

# T.T.C.P.

TIBIO TALO CALCANEUS PLATE



**SURGICAL TECHNIQUE**

**LOWER  
EXTREMITY  
SOLUTIONS**

 **INTEGRA™**  
Extremity Reconstruction

# T.T.C.P.

## Tibio Talo Calcaneus Plate

### Indications

The TTC plate is intended for arthrodesis of the ankle joint and distal tibia, fractures, osteotomies, fusions and replantations of small bones in the foot and ankle.

### Contraindications

The implant should not be used in a patient who has currently, or who has a history of:

- Local or systemic acute or chronic inflammation
- Active infection or inflammation
- Suspected or documented metal allergy or intolerance

### Description

Implants:

4 sizes of implants :

- 4 right & 4 left plates (in 6,7,8, and 9 hole configurations)
- 4.5mm diam. screw for fixation of the tibia and talus – Length 14 mm to 65 mm
- 6.5mm diam. screw for fixation of the calcaneus - Length 20 mm to 65 mm
- Lock-screws for 4.5 mm diam. screws
- Lock-screws for 6.5 mm diam. screws

Instruments:

The hindfoot instrument set is composed of generic and specific instruments

- The generic instruments are used to implant the 4.5 and 6.5mm screws and lock-screws
- Specific tools include trial plates, drill guides, plate benders and compression forceps

Please refer to Instrument Set Diagram (P. 12) for additional information



# Surgical Technique

Designed in conjunction with Robert Anderson, MD, Bruce Cohen, MD, W. Hodges Davis, MD and Carroll Jones, MD



As the manufacturer of this device, Integra does not practice medicine and does not recommend this or any other surgical technique for use on a specific patient. The surgeon who performs any implant procedure is responsible for determining and using the appropriate techniques for implanting the device in each patient.

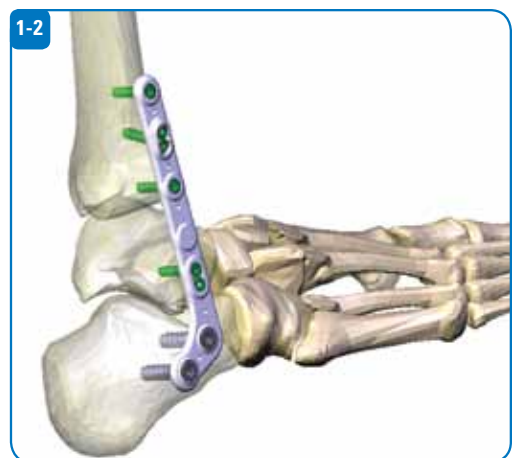
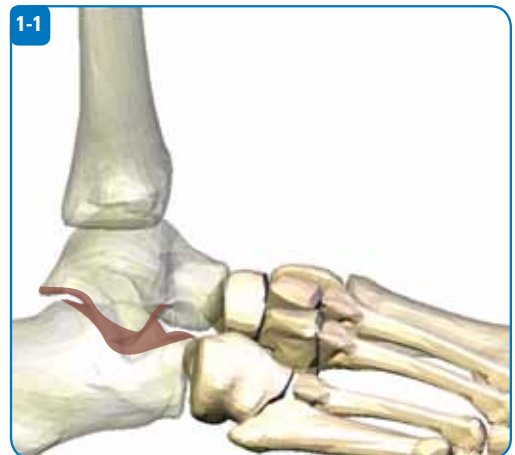
## Step 1 • Articular Surfaces Preparation

The articular surfaces should be prepared using the standard procedure for cartilage resection and/or bone graft placement (Fig. 1-1)

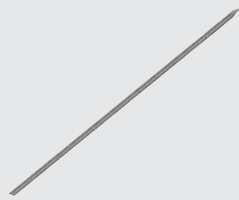
If necessary, deformity correction and alignment should also be performed.

Compression with separate fixation screws may be done prior to plate application. Should this be required, one should take care that these separate fixation screws do not hinder later positioning of the T.T.C.P. and screws.

The final plate placement is shown in Figure 1-2.



## PREPARE



115 216ND  
K-Wire



169 001ND • 169 004ND  
Trial Implants



129 765ND  
Plate benders

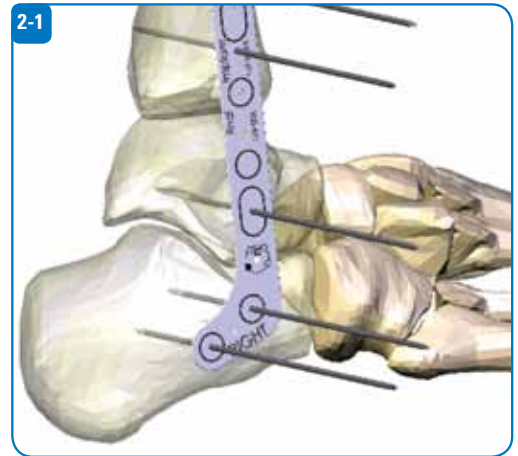
### Step 2 • Trial Plate Positioning

Trial implants (references 169 001ND, 169 002ND, 169 003ND, 169 004ND) are used to determine the appropriate implant size.

The trial implant should be positioned laterally, in order to provide:

- 2 to 3 holes in the short J-shaped or L-shaped part of the plate facing the calcaneus
- The oblong central hole facing the talus, if any is present
- The long part of the plate aligned with the tibia K-wires (reference 115 216ND) are used for temporary fixation of the trial implant (Fig. 2-1)

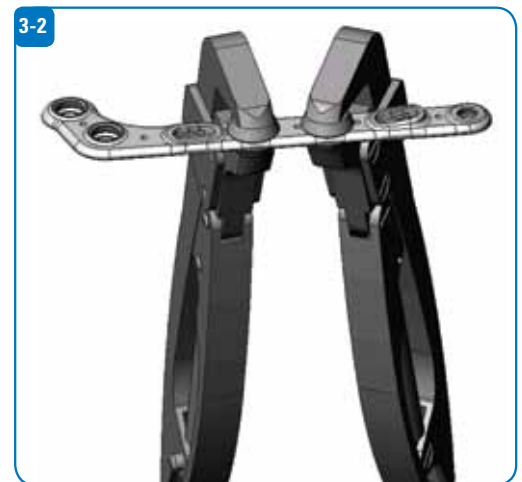
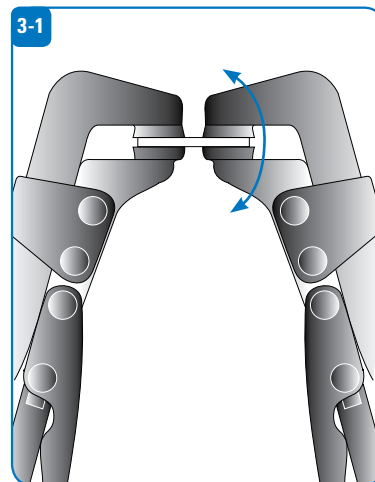
The trial implants are flexible and allow contouring to the lateral surface of the calcaneus, the talus and the tibia. The contoured trial implant may be used as a template for contouring the final implant later in the procedure.



### Step 3 • Plate Contouring

The plates are pre-bent to better fit the lateral aspect of the hindfoot. However, when deemed necessary by the surgeon, the plate may be further contoured using plate benders (129 765ND) as shown in Figures 3-1 and 3-2.

**Warning** : It is imperative that the bending be implemented between two consecutive lipped holes. If not, the intermediate threaded holes may be damaged or deformed and the locking function minimized or lost.





219 665ND  
Drill guides



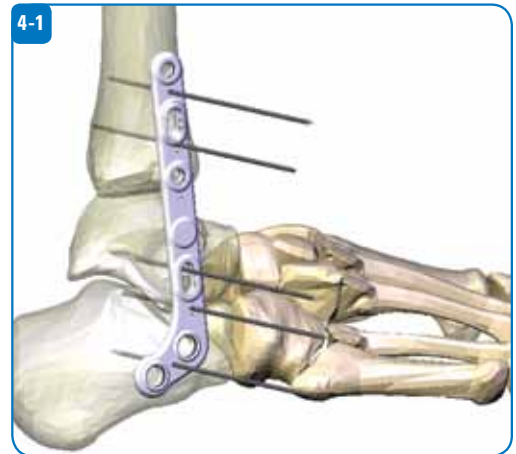
219 865ND  
Screwdriver

## Step 4 • Implant Positioning

The implant is selected, based on the size defined using the trial plate.

The plate can slide along the k-wire(s) used to position the trial plate (Fig. 4-1).

The k-wires serve as temporary fixation during preparation of the screw holes.

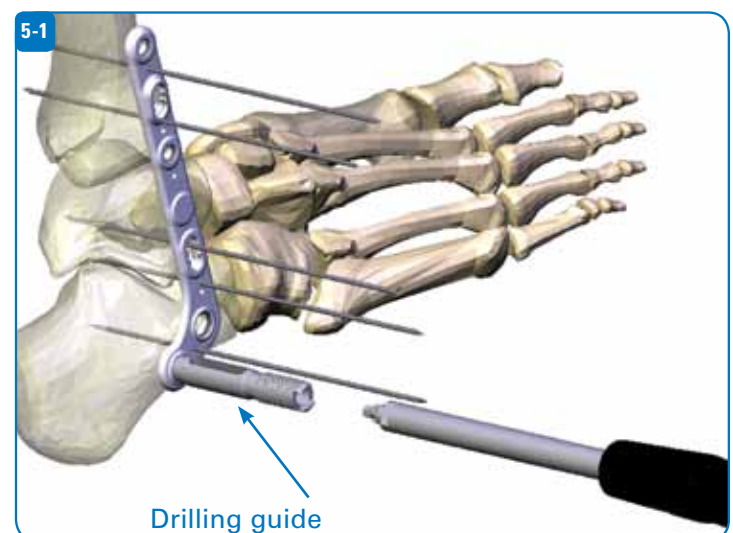


## Step 5 • Drill Screw Holes

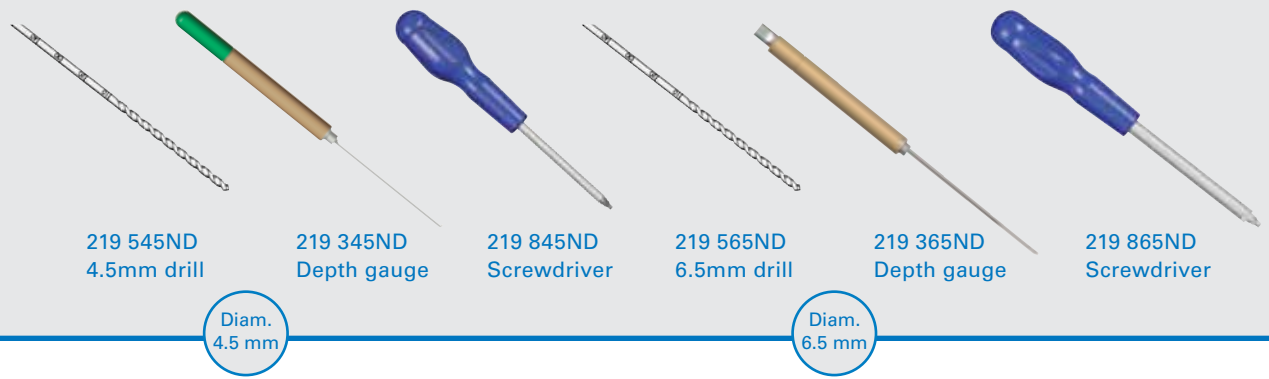
Holes should be prepared, starting with the calcaneal screw holes as shown in Figure 5-1.

K-wires may be used to temporarily hold the plates in position until the screws are inserted.

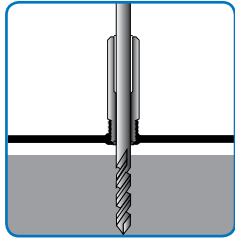
Drilling guides (Reference 219 665ND) are fixed to the plate on the appropriate threaded holes using the screwdriver (Reference 219 865ND).



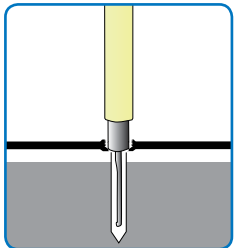
## PREPARE



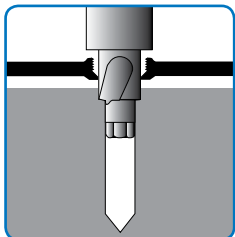
### Step 6 • Screw Insertion



- 1) Prepare holes with the appropriate drill (ref 219 545ND for screws diam. 4.5mm – or ref 219 565ND for screws diam. 6.5mm) through the drill guide. The screw length can be read from the calibrated scale on the drill. The length is read from the top side of the drill guide.

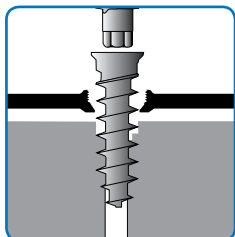


- 2) Alternately, the screw length can be measured using the depth gage (219 345ND for screws diam. 4.5mm – or ref 219 365ND for screws diam. 6.5mm).

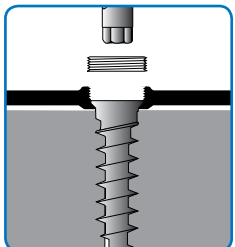


- 3) Chamfer the drill hole with the screwdriver (219 845ND for screws diam. 4.5mm – or ref 219 865ND for screws diam. 6.5mm).

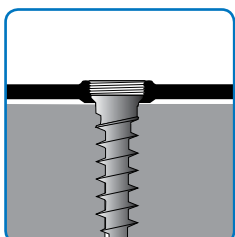
Ensure that the threaded hole is not damaged when performing the chamfering.



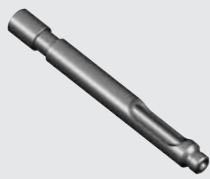
- 4) Insert the screw into the prepared hole until it reaches the end.  
Clean the threaded hole before and after introducing the screw.  
Maintain axial alignment between the screw and the threaded hole.



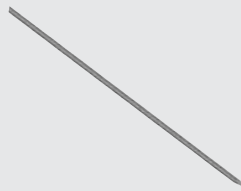
- 5) Assemble the lock-screw to the appropriate screwdriver or power driver. The screw and lock-screw should be inserted in each hole before starting preparation of the next screw hole.



- 6) Locking: Fully seat the lock-screw with the screwdriver. The lock-screw should be flush with the top of the plate when it is fully inserted.



219 645ND  
Drill guides



115 425ND  
K-wire



219 900ND  
Compression clamp

## Step 7 • Joint Space Reduction

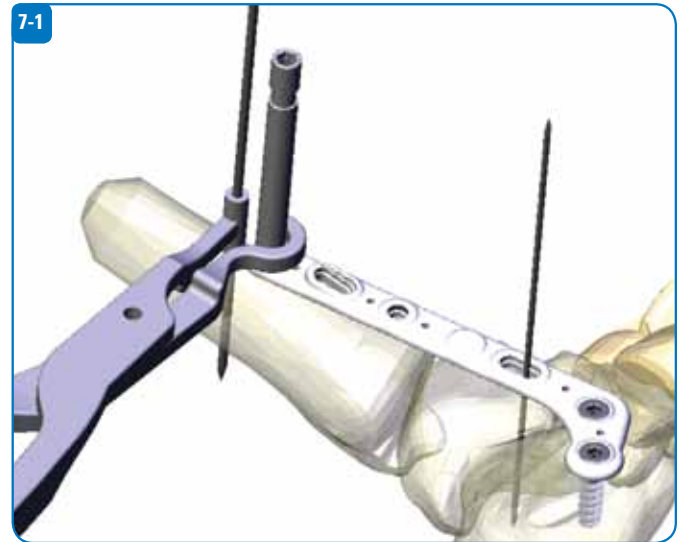
- 1) After insertion of the calcaneal screws, compression is applied and maintained to reduce the arthrodesis (Fig. 7-1).

A drill guide (219 645ND) is fixed to the most proximal hole.

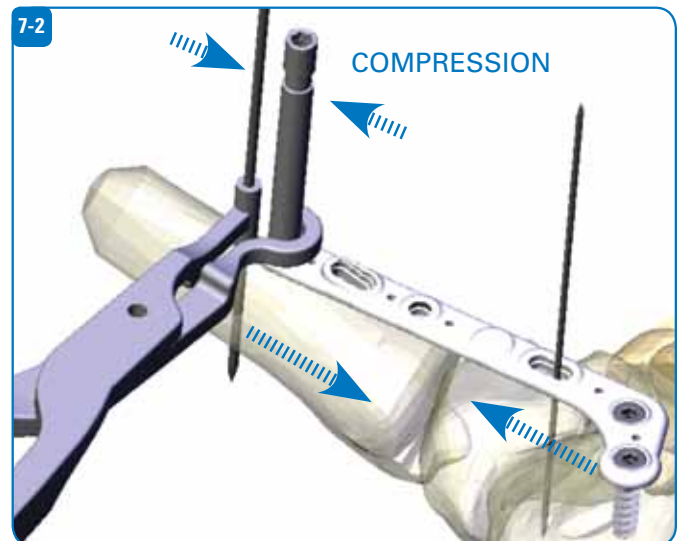
A 2.5mm K-wire (115 425ND) is inserted in the tibial diaphysis, 20mm from the plate.

The compression clamp (219 900ND) is fixed, in a open position, to the drilling guide and the K-wire.

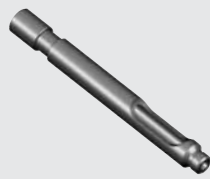
Temporary K-wires are removed.



- 2) Compression is applied with the compression clamp (219 900ND) as shown in Figure 7-2.



## PREPARE



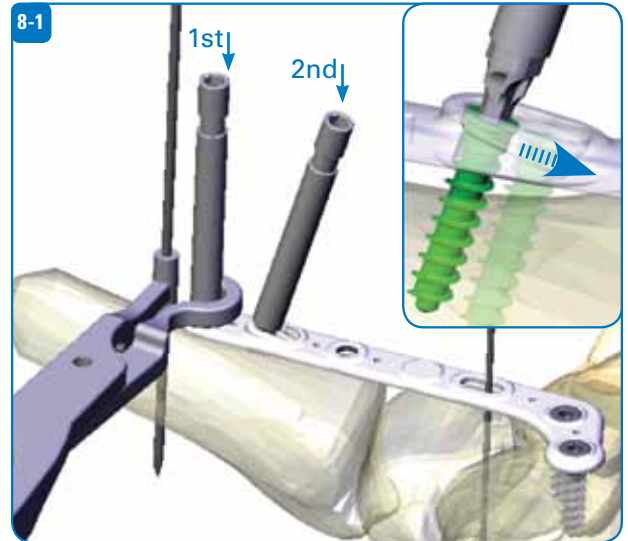
219 645ND  
Drilling guides



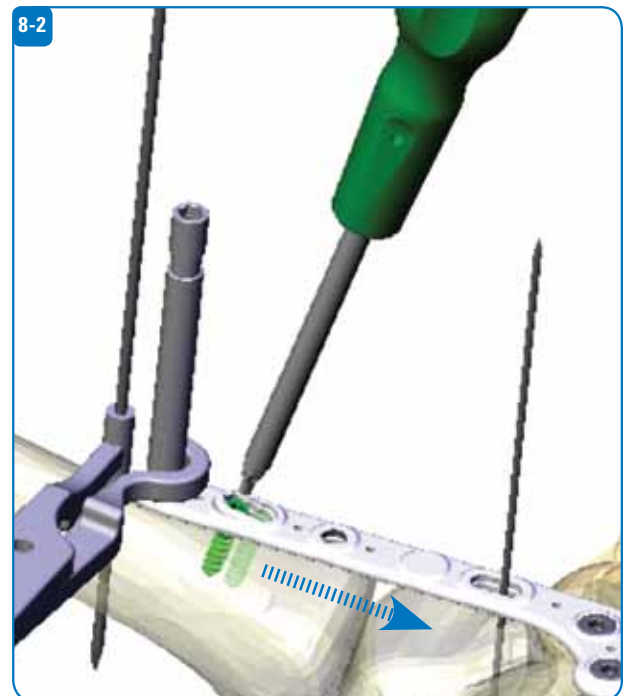
219 845ND  
Screwdriver

### Step 8 • Tibial Fixation

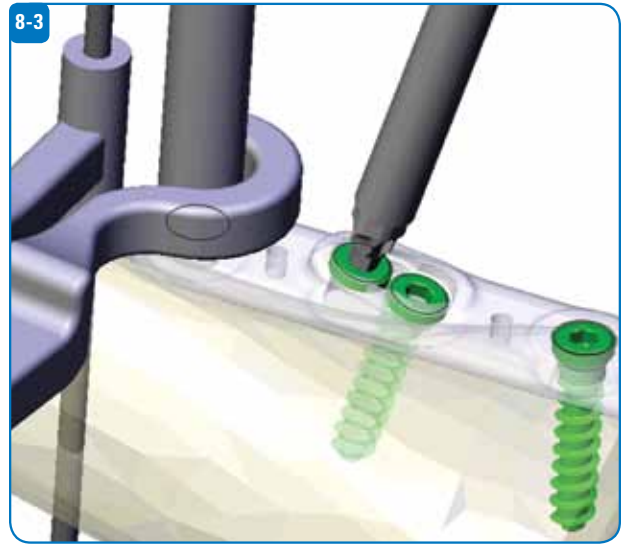
1) Connect a 2nd guide (219 645ND) as shown in Figure 8-1 and proceed with screw insertion (as described in Section 6) at the upper part of the inclined oblong hole.



2) This enables the application of additional compression during screw insertion as shown in Figure 8-2.



3) Once compression has been applied and the screw tightened, use 2 lock-screws to lock the oblong hole (Fig. 8-3).



4) Insert the remaining screws into the tibia as shown in Figure 8-4.



## PREPARE



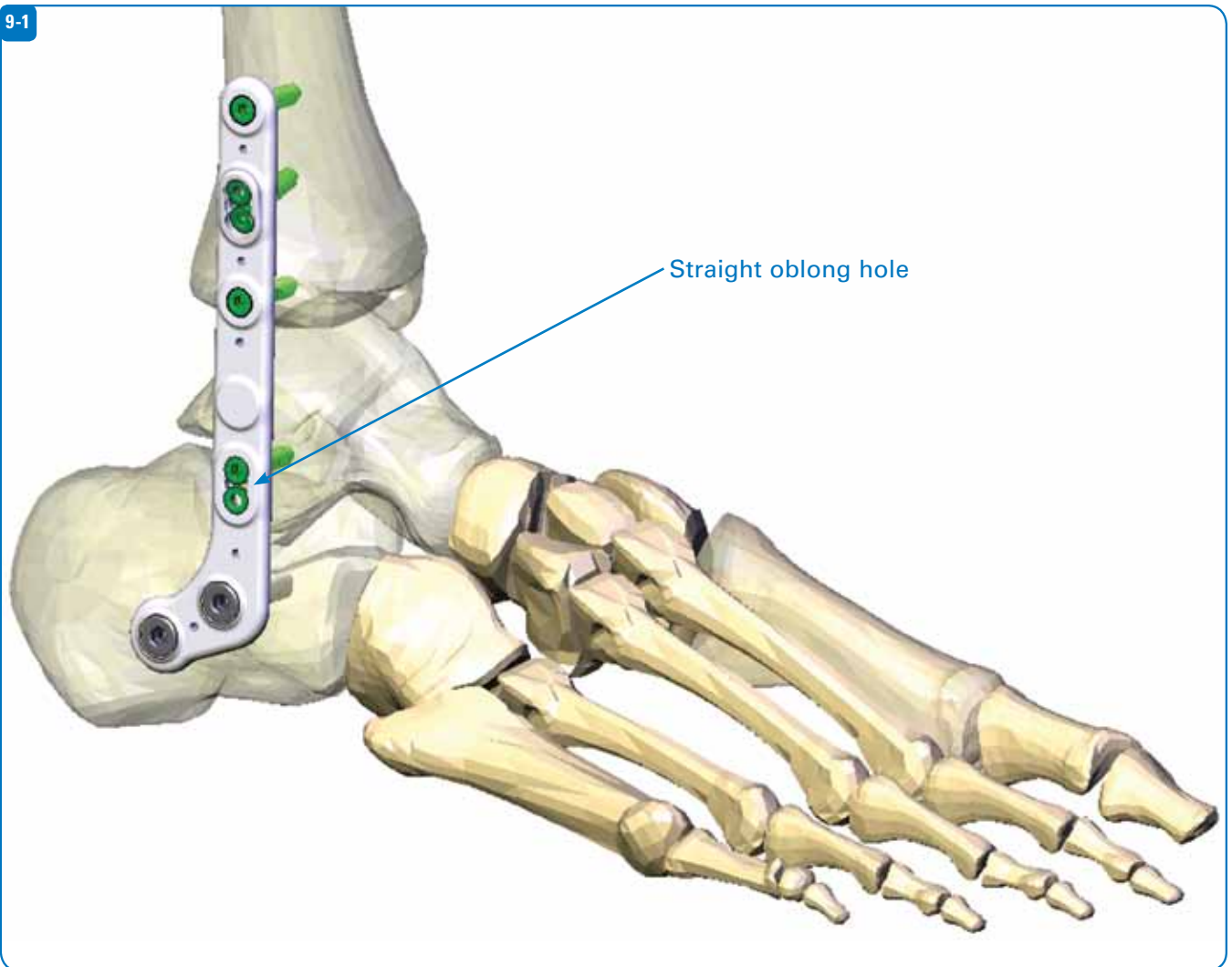
219 845ND  
Screwdriver

### Step 9 • Talar Fixation

If the talus is present, fixation should be performed using 2 screws in the straight oblong hole, followed by 2 lock-screws (Fig. 9-1).

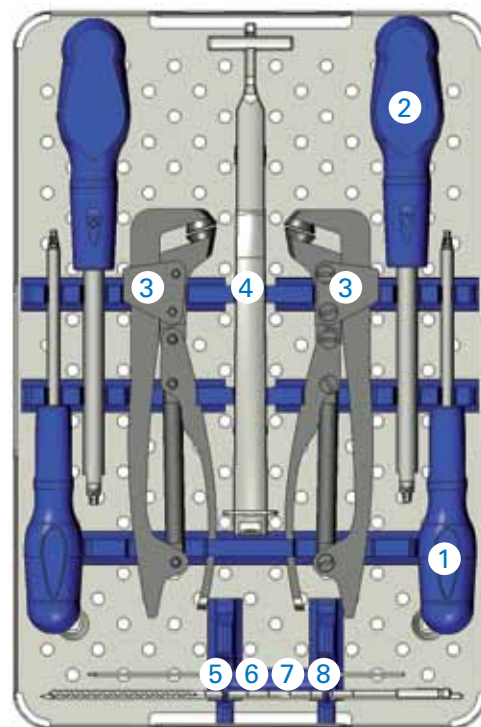
If no talus remains, this straight oblong hole faces the distal tibia. Insertion of a screw is recommended, with 2 lock-screws.

9-1



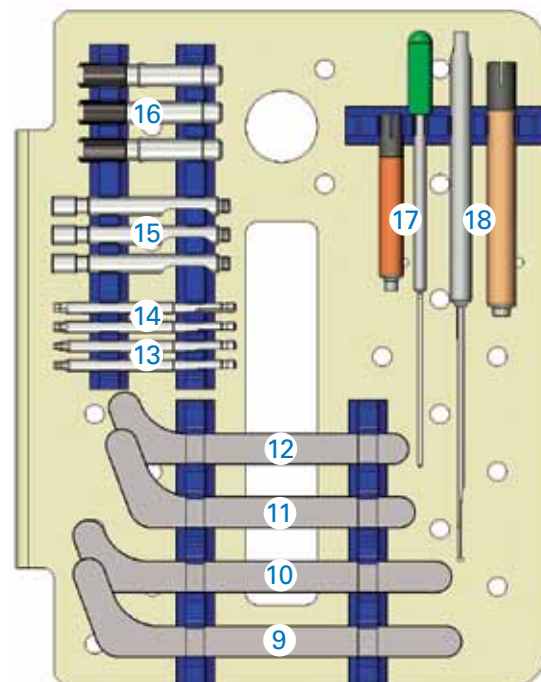
## Instruments

|    | Part #    | Description                               |
|----|-----------|---|
| 1. | 219 845ND | Hex screwdriver for diam. 4.5 Screw       |
| 2. | 219 865ND | Hex screwdriver for diam. 6.5 Screw       |
| 3. | 219 765ND | Bending forceps, diam. 6.5 hole, L. 193mm |
| 4. | 219 900ND | Compression forcep, L. 260mm              |
| 5. | 219 545ND | 3.0 diam drill for diam. 4.5 screw        |
| 6. | 219 565ND | 3.5 diam drill for diam. 6.5 screw        |
| 7. | 115 216ND | K-wire, diam. 1.6mm, L. 150mm             |
| 8. | 115 425ND | K-wire, diam. 2.5mm, L. 200mm             |



## Instruments

|     | Reference | Description                                 |
|-----|-----------|---|
| 9.  | 169 004ND | Trial TTC implant, 9 holes                  |
| 10. | 169 002ND | Trial TTC implant, 8 holes                  |
| 11. | 169 003ND | Trial TTC implant, 7 holes                  |
| 12. | 169 001ND | Trial TTC implant, 6 holes                  |
| 13. | 219 445ND | Screwdriver / AO, hex. diam. 2.5mm, L. 76mm |
| 14. | 219 465ND | Screwdriver / AO, hex. diam. 3.5mm, L. 76mm |
| 15. | 219 645ND | Drilling guide, diam. 3.0mm                 |
| 16. | 219 665ND | Drilling guide, diam. 3.5mm                 |
| 17. | 219 345ND | Depth gauge, diam. 4.5mm screws             |
| 18. | 219 365ND | Depth gauge, diam. 6.5mm screws             |



# T.T.C.P.

## TIBIO TALO CALCANEUS PLATE

### Implants

T.T.C.P.

| Reference  | Description     |
|------------|-----------------|
| 181 001SND | Right - 6 holes |
| 181 002SND | Right - 8 holes |
| 181 003SND | Right - 7 holes |
| 181 004SND | Right - 9 holes |
| 181 011SND | Left - 6 holes  |
| 181 012SND | Left - 8 holes  |
| 181 013SND | Left - 7 holes  |
| 181 014SND | Left - 9 holes  |

### Instruments

| Reference | Description                                 |
|-----------|---|
| 219 845ND | Screwdriver / Hex. diam. 2.5mm, L. 191mm    |
| 219 865ND | Screwdriver / Hex. diam. 3.5mm, L. 230mm    |
| 219 445ND | Screwdriver / AO, hex. diam. 2.5mm, L. 76mm |
| 219 465ND | Screwdriver / AO, hex. diam. 3.5mm, L. 76mm |
| 219 645ND | Drilling guide, diam. 3.0mm                 |
| 219 665ND | Drilling guide, diam. 3.5mm                 |
| 219 545ND | Drill, diam. 3.0mm, L. 190mm                |
| 219 565ND | Drill, diam. 3.5mm, L. 200mm                |
| 219 900ND | Compression forcep, L. 260mm                |
| 219 765ND | Bending forceps, diam. 6.5mm hole, L. 193mm |
| 219 345ND | Depth gauge, diam. 4.5mm screws             |
| 219 365ND | Depth gauge, diam. 6.5mm screws             |
| 115 216ND | K-wire, diam. 1.6mm, L. 150mm               |
| 115 425ND | K-wire, diam. 2.5mm, L. 200mm               |
| 169 001ND | Trial TTC plate, 6 holes                    |
| 169 002ND | Trial TTC plate, 8 holes                    |
| 169 003ND | Trial TTC plate, 7 holes                    |
| 169 004ND | Trial TTC plate, 9 holes                    |

### Container

#### Container For Ancillary Instruments

| Reference | Description |
|-----------|-------------|
| 169 101ND | Container   |
| 169 111ND | Base        |
| 169 103ND | Lid         |
| 169 104ND | Cylinder    |
| 169 105ND | Module      |

#### Container For Ancillary Instruments

| Reference | Description                        |
|-----------|------------------------------------|
| 188 201ND | Container for non sterile implants |
| 188 211ND | Container                          |
| 188 215ND | Base                               |
|           | Rack                               |

### Diam. 4.5 mm + Lock Screws

Sterile stainless steel screws

| Reference  | Description              |
|------------|--------------------------|
| 286 414SND | Length 14mm              |
| 286 416SND | Length 16mm              |
| 286 418SND | Length 18mm              |
| 286 420SND | Length 20mm              |
| 286 422SND | Length 22mm              |
| 286 424SND | Length 24mm              |
| 286 426SND | Length 26mm              |
| 286 428SND | Length 28mm              |
| 286 430SND | Length 30mm              |
| 286 435SND | Length 35mm              |
| 286 440SND | Length 40mm              |
| 286 445SND | Length 45mm              |
| 286 450SND | Length 50mm              |
| 286 455SND | Length 55mm              |
| 286 460SND | Length 60mm              |
| 286 465SND | Length 65mm              |
| 186 400SND | Lock screws, diam. 4.5mm |

### Diam. 6.5 mm + Lock Screws

Sterile stainless steel screws

| Reference  | Description              |
|------------|--------------------------|
| 286 62SND  | Length 20mm              |
| 286 625SND | Length 25mm              |
| 286 630SND | Length 30mm              |
| 286 635SND | Length 35mm              |
| 286 640SND | Length 40mm              |
| 286 645SND | Length 45mm              |
| 286 650SND | Length 50mm              |
| 286 655SND | Length 55mm              |
| 286 660SND | Length 60mm              |
| 286 665SND | Length 65mm              |
| 186 600SND | Lock screws, diam. 6.5mm |

- The products are manufactured and referenced within the frame of the standards in force.
  - Implantation procedures are described in the surgical technique.
- The manufacturer reserves the right, without prior notice, to modify the products
- WARNING : Federal law (USA) restricts this device to sale by or on the order of a physician.



**INTEGRA™**  
Extremity Reconstruction

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