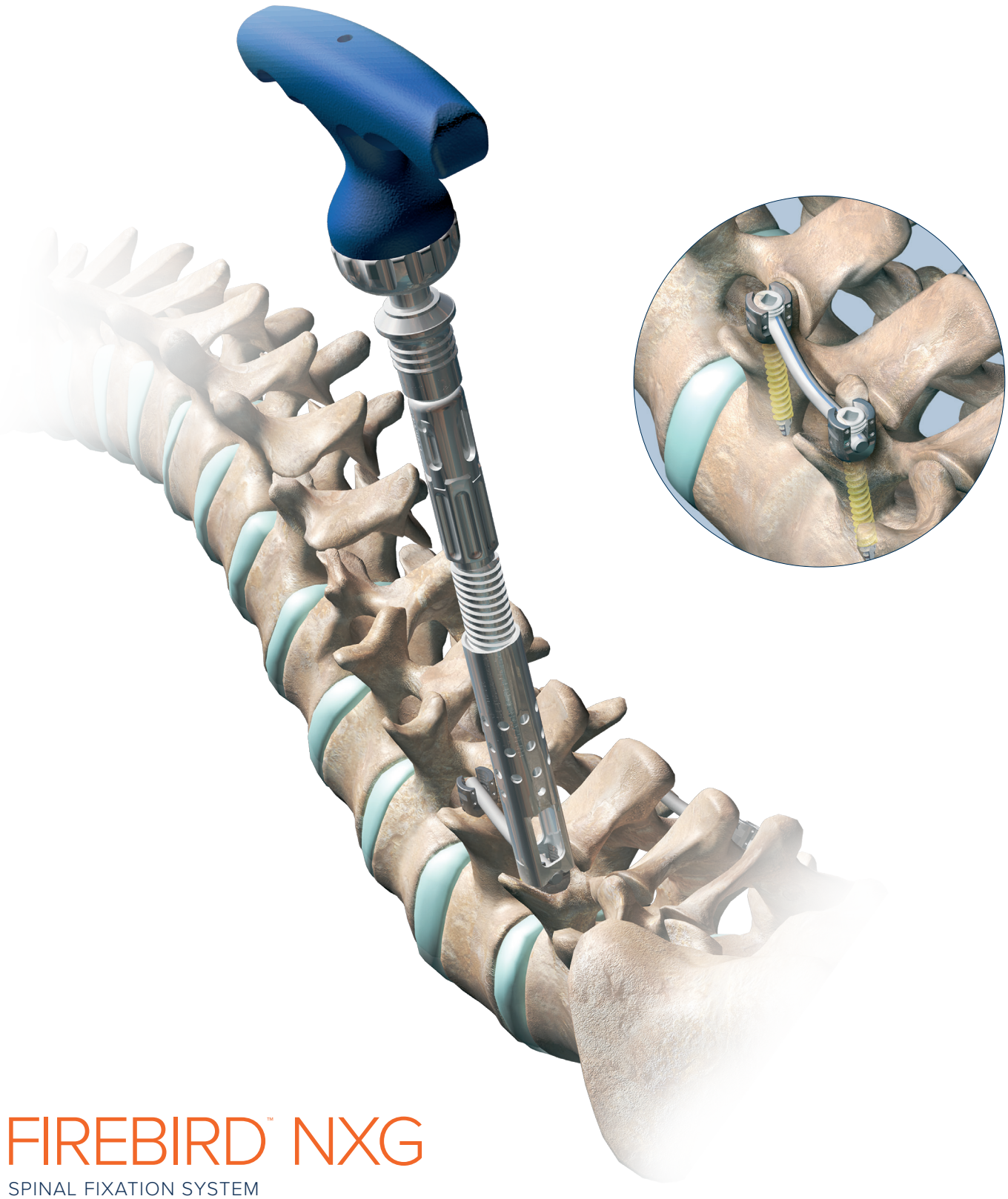
ORTHOFIX | SeaSpine



FIREBIRD™ NXG

SPINAL FIXATION SYSTEM
OPERATIVE TECHNIQUE

CONTENTS

FIREBIRD™

The surgical technique shown is for illustrative purposes only. The technique(s) actually employed in each case will always depend upon the medical judgment of the surgeon exercised before and during surgery as to the best mode of treatment for each patient. Please see the Instructions For Use for the complete list of indications, warnings, precautions, and other important medical information.

INTRODUCTION

Firebird™ NXG is the fourth-generation Firebird Spinal Fixation System for comprehensive posterior thoracolumbar surgical cases including degenerative disc disease.

The Firebird Spinal Fixation System and Phoenix™ MIS Spinal Fixation System are temporary, multiple component systems comprised of a variety of non-sterile and sterile, single use components, made of titanium alloy or cobalt chrome alloy, that allow the surgeon to build a spinal implant construct. The systems are attached to the vertebral body and ilium through screw or hook fixation to the non-cervical spine.

The systems consist of an assortment of rods, multi-axial and mono-axial pedicle screws, set screws, lateral offsets, bone screws, screw bodies, hooks, iliac connectors, and sterile packed HA-coated bone screws. A subset of the Firebird Spinal Fixation System and Phoenix MIS Spinal Fixation System components may be used in pediatric patients. These components consist of a variety of screws ranging in diameters from 4.0 to 7.5mm and lengths ranging from 25 to 60mm. The systems' implants are not compatible with components or metal from any other manufacturer's system.

STEP 1. PEDICLE SCREW STARTING POINTS

Modular screws are available for both the straightforward and anatomic approaches. The straightforward approach is indicated by the red lines. The anatomic approach is indicated by the blue lines (FIG. 01A & 01B).

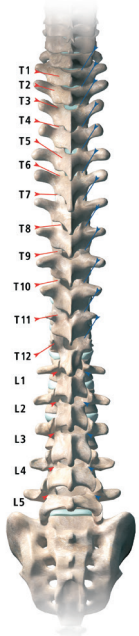


FIG. 01A

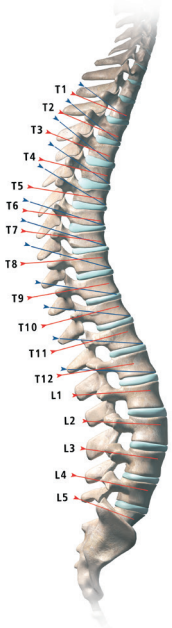


FIG. 01B

LEVEL	CEPHALAD-CAUDAD STARTING POINT	MEDIAL-LATERAL STARTING POINT
T1	Midpoint TP	Junction: TP-Lamina
T2	Midpoint TP	Junction: TP-Lamina
T3	Midpoint TP	Junction: TP-Lamina
T4	Junction: Proximal Third-Midpoint TP	Junction: TP-Lamina
T5	Proximal Third TP	Junction: TP-Lamina
T6	Junction: Proximal Edge-Proximal Third TP	Junction: TP-Lamina-Facet
T7	Proximal TP	Midpoint Facet
T8	Proximal TP	Midpoint Facet
T9	Proximal TP	Midpoint Facet
T10	Junction: Proximal Edge-Proximal Third TP	Junction: TP-Lamina-Facet
T11	Proximal Third TP	Just medial to lateral pars
T12	Midpoint TP	At the level of lateral pars
L1	Midpoint TP	Junction: lateral pars and superior facet
L2	Midpoint TP	Junction: lateral pars and superior facet
L3	Midpoint TP	Junction: lateral pars and superior facet
L4	Midpoint TP	Junction: lateral pars and superior facet
L5	Midpoint TP	Junction: lateral pars and superior facet
S1	Midpoint Sacral Ala	Junction: sacral ala and superior facet

STEP 2. PEDICLE PREPARATION

Identification of the Pedicles

Proper entry point to the pedicle is located at the convergent point of three anatomic structures: the middle of the transverse process, the superior facet, and the pars interarticularis converge over the dorsal portion of the pedicle (FIG. 02A). This starting point can also be identified at the lateral border of the superior articular facet where it intersects with a line drawn through the middle of the transverse process (FIG. 02B). A burr or rongeur may be used to clear away the hard cortical bone at the junction of the facet and transverse process, thereby exposing the cancellous portion of the pedicle (FIG. 02C).

The starting point in the sacral pedicles is different from the lumbar pedicles due to the lack of transverse processes and the presence of the sacral ala. The size and configuration of the S1 pedicle allow the surgeon more flexibility in positioning the screw within the sacrum. The S1 pedicle is caudal and slightly lateral to the superior articular process; therefore, the entry point should be in the most caudal portion of the pedicle.

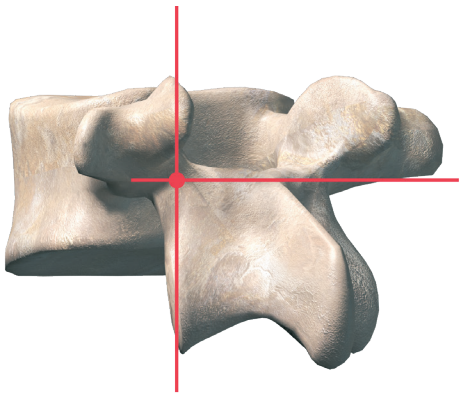


FIG. 02A

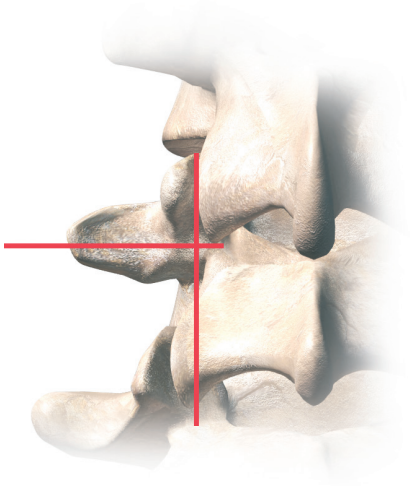


FIG. 02B

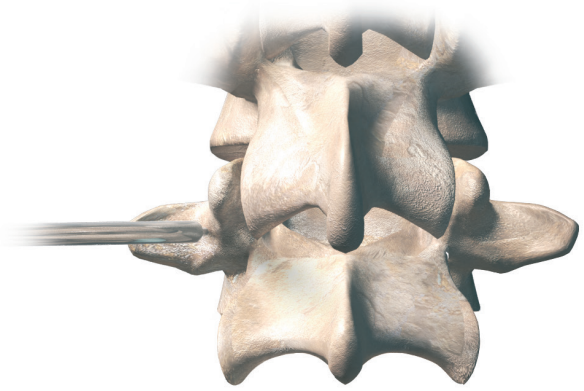


FIG. 02C

STEP 2. PEDICLE PREPARATION CONTINUED

Preparation of the Pedicle Canal

NOTE
The sagittal plane inclination of the probe should be parallel to the adjacent vertebral endplate (FIG. 02D).

At the most cephalad vertebrae included in the construct, the starting point should be at the caudal portion of the pedicle and the probe should be angled in a cephalad direction (FIG. 02E). This maneuver will place the pedicle screw entry hole below and away from the unfused superior facet joint (FIG. 02F).

The S1 sacral entry point should be placed at the caudal portion of the S1 pedicle. The probe is then angled 25° to 30° medially and cephalad thus directing the probe tip toward the sacral endplate. The caudal entry point and the cephalad angulation of the probe will ensure that the S1 screw will not interfere with the placement of the adjacent L5 screw (FIG. 02G).

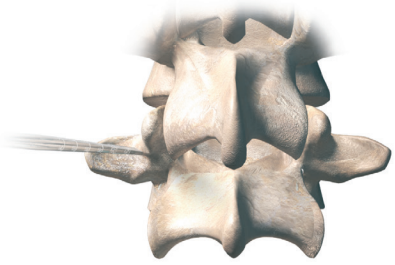


FIG. 02D

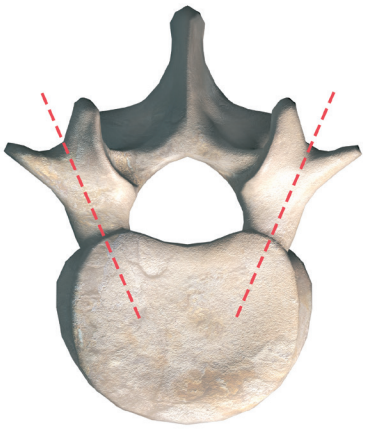


FIG. 02E

NOTE
Most surgeons will place S1 screws bicortical (i.e. just through the anterior cortex of S1).

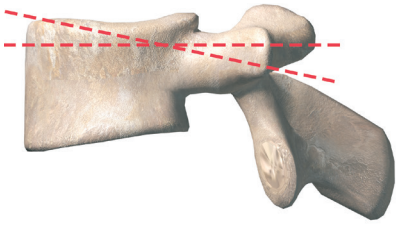


FIG. 02F

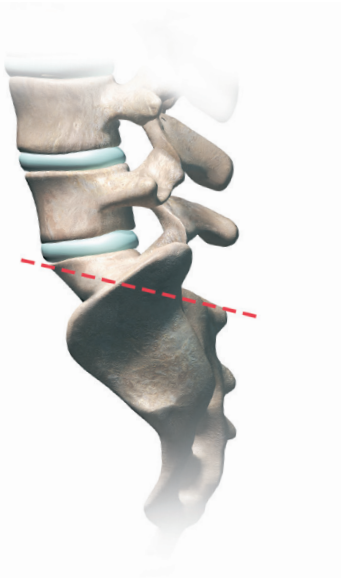


FIG. 02G

STEP 3. BONE AWL

Bone Awl (36-1001)

Penetrate the cortex of the bone with the bone awl to create a pilot hole at the pedicle entry point (FIG. 03).

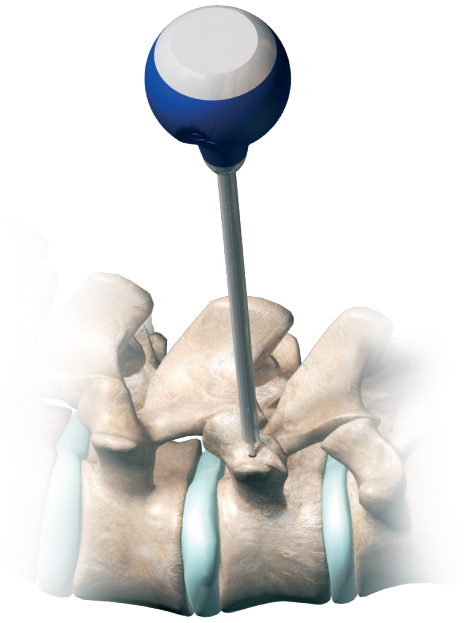


FIG. 03

STEP 4. BONE PROBE

Straight Lumbar Probe (36-1002)
Curved Lumbar Probe (36-1003)

Use the bone probe to generate the desired depth in the pedicle canal, staying within the pedicle walls (FIG. 04).

Thoracic and Duckbill probes in curved and straight configurations are available by request.

FIG. 04

STEP 5. SOUNDER

Straight Sounder (55-1004)
Curved Sounder (55-1005)

Use the sounder to confirm the existence of bone along the walls of the screw trajectory. Internally palpate to ensure the walls are not perforated (FIG. 05).

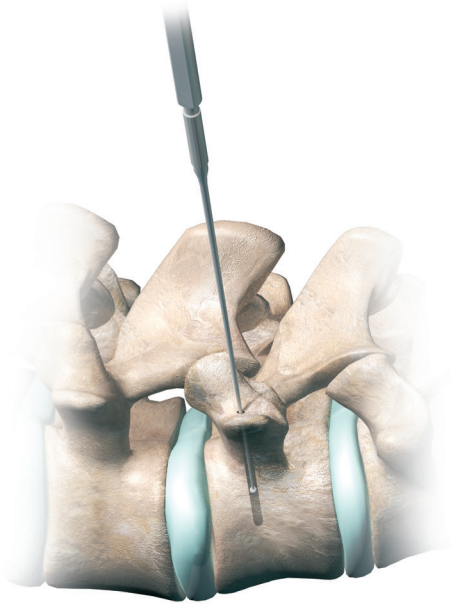


FIG. 05

STEP 6. BONE TAP

Tap (36-1024 – 36-1027)

Tap to the appropriate depth (FIG. 06A) based on the length of the pedicle screw to be implanted for optimized screw purchase, using the millimeter markings on the tap as a guide. The tap sleeve color matches the color of the corresponding modular screw diameter. See table below (FIG. 06B).

NOTE
To attach the Straight Ratcheting Handle (36-1010) or Ratcheting T-handle (36-1011) to the modular taps, retract the shaft connector sleeve and insert the square-drive shaft end of tap into the handle connector (rotate the instrument shaft if necessary to ensure full seating inside the shaft connector), and release shaft connector sleeve. Pull instrument shaft to confirm secure connection. To disengage the tap from the handle, retract the shaft connector sleeve and slide the instrument shaft from the shaft connector.

NOTE
Ensure that the tap is fully inserted and seated inside the Straight or Ratcheting T-handle, prior to the application of torque. Inadequate seating may create a binding condition with the handle, after torque is applied. Proper connection of the shaft with the handle can be confirmed by gently tugging on the shaft.

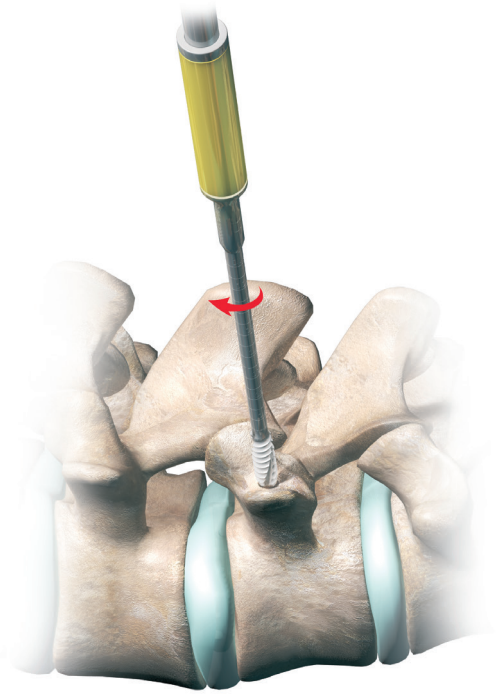


FIG. 06A

PART NO.	DESCRIPTION	COLOR
51-1423	3.5mm Bone Tap	Copper
36-1024	4.5mm Tap	Silver
36-1025	5.5mm Tap	Green
36-1026	6.5mm Tap	Gold
36-1027	7.5mm Tap	Blue
36-1028	8.5mm Tap	Magenta
36-0145	4.5mm Tap, Cannulated	Silver
36-0155	5.5mm Tap, Cannulated	Green
36-0165	6.5mm Tap, Cannulated	Gold
36-0175	7.5mm Tap, Cannulated	Blue
36-0185	8.5mm Tap, Cannulated	Magenta

FIG. 06B

STEP 7. SCREW INSERTION

Multi-Axial Screw Driver (36-1831/36-1835)

After the modular screw has been attached to the Top Loading Body, insert the distal tip of driver into the body of the pedicle screw. Turn the knob clockwise to thread and secure the Multi-Axial screw to the Multi-Axial screw driver tip (FIG. 07A).

NOTE
Ensure the Multi-Axial Screw is fully threaded and rigidly fixed on the Multi-Axial Screw Driver tip and is in alignment with the driver shaft prior to screw insertion. Misalignment, improper engagement of screw to driver, or loosening of knob during screw insertion can result in undesired trajectory of bone screw.

NOTE
Do not hold knob stationary while applying torque to screw. Screw loosening from the screw driver tip will result during screw insertion.

NOTE
Do not apply levering force to driver during screw insertion as this may result in an unintended trajectory of screw or pedicle fractures (FIG. 07B).

To disengage the screw driver from the screw body, turn the knob counter clockwise until the screw releases from the tip.

For Reduction Body technique, use the Multi-Axial Reduction Screw Driver (61-1331). Collar must be set to “UNLOCK” position to attach a multi-axial screw, and set to “LOCK” position for screw insertion.

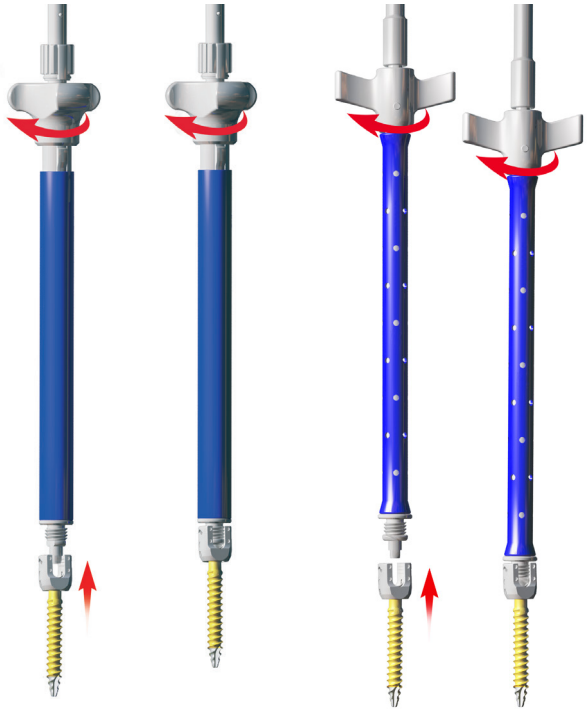


FIG. 07A

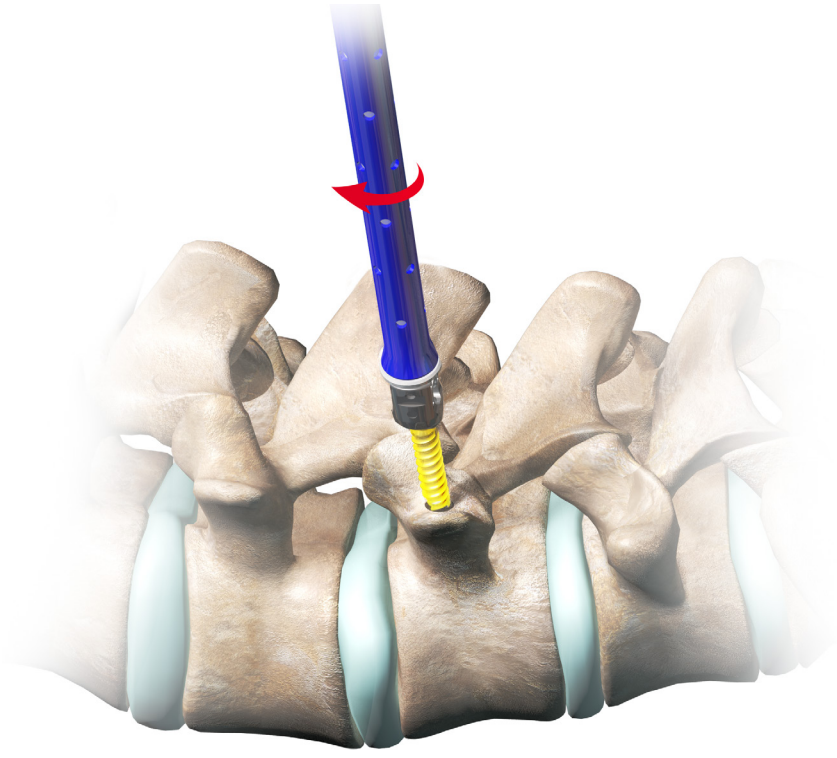


FIG. 07B

NOTE
If the Multi-Axial Screws are placed too deeply, full range of motion may be lost. To regain mobility, the Multi-Axial Adjustment Driver (52-1339) can be used to engage the bone screw and adjust height.

NOTE
To attach the Straight Ratcheting Handle (36-1010) or Ratcheting T-handle (36-1011) to the Multi-Axial Screw Driver, retract the shaft connector sleeve and insert the square-drive shaft end of the Multi-Axial Screw Driver into the handle connector (rotate the instrument shaft if necessary to ensure full seating inside the shaft connector), and release shaft connector sleeve. Pull instrument shaft to confirm secure connection. To disengage the screw driver from the handle, retract the shaft connector sleeve and slide the instrument shaft from the shaft connector.

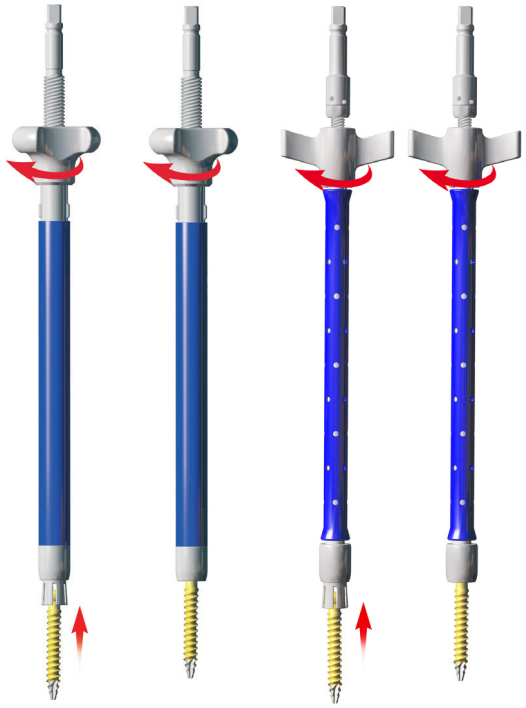


FIG. 07C

Modular Screw Driver (36-1832/36-1838)

Attach the appropriate modular screw onto the modular screw driver by fully seating the head of the modular screw into the collet at the distal tip. Turn the knob clockwise until fully tightened (FIG. 07C). To disengage the driver from the modular screw, turn the knob counterclockwise until the sleeve completely releases the collet.

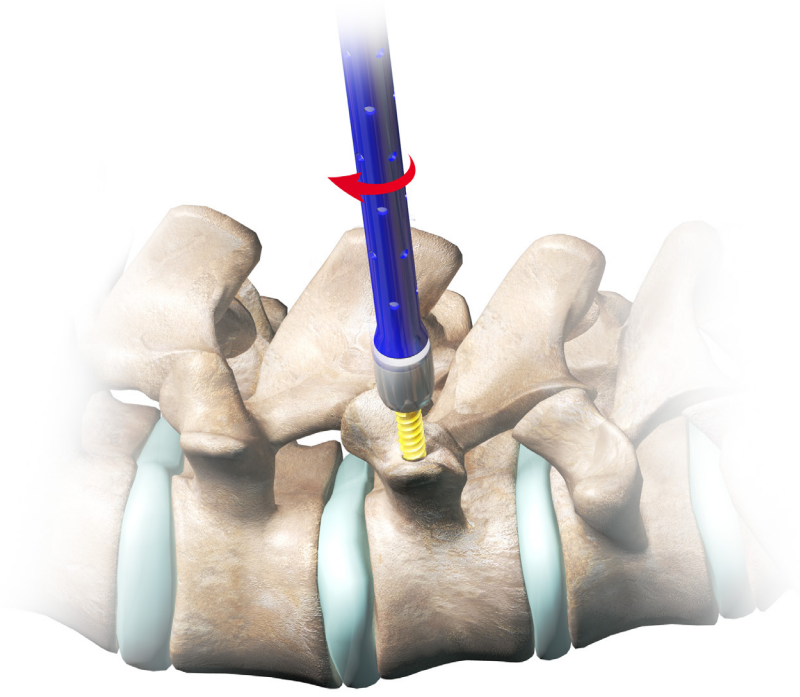


FIG. 07D

STEP 7. SCREW INSERTION CONTINUED

NOTE
To avoid difficulty during attachment of the modular screw, ensure the shaft is fully extended by turning the knob counterclockwise to fully expose the collet.

NOTE
Ensure the modular screw is rigidly fixed on the screw driver tip and is in alignment with the driver shaft prior to screw insertion. Misalignment, improper engagement of screw to driver, or loosening of knob during screw insertion may result in undesired trajectory of modular screw.

NOTE
Ensure the Multi-Axial Screw Driver and Modular Screw Driver are fully inserted and seated inside the Straight or Ratcheting T-handle, prior to the application of torque. Inadequate seating may result in the handle separating from, or binding on, the instrument shaft.

NOTE
Do not hold knob stationary while applying torque to screw. This will result in screw loosening in the collet.

NOTE
Do not apply levering force to driver during screw insertion as this can result in an unintended trajectory of screw or pedicle fractures. Do not apply levering force to the driver if the knob is not fully tightened, bending or breakage of the collet prongs may result (FIG. 07D).

NOTE
An axial removal of the driver from the modular screw is recommended. Attempting to remove the driver from the modular screw at an extreme angle may cause the driver to become lodged onto the bone screw.

NOTE
The Modular Screw Driver (36-1832) is not compatible with the Straight Ratcheting Handle (52-1010), Ratcheting T-Handle (52-1011), and Straight Ratcheting Handle, Small (52-1013).

NOTE
To attach the Straight Ratcheting Handle (36-1010) or Ratcheting T-handle (36-1011) to the Modular Screw Driver, retract the shaft connector sleeve and insert the square-drive shaft end of Modular Screw Driver into the handle connector (rotate the instrument shaft if necessary to ensure full seating inside the shaft connector), and release shaft connector sleeve. Pull instrument shaft to confirm secure connection. To disengage the Modular Screw Driver from the handle, retract the shaft connector sleeve and slide the instrument shaft from the shaft connector.

STEP 8. DECORTICATION

Decorticating Planer (36-1334)

After placement of modular screw, place the Decorticating Planer over the spherical head of the modular screw (FIG. 08). Rotate the planer clockwise and counterclockwise to decorticate bone and allow for proper seating of the top loading body providing full range of motion.

NOTE
To attach the Straight Ratcheting Handle (36-1010) or Ratcheting T-handle (36-1011) to the Decorticating Planer, retract the shaft connector sleeve and insert the square-drive shaft end of Decorticating Planer into the handle connector (rotate the instrument shaft if necessary to ensure full seating inside the shaft connector), and release shaft connector sleeve. Pull instrument shaft to confirm secure connection. To disengage the Decorticating Planer from the handle, retract the shaft connector sleeve and slide the instrument shaft from the shaft connector.

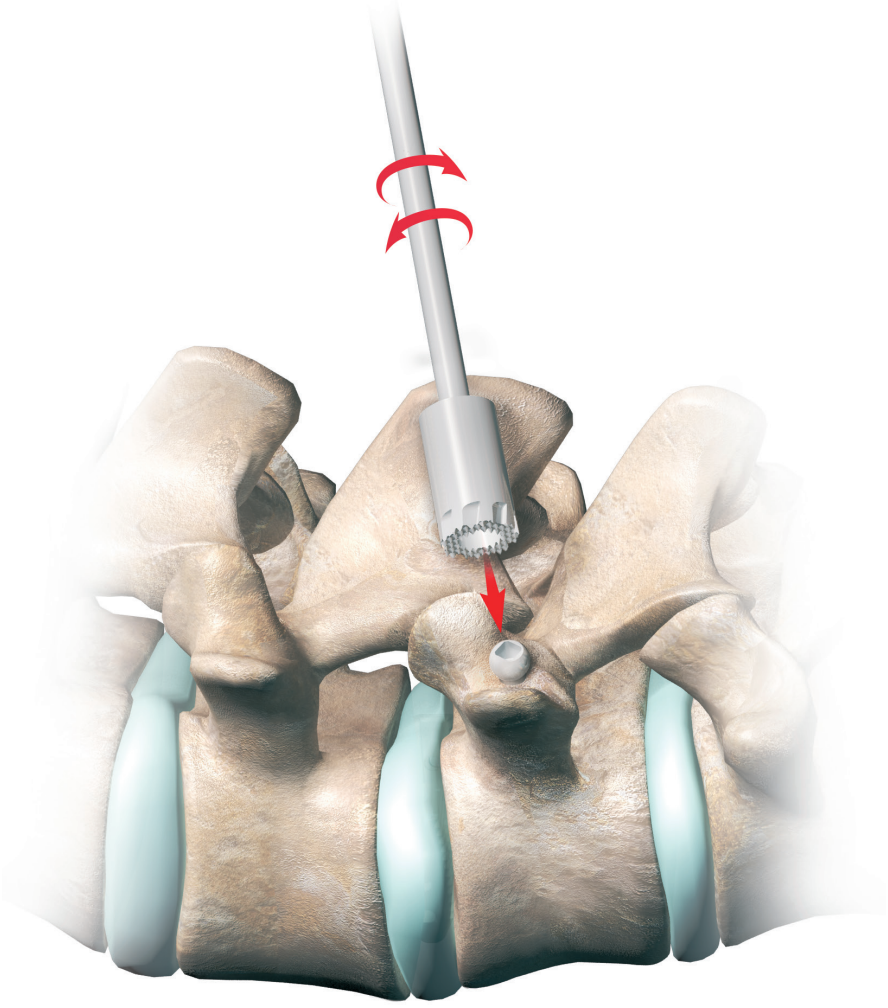


FIG. 08

STEP 9. SCREW BODY OPTIONS

Top Loading Body (36-2101)
Reduction Body (36-2103)
Closed Body (44-2102)

The Top Loading Body (FIG. 09A) is available standard in the set. The Reduction Body (FIG. 09C) and Closed Body (FIG. 09B) are available by request.

NOTE
Closed Body (44-2102) can only be tightened using the Torque Limiting Handle (52-1512) to a torque value of 100 in-lbs.

See page 31.

Reduction Body Technique section in this operative technique when using the Reduction Body (36-2103).

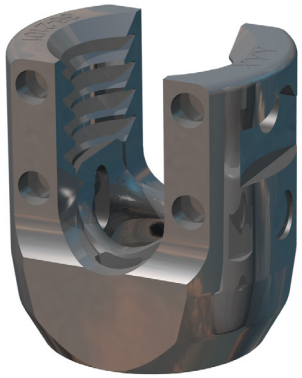


FIG. 09A

FIG. 09B

FIG. 09C

STEP 10. MODULAR BODY ATTACHMENT

Top Loading Body (36-2101)

After placement of the modular screw, attach the appropriate top loading body to the Multi-Axial Body Inserter (54-0007) (FIG. 10), by aligning the pin holes on body with inserter and clamp. Slide the body onto the modular screw by applying an axial force to connect the base of the body to the spherical head of the modular screw. The pressure cap will move freely in the body to allow for proper insertion.

Confirm a secure connection between the top loading body and modular screw by pulling up on the Multi-Axial Body Inserter prior to disengaging. When the top loading body remains attached to the modular screw, the assembly is secure.

NOTE
Improper assembly of the top loading body onto the bone screw can cause the top loading body to separate from the bone screw in subsequent steps such as rod reduction. Presence of soft tissue trapped between the bone screw and the top loading body could hinder achieving adequate attachment.

FIG. 10

STEP 11. SCREW ADJUSTMENT

Head Adjuster (36-1038)

Use the head adjuster to align the rod saddle of the top loading bodies of the multi-axial screw prior to rod insertion.

Multi-Axial Adjustment Driver (52-1339)

Use the multi-axial adjustment driver to adjust the sagittal height of the multi-axial screws prior to rod insertion (FIG. 11).

NOTE
This instrument can assist in restoring mobility of the top loading bodies if the modular screw has been driven too deep.

NOTE
The driver needs to be fully seated in the drive feature of the modular screw prior to the application of force to avoid stripping of the modular screw or the driver.

NOTE
To attach the Straight Ratcheting Handle (36-1010) or Ratcheting T-handle (36-1011) to the multi-axial adjustment driver, retract the shaft connector sleeve and insert the square-drive shaft end of multi-axial adjustment driver into the handle connector (rotate the instrument shaft if necessary to ensure full seating inside the shaft connector), and release shaft connector sleeve. Pull instrument shaft to confirm secure connection. To disengage the multi-axial adjustment driver from the handle, retract the shaft connector sleeve and slide the instrument shaft from the shaft connector.

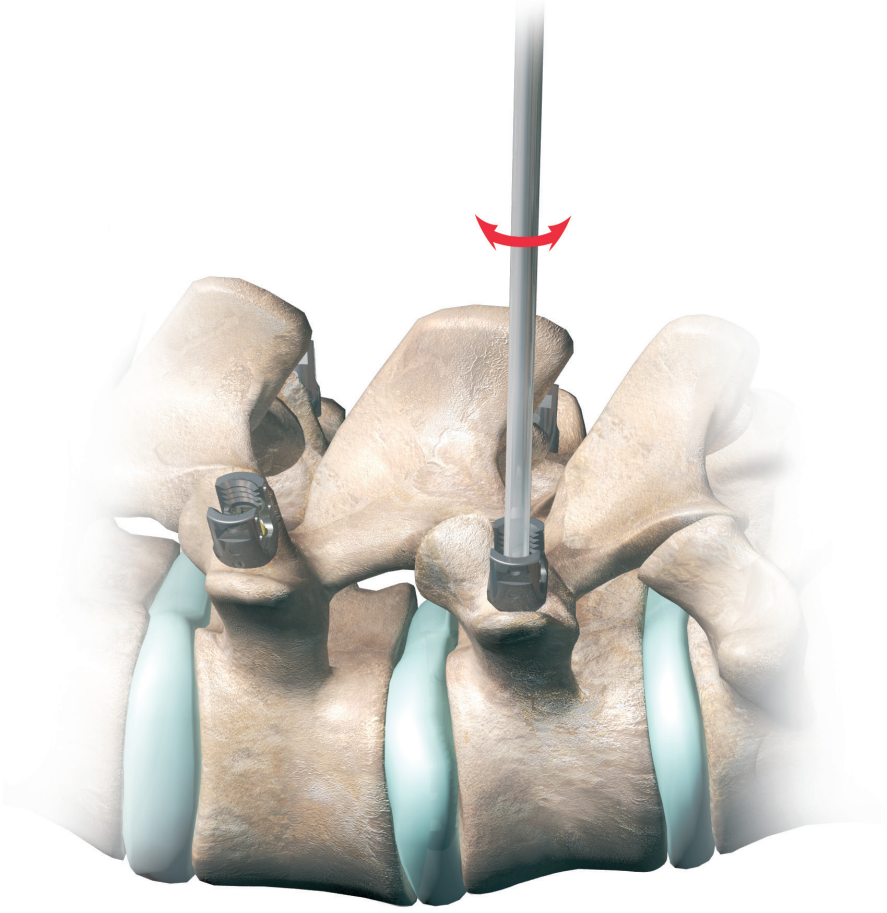


FIG. 11

STEP 12. ROD SELECTION

Straight and pre-lordosed rods are available in Titanium (standard) and Cobalt Chrome (by request) in a variety of lengths (FIG. 12).

NOTE
When there is need for a stiffer rod, Cobalt Chrome rods may be used as an alternative to Titanium rods.

FIG. 12

STEP 13. ROD CONTOURING

French Rod Bender (36-1046)

Utilize the rod bender, (FIG. 13) to create the desired contour using the line on the rod as a guide.

The French Rod Bender has settings for 4.5, 5.5, and 6.0mm diameter rods. Ensure the proper setting is used for rod diameter being implanted.

WARNING
The correct handling of the implant is extremely important. Implants should not be excessively or repeatedly bent, notched, or scratched. These operations can produce defects in surface finish and internal stress concentrations, which may become the focal point for eventual failure of the device.

FIG. 13

STEP 14. ROD INSERTION

Rod Inserter (36-1581)

Orient the multi-axial screws (as needed with the Head Adjuster 36-1038) so the rod saddle of the top loading screw bodies are in line to accept rod. Once positioning is achieved, use the rod inserter to place the rod in the screw bodies (FIG. 14).

NOTE
Avoid applying unnecessary lateral bending or rotational force to rod inserter.

NOTE
Ensure the rod seating area is clear of any bony/ tissue interferences before attempting to reduce the rod.

Rod Gripper (36-1980)

The rod gripper may also be used to insert the rod. The rod gripper may also be used to apply rotational force to adjust rod orientation prior to fixation.

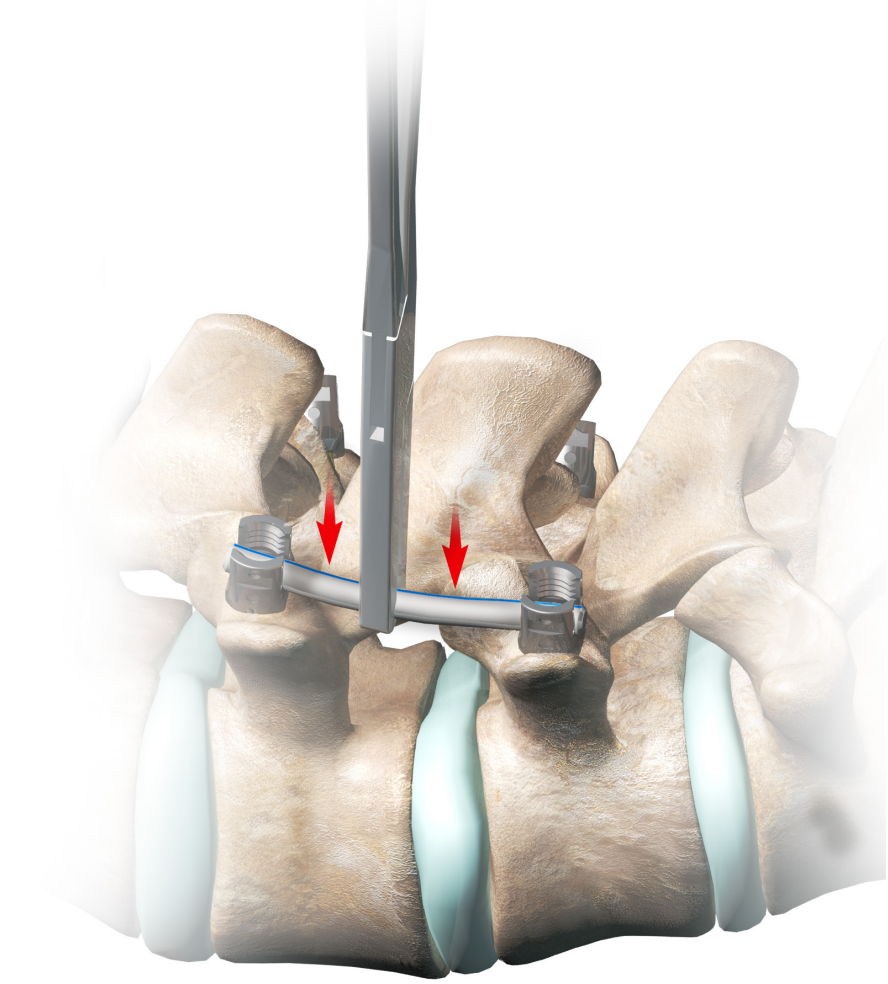


FIG. 14

STEP 15. ROD REDUCTION

Rod Rocker (52-1251)

Attach the rod rocker to the top loading body and lever rod until seated in the screw (FIG. 15A).

NOTE
Unnecessary lateral bending or excess rotational force may cause rocker to slip from the multi-axial screw during reduction or the inability to properly insert set screw.

NOTE
Applying too much reduction force to the multi-axial screws can result in screw pullout.

NOTE
When using the Reduction Body (36-2103), see Reduction Body Technique section in this operative technique.

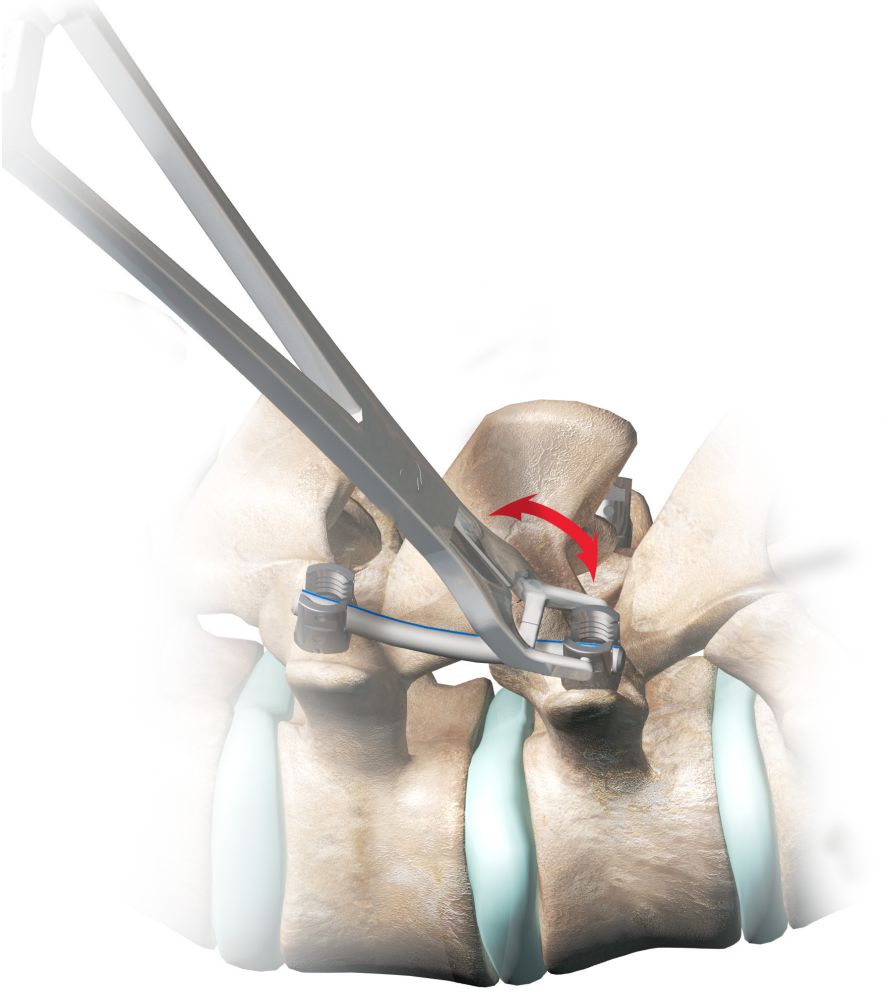


FIG. 15A

Rod Reduction with Tubular Rod Reducer (51-1989)

To set the distal tip into the stab-and-grab function, turn the drive knob on the proximal end counterclockwise until a soft detent position is reached. The knob will be positioned approximately 3mm from the reduction tube.

To fully extend and expand the distal tip of the Tubular Rod Reducer into its fully unlocked position, continue turning the drive knob on the proximal end counterclockwise until it contacts the reduction tube (FIG. 15B).

Capture the rod in the slot at the distal tip, fully engage the pins on the inside of the distal end of the inner tube with the two pin holes on the outside of the top loading body (FIG. 15C). With the stab-and-grab function, the tip will click into place when each pin engages the pin holes on the top loading body, capturing the top loading body (FIG. 15D).

NOTE
It may be difficult to engage the instrument onto the reduction features of the top loading body if the distal end of the instrument is not fully extended. Conversely, it may be difficult to remove the instrument from the top loading body if the knob has not been turned counterclockwise to release the distal end from the top loading body.

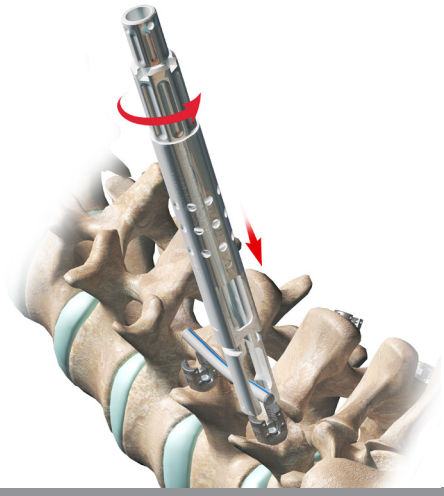


FIG. 15B

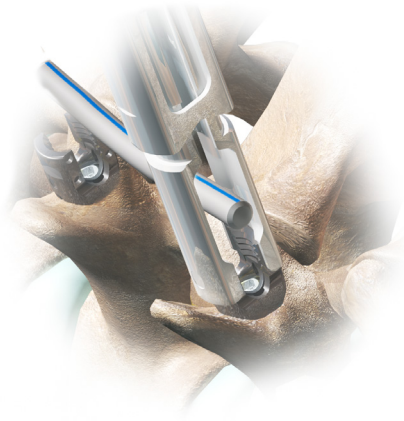


FIG. 15C

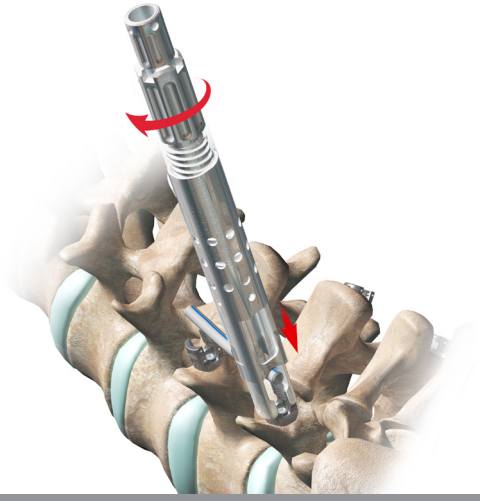


FIG. 15D

STEP 15. ROD REDUCTION CONTINUED

Rod reduction is achieved by gently holding the outer reduction sleeve and turning the drive knob clockwise. The instrument will provide up to 28mm of reduction (FIG. 15E).

If resistance is encountered, the optional Driver, Tubular Rod Reducer (51-1990) may be attached to either the Straight Ratcheting Handle or Ratcheting T-Handle. Slide the Driver over the retention sleeve at the very proximal end, being careful to match the ends of the Driver with the notches in the drive knob. Turn Driver clockwise to complete the reduction maneuver. Complete reduction has been achieved when the drive knob cannot be turned any further (FIG. 15F).

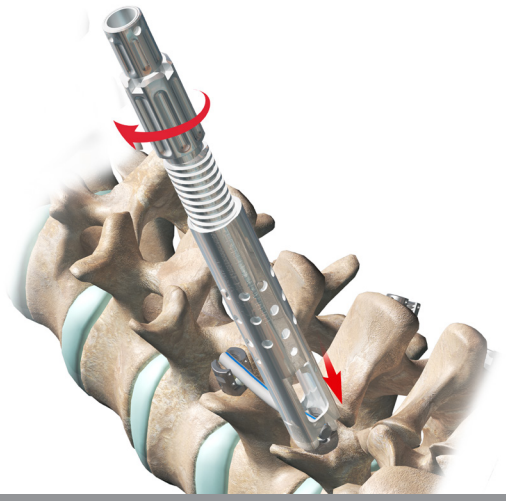


FIG. 15E

NOTE
To attach the Straight Ratcheting Handle (36-1010) or Ratcheting T-handle (36-1011) to the Driver, Tubular Rod Reducer, retract the shaft connector sleeve and insert the square-drive shaft end of Driver, Tubular Rod Reducer into the handle connector (rotate the instrument shaft if necessary to ensure full seating inside the shaft connector), and release shaft connector sleeve. Pull instrument shaft to confirm secure connection. To disengage the Driver, Tubular Rod Reducer from the handle, retract the shaft connector sleeve and slide the instrument shaft from the shaft connector.

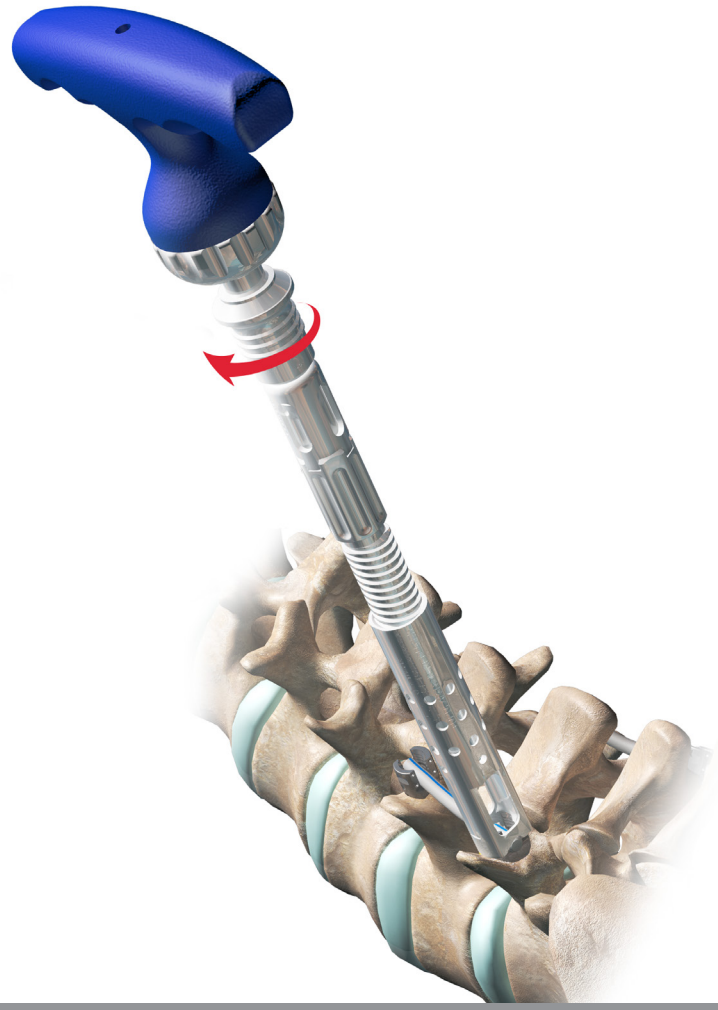


FIG. 15F

Remove the Driver and insert a Set Screw (36-2001) with provisional tightening using Reduction Set Screw Inserter (36-1260).

To remove the Tubular Rod Reducer (FIG. 15G) after complete reduction, simply turn the drive knob counter-clockwise past the stab-and-grab position and the Tubular Rod Reducer will lift off the top loading body.

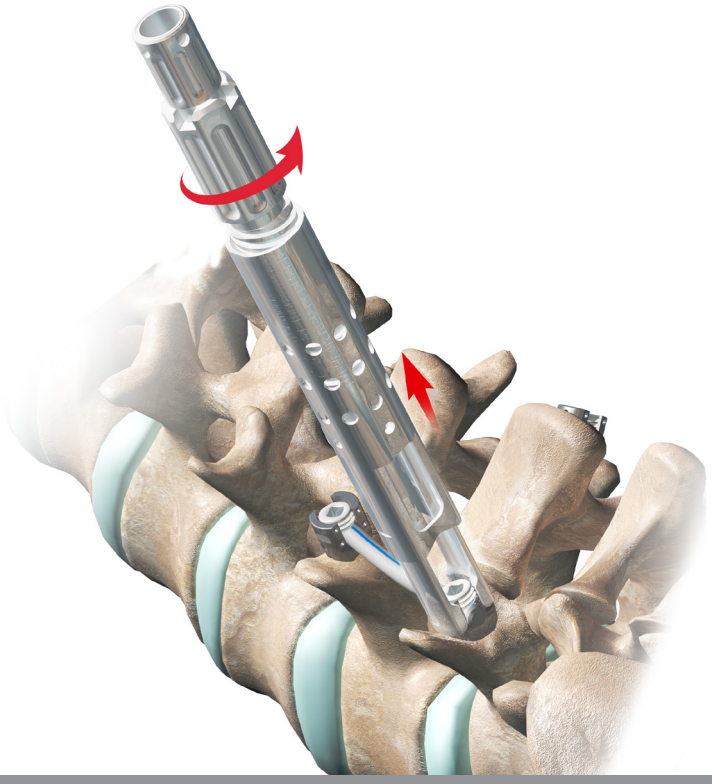


FIG. 15G

STEP 16. PRELIMINARY TIGHTENING

Set Screw Inserter (36-1160)
Reduction Set Screw Inserter (36-1260)

Turn the set screw inserter clockwise to thread set screw into the top loading body and provisionally seat the rod (FIG. 16).

NOTE
The top loading body and the set screw can cross thread if the axis of both implants are not aligned prior to insertion. Prior to advancing the set screw, seat the set screw onto the top loading body and rotate the set screw counterclockwise while applying a light downward pressure until a click is felt, indicating thread alignment of the set screw and top loading body.

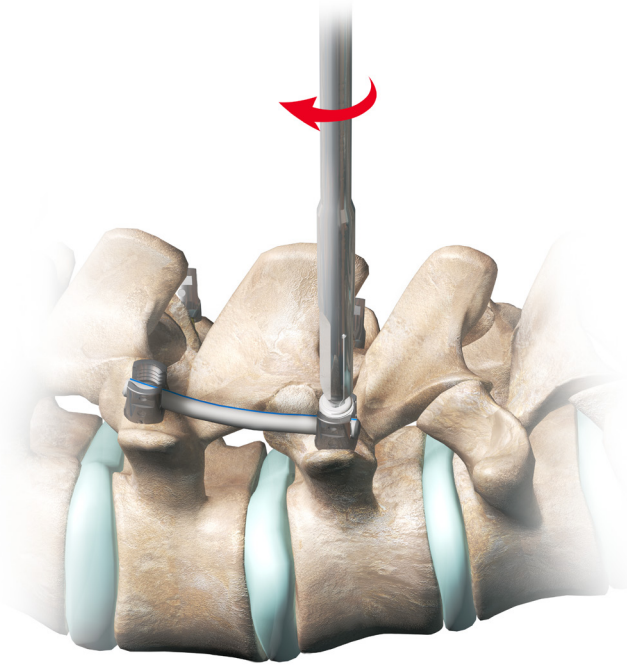


FIG. 16

STEP 17. ROD MANIPULATION

Option A:

***In situ* Rod Benders (36-1070 Right, 36-1071 Left)**

Position the *in situ* rod benders on rod. Gently manipulate rod benders to create a bend in the rod in the sagittal plane and adjust rod lordosis. (FIG. 17A)

The *in situ* benders can accommodate 5.5mm and 6.0mm diameter rods depending on which end is utilized. Ensure the correct end of the *in situ* bender is selected to match the corresponding rod diameter.

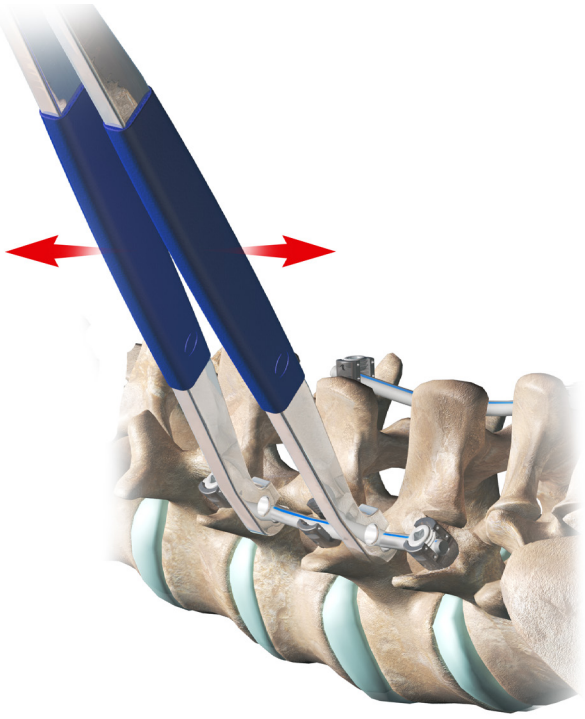


FIG. 17A

Option B:

Rod Gripper (36-1980)

Attach rod gripper to rod and apply rotational force to adjust rod orientation prior to final tightening (FIG. 17B).

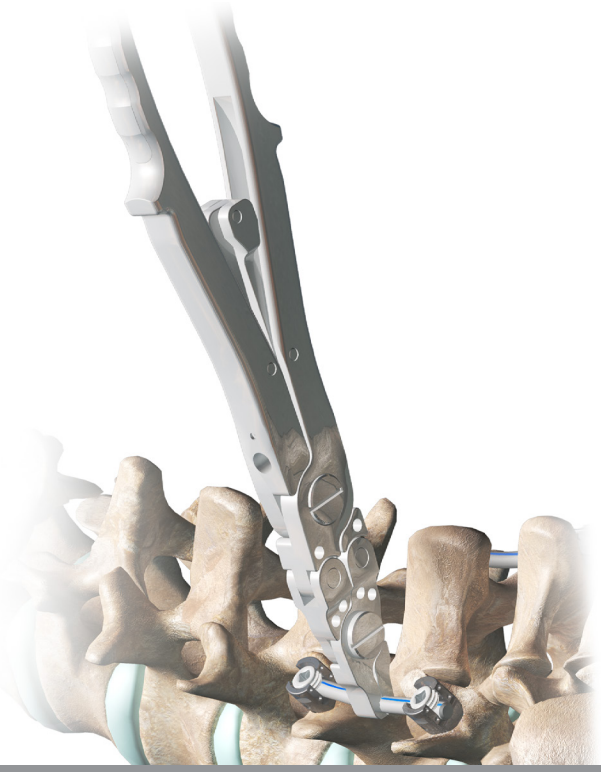


FIG. 17B

STEP 18. COMPRESSION/DISTRATION

Compressor (36-1591)
Distractor (55-1070)

For compression, after all set screws have been provisionally tightened, loosen the set screw of the multi-axial screw to be adjusted using the set screw inserter. Compress across the appropriate multi-axial screw bodies while ensuring the tips remain on rod (FIG. 18).

Tighten the set screw when the desired compression has been achieved.

For distraction, follow the same process as in compression but use the distractor to achieve desired distraction. Similarly, tighten the set screw when desired distraction has been achieved.

NOTE
Applying too much compression or distraction force to screws may result in pedicle fracture.

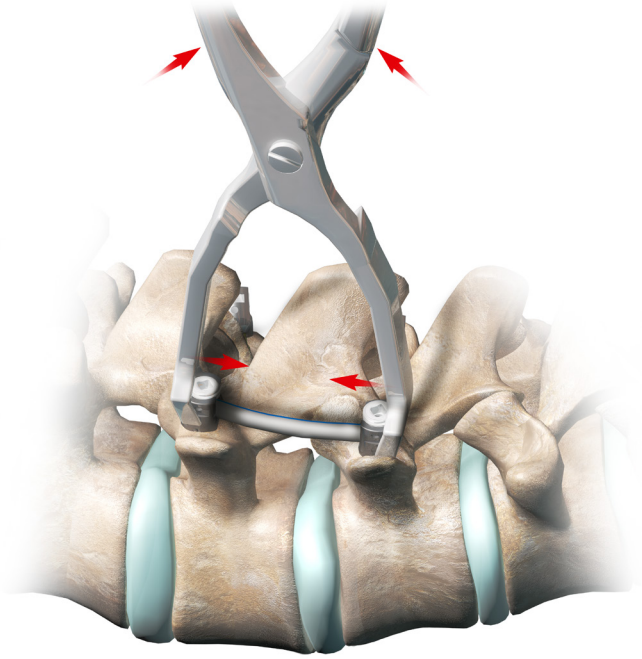


FIG. 18

STEP 19. FINAL TIGHTENING

Counter Torque Wrench (36-1765), Set Screw Driver (36-1161), Torque Limiting Handle (36-1512 or 36-1612)

Position the counter torque wrench over the multi-axial screw and rod making sure to engage the notched counter torque wrench tips with the rod. Place the set screw driver through the cannulation of the counter torque wrench and into the square drive of the set screw. Turn the torque limiting handle clockwise to tighten the set screw to 80 in-lbs. The torque limiting handle will reach its maximum torque and release at 80 in-lbs as indicated by tactile feedback and an audible click (FIG. 19).

NOTE
If the notches of the Counter Torque Wrench are not correctly seated on the rods during tightening, a pedicle fracture could result.

NOTE
To attach the Torque Limiting Handle (36-1512 or 36-1612) to the Set Screw Driver, retract the shaft connector sleeve and insert the square-drive shaft end of the Set Screw Driver into the handle connector (rotate the instrument shaft if necessary to ensure full seating inside the shaft connector), and release shaft connector sleeve. Pull instrument shaft to confirm secure connection. To disengage the Set Screw Driver from the handle, retract the shaft connector sleeve and slide the instrument shaft from the connector.

NOTE
The Top Loading Body (36-2101) and the Reduction Body (36-2103) can only be final tightened using the Torque Limiting Handle (36-1512 or 36-1612) to a torque value of 80 in-lb. (9.04 Nm).

NOTE
Closed Body (44-2102) can only be tightened using the Torque Limiting Handle (52-1512) to a torque value of 100 in-lb. (11.3 Nm).

NOTE
The torque handles should not be impacted. Avoid applying excessive lateral loads during final tightening. The torque handles should not be used as a prying tool.

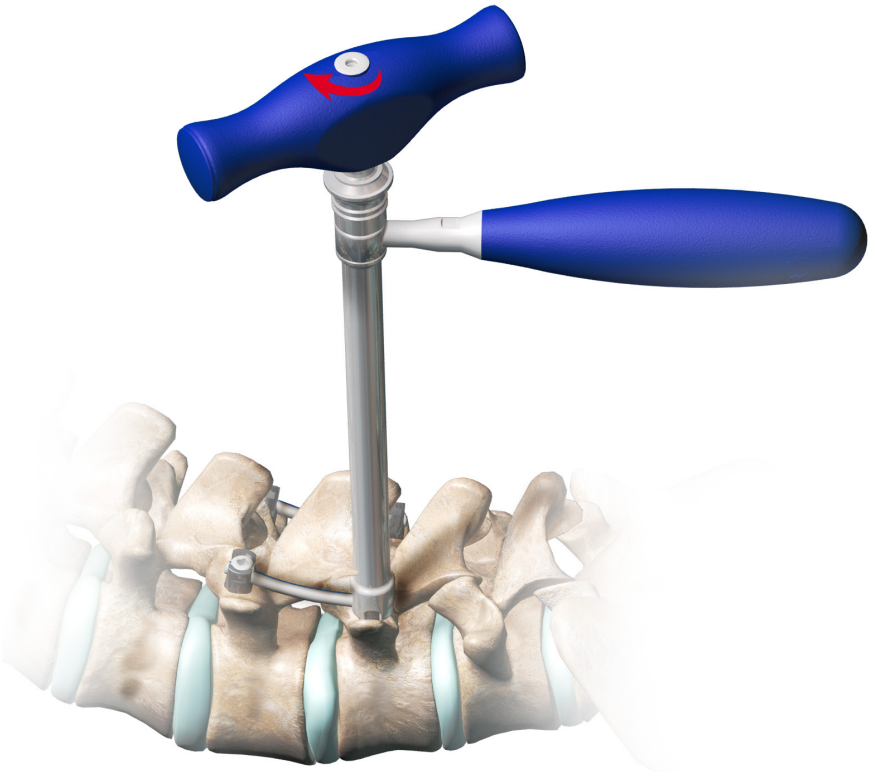


FIG. 19

STEP 20. CROSS CONNECTOR

Cross Connectors provide additional torsional rigidity to the construct by bridging the parallel rods. Position the Cross Connector Caliper (52-1101) directly over the rods and measure the distance across the rods (FIG. 20A).

Select the appropriate Cross Connector (55-53XX) and position on the rods (FIG. 20B). Ensure rods are fully seated in the notches on the bodies of the Cross Connector. Lock the Cross Connector into position by fully seating the Cross Connector Torque Limiting Driver (55-1089 or 55-1189) into the set screw and rotating clockwise.

Tactile feedback will indicate when the final torque is achieved.

NOTE
The driver could slip and/or damage the set screw if the user fails to fully seat the driver into the drive feature of the implant.

NOTE
The torque handles should not be impacted. Avoid applying excessive lateral loads during final tightening. The torque handles should not be used as a prying tool.

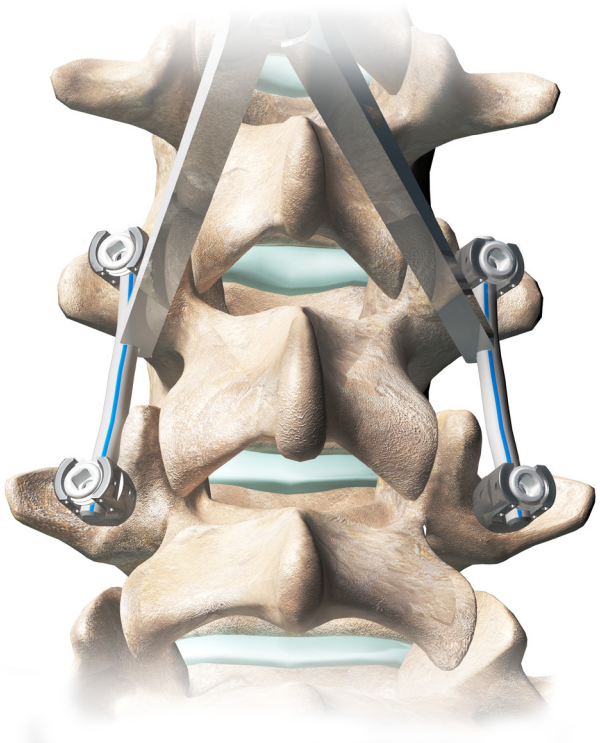


FIG. 20A

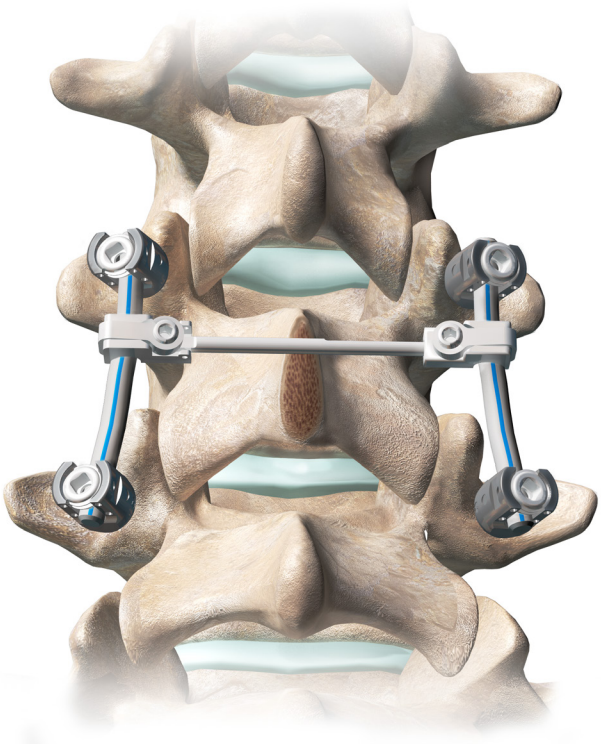


FIG. 20B

STEP 21. IMPLANT REMOVAL

Set Screw Driver (36-1161)
Counter Torque Wrench (36-1765)
Torque Limiting Handle (36-1512 or 36-1612)
Multi-Axial Adjustment Driver (52-1339)

In order to remove the multi-axial screws, fully seat the set screw driver securely into the set screw and turn counterclockwise to loosen the set screw. Use of the counter torque wrench is recommended to avoid damage to the pedicle (FIG. 21). Carefully remove all set screws. The multi-axial adjustment driver can be utilized to remove the screw assemblies by inserting through the body and fully engaging the modular screw.

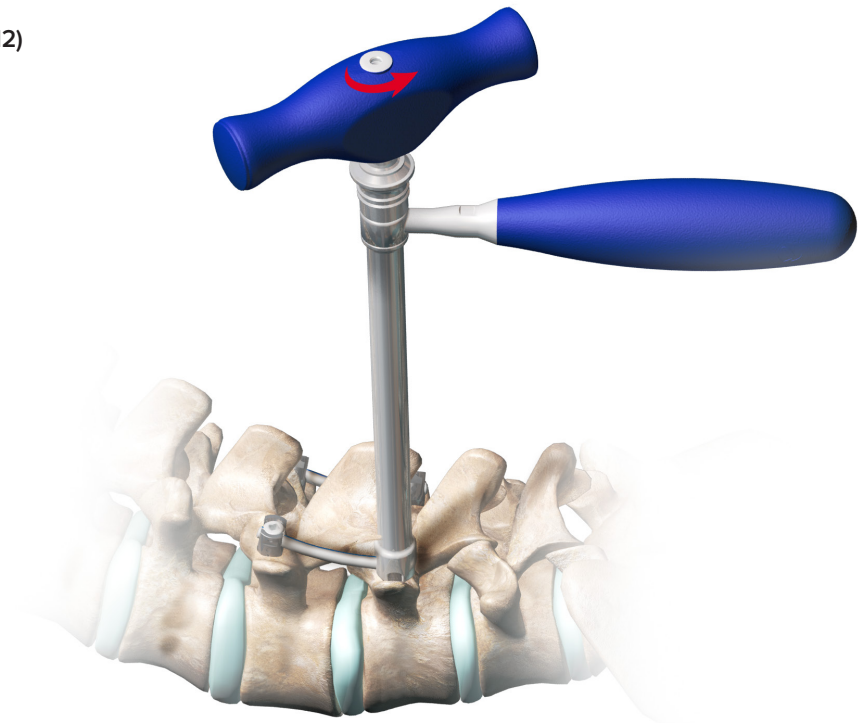


FIG. 21

REDUCTION BODY TECHNIQUE

STEP 22. MODULAR BODY ATTACHMENT

Place modular screw as described in steps 2–9 of this operative technique. Attach the Reduction Body (36-2103) to the modular screw using the Multi-Axial Body Inserter (54-0007) in the same manner as described in step 10 of this operative technique.

Confirm a secure connection between the reduction body and modular screw by pulling up on the Multi-Axial Body Inserter prior to disengaging. When the top loading body remains attached to the modular screw, the assembly is secure.

NOTE
Levering the Reduction Body tab while using the Multi-Axial Body Inserter (54-0007) during insertion may cause the tab to unintentionally break off. The optional Hook Holder (51-7100) can be used to minimize the potential premature tab breakage.

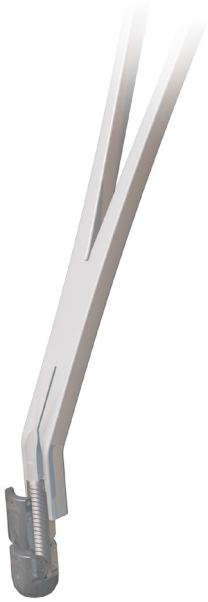


FIG. 22

STEP 23. ROD PLACEMENT

After placing the rod into the saddles, insert set screws into the screws cephalad and caudal to the reduction target. Tighten all set screws caudal to the reduction screw with the torque limiting handle and counter torque wrench and leave the set screws cephalad of the reduction loose. The opposite approach is equally functional (FIG. 23).

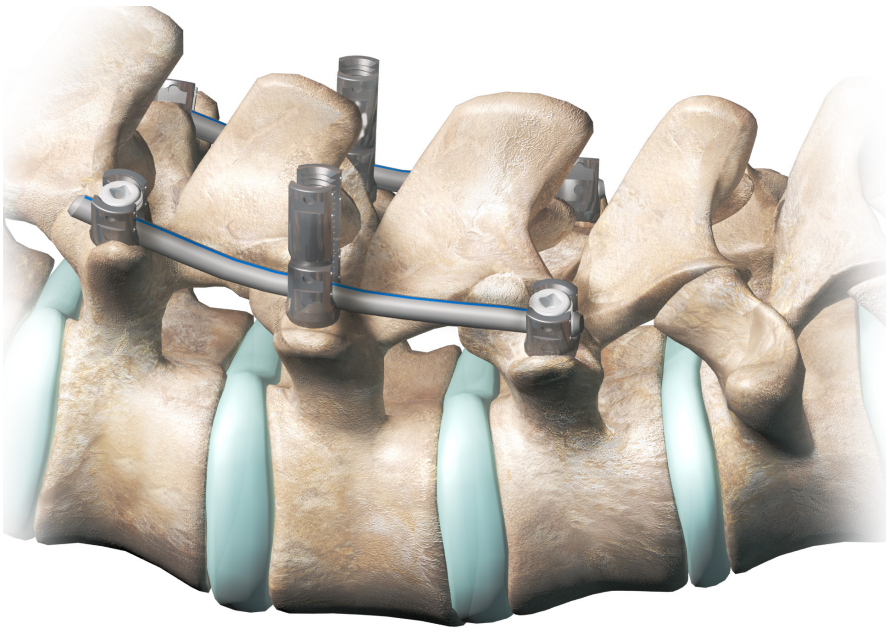


FIG. 23

STEP 24. ANTI-SPLAY CAP ATTACHMENT

Slide an Anti-Splay Cap (68-0111) down each reduction body until it fully seats on the top of the reduction body and rotate 90° clockwise to lock anti-splay cap to the reduction body (FIG. 24).

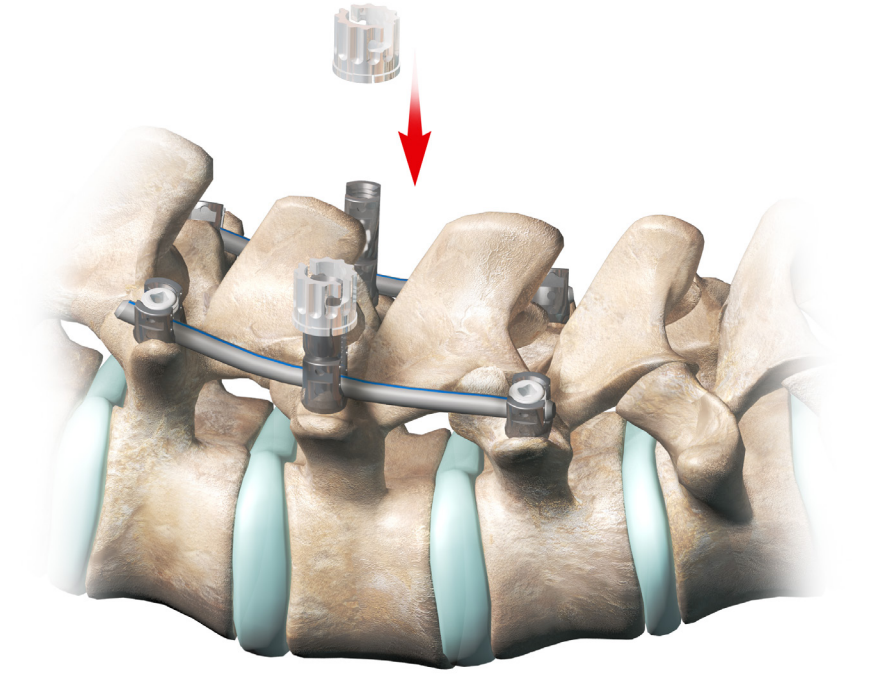


FIG. 24

STEP 25. SET SCREW PLACEMENT

Insert set screw (36-2001) into reduction body using the Set Screw Inserter (36-1160) or Reduction Set Screw Inserter (36-1260). The Set Screw Inserter will allow the set screw to be inserted approximately 8 to 9 turns into the reduction body. The Reduction Set Screw Inserter will allow the set screw to be inserted the entire distance.

To continue rod reduction using the set screw, use the Set Screw Driver (36-1161) attached to the ratcheting T-Handle (36-1011) or Straight Ratcheting Handle (36-1010). Advance the set screws in unison or back-and-forth from one set screw to the other (FIG. 25).

NOTE
Do not remove the anti-splay caps until the set screw is seated below the tabs.

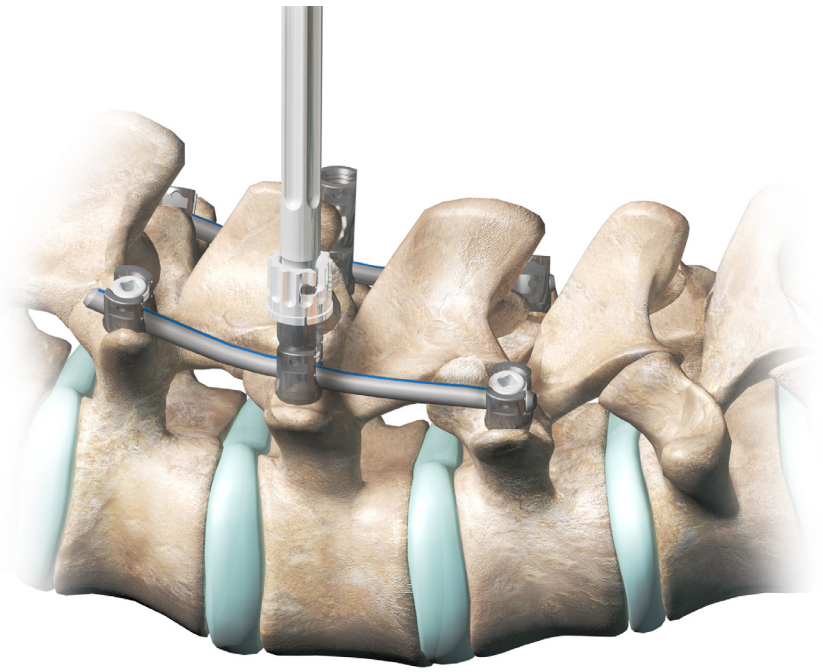


FIG. 25

STEP 26A. ANTI-SPLAY CAP REMOVAL

Once the set screw has advanced beyond the tab break points, the anti-splay cap can be removed by rotating 90° in the marked direction (UNLOCK) and using the anti-splay cap remover (61-0112) (FIG. 26A).

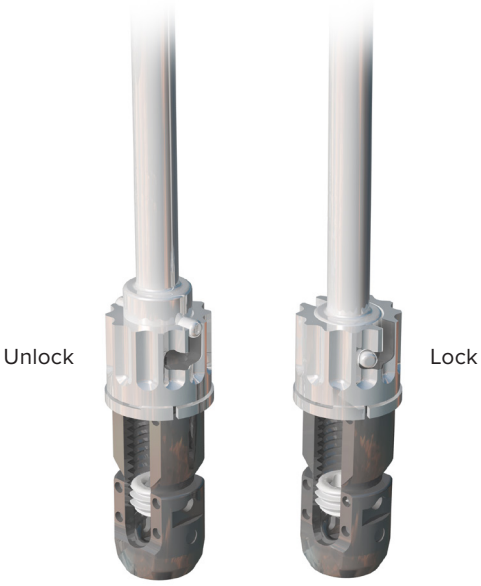


FIG. 26A

STEP 26B. TAB REMOVAL

Once the anti-splay cap has been removed, the tabs can then be broken using the tab removal tool (61-0400) (FIG. 26B).

NOTE
Insert Tab Removal Tool onto each tab of the Reduction Body until fully seated prior to breaking off tab. This will ensure the tab is captured by the Tab Removal Tool after breakage. Do not actuate the sliding sleeve when breaking off tab.

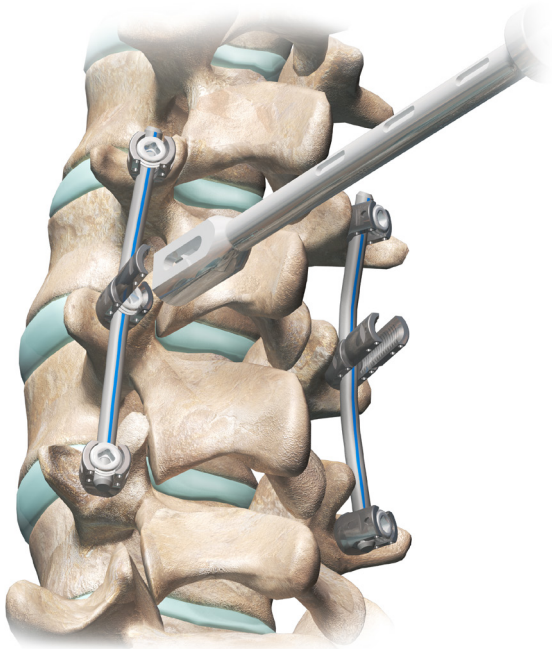


FIG. 26B

STEP 26C. TAB REMOVAL

After breakage of each tab, slide sleeve toward handle to eject the removed tab (FIG. 26C). Repeat step 26B for the remaining tabs.

FIG. 26C

STEP 27. FINAL TIGHTENING

NOTE
You may choose to remove the reduction body tabs prior to final tightening or you may final tighten the construct and then remove the tabs. If you choose to final tighten prior to removing the tabs, use the optional Reduction Counter Torque Wrench (61-1265) instead of the Counter Torque Wrench (36-1765).

NOTE
The torque handles should not be impacted. Avoid applying excessive lateral loads during final tightening. The torque handles should not be used as a prying tool.

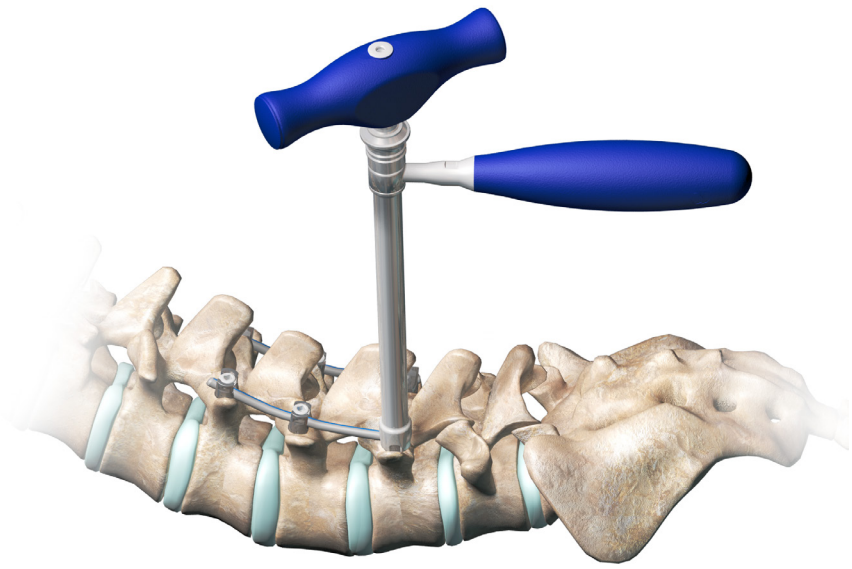


FIG. 27

STEP 27. FINAL TIGHTENING CONTINUED

Counter Torque Wrench (36-1765) or
Optional Reduction Counter Torque Wrench (61-1265)
Set Screw Driver (36-1161)
Torque Limiting Handle (36-1512 or 36-1612)

Position the counter torque wrench over the multi-axial screw and rod making sure to engage notched counter torque wrench with the rod. Place the set screw driver through the cannulation of the counter torque wrench and into the square drive of the set screw. Turn the torque limiting handle clockwise to tighten the set screw to 80 in-lb.

The Reduction Counter Torque Wrench allows the handle to be used either in-line with the rod axis, or at 90° to the rod axis. This is achieved by depressing the button and indexing the shaft to the desired orientation. The laser marking at the top of the shaft (thick line flanked by two thin lines) indicates the orientation that the rod must be aligned with, relative to the instrument, in order to engage the hooked feature on the end of the Reduction Counter Torque Wrench shaft.

The rod engagement is of the bayonetted type, therefore, the Reduction Counter Torque Wrench needs to be rotated at a slight angle to the rod during entry and then locked with a twisting action. Reverse motion is applicable when removing the Reduction Counter Torque Wrench after final tightening.

The torque limiting handle will reach its maximum torque and release at 80 in-lb as indicated by a tactile feedback and an audible click.

NOTE
To attach the Torque Limiting Handle (36-1512 or 36-1612) to the Set Screw Driver, retract the shaft connector sleeve and insert the square-drive shaft end of the Set Screw Driver into the handle connector (rotate the instrument shaft if necessary to ensure full seating inside the shaft connector), and release shaft connector sleeve. Pull instrument shaft to confirm secure connection. To disengage the Set Screw Driver from the handle, retract the shaft connector sleeve and slide the instrument shaft from the shaft connector.

NOTE
If the Counter Torque Wrench is not correctly seated on the rods during final tightening, a pedicle fracture could result.

NOTE
The Top Loading Body (36-2101) and the Reduction Body (36-2103) can only be final tightened using the Torque Limiting Handle (36-1512 or 36-1612) to a torque value of 80 in-lb.

NOTE
If the Counter Torque Wrench is not fully seated on the rods and is tilted in the cephalad – caudal direction, the set screw would not be adequately tightened and could lead to loosening of the construct post-op.

NOTE
The driver could slip and/or damage the set screw if the user fails to fully seat the driver in the drive feature of the set screw.

TECHNICAL INFORMATION

TECHNICAL INFORMATION & MATERIALS

SCREW REMOVAL

Set Screw Driver	36-1161
Multi-Axial Adjustment Driver	52-1339
Counter Torque Wrench	36-1765
Torque Limiting Handle	36-1512 or 36-1612

Screw	Ti-6Al-4V
Rod	Ti-6Al-4V or CoCr
Instruments	Stainless Steel, Aluminum, Silicone

CoCr	Cobalt Chrome
Ti-6Al-4V	Titianium Alloy

COBALT CHROME (COCR) ALLOY 1 PER ASTM F1537

Element	Composition % (mass/mass)	
	min	max
Carbon	----	0.14
Aluminum	----	----
Lanthanum	----	----
Chromium	26.0	30.0
Molybdenum	5.0	7.0
Nickel	----	1.0
Iron	----	0.75
Silicon	----	1.0
Manganese	----	1.0
Nitrogen	----	0.25
Cobalt		Balance

IMPLANT	DRIVE FEATURE	FINAL TIGHTENING TORQUE VALUE	FINAL TIGHTENING TORQUE DRIVER PART NUMBER
Set Screw	4.0mm Square	80 in-lb	36-1512 or 36-1612
Bone Screw	4.0mm Square		
Cross Connector	2.75mm Hex	13 in-lb	55-1089 or 55-1189

TITANIUM ALLOY (TI-6AL-4V) PER ASTM F136

Element	Composition % (mass/mass)
Nitrogen, max	0.05
Carbon, max	0.08
Hydrogen, max	0.012
Iron, max	0.25
Oxygen, max	0.13
Aluminum	5.5–6.50
Vanadium	3.5–4.5
Titanium	Balance

INSTRUCTIONS FOR ASSEMBLY/DISASSEMBLY MULTI-AXIAL SCREW DRIVER (36-1831)

There are five parts to the Multi-Axial Screw Driver: 1) Outer Sleeve, 2) Drive Adapter, 3) Knob, 4) Screw Extender, 5) Shaft

The Multi-Axial Screw Driver requires disassembly prior to cleaning using the following steps.

> **NOTE**
> The Multi-Axial Screw Driver has two dots on each part to differentiate it from the Modular Screw Driver part.

Assembly of the Multi-Axial Screw Driver (36-1831)

Hold the Screw Extender by the distal end with one hand and slide the blue Outer Sleeve down the shaft of the Screw Extender until an audible click is heard (FIG. 01 & 02).

Holding the blue Outer Sleeve in one hand, slide Knob onto the Screw Extender until it clicks (FIG. 03 & 04).

Insert the Shaft (the end without the square drive) completely into the distal end of the Screw Extender (FIG. 05).

Grip the blue Outer Sleeve and the end of the Shaft. Ensure the Shaft is fully inserted by applying pressure with thumb or forefinger; while holding the collar against the stop pin, align the male flat cut-away on the end of the Shaft to the corresponding female flat on the Drive Adapter and insert the Drive Adapter until it bottoms out (FIG. 06 & 07).

Hold the square drive feature at the end of the Shaft to prevent it from turning. Rotate the collar of the Drive Adapter clockwise until it is fully seated and the spring clips engage completely. If necessary, attach and hold a Modular Handle to facilitate tightening of the collar (FIG. 08 & 09).

Disassembly of the Multi-Axial Screw Driver (36-1831)

Grip the blue Outer Sleeve and the distal tip of the Shaft with one hand and use the other hand to unscrew the collar on the Drive Adapter located above the Knob using a counterclockwise rotation. If necessary, attach and hold a Modular Handle to facilitate loosening of the collar (FIG. 09 & 08).

Once the collar is completely unscrewed, disengage the Drive Adapter from the remainder of the instrument by pulling it away (FIG. 07).

Grip the blue Outer Sleeve with one hand, then grasp the distal tip of the Shaft between your thumb and forefinger using your other hand. Next gently pull on the Shaft to separate the Shaft from the remainder of the instrument (FIG. 06 & 05).

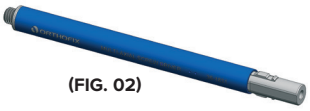
With one hand, pinch the release buttons on the proximal end of the Screw Extender and gently pull the Knob away from the Screw Extender (FIG. 04 & 03).

With one hand, pinch the release buttons on the proximal end of the Screw Extender, slide the Outer Sleeve off the proximal end of the Screw Extender (FIG. 02 & 01).

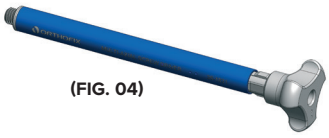
Once disassembly is completed there will be five parts to the Multi-Axial Screw Driver.

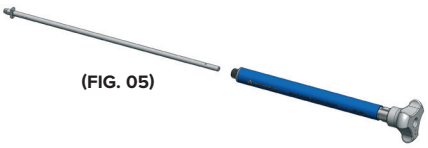
> **NOTE**
> To avoid components falling, it is suggested to hold the assembly horizontal and/or perform the assembly over a table.

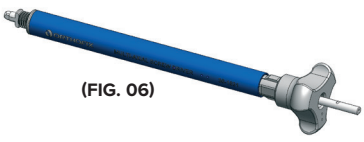

(FIG. 01)

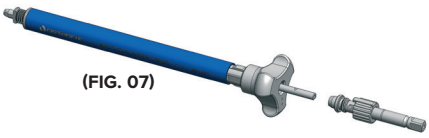

(FIG. 02)

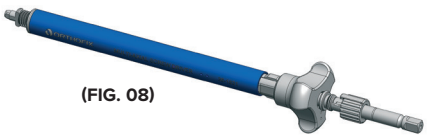

(FIG. 03)

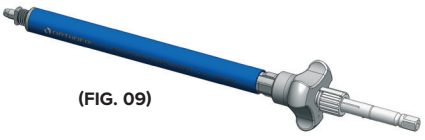

(FIG. 04)


(FIG. 05)


(FIG. 06)

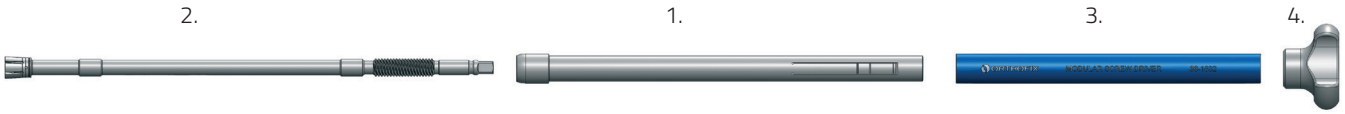

(FIG. 07)


(FIG. 08)


(FIG. 09)

INSTRUCTIONS FOR ASSEMBLY/DISASSEMBLY MODULAR SCREW DRIVER (36-1832)

There are four parts to the Modular Screw Driver: 1) Locking Sleeve, 2) Drive Assembly, 3) Outer Sleeve, 4) Knob



The Modular Screw Driver requires disassembly prior to cleaning using the following steps.

> **NOTE**
> The Multi-Axial Screw Driver has two dots on each part to differentiate it from the Modular Screw Driver part. (There are no dots present on the Modular Screw Driver parts).

Assembly of the Modular Screw Driver (36-1832)

Hold the proximal end of the Locking Sleeve in one hand. With the other hand, pinch the release buttons on the Locking Sleeve and slide the blue Outer Sleeve down the shaft of the Locking Sleeve until an audible click is heard (FIG. 01 & 02).

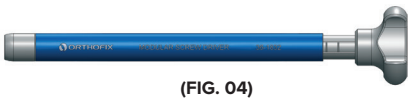
(FIG. 01)

(FIG. 02)

Holding the blue Outer Sleeve in one hand, pinch the release buttons on the Locking Sleeve and slide the Knob on until it clicks. Give the Knob a quick pull to ensure it is locked into place on the Locking Sleeve (FIG. 03 & 04).

(FIG. 03)

Grasping the distal end of the Locking Sleeve, insert the Drive Assembly (square end first) completely into the Locking Sleeve. Rotate the Knob clockwise until the thread is partially engaged in the Drive Assembly (FIG. 05–07).



(FIG. 04)

Disassembly of the Modular Screw Driver (36-1832)

Grip the distal end of the Locking Sleeve, rotate the Knob counterclockwise until loose.

> **NOTE**
> The Drive Assembly will freely fall out when it is fully unthreaded). Remove the Drive Assembly by pulling the distal end until it is completely free from the Locking Sleeve (FIG. 07, 06, & 05).

(FIG. 05)

(FIG. 06)

Grip the blue Outer Sleeve, with one hand and slide it toward the distal tip of the Locking Sleeve. Pinch the release buttons on the proximal end of the Locking Sleeve and gently pull Knob away from the Locking Sleeve (FIG. 04 & 03).

With one hand, pinch the release buttons on the proximal end of the Locking Sleeve, then slide the blue Outer Sleeve off the proximal end of the Locking Sleeve (FIG. 02 & 01).

(FIG. 07)

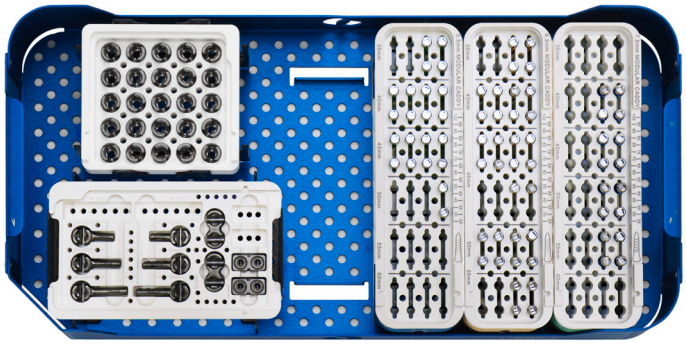
Once disassembly is completed there will be four parts to the Modular Screw Driver.

> **NOTE**
> Due to the quad-lead threads on the shaft and knob, the Drive Assembly can easily disengage (unthread) when the Modular Screw Driver is held vertically with the distal end pointed down.

TRAY CONFIGURATION IMPLANT CASE (36-9099) & INSTRUMENT CASE 1 (36-9091)

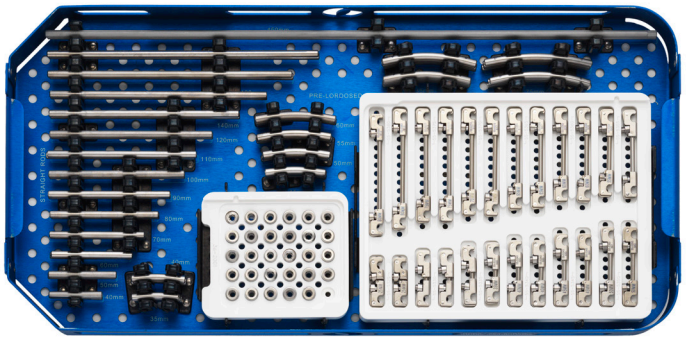
36-8306

Implant Case, Top Tray



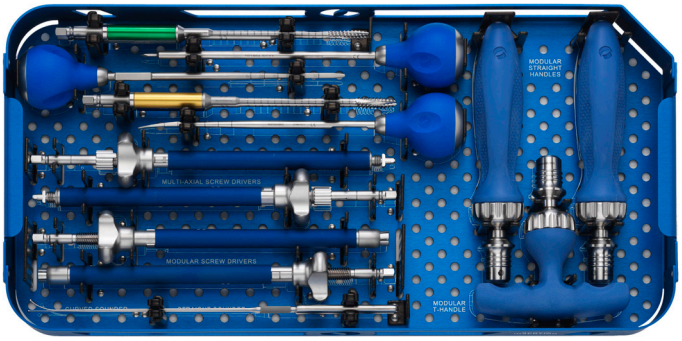
36-8307

Implant Case, Bottom Tray



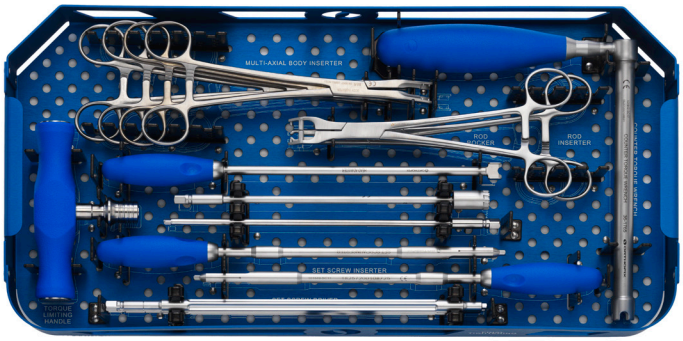
36-8301

Instrument Case 1, Top Tray



36-8302

Instrument Case 1, Bottom Tray

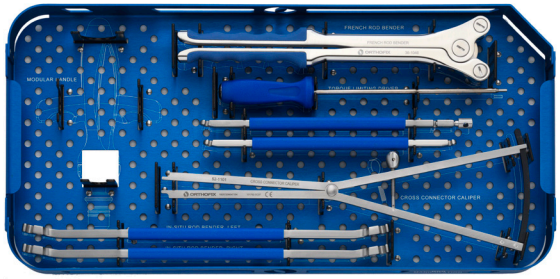


Products shown not to scale

TRAY CONFIGURATION INSTRUMENT CASE 2 (36-9092) & REDUCTION IMPLANTS/INSTRUMENT CASE (36-9104)

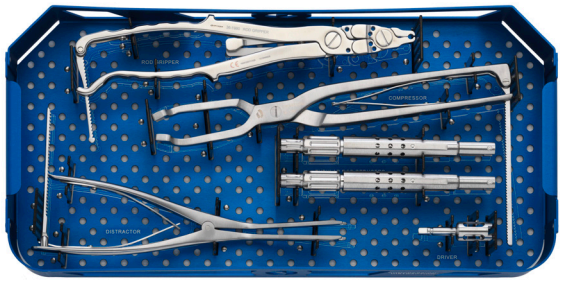
36-8303

Instrument Case 2, Top Tray



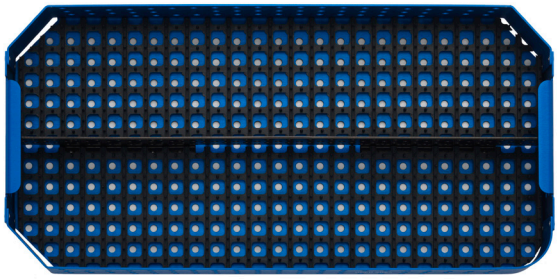
36-8304

Instrument Case 2, Middle Tray



36-8305

Instrument Case 2, Bottom Tray

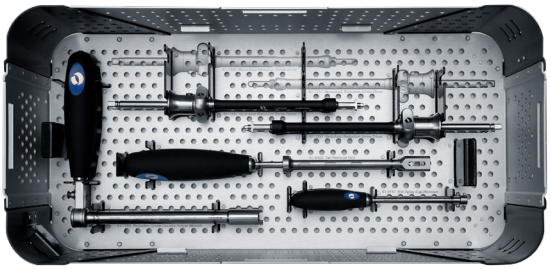


36-8476

Reduction Implants Instrument Case, Top Tray

36-8475

Reduction Implants Instrument Case, Bottom Tray

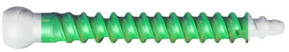


Products shown not to scale

IMPLANTS IMPLANT CASE (36-9099)

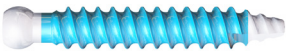
Non-Crannulated Screw

PN 5.5mm



PN 6.5mm

PN 7.5mm



Top Loading Body

PN 36-2101

Set Screw

PN 36-2001

Straight (40–450mm)
(Cobalt Chrome by request)

Pre-Lordosed Rod (35–80mm)

Multi-Axial Cross Connector (25–65mm)

PN 55-53XX

Lateral Offset (15, 20, and 25mm)

PN 55-63XX

5.5 x 5.5mm Parallel Rod Connector, T-T

PN 52-6805

5.5mm/5.5mm Rod Connector, F-F

PN 36-6801

Products shown not to scale

IMPLANTS OPTIONAL IMPLANTS (36-9099)

5.5mm/5.5mm Rod Connector, Axial

PN 36-6701

8mm Low Profile Offset

PN 36-6408

11mm Low Profile Offset

PN 36-6411

14mm Low Profile Offset

PN 36-6414

17mm Low Profile Offset

PN 36-6417

20mm Low Profile Offset

PN 36-6420

23mm Low Profile Offset

PN 36-6423

26mm Low Profile Offset

PN 36-6426

29mm Low Profile Offset

PN 36-6429

32mm Low Profile Offset

PN 36-6432

35mm Low Profile Offset

PN 36-6435

Set Screw, Low Profile Offset

PN 36-2002

30mm Lateral Offset

PN 51-6330

35mm Lateral Offset

PN 51-6335

80mm Lateral Offset

PN 51-6380

Products shown not to scale

INSTRUMENTATION INSTRUMENT CASE 1 (36-9091)

Bone Awl

PN 36-1001

Curved Lumbar Probe

PN 36-1003

Straight Lumbar Probe

PN 36-1002

Curved Sounder

PN 55-1005

Straight Sounder

PN 55-1004

4.5mm Tap

PN 36-1024

Products shown not to scale

INSTRUMENTATION INSTRUMENT CASE 1 (36-9091)

5.5mm Tap

PN 36-1025

6.5mm Tap

PN 36-1026

7.5mm Tap

PN 36-1027

Modular Screw Driver

PN 36-1838

Multi-Axial Screw Driver

PN 36-1835

Straight Ratcheting Handle

PN 36-1010

Ratcheting T-Handle

PN 36-1011

Products shown not to scale

INSTRUMENTATION INSTRUMENT CASE 1 (36-9091)

Multi-Axial Body Inserter

PN 54-0007

Rod Inserter

PN 36-1581

Rod Rocker

PN 36-1251

Decorticating Planer

PN 36-1334

Head Adjuster

PN 36-1038

Reduction Set Screw Inserter

PN 36-1260

Products shown not to scale

INSTRUMENTATION INSTRUMENT CASE 1 (36-9091)

Set Screw Driver

PN 36-1161

Multi-Axial Adjustment Driver

PN 52-1339

Counter Torque Wrench

PN 36-1765

Torque Limiting Handle

PN 36-1512 or 36-1612

Products shown not to scale

INSTRUMENTATION INSTRUMENT CASE 2 (36-9092)

French Rod Bender

PN 36-1046

Cross Connector Caliper

PN 52-1101

Cross Connector Torque Limiting Driver

PN 55-1089 or 55-1189

Cross Connector Bender, Left

PN 36-1103

Cross Connector Bender, Right

PN 36-1102

In Situ Rod Bender, Left

PN 36-1071

In Situ Rod Bender, Right

PN 36-1070

Products shown not to scale

INSTRUMENTATION INSTRUMENT CASE 2 (36-9092)

Rod Gripper

PN 36-1980

Driver, Tubular Rod Reducer

PN 51-1990

Tubular Rod Reducer

PN 51-1989

Compressor

PN 36-1591

Distractor

PN 55-1070

Products shown not to scale

REDUCTION IMPLANTS AND INSTRUMENTATION CASE (36-9104)

Reduction Body

PN 36-2103

Anti-Splay Cap

PN 68-0111

Reduction Counter Torque Wrench

PN 51-1265

Anti-Splay Cap Remover

PN 61-0112

Tab Removal Tool

PN 61-0400

Multi-Axial Reduction Screw Driver

PN 61-1331

Products shown not to scale

IMPLANTS

Implant Case 36-9099

PART NO.	DESCRIPTION	QTY
TOP LEVEL – MODULAR, NON-CANNULATED		
36-8321	5.5mm Caddy	1
44-5535	5.5mm x 35mm Bone Screw, Self-Tapping	4
44-5540	5.5mm x 40mm Bone Screw, Self-Tapping	8
44-5545	5.5mm x 45mm Bone Screw, Self-Tapping	8
44-5550	5.5mm x 50mm Bone Screw, Self-Tapping	2
36-8322	6.5mm Caddy	1
44-5635	6.5mm x 35mm Bone Screw, Self-Tapping	4
44-5640	6.5mm x 40mm Bone Screw, Self-Tapping	8
44-5645	6.5mm x 45mm Bone Screw, Self-Tapping	10
44-5650	6.5mm x 50mm Bone Screw, Self-Tapping	8
44-5655	6.5mm x 55mm Bone Screw, Self-Tapping	4
36-8323	7.5mm Caddy	1
44-5740	7.5mm x 40mm Bone Screw, Self-Tapping	4
44-5745	7.5mm x 45mm Bone Screw, Self-Tapping	4
44-5750	7.5mm x 50mm Bone Screw, Self-Tapping	4
44-5755	7.5mm x 55mm Bone Screw, Self-Tapping	4
36-8314	Top Loading Body Caddy	1
36-2101	Top Loading Body	22
36-8315	Lateral Offset and Rod Connector Caddy	1
51-6315	15mm Lateral Offset	2
51-6320	20mm Lateral Offset	2
51-6325	25mm Lateral Offset	2
52-6805	5.5 x 5.5mm Side by Side Rod Connector T-T	2
36-6801	Rod Connector, Front Loading	2
BOTTOM LEVEL		
36-8316	Cross Connector Caddy	1
55-5325	25mm Multi-Axial Cross Connector	2
55-5330	30mm Multi-Axial Cross Connector	2
55-5335	35mm Multi-Axial Cross Connector	2
55-5340	40mm Multi-Axial Cross Connector	2
55-5345	45mm Multi-Axial Cross Connector	2
55-5350	50mm Multi-Axial Cross Connector	2
55-5355	55mm Multi-Axial Cross Connector	2
55-5360	60mm Multi-Axial Cross Connector	2
55-5365	65mm Multi-Axial Cross Connector	2
52-2040	40mm Rod	2
52-2050	50mm Rod	2
52-2060	60mm Rod	2
52-2070	70mm Rod	2
52-2080	80mm Rod	2
52-2090	90mm Rod	2
52-2100	100mm Rod	2
52-2110	110mm Rod	2
52-2120	120mm Rod	2
52-2140	140mm Rod	2
52-2160	160mm Rod	2
52-2180	180mm Rod	2
52-2200	200mm Rod	2
52-2450	450mm Rod	2
52-6035	35mm Pre-Lordosed Rod	4
52-6040	40mm Pre-Lordosed Rod	4
52-6045	45mm Pre-Lordosed Rod	4
52-6050	50mm Pre-Lordosed Rod	4
52-6055	55mm Pre-Lordosed Rod	4

Implant Case 36-9099 CONTINUED

PART NO.	DESCRIPTION	QTY
BOTTOM LEVEL		
52-6060	60mm Pre-Lordosed Rod	4
52-6065	65mm Pre-Lordosed Rod	4
52-6070	70mm Pre-Lordosed Rod	4
52-6075	75mm Pre-Lordosed Rod	4
52-6080	80mm Pre-Lordosed Rod	4
36-8313	Set Screw Caddy	1
36-2001	Set screw	30

Optional Caddies

PART NO.	DESCRIPTION	QTY
OPTIONAL STOCKED NON-CANNULATED MODULAR CADDIES		
36-9094	4.5mm Caddy	1
44-5430	4.5mm x 30mm Bone Screw, Self-Tapping	4
44-5435	4.5mm x 35mm Bone Screw, Self-Tapping	4
44-5440	4.5mm x 40mm Bone Screw, Self-Tapping	4
36-9099	5.5mm Caddy	1
44-5535	5.5mm x 35mm Bone Screw, Self-Tapping	4
44-5540	5.5mm x 40mm Bone Screw, Self-Tapping	8
44-5545	5.5mm x 45mm Bone Screw, Self-Tapping	8
44-5550	5.5mm x 50mm Bone Screw, Self-Tapping	2
36-9101	6.5mm Caddy	1
44-5635	6.5mm x 35mm Bone Screw, Self-Tapping	4
44-5640	6.5mm x 40mm Bone Screw, Self-Tapping	8
44-5645	6.5mm x 45mm Bone Screw, Self-Tapping	10
44-5650	6.5mm x 50mm Bone Screw, Self-Tapping	8
44-5655	6.5mm x 55mm Bone Screw, Self-Tapping	4
36-9102	7.5mm Caddy	1
44-5740	7.5mm x 40mm Bone Screw, Self-Tapping	4
44-5745	7.5mm x 45mm Bone Screw, Self-Tapping	4
44-5750	7.5mm x 50mm Bone Screw, Self-Tapping	4
44-5755	7.5mm x 55mm Bone Screw, Self-Tapping	4
OPTIONAL STOCKED CANNULATED MODULAR CADDIES		
36-9095	5.5mm Caddy	1
77-8540	5.5mm x 40mm Bone Screw, Self-Tapping	4
77-8545	5.5mm x 45mm Bone Screw, Self-Tapping	4
36-9096	6.5mm Caddy	1
77-8635	6.5mm x 35mm Bone Screw, Self-Tapping	2
77-8640	6.5mm x 40mm Bone Screw, Self-Tapping	4
77-8645	6.5mm x 45mm Bone Screw, Self-Tapping	8
77-8650	6.5mm x 50mm Bone Screw, Self-Tapping	4
36-9097	7.5mm Caddy	1
77-8740	7.5mm x 40mm Bone Screw, Self-Tapping	2
77-8745	7.5mm x 45mm Bone Screw, Self-Tapping	4
77-8750	7.5mm x 50mm Bone Screw, Self-Tapping	2
OPTIONAL EMPTY CADDY		
36-8320	4.5mm Caddy	
36-8324	8.5mm Caddy	
36-8321	5.5mm Caddy	
36-8322	6.5mm Caddy	
36-8323	7.5mm Caddy	

Optional Implants

PART NO.	DESCRIPTION
OPTIONAL IMPLANTS	
36-2103	Reduction Body
36-6701	Axial Rod Connector
36-6408	Low Profile Offset, 8mm
36-6411	Low Profile Offset, 11mm
36-6414	Low Profile Offset, 14mm
36-6417	Low Profile Offset, 17mm
36-6420	Low Profile Offset, 20mm
36-6423	Low Profile Offset, 23mm
36-6426	Low Profile Offset, 26mm
36-6429	Low Profile Offset, 29mm
36-6432	Low Profile Offset, 32mm
36-6435	Low Profile Offset, 35mm
36-2002	Set Screw, Low Profile Offset
51-6330	Lateral Offset, 30mm
51-6335	Lateral Offset, 35mm
51-6380	Lateral Offset, 80mm
51-2450	Rod, 450mm x Dia. 5.5mm, Cobalt Chrome
51-2600	Rod, Cobalt Chrome, Straight, 600mm
52-2600	Rod, Titanium, 600mm
55-5370	70mm Multi-Axial Cross Connector
55-5375	75mm Multi-Axial Cross Connector
55-5380	80mm Multi-Axial Cross Connector
52-6090	Rod, Titanium, Pre-Lordosed, 90mm
52-6100	Rod, Titanium, Pre-Lordosed, 100mm
52-6110	Rod, Titanium, Pre-Lordosed, 110mm
52-6120	Rod, Titanium, Pre-Lordosed, 120mm

Screws

DIAMETER	25-55MM
FIREBIRD HA COATED SCREWS CANNULATED, SINGLE-USE, STERILE PACKED	
5.5mm	77-55XXSP
6.5mm	77-56XXSP
7.5mm	77-57XXSP
8.5mm	77-58XXSP

MODULAR, NON-CANNULATED SCREWS

DIAMETER	25-95MM	100MM	110MM
4.0mm	44-53XX	44-5310	44-5311
4.5mm	44-54XX	44-5410	44-5411
5.5mm	44.55XX	44-8510	44-8511
6.5mm	44.56XX	44-8610	44-8611
7.5mm	44.57XX	44-8710	44-8711
8.5mm	44.58XX	44-8810	44-8811
9.5mm	44.59XX	44-8910	44-8911
10.5mm	44.50XX	44-8010	44-8011
11.5mm	44.51XX	44-8110	44-8111

MODULAR, CANNULATED SCREWS

DIAMETER	25-95MM	100MM	110MM
4.5mm	77-84XX	77-8410	77-8411
5.5mm	77-85XX	77-8510	77-8511
6.5mm	77-86XX	77-8610	77-8611
7.5mm	77-87XX	77-8710	77-8711
8.5mm	77-88XX	77-8810	77-8811
9.5mm	77-89XX	77-8910	77-8911
10.5mm	77-80XX	77-8010	77-8011
11.5mm	77-81XX	77-8110	77-8111

INSTRUMENTATION

Instrument Case 1 36-9091

PART NO.	DESCRIPTION	QTY
TOP LEVEL		
36-1001	Bone Awl	1
36-1003	Curved Lumbar Probe	1
36-1002	Straight Lumbar Probe	1
55-1005	Curved Sounder	1
55-1004	Straight Sounder	1
36-1024	4.5mm Tap	1
36-1025	5.5mm Tap	1
36-1026	6.5mm Tap	1
36-1027	7.5mm Tap	1
36-1835	Multi-Axial Screw Driver	2
36-1838	Modular Screw Driver	2
36-1010	Straight Ratcheting Handle	2
36-1011	Ratcheting T-Handle	1
BOTTOM LEVEL		
54-0007	Multi-Axial Body Inserter	4
36-1581	Rod Inserter	1
52-1251	Rod Rocker	1
36-1334	Decorticating Planer	1
36-1038	Head Adjuster	1
36-1260	Reduction Set Screw Inserter	2
36-1161	Set Screw Driver	2
52-1339	Multi-Axial Adjustment Driver	1
36-1765	Counter Torque Wrench	1
36-1512 or 36-1612	Torque Limiting Handle	1

Instrument Case 1 36-9092

PART NO.	DESCRIPTION	QTY
TOP LEVEL		
36-1046	French Rod Bender	1
52-1101	Cross Connector Caliper	1
55-1089 or 55-1189	Cross Connector Torque Limiting Driver	1
36-1103	Cross Connector Bender, Left	1
36-1102	Cross Connector Bender, Right	1
36-1071	*In Situ* Rod Bender, Left	1
36-1070	*In Situ* Rod Bender, Right	1
MIDDLE LEVEL		
36-1980	Rod Gripper	1
51-1990	Driver, Tubular Rod Reducer	1
51-1989	Tubular Rod Reducer	2
36-1591	Compressor	1
55-1070	Distractor	1
BOTTOM LEVEL		
36-8305	Open Tray w/mat	1

Reduction Implant/Instruments 36-9104

PART NO.	DESCRIPTION	QTY
BOTTOM LEVEL		
36-0090	Reduction Implant / Instrument Case	1
36-8468	Reduction Body Caddy	1
36-2103	Reduction Body	12
36-8471	Anti-Splay Cap Caddy	1
68-0111	Anti-Splay Cap	12
61-0112	Anti-Splay Cap Remover	1
61-0400	Tab Removal Tool	1
61-1265	Reduction Bayonet CTW	1
61-1331	Multi-Axial Reduction Screw Driver	2
36-8474	Lid, Reduction Implant / Instrument Case	1
36-8475	Base, Reduction Implant / Instrument Case	1
36-8476	Tray, Reduction Implant / Instrument Case	1

Optional Instruments

PART NO.	DESCRIPTION
51-1423	3.5mm Bone Tap
36-1028	8.5mm Tap
36-0145	4.5mm Cannulated Tap
36-0155	5.5mm Cannulated Tap
36-0165	6.5mm Cannulated Tap
36-0175	7.5mm Cannulated Tap
36-0185	8.5mm Cannulated Tap
36-1010	Straight Ratcheting Handle
36-1011	Ratcheting T-Handle
36-1202	Straight Duckbill Probe
36-1203	Curved Duckbill Probe
36-1402	Straight Thoracic Probe
36-1403	Curved Thoracic Probe
36-1832	Modular Screw Driver
36-1831	Multi-Axial Screw Driver
61-1265	Reduction Counter Torque Wrench
61-0400	Tab Removal Tool
68-0111	Anti-Splay Cap
61-0112	Anti-Splay Cap Remover
61-1331	Multi-Axial Reduction Screw Driver
51-7100	Hook Holder, Regular, Straight
52-1035	Rod Connector Inserter

FIREBIRD NXG

SPINAL FIXATION SYSTEM

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