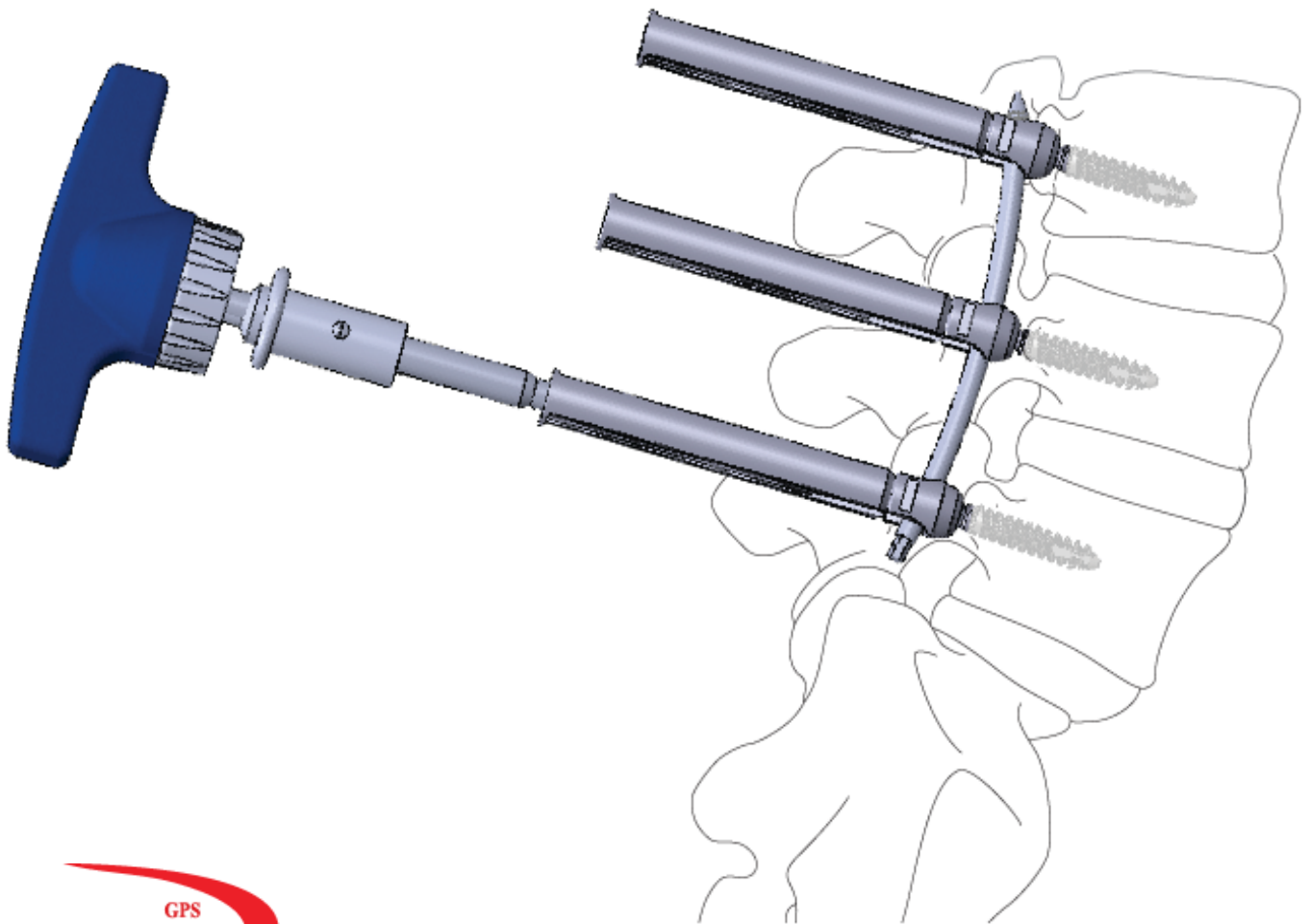


LOW PROFILE, POLYAXIAL SYSTEM
OFFERING A LESS INVASIVE
APPROACH FOR PATHOLOGIES OF
THE THORACOLUMBAR SPINE



G SURGICAL
PEDICLE
SYSTEM

G SURGICAL
MARKSMAN PERCUTANEOUS MIS
MINIMALLY INVASIVE SPINE SYSTEM
SURGICAL TECHNIQUE



9433 Bee Cave Road, Building 3,
Suite 101-A, Austin, TX 78733 USA
Phone: 1 512 494 4749
www.gsurgical.com

SURGICAL APPROACH AND PREPARATION

The patient is positioned prone as is customary for the surgeon and the operative area cleaned and prepared. A C-arm is readied and positioned so that fluoroscopic images of the pedicles can be obtained both AP and Lateral. The incision point is determined using the C-arm on AP view. A skin marker is used to mark the incision point.

JAMSHIDI NEEDLE POSITIONING

Using a Jamshidi Needle SSP0400, access the pedicle and confirm the correct location with both AP and Lateral images. The Jamshidi Needle is advanced to the desired depth with in the vertebral body and has laser lines, 10 mm increments for referencing depth.

GUIDE WIRE INSERTION

Remove the stylet from the Jamshidi Needle and insert a 1.6 mm Guide Wire through the cannulated sheath. Both trocar tip nitinol and threaded stainless steel Guide Wires are available. Advance the Guide Wire to the desired depth and verify position with fluoroscopy.

SCREW PREPARATION

Place the 14 mm dilator over the Guide Wire, use sequential dilators until the cannula radiolucent, 16.3 mm can be inserted.

TAPPING

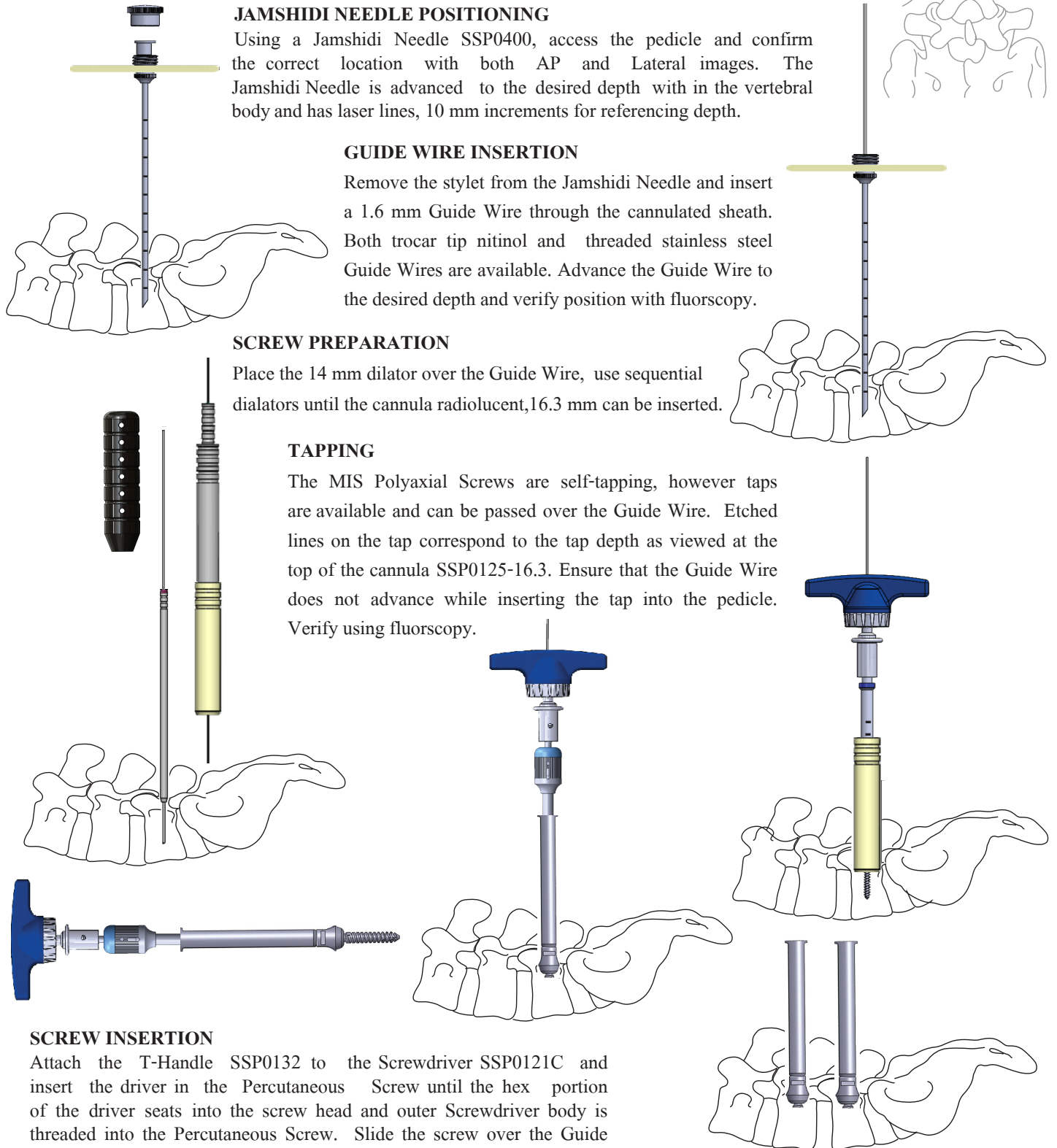
The MIS Polyaxial Screws are self-tapping, however taps are available and can be passed over the Guide Wire. Etched lines on the tap correspond to the tap depth as viewed at the top of the cannula SSP0125-16.3. Ensure that the Guide Wire does not advance while inserting the tap into the pedicle. Verify using fluoroscopy.

SCREW INSERTION

Attach the T-Handle SSP0132 to the Screwdriver SSP0121C and insert the driver in the Percutaneous Screw until the hex portion of the driver seats into the screw head and outer Screwdriver body is threaded into the Percutaneous Screw. Slide the screw over the Guide Wire and Cannula taking care not to allow the Guide Wire to advance. Continue insertion of the screw using fluoroscopic guidance to reference the predetermined depth. The Guide Wire can now be removed along with the screwdriver and cannula, Rotate the tab portion of the screw so that the slotted opening of the screw is in line with the planned rod trajectory.

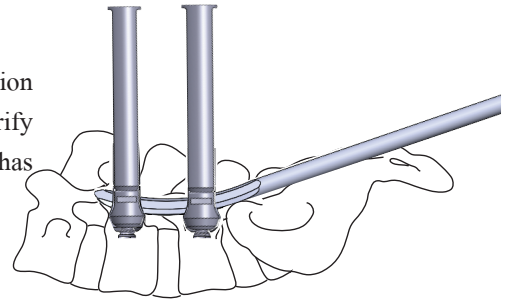
ADDITIONAL SCREW PLACEMENT

Additional screws can be inserted following the same method described above until all screw have been inserted.



TISSUE DISSECTION

A blunt Tissue Dissector, SSP0112 can be used to facilitate rod entry prior to rod insertion by inserting the Tissue Dissector into the slotted portion of the Screw Towers. Verify the location using fluoroscopy before rod insertion noting the Tissue Dissector has passed through each tower.



ROD INSERTION

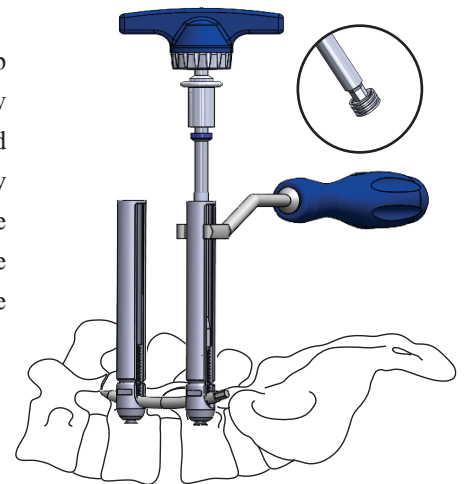
Insert the desired rod into the Rod Inserter, SSP0115 by attaching the rod hex end into the Rod Inserter and secure in place by screwing the knob until tight. Note the rod should be orientated in the inserter so the contour of the rod parallels the anatomical curve of the spine. Insert the rod through the slotted portion of the screw extension with the tip in the screw tulip. Continue insertion by rocking the Rod Inserter to pass the rod into the adjacent screw tulip. The incision may need to be slightly extended to allow the Rod Inserter to seat level with the first screw tulip. Verify the rod is seated into the tulip using fluoroscopy. If you are unable to rotate the extension, the rod has properly passed through the extension of the screw.

ROD REDUCTION

If the rod is not fully seated in the tulip portion of the screw, the partial threaded section of the screw extension will reduce the rod as the set screw is inserted and provisionally tightened within the percutaneous screw.

SET SCREW INSERTION

Insert the set screw into the 4.5 mm Ball Tip Driver, SSP0219 and pass through the screw extension. The screw will center the tulip head for easy starting. Tighten the set screw firmly by hand initially. If counter force is required, the Power Holder, SSP0302 or SSP0218 can be attached to the screw extension. Continue for the remaining screws for rod initial tightening.

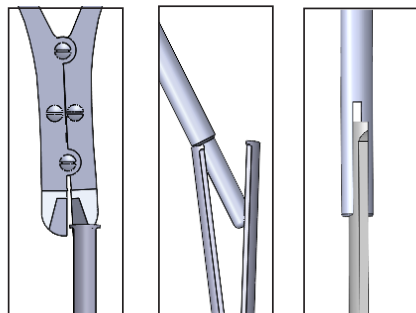


FINAL SET SCREW TORQUE

Insert the 4.5 mm Torque Measuring Device, SSP0209-106 and attached SSP0223 through the screw extension. Tighten the set screw until the Torque Measuring Device snaps over indicating 106 in-lbs has been achieved. The Power Holder, SSP0302 can be attached to the screw extension to apply counter torque.

TAB EXTENSION REMOVAL

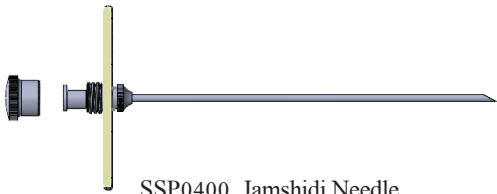
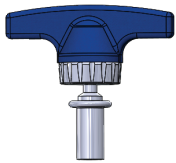
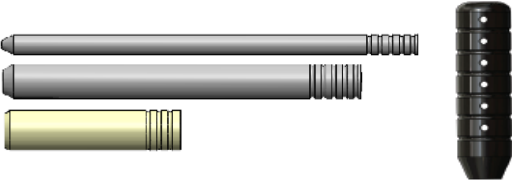
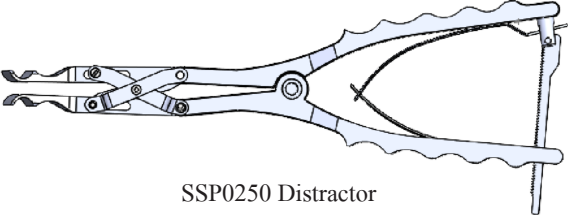
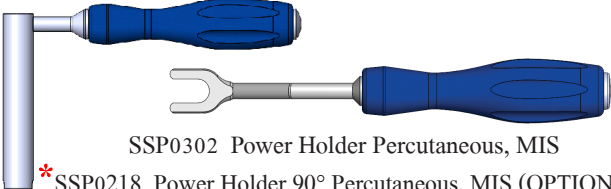
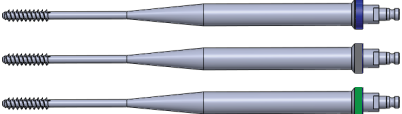
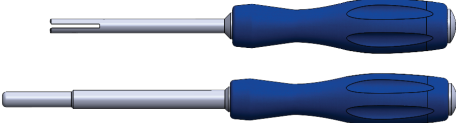
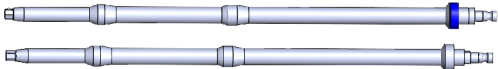
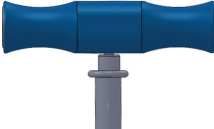
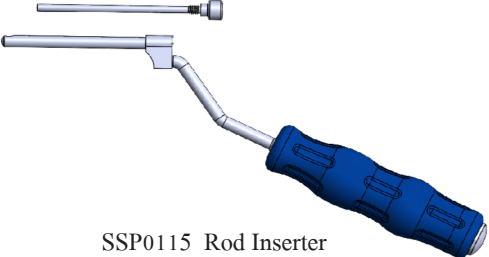
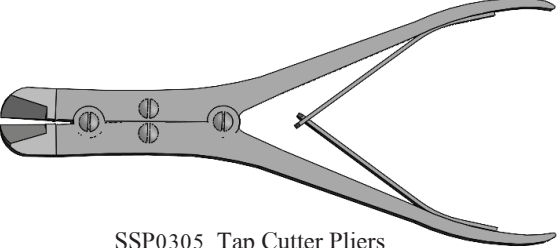
The construct should be verified to be sure all set screws have been torqued and the screws are positioned as desired. Using the Tab Cutter Pliers SSP0305, cut the top section of the extension on both sides. The tab extensions can now be forced open and subsequently can break away from the screw by forcing the extensions side to side using either the slotted Tab Breaker SSP0303 or the Internal Tab Breaker SSP0304. Discard the 2 extension pieces.



REMOVAL OF IMPLANT (IF NECESSARY)

The Marksman Percutaneous MIS System can be removed using the implantation sequence in reverse. Attach the T-Handle SSP0132 to the Wedge Tip Driver SSP0120C and insert the driver into set screw. Turn the handle in the counterclockwise direction, applying counter-torque to the screw using the SSP0315 Power Holder. Remove the loosened set screw. Remove the rod. Insert the driver into the Percutaneous Screw until the hex portion of the driver seats into the screw head. Turn the T-Handle in the counterclockwise direction and remove the screw.

G Surgical Marksman MIS Instruments are provided in a 2 level autoclavable case. All instruments are manufactured from surgical grade stainless steel, with laser engrave markings for easy identification and have silk screen graphics for placement of instruments in the autoclavable case. Anatomical silicone handles are provided for ease of use.

 SSP0400 Jamshidi Needle	 SSP0132 T-Handle, Ratcheting Cannulated
 GW1640 Nitinol Guide Wire 1.6 mm x 400 mm GW1650 Stainless Steel Guide Wire 1.6 mm x 500 mm	 SSP0112 Tissue Dissector
 SSP0125 Dilator Set, 8.0 mm, 14.0 mm, 16.3 mm, Insertor	 SSP0250 Distractor
 SSP0121C Screwdriver	 SSP0302 Power Holder Percutaneous, MIS * SSP0218 Power Holder 90° Percutaneous, MIS (OPTIONAL)
 SSP0124-55 Tap, Cannulated 5.5 mm SSP0124-65 Tap, Cannulated 6.5 mm SSP0124-75 Tap, Cannulated 7.5 mm	 SSP0303 Tab Breaker, Percutaneous Screw, MIS SSP0304 Tab Breaker ID, Percutaneous Screw, MIS
 SSP0219 Wedge Tip Driver, Ball Tip SSP0223 Set Screw Driver, Final Torque	 SSP0290-106 Torque Limiting Device, MIS
 SSP0115 Rod Inserter	 SSP0305 Tap Cutter Pliers