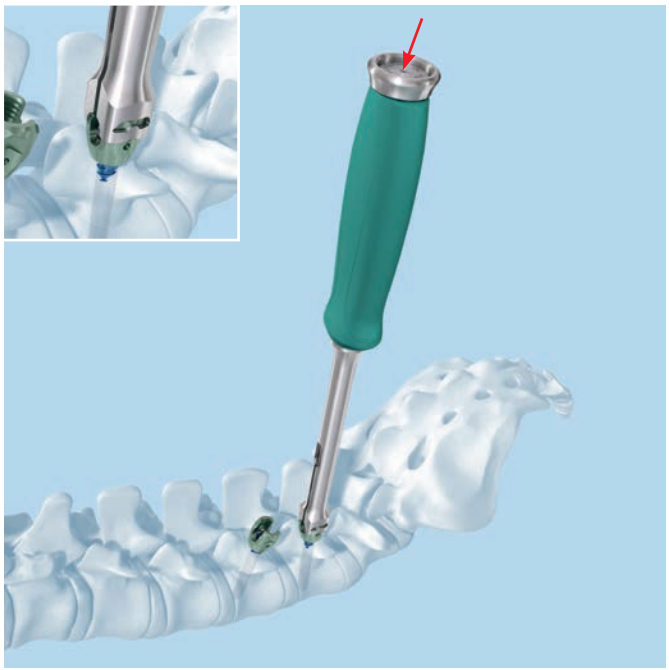
Instrument	
03.632.037	Positioning Instrument for Polyaxial Screw Heads, for Matrix 5.5

To pick up a screw head, align the positioning instrument for polyaxial screw heads to the rod slot features on the polyaxial head implant and press down.

Position the placement tool with the polyaxial head over the unassembled pedicle screw and press down. To ensure the polyaxial head is securely attached to the unassembled pedicle screw, gently lift up on the placement tool and angulate the polyaxial head.

To release the head placement tool, press the button located at the distal end of the instrument.





Notes:

- **If the polyaxial head does not successfully attach to the head of the bone screw, additional reaming or screw height adjustment may be required to ensure sufficient space exists to allow free mobility of the head.**
- **Polyaxial heads and screws can be assembled a maximum of three times.**
- **Care should be taken when reaming the most superior (and inferior) level to protect the facet joints.**

Polyaxial head removal

Instruments

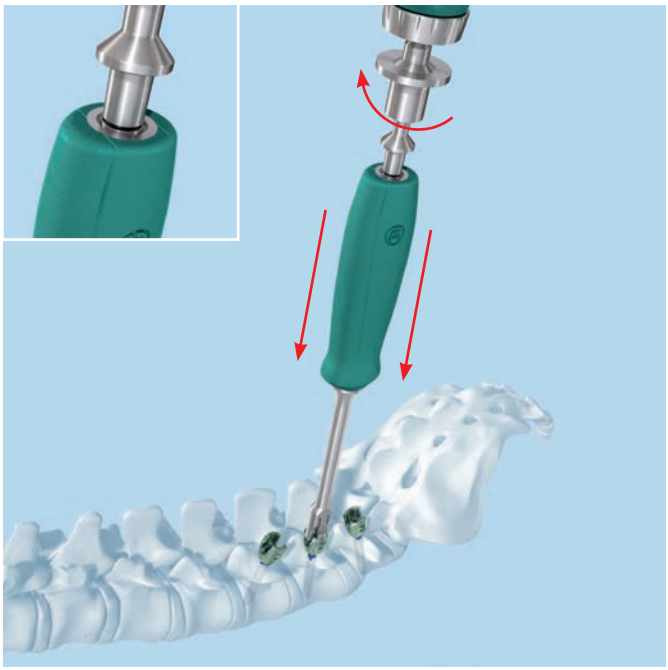
03.632.045	Removal Instrument for Polyaxial Screw Heads, for Matrix 5.5
388.654	Ratchet with Handle, with Hexagonal Quick Coupling 6.0 mm

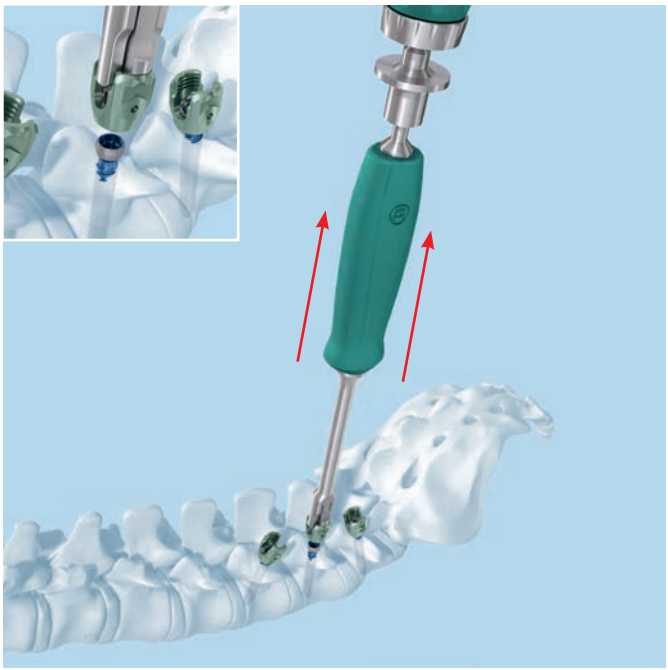
If required, the polyaxial head can be removed from the pedicle screw intraoperatively.

Remove the locking cap and rod. Slide the inner shaft of the ratchet into the handle of the head removal tool and thread counter-clockwise until the black line is visible. Press the tip of the head removal tool into the polyaxial head. A tactile click may be felt. While holding the green silicone handle, thread the inner shaft clockwise until it stops. Lift to remove the head.

To remove the implant head from the instrument, turn the ratchet counter-clockwise until the black line is visible. Pull the head off the instrument.

Note: **The removal instrument can be used to remove the polyaxial head of both unassembled as well as preassembled screws. To remove the polyaxial reduction head, the tabs must first be broken off.**





Add transverse connectors

Instruments

03.632.050	Retaining Sleeve for Transverse Connectors, Snap-on, for Matrix
03.632.052	Screwdriver Stardrive, T15, short, for Matrix
03.632.053	Length indicator for Transverse Connectors, Snap-on, for Matrix
03.632.204	Torque-limiting Handle, 3 Nm

Use the length indicator for transverse connector to indicate the distance between the two rods and note the reference number located on the back of the caliper scale (1– 8).

Select the appropriate transverse connector.

Use the screwdriver and the torque limiting handle to secure the transverse connector to the rods. When tightening the setscrews a tactile release is felt.

Note: **Always use retaining sleeve when tightening the setscrew.**

Warning: **The MATRIX transverse connector contains nitinol components. Implants that contain nitinol should not be used in patients with nickel sensitivities or allergies.**

Adding Rod-to-Rod Connectors

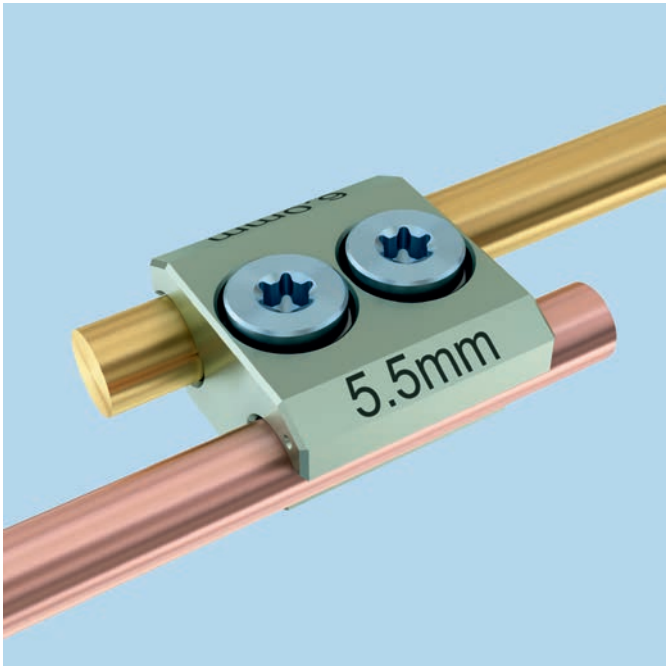
Instruments

03.632.204	Torque-limiting Handle, 3 Nm
03.632.055	Screwdriver Shaft Stardrive, T15, standard
03.632.050	Retaining Sleeve for Transverse Connectors, Snap-on, for Matrix

Choose the snap-on open parallel connector according the rod diameters to be received. The diameters accepted are etched on both sides of the connector to ensure the correct rod size is attached to each opening.

Precaution: **Parallel connectors with one set screw should be used in pairs on each side of the construct. Connectors with two set screws can be used one per side of the construct.**

Attach the preferred connector to each rod. Mount the T15 screwdriver shaft to the 3 Nm torque-limiting handle and slide the retaining sleeve over the screwdriver shaft. To secure the connector to the rods, engage the T15 drive into each setscrew recess, slide the retractable retaining sleeve to the distal position. Tighten all the set screws until a tactile release is felt.



Notes:

- **If any part of the construct requires further adjustment, all set screws must be loosened to the point of resistance. Do not remove set screws from the assembly. After final adjustment, retighten the set screws.**
- **Parallel connectors contain Nitinol components. Implants that contain Nitinol should not be used in patients with nickel sensitivities or allergies.**
- **The retaining sleeve for transverse connectors cannot be used when tightening parallel with two set screws.**

Precautions:

- **Care should be taken not to tighten the connector on a portion of the rod that has been contoured or deformed by a rod cutter.**
- **Synthes connectors are tested using Synthes 5.5 or 6.0 mm rods and not compatible with those rods of similar diameter from other manufacturers.**
- **Refer to the torque-limiting handle package and labeling for the recommended calibration maintenance.**

Optional Instrument

03.632.052	Screwdriver Stardrive, T15, short, for Matrix

Transverse bar attachment (for monoaxial screws only)

The transverse bar provides an extension to the monoaxial screw in situations where the rod contour or patient anatomy prevents a direct screw-to-rod connection.

Instruments	
03.632.052	Screwdriver Stardrive, T15, short, for Matrix
03.632.169	Rod Pusher for Rods ∅ 5.5/6.0 mm, for Matrix
03.632.204	Torque-limiting Handle, 3 Nm

Place the opening of the transverse bar over the 5.5 mm rod. Loosely attach the transverse bar to the rod by tightening the setcrew within the T15 stardrive screwdriver shaft and 3.0 Nm torque limiting handle.

Introduce the transverse bar into the screw opening. Use the rod pusher for 5.5/6.0 mm rods.

Secure the transverse bar to the screw by inserting the locking cap and tighten, following locking cap final tightening procedure (refer to step 8 of the surgical technique).

Secure the transverse bar to the rod using the T15 stardrive screwdriver shaft and 3.0 Nm torque limiting handle. Tighten the setscrew firmly until a tactile release is felt.

Warning: **Final tightening of the setscrew should only be performed with a calibrated Synthes 3 Nm torque limiting handle.**

Locking Cap Removal

Loosen locking cap

Instruments	
03.620.061	T-Handle with Ratchet Wrench and with Torque Limiter, 10 Nm
03.632.400	Screwdriver Shaft Stardrive, T25, standard, straight tip, with Hexagonal Coupling, for Matrix
03.632.080	Handle, detachable, for Matrix 5.5
03.632.049	Counter Torque, standard, for Matrix 5.5

To remove a locking cap, slide the counter torque with detachable handle over the screwhead. Place the ratchet of the torque limiting handle in the neutral position, engage a T25 screwdriver with the Stardrive recess of the locking cap and turn counter-clockwise.

Note: **Locking caps are designed to lock the construct safely and minimize the chance of post-operative loosening and rod-push-through. Therefore, in certain cases, the loosening torque may be higher than 10 Nm. In such cases, use the following techniques to remove a locking cap.**

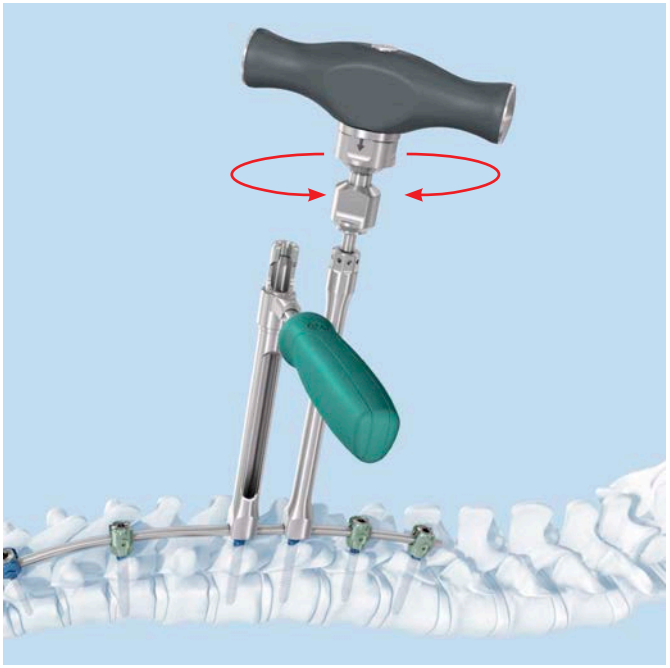
Sequentially turn clockwise and then immediately counterclockwise. Turn until tactile or audible feedback from the implant is experienced. Repeat the steps until the locking cap is loose.

Note: **For this technique, always use the torque limiting handle (03.620.061) to reduce risk of damage to the T25 screwdriver shaft.**

If after multiple attempts to loosen the locking cap the torque is still excessive, one of the following techniques should be used:

Option A: Counter torque on a adjacent screw

Instruments	
03.620.061	T-Handle with Ratchet Wrench and with Torque Limiter, 10 Nm
03.632.400	Screwdriver Shaft Stardrive, T25, standard, straight tip, with Hexagonal Coupling, for Matrix
03.632.049	Counter Torque, standard, for Matrix 5.5
03.632.080	Handle, detachable, for Matrix
03.632.006	Rod Pusher/Counter Torque, standard, for Matrix 5.5



Place the rod pusher/counter torque with detachable handle over an adjacent screw on the same rod (i.e. one level higher or lower). Simultaneously place the countertorque over the locking cap to be loosened and engage the screwdriver shaft and torque limiting handle with the stardrive recess of the locking cap. Place the ratchet of the torque limiting handle in the neutral position and begin to sequentially turn clockwise and then immediately counter-clockwise. Turn until tactile or audible feedback from the implant is experienced. Repeat the steps until the locking cap is loose.

Note:

- **For this technique, always use the torque limiting handle (03.620.061) to reduce risk of damage to the T25 screwdriver shaft.**
- **Retighten the locking cap on which the counter torque was applied to 10 Nm.**

Option B: Apply a downward force to the rod

Instruments	
03.620.061	T-Handle with Ratchet Wrench and with Torque Limiter, 10 Nm
03.632.401	Screwdriver Shaft Stardrive, T25, long, straight tip, with Hexagonal Coupling, for Matrix
03.632.079	Rod Introduction Pliers, long, for Matrix 5.5
Optional Instruments	
03.632.002	Screwdriver Shaft Stardrive, T25, standard, for Matrix 5.5
03.632.009	Rod Persuader, standard, for Matrix 5.5

Apply a downward force to the rod. Place the Rod Persuader on the screw and firmly squeeze the handles. Place the ratchet of the torque limiting handle in the neutral position. With the reduction load applied begin to sequentially turn clockwise and then immediately counterclockwise. Turn until tactile or audible feedback from the implant is experienced. Repeat the steps until the locking cap is loose.

Note: **For this technique, always use the torque limiting handle (03.620.061) to reduce risk of damage to the T25 screwdriver shaft.**

Implants*

Monoaxial screws

04.633.420– 04.633.445	4.0 mm Titanium MATRIX Monoaxial Screws 20 mm – 45 mm thread lengths
04.633.520– 04.633.555	5.0 mm Titanium MATRIX Monoaxial Screws 20 mm – 55 mm thread lengths
04.633.120– 04.633.160	5.5 mm Titanium MATRIX Monoaxial Screws 20 mm – 60 mm thread lengths
04.633.620– 04.633.665	6.0 mm Titanium MATRIX Monoaxial Screws 20 mm – 65 mm thread lengths
04.633.725– 04.633.799	7.0 mm Titanium MATRIX Monoaxial Screws 25 mm – 100 mm thread lengths
04.633.825– 04.633.899	8.0 mm Titanium MATRIX Monoaxial Screws 25 mm – 100 mm thread lengths
04.633.930– 04.633.999	9.0 mm Titanium MATRIX Monoaxial Screws 30 mm – 100 mm thread lengths

* All implants are available sterile packed. Add suffix «S» to article number.

Preassembled polyaxial screws

04.632.420 – 04.632.445	Pedicle Screw Matrix 5.5 Polyaxial ∅ 4.0 mm, preassembled, lengths 20–45 mm, Titanium Alloy (TAN)
04.632.520 – 04.632.555	Pedicle Screw Matrix 5.5 Polyaxial, ∅ 5.0 mm, preassembled, length 20–55 mm, Titanium Alloy (TAN)
04.632.120 – 04.632.160	Pedicle Screw Matrix 5.5 Polyaxial ∅ 5.5 mm, preassembled, length 20–60 mm, Titanium Alloy (TAN)
04.632.620 – 04.632.665	Pedicle Screw Matrix 5.5 Polyaxial ∅ 6.0 mm, preassembled, lengths 20–65 mm, Titanium Alloy (TAN)
04.632.725 – 04.632.799	Pedicle Screw Matrix 5.5 Polyaxial ∅ 7.0 mm, preassembled, lengths 25–100 mm, Titanium Alloy (TAN)
04.632.825 – 04.632.899	Pedicle Screw Matrix 5.5 Polyaxial ∅ 8.0 mm, preassembled, lengths 25–100 mm, Titanium Alloy (TAN)
04.632.930 – 04.632.999	Pedicle Screw Matrix 5.5 Polyaxial ∅ 9.0 mm, preassembled, lengths 30–100 mm, Titanium Alloy (TAN)

Bone screws

04.639.420 – 04.639.445	Pedicle Screw Matrix 5.5 ∅ 4.0 mm, lengths 20–45 mm, Titanium Alloy (TAN)
04.639.520 – 04.639.555	Pedicle Screw Matrix 5.5 ∅ 5.0 mm, lengths 20–55 mm, Titanium Alloy (TAN)
04.639.120 – 04.639.160	Pedicle Screw Matrix 5.5 ∅ 5.5 mm, length 20–60 mm, Titanium Alloy (TAN)
04.639.620 – 04.639.665	Pedicle Screw Matrix 5.5 ∅ 6.0 mm, lengths 20–65 mm, Titanium Alloy (TAN)
04.639.725 – 04.639.799	Pedicle Screw Matrix 5.5 ∅ 7.0 mm, lengths 25–100 mm, Titanium Alloy (TAN)
04.639.825 – 04.639.899	Pedicle Screw Matrix 5.5 ∅ 8.0 mm, lengths 25–100 mm, Titanium Alloy (TAN)
04.639.930 – 04.639.999	Pedicle Screw Matrix 5.5 ∅ 9.0 mm, lengths 30–100 mm, Titanium Alloy (TAN)

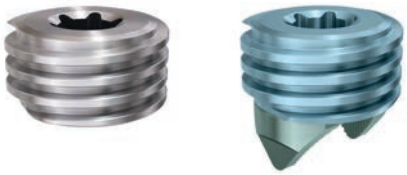
Screw heads

04.632.001	Screw Head, polyaxial, for Matrix 5.5, Titanium Alloy (TAN)
04.634.002	Reduction Head, polyaxial, for Matrix 5.5, Titanium Alloy (TAN)

Preassembled reduction screws

04.634.420 – 04.634.445	Reduction Screw Matrix 5.5 ∅ 4.0 mm, lengths 20–45 mm, Titanium Alloy (TAN)
04.634.520 – 04.634.555	Reduction Screw Matrix 5.5 ∅ 5.0 mm, lengths 20–55 mm, Titanium Alloy (TAN)
04.634.120 – 04.634.160	Reduction Screw Matrix 5.5 ∅ 5.5 mm, length 20–60 mm, Titanium Alloy (TAN)
04.634.620 – 04.634.665	Reduction Screw Matrix 5.5 ∅ 6.0 mm, lengths 20–65 mm, Titanium Alloy (TAN)
04.634.725 – 04.634.765	Reduction Screw Matrix 5.5 ∅ 7.0 mm, lengths 25–65 mm, Titanium Alloy (TAN)
04.634.825 – 04.634.865	Reduction Screw Matrix 5.5 ∅ 8.0 mm, lengths 25–65 mm, Titanium Alloy (TAN)

Locking cap



09.632.099	Locking Cap, flat, one-step, for Matrix 5.5, Cobalt-chrome alloy (CoCrMo)
04.632.000	Locking Cap, one-step, for Matrix 5.5 Titanium Alloy (TAN)

Rods

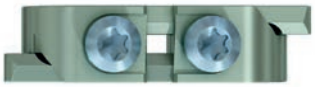
04.633.280	Scoliosis Rod ∅ 5.5 mm, prebent, length 400/80 mm, Pure Titanium
04.633.185	Scoliosis Rod ∅ 5.5 mm, prebent, length 400/80 mm, Titanium Alloy (TAN)
09.633.185	Scoliosis Rod ∅ 5.5 mm, prebent, length 400/80 mm, Cobalt-Chrome Alloy (CoCrMo)

04.633.292	Rod ∅ 5.5 mm, hard, length 200 mm, Pure Titanium
04.633.293	Rod ∅ 5.5 mm, hard, length 300 mm, Pure Titanium
04.633.294	Rod ∅ 5.5 mm, hard, length 400 mm, Pure Titanium
04.633.295	Rod ∅ 5.5 mm, hard, length 500 mm, Pure Titanium
04.633.282	Rod ∅ 5.5 mm, hard, length 200 mm, Titanium Alloy (TAN)
04.633.283	Rod ∅ 5.5 mm, hard, length 300 mm, Titanium Alloy (TAN)
04.633.284	Rod ∅ 5.5 mm, hard, length 400 mm, Titanium Alloy (TAN)
04.633.285	Rod ∅ 5.5 mm, hard, length 500 mm, Titanium Alloy (TAN)
09.633.190	Rod ∅ 5.5 mm, length 200 mm, Cobalt-Chrome Alloy (CoCrMo)
09.633.191	Rod ∅ 5.5 mm, length 300 mm, Cobalt-Chrome Alloy (CoCrMo)
09.633.192	Rod ∅ 5.5 mm, length 400 mm, Cobalt-Chrome Alloy (CoCrMo)
09.633.193	Rod ∅ 5.5 mm, length 500 mm, Cobalt-Chrome Alloy (CoCrMo)

04.633.500	Rod ∅ 5.5 mm, hard, length 500 mm, with Hexagonal End, Pure Titanium	
09.633.500	Rod ∅ 5.5 mm, length 500 mm, with Hexagonal End, Cobalt-chrome alloy (CoCrMo)	
04.633.286	Rod ∅ 5.5 mm, hard, length 500 mm, with Hexagonal End, Titanium Alloy (TAN)	
04.633.187	Connecting Rod ∅ 5.5/6.0 mm, length 500 mm, Pure Titanium	
04.633.188	Connecting Rod ∅ 5.5/6.0 mm, length 500 mm, Titanium Alloy (TAN)	
04.633.190	Connecting Rod ∅ 3.5/5.5 mm, length 500 mm, Titanium Alloy (TAN)	
04.633.191	Connecting Rod ∅ 4.0/5.5 mm, length 500 mm, Titanium Alloy (TAN)	
09.633.187	Connecting Rod ∅ 5.5/6.0 mm, length 500 mm, Cobalt-chrome alloy (CoCrMo)	

Snap-On Transverse Connector

	length	size
04.633.317	17–22 mm	1
04.633.321	21–26 mm	2
04.633.326	26–31 mm	3
04.633.330	30–33 mm	4
04.633.333	33–38 mm	5
04.633.338	38–47 mm	6
04.633.347	47–62 mm	7
04.633.364	62–90 mm	8



Snap-On Open Parallel Connectors

	diameters	set screws
04.633.400	5.5 to 5.5 mm	1
04.633.401	5.5 to 6.0 mm	1
04.633.402	6.0 to 6.0 mm	1
04.633.403	5.5 to 5.5 mm	2
04.633.404	5.5 to 6.0 mm	2
04.633.405	6.0 to 6.0 mm	2

Hooks

Titanium MATRIX Lamina Hooks	
04.633.010	Extra Small
04.633.011	Small
04.633.012	Medium
04.633.013	Large
04.633.015	Small, Straight
04.633.017	Large, Straight
04.633.018	Thoracic
04.633.022	Medium, Tall Body
04.633.023	Large, Tall Body
04.633.050	Offset right
04.633.051	Offset left
04.633.062	Angled upwards
04.633.072	Angled downwards

Titanium MATRIX Pedicle Hooks	
04.633.031	Small
04.633.032	Medium

Titanium MATRIX Transverse Process Hooks	
04.633.040	Right
04.633.041	Left

Instruments

For pedicle preparation

Tap for Pedicle Screws, length 180 mm

03.632.103	3.5 mm
03.632.104	4.0 mm
03.632.105	5.0 mm
03.632.155	5.5 mm
03.632.106	6.0 mm
03.632.107	7.0 mm
03.632.108	8.0 mm
03.632.109	9.0 mm

Ball Tip Probes

388.545	Feeler for Screw Channel, straight, ∅ 2.3 mm, length 275 mm
388.546	Feeler for Screw Channel, curved, ∅ 2.3 mm, length 275 mm
388.549	Feeler, straight, with rounded tip

03.632.057	Pedicle Marker for Matrix

03.632.058	Inserter for Pedicle Marker, for Matrix

Awls and Probes

388.551	Pedicle Awl ∅ 3.0 mm, length 230 mm, for Screws ∅ 4.0 and 4.2 mm	
388.656	Pedicle Awl ∅ 4.0 mm with Silicone Handle, length 255 mm, for Pedicle Screws ∅ 5.0 to 7.0 mm	
03.622.005	Pedicle Probe, thoracic	
03.632.054	Pedicle Probe, thoracic, small	
388.536	Pedicle Probe for Screws ∅ 4.2 mm, length 240 mm	
388.655	Pedicle Probe ∅ 3.7 mm with Silicone Handle, length 240 mm, for Pedicle Screws ∅ 5.0 to 7.0 mm	
388.657	Pedicle Probe ∅ 3.8 mm, curved, with Silicone Handle, length 290 mm, for Pedicle Screws ∅ 5.0 to 7.0 mm	

For screw insertion

Retaining Sleeves

03.632.024	Retaining Sleeve, for Monoaxial Screws, standard, for Matrix 5.5
03.632.028	Retaining Sleeve for Monoaxial Screws, for Matrix
03.632.001	Retaining Sleeve, standard, for Matrix 5.5
03.632.036	Retaining Sleeve, long, for Matrix 5.5
03.616.042	Retaining Sleeve, locking
03.616.043	Retaining Sleeve, locking, long

T25 Stardrive Shafts

03.632.002	Screwdriver Shaft Stardrive, T25, standard, for Matrix 5.5
03.632.072	Screwdriver Shaft Stardrive, T25, long, for Matrix
03.632.400	Screwdriver Shaft Stardrive, T25, standard, straight tip, with Hexagonal Coupling, for Matrix
03.632.401	Screwdriver Shaft Stardrive, T25, long, straight tip, with Hexagonal Coupling, for Matrix

Screwdrivers Stardrive T25 with T-Handle

03.632.004	Screwdriver Stardrive, with T-Handle, standard, for Matrix 5.5
03.632.074	Screwdriver Stardrive, T25, long, with T-Handle, for Matrix

Straight Handle T25 Stardrive

03.632.005	Screwdriver Stardrive, T25, with straight handle, standard, for Matrix 5.5
03.632.075	Screwdriver Stardrive, T25, long, with straight handle, for Matrix

Ratchet Wrench

03.632.090	T-Handle with Ratchet Wrench, with Hexagonal Coupling 6.0 mm
03.632.091	Handle with Ratchet Wrench, straight, with Hexagonal Coupling 6.0 mm

For assembly and removal of polyaxial screw heads

03.632.007	Alignment Tool for polyaxial Screw Head, for Matrix 5.5	
03.632.037	Positioning Instrument for Polyaxial Screw Heads, for Matrix 5.5	
03.632.045	Removal Instrument for Polyaxial Screw Heads, for Matrix 5.5	
03.632.046	Reamer for Pedicle Screws, for Matrix	
68.632.125	Loading Station for Matrix 5.5	

For hook placement

03.632.013	Lamina Feeler, small, for Matrix	
03.632.014	Lamina Feeler, large, for Matrix	
03.632.021	Holding Forceps, lateral, for Hooks, for Matrix 5.5	
03.632.022	Holding Forceps, straight, for Hooks, for Matrix 5.5	
03.632.023	Holding Forceps, curved, for Hooks, for Matrix 5.5	
03.632.044	Hook Positioner, for Matrix	
03.632.100	Pedicle Feeler, for Matrix	
03.632.163	Transverse Process Finder for Matrix	

For rod cutting and bending

388.906	Trial Rod ∅ 5.0 mm, length 150 mm	
388.907	Trial Rod ∅ 5.0 mm, length 500 mm	
388.750	USS Rod Cutting and Bending Device	
388.720	Bolt Cutter	
03.632.017	Rod Bender with Silicone Handle	

In Situ Benders, for 5.5 mm rods

03.632.038	In-situ Bender for Rods ∅ 5.5 mm, right	
03.632.039	In-situ Bender for Rods ∅ 5.5 mm, left	

Bending Irons for Coronal Plane, for 5.5 mm rods

03.632.040	Bending Iron for Rods ∅ 5.5 mm, left, for Coronal Plane	
03.632.041	Bending Iron for Rods ∅ 5.5 mm, right, for Coronal Plane	

For rod insertion

03.632.020	Wrench, hexagonal for Rods ∅ 5.5/6.0 mm, for Matrix	
03.632.081	Rod Holding Forceps for Rods ∅ 5.5 mm	
03.632.169	Rod Pusher for Rods ∅ 5.5/6.0 mm, for Matrix	
03.632.202	Holding Forceps for Rods ∅ 5.5 and ∅ 6.0 mm	

For rod reduction

Reduction Instruments

03.632.408	Reduction Instrument for Spondylolisthesis, standard, for Matrix 5.5
03.632.409	Reduction Instrument for Spondylolisthesis, long, for Matrix 5.5
03.620.091	Socket, hexagonal 6.0 mm
388.654	Ratchet with Handle, with Hexagonal Quick Coupling 6.0 mm

Rod Persuaders

03.632.009	Rod Persuader, standard, for Matrix 5.5
03.632.079	Rod Introduction Pliers, long, for Matrix 5.5

Rocker Forks

03.632.010	Rocker Fork, small, for Matrix 5.5
03.632.011	Rocker Fork, footed, for Matrix 5.5
03.632.012	Rocker Fork, medium, for Matrix 5.5

Instruments for reduction screws

03.632.025	Counter Torque for Reduction Screws, for Matrix 5.5

03.632.042	Rod Pusher/Counter Torque for Reduction Screw, for Matrix 5.5

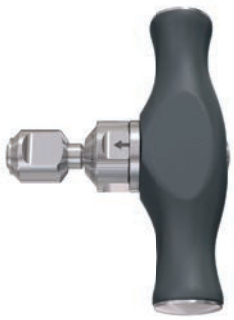
03.632.026	Rod Pusher/Counter Torque for Reduction Screws, for Matrix 5.5

03.632.029	Holding Crown for Reduction Screws, for Matrix 5.5

03.632.030	Tab Remover for Reduction Screws, for Matrix

For cap introduction and tightening

03.620.061	T-Handle with Ratchet Wrench and with Torque Limiter, 10 Nm



Rod Pusher/Counter Torques

03.632.006	Rod Pusher/Counter Torque, standard, for Matrix 5.5

03.632.076	Rod Pusher/Counter Torque, long, for Matrix 5.5

03.632.049	Counter Torque, standard, for Matrix 5.5

03.632.099	Counter Torque, long, for Matrix 5.5

03.632.080	Handle, detachable, for Matrix

For rotation correction

03.632.060	Derotation Instrument for Matrix 5.5	

For distraction and compression

03.632.000	Distraction Fork	
03.632.200	Compression Forceps, parallel, for Rods ∅ 5.5 and ∅ 6.0 mm	
03.632.201	Spreader Forceps, parallel, for Rods ∅ 5.5 and ∅ 6.0 mm	
03.632.203	Compression Forceps, parallel, for Rods ∅ 5.5 and ∅ 6.0 mm, for 2 Levels	

For transverse and parallel connectors

03.632.050	Retaining Sleeve for Transverse Connectors, Snap-on, for Matrix	
03.632.052	Screwdriver Stardrive, T15, short, for Matrix	
03.632.055	Screwdriver Shaft Stardrive, T15, standard (straight tip)	
03.632.053	Length indicator for Transverse Connectors, Snap-on, for Matrix	
03.632.204	Torque-limiting Handle, 3 Nm	

Bibliography

Aebi M, Arlet V, Webb JK, (2007): AOSPINE Manual (2 vols), Stuttgart, New York: Thieme.

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

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