



$\begin{array}{c|c} G & B & B & A & L & T^{\textcircled{R}} \\ \hline Cervical Thoracic Spinal System \end{array} \text{Surgical Technique} \\ \end{array}$

The GIBRALT Spinal System is a comprehensive solution for posterior stabilization and fusion of the cervical and thoracic spine. Offering exceptional versatility and ease-of-use, the GIBRALT Spinal System features top-loading polyaxial screws, hooks, offset connectors, rod-to-rod connectors, and occipital plates which can be constructed into a multitude of configurations based on individual patient anatomy.

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OPERATIVE TECHNIQUE OVERVIEW



Screw Placement









Insert Screw

1

Insert Set Screw



Drill

Cut and Contour the Rod

10 Place Rod into Tulip Heads



Tighten Set Screws







13

Compression/Distraction

Additional Options – Cross Connectors and Rod-to-Rod Connectors



DETAILED OPERATIVE TECHNIQUE

PRE-OPERATIVE PLANNING

When using the Gibralt Spinal Screw System, the patient should be positioned prone, lying flat on the table. A radiolucent frame or chest rolls may be used, but the kneeto-chest position should be avoided.

Using fluoroscopic imaging, it should be verified that the true views of both anterior-posterior (A/P) and lateral images of the spine (views which adequately delineate pedicle morphology and geometry) are obtainable. It is recommended that pre-operative planning is used to help determine a proper entry point and trajectory.

PLACEMENT OF LAMINAR HOOKS

Hooks are available for use in the cervical spine. Select the appropriate Hook size and configuration for the anatomy. There are five different types of Hooks available: Straight, Left and Right Offset and Left and Right Angle Hooks (See page 12 for Hook offering).

Clamp the desired Hook with the **Hook Holder (05-009-40-0000)** making sure that the prongs of the instrument interface with the indentations on the outside head of the Hook (Figure 1).

Place Hooks as needed under the superior or inferior lamina (Figure 2).

The Hooks may be oriented either in a cranial or caudal position.

Repeat the steps above to place remaining hooks as determined in the pre-operative plan.

Once the Hooks have been inserted, utilize the **Set Screw Starter (05-009-20-0000)** to insert the appropriate inner Set Screw and provisionally tighten in a clockwise motion (Figure 3).





Fig. 2



Fig. 3



Fig. 4



Fig. 5



Fig. 6



PLACEMENT OF POLYAXIAL SCREWS

Determine the ideal entry point for the Polyaxial Screw and penetrate the cortical bone to initiate an entry point using the **Awl (05-009-02-0000)** (Figure 4).

The **Probe (05-009-03-0000)** can then be used to cannulate the pedicle (Figure 5).

After the pedicle has been cannulated, it may be tested to ensure the integrity of the pedicular wall by using the **Sounding Probe (05-009-04-0000)** (Figure 6).

Determine the desired diameter and depth of the drill penetration. There are two drill options available, Fixed and Adjustable. Fixed drills are available in either a 10mm, 12mm or 14mm depth. **Adjustable Drill (05-009-94-00XX)** and **Drill Guide Stop (05-009-93-0000)** offer a drilling depth range from 14mm to 28mm in 2mm increments. The depth is determined by the position of the drill guide stop on the adjustable drill.

Attach the Drill Bit to the desired handle. Align the **Drill Guide (05-009-15-0000)** with the appropriate screw trajectory. Insert the Drill Bit through the **Drill Guide (05-009-15-0000)** and proceed with drilling to the desired depth (Figure 7).

Confirm depth and containment within the pilot hole with the **Depth Gauge (05-009-10-0000)** or probe. Tap the pilot hole using the **3.5mm Tap (05-009-05-0000)** or **4.0mm Tap (05-009-07-0000)** while maintaining the appropriate trajectory (Figure 8).

Note: The Taps are undersized by approximately 0.15mm. Continue to drill and tap the remaining pilot holes in the same manner.



SCREW INSERTION

After selecting the appropriate screw size, insert the hexalobe tip of the **Polyaxial Screwdriver (05-009-85-0000)** into the screw. Rotate the outer knob of the Screwdriver clockwise until the head of the screw is secured on the Driver (Figure 9). Insert the screw into the prepared pilot hole to the desired depth (Figure 10).

To disengage the screw from the driver, turn the knob counterclockwise and pull straight out of the internal hexalobe on the screw. To back out or adjust the screw, insert the hexalobe tip of the screwdriver into the screw. Rotate the outer knob of the screwdriver clockwise until the screwdriver is secured to the screw. Once the screw is engaged, back out the screw by turning the handle counterclockwise. Continue to insert all remaining Polyaxial Screws in the same manner.



ROD PLACEMENT

The rods are provided in pre-contoured, precut lengths, however a **Rod Cutter (05-009-31-0000)** is provided if other sizes are needed. The final length of the rod should extend 2mm beyond the margin of the screw housing so the screw locking mechanism engages correctly (Figure 11). To contour the rods, secure the rod with the **Rod Bender (05-009-22-0000)** and contour to achieve the desired curvature (Figure 12).

Handheld Rod Benders (05-009-23-0001 & 05-009-23-0002) are also available and can be used to provide additional leverage when contouring the rod. Utilize the removal screwdriver to adjust the A-P height of the screws as needed. Adjust the alignment of the Polyaxial Screws using the **Head Adjuster (05-009-59-0000)** so that the rod openings are in alignment. Once adjusted, they will easily stay in the correct alignment due to the unique EZ Set Tulip Design.

Fig. 9

Fig. 10





6



Fig. 13



Fig. 14



Fig. 15

Place the contoured rod into Polyaxial Screw (Figure 13). If necessary, there are two options for reducing the rod into the Hook or screw heads.

1) The **Rod Persuader (05-009-33-0000)** can be placed over the head of the hook or screw and the handles compressed to reduce the rod (Figure 14).

2) There are also multiple **Inline Rod Persuaders (05-009-65-0000)** which fit over the individual screw heads. The **Inline Rod Persuader Knob (05-009-66-0000)** is inserted over the top of the **Inline Rod Persuader (05-009-65-0000)** and rotated clockwise to reduce the rod (Figure 15). The Rod Persuader Knob can then be removed and placed over the next Inline Rod Reducer to reduce the rod into the next screw head sequentially.

SET SCREW INSERTION

Determine the appropriate inner set screw for each Polyaxial Screw or Hook, depending on whether a cross connector will be used at the indicated level. Utilizing the **Set Screw Starter (05-009-20-0000)**, insert the appropriate inner set screw into the Hooks and Polyaxial Screws and provisionally tighten in a clockwise motion (Figure 16).



Fig. 16

COMPRESSION/DISTRACTION

After the construct has been properly assembled, segmental compression and/or distraction can be accomplished using the **Compressor (05-009-28-0000)** or **Distractor (05-009-29-0000)** while tightening the Set Screws sequentially (Figure 17).

FINAL TIGHTENING

To perform final tightening of the construct, attach the **Set Screw Driver (05-009-19-0000)** to the **Torque Limiting Handle (05-009-78-0000)** (22 in/lb) slide the **Inline Counter Torque (05-009-88-0000)** over the screw head and seat it against the rod. Insert the **Set Screw Driver (05-009-19-0000)** and turn the **Torque Limiting Handle (05-009-78-0000)** clockwise until an audible/tactile click is achieved (Figure 18). Repeat in the same manner on all remaining components to secure the construct.

ADDITIONAL OPTIONS

ROD TO ROD CROSS CONNECTOR PLACEMENT

Choose the appropriate size Rod to Rod Cross Connector and contour as needed, using the **Cross Connector Benders (05-009-41-0000)** provided. Capture the Cross Connector Nut with the **Cross Connector Nut Starter (05-009-53-0000)** to hold the cross connector and place onto the rod (Figure 19). Insert the **Set Screwdriver (05-009-19-0000)** Attach to the Torque Limiting Driver (05-009-88-0000) through the **Torque Limiting Nut Driver (05-009-53-0000)** over the rod to rod cross connector nut into the set screw. Rotate the **Torque Limiting Nut Driver (05-009-53-0000)** counterclockwise until the Torque handle breaks over (Figure 20). Repeat the procedure on the opposite side to final tighten the construct.

SCREW HEAD TO SCREW HEAD CROSS CONNECTOR PLACEMENT

Choose the appropriate size Screw Head to Screw Head Cross Connector and contour as needed, using the **Cross Connector Benders (05-009-41-0000)** provided (Figure 21). Note: It is critical that the Cross Connector be contoured in most situations so that both rings of the cross connector are flush with the base of the tulip. If not contoured correctly, the application of torque to the Cross Connector Nut may cause issues with the inner set screw. Place the **Hook Holder (05-009-40-0000)** around the outside of the Polyaxial Screw where the Cross Connector will be inserted. Capture the retaining nut with the **Cross Connector Nut Starter (05-009-53-0000)** and turn clockwise to thread onto the extended Set Screw (Figure 22). Attach the **Cannulated Palm Torque Nut Driver (05-009-78-0000)** on the cross connect nut, then put the Set Screw Driver with torque **T-handle (05-009-78-0000)** through cannulation palm torque handle to engage the T-15 set screw drive feature. Hold the Torque T-handle stationary, then rotate the cannulated palm torque handle clockwise until it audibly clicks to secure the Cross Connecter Retaining Nut (Figure 23).



Fig. 17



Fig. 18



Fig. 19



Fig. 20





Fig. 22



Fig. 23



Transitional Rods and Rod Connectors are available to link to other ChoiceSpine Spinal Systems. The Gibralt System offers two different types of transitional rods, which can be linked to thoracic components.

ROD-TO-ROD TRANSITION CONNECTORS

The Gibralt offers three different sizes of Rod-to-Rod Connectors for use with other ChoiceSpine Spinal Systems. See page 11 with images of Connector options.

- 1) Axial Rod-to-Rod Connectors are available to connect 3.5mm to 5.5.mm and 3.5mm to 6mm rod sizes.
- 2) Wedding Band Connectors are available to connect 3.5mm to 5.5.mm and 3.5mm to 6mm rod sizes.
- Inline Rod-to-Rod Connectors are available for 3.5mm to 3.5mm rods.

To utilize a Rod-to-Rod connector, select the appropriate type and size and insert the end of the 3.5mm rod into the 3.5mm opening of the connector. Use the **Set Screw Starter (05-009-20-0000)** to engage the appropriate set screw by turning clockwise in the locking hole to secure the rod provisionally.

Note: The open side of the wedding band connector utilizes the Rod to Rod Connector Set Screw.

All other Rod to Rod Connectors utilize the Standard Set Screw. Next, insert the other rod (either 3.5mm, 5.5.mm or 6.0mm depending on the component used) into the remaining opening on the connector. Use the **Set Screw Starter (05-009-20-0000)** to engage the appropriate Set Screw by turning clockwise in the locking hole to secure the rod provisionally (Figure 24). Use the **Set Screw Driver (05-009-19-0000)** connected to the **Torque Handle (05-009-78-0000)** to tighten all Set Screws until the Torque Handle audibly clicks.





IMPLANT LISTING

PART NUMBER	DESCRIPTION
05-000-20-3510	Screw, Polyaxial, 3.5X10
05-000-20-3512	Screw Polyaxial 3 5X12
05-000-20-3514	Screw Polyaxial 3 5X14
05-000-20-3516	Screw Polyaxial 3 5X16
05-000-20-3518	Screw, Polyavial, 3.5X18
05-000-20-3520	Screw, Polyaxial, 3.5X10
05 000 20 3522	Scrow Polyavial 3 5X20
05-000-20-3522	Screw, Polyavial, 3.5X22
05-000-20-3524	Screw, Polyaxial, 3.3724
05-000-20-3520	Screw, Polyaxial, 3.5720
05-000-20-3528	Sciew, Polyaxial, 3.3726
05-000-20-4010	Screw, Polyaxial, 4.0X10
05-000-20-4012	Screw, Polyaxial, 4.0X12
05-000-20-4014	Screw, Polyaxial, 4.0X14
05-000-20-4016	Screw, Polyaxial, 4.0X16
05-000-20-4018	Screw, Polyaxial, 4.0X18
05-000-20-4020	Screw, Polyaxial, 4.0X20
05-000-20-4022	Screw, Polyaxial, 4.0X22
05-000-20-4024	Screw, Polyaxial, 4.0X24
05-000-20-4026	Screw, Polyaxial, 4.0X26
05-000-20-4028	Screw, Polyaxial, 4.0X28
05-006-01-3501	Hook Straight (Image Shown)
05-006-01-3502	Hook Left Angle
05-006-01-3503	Hook Right Angle
05-006-01-3504	Hook Offset Right
05-006-01-3505	Hook Offset Left
05-000-24-0275	Set Screw
00 000 2 1 02/0	
05-004-00-2230	X-Connector, Rod to Rod, 22-30
05-004-00-2636	X-Connector, Rod to Rod, 26-36
05-004-00-3242	X-Connector, Rod to Rod, 32-42
05-004-00-3848	X-Connector, Rod to Rod, 38-48
05-004-00-4452	X-Connector, Rod to Rod, 44-52
05-004-10-2230	X-Connector, Head to Head, 22-30
05-004-10-2636	X-Connector, Head to Head, 26-36
05-004-10-3242	X-Connector, Head to Head, 32-42
05-004-10-3848	X-Connector, Head to Head, 38-48
05-004-10-4452	X-Connector, Head to Head, 44-52
05-000-25-0001	Connector, Nut
05-000-24-0925	Connector, Set Screw
05-002-03-3530	Rod, Prebent, Ti, 3.5X30
05-002-03-3540	Rod, Prebent, Ti, 3.5X40
05-002-03-3550	Rod, Prebent, Ti, 3.5X50
05-002-03-3560	Rod, Prebent, Ti, 3.5X60
05-002-03-3570	Rod. Prebent. Ti, 3 5X70
05-002-03-3580	Rod. Prebent, Ti, 3 5X80
05-002-03-3590	Rod, Prebent, Ti, 3.5X90
05-004-08-3512	Offset Connector 3 5mm v 12mm
05-004-08-3515	Offset Connector 3 5mm x 15mm















PART NUMBER DESCRIPTION

05-004-07-3555	Connector, WEDDING Band, 3.5-5.5
05-004-07-3560	Connector, WEDDING Band, 3.5-6.0
05-004-06-3555	Connector, COMBINATION, 3.5-5.5
05-004-06-3560	Connector, COMBINATION, 3.5-6.0
05-004-05-3535	Connector, Inline, 3.5-3.5
05-000-24-0002	Set Screw, Rod to Rod
05-002-00-3512	Rod, Straight, Ti, 3.5X120
05-002-00-3524	Rod, Straight, Ti, 3.5X240
05-002-01-0001	Rod, Transition, Ti, 3.5mm-5.5mm,420mm



INSTRUMENT LISTING

PART NUMBER	DESCRIPTION	
05-009-02-0000	Straight Awl 3.5	
05-009-03-0000	Probe 1.75	
05-009-04-0000	Straight, Sounder	
05-009-05-0000 05-009-07-0000	Тар, 3.5 Тар, 4.0	
05-009-10-0000	Depth Gauge	
05-009-10-2010 05-009-10-2012 05-009-10-2014	Drill, 2.0X10 Drill, 2.0X12 Drill, 2.0X14	
05-009-15-0000	Drill Guide	
05-009-19-0000	Set Screw, Driver, Retaining Shaft	
05-009-20-0000	Set Screw, Starter	
05-009-26-0000	Rod Holder, Forceps	
05-009-40-0000	Hook Holder	
05-009-53-0000	X-Connector Nut Starter	
05-009-56-1000	Polyaxial Screwdriver, T10	
05-009-59-0000	Poly, Head Adjuster	
05-009-78-0000	lorq, I Handle 1/4 SQ Drive, 22 IN	
05-009-85-0000	Screwdriver, Fixed Handle	
05-009-87-0000	Rod Rocker	
05-009-88-0000	Inline Countertorque	
05-009-93-0000	Adjustable Stop	
05-009-94-0020	Drill, Adjustable, 2.0	the second se
05-009-95-0000	Torque Palm, Driver	
05-009-99-0000	Ratcheting AO STR Handle Straight	

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PART NUMBER DESCRIPTION 05-009-22-0000 Rod Bender, 3.5 05-009-23-0001 IN SITU, Rod Bender, Left

- 05-009-23-0002 IN SITU, Rod Bender, Right
- 05-009-28-0000 Compressor
- 05-009-29-0000
- 05-009-31-0000
- 05-009-33-0000
 - Rod Persuader

Distractor

Rod Cutter, 3.5

- 05-009-35-0000 Rod Template
- 05-009-41-0000 Spine PC Bender, X-CONN
- 05-009-65-0000 Inline Rod Persuader
- 05-009-66-0000 Rod Persuader Knob
- 05-009-91-0000 Under Rod Reducer



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For Instructions for Use, please visit https://choicespine-eifu.com/



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