



**Mediox**

***Posterior Pedicle screw system  
-CTS 3.5***

**Surgical Technique**

# CONTENTS

<b>Indications and contraindications</b>	01
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## **Surgical technique**

1. Patient Position and Exposure	02
2. Screw Insertion Position	02
3. Drilling	03
4. Awl Insertion	03
5. Pedicle Entrance	04
6. Tap Thread (Optional)	04
7. Screws Insertion	05
8. Rod Contouring	06
9. Rod linkage	06
10. Set Screw Pre-tightening	07
11. Hooks Insertion (Optional)	08
12. Compression/Distractio	09
13. Screws Final Tighten	10

<b>Implants</b>	12
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<b>Instruments</b>	14
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## Indications and contraindications

### Indications

Instability in occipitocervical segment or upper cervical

- Rheumatoid Arthritis.
- Deformity.
- Trauma.
- Tumor.

Instability in low cervical

- Trauma.
- Tumor.
- Latrogenic instability following laminectomy.

### Contraindications

- Not apply for internal fixation because of deformity or destroy of pedicle or lateral mass of vertebrae
- Not apply for internal fixation before infection control of cervical spine
- Not apply for posterior fixation because of fewer segment(<3)of anterior spinal cord compression for cervical degeneration and other diseases other diseases.
- Anterior cervical spinal cord or root compression because of certebrae fracture,disc destroy and anterior instability,must perform operations anterior approach to get stabilization

The following surgical technique describes the application of the Posterior Pedicle screw system – CTS3.5 utilizing cervical lateral mass screw fixation for illustrative purposes.

## Surgical technique

### 1. Patient Position and Exposure

The patient is placed in a prone position to avoid oppression of a particular area. Placed head on a padded holder or secured with tripod pins. Sterile drapes have to be applied to the neck and back. The incision from the midline of the appropriate spinal segment and separate till exposes spinous processes.



Decortication of the paraspinal musculature under subperiosteal. Peeling outwards to expose facet joints and intertransverse. Remove joint capsules of the zygapophyseal joints in the fusion segment. Be mindful that to protect the proximal joint capsule.

### 2. Screw Insertion Position

Preoperative CT scan photos and X-ray radiographs were used to identify anatomic differences. Use Intraoperative perspective to assist placement screws at lateral cervical spine. The optimal insertion point is at the center and the upper 1 mm place.



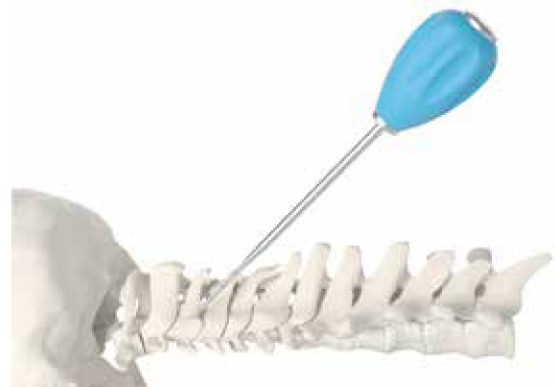
### 3. Drilling

Use Adjustable Drill Bit (12010009/12010010) or Awl (12016010) to exposure pedicle entry point; If choose Adjustable Drill Bit (12010009 /12010010) to create a pathway into the pedicle, it have to fit with the Drill Guide (12010007) and Adjustable Drill Bit Stop (12010006). Adjust depending on the depth of the trajectory. The drilling bit has a scale that can be a reference. (The angle reference for the screw insertion: the angle of sagittal view about 45 °, the angle of camber about 25 °.)



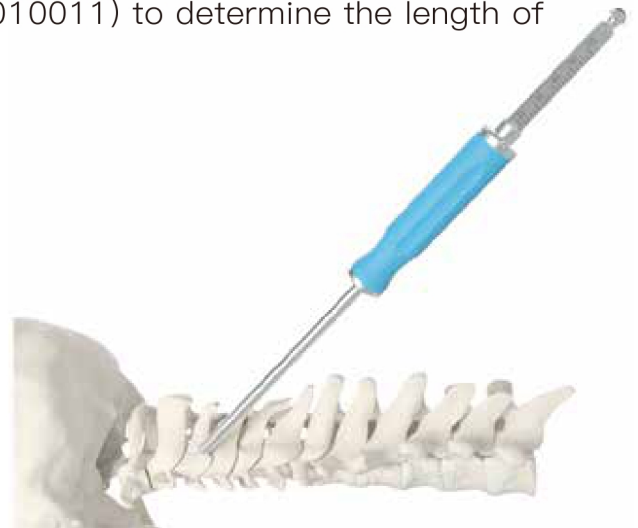
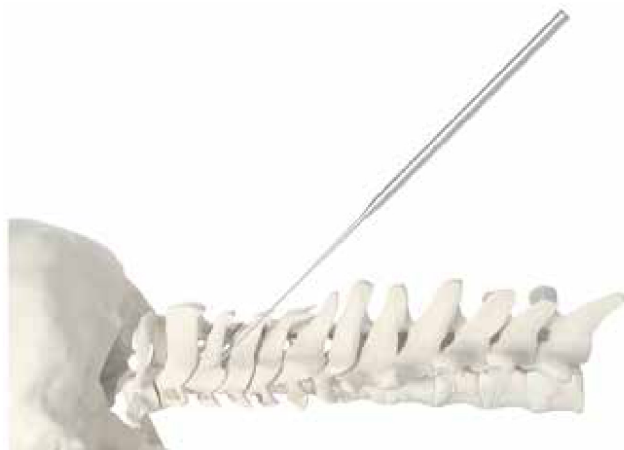
### 4. Awl Insertion (If last step chosen by Awl)

Use Pedicle Probe  $\phi 2.4$  (12010003) to create a pathway into the pedicle. The correct rotational insertion of the instrument allows the Pedicle Probe  $\phi 2.4$  (12010003) to follow a path of minimum resistance without damaging the pedicle walls.



## 5. Pedicle Entrance

Once have opened the channel of the pedicle, use Pedicle Feeler (12010012) to ensure that every side of pedicle pathway and the end of the pathway have not been destroyed. Use Depth Gauge (12010011) to determine the length of the screw.



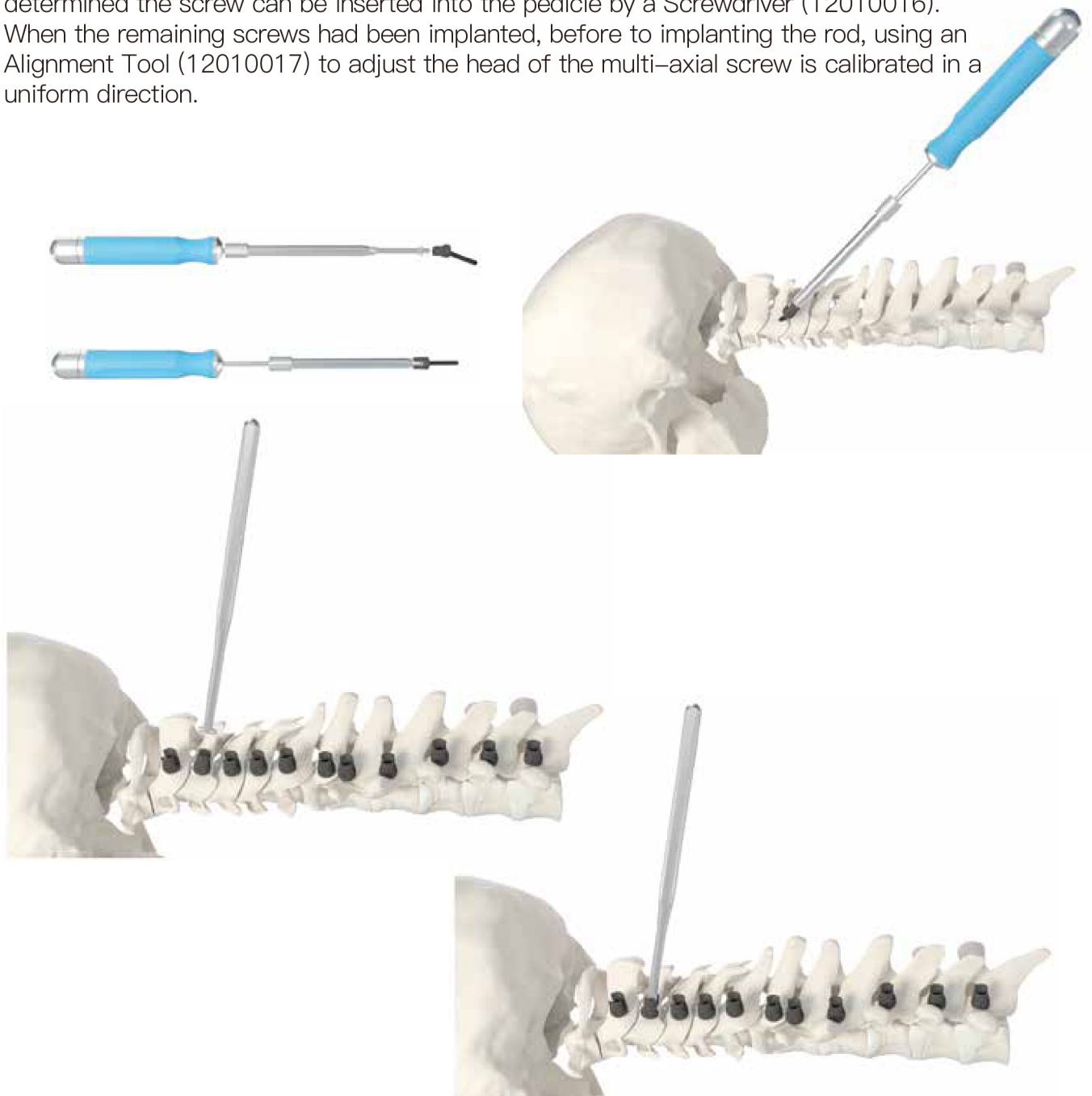
## 6. Tap Thread (Optional)

Use the bone taps to create the bone canal. We provide three Tap, specification chosen according to different conditions. After tapping, use Pedicle Feeler (12010012) to re-check that every side of pedicle pathway and the end of the pathway have not been destroyed.



## 7. Pedicle screw insertion

When the pedicle pathway prepared, and the proper screw diameter and length determined the screw can be inserted into the pedicle by a Screwdriver (12010016). When the remaining screws had been implanted, before to implanting the rod, using an Alignment Tool (12010017) to adjust the head of the multi-axial screw is calibrated in a uniform direction.



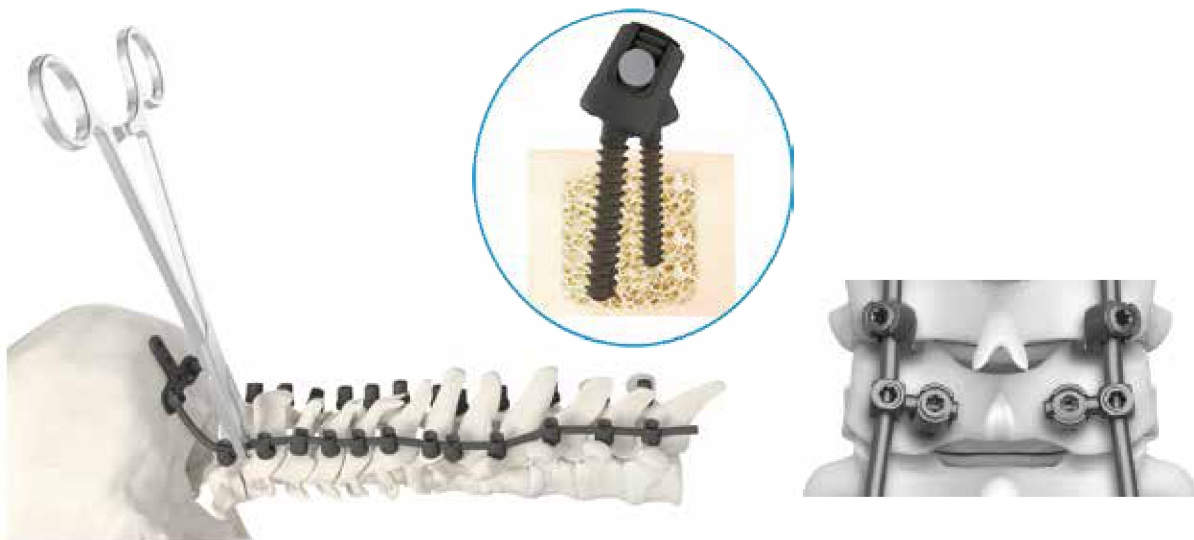
## 8. Rod contouring

Once all the screws are inserted, the appropriate length rod is determined. Use the Rod Template (12010018) to more accurately determine the appropriate rod length and circular measure.



## 9. Rod linkage

Multi-axial screws allow a 5mm bends in the inner/outer direction without the need for additional bending. Transverse Connector can be used depending on the need to increase the inner/outer direction offset.





## 10. Set Screw Pre-tightening

The Rod Holder (12010021) can be used to help place the titanium rod into the grooves of the implant. Pre-screwdriver (12010028) can be used to hold the set screw for temporary locking. Countertorque (12010029) and Rod Reducer (12010022) will help to press the rod which is not fully seated at the bottom into the groove.

Method 1: If the rod is not fully seated into the bottom of the screw head. Use a Countertorque (12010029) to fully seat the rod and use a Pre-screwdriver (12010028) to insert the set screw.



Method 2: The Rod Reducer (12010022) buckles the bottom of the screw head, presses the Rod reducer (12010022) handle to press the Rod into the bottom of the U-shaped groove of the screw.



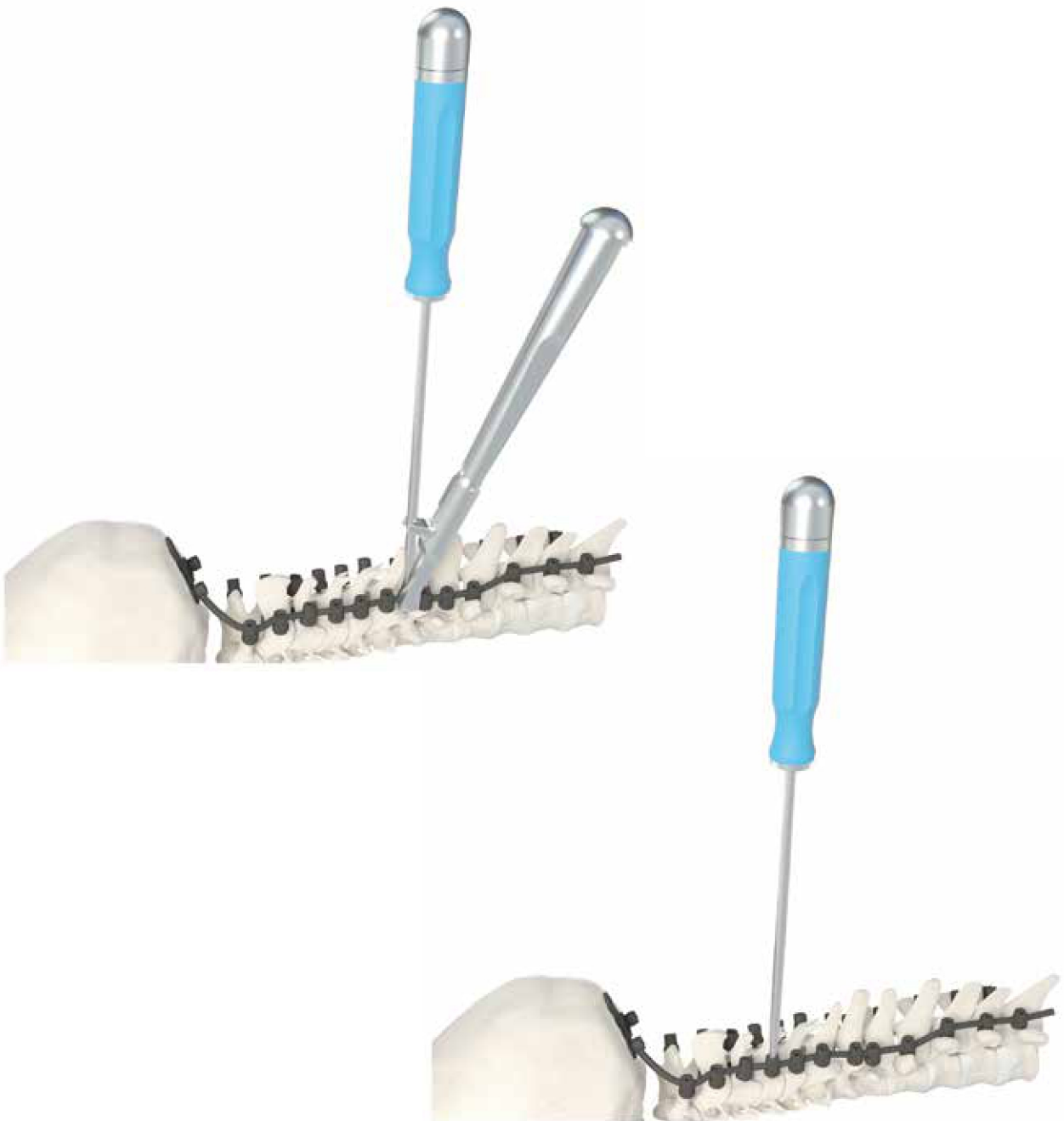
## 11. Hooks Insertion (Optional)

Use Laminar Elevator (12010001) to prepare the lamina and remove the ligamentum flavum. You can also peel carefully by using the Hook Holder (12010025). When implanting a hook, it may be necessary to have a limited resection of the lower end of the upper vertebral body. If the ligamentum flavum is calcified or the lamina overlaps, a high-speed drill can be used. Select the appropriate hook is based on the thickness of the lamina and use the Hook Holder to install it.

Based on the position of the Hook, use Rod Template (12010018) to determine the rod's curvature and length, cut the rod, and bend the rod in the shape of the spine. Use Rod Holder (12010021) is to implant the rod.

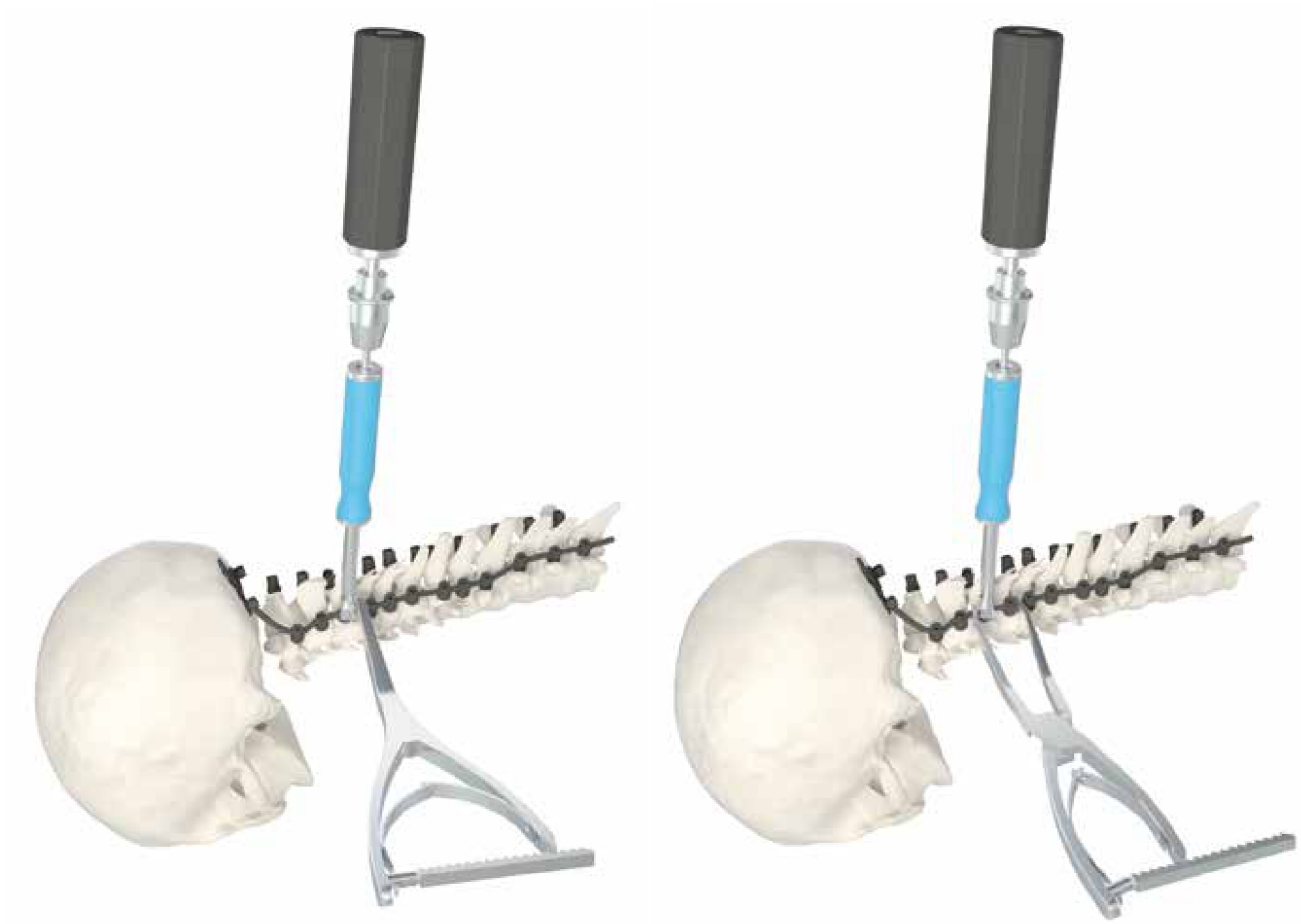


Implant the set screw, but do not tighten. If necessary, use the guide on the Hook Holder (12010025) to insert the Set Screw Driver (12010027) and tighten the set screw.



## 12. Compression/Distraction

The correction can be performed by compression on the concave side of the sagittal plane and distraction on the convex side of the sagittal plane. Compression or distraction operation should be performed after all set screws are implanted but before the final tighten.



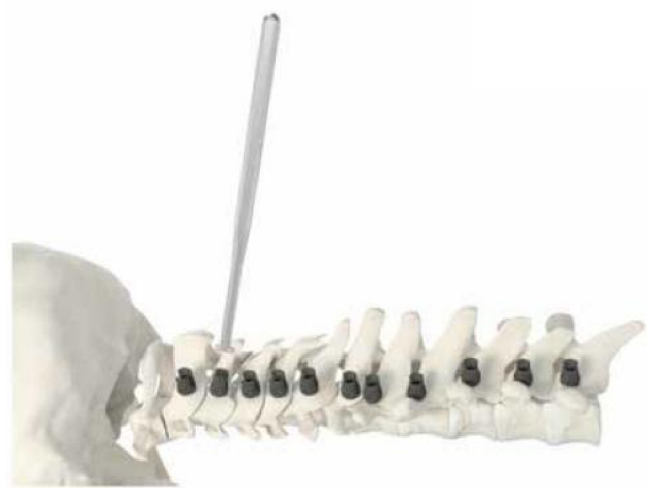
## 13. Screws Final Tighten

Set screw Driver–quick connect (12010031) can be attached to Torque Limit Handle (12010032) and composed as anti–torque wrench. Combine with Countertorque (12010029) will finally tighten the set screw.



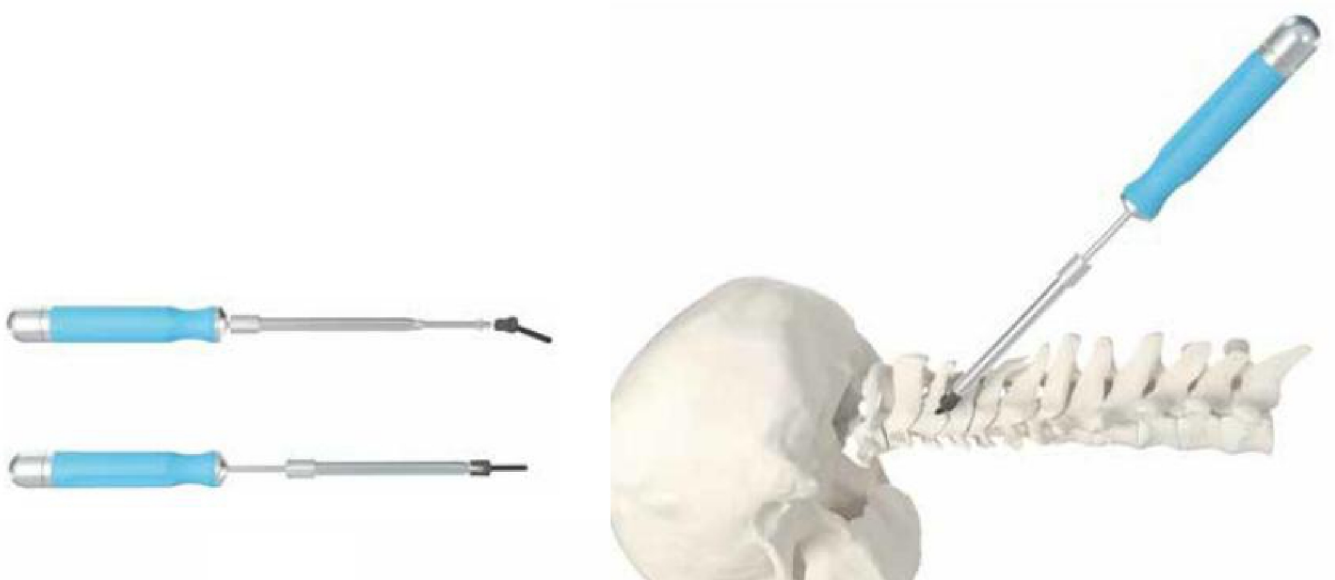
## 14. CTS 3.5 Cancellous all size

- Material: Titanium.
- Self tapping.
- Diameter 3.5 and 4.0mm. Length: 8mm - 34mm, 2mm increments.
- Tilt 30° from vertical, rotate 60° or 30° multi-directional.
- Compatible with 3.5mm diameter vertical braces.



## 15. CTS -3.5 Cortex Shaft Screws (C1 - C2) all size

- Material: Titanium.
- Diameter: 3.5mm.
- Length: 26mm-40mm, each step increases by 2mm.
- Sharp screw head, self-tapping.
- The screw body is divided into 2 parts:
  - + The lower end has a small thread that adheres tightly to the vertebral body.
  - + The threadless top head helps the screw move easily through the bow leg.
- Tilts 30-45 degrees from vertical, allowing rotation 60-90 degrees or 30-45 degrees in any direction.
- Used with 3.5mm diameter vertical bars and internal locking screws.



## 16. CTS 3.5 Cortex all size

- Material: Titanium.
- Diameter: 4.0mm.
- Length: 20mm-52mm, each step increases by 2mm.
- Sharp screw head, self-tapping.
- 45 degree tilt, allows 60 degree or 30 degree rotation in any direction.
- Used with 3.5mm diameter vertical bars and internal locking screws.



## 17. CTS - 3.5 Cortex Occipital Screws

- Material: Titanium.
- Diameter: 3.5mm, length 6mm - 18mm, each step increases by 2mm
- Diameter: 4.0mm length: 6mm - 20mm, each step increases by 2mm.
- Blunt screw head, thin self-tapping thread
- Star-shaped core screws are compatible with brand tools.



## 18. CTS - 3.5 Occipital Plates

- Material: Titanium.
- There are 2 types: Y-shaped and oval-shaped, thickness 3.5mm - 3.7mm
- The brace body has 3-4 holes for screws. The hole diameter is suitable for 3.5mm/4.0mm diameter screws.
- Compatible with posterior cervical multiaxial screws with diameter 3.5/4.0 and posterior cervical vertical brace with diameter 3.5mm.

## 19. CTS - 3.5 Parallel Rod Connector

- Material: Titanium.
- Diameter: one end 3.5mm and one end 5.5mm, allowing to link two vertical bars of two different diameters into a straight line and fixed on the screw with 3 included locking screws.
- Triangular prism connector.
- Compatible with posterior cervical multiaxial screws with diameters of 3.5mm and 4.0mm.





## 20. CTS - 3.5 Set screw

- Material: Titanium.
- Diameter: 6mm.
- Height: 1.7mm.
- Has a one-way screw thread design, the external thread matches the internal thread of the screw head, avoiding self-unscrewing and preventing it from coming out.
- Designed with a star-shaped lock head to avoid slipping and sliding when tightening.
- Used with posterior cervical multiaxial screws with diameters of 3.5mm, 4.0mm and vertical rods with diameter of 3.5mm.

## 21. CTS-3.5 Cross Link

- Material: Titanium
- Diameter: 3.5mm.
- Length from 40mm to 75mm, each step increases by 5mm.
- Multi-directional rotation, bending and length adjustable.
- Fixed to the vertical bar with 2 locking screws.
- Used with 3.5mm diameter vertical bars.



## 22. CTS - 3.5 Rod 3.5/5.5mm

- Material: Titanium
- Diameter: one end of the vertical bar is 3.5mm and one end of the vertical bar is 5.5mm.
- Length includes 3 sizes:
  - + Short: 3.5mm diameter 120mm long, 5.5mm diameter 170mm long.
  - + Medium: 3.5mm diameter 240mm long, 5.5mm diameter 250mm long.
  - + Length: 3.5mm diameter 190mm long, 5.5mm diameter 500mm long.
- Uniform cylinder.
- There are vertical lines to mark when rotating.
- Used to connect with screws from neck to chest and back.



## 23. CTS - 3.5 Rod

CTS - 3.5 Rod 80-120mm

- Material: Titanium
- Diameter: 3.5mm.
- Length: 80-120mm.
- Uniform cylindrical circular block.
- There are vertical lines to mark when rotating.
- Compatible with posterior cervical multiaxial screws with diameters of 3.5mm, 4.0mm and locking screws.

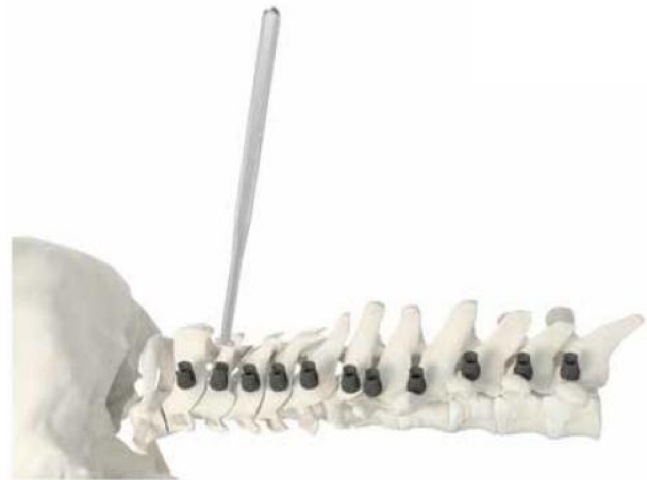
CTS - 3.5 Rod 240mm

- Material: Titanium
- Diameter: 3.5mm.
- Length: 240mm.
- Uniform cylindrical circular block.
- There are vertical lines to mark when rotating.
- Compatible with posterior cervical multiaxial screws with diameters of 3.5mm, 4.0mm and locking screws.



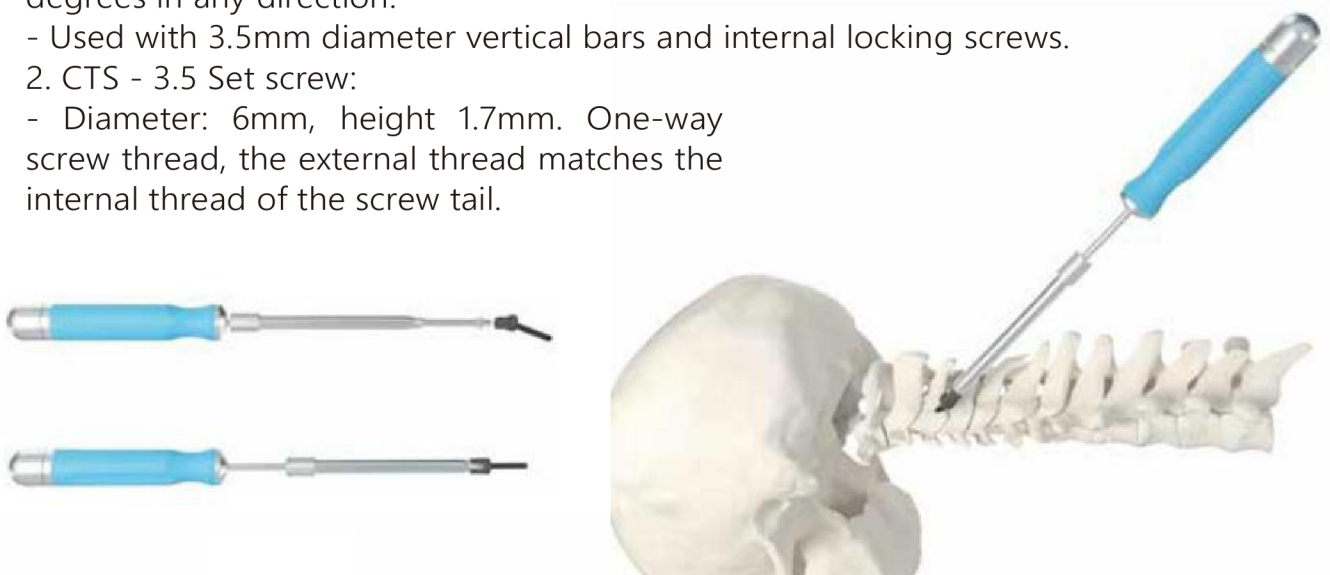
## 24. CTS 3.5 Cancellous all size with CTS - 3.5 Set screw

- Material: Titanium
- 1. CTS 3.5 Cancellous
  - Self tapping.
  - Diameter 3.5 and 4.0mm. Length: 8mm - 34mm, 2mm increments.
  - Tilt 30° from vertical, rotate 60° or 30° multi-directional.
  - Compatible with 3.5mm diameter vertical braces
- 2. CTS - 3.5 Set screw:
  - Diameter: 6mm, height 1.7mm. One-way screw thread, the external thread matches the internal thread of the screw tail.



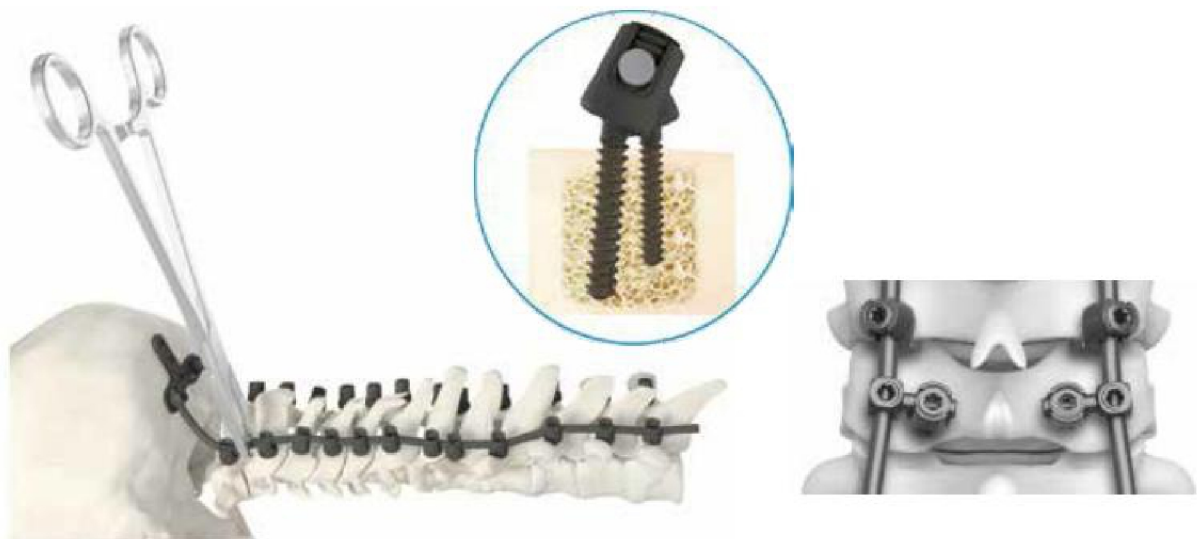
## 25. CTS -3.5 Cortex Shaft Screws (C1 - C2) all size with CTS - 3.5 Set screw

- Material: Titanium.
- 1. CTS -3.5 Cortex Shaft Screws (C1 - C2)
  - Diameter: 3.5mm.
  - Length: 26mm-40mm, each step increases by 2mm.
  - Sharp screw head, self-tapping.
  - The screw body is divided into 2 parts:
    - + The lower end has a small thread that adheres tightly to the vertebral body.
    - + The threadless top head helps the screw move easily through the bow leg.
  - Tilts 30-45 degrees from vertical, allowing rotation 60-90 degrees or 30-45 degrees in any direction.
  - Used with 3.5mm diameter vertical bars and internal locking screws.
- 2. CTS - 3.5 Set screw:
  - Diameter: 6mm, height 1.7mm. One-way screw thread, the external thread matches the internal thread of the screw tail.



## 26. CTS 3.5 Cortex all size with CTS - 3.5 Set screw

- Material: Titanium.
- 1. CTS 3.5 Cortex all size
  - Diameter: 4.0mm.
  - Length: 20mm-52mm, each step increases by 2mm.
  - Sharp screw head, self-tapping.
  - 45 degree tilt, allows 60 degree or 30 degree rotation in any direction.
  - Used with 3.5mm diameter vertical bars and internal locking screws.
- 2. CTS - 3.5 Set screw:
  - Diameter: 6mm, height 1.7mm. One-way screw thread, the external thread matches the internal thread of the screw tail.



## 27. CTS - 3.5 Cortex Occipital Screws with CTS - 3.5 Set screw

- Material: Titanium.
- 1. CTS - 3.5 Cortex Occipital Screws
  - Diameter: 3.5mm, length 6mm - 18mm, each step increases by 2mm
  - Diameter: 4.0mm length: 6mm - 20mm, each step increases by 2mm.
  - Blunt screw head, thin self-tapping thread
  - Star-shaped core screws are compatible with brand tools.
- 2. CTS - 3.5 Set screw:
  - Diameter: 6mm, height 1.7mm. One-way screw thread, the external thread matches the internal thread of the screw tail.



# Implants

## Mediox Posterior Pedicle screw system-CTS 3.5

### Cancellous Multi Axial Screws CTS 3.5



D	L	Product Code
Φ3.5	8	950603508
Φ3.5	10	950603510
Φ3.5	12	950603512
Φ3.5	14	950603514
Φ3.5	16	950603516
Φ3.5	18	950603518
Φ3.5	20	950603520
Φ3.5	22	950603522
Φ3.5	24	950603524
Φ3.5	26	950603526
Φ3.5	28	950603528
Φ3.5	30	950603530
Φ3.5	32	950603532
Φ3.5	34	950603534
Φ4.0	8	950604008
Φ4.0	10	950604010
Φ4.0	12	950604012
Φ4.0	14	950604014
Φ4.0	16	950604016
Φ4.0	18	950604018
Φ4.0	20	950604020
Φ4.0	22	950604022
Φ4.0	24	950604024
Φ4.0	26	950604026
Φ4.0	28	950604028
Φ4.0	30	950604030
Φ4.0	32	950604032
Φ4.0	34	950604034

### CTS -3.5 Cortex Shaft Screws (C1 - C2)



D	L	Product Code
Φ3.5	26	950623526
Φ3.5	28	950623528
Φ3.5	30	950623530
Φ3.5	32	950623532
Φ3.5	34	950623534
Φ3.5	36	950623536
Φ3.5	38	950623538
Φ3.5	40	950623540

### CTS 3.5 Cortex Multi Axial Screws



D	L	Product Code
Φ4.0	20	950614020
Φ4.0	22	950614022
Φ4.0	24	950614024
Φ4.0	26	950614026
Φ4.0	28	950614028
Φ4.0	30	950614030
Φ4.0	32	950614032
Φ4.0	34	950614034
Φ4.0	36	950614036
Φ4.0	38	950614038
Φ4.0	40	950614040
Φ4.0	42	950614042
Φ4.0	44	950614044
Φ4.0	46	950614046
Φ4.0	48	950614048
Φ4.0	50	950614050
Φ4.0	52	950614052

### CTS 3.5 Cortex Occipital Screws

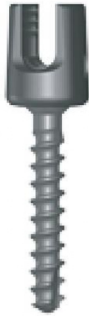


D	L	Product Code
Φ3.5	6	950633506
Φ3.5	8	950633508
Φ3.5	10	950633510
Φ3.5	12	950633512
Φ3.5	14	950633514
Φ3.5	16	950633516
Φ3.5	18	950633518
Φ3.5	20	950633520
Φ3.5	22	950633522
Φ3.5	24	950633524
Φ4.0	6	950634006
Φ4.0	8	950634008
Φ4.0	10	950634010
Φ4.0	12	950634012
Φ4.0	14	950634014
Φ4.0	16	950634016
Φ4.0	18	950634018
Φ4.0	20	950634020
Φ4.0	22	950634022
Φ4.0	24	950634024

# Implants

## Mediox Posterior Pedicle screw system-CTS 3.5

### Cancellous Multi Axial Screws CTS 3.5 with Set Screw



D	L	Product Code
Φ3.5	8	S950603508
Φ3.5	10	S950603510
Φ3.5	12	S950603512
Φ3.5	14	S950603514
Φ3.5	16	S950603516
Φ3.5	18	S950603518
Φ3.5	20	S950603520
Φ3.5	22	S950603522
Φ3.5	24	S950603524
Φ3.5	26	S950603526
Φ3.5	28	S950603528
Φ3.5	30	S950603530
Φ3.5	32	S950603532
Φ3.5	34	S950603534
Φ4.0	8	S950604008
Φ4.0	10	S950604010
Φ4.0	12	S950604012
Φ4.0	14	S950604014
Φ4.0	16	S950604016
Φ4.0	18	S950604018
Φ4.0	20	S950604020
Φ4.0	22	S950604022
Φ4.0	24	S950604024
Φ4.0	26	S950604026
Φ4.0	28	S950604028
Φ4.0	30	S950604030
Φ4.0	32	S950604032
Φ4.0	34	S950604034

### CTS -3.5 Cortex Shaft Screws (C1 - C2) with Set Screw



D	L	Product Code
Φ3.5	26	S950623526
Φ3.5	28	S950623528
Φ3.5	30	S950623530
Φ3.5	32	S950623532
Φ3.5	34	S950623534
Φ3.5	36	S950623536
Φ3.5	38	S950623538
Φ3.5	40	S950623540



### CTS 3.5 Cortex Multi Axial Screws with Set Screw




D	L	Product Code
Φ4.0	20	S950614020
Φ4.0	22	S950614022
Φ4.0	24	S950614024
Φ4.0	26	S950614026
Φ4.0	28	S950614028
Φ4.0	30	S950614030
Φ4.0	32	S950614032
Φ4.0	34	S950614034
Φ4.0	36	S950614036
Φ4.0	38	S950614038
Φ4.0	40	S950614040
Φ4.0	42	S950614042
Φ4.0	44	S950614044
Φ4.0	46	S950614046
Φ4.0	48	S950614048
Φ4.0	50	S950614050
Φ4.0	52	S950614052

### CTS 3.5 Cortex Occipital Screws with Set Screw





D	L	Product Code
Φ3.5	6	S950633506
Φ3.5	8	S950633508
Φ3.5	10	S950633510
Φ3.5	12	S950633512
Φ3.5	14	S950633514
Φ3.5	16	S950633516
Φ3.5	18	S950633518
Φ3.5	20	S950633520
Φ3.5	22	S950633522
Φ3.5	24	S950633524
Φ4.0	6	S950634006
Φ4.0	8	S950634008
Φ4.0	10	S950634010
Φ4.0	12	S950634012
Φ4.0	14	S950634014
Φ4.0	16	S950634016
Φ4.0	18	S950634018
Φ4.0	20	S950634020
Φ4.0	22	S950634022
Φ4.0	24	S950634024

Rod

	D	L	Product Code
	Φ3.5	80	950690000
	Φ3.5	120	950690001
	Φ3.5	240	950690002
	Φ3.5/Φ5.5	120/170	950690100
	Φ3.5/Φ5.5	240/250	950690101
	Φ3.5/Φ5.5	190/500	950690102

Occipital Plates

	L	Product Code
	3 holes	950691000
	4 holes	950691100

Hooks

	L	Product Code
	Small	950692000
	Large	950692100

Open Transverse Connector

	Product Code
	950693000

Close Transverse Connector

	Product Code
	950693100

### Parallel Rod Connector



Product Code

950693200

### Occipital Connector



Product Code

950693300

### Set Screw



D

Product Code

Φ6

950694000

### Cross Link



L

Product Code

40

950695040

45

950695045

50

950695050

55

950695055

60

950695060

65

950695065

70

950695070

75

950695075

### Cross Link-C



L

Product Code

40

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950695145

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950695150

55

950695155

60

950695160

65

950695165

70











950695170









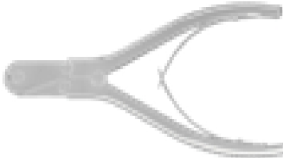
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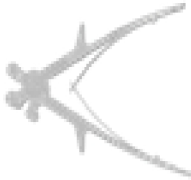
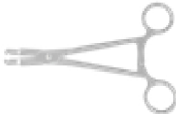




950695175






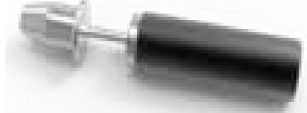


# Instruments

## Mediox Posterior Pedicle screw system-CTS 3.5 Instrument Set

Product Code	Parts Description	Pieces	Picture
12010001	Laminar Elevator	1	
12016010	Awl	1	
12010003	Pedicle Probe – $\Phi 2.4$	1	
12010004	Cylinder Pedicle	1	
12010005	Ball Pedicle Marker	1	
12010006	Adjustable Drill Bit Stop	1	
12010007	Drill Guide	1	
12006017	Quick Coupling Handle	1	
12010009	Adjustable Drill Bit – $\Phi 2.4$	1	
12010010	Adjustable Drill Bit – $\Phi 2.9$	1	

Product Code	Parts Description	Pieces	Picture
12010011	Depth Gauge	1	
12010012	Pedicle Feeler	1	
12010013	Adjustable Cancellous (occipital) Tap – $\Phi 3.5$	1	
12010014	Adjustable Cancellous Tap – $\Phi 4.0$	1	
12010015	Adjustable Cancellous (occipital) Tap – $\Phi 4.0$	1	
12010016	Screwdriver	2	
12010017	Alignment Tool	1	
12010018	Rod Template	1	
12010019	Rod Cutter	1	

Product Code	Parts Description	Pieces	Picture
12010020	Rod Bender	1	
12010021	Rod Holder	1	
12010022	Rod Reducer	1	
12010023	Compression Forceps	1	
12010024	Distraction Forceps	1	
12010025	Hook Holder	1	

Product Code	Parts Description	Pieces	Picture
12010026	Clasp Pusher	1	
12010027	Set Screw Driver – $\Phi 3.2$	1	
12010028	Pre-screwdriver	1	
12010029	CounterTorque	1	
12010031	Set Screw Driver – Quick Connect	1	
12010032	Torque Limit Handle	1	
12010891	Instrument Case	1	
12010992	Implant Case	1	



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