

SILHOUETTE

NEW SURGICAL TECHNIQUE RTS
REDUCED TRAY SYSTEM

SILHOUETTE™ SPINAL FIXATION SYSTEM

Zimmer Spine, the leader in shaping the future of spine surgery, offers you the *Silhouette*™ Spinal Fixation System. The *Silhouette* System is everything to day's spine surgeon demands in an in-line, top-loading polyaxial system. With uncompromised biomechanics and ease-of-placement, the *Silhouette* System puts confidence in your hands.

SILHOUETTE RTS* INSTRUMENTATION SET

The *Silhouette* RTS Instrumentation Set provides the instruments needed for 1- or 2-level lumbar procedures.

* RTS: Reduced Tray System

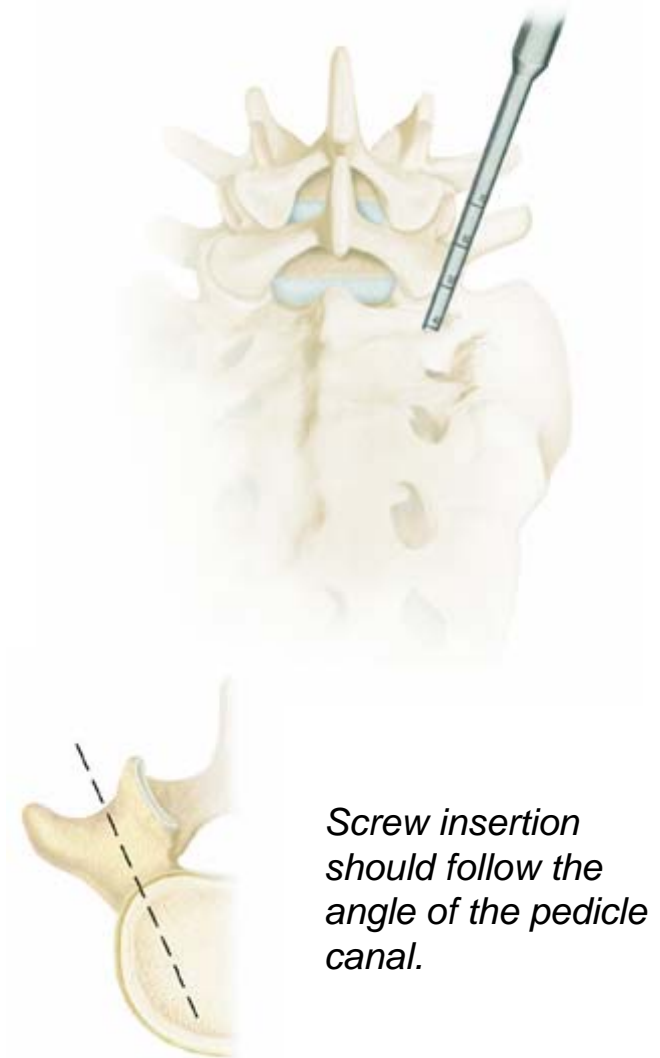
PEDICLE PREPARATION

Determine the pedicle canal entry site.

Prepare the pedicle canal, using preferred instrumentation.

Insert the Straight Bone Probe into the established entry site, gently pressing through the pedicle canal to determine hole depth.

Note: Do not use the Curved Bone Probe for 4.5 mm screws.



Screw insertion should follow the angle of the pedicle canal.

PEDICLE PREPARATION cont.

Pedicle Markers may be placed to identify appropriate screw trajectory via a lateral x-ray/fluoroscopy view.

Different bands on the Pedicle Markers are used to indicate left- or right-side placement.



PEDICLE PREPARATION cont.

Insert a Straight or Curved Sound Probe, and palpate the hole's inner surface to verify pedicle wall integrity.

Sound Probes are graduated to aid in determining hole depth.



SCREW INSERTION WITH POLYAXIAL HEADS ATTACHED

In this technique, screws with pre - assembled polyaxial heads are placed into the pedicles. An alternate technique, in which the polyaxial heads are removed prior to screw insertion, appears on [page 10](#).

Note: Silhouette screws are self-tapping. The use of a tap is optional.

With a properly prepared pedicle, select the appropriate polyaxial screw length.

Assemble the Polyaxial Screw Driver Shaft, Screw Body Stabilizer and Ratchet Handle.

Fully engage the hex end of the Polyaxial Screw Driver into the spherical head of the screw.

Thread the Screw Body Stabilizer onto the screw's polyaxial head.



Polyaxial Screws

4.5 mm 25-45 mm

5.5 mm 25-55 mm

6.5 mm 30-60 mm

7.5 mm 30-60 mm

8.5 mm 35-55 mm



SCREW INSERTION WITH POLYAXIAL HEADS ATTACHED cont.

Insert the polyaxial screw into the desired pedicle and advance to a depth where full angulation of the polyaxial head is maintained.

Note: Further advancement limits the angulation of the polyaxial screw.

Unthread the Screw Body Stabilizer from the polyaxial head, and remove the Polyaxial Screw Driver.

Repeat the process until all screws are placed.



FIXED SCREW INSERTION

Select the appropriate fixed screw length.

Assemble the Fixed Screw Driver Shaft, Screw Body Stabilizer and Ratchet Handle.

Place the fixed screw on the Fixed Screw Driver and thread the Screw Body Stabilizer onto the body of the screw.

Insert the fixed screw into the desired pedicle until the bottom of the fixed screw body contacts the bone surrounding the screw insertion site.



FIXED SCREW INSERTION cont.

Unthread the Screw Body Stabilizer from the screw and remove the Fixed Screw Driver.

Repeat the process until all screws are placed.

Fixed Screws

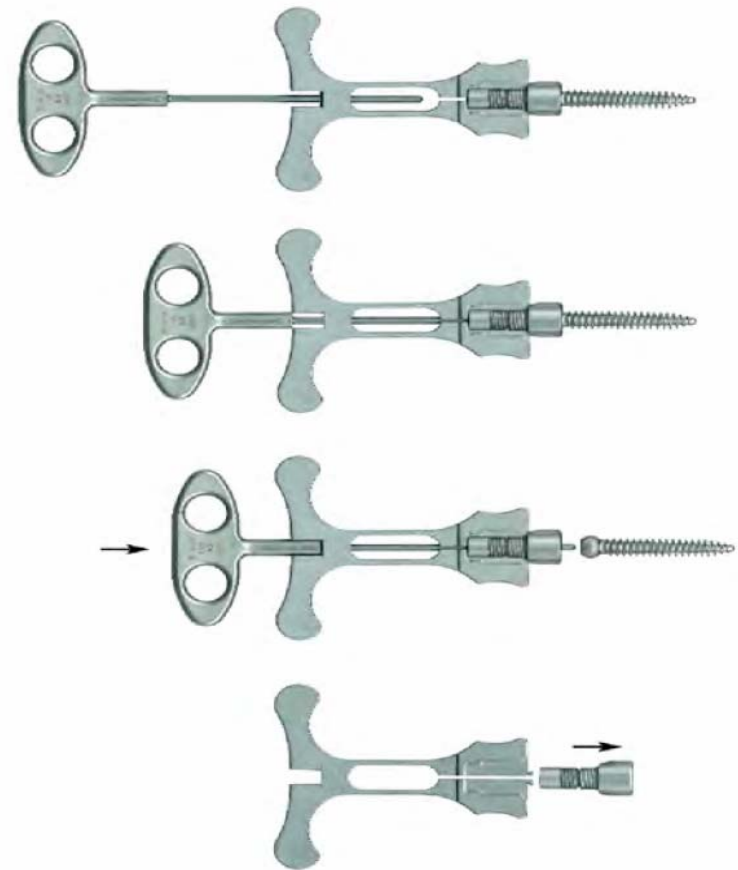
<i>4.5 mm</i>	<i>25-45 mm</i>
<i>5.5 mm</i>	<i>25-55 mm</i>
<i>6.5 mm</i>	<i>30-55 mm</i>
<i>7.5 mm</i>	<i>30-60 mm</i>
<i>8.5 mm</i>	<i>35-55 mm</i>



ALTERNATIVE TECHNIQUE: SCREW INSERTION WITH POLYAXIAL HEADS REMOVED – THE “SNAP” TECHNIQUE

In this alternative technique, pre-assembled polyaxial heads are removed prior to screw insertion, and reattached after completion of the interbody procedure.

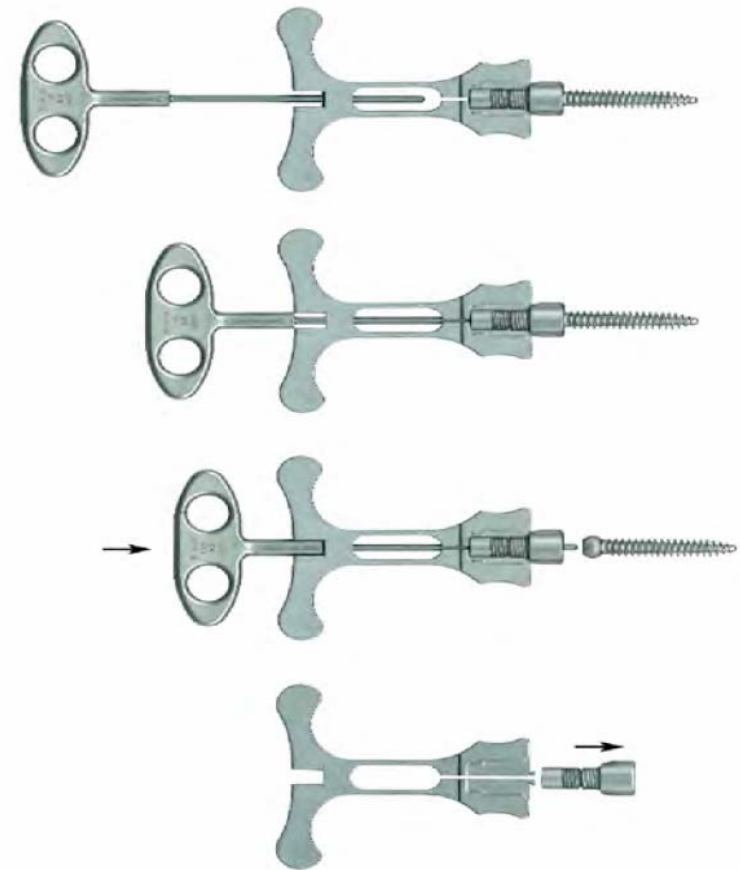
POLYAXIAL SCREW DISASSEMBLY
Remove the polyaxial head from the screw using the Polybody Disassembly Instrument (also called Poly-Popper). Insert the Polybody Disassembly Instrument into the slot of a polyaxial screw and attach. Release the screw from the polyaxial head by inserting and depressing the Push Rod.



THE “SNAP” TECHNIQUE cont.

Note: It is important to reassemble each polyaxial head with the screw from which it was removed.

- Screws, retainers and polyaxial heads are matched during the initial inspection process and lot-tested for interconnection strength per ASTM-F1798-97. Reassembling the correct components maintains the interconnection strength, and more importantly, allows for traceability of components and assemblies.
- Follow these steps to ensure that the appropriate polyaxial heads and screws will be reassembled.
- Disassemble only the required number of polyaxial screws needed to complete the case. For example, disassemble only six screws for a two-level case. Do not disassemble the entire tray of polyaxial screws.
- Segregate disassembled components by screw size. Verify screw length by using the screw length guide provided in the screw tray.



SCREW INSERTION



Assemble the Disassembled Screw Driver Sleeve and the 3.5 mm Disassembled Screw Driver Shaft.

Fully capture the spherical head of the screw inside the Disassembled Screw Driver Assembly.

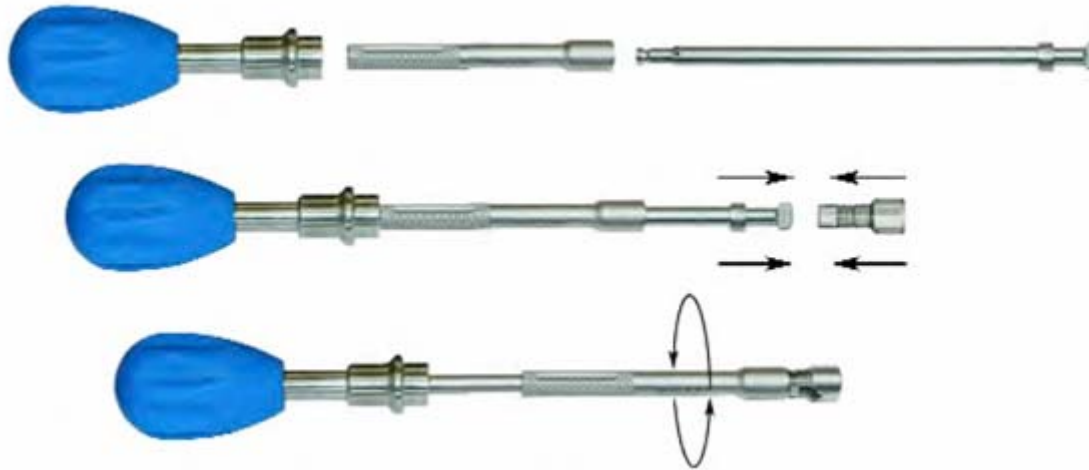
SCREW INSERTION cont.

Insert the screw into the pedicle, leaving one or two threads of the screw above the level of the bone.

The screw can now serve as a low-profile vertebral anchor, and can assist in interbody fusion techniques. Distraction or compression can be applied directly to the spherical screw head.



HEAD REATTACHMENT



Prior to reattachment, verify that the polyaxial head size matches the screw size.

Using the Compact Shaft Inserter, Screw Body Stabilizer and Palm-Style Handle, apply gentle pressure to reattach the polyaxial head to the screw from which it was removed. An audible “snap” indicates assembly.

HEAD REATTACHMENT cont.

To test appropriate polyaxial head attachment, gently pull up on the Palm-Style Handle and check the range of motion.

Attach the remaining polyaxial heads to the screws .



POLYAXIAL SCREW ORIENTATION / ROD PLACEMENT

Place the Compact Shaft Inserter and Screw Body Stabilizer on the polyaxial head, and manipulate each head so that slots on all heads are aligned for the introduction of the 5.5 mm rod.

Select rods of appropriate length.



Straight	Curved	Hex-End
10.0 cm	6.0 cm	10.0 cm
20.0 cm	8.0 cm	20.0 cm
47.0 cm	10.0 cm	47.0 cm



The Silhouette Polyaxial Screw head can be rotated 360° and angulated 60° to facilitate rod placement.

ROD BENDING / PLACING

Place the rod provisionally into each screw and determine the amount of contouring required to achieve the desired sagittal profile.

Contour the rods as needed, using the French Rod Bender. A contoured rod should fit into the bottom of each polyaxial screw body. Use the Rod Holder for optimal rod insertion.



LOCK NUT APPLICATION

Position the lock nut with its flanged edge down. Lower the Lock Nut Starter onto the lock nut and push to snap into place.



LOCK NUT APPLICATION cont.

Slide the Lock Nut Starter with lock nut over the polyaxial screw head.

Note: To reduce the possibility of cross-threading, turn the Lock Nut Starter counterclockwise until you feel a “click.”

Turn the Lock Nut Starter clockwise to start the lock nut.

The lock nut starts easily when properly aligned. If incorrectly aligned, the lock nut will exhibit noticeable resistance during initial threading. If this occurs, back the lock nut completely off the screw and check that it is properly seated in the starter. Attempt to start the lock nut again.

Repeat the process until all lock nuts are placed.



COMPRESSION / DISTRACTION

Provisionally tighten the lock nut on one side of the segment being translated, while leaving the lock nut on the contra-lateral side loose.

Perform compression or distraction against the provisionally tightened assembly.

After achieving the desired amount of correction, perform final tightening of the lock nut.

If compression or distraction against an adjacent segment is not desirable, attach a Rod Clamp to the rod to provide a stable structure against which to compress or distract.



FINAL LOCK NUT TIGHTENING



Initial torque position.



*Final torque position
(100 in-lbs).*

Tighten the lock nut until the two half circles on the Torque Wrench Handle align and form a complete circle (100 in-lbs).



FINAL LOCK NUT TIGHTENING cont.

Repeat the procedure until the remaining lock nuts are tightened.



BREAK-OFF TAB REMOVAL

Insert the cylindrical portion of the Extended-Tab Break-Off Tool between the two tabs. Grasp one tab with the tool and manipulate until it detaches from the implant.

Rotate the tool 180° and remove the second tab in the same manner.

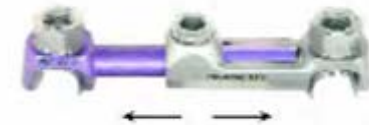
Repeat the procedure until all of the tabs have been removed. Ensure that all removed tabs are accounted for.



TRANSVERSE CONNECTOR PLACEMENT

Transverse Connectors may be used to connect rod segments. Use the Adjustable Transverse Connector Gauge to determine the appropriate Transverse Connector length.

If necessary, loosen the Adjustable Transverse Connector Set Screw to allow free movement of the connector rod in the sleeve.



Adjustable Transverse Connectors are color-coded according to connector length.



Blue 30-40 mm



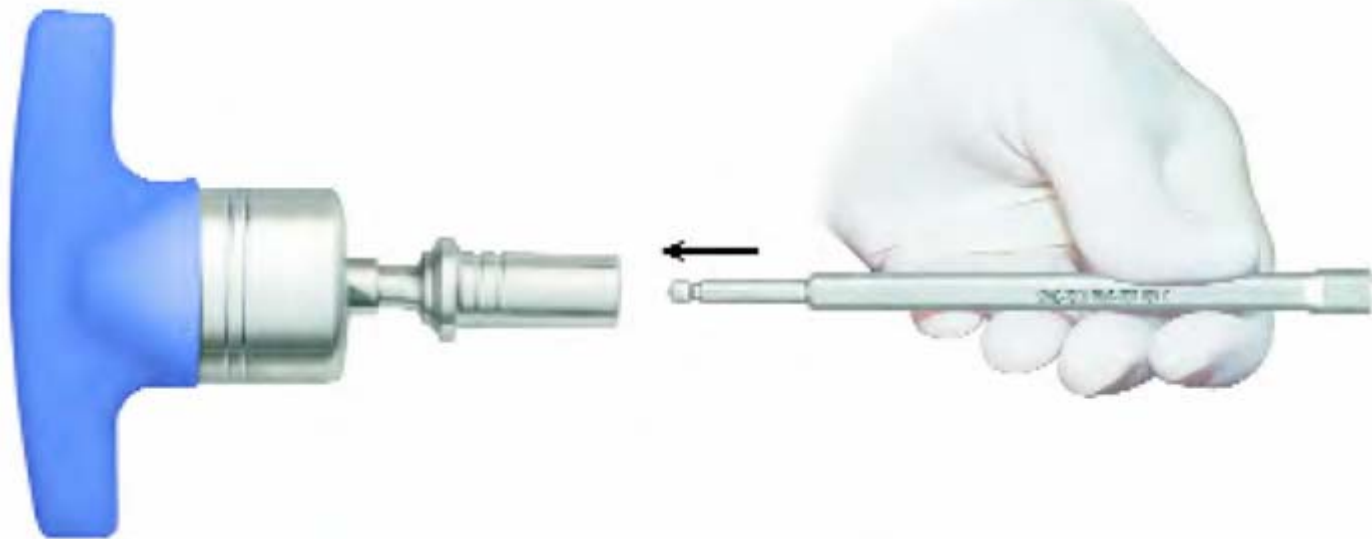
Magenta 40-50 mm



Green 50-60 mm

TRANSVERSE CONNECTOR PLACEMENT cont.

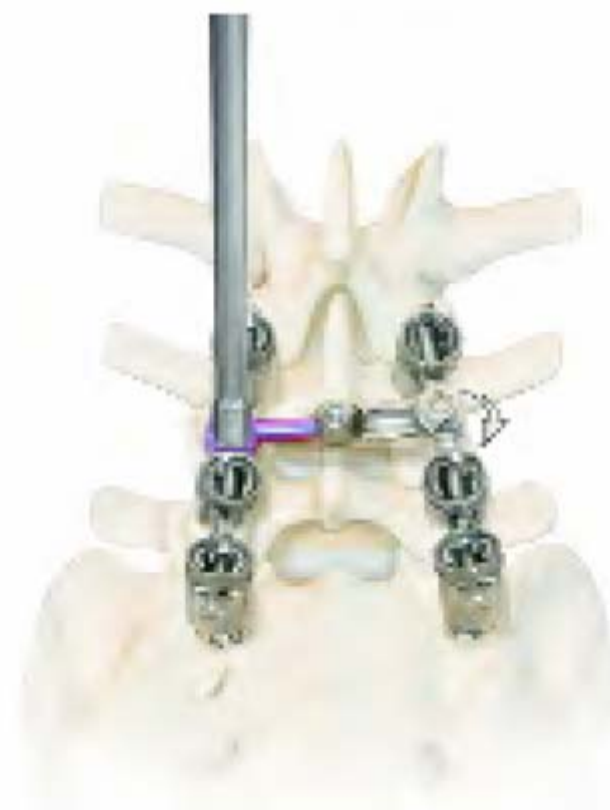
Assemble the 50 in-lb Torque-Limiting T-Handle and the Transverse Connector Nut Driver Shaft.



TRANSVERSE CONNECTOR PLACEMENT cont.

Using the Transverse Connector Nut Driver assembly, snap the connector over one rod and then over the other.

Tighten the nuts until you hear an audible “click” from the (50 in-lb) Torque-Limiting T-Handle.



TRANSVERSE CONNECTOR PLACEMENT cont.

To tighten the set screw of the Adjustable Transverse Connector, use the 50 in-lb Torque-Limiting T-Handle/Set Screw Driver until you hear an audible “click.”



REMOVAL INSTRUMENTS

POLYAXIAL SCREW EXTRACTOR

The Polyaxial Screw Extractor, with universal joint design, provides an alternative to the 3.5 mm Hex Polyaxial Screw Driver or Fixed Screw Driver for removal of a locked polyaxial screw.

Remove locking nuts and rods.

Using the Polyaxial Screw Extractor, engage the polyaxial screw head.

Remove the implant by unscrewing the polyaxial screw counterclockwise.

Repeat the process until all screws are removed.



POLYBUSTER INSTRUMENT ASSEMBLY AND USAGE

Insert the Push Rod into the Cannula.
Thread through until the Push Rod slides freely in the Cannula shaft.

Place the Push Rod into the saddle of the *Silhouette* Polyaxial Screw.

Once the Push Rod is seated in the saddle, thread the Cannula over the polyaxial head.

Thread the Driver into the Cannula.

Provide anti-torque to the Cannula. Rotate the Driver until the implant separates.

The retainer will remain on the head of the polyaxial screw. Orient the retainer so that the 3.5 mm Hex Polyaxial Screw Driver can engage the screw. Remove the polyaxial screw.



The *Silhouette* PolyBuster Instrument removes the polyaxial head to simplify removal of the remaining screw.