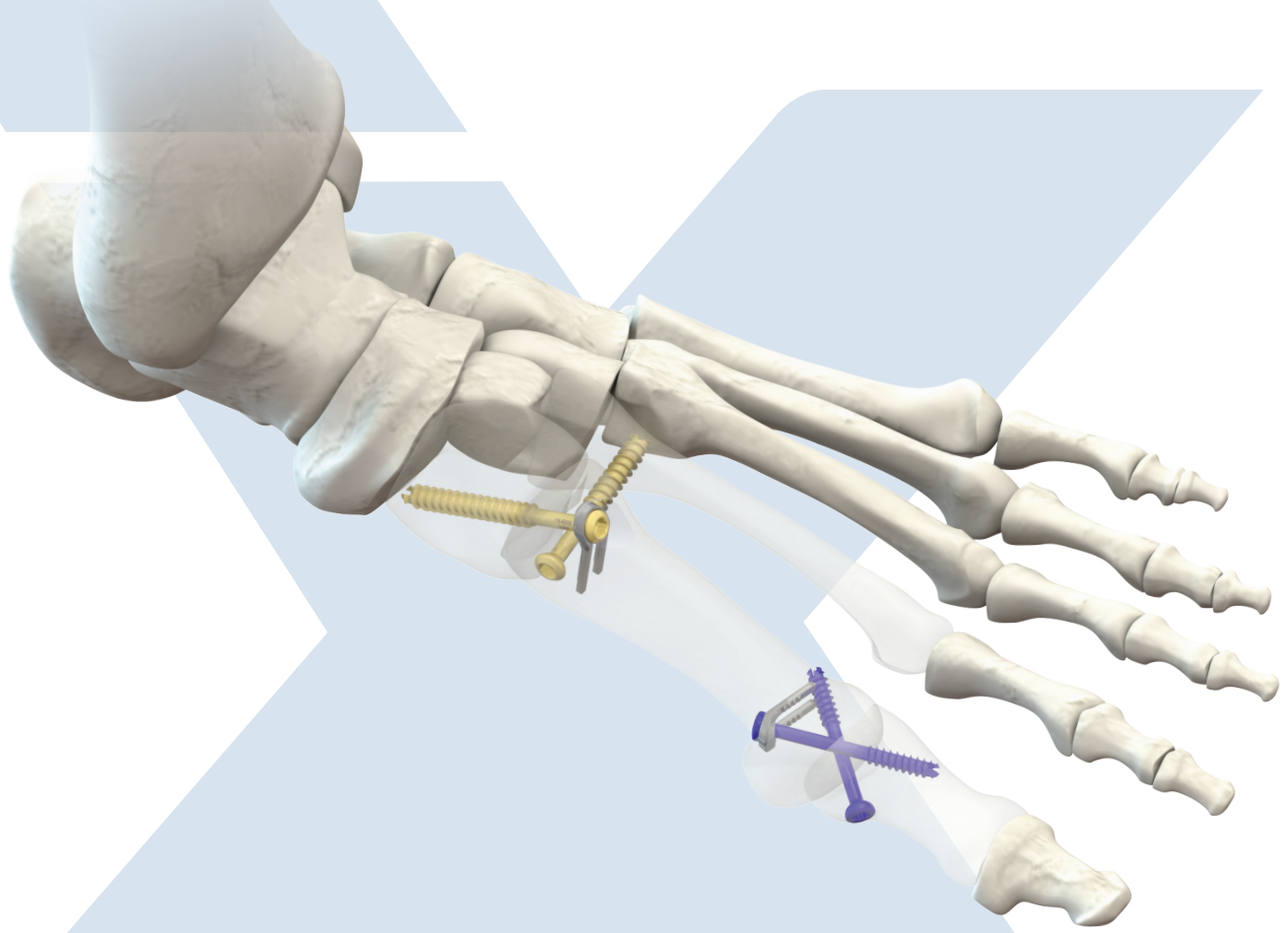


# IO Freedom™

Fusion Fixation



## IO Freedom Surgical Technique

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MEDICAL

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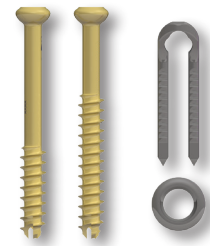
# IO Freedom™

## Fusion Fixation

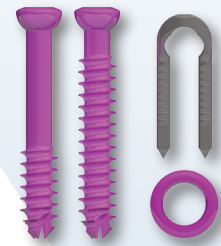
### Implants



3.5mm



4.5mm



6.5mm

Cannulated Short and Long Thread Screws, X-Posts and Screw Washers

### General Instruments



Ratcheting Handle, Medium



Ratcheting Handle, Mini



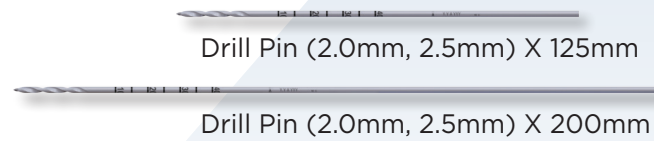
X-Post Inserter



Cleaning Brush



Guidewires — (1.4mm, 1.6mm, 2.0mm)

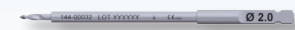


Drill Pin (2.0mm, 2.5mm) X 125mm

Drill Pin (2.0mm, 2.5mm) X 200mm



Joint Preparation Rasp



Fenestrating Drill

### General Instruments

#### 3.5mm Instruments



1.4mm Wire Depth Gauge



2.5mm Cannulated Drill



3.5mm Lag Screw Countersink



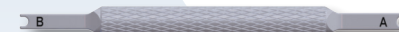
3.5mm X-Post Countersink



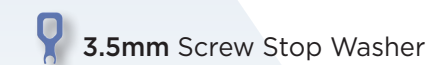
T15 Driver



X-Post Drill Guide, 3.5mm

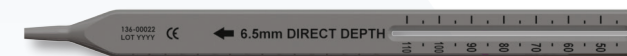


3.5mm Screw Stop Key



3.5mm Screw Stop Washer

#### 6.5mm Instruments



2.0mm Wire Depth Gauge



4.5mm Cannulated Drill



6.5mm Lag Screw Countersink



6.5mm X-Post Countersink

#### 4.5mm Instruments



1.6mm Wire Depth Gauge



3.0mm Cannulated Drill



4.5mm Lag Screw Countersink



4.5mm X-Post Countersink



3.0mm Hex Driver



X-Post Drill Guide, 4.5mm



4.5mm Screw Stop Key



4.5mm Screw Stop Washer



T25 Driver



X-Post Drill Guide, 6.5mm



6.5mm Screw Stop Key



6.5mm Screw Stop Washer

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# IO Freedom™ Surgical Technique Guide

*Indication for use: This Intraosseous Fixation System is intended for reduction and internal fixation of arthrodeses, osteotomies, intra- and extra-articular fractures and nonunions of the small bones and joints of the hand, wrist, foot and ankle, appropriate for the size of the device.*

*This technique guide will illustrate a Lapidus fusion.*

## STEP 1. Exposure and Joint Preparation

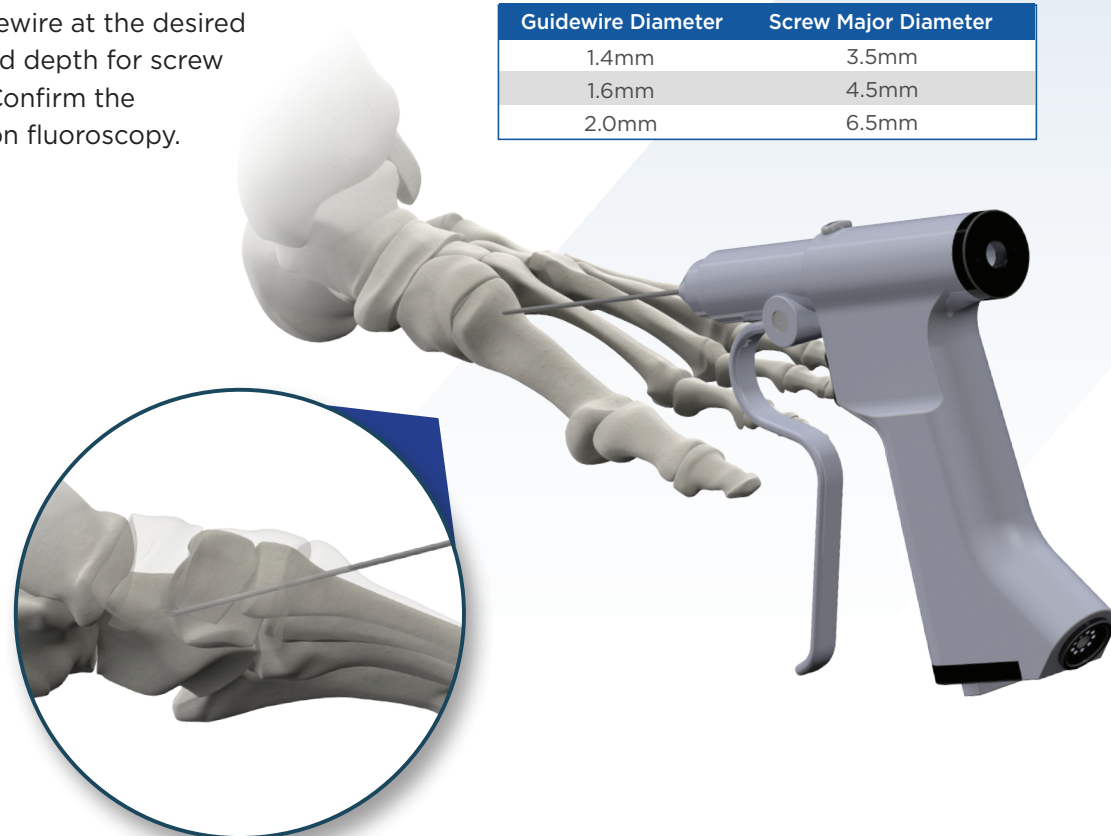
Access the intended fusion site to prepare and reduce the joint as desired. The minimal footprint of the implants and instrumentation of the IO Freedom allows for both standard and MIS approaches for these surgical techniques.

Once the joint surfaces are properly prepared and reduced, provisionally pin the joint so not to interfere with the Screw/X-Post construct. In order to not block compression, it is recommended to remove the provisional fixation prior to the final tightening of the Lag Screw.

## STEP 2. Placement of Guidewire for the Lag Screw

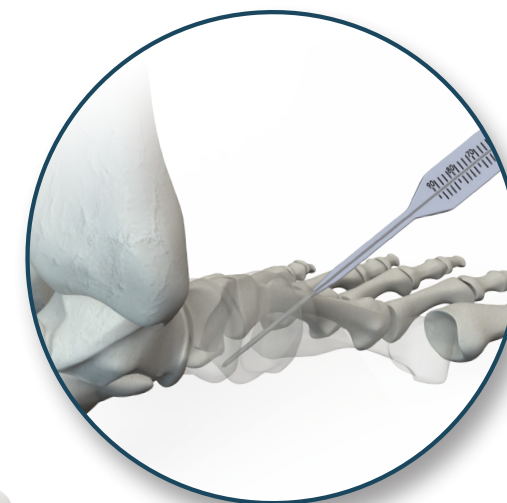
Place a Guidewire at the desired trajectory and depth for screw placement. Confirm the positioning on fluoroscopy.

Guidewire Diameter	Screw Major Diameter
1.4mm	3.5mm
1.6mm	4.5mm
2.0mm	6.5mm



## STEP 3. Determine the Lag Screw Length

Utilizing the appropriately sized wire Depth Gauge, measure the depth of the placed Guidewire to determine the length of the Lag Screw. Note: Each size Lag Screw has available options for both short and long thread lengths. It is recommended to utilize a short-threaded Lag Screw if the starting point of the placement of the screw is more than 15mm from the joint line.

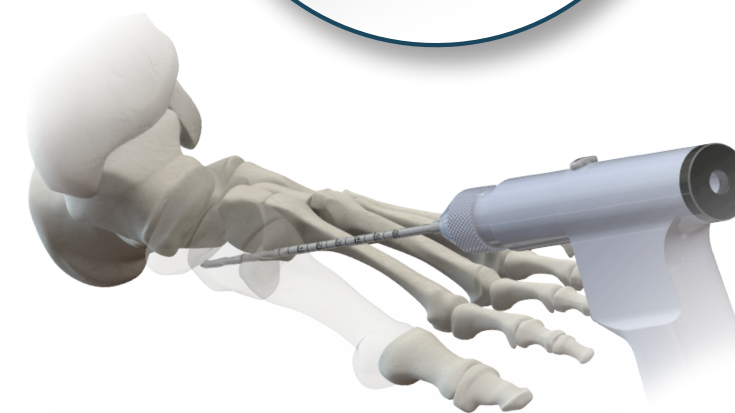


## STEP 4. Drill Screw Pilot Hole

Drill over the placed Guidewire with the appropriately sized drill. The depth of drilling is left up to the surgeon's discretion. Each laser marked line on the drill represents 5mm.

*Note: All IO Freedom screws are self-tapping and self-drilling screws.*

Drill Diameter	Screw Major Diameter
2.5mm	3.5mm
3.0mm	4.5mm
4.5mm	6.5mm

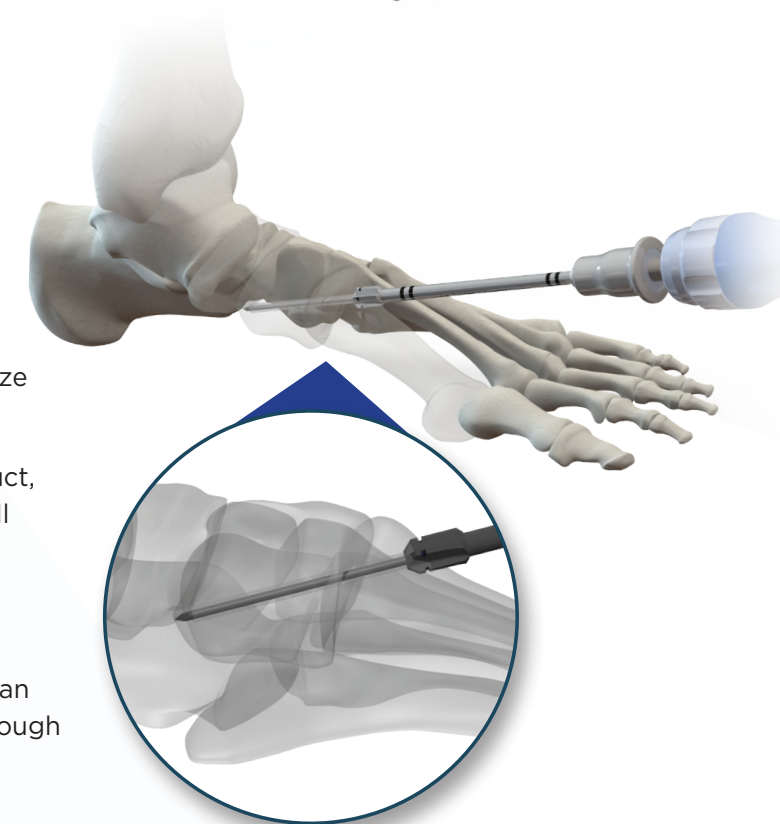


## STEP 5. Countersink

If just placing an independent Lag Screw - utilize the Screw Countersink if desired.

If the intent is to utilize a Screw/X-Post construct, you must use the X-Post countersink, which will create space for the profile of the device.

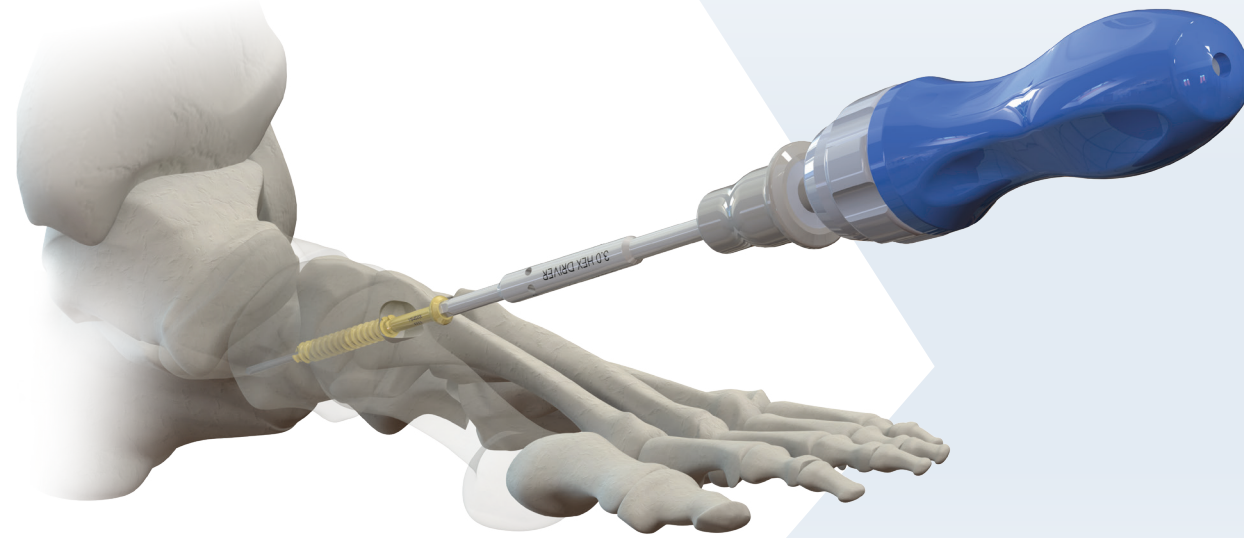
With either of these countersinks, advance the instrument over the Guidewire until the laser marked groove is seated in bone. The groove can be seen under fluoroscopy for visualization through MIS techniques.





### STEP 6. Lag Screw Insertion

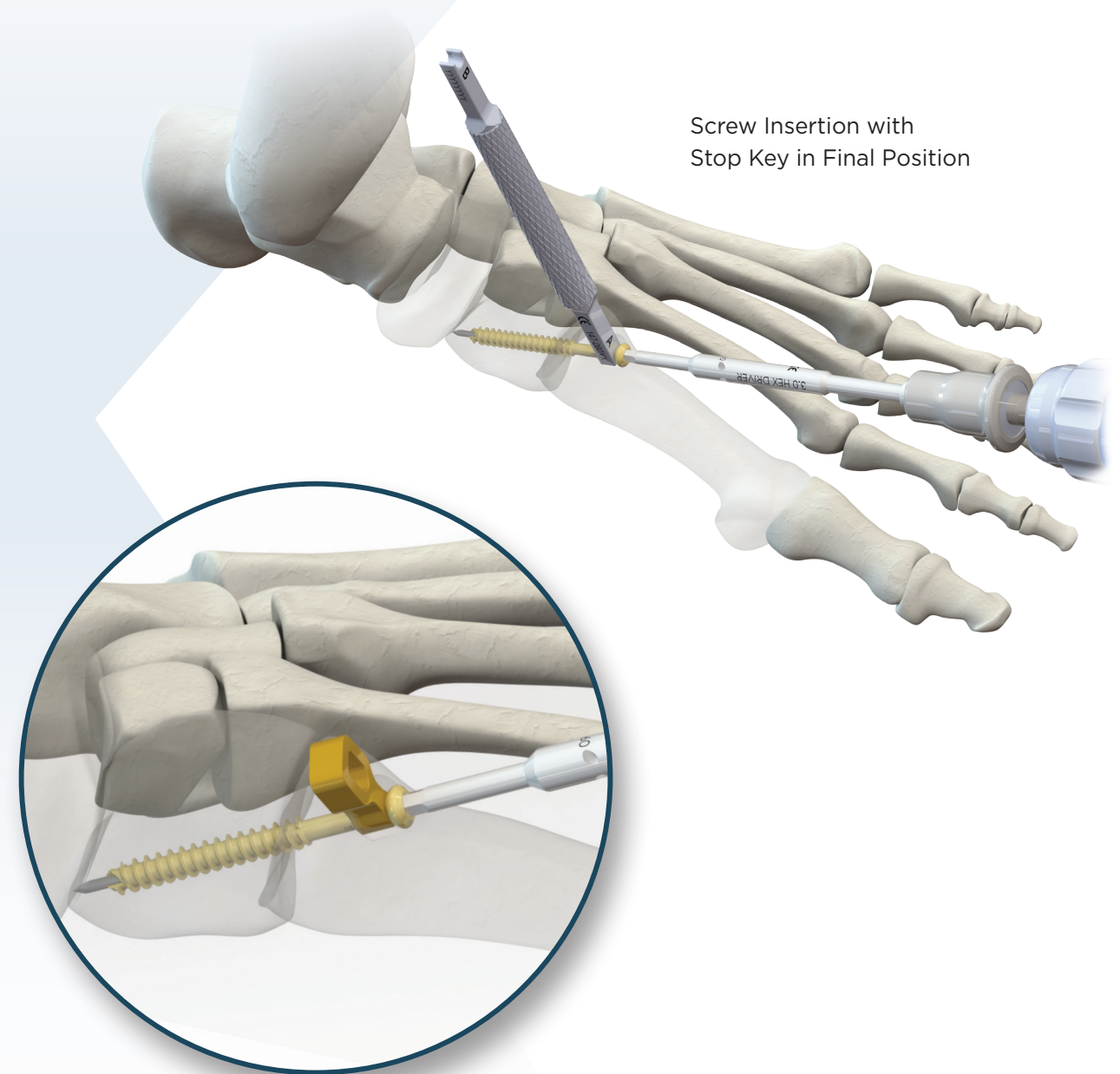
Place the Lag Screw over the Guidewire and insert into the bone.



For the placement of a Screw/X-Post Construct, advance the screw until the Screw Stop Washer (attaches to the screw), or Screw Stop Key (held in place) is flush against the head of the screw and cortex of the bone. This will ensure enough space to allow the X-Post Drill Guide to be adequately seated in the next step.

*Note: If a standard Screw Washer is to be used, this should be placed on the screw prior to screw insertion.*

### Two Options

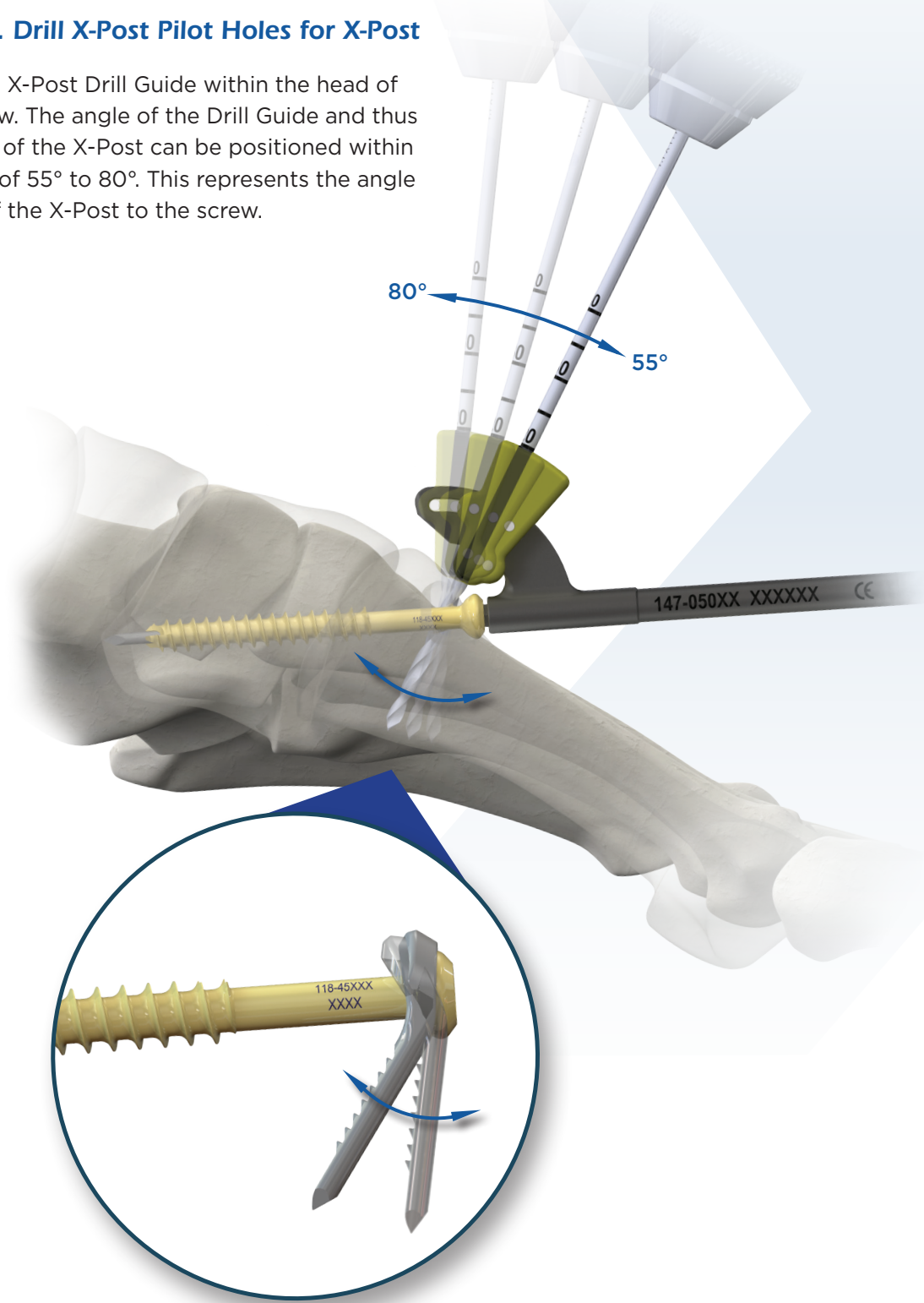


Screw Insertion with Stop Key in Final Position

Screw Insertion with Stop Washer in Final Position

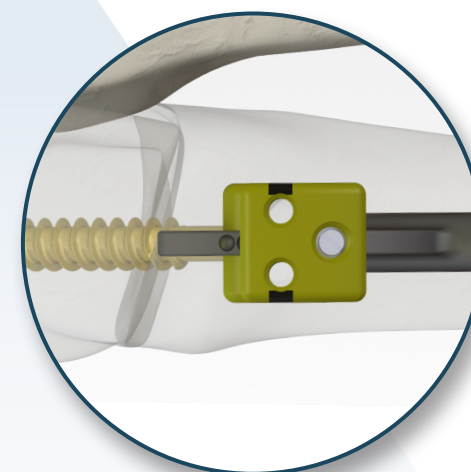
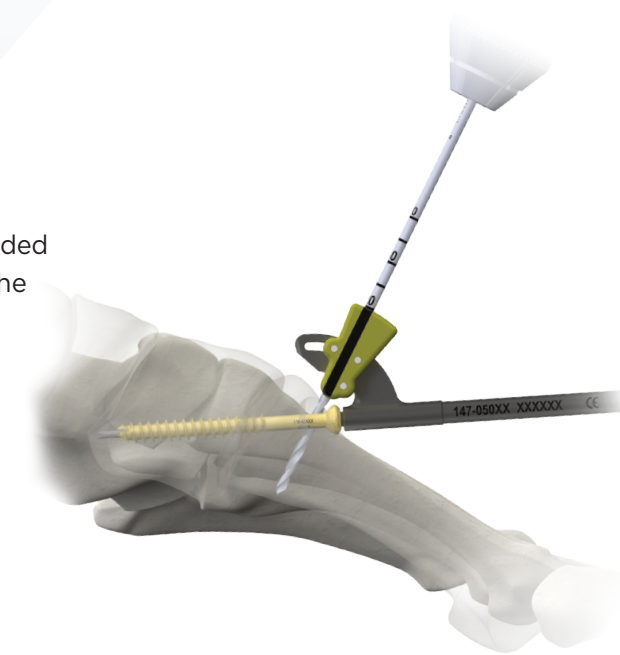
**STEP 7. Drill X-Post Pilot Holes for X-Post**

Seat the X-Post Drill Guide within the head of the screw. The angle of the Drill Guide and thus the legs of the X-Post can be positioned within a range of 55° to 80°. This represents the angle range of the X-Post to the screw.

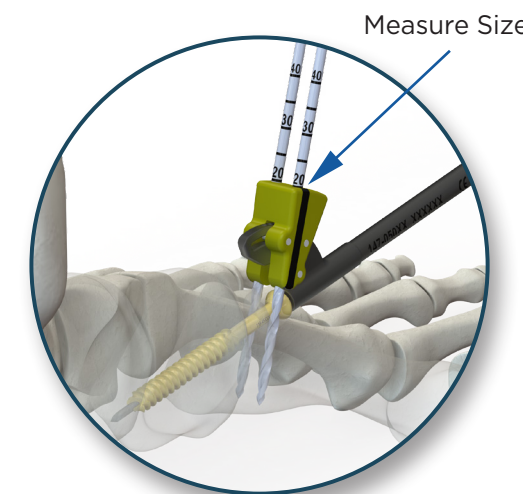


Adjust the Drill Guide's position to the desired position for the X-Post placement. It is recommended to place the legs of the X-Post fairly parallel to the joint surface to optimize compression. The laser line on the side of the drill guide will help to visualize the positioning of the guide prior to placing the Drill Pins.

Advance the appropriately sized Drill Pin at the desired angle to the desired depth for the X-Post legs. It is recommended that the Drill Pins be placed a minimum of ≈ 10mm from the joint-line.



Top View



To avoid interference during Pin placement, place the short Drill Pin (125mm) first.

Verify the position of the Drill Pins with fluoroscopy in both the AP and lateral views. The tip of the Drill Pins will coincide with the desired X-Post

length. Verify that the Drill Pins have been placed in an acceptable angle. They should be positioned on either side of the screw. The length can be determined based on the calibrated measurement of either Drill Pin and the top of the X-Post Drill Guide.

Drill Guide Size	Drill Pin Size
3.5mm	Small (2.0)
4.5mm	Small (2.0)
6.5mm	Large (2.5)

X-Post Size	Leg Length Options
3.5mm	15, 20, 25, & 30mm
4.5mm	15, 20, 25, & 30mm
6.5mm	20, 25, 30, & 35mm



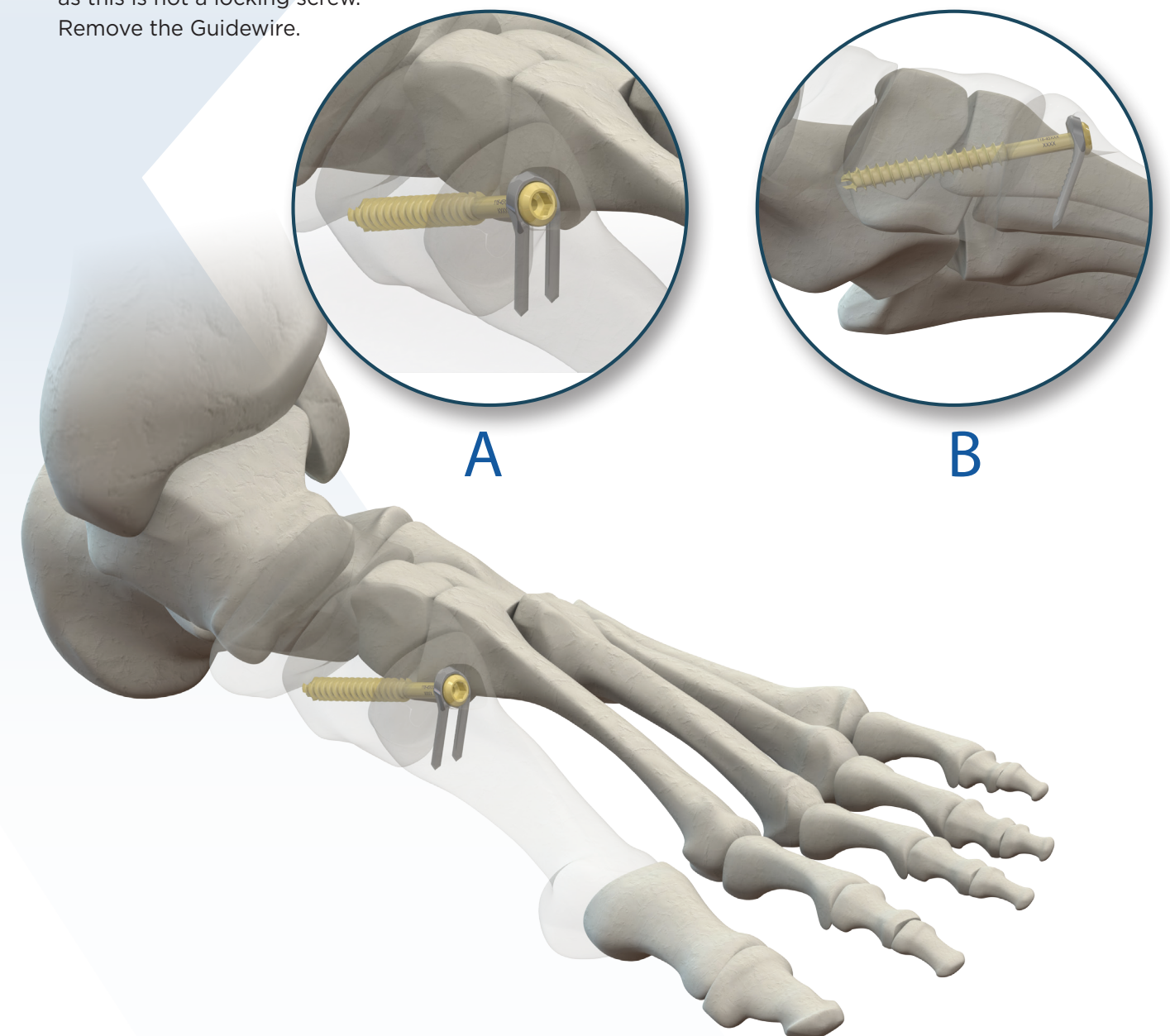
### STEP 8. Insert X-Post

Load the X-Post into the X-Post Inserter by placing the top of the X-Post into the distal end of the Inserter. Lock the X-Post onto the Inserter by turning the top of the Inserter clockwise. Once properly loaded, remove the Drill Guide and Drill Pins. Place the legs of the X-Post into the drilled holes with the arrow on the X-Post Inserter facing the joint. Advance the X-Post until it is approximately 5mm from a fully seated position. Remove the Inserter and tamp the X-Post to the fully seat position.



### STEP 9. Final Tightening of Lag Screw

Once the X-Post is fully inserted, advance the Lag Screw into the screw head recess of the X-Post. The X-Post will act as a “stop” for the screw. Continue to advance the screw until tactile compression is felt. Care should be taken not to over tighten the construct, as this is not a locking screw. Remove the Guidewire.



## IO Freedom Component List: Implants

### Removal Instructions:

It is recommended to remove the Lag Screw prior to removing the X-Post:

#### Lag Screw Removal

Clear any tissue or bony ingrowth from the screw head. A Guidewire may be introduced into the cannulation for guidance of the implant driver. Insert the Driver into the screw and back out the screw by turning counterclockwise.

#### X-Post Removal

Expose the site and bridge of the X-Post. If the X-Post is recessed, use an elevator to lift the implant bridge. Reattach the X-Post Inserter or utilize forceps to remove the implant by tamping outward.

### IO Freedom X-Posts

Part #	Description
147-35815	3.5mm FREEDOM X-Post 15mm
147-35820	3.5mm FREEDOM X-Post 20mm
147-35825	3.5mm FREEDOM X-Post 25mm
147-35830	3.5mm FREEDOM X-Post 30mm
147-45815	4.5mm FREEDOM X-Post 15mm
147-45820	4.5mm FREEDOM X-Post 20mm
147-45825	4.5mm FREEDOM X-Post 25mm
147-45830	4.5mm FREEDOM X-Post 30mm
147-65820	6.5mm FREEDOM X-Post 20mm
147-65825	6.5mm FREEDOM X-Post 25mm
147-65830	6.5mm FREEDOM X-Post 30mm
147-65835	6.5mm FREEDOM X-Post 35mm

### IO Freedom Washers

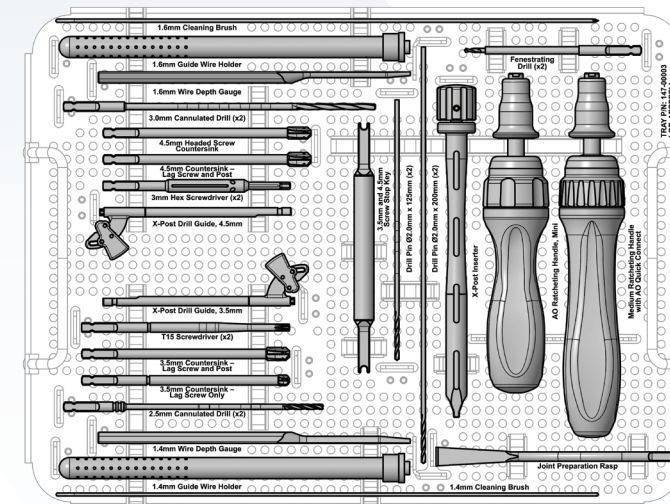
Part #	Description
147-35600	3.5mm Screw Washer
148-35451	4.5mm Screw Washer
147-65600	6.5mm Screw Washer

### IO Freedom Reusable Instruments

Part #	Description
101-00009	Guidewire Holder - 1.6mm
118-00030	3.0mm Hex Driver
118-02039	Ratcheting Handle, medium
101-00010	1.6mm Wire Depth Gauge
132-00214	1.4mm Guidewire Holder
136-00006	2.0mm Guidewire Holder
136-00022	2.0mm Wire Depth Gauge
136-00024	T25 Driver
144-00013	1.4mm Wire Depth Gauge
144-00015	T15 Driver
147-01000	X-Post Inserter
147-05035	X-Post Drill Guide, 3.5mm
147-05045	X-Post Drill Guide, 4.5mm
147-05065	X-Post Drill Guide, 6.5mm
147-06043	3.5mm and 4.5mm Screw Stop Key
147-06064	4.5mm and 6.5mm Screw Stop Key
148-02039	Ratcheting Handle, mini

### IO Freedom Disposable Instruments

Part #	Description
101-00006	1.6mm Guidewire
101-00023	1.6mm Cleaning Brush
118-02030	3.0mm Cannulated Drill
118-02045	4.5mm Lag Screw Countersink
147-02012	Drill Pin, 2.0 x 125mm
147-02020	Drill Pin, 2.0 x 200mm
147-02512	Drill Pin, 2.5 x 125mm
147-02520	Drill Pin, 2.5 x 200mm
130-02200	2.0mm Cleaning Brush
136-00005	2.0mm Guidewire
136-00145	4.5mm Cannulated Drill
144-00012	3.5mm Lag Screw Countersink
144-00014	1.4mm Guidewire
144-00025	2.5mm Cannulated Drill
147-00023	1.4mm Cleaning Brush
147-01035	3.5mm X-Post Countersink
147-01045	4.5mm X-Post Countersink
147-01065	6.5mm X-Post Countersink
147-03065	6.5mm Lag Screw Countersink
147-07035	3.5mm Lag Screw Stop Washer
147-07045	4.5mm Lag Screw Stop Washer
147-07065	6.5mm Lag Screw Stop Washer
144-00032	Fenestrating Drill
144-00030	Joint Preparation Rasp







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a smarter approach for fusion.  
Period.

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