



SURGICAL TECHNIQUE

Product by

Fusion
ORTHOPEDICS

This technique offers recommendations for the use of the ***Revolution External Plating System***.

The surgeon user must consider the needs of each patient and build the construct accordingly.

All devices must be sterilized before surgery.

Sterilization instructions can be seen in the Instructions for Use.

For complete product listing please refer to pocket guide.

Please contact your local Metalogix representative for further questions.

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1. INDICATIONS ,CONTRAINDICATIONS AND WARNINGS

INDICATIONS

The **Revolution** External Plating System is indicated for treatment of a variety of broken or deformed bones:

- Stabilizes open and/or unstable fracture of complex proximal and/or distal tibial fractures
- Fusions of the joints and bone (hand, foot, long-bone)
- Correction of bone or soft tissue deformities
- Correction of segmental or non-segmental bone, soft tissue defects or bone loss
- Neutralization of fractures stabilized with limited internal fixation
- Adult and Pediatric subgroups except newborns

CONTRAINDICATIONS

The **Revolution** External Plating System is NOT designed or sold for any use except as indicated. Use of the system is contradicted in the following situations:

- Patient with compromised immune system
- Non-compliant patient who would not be able to ensure proper frame adjustment or wire and pin care
- Any fracture, where rigid fixation or reduction cannot be achieved by means of external fixation
- Patient with metal allergy

MRI SAFETY INFORMATION

The **Revolution** External Plating System has not been evaluated for safety and compatibility in the MR environment. It has not been tested for heating, migration, or image artifact in the MR environment. The safety of the **Revolution** External Plating System in the MR environment is unknown. Scanning a patient who has this device may result in patient injury.

LOAD-BEARING INFORMATION

It is recommended to use a minimum of three (3) struts and 5mm or 6mm Half-Pins for weight bearing.

PEDIATRIC WARNING

Particular care should be taken that wires and half-pins do not enter the joints or damage the growth plates in children.

NOTE: Please refer to product Instructions For Use (IFU) for more information. IFU can be downloaded at www.metalogixortho.com

All products are single-use except for instruments (Trocar & Sheath, Wire Tensioner, T-Handle, and all Wrenches)

INDICATIONS ,CONTRAINDICATIONS AND WARNINGS

WARNINGS

The correct selection of device components is extremely important. The appropriate type and size should be selected for the patient based on injury, weight, compliance, etc.

Pre-Operation or preliminary assembly of the External Plating System is recommended to reduce operative times and to assure an adequate supply of components prior to surgery.

Intraoperative fracture or instrument breakage can occur. Instruments which have been used extensively or with excessive force are susceptible to fracture. Examine all instruments for wear and damage prior to surgery and replace where necessary. Single use devices should not be reused due to risks of breakage, failure, or patient infection.

Medial or lateral, anterior or posterior translation may occur if the body of the fixator is not placed parallel to the diaphysis.

Wire and pin placement requires strict anatomical consideration to avoid damage to nerves, muscles, tendons, and vessels. Wires should be gently pushed through soft tissue, not drilled, to reduce the possibility of soft tissue injury.

Half-Pin or Wire drilling through the bone should be done slowly to avoid heat necrosis of surrounding tissues and bone.

Use caution when handling the sharp tips of Wires or Half-Pins. The tips of the Wire or end of the Half-Pin should be held when they are being clipped off. Eye protection is recommended for operating room personnel.

Pin/Wire site care is crucial in reducing infections.

Periodic postoperative follow-up and radiographs are recommended.

Any device inserted into the patient, such as: Half-Pins, Wires, Drill Bits, and in general any device which is labeled **“SINGLE USE ONLY”** MUST NOT BE REUSED.

NOTE: Please refer to product Instructions For Use (IFU) for more information. IFU can be downloaded at www.metalogixortho.com

All products are single-use except for instruments (Trocar & Sheath, Wire Tensioner, T-Handle, and all Wrenches)

2. INTRODUCTION

The **Revolution External Plating System** allows for a wide variety of external fixation constructs. The plates are secured to the bone by placement of tension wires or **HALF-PINS**. Plate configurations can be placed below or above the injury and can be attached to the other plates by **THREADED RODS** or the **SUPER STRUTS**. The combination of components can be adjusted to multiple angles by unlocking and locking the **SUPER STRUTS**. The **Revolution System** provides a ridged fixation solution for destabilized tissue and/or bone.

The principles of Ilizarov are preserved throughout the **Revolution System** but have been refined to improve surgical access and operative time. The **Revolution External Plating System** is designed to serve surgeons and improve the patient experience. The system was created in San Antonio, Texas.



3. ADVANTAGES

SIMPLICITY

- All plates are marked with an anterior, medial, and lateral symbol. All plates are marked with stars to indicate the positions are 45 degrees from the anterior.
- **Revolution** offers pre-assembled frames specified by the user.
- **Revolution SUPER STRUTS** only require one bolt manipulation for quick adjustments.
- **Revolution SUPER STRUTS** offer **SPEED NUTS** to simplify attaching the strut to the plate or other mounting devices.
- **Revolution WIRES** have cold forged tips and hold a cutting edge, potentially reducing the risk of thermal necrosis.
- **Revolution HALF-PIN FIXATION BOLTS** hold the **TROCAR & SHEATH** for all **HALF-PIN** sizes.
- **Revolution WIRE FIXATION BOLTS** have machined serrations to clamp onto the wire. Markings allow the surgeon to see which side of the bolt to place the wire .
- **Revolution FOOT-PLATES** come with marked dedicated holes for the **WALKER RAILS**.
- **WALKER RAILS** are one size fits all.

STABILITY

- **PLATES** are anodized and made from Aluminum 6061 T6.
- **HALF-PINS** and wires are made from biocompatible 316 LVM StainlessSteel.
- The locking nut on the **SUPER STRUT** will lock the fine adjustment in its location.
- **WIRE FIXATION BOLTS** will have reduced bending when wire is being tensioned. Stress on the bolt will be reduced when used in combination with the **SPHERICAL NUT**.

PATIENT COMFORT

- All **PLATES** are open to allow comfort for the patient when lying down. This will allow room for patient anatomy to swell in an open space.
- Fewer plate sizes are needed because the **PLATES** are open. **REVOLUTION PLATES** come in **120mm, 140mm, 160mm, 180mm, 200mm, and 220mm** inner diameter sizes.
- Different plate shapes allow for the best treatment. **REVOLUTION PLATES** come in **n-PLATE, C-PLATE, J-PLATE, I-PLATE, and FOOT PLATE**.
- **SUPER STRUTS** can be angled up to 90°
- **SUPER STRUTS** have simplified identification markings on the fine adjustment nut to allow the user to easily adjust by hand or with a Standard 10mm Wrench.
- **WALKER RAIL** is designed to have the same arch as the human foot.

4. DEVICE DESCRIPTION - PLATES

n-PLATE

Sizes available in 120, 140, 160, 180, 200, and 220mm InnerDiameter

J-PLATE

Sizes available in 120, 140, 160, 180, and 200mm InnerDiameter

C-PLATE

Sizes available in 120, 140, 160, 180, and 200mm InnerDiameter

I-PLATE

Sizes available in 135, 195, and 244 mm long and 30mm wide (**NOT in Trays and must be requested**)

FOOT-PLATE

Sizes available in 120, 140, 160, 180, 200mm InnerDiameter (**200mm NOT in Trays and must be requested**)

Revolution External Plates are made from high strength anodized Aluminum 6061 T6. All plates are open to provide patient comfort. All plates will eliminate the minimum spacing between itself and limb when post-op swelling occurs.

Double row holes allow freedom of hardware placement and extra strength. The plates are marked on the side with the inner diameter size. There are medial and lateral line markings, as well as star markings to symbolize 45 degrees from the anterior.



n-PLATE

C-PLATE

J-PLATE

I-PLATE

DEVICE DESCRIPTION - PLATES

FOOT PLATES:

Revolution FOOT PLATES are made from high strength anodized Aluminum 6061 T6. All **FOOT PLATES** have triple row holes to allow surgeons freedom in hardware placement. The posterior marking is in the shape of a triangle. The **FOOT PLATES** are marked on the side with the inner diameter size. There are also star markings to symbolize 45° from the posterior. The white circular holes in the corners are dedicated holes for the **WALKER RAIL**. The ends are tapered to accept a standard 6mm threaded component.



NOTE: The **WHITE CIRCLE** holes are for mounting the Walker Rail. Nothing should occupy these holes.

Sizes available: 120mm, 140mm, 160mm, 180mm, and 200mm **INNER DIAMETER** (200mm available upon request).

DEVICE DESCRIPTION - PLATES

WELDED **STACKED** PLATE TIBIAL BLOCK

THE *REVOLUTION* EXTERNAL FIXATION SYSTEM FEATURES PREASSEMBLED FRAME OPTIONS.

Welded Stacked Plate Tibial Block x 120mm

- Proximal Plate- C-Plate x 120mm
- Distal Tibial Plate- n-Plate x 120mm
- Foot Plate x 120mm

Welded Stacked Plate Tibial Block x 160mm

- Proximal Plate- C-Plate x 160mm
- Distal Tibial Plate- n-Plate x 160mm
- Foot Plate x 160mm

Welded Stacked Plate Tibial Block x 140mm

- Proximal Plate- C-Plate x 140mm
- Distal Tibial Plate- n-Plate x 140mm
- Foot Plate x 140mm

Welded Stacked Plate Tibial Block x 180mm

- Proximal Plate- C-Plate x 180mm
- Distal Tibial Plate- n-Plate x 180mm
- Foot Plate x 180mm

Tibial block height is **60mm**.

The frame can be configured by positioning the **SUPER STRUTS** into the desired location.

The **FORE-FOOT BRIDGE** height can be adjusted to allow better visibility when using fluoroscopy. The **WALKER RAILS** ship separately and are not to be sterilized.

All three (3x) posts are permanently fixed in all welded tibial blocks.



NOTE: The **STACKED TIBIAL BLOCK** post placements are permanent and cannot be moved. These were strategically placed to achieve the highest stability possible. See above figure.

DEVICE DESCRIPTION - PLATES

WELDED **CASCADE** PLATE TIBIAL BLOCK

THE *REVOLUTION* EXTERNAL FIXATION SYSTEM
 FEATURES PRE-ASSEMBLED FRAME OPTIONS.

Welded Cascade Plate Tibial Block x 120/140mm

- Proximal Plate- n-Plate x 140mm
- Distal Tibial Plate- n-Plate x 120mm
- Foot Plate x 120mm

Welded Cascade Plate Tibial Block x 140/160mm

- Proximal Plate- n-Plate x 160mm
- Distal Tibial Plate- n-Plate x 140mm
- Foot Plate x 140mm

Welded Cascade Plate Tibial Block x 160/180mm

- Proximal Plate- n-Plate x 180mm
- Distal Tibial Plate- n-Plate x 160mm
- Foot Plate x 160mm

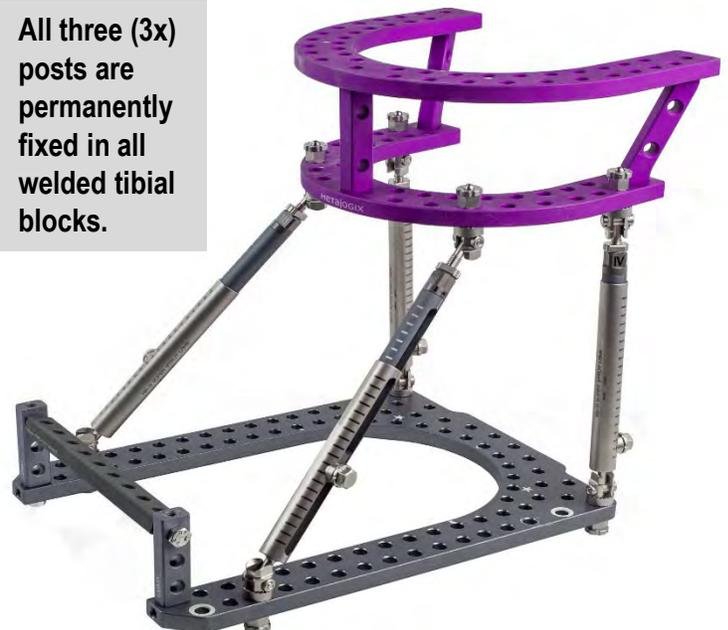
Welded Cascade Plate Tibial Block x 180/200mm

- Proximal Plate- n-Plate x 200mm
- Distal Tibial Plate- n-Plate x 180mm
- Foot Plate x 180mm

Tibial block height is **60mm**.

The frame can be configured by positioning the **SUPER STRUTS** into the desired location. The **FORE-FOOT BRIDGE** height can be adjusted to allow better visibility when using fluoroscopy. The **WALKER RAILS** ship separately and are not to be sterilized.

All three (3x) posts are permanently fixed in all welded tibial blocks.



NOTE: The **CASCADE TIBIAL BLOCK** post placements are permanent and cannot be moved. These were strategically placed to achieve the highest stability possible. See above figure.

DEVICE DESCRIPTION - ACCESSORY

WALKER RAIL:

The **WALKER RAIL** is profiled to follow a natural gait achieving the best walking motion for the patient.. As a result, the anterior and posterior shoe ends feature different angled slopes. One **WALKER RAIL** fits all **FOOT PLATE** sizes. There are dedicated **WALKER RAIL** mounting holes on the **FOOT PLATES** which are identified by a white circle around the dedicated holes. Either a 14mm or 20mm **STANDARD BOLT** should be used to attach the **WALKER RAIL** to the **FOOT PLATE**.



NOTES: Do NOT steam sterilize WALKER RAILS. They are NOT offered sterile and must be applied post-operatively. Use caution when walking on wet surfaces.

Two (2) WALKER RAILS must be used with each frame construct.

DEVICE DESCRIPTION - BOLTS

STANDARD BOLTS:



STANDARD BOLTS are made from stainless steel and feature a standard M6 thread and a 10mm hex head. Sizes available in 14, 20, and 30mm lengths

WIRE FIXATION BOLT:



WIRE FIXATION BOLTS are made from stainless steel. A tight tolerance shoulder is designed to distribute the bending load of the bolt when being tensioned. The bolt offers a serrated 2.0mm wire v-slot to keep the wire from loosening. The top of the bolt is marked with a black line across the top indicating the location of the wire slot. The bolt has a 10mm hex head allowing more wrench placement for counter-torque.

NOTE: Recommended to use with the Spherical Nut

WIRE FIXATION BOLT - LONG (*not pictured*) has the same characteristics of the **WIRE FIXATION BOLT** and features a hole in the center for wire placement through the center of the bolt.

HALF-PIN BOLT:



The **Revolution HALF-PIN BOLT** is made from stainless steel. The **STANDARD 10mm WRENCH** can fit the hex head for counter-torque. The **HALF-PIN BOLT** allows for a 4, 5, or 6mm **HALF-PINS** to be used along with the **TROCAR & SHEATH**. The bolt comes preassembled with a clamping washer. The washer has teeth on both sides to add grip strength.

NOTE: Do NOT fully tighten the bolt when using the Trocar & Sheath. The bolt could possibly impinge into the Trocar & Sheath if too much torque is applied. Only fully tighten bolt after Trocar & Sheath is removed.

DEVICE DESCRIPTION - HARDWARE

POSTS:



Revolution POSTS are made from stainless steel. They have a 10mm by 15mm cross-section. The 15mm surface allows for maximum area for mounting pins or bolts. All posts contain serrations at the base to prevent screw loosening. When fixed to any of the plates, a 14mm or 20mm **STANDARD BOLT** can be used.

Sizes available in 1, 2, 3, 4, and 5 holes

FORE-FOOT BRIDGE:



Revolution FORE-FOOT BRIDGES are made from stainless steel. They have a 10mm by 15mm cross-section. Every **FOOT PLATE** size will have a dedicated **FORE-FOOT BRIDGE** size. All bridges contain serrations at the ends to prevent screw loosening.

Sizes available for fitting to a 120, 140, 160, 180, and 200mm **FOOT PLATE**.

PLATE EXTENDERS:



Revolution PLATE EXTENDERS are made from stainless steel. A Standard 10mm Wrench can fit on the plate to achieve counter-torque.

Sizes available in 30mm and 50mm lengths

NOTE: It is recommended to use a washer when either a wire or Half-Pin will be placed in the slotted area.

THREADED RODS:



Revolution M6 THREADED RODS are made from stainless steel. They have rounded ends to eliminate any risk of sharp burrs.

Sizes are available in 40mm, 60mm, 120mm, 160mm, 200mm, 220mm, 240mm, 300mm, and 400mm overall length.

NOTE: 200 - 400mm lengths are **NOT** in trays and are available upon request.

DEVICE DESCRIPTION - HARDWARE

HINGES:

Revolution HINGES are made from stainless steel. They can be combined to create hinge movements in space. They can also be connected to **THREADED RODS** and **POSTS** to create a wide range of simple hinged assemblies.



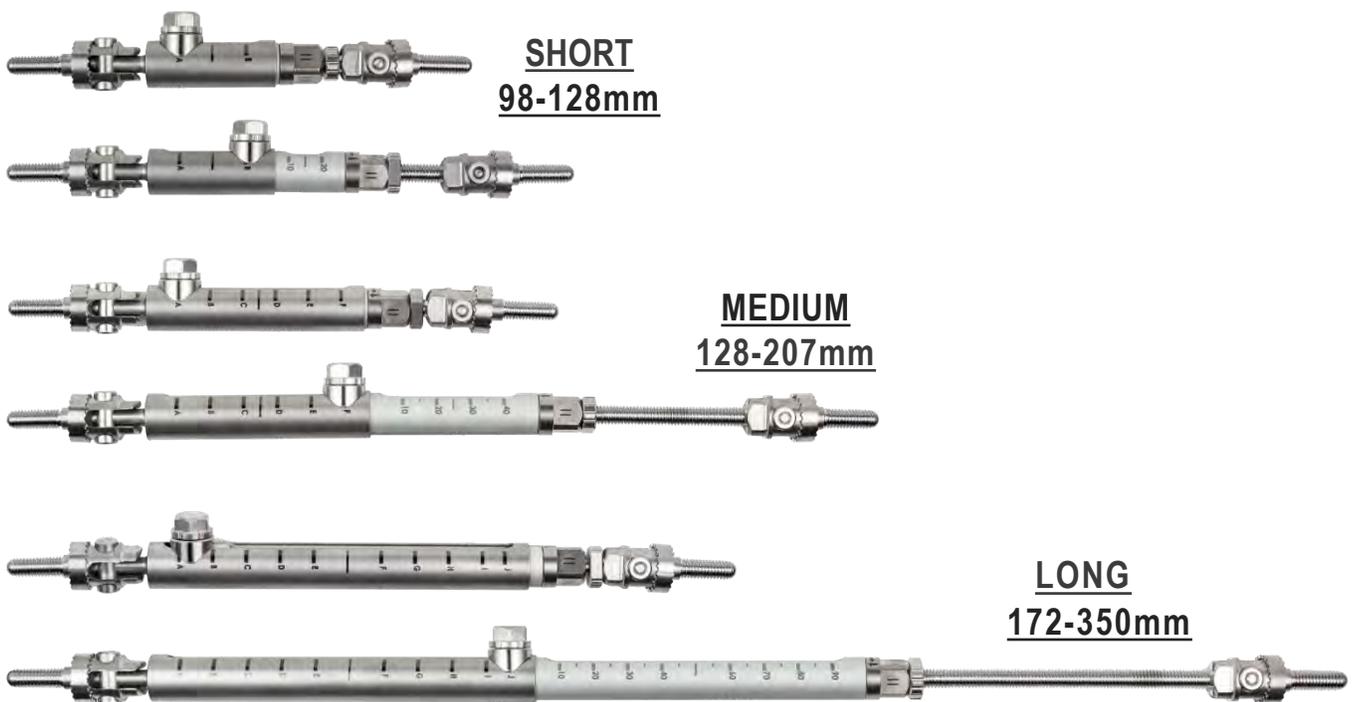
NOTE: It is recommended to reinforce the HINGES with STANDARD NUTS when attaching to THREADED RODS or POSTS.

DEVICE DESCRIPTION - HARDWARE

SUPER STRUTS:

- SUPER STRUT -SHORT
- SUPER STRUT - MEDIUM
- SUPER STRUT -LONG

Revolution SUPERSTRUTS allow the surgeon to simplify the frame assembly. The struts can be micro adjusted by distraction or compression. Each adjustment point is marked with Roman numerals. Each turn to the next Roman numeral corresponds to $\frac{1}{4}$ mm of compression or distraction. One full turn equals 1mm of movement. The hinge movement on the ends are able to move to any desired angulation and can be locked.



NOTES: For maximum stability, it is NOT recommended to angle the struts to 90 degrees.

SUPERSTRUTS are attached to the plates using the SPEED NUTS for quick locking. Have the hex oriented towards the plate.

Tightening sequence should be nut, nut, then bolt.

Quick adjust bolt should face out when assembled to construct for easy access.

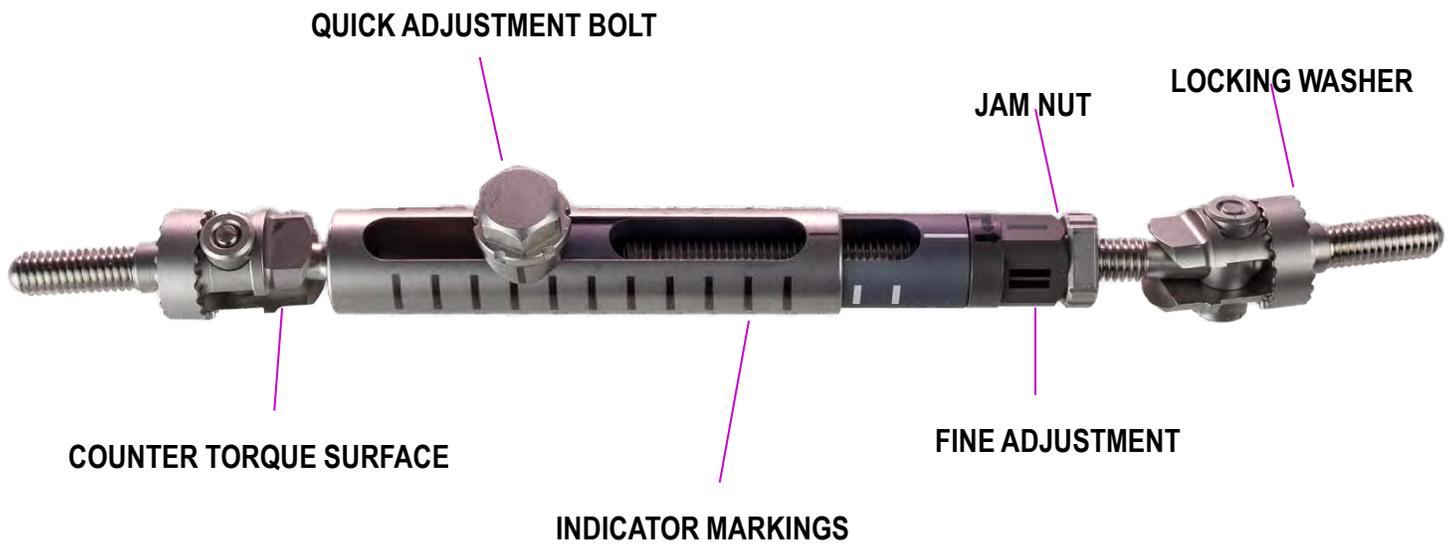
DEVICE DESCRIPTION - HARDWARE

SUPER STRUTS:

- SUPER STRUT - SHORT
- SUPER STRUT - MEDIUM
- SUPER STRUT - LONG



NOTE: For maximum stability, it is NOT recommended to angle the struts to 90 degrees.



DEVICE DESCRIPTION - HARDWARE

SUPER STRUTS:

SUPER STRUTS come loosely pre- assembled giving the surgeon the ability to mount the frame to the limb. Once proper alignment is achieved, lock the two end nuts and then the quick adjust bolt.



NOTE: The middle strut will not be pre-assembled. The surgeon will place it once they find the proper alignment.



DEVICE DESCRIPTION - NUTS

STANDARD NUT X 10 MM:



Revolution **STANDARD NUT** (10mm -M6X1mm) is made from stainless steel.

SPHERICAL NUT X 10 MM:



Revolution **SPHERICAL NUT** (10mm - M6X1mm) is made from stainless steel. The spherical radius on the surface of the nut distributes bending forces on the **WIRE FIXATION BOLTS** when being tensioned. The **SPHERICAL NUT** can also be combined with a **SPHERICAL WASHER** to allow a maximum of 12° angulation on **THREADED RODS**

SPHERICAL WASHER:



NOTE: To take advantage of the **SPHERICAL NUT X 10mm**, the user should use this with the **WIRE FIXATION BOLTS**.

SPEED NUT:



Revolution **SPEED NUT** (10mm - M6X1mm) is made from stainless steel. The flanged portion is designed so the user's fingers can quickly tighten the nut. **SPEED NUTS** are meant for **SUPER STRUTS**, but can be used on other components.

NOTE: To take advantage of the Speed Nut, the user must have the hex towards the mating object.

COUNTER NUT:



Revolution **COUNTER NUT** (10mm-M6X1mm) is made from stainless steel. This is useful for attaching elements placed in adjacent holes. It can be used as a compression/distraction nut as it has four flats with sequential dots.

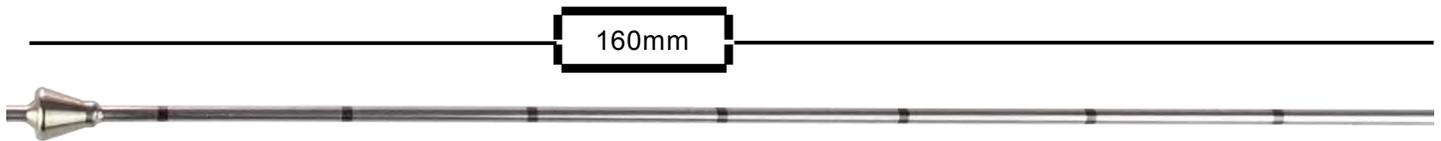
DEVICE DESCRIPTION - IMPLANTS

WIRES:

- TRUSS WIRE
- SMOOTH WIRE

Revolution WIRES are made from 316 LVM surgical stainless steel with a diameter of 2.0mm x 400mm long. The cold forged tip is specifically designed to efficiently drill through both cortical and cancellous bone.

The **TRUSS WIRE** has markings with a spacing of 20mm behind the bead.



HALF-PINS:

- SELF-DRILL HALF-PIN
- BLUNT HALF-PIN

Revolution HALF-PINS are made from 316 LVM surgical stainless steel with diameters of 4mm, 5mm, and 6mm each having a total length of 215mm. The ends of the **HALF-PINS** have AO connections. There are two different types of **HALF-PINS**; Self-Drill and Blunt.

Thread Lengths:

4mm- 15mm, 30mm, and 50mm

5mm- 30mm, 40mm, 60mm, 80mm

6mm- 40mm, 50mm, 60mm

(70 and 80mm can be ordered separately)

Self-Drill



Blunt



NOTES: The BLUNT HALF-PINS are offered in the Implant Tray. The SELF-DRILL HALF-PINS are offered in the Implant Modular Tray.

There is a designated drill and sheath tube for each HALF-PIN diameter. The drill bits and sheath are marked with either 4mm, 5mm, or 6mm.

When using BLUNT HALF-PINS, pre-drilling is necessary.

5. SURGICAL TECHNIQUE

PREOPERATIVE PLANNING:

The proper size plate should be ordered after considering patient anatomy. Plate Sizing Templates can be used to determine appropriate plate diameters.

The diameter should allow 2 cm of clearance between the limb and template.



NOTE: Plate Sizing Templates are NOT in the tray and should be ordered separately.

SURGICAL TECHNIQUE

PRE-ASSEMBLED FRAME:

The *Revolution* External Plating System offers pre-assembled frames in 120mm, 140mm, 160mm, 180mm. The frames come in **STACKED** and **CASCADE** style.

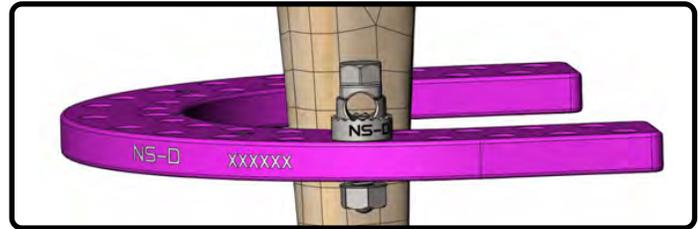
The tibial block has a static height of 60mm. The frame height can be adjusted through the struts by releasing the quick adjustment bolt.



SURGICAL TECHNIQUE

HALF-PIN INSERTION:

1. When using the **HALF-PIN** off the plates, identify the proper insertion location hole on the plate and insert the **HALF-PIN BOLT**.
2. Slightly secure bolt/nut to allow proper **TROCAR & SHEATH** fit.

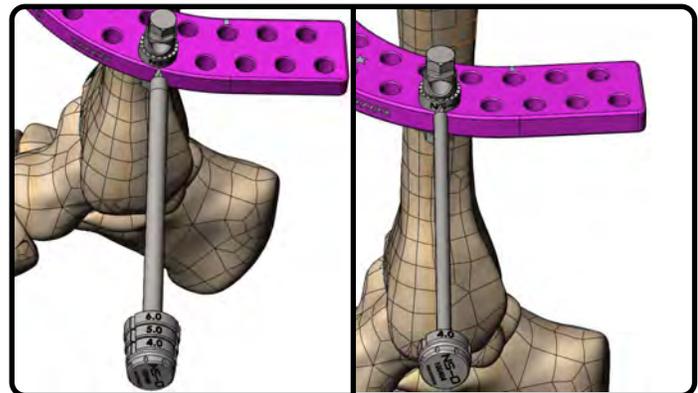


NOTES: To allow the **TROCAR & SHEATH** to fit, user must not fully tighten the nut on the bolt.

Do not fully tighten the nut to the bolt when using the **TROCAR & SHEATH**. The bolt could possibly impinge into the **TROCAR & SHEATH** if too much torque is applied.

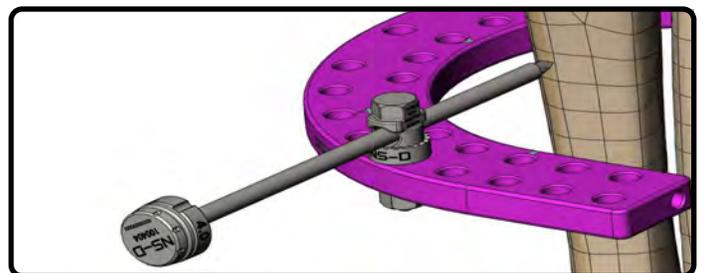
3. The **TROCAR & SHEATH** will be assembled with the trocar inside the 4mm, 5mm and 6mm sheaths.

NOTE: Remove the **SHEATH** sleeves that are not related to the desired pin. For example, a 4mm **HALF-PIN** will be used and the 5 and 6mm sheath sleeve will be removed for this procedure.



When cleaning, the **SHEATH** sleeves and Trocar must be disassembled.

4. Use **TROCAR & SHEATH** to go through the soft tissue and stop once the **TROCAR** touches the bone. If using **SELF-DRILL HALF-PINS**, the **TROCAR** can be removed and a designated **HALF-PIN** can be inserted instead.



SURGICAL TECHNIQUE

HALF-PIN INSERTION:

5. If using the **BLUNT HALF-PINS**, remove the **TROCAR** from assembly and insert required drill bit through the **SHEATH**.

NOTES: A drill bit can also be used for **SELF-DRILL HALF-PIN'S** if desired.

If a 4mm **HALF-PIN** is used, the 4mm **DRILL BIT** will be used for pre-drill. The same principle will be used with 5mm and 6mm.

6. Drill to desired depth and remove drill. The **DRILL BITS** have depth markings to allow the doctor to choose according **HALF-PIN** thread length.

NOTES: Depth markings on each drill bit are dedicated to each **HALF-PIN** thread length.

Efforts should be made to keep the **DRILL BIT** cool during insertion.

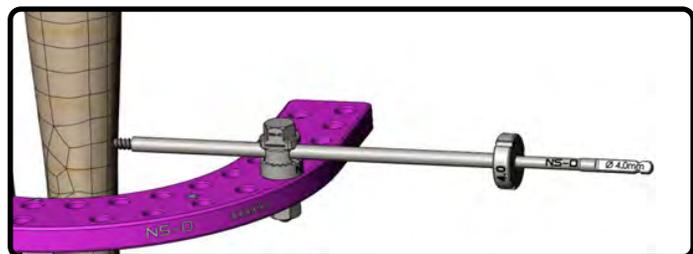
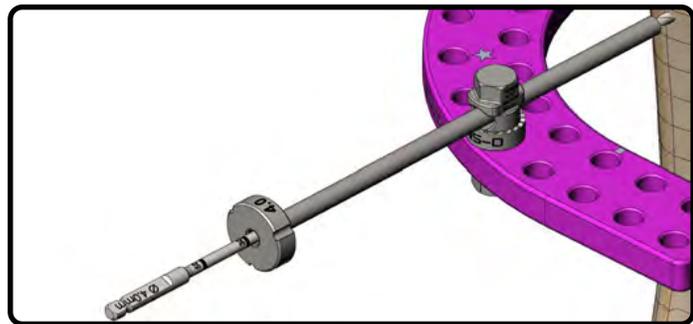
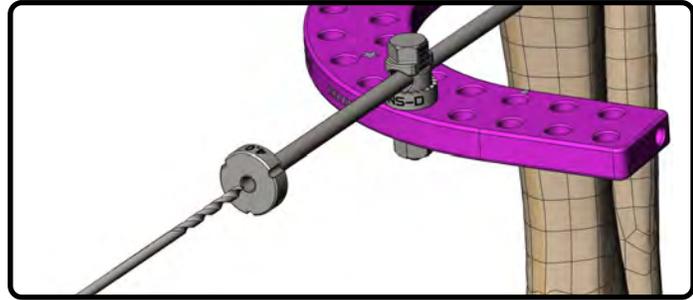
Use an in-and-out pulse action to help clear flutes and drill guides of any bone debris. Drills should not be completely removed from guide during pulse action.

Avoid applying lateral pressure on the sleeves or drill bit by ensuring the drill path is in line with the drill guide.

7. The **HALF-PIN** diameter is indicated on the AO connection area of the **HALF-PIN**, and the **SHEATH** diameter is indicated on the collar of the **SHEATH**. Ensure the diameter of the **HALF-PIN** matches the diameter of the selected **SHEATH**.

8. Insert **HALF-PIN** through sheath sleeve. Manual **HALF-PIN** placement may be necessary when entering the second cortex.

NOTE: Efforts should be made to keep the **HALF-PIN** cool during insertion.



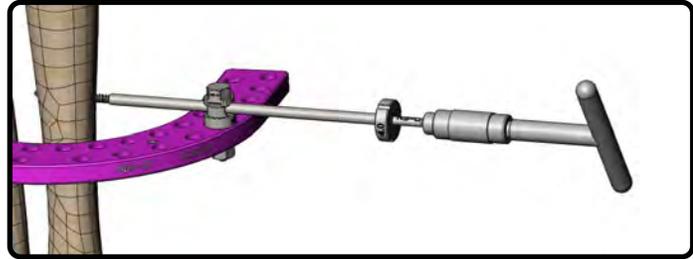
SURGICAL TECHNIQUE

HALF-PIN INSERTION:

9. Use **AO T-HANDLE WRENCH** to manually insert. Once placement is successful, loosen nut on **HALF-PIN BOLT** and remove sheath.

NOTE: The weakest point of the pin is at the thread-shank junction. Sinking the shank of the pin into the proximal cortex will improve the stiffness.

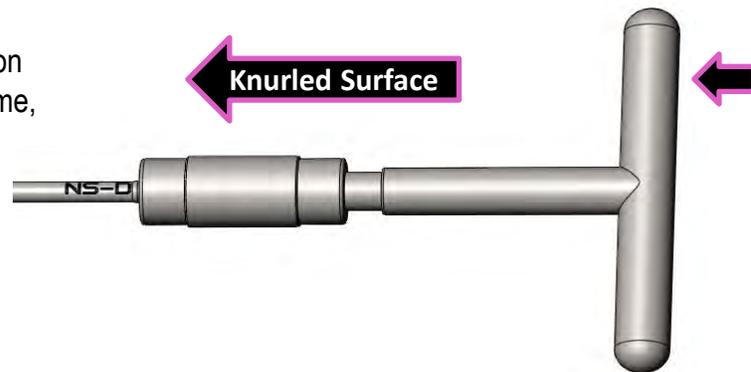
NOTE: The AO T-HANDLE WRENCH has ball bearings to snap onto the HALF-PINS.



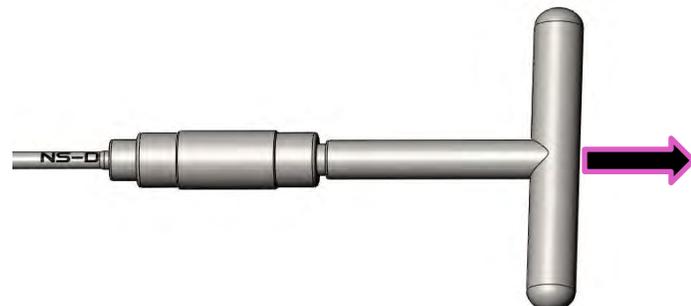
- a) Insert the **T-HANDLE WRENCH** on the AO end of the **HALF-PIN**. Rotate the **T-HANDLE WRENCH** to where the flat orientates with the flat on the AO end of the **HALF-PIN**.



- b) Once the flats are engaged, push up the knurled sleeve on the **T-HANDLE WRENCH** to fully engage. At the same time, push the handle up against the **HALF-PIN**.



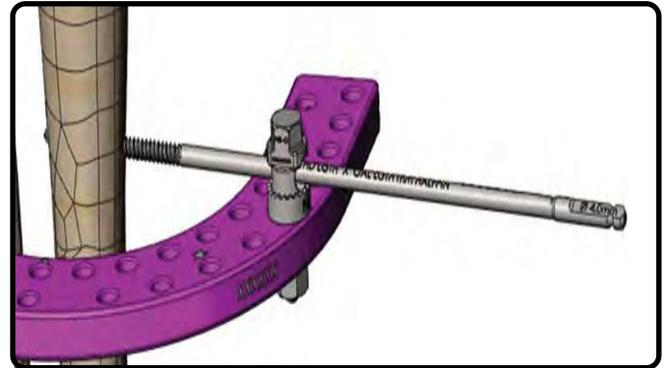
- c) Once the **T-HANDLE WRENCH** is fully seated, release the knurl and pull the **T-HANDLE WRENCH** back.



SURGICAL TECHNIQUE

HALF-PIN INSERTION:

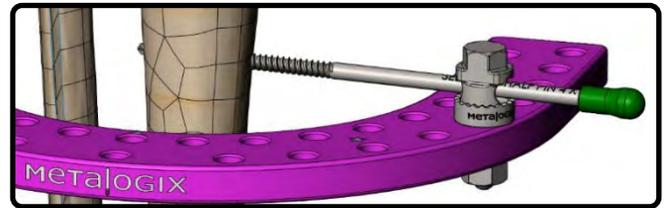
10. Tighten **HALF-PIN FIXATION BOLT** with two (2) wrenches. One wrench on the nut and the other on the **HALF-PIN FIXATION BOLT** hex.



11. Cut the excess **HALF-PIN** length and attach desired pin guards.

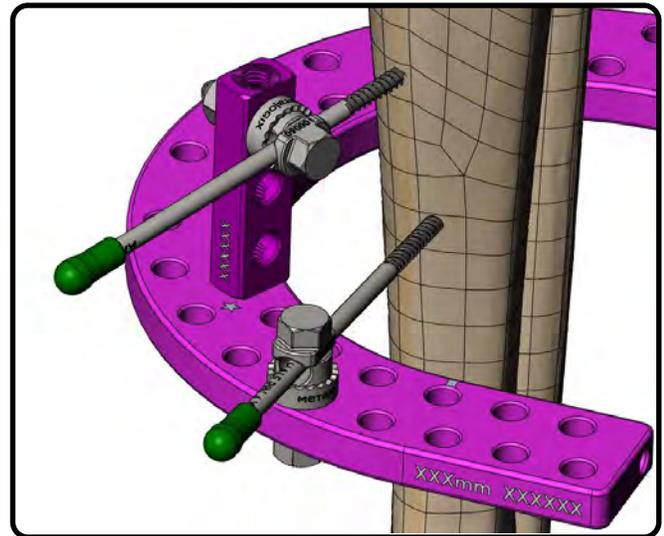
NOTE: Pin guards come in three (3) different colors.

4MM-GREEN 5MM-RED 6MM-BLACK



NOTE: HALF-PIN cutters are provided by hospitals.

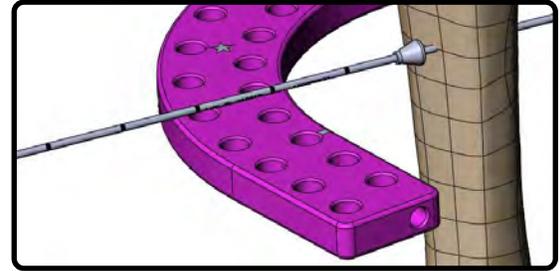
12. **HALF-PINS** can be placed on any posts instead of the plate. Loosely attach the post to desired hole with either a **14mm or 20mm bolt**. A **20mm bolt** will block the first hole.
13. Attach the **HALF-PIN FIXATION BOLT**. Repeat steps 2-8.
14. Fully tighten the posts to the plate by applying counter-torque using a wrench on the bolt hex and post.
15. Sequence of tightening should be: tighten **HALF-PIN FIXATION BOLT** to post, then tighten post to plate.



SURGICAL TECHNIQUE

WIRE INSERTION:

1. Insert the wire through the soft tissue and drill through the bone to the opposite soft tissue edge. Ensure the wire is beyond the plate's outside diameter. The Ilizarov principle for wire insertion should be observed: Insert the wire through the soft tissue to the bone, slowly drill the wire through the bone (in a pulsing action), once past the second cortex, tap the wire through the soft tissue, pull the wire through to the appropriate length to attach to the hardware.

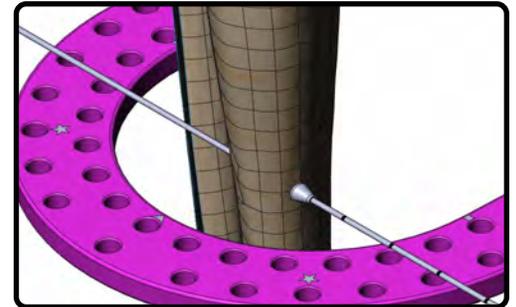


NOTES: Keep the wire straight. Avoid excessive pressure. **DO NOT BEND THE WIRE.**

Efforts should be made to keep the wire cool during insertion. Can use in-and-out pulse action.

It is also acceptable to use the **WIRE FIXATION BOLT** as a guide.

Wires should rest directly on the plates. If one does not, then build the plate up to the wire. **Do NOT bend a wire down to the frame.**

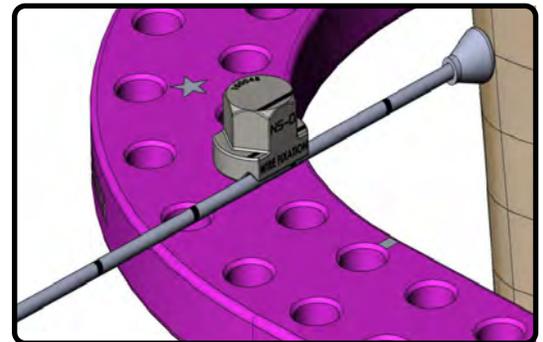


2. If a **TRUSS WIRE** is used, make a small incision in the soft tissue along the axis of the wire to allow the bead to pass through the skin. The bead on the wire will make contact with the bone cortex.

NOTES: **TRUSS WIRES** have depth markings behind the bead. 20mm spacing. **SMOOTH WIRES** have no markings.

The **WIRE FIXATION BOLT** has a side slot only. The **WIRE FIXATION BOLT - LONG** has a center slot as well as a side slot.

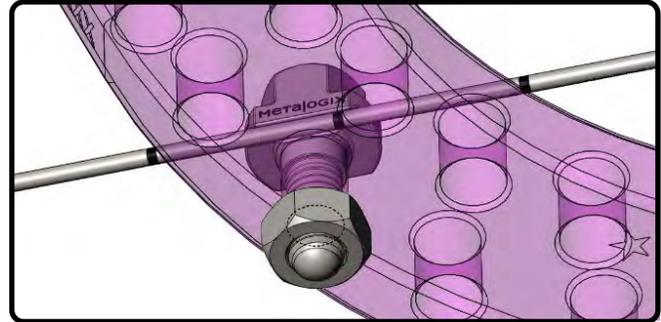
3. Secure the wire by using **WIRE FIXATION BOLT OR WIRE FIXATION BOLT - LONG**. A black line can be seen on the top face to indicate slot fixation feature. The black will be parallel with axis of the wire. Secure bolt by using a **SPHERICAL NUT x 10mm**. Use a **10mm WRENCH** to hold the hex head of the bolt.



SURGICAL TECHNIQUE

WIRE INSERTION:

4. Tighten **WIRE FIXATION BOLT** on the side opposite where the tension will be applied. For **TRUSS WIRES**, completely tighten down the bolt on the truss side and then tension the wire on the opposite side. Bend the tightened end of the wire (the tip) 90° before tensioning. This confirms the wire on the opposite side of the tensioning is tight before the wire is tensioned.



NOTES: It is recommended to use a SPHERICAL NUT X 10mm. However, any other nut will be acceptable.

It is recommended to tension anywhere between 50kg-125kg, as per surgeon's preference.

After tensioning, go back and re-tighten WIRE FIXATION BOLTS.

Simultaneously tensioning two (2) wires on the same plate is highly advisable.

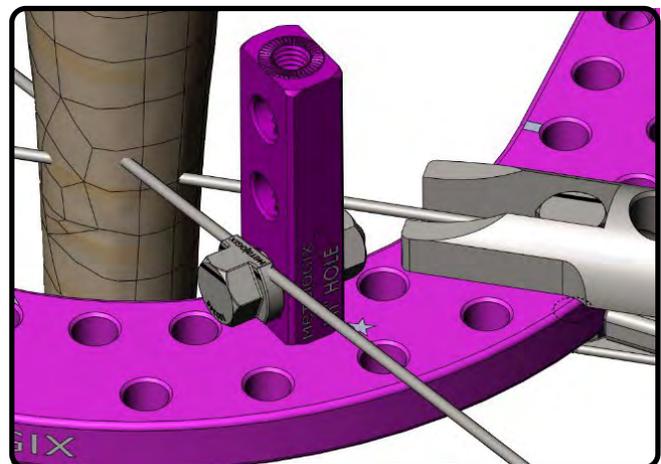
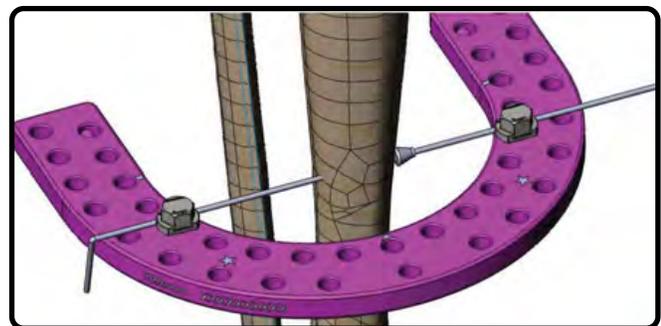
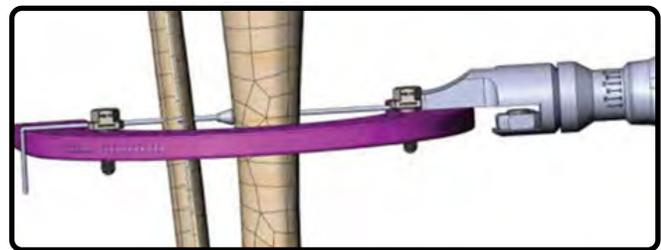
When placing two (2) wires, it is advised to spread wires to as close to 90° as anatomically possible. Use at least two (2) planes of wires/half-pins in each major bone segment.

The sequence of tensioning will be dependent on frame application and surgeon preference.

5. Build the frame to the wire. The same concept used to tighten wire to the plate may be used to tighten wires to a post.

NOTE: Building the frame to the wire can also be achieved by adding washers above or below a WIRE FIXATION BOLT.

Use a 14MM BOLT to attach a post on a plate.



SURGICAL TECHNIQUE

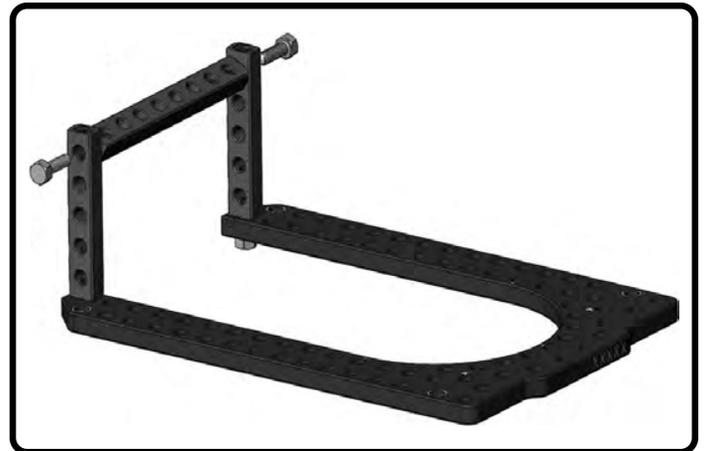
FORE-FOOT BRIDGE ASSEMBLY:

1. It is recommended to close *off* the **FOOT PLATE** with the **FORE-FOOT BRIDGE** construct.
2. The **FORE-FOOT BRIDGE** should be attached and in-place before any wires are tightened to the **FOOT PLATE**.
3. Place a **5-HOLE POST** on the end of the **FOOT PLATE** legs. Turn the posts, so that the long side is parallel to the inside wall. Place either a **14mm or 20mm BOLT** to hold the posts in place. Do not fully tighten the posts.



NOTE: Depending upon the surgeon's desired height of the bridge, any post can be used.

4. When the height and angulation of the **FORE-FOOT BRIDGE** is determined, use **20mm BOLTS** to lock the bridge in place.



NOTES: Use 20mm BOLTS when attaching the FORE-FOOT BRIDGE to the posts.

The FORE-FOOT BRIDGE angle can be adjusted by loosening the 20mm BOLTS. The FORE-FOOT BRIDGE has 10mm width for the wrench to hold for counter torque.

5. Fully tighten the **FORE-FOOT BRIDGE** first before tightening the posts to the plate.



SURGICAL TECHNIQUE

WIRE TENSIONER:

1. The **WIRE TENSIONER** is a spring-loaded, forceps style instrument. The tensioner head has a unique swivel head to capture wire and **WIRE FIXATION BOLTS** at difficult angles. The head is also extended to reach inside holes on **FOOT PLATES**. The tensioner has tensioning forces from 0kg- 125kg.

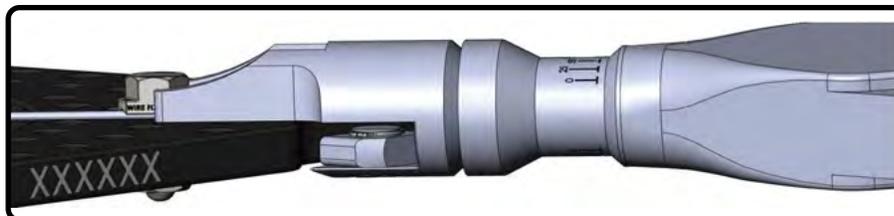
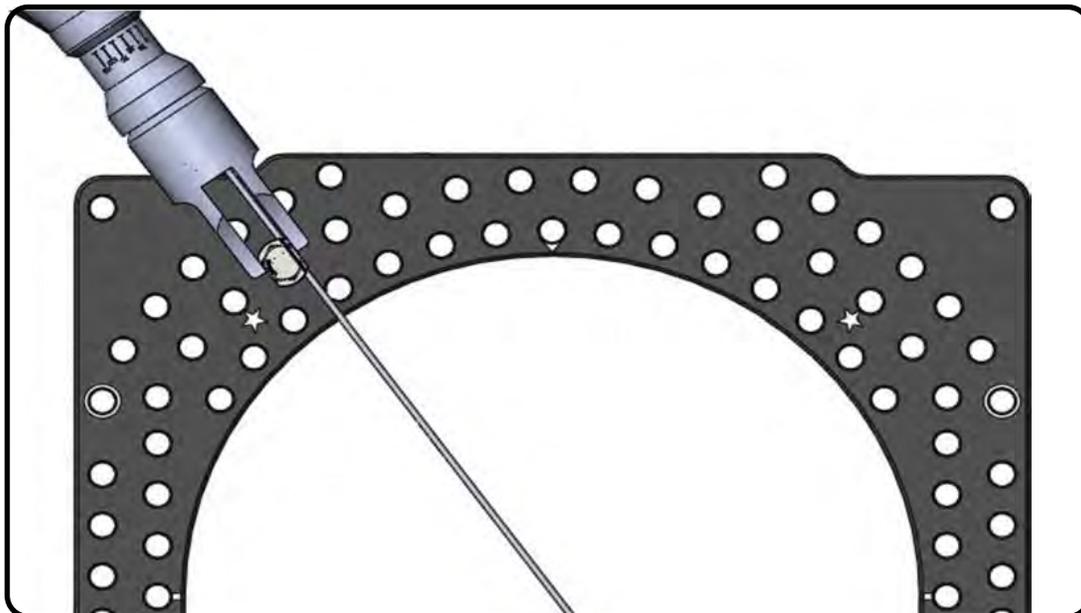
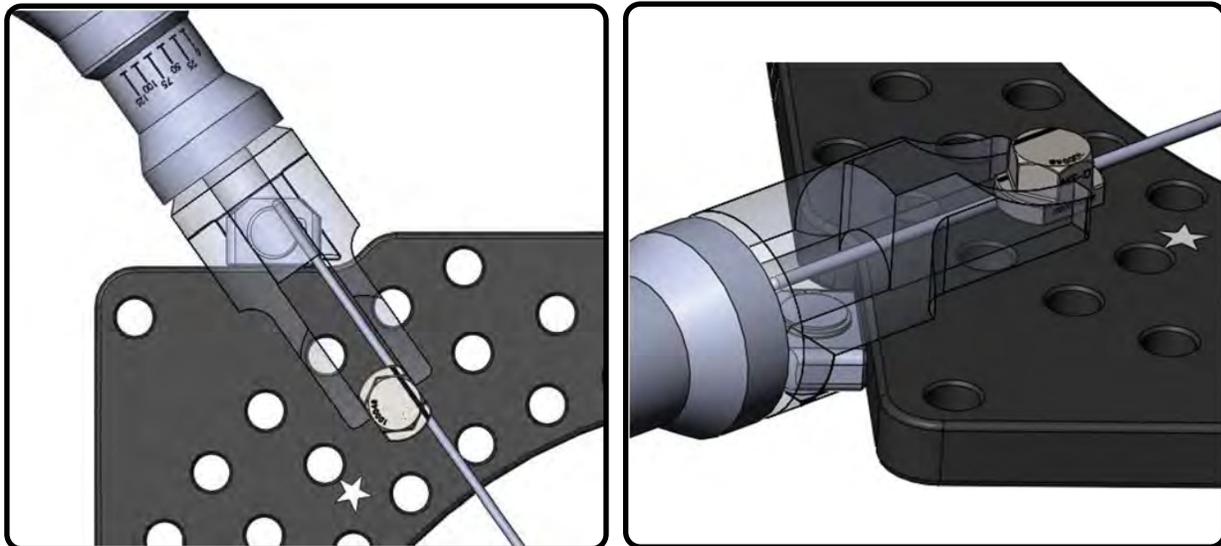
NOTE: Reading is done behind the collar/tube interface.



SURGICAL TECHNIQUE

WIRE TENSIONER:

Examples of the Wire Tensioner being used on a Foot Plate:



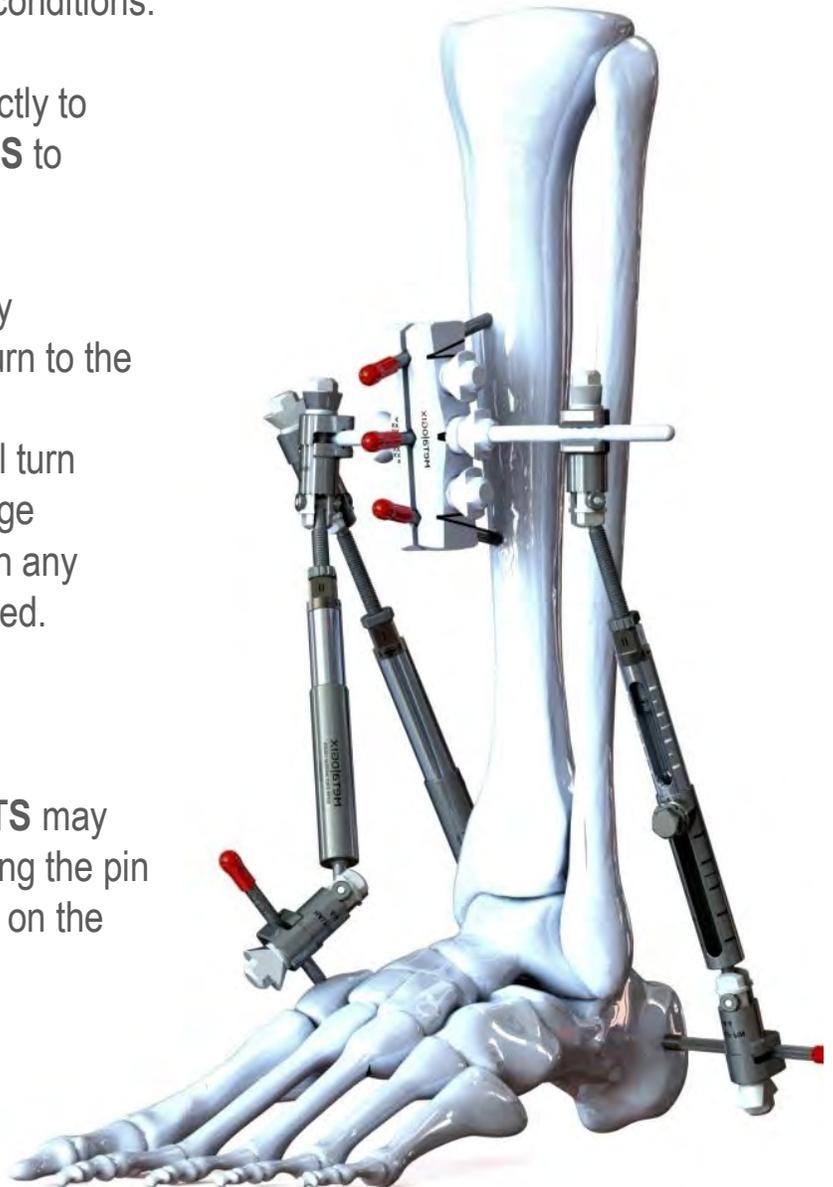
6. REVOLUTION TRAUMA

The **Revolution** Trauma System allows for a wide variety of **PIN-to-PIN SUPER STRUTS** and **PIN-to-PLATE SUPER STRUTS** configurations for various surgical conditions.

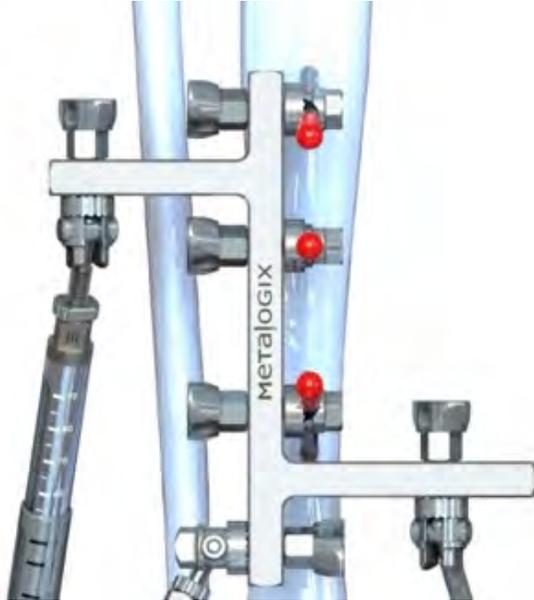
SUPER STRUTS can be fixed directly to **HALF-PINS** and **STEINMANN PINS** to simplify frame assembly.

The struts can be micro adjusted by distraction or compression. Each turn to the next Roman Numeral is 1/4mm of compression or distraction. One full turn equals 1mm of movement. The hinge movement on the ends can move in any desired angulation and can be locked.

NOTE: PIN-to-PIN SUPER STRUTS may snap directly onto the pin by inserting the pin into the clamp and tightening down on the 10mm bolt.



REVOLUTION TRAUMA



Z-POST ATTACHMENT

Attach **PIN-to-PLATE SUPER STRUTS** to the **Z-POST** and tighten nuts using a **STANDARD 10mm WRENCH**.



SUPER STRUT ATTACHMENT

Attach either **PIN-to-PIN SUPER STRUT** or a **PIN-to-PLATE SUPER STRUT** to either side of the **STEINMANN PIN**, approximately two finger widths from the skin.

REVOLUTION TRAUMA

MULTI-PIN CLAMP ATTACHMENT

Make a stab incision over the anticipated **HALF-PIN** placement. Use blunt dissection through the soft tissue to bone, using a **TROCAR & SHEATH**. Drill using the provided drills through the **TROCAR & SHEATH** using the corresponding drill size for the anticipated **HALF-PIN** size.

Note: There are two options for Half-Pins available in the system, Self-Drill Half-Pins and Blunt Half-Pins. It is recommended to predrill using the provided drills in the proximal tibia where dense bone is typically encountered.

Insert the pin into the tibia. The **HALF-PIN** can be inserted using the **T-HANDLE WRENCH**. Remove the **TROCAR & SHEATH**. Place a **MULTI-PIN CLAMP** over the **HALF-PIN** through the proximal hole of the **MULTI-PIN CLAMP**.

Repeat steps for second and third pin placements.

Hand tighten the nuts on the side of the **MULTI-PIN CLAMP**.

Attach two **30° ANGLED HORNS** or **STRAIGHT HORNS** ensuring the **30° ANGLED HORNS** are angled posteriorly.

Note: Posts should be fully seated prior to tightening.

Attach **PIN-to-PIN SUPER STRUTS** to the **STRAIGHT HORNS** or **30° ANGLED HORNS**.

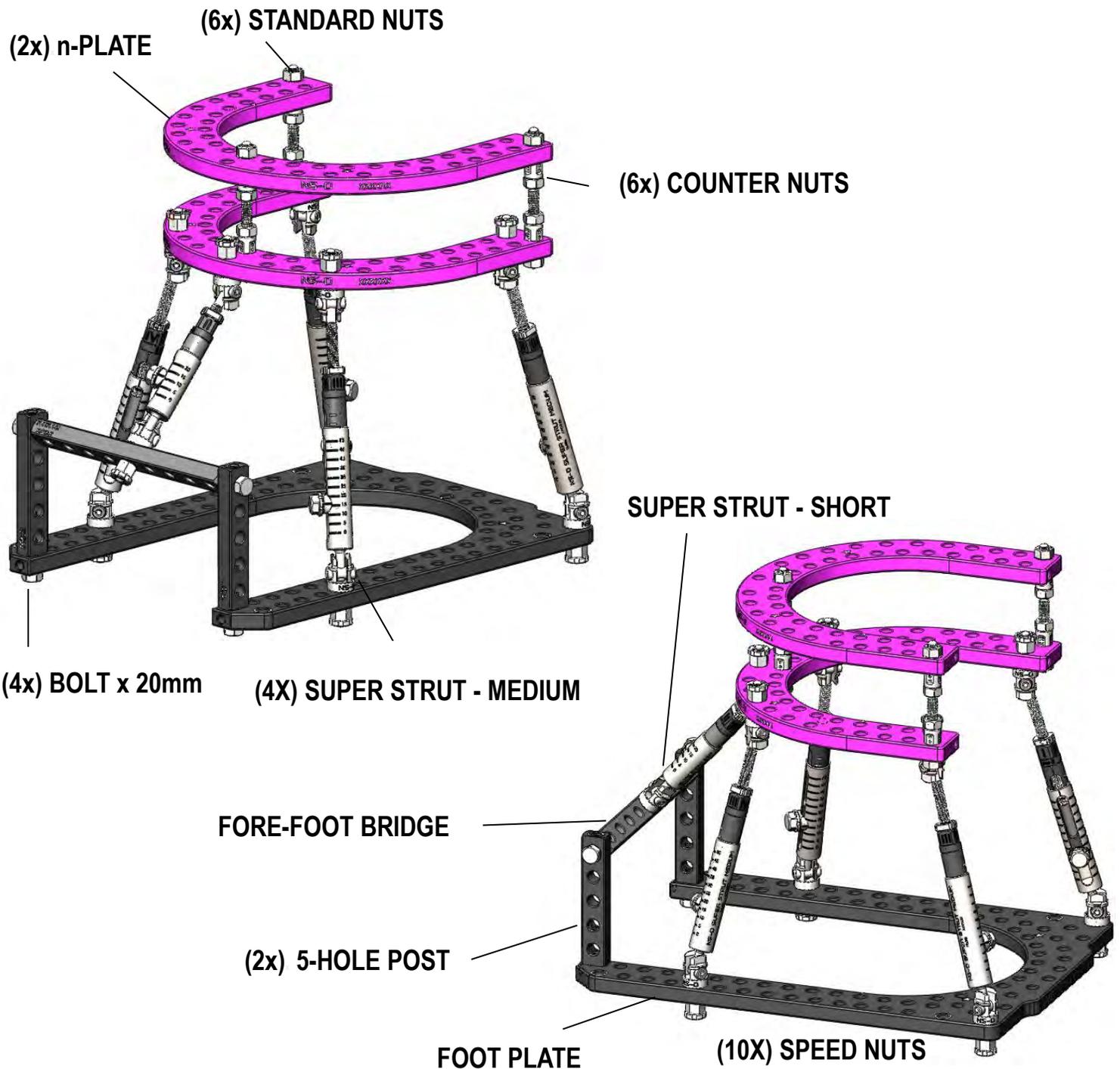
Use the **STANDARD 10mm WRENCH** to tighten all nuts on the construct.



7. FRAME EXAMPLES

STATIC FOOT & ANKLE FRAME ASSEMBLY:

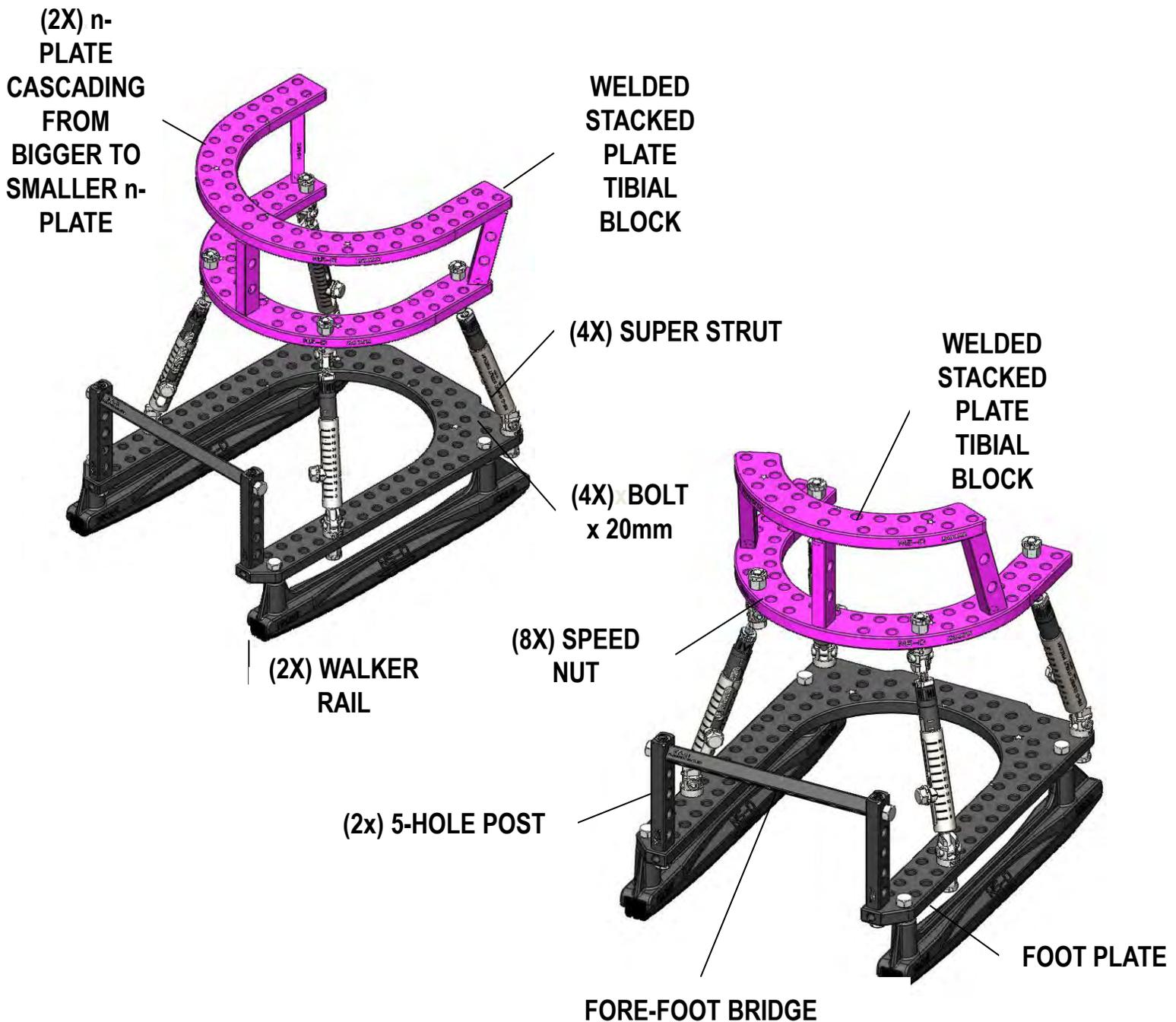
If the surgeon wants to build the frame, it is recommended to have a minimum of three points of fixation per **TIBIAL BLOCKPLATE** and four points of fixation per **FOOT PLATE**. Additional frame stability can be gained by attaching a **SUPER STRUT** to the **FORE-FOOT BRIDGE** as shown below.



FRAME EXAMPLES

CASCADE/STACKED FOOT & ANKLE FRAME ASSEMBLY:

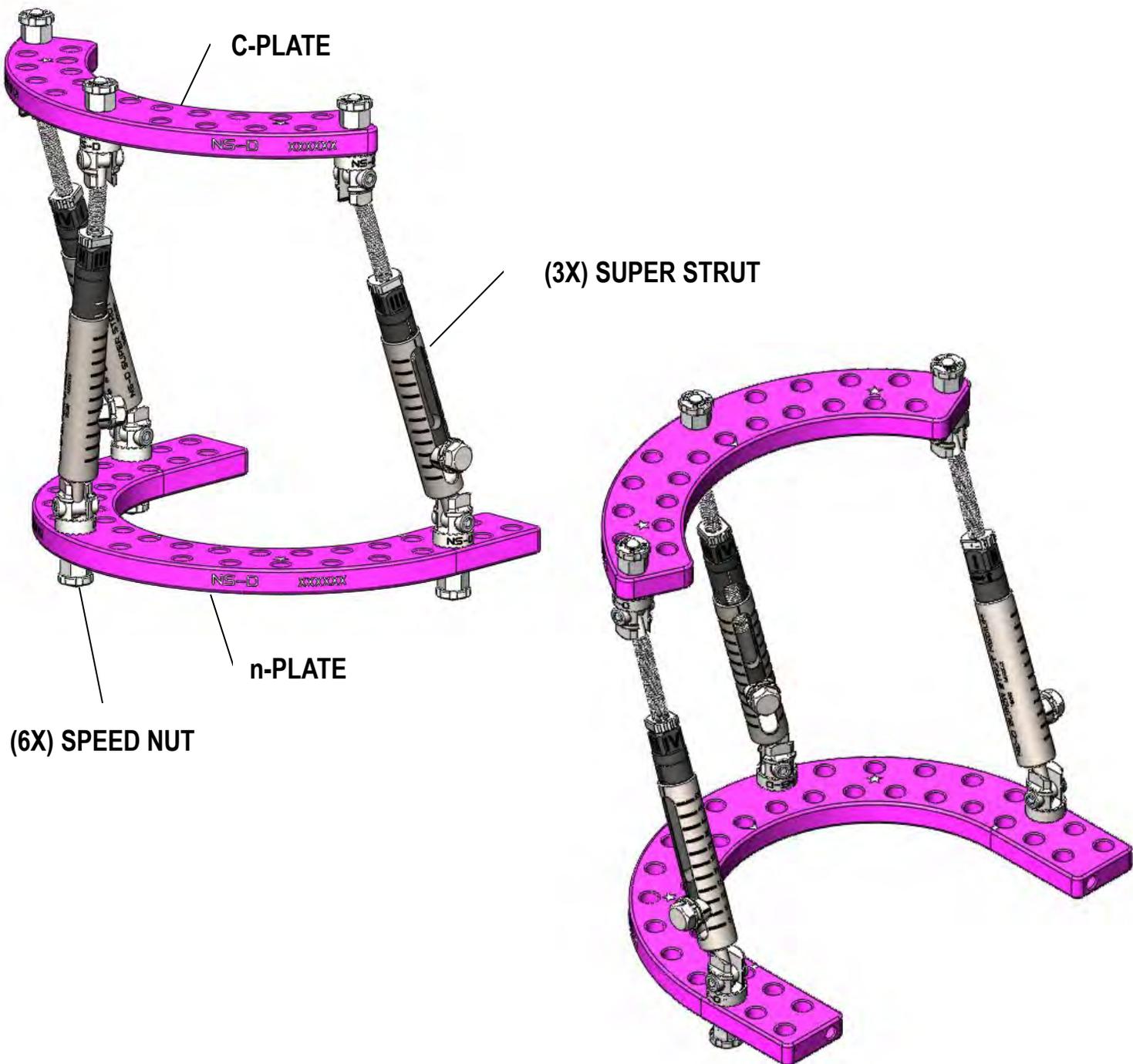
The **CASCADE FRAME** consists of a welded Tibial Block with (2x) **n-PLATES** (Image on left). The **n-PLATES** are cascading from a bigger size **n-PLATE** down to a smaller size. The **STACKED FRAME** (Image on right) consists of a welded stacked Tibial Block with (1x) **C-PLATE** and same size **n-PLATE**. The angulated posts in the Tibial Block are welded and can not be moved. However, wires or **HALF-PINS** can be attached to them.



FRAME EXAMPLES

TRAUMA FRAME ASSEMBLY:

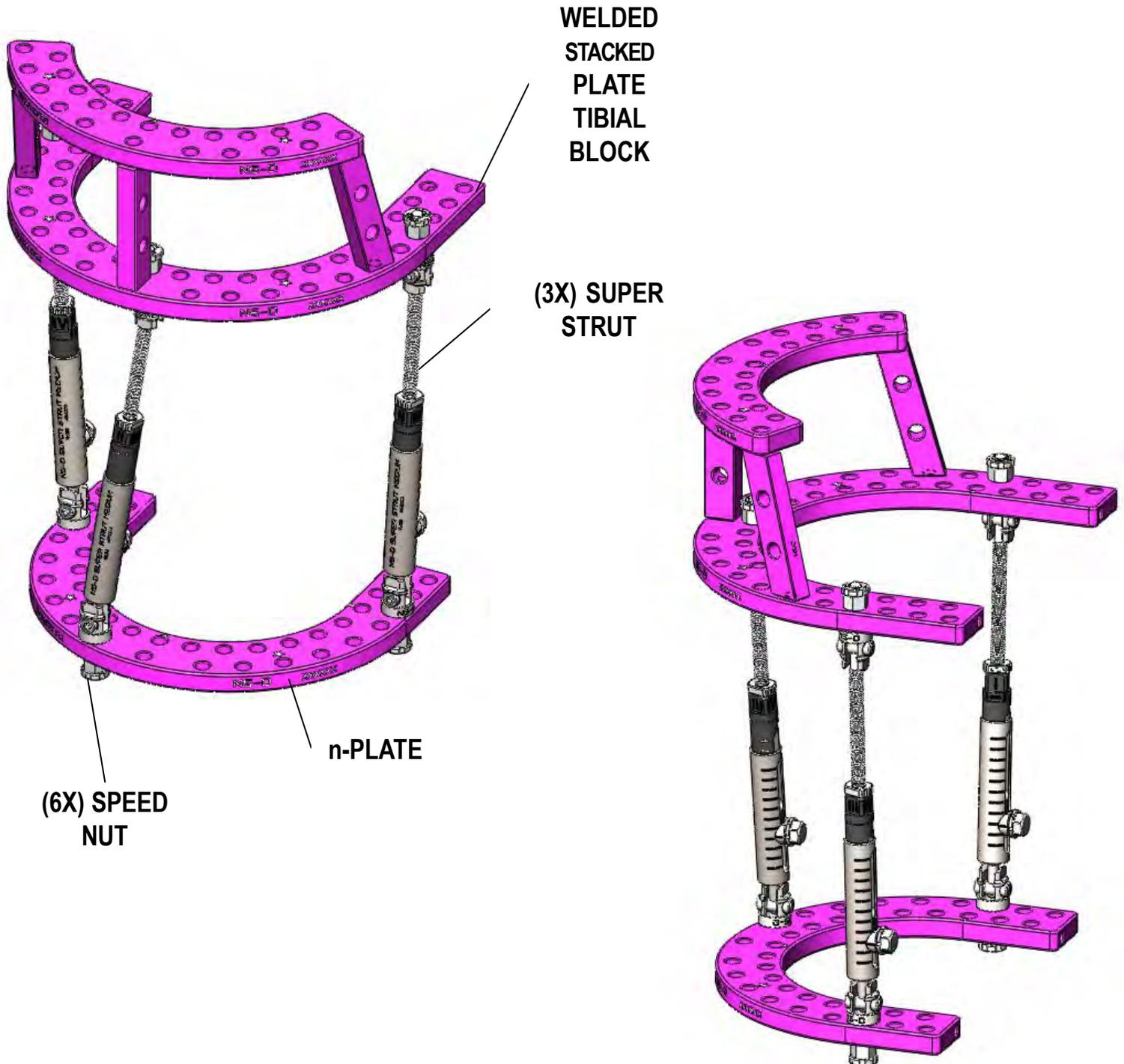
The **TRAUMA FRAME ASSEMBLY** can be used to support the distal/proximal/mid-tibial shaft fractures. It is recommended to have a minimum of three (3) **SUPER STRUTS**. A **C-PLATE** and an **n-PLATE** can be used for this construct.



FRAME EXAMPLES

TRAUMA FRAME ASSEMBLY:

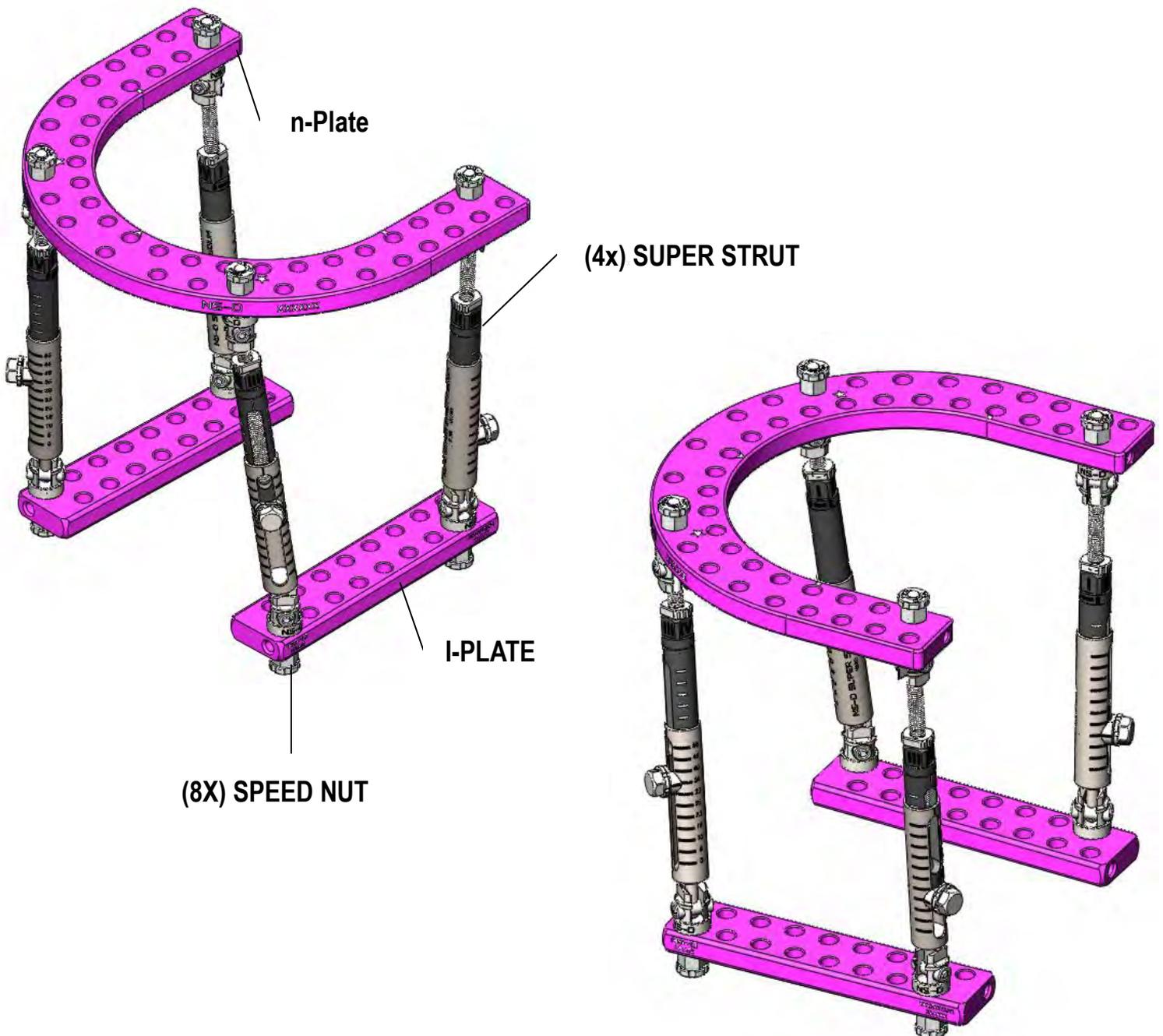
The **TRAUMA FRAME ASSEMBLY** can be used to support the distal/proximal/mid-tibial shaft. For extra support, a welded **STACKED TIBIAL BLOCK** can be added. It is recommended to have a minimum of three (3) **SUPER STRUTS**.



FRAME EXAMPLES

TRAUMA FRAME ASSEMBLY:

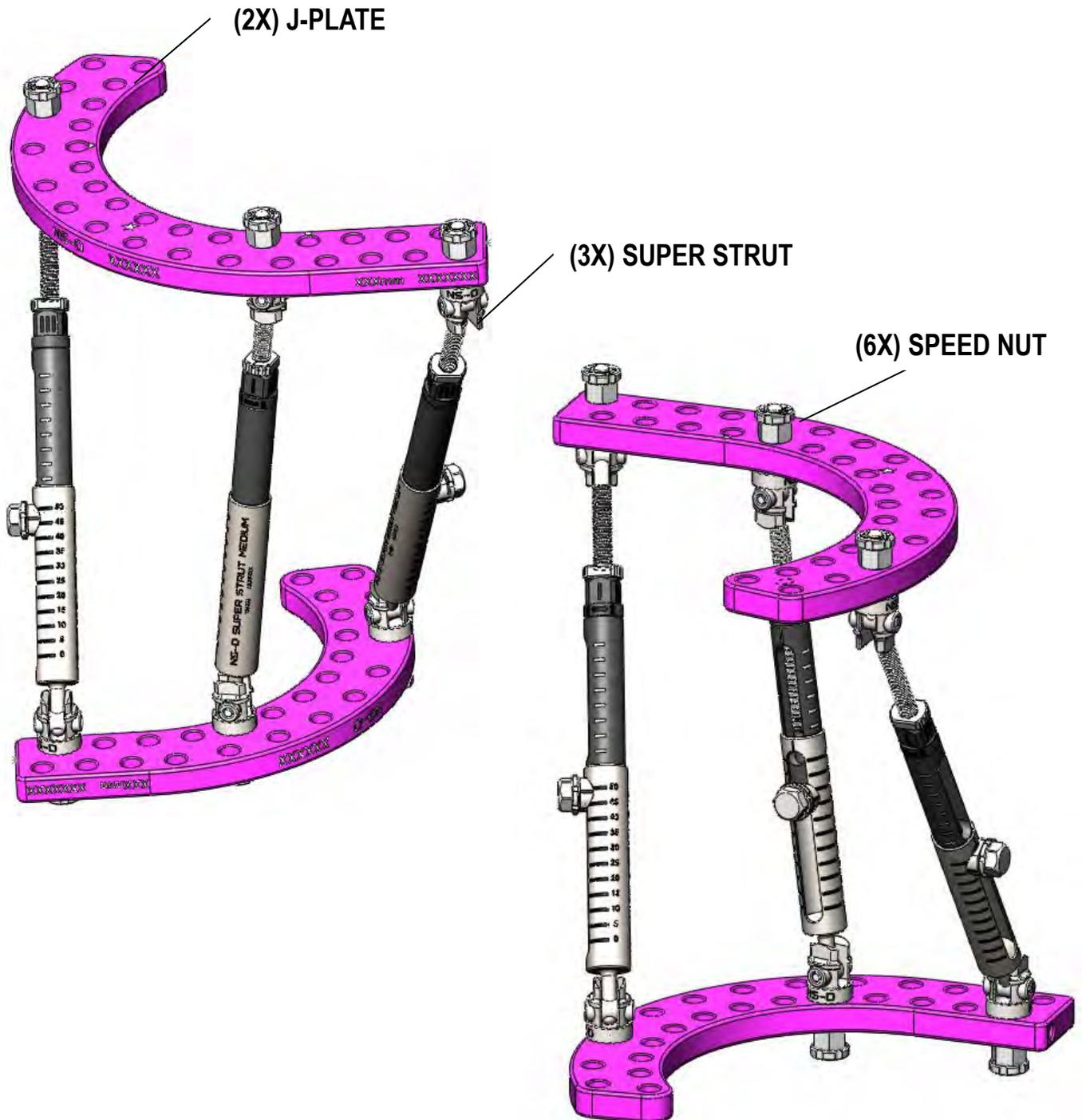
The **TRAUMA FRAME ASSEMBLY** can be used to support the distal tibial fractures. It is recommended to have a minimum of four (4) **SUPER STRUTS**, attached through calcaneus with a full **STEINMANN PIN**.



FRAME EXAMPLES

TRAUMA FRAME ASSEMBLY:

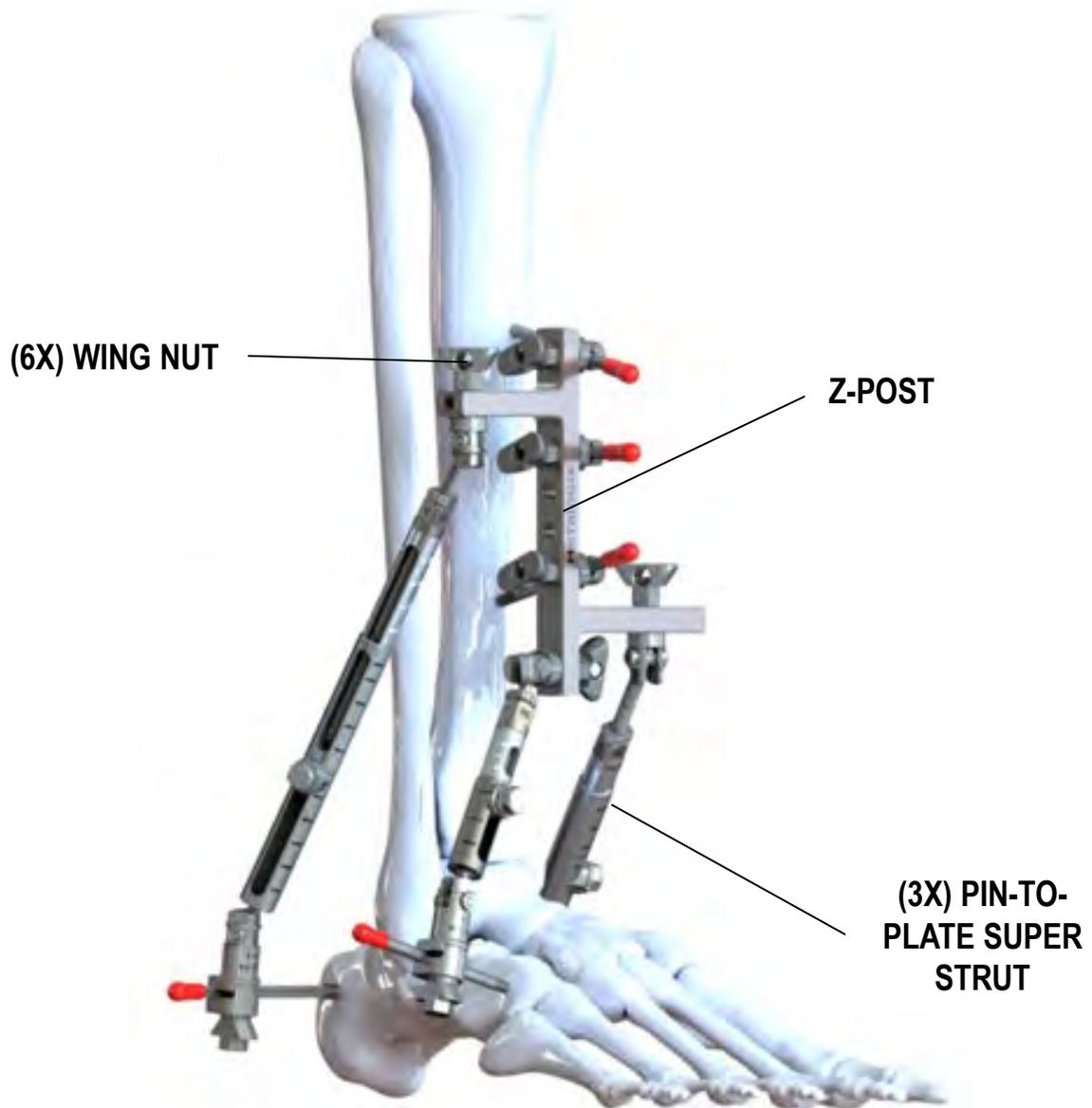
The **FLAP** or **TRAUMA FRAME ASSEMBLY** can be used to support the tibial shaft and foot but allowing more of an open for swelling by using **J-PLATES**. It is recommended to have a minimum of three (3) **SUPER STRUTS**.



FRAME EXAMPLES

Z-POST TRAUMA FRAME ASSEMBLY:

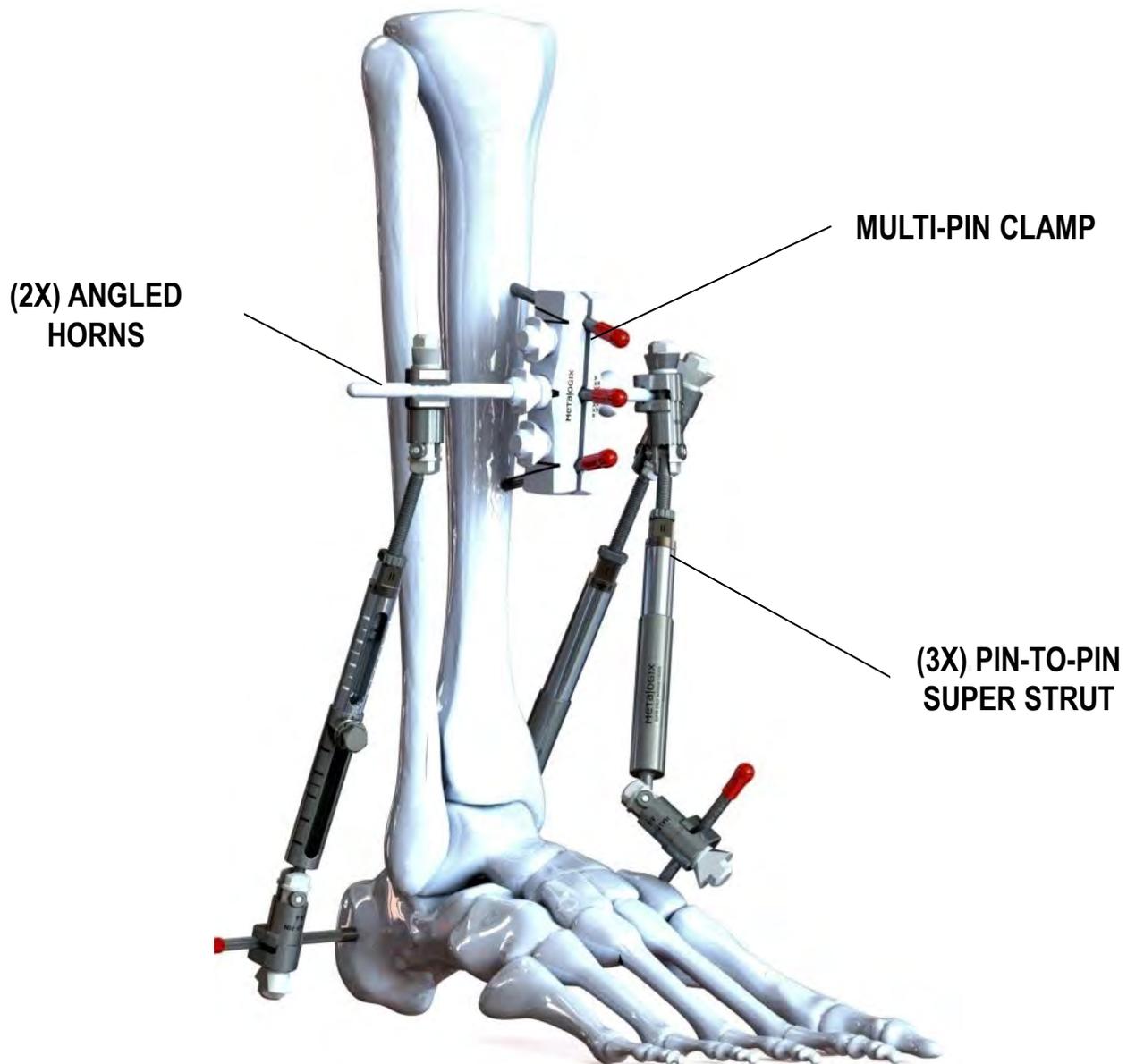
A **Z-POST** may be used to attach to the distal/proximal/mid-tibial shaft. It is recommended to have a minimum of **three (3) PIN-to-PLATE SUPER STRUTS**.



FRAME EXAMPLES

MULTI-PIN CLAMP TRAUMA FRAME ASSEMBLY:

A **MULTI-PIN CLAMP** may be used to attach to the distal/proximal/mid-tibial shaft. It is recommended to have a minimum of **three (3) PIN-to-PIN SUPER STRUTS**.



8. ORDERING INFORMATION

REVOLUTION TRAYS

PART #	DESCRIPTION	TRAY QUANTITY
900123-F	Implant Tray / IMP-001 thru 020	1
900124-F	C & Footplate Tray / CFP-001 thru 020	1
900125-F	J & n-Plate Tray / JNP-001 thru 020	1
900126-F	Instrument + Hardware Tray / IHT-001 thru 020	1
900127-F	General Tray / GEN-001 thru 020	1
900128-F	Implant Modular Tray / IMT-01 thru 020	1
900129-F	Nut & Bolt Caddy Tray / NBT-001 thru 020	1

PART #	DESCRIPTION	TRAY QUANTITY
900123-F	Implant Tray / IMP-021 thru 035	1
900124-F	C & Footplate Tray / CFP-021 thru 035	1
900125-F	J & n-Plate Tray / JNP-021 thru 035	1
900126-F	Instrument + Hardware Tray / IHT-021 thru 035	1
900127-F	General Tray / GEN-021 thru 035	1
900128-F	Self-Drill Half-Pin Tray / SDHP-A thru T	1
900129-F	Secondary Nut & Bolt Caddy / SNB-A thru P	1
900130-F	Blunt Half-Pin Caddy (purple) BHP-A thru Y	1
900131-F	Primary Nut & Bolt Caddy (purple) PNB-A thru O	1

NOTE: To order trays or parts, use Sales/Restock Order Form.



ORDERING INFORMATION

C & FOOTPLATE TRAY

PART #	DESCRIPTION	TRAY QUANTITY
900124-F	C & Footplate Tray / CFP-001 thru 020	1
116120	C-Plate x 120mm	2
116140	C-Plate x 140mm	2
116160	C-Plate x 160mm	2
116180	C-Plate x 180mm	2
116200	C-Plate x 200mm	2
114120	Foot Plate x 120mm	2
114140	Foot Plate x 140mm	2
114160	Foot Plate x 160mm	2
114180	Foot Plate x 180mm	2
PART #	DESCRIPTION	TRAY QUANTITY
900124-F	C & Footplate Tray / CFP-021 thru 035	1
116120	C-Plate x 120mm	2
116140	C-Plate x 140mm	2
116160	C-Plate x 160mm	2
116180	C-Plate x 180mm	2
116200	C-Plate x 200mm	2
114120	Foot Plate x 120mm	2
114140	Foot Plate x 120mm	2
114160	Foot Plate x 160mm	2
114180	Foot Plate x 180mm	2

ORDERING INFORMATION

J & n-PLATE TRAY

PART #	DESCRIPTION	TRAY QUANTITY
900125-F	J & n-Plate Tray / JNP-001 thru 020	1
115120	n-Plate x 120mm	2
115140	n-Plate x 140mm	2
115160	n-Plate x 160mm	2
115180	n-Plate x 180mm	2
115200	n-Plate x 200mm	2
115220	n-Plate x 220mm	2
119120	J-Plate x 120mm	2
119140	J-Plate x 140mm	2
119160	J-Plate x 160mm	2
119180	J-Plate x 180mm	2
119200	J-Plate x 200mm	2
PART #	DESCRIPTION	TRAY QUANTITY
900125-F	J & n-Plate Tray / JNP-021 thru 035	1
115120	n-Plate x 120mm	2
115140	n-Plate x 140mm	2
115160	n-Plate x 160mm	2
115180	n-Plate x 180mm	2
115200	n-Plate x 200mm	2
115220	n-Plate x 220mm	2
119120	J-Plate x 120mm	2
119140	J-Plate x 140mm	2
119160	J-Plate x 160mm	2
119180	J-Plate x 180mm	2

ORDERING INFORMATION

INSTRUMENT & HARDWARE TRAY

PART #	DESCRIPTION	TRAY QUANTITY
900126-F	Instrument + Hardware Tray / IHT-001 thru 020	1
901040	Threaded Rod x 40mm	4
901060	Threaded Rod x 60mm	4
901080	Threaded Rod x 80mm	4
901120	Threaded Rod x 120mm	4
901160	Threaded Rod x 160mm	4
100720	Male Hinge	4
100722	Female Hinge	4
100790	90° Hinge	2
100820	Plate Extender x 30mm	4
100850	Plate Extender x 50mm	4
100801	1-Hole Post	6
100802	2-Hole Post	6
100803	3-Hole Post	6
100804	4-Hole Post	6
100805	5-Hole Post	6
100120	Fore-Foot Bridge x 120mm	2
100140	Fore-Foot Bridge x 140mm	2
100160	Fore-Foot Bridge x 160mm	2
100180	Fore-Foot Bridge x 180mm	2
100201	Fore-Foot Bridge x 200mm	2
105300	Super Strut - Short	4
105200	Super Strut - Medium	4
105400	Super Strut - Long	4
100404	Trocar & Sheath	2
n/a	Wire Tensioner	2
900103	T-Handle Wrench x AO	2
900104	90° Tubular Wrench	2
900105	Open End/Swivel End Wrench x 10mm	2
900106	Standard Wrench x 10mm	2

ORDERING INFORMATION

INSTRUMENT & HARDWARE TRAY

PART #	DESCRIPTION	TRAY QUANTITY
900126-F	Instrument + Hardware Tray / IHT-021 thru 035	1
901040	Threaded Rod x 40mm	4
901060	Threaded Rod x 60mm	4
901080	Threaded Rod x 80mm	4
901120	Threaded Rod x 120mm	4
901160	Threaded Rod x 160mm	4
100720	Male Hinge	4
100722	Female Hinge	4
100790	90° Hinge	2
100820	Plate Extender x 30mm	4
100850	Plate Extender x 50mm	4
100801	1-Hole Post	6
100802	2-Hole Post	6
100803	3-Hole Post	6
100804	4-Hole Post	6
100805	5-Hole Post	6
100120	Fore-Foot Bridge x 120mm	2
100140	Fore-Foot Bridge x 140mm	2
100160	Fore-Foot Bridge x 160mm	2
100180	Fore-Foot Bridge x 180mm	2
100201	Fore-Foot Bridge x 200mm	2
105300	Super Strut - Short	4
105200	Super Strut - Medium	4
105400	Super Strut - Long	4
100404	Trocar & Sheath	2
n/a	Wire Tensioner	2
900103	T-Handle Wrench x AO	2
900104	90° Tubular Wrench	2
900105	Open End/Swivel End Wrench x 10mm	2
900106	Standard Wrench x 10mm	2

ORDERING INFORMATION

IMPLANT TRAY

PART #	DESCRIPTION	TRAY QUANTITY
900123-F	Implant Tray / IMP-001 thru 020	1
900120	Smooth Wire x 2.0mm	16
900220	Truss Wire x 2.0mm	16
624004	Steinmann Pin x 4mm	2
624005	Steinmann Pin x 5mm	2
624006	Steinmann Pin x 6mm	2
618015	Blunt Half-Pin 4x20x215mm	4
618030	Blunt Half-Pin 4x30x215mm	4
618050	Blunt Half-Pin 4x50x215mm	4
621030	Blunt Half-Pin 5x30x215mm	4
621040	Blunt Half-Pin 5x40x215mm	4
621060	Blunt Half-Pin 5x60x215mm	4
621080	Blunt Half-Pin 5x80x215mm	4
623040	Blunt Half-Pin 6x40x215mm	4
623040	Blunt Half-Pin 6x50x215mm	4
623040	Blunt Half-Pin 6x60x215mm	4
100504	2.9mm Drill Bit	3
100505	3.5mm Drill Bit	3
100506	4.7mm Drill Bit	3
100048	Wire Fixation Bolt	25
100050	Half-Pin Bolt 4-6mm	10
900026	Speed Nut	20
900060	Wing Bolt x 14mm	12
900061	Wing Bolt x 20mm	12
900030	Wing Nut	16
900043	Large Pin Stopper	6
900044	Large Wire Stopper	6
900045	Small Pin Stopper	20
900046	Small Pin Stopper	20
900035	Standard Nut	50
900032	Flat Washer	20

PART #	DESCRIPTION	TRAY QUANTITY
900123-F	Implant Tray / IMP-021 thru 035	1
900120	Smooth Wire x 2.0mm	16
900220	Truss Wire x 2.0mm	16
624004	Steinmann Pin x 4mm	2
624005	Steinmann Pin x 5mm	2
624006	Steinmann Pin x 6mm	2
900130-F	Blunt Half-Pin Caddy (purple) BHP-A thru Y	1
900131-F	Primary Nut & Bolt Caddy (purple) PNB-A thru O	1

ORDERING INFORMATION

IMPLANT MODULAR TRAY

PART #	DESCRIPTION	TRAY QUANTITY
900128-F	Implant Modular Tray / IMT-01 thru 020	1
617015	Self-Drill Half-Pin 4x20x215mm	4
617030	Self-Drill Half-Pin 4x30x215mm	4
617050	Self-Drill Half-Pin 4x50x215mm	4
620030	Self-Drill Half-Pin 5x30x215mm	4
620040	Self-Drill Half-Pin 5x40x215mm	4
620060	Self-Drill Half-Pin 5x60x215mm	4
620080	Self-Drill Half-Pin 5x80x215mm	4
622040	Self-Drill Half-Pin 6x40x215mm	4
622050	Self-Drill Half-Pin 6x50x215mm	4
622060	Self-Drill Half-Pin 6x60x215mm	4
100504	2.9mm Drill Bit	3
100505	3.5mm Drill Bit	3

ORDERING INFORMATION

SELF-DRILL HALF-PIN CADDY (Trays 021 -035)

PART #	DESCRIPTION	TRAY QUANTITY
900128-F	Self-Drill Half-Pin Tray / SDHP-A thru T	1
617015	Self-Drill Half-Pin 4x20x215mm	4
617030	Self-Drill Half-Pin 4x30x215mm	4
617050	Self-Drill Half-Pin 4x50x215mm	4
620030	Self-Drill Half-Pin 5x30x215mm	4
620040	Self-Drill Half-Pin 5x40x215mm	4
620060	Self-Drill Half-Pin 5x60x215mm	4
620080	Self-Drill Half-Pin 5x80x215mm	4
622040	Self-Drill Half-Pin 6x40x215mm	4
622050	Self-Drill Half-Pin 6x50x215mm	4
622060	Self-Drill Half-Pin 6x60x215mm	4
100504	2.9mm Drill Bit	3
100505	3.5mm Drill Bit	3
100506	4.5mm Drill Bit	3

ORDERING INFORMATION

BLUNT HALF-PIN CADDY (Trays 021 - 035)

PART #	DESCRIPTION	TRAY QUANTITY
900130-F	Blunt Half-Pin Caddy / BHP-A thru Y	1
618015	Blunt Half-Pin 4x20x215mm	4
618030	Blunt Half-Pin 4x30x215mm	4
618050	Blunt Half-Pin 4x50x215mm	4
621030	Blunt Half-Pin 5x30x215mm	4
621040	Blunt Half-Pin 5x40x215mm	4
621060	Blunt Half-Pin 5x60x215mm	4
621080	Blunt Half-Pin 5x80x215mm	4
623040	Blunt Half-Pin 6x40x215mm	4
623040	Blunt Half-Pin 6x50x215mm	4
623040	Blunt Half-Pin 6x60x215mm	4
100504	2.9mm Drill Bit	3
100505	3.5mm Drill Bit	3
100506	4.5mm Drill Bit	3

ORDERING INFORMATION

NUT & BOLT CADDY TRAY

PART #	DESCRIPTION	TRAY QUANTITY
900129-F	Nut & Bolt Caddy Tray / NBT-001 thru 020	1
100049	Wire Fixation Bolt - Long	16
100065	Standard Bolt x 14mm	20
100070	Standard Bolt x 20mm	20
100080	Standard Bolt x 30mm	20
94007A000	Spherical Washer Coupling	20
100719	Counter Nut	8
900039	Spherical Nut	40
900110	Pin Caps 4mm	20
900111	Pin Caps 5mm	20
900112	Pin Caps 6mm	20
900025	Nut w/Nylon Insert	10

ORDERING INFORMATION

SECONDARY NUT & BOLT CADDY (Trays 021 – 035)

PART #	DESCRIPTION	TRAY QUANTITY
900129-F	Secondary Nut & Bolt Caddy / SNB-A thru P	1
100049	Wire Fixation Bolt - Long	16
100065	Standard Bolt x 14mm	20
100070	Standard Bolt x 20mm	20
100080	Standard Bolt x 30mm	20
94007A000	Spherical Washer Coupling	20
100719	Counter Nut	8
900039	Spherical Nut	40
900110	Pin Caps 4mm	20
900111	Pin Caps 5mm	20
900112	Pin Caps 6mm	20
900025	Nut w/Nylon Insert	10

ORDERING INFORMATION

PRIMARY NUT & BOLT CADDY (Trays 021 – 035)

PART #	DESCRIPTION	TRAY QUANTITY
900131-F	Primary Nut & Bolt Caddy / PNB-A thru O	1
100048	Wire Fixation Bolt	25
100050	Half-Pin Bolt 4-6mm	10
900026	Speed Nut	20
900060	Wing Bolt x 14mm	12
900061	Wing Bolt x 20mm	12
900030	Wing Nut	16
900043	Large Pin Stopper	6
900044	Large Wire Stopper	6
900045	Small Pin Stopper	20
900046	Small Pin Stopper	20
900035	Standard Nut	50
900032	Flat Washer	20

ORDERING INFORMATION

EMPTY TRAYS

PART #	DESCRIPTION	TRAY QUANTITY
900127-F	General Tray / GEN-001 thru 020	1
PART #	DESCRIPTION	TRAY QUANTITY
900127-F	General Tray / GEN-021 thru 035	1

NOTE: These are empty trays that can be ordered and filled to however the reps feels is necessary per surgery.

ORDERING INFORMATION

SPECIAL REQUEST ITEMS

PART #	DESCRIPTION
n/a	Pre-Assembled Frame / Customized
100806	I-Plate
100807	I-Plate - Long
100808	I-Plate - XL
114200	Footplate x 200mm
137120	Welded Cascade Tibial Block 120/140
137140	Welded Cascade Tibial Block 140/160
137160	Welded Cascade Tibial Block 160/180
137180	Welded Cascade Tibial Block 180/200
135120	Welded Stacked Tibial Block 120
135140	Welded Stacked Tibial Block 140
135160	Welded Stacked Tibial Block 160
135180	Welded Stacked Tibial Block 180
100600	Straight Modular Post
100610	Angled Cascade Modular Post
901200	Threaded Rod x 200mm
901220	Threaded Rod x 220mm
901240	Threaded Rod x 240mm
901300	Threaded Rod x 300mm
901400	Threaded Rod x 400mm
900040	T-Block n-Plate
900041	T-Block Footplate
900115	Ratchet Wrench x 10mm
n/a	Plate Sizing Template

ORDERING INFORMATION

REVOLUTION TRAUMA

PART #	DESCRIPTION
205250	Pin-to-Pin Super Strut - Medium
205350	Pin-to-Pin Super Strut - Long
205210	Pin-to-Plate Super Strut - Medium
205310	Pin-to-Plate Super Strut - Long
118010	Z-Post
200180	Multi-Pin Clamp
200143	Straight Horn
200144	30° Angled Horn

REFERENCES

Basic Ilizarov techniques (1990). Techniques in Orthopaedics, 5(4).

Catagni, M.A. (2003). Atlas for the insertion of transosseous wires and half-pins: Ilizarov method (2nd ed.). A. Bianchi-Maiocchi (Ed.). Milan, Italy: Medi SurgicalVideo.

Gubin, A. V., Borzunov, D. Y., & Malkova, T. A. (2013). The Ilizarov paradigm: thirty years with the Ilizarov method, current concerns and future research. International Orthopaedics, 37(8), 1533-1539.

<http://doi.org/10.1007/s00264-013-1935-0>

Hamdy. MB. ChB, MSc. FRCSC, R. C., McCarthy. MD, J. J., & Clarke. MD, H. D. (Eds.). (2011). Management of limb-length discrepancies (45th ed.).

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NOTES

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This document is intended for use by a medical professional. It is their responsibility to evaluate the suitability of a technique based on their experience.

The surgical technique is presented to demonstrate the **Revolution** system. Refer to the instructions for use (IFU-0002-0001) before using the product.

Please contact your Metalogix representative with any questions.

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