Nota Bene

The technique description herein is made available to the healthcare professional to illustrate the authors' suggested treatment for the uncomplicated procedure. In the final analysis, the preferred treatment is that which addresses the needs of the patient.
Indications

The TRIGEN "META-NAIL" Retrograde Femoral Nail is indicated for fractures of the femur including stable and unstable distal metaphyseal fractures, diaphyseal fractures, intra-articular fractures, peri-prosthetic fractures, non-unions, mal-unions and for the prophylactic nailing of impending pathological fractures.
TRIGEN™ META-NAIL™ Retrograde Femoral Nail Specifications

**Specifications**

<table>
<thead>
<tr>
<th>Material</th>
<th>Ti6Al4V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>10, 11.5 &amp; 13mm</td>
</tr>
<tr>
<td>Lengths</td>
<td>10-50cm^*</td>
</tr>
<tr>
<td>Nail Color</td>
<td>Gold</td>
</tr>
<tr>
<td>Cross Section</td>
<td>Round</td>
</tr>
<tr>
<td>Distal Diameter (driving end)</td>
<td>12mm (10, 11.5 dia)</td>
</tr>
<tr>
<td></td>
<td>13mm (13 dia)</td>
</tr>
<tr>
<td>Proximal Diameter (non-driving end)</td>
<td>10, 11.5 &amp; 13mm</td>
</tr>
<tr>
<td>Smallest Thru Diameter</td>
<td>5.0mm</td>
</tr>
<tr>
<td>Wall Thickness</td>
<td>2.3mm (10 dia)</td>
</tr>
<tr>
<td></td>
<td>3.0mm (11.5 dia)</td>
</tr>
<tr>
<td></td>
<td>2.3mm (13 dia)</td>
</tr>
<tr>
<td>Guide Bolt Thread</td>
<td>5/16-24 UNF</td>
</tr>
<tr>
<td>Screw Diameter</td>
<td>5.0mm</td>
</tr>
<tr>
<td>Screw Color</td>
<td>Gold</td>
</tr>
<tr>
<td>Major Diameter</td>
<td>5.0mm</td>
</tr>
<tr>
<td>Minor Diameter (core)</td>
<td>4.3mm</td>
</tr>
<tr>
<td>Screw Lengths</td>
<td>25-110mm</td>
</tr>
<tr>
<td>Hex Size</td>
<td>4.7mm</td>
</tr>
<tr>
<td>Alternative Hex Drivers</td>
<td>RT Femoral &amp; Recon</td>
</tr>
<tr>
<td></td>
<td>7.0mm Cannulated Screw PER-LOC™ 4.7mm Hex Driver, PROFIX™ 7.0mm Hex Driver</td>
</tr>
<tr>
<td>Alternative Modes</td>
<td>No</td>
</tr>
</tbody>
</table>

**Distal Locking (Driving End)**

| Static Lock Locations/Orientations | 35mm/ML - Threaded, can be locked with META-NAIL Cap |
|                                   | 30mm/25° - Threaded w/bushing                   |
|                                   | 40mm/25° - Threaded w/bushing                   |
| Static Locking Hole Dimensions   | Threaded 4.5mm minor dia.                       |
|                                   | Threaded 5.3mm major dia.                      |

**Proximal Locking (Non-Driver End)**

| Static Lock Locations/Orientations | 5mm/AP |
|                                   | 35mm/AP |
| Static Locking Hole Dimensions    | 5.3mm   |
| Proximal Screw Hole Diameter      | 5.3mm   |
| AP Bow Radius                      | 2M      |
| AP Bow Location                    | Starts 100mm from Driving End                   |

NOTE: These views are not to scale and should be used as a pictorial representation only.

* Set does not include all sizes; Outlier sizes may be special order only
**Surgical Technique**

**Patient Positioning**

Position the patient supine on a radiolucent table. Flex the affected limb approximately 45° over a posterior support to assist with fracture reduction. Check for length and rotation by comparison to the unaffected limb.

Rotate the C-Arm to ensure optimal AP and lateral visualization of the entire femur. The C-Arm should be able to freely access the femur up to and including the intertrochanteric area. A distraction device may also be applied to obtain and/or maintain traction.

Intra-articular fracture components should be addressed with interfragmentary screw fixation prior to nail insertion. Care should be taken to place the screws in the anterior and posterior aspect of the distal femur and safely out of the nail's intended path.

Note: Cannulated screw guide wires allow for confirmation of definitive screw placement prior to fracture fixation and nail insertion.
Instruments for Opening the Distal Femur

3.2mm Tip Threaded Guide Wire
Cat. No. 7163-1690

12.5mm Entry Reamer
Cat. No. 7163-1116

Honeycomb
Cat. No. 7167-4075

Entry Portal Tube
Cat. No. 7167-4060

Entry Portal Handle
Cat. No. 7167-4092

Mini Connector
Cat. No. 7163-1186

T-Handle
Cat. No. 7167-4076

3.2mm T-Handle Trocar
Cat. No. 7167-4074

Cannulated Awl
Cat. No. 7167-4000
Surgical Technique (continued)

Incision and Entry Point

Assemble the Honeycomb (7167-4075), Entry Handle (7167-4092) and Entry Tube (7167-4060). The pieces will lock in place securely at either 0° or 180°.

A 3-4cm midline incision is made followed by a medial parapatellar capsular incision to expose the intercondylar notch. Gently retract the patellar tendon laterally.

The entry point is located within the intercondylar notch just anterior and lateral to the femoral attachment of the posterior cruciate ligament.
Entry Portal Acquisition

Attach a 3.2mm Tip Threaded Guide Wire (7163-1690) to the drill via the Mini Connector (7163-1186) and insert 6-8cm into the distal femoral metaphysis. The Entry Portal Instrumentation serves as a soft tissue protector.

The Guide Wire should be in-line with the femoral axis in the AP view and anterior to Blumensaat's Line in the lateral.

In the instance of suboptimal Wire placement, rotate the Honeycomb within the Entry Tube to the desired location and insert another 3.2mm Tip Threaded Guide Wire.
Surgical Technique (continued)

Entry Portal

After definitive Guide Wire placement, remove the Honeycomb from the Entry Tube along with any additionally inserted Guide Wires and attach the 12.5mm Entry Reamer to power. Advance over the Guide Wire through the Entry Tube to a depth of 6-8cm.

Check position via radiographic imaging and then remove the 12.5mm Entry Reamer and 3.2mm Tip Threaded Guide Wire.

Alternative Technique: Entry Portal

Attach the T-Handle (7167-4076) to the Cannulated Awl (7167-4000) and insert into the distal femur to a depth of 6-8cm. Introduce the 3.2mm T-Handle Trocar (7167-4074) into the back of the assembly prior to insertion in order to prevent awl slippage and accumulation of cortical bone within the cannulation.
Instruments for Fracture Reduction & Reaming

- Entry Portal Tube
  Cat. No. 7167-4060

- Ruler
  Cat. No. 7167-4079

- Entry Portal Handle
  Cat. No. 7167-4092

- T-Handle
  Cat. No. 7167-4076

- Reamer Heads
  Cat. No. 7111-8231-8246

- Gripper
  Cat. No. 7163-1186

- Obturator
  Cat. No. 7167-4078

- Reamer Shaft
  Cat. No. 7111-8200

- Reducer
  Cat. No. 7167-4077

- 3.0mm Ball-Tip Guide Rod
  Cat. No. 7163-1526
Fracture Reduction

Insert the back end of the 3.0mm Ball Tip Guide Rod (7163-1626) into the front of the Gripper (7167-4080) and gently close the trigger-grip. Connect the Reducer and Reducer Connector (7167-4077) so that the words “Slot Orientation” are in line with the opening at the tip. Complete the assembly by connecting it to the T-Handle.

Note: If blocking screws are desired at this point in the procedure, refer to the blocking screws technique section (pp. 18-24).

Advance the Reducer into the intramedullary canal and use the curved tip to direct the 3.0mm Ball Tip Guide Rod past the fracture into the region of the proximal femur.

The Guide Rod should be center-center in the AP and lateral views.
Reducer Removal

Once the Guide Rod is at the desired depth, detach the Gripper and remove the Reducer from the femoral canal. Slide the Obturator (7167-4078) into the back of the T-Handle during extraction in order to maintain Guide Rod position within the canal.

Imagen Measurement

After Reducer removal, re-confirm Guide Rod placement within the proximal femur and slide the Ruler (7167-4079) over the Guide Rod to the desired depth. The metal tip of the Ruler denotes the driving end of the META-NAIL™ Retrograde Femoral Nail.

Confirm Guide Rod position in the window at the opposite end of the Ruler as shown in order to ensure accurate implant measurement. Push down on the top of Ruler until contact is made with the 3.0mm Guide Rod. Implant length is read from the exposed calibrations at the end of the ruler.

Note: Implant length selection should take into consideration the fact that the nail must be countersunk past the articular surface of the distal femur.

Note: Confirm that the Ruler opens easily and adjust the thumb-wheel connection at the end to allow for free movement.
Unreamed Technique

Radiographic templating is used to determine nail size. The appropriate diameter implant will provide translational fill within the isthmus of the intramedullary canal. Generally, selection of a nail at least 1-1.5mm less than the narrowest canal measurement on the lateral radiograph assists in avoiding implant incarceration during insertion.

Note: The 7.6mm diameter of the Reducer provides an initial “sound” for determining canal width in small diameter femurs.
Reamed Technique

Radiographic templating and intra-operative measurement will determine nail size. Beginning with the 9.0mm Front Cutting Reamer Head (7111-8231) and Flexible Reamer Shaft (7111-8200), ream the intramedullary canal sequentially in half millimeter increments to a size 1-1.5mm larger than the selected nail size.

Ensure Guide Rod placement during reaming by inserting the Obturator into the back of the Reamer unit during retraction. Continue to confirm Guide Rod placement in the proximal femur throughout reaming. Periodically move the reamer back and forth in the canal to clear debris from the cutting flutes.
Surgical Technique (continued)

Instruments for Nail Assembly & Insertion

* 4.0mm Long Pilot Drill (7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)
Nail Assembly

Attach the META-NAIL™ Drill Guide (7165-4502) to the nail with the Guide Bolt Long (7165-4506) and tighten with the Guide Bolt Wrench (7163-1140) and T-Handle. The nail is correctly aligned when:

1. The line on the insertion barrel matches the line on the back of the nail
2. The “A” on the nail matches the “A” on the insertion barrel
3. The apex of the nail’s AP Bow and the Drill Guide itself are oriented anterior

The bevel on the front of the nail marks the connection to the Drill Guide and can be seen in the lateral view as a means for determining distal insertion depth.

Note: Do not use the META-NAIL Extension Drill Guide to insert the Retrograde Femoral Nail as the Insertion Barrel is too short to allow for adequate countersinking of the nail. It is recommended to use the standard Drill Guide and Long Guide Bolt due to the longer Insertion Barrel.

Attach the Anterior Drop (7165-4501) to the Drill Guide and verify targeting accuracy by inserting a gold 9.0mm Drill Sleeve (7163-1152) and silver 4.0mm Drill Sleeve (7167-4083) into the Drop and passing a 4.0mm Long Pilot Drill (7163-1110)* through the assembly. An incorrectly attached nail will not target.

* 4.0mm Long Pilot Drill (7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)
Nail Insertion

Remove the Anterior Drop and attach the Impactor (7167-4081) to the Drill Guide. Orient the Drill Guide assembly in the AP position and advance the nail over the Guide Rod by light blows from the Slotted Hammer (7167-4082) to the desired depth.

Additional reaming of the intramedullary canal may be necessary if excessive force is required to insert the nail.

Verify fracture reduction as the nail crosses the fracture site paying close attention to rotation, length, alignment, distraction and/or shortening. Check final nail position in both the AP and lateral views for correct alignment.
Check Nail Depth

Distal
In the AP and lateral views, confirm nail position within the distal femur. The notch at the nail/Drill Guide junction will be visible in the lateral. Each gauge on the insertion barrel represents a 10mm depth interval.

Proximal
In the AP view, confirm that the nail has been inserted to the desired depth. Femoral fractures should be treated with the longest nail possible in order to reduce the likelihood of stress risers. Remove the Guide Rod once the nail has been fully seated and attach the Anterior Drop.

Note: Following nail insertion, confirm that the nail and Drill Guide are securely connected as hammering can loosen the Guide Bolt.
Surgical Technique (continued)

Instruments for Standard Locking

- **4.0mm Long Pilot Drill** (Cat. No. 7163-1110)
- **4.0mm Short Drill** (Cat. No. 7163-1117)
- **4.0mm Long Pilot Drill** (Cat. No. 7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)
- **4.0mm Short Drill** (Cat. No. 7163-1117) is interchangeable with 4.0mm AO Short Drill (7163-1123)
- **Long Screw Length Sleeve** (Cat. No. 7165-4520)
- **Medium Hexdriver** (Cat. No. 7163-1066)
- **4.0mm Drill Sleeve** (Cat. No. 7163-1156)
- **9.0mm Drill Sleeve** (Cat. No. 7163-1152)
- **4.0mm Drill Sleeve** (Cat. No. 7163-1156)
- **4.0mm Long Pilot Drill** (Cat. No. 7163-1110)
- **MINI CONNECTOR** (Cat. No. 7163-1186)
- **Nail Cap Set Screw** (Cat. No. 7165-6000)
- **META-NAIL™ Anterior Drop** (Cat. No. 7165-4501)
- **Mini Connector** (Cat. No. 7163-1186)
- **Screwdriver Release** (Cat. No. 7167-4084)
- **4.0mm Long Pilot Drill** (Cat. No. 7163-1110)
- **4.0mm Short Drill** (Cat. No. 7163-1117)
- **4.0mm Short Drill** (Cat. No. 7163-1117)
- **Screw Depth Gauge** (Cat. No. 7163-1189)

* 4.0mm Long Pilot Drill (7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)
** 4.0mm Short Drill (7163-1117) is interchangeable with 4.0mm AO Short Drill (7163-1123)
Locking Screw Measurement

There are three (3) methods:

1. Gold 9.0mm Drill Sleeve, silver 4.0mm Drill Sleeve and 4.0mm Long Pilot Drill*
2. Screw Depth Gauge (7163-1189)
3. Long Screw Length Sleeve (7165-4520) and 4.0mm Long Pilot Drill*

Locking Screw Insertion

Distal locking options include three (3) statically locked threaded holes that are targeted through the orange and green color-coded holes on the Anterior Drop.

Proximal locking options include two (2) statically locked, non-threaded AP holes.

Gold 5.0mm locking screws are compatible with 10, 11.5 and 13mm diameter nails.

Note: The 4.0mm Short Step Drill (7164-1123) may be used to drill for a gold 5.0mm locking screw in the instance of hard cortical bone. Its 4.7-4.0mm width transition facilitates easier screw insertion without compromising purchase.

* 4.0mm Long Pilot Drill (7163-1121) is interchangeable with 4.0mm AO Long Drill (7163-1121)
Distal Locking
Make a small incision at the site of screw entry and insert the gold 9.0mm Drill Sleeve and silver 4.0mm Drill Sleeve through the desired slot on the Anterior Drop down to bone. Drill both cortices with the 4.0mm Long Pilot Drill*.

Measure for screw length using either the calibrations on the 4.0mm Long Pilot Drill* or by removing the 4.0mm Drill Sleeve and using the Screw Depth Gauge. Attach the appropriate length screw to the end of the Medium Hexdriver (7163-1066) and insert through the gold 9.0mm Drill Sleeve on power until the laser etched ring on the Hexdriver reached the back of the Drill Sleeve. Attach the T-Handle to the Hexdriver and tighten the screw by hand.

Proximal Locking
Proximal locking is performed in the AP plane using a free-hand technique. Confirm fracture reduction and align the C-Arm over the desired locking hole. Obtain a “perfect circle” image of the locking hole and use a blunt object to approximate the location of the locking hole by dimpling the skin.

Make a stab incision at the site, insert the 4.0mm Long Pilot Drill*, and drill both cortices. Measure for screw length using the Screw Depth Gauge. Alternatively, leave the 4.0mm Long Pilot Drill* in place, insert the Long Screw Length Sleeve down to bone, and read the exposed calibrations off the drill. Insert the appropriate length screw using the Medium Hexdriver/T-Handle assembly.

* 4.0mm Long Pilot Drill (7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)
Surgical Technique (continued)

Instruments for Blocking Screw Insertion

- **4.0mm Long Pilot Drill (7163-1110)** is interchangeable with **4.0mm AO Long Drill (7163-1121)**

### Instruments for Blocking Screw Insertion

- **Retrograde Femoral Blocking Screw Attachment**
  - Cat. No. 7165-4508
- **T-Handle**
  - Cat. No. 7165-4076
- **11.0mm T-Handle Awl**
  - Cat. No. 7165-4522
- **8.5mm/10.0mm Screw Cartridge**
  - Cat. No. 7165-4511
- **11.5mm/13.0mm Screw Cartridge**
  - Cat. No. 7165-4513
- **Offset Blocking Screw Cartridge**
  - Cat. No. 7165-4514
- **Blocking Screw Alignment Pin**
  - Cat. No. 7163-1110
- **4.0mm Long Pilot Drill**
  - Cat. No. 7163-1110
- **4.0mm Drill Sleeve**
  - Cat. No. 7163-1156
- **9.0mm Drill Sleeve**
  - Cat. No. 7163-1152
- **Medium Hexdriver**
  - Cat. No. 7163-1066
- **11.0mm T-Handle Awl**
  - Cat. No. 7165-4522
- **Blocking Screw Device**
  - Cat. No. 7165-4515
- **Mini Connector**
  - Cat. No. 7163-1186

* 4.0mm Long Pilot Drill (7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)
Blocking Screw Technique: Incision & Entry Point

A 3-4cm midline incision is made followed by a medial parapatellar capsular incision to expose the intercondylar notch. Gently retract the patellar tendon laterally.

The entry point is located within the intercondylar notch just anterior and lateral to the femoral attachment of the posterior cruciate ligament.

Entry Portal Acquisition

Insert the 110mm T-Handle Awl (7165-4522) manually to a depth just distal to the fracture.

Note: When creating the initial entry point, pay close attention to the trajectory of the Awl and its relationship to the anatomic axis of the femur. Correct Awl trajectory in the distal fragment must be established prior to alignment with the anatomic axis of the proximal fragment. This will ensure accurate fracture reduction when the nail is inserted.
AP Blocking Screw Insertion

In order to prevent varus or valgus malalignment of the distal fragment, blocking screws may be placed in the AP plane. Attach the Blocking Screw Device (7165-4515) to the 11.0mm T-Handle Awl and move it into the desired position in the AP plane.

Note: The Blocking Screw Alignment Pins (7165-4523) can be screwed into the three (3) threaded holes on the metal handle of the Blocking Screw Device to serve as external points of reference during fracture alignment.

Tighten the device to the Awl and insert the appropriate Blocking Screw Cartridge (7165-4511, 7165-4513, 7165-4514). Adjust the Cartridge proximally or distally within the Blocking Screw Device to determine blocking screw position.

Insert the gold 9.0mm Drill Sleeve and silver 4.0mm Drill Sleeve into the desired cartridge hole and down to bone. Drill both cortices with the 4.0 mm Long Pilot Drill*. Screw length is determined by reading the exposed drill bit calibrations or by removing the 4.0mm Drill Sleeve and measuring with the Screw Depth Gauge. Insert the screw with the Medium Hexdriver/T-Handle assembly until the screw engages the far cortex.

Note: Use caution during drilling and insertion of blocking screws in the AP plane. Plunging the drill bit past the posterior cortex or insertion of a screw that is too long may damage neurovascular structures located posterior to the distal femur.

* 4.0mm Long Pilot Drill (7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)
Surgical Technique (continued)

Following implantation of the distal blocking screw and fracture reduction, pass the 110mm T-Handle Awl into the proximal fragment. Re-position either the Blocking Screw Cartridge or the Awl as necessary and follow the previously described technique for blocking screw insertion.

ML Blocking Screw Insertion

In order to prevent anterior or posterior malalignment of the distal fragment, blocking screws may also be placed in the ML plane. Attach the Blocking Screw Device to the 110mm T-Handle Awl and rotate it into the desired position in the ML plane.

Tighten the device to the Awl and insert the appropriate Blocking Screw Cartridge. Adjust the Cartridge proximally or distally within the Blocking Screw Device to determine blocking screw position. Blocking screw insertion follows the previously described technique.
Blocking Screw Insertion with Reducer

Blocking screw insertion can also be performed by attaching the Blocking Screw Device to the Reducer instead of the 11.0mm T-Handle Awl. Blocking screw insertion follows the previously described technique.

Final View: AP and ML Blocking Screw Insertion

Once blocking screw insertion is complete, remove the Blocking Screw Device from the 110mm T-Handle Awl or Reducer and obtain both AP and lateral radiographic images to confirm accurate placement.

The Awl or Reducer provides a good indication of the nail’s insertion trajectory based upon the location of the blocking screws. Following confirmation of proper screw placement, proceed with nail insertion following the META-NAIL™ system insertion technique.
Surgical Technique (continued)

Stability Blocking Screw Insertion

Following nail insertion and confirmation of fracture reduction, blocking screws can be placed on either side of the nail in the metaphyseal region for additional stability. Screws may be inserted in both the AP and ML planes.

With the nail inserted, attach the Retrograde Femoral Blocking Screw Attachment (7165-4508) to the Anterior Drop, matching the orange shape found on the Blocking Screw Attachment to the corresponding one on the Drop (Triangle to Triangle for AP screws and Square to Square for ML screws). Follow the previously described technique for Cartridge positioning and blocking screw insertion.

Note: The AP blocking screws targeted through the two (2) holes built into the Anterior Drop cannot be used if the most superior oblique distal locking screw has been inserted.
Final View: Stability Blocking Screws

Once stability blocking screw insertion is complete, remove the Blocking Screw Attachment and Anterior Drop from the Drill Guide and obtain both AP and lateral radiographic images to confirm accurate placement.

TRIGEN™ Nail Cap and Nail Cap Set Screw Insertion: Optional

Remove the Drill Guide/Anterior Drop assembly. Attach the selected Nail Cap or Nail Cap Set Screw to the Medium Hexdriver/T-Handle assembly and insert into the end of the nail until tight.

Note: The TRIGEN Nail Cap does not engage with the most distal locking screws to create a fixed angle construct.

Note: If cross-threading occurs, rotate the Nail Cap or Nail Cap Set Screw counterclockwise until its threads line up with those of the nail. Proceed with insertion until tight.
Instruments for Implant Removal

- **3.2mm Tip Threaded Guide Wire**
  Cat. No. 7163-1690

- **12.5mm Entry Reamer**
  Cat. No. 7163-1116

- **Impactor**
  Cat. No. 7167-4081

- **One Piece Impactor***
  Cat. No. 7163-1185

- **Mini Connector**
  Cat. No. 7163-1186

- **Disposable Nail Extractor**
  Cat. No. 7163-1320

- **3.0mm x 1000mm Ball Tip Guide Rod**
  Cat. No. 7163-1226

- **T-Handle**
  Cat. No. 7167-4076

- **Medium Hexdriver**
  Cat. No. 7163-1066

- **Slotted Hammer**
  Cat. No. 7167-4082

* Additional Guide Rods listed on page 30
** The One Piece Impactor is located in the original TRIGEN Instrument Set (7163-1326)
*** The Disposable Nail Extractor (7163-1320) is interchangeable with the Large Nail Extractor located in the original TRIGEN Instrument Set (7163-1326) and the HFN Instrument Set (7120-0001)
Nail Extraction: Optional

Standard Technique
Remove the Nail Cap or Nail Cap Set Screw if implanted and all of the proximal locking screws with the Medium Hexdriver/T-Handle assembly. Remove all of the distal locking screws except for one in the same manner.

Thread the Extraction Bolt (763-1320) into the Impactor (767-4081) or One Piece Impactor (763-1185)* and introduce the extraction assembly into the end of the nail. Remove the remaining distal locking screw and then extract the nail with a back-slapping motion using the Slotted Hammer.

Percutaneous Technique
This technique assumes the absence of a Nail Cap or Nail Cap Set Screw. Remove all proximal locking screws and all but one of the distal locking screws as previously described. Under fluoroscopy, insert a 3.2mm Tip Threaded Guide Wire into the end of the nail on power or by hand. Make a 2cm incision around the Wire and advance the 12.5mm Entry Reamer over the Wire and into the end of the nail to remove any bony in-growth.

Thread the Impactor or One Piece Impactor into the back of the Disposable Nail Extractor** and then thread the assembly into the end of the nail. Remove the remaining distal locking screw and then extract the nail with a back-slapping motion.

Note: The tip of the Entry Reamer is straight for approximately 1cm before flaring out. It is this portion of the Entry Reamer that enters the top of the nail.

* The One Piece Impactor is found only in original TRIGEN Instrument Set (763-1326)
** The Disposable Nail Extractor (763-1320) is interchangeable with the Large Nail Extractor located in the original TRIGEN Instrument Set (763-1326) and the HFN Instrument Set (710-0003)
An Alternative Method for Extraction

Guide Rod Jamming Technique

Advance the end of a 3.0mm Ball Tip Guide Rod through the end of the nail. Insert a smooth 2.0mm Guide Rod (7111-8280) in the same manner. With both Guide Rods in place attach the Gripper to the end of the 3.0mm Ball Tip Guide Rod and pull it back so that it wedges the ball tip against the smooth 2.0mm Guide Rod. Backslap against the Gripper with the Slotted Hammer to extract the nail.

Guide Rods

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7111-8280</td>
<td>2.0mm x 900mm Smooth (RUSSELL-TAYLOR System)*</td>
</tr>
<tr>
<td>7111-8202</td>
<td>3.0mm x 900mm Ball Tip (RUSSELL-TAYLOR System)*</td>
</tr>
<tr>
<td>7163-1626</td>
<td>3.0mm x 1000mm Ball Tip (TRIGEN *System)</td>
</tr>
</tbody>
</table>

Additional Removal Items

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>115074</td>
<td>Large Extractor Hook*</td>
</tr>
<tr>
<td>115073</td>
<td>Small Extractor Hook*</td>
</tr>
<tr>
<td>914658</td>
<td>Large Easy Out**</td>
</tr>
<tr>
<td>914659</td>
<td>Small Easy Out**</td>
</tr>
</tbody>
</table>

* Available sterile packed. For nail removal only, do not use for nail insertion
** Located in RUSSELL-TAYLOR Extraction Kit (Set #7508) available through Loaners
# Catalog Information – Implants

## TRIGEN™ Internal Captured Screws 5.0mm

Set No. 7163-1321

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>7164-2225</td>
<td>Internal Hex Captured Screw 5.0mm X 25mm</td>
</tr>
<tr>
<td>7164-2230</td>
<td>Internal Hex Captured Screw 5.0mm X 30mm</td>
</tr>
<tr>
<td>7164-2235</td>
<td>Internal Hex Captured Screw 5.0mm X 35mm</td>
</tr>
<tr>
<td>7164-2240</td>
<td>Internal Hex Captured Screw 5.0mm X 40mm</td>
</tr>
<tr>
<td>7164-2245</td>
<td>Internal Hex Captured Screw 5.0mm X 45mm</td>
</tr>
<tr>
<td>7164-2250</td>
<td>Internal Hex Captured Screw 5.0mm X 50mm</td>
</tr>
<tr>
<td>7164-2255</td>
<td>Internal Hex Captured Screw 5.0mm X 55mm</td>
</tr>
<tr>
<td>7164-2260</td>
<td>Internal Hex Captured Screw 5.0mm X 60mm</td>
</tr>
<tr>
<td>7164-2265</td>
<td>Internal Hex Captured Screw 5.0mm X 65mm</td>
</tr>
<tr>
<td>7164-2270</td>
<td>Internal Hex Captured Screw 5.0mm X 70mm</td>
</tr>
<tr>
<td>7164-2275</td>
<td>Internal Hex Captured Screw 5.0mm X 75mm</td>
</tr>
</tbody>
</table>

## TRIGEN META-NAIL™ 10mm Retrograde Femoral

Set No. 7165-3000

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Length</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>7165-3018*</td>
<td>META-NAIL Retrograde 10mm x 18cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3020*</td>
<td>META-NAIL Retrograde 10mm x 20cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3022*</td>
<td>META-NAIL Retrograde 10mm x 22cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3024*</td>
<td>META-NAIL Retrograde 10mm x 24cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3026</td>
<td>META-NAIL Retrograde 10mm x 26cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3028</td>
<td>META-NAIL Retrograde 10mm x 28cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3030</td>
<td>META-NAIL Retrograde 10mm x 30cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3032</td>
<td>META-NAIL Retrograde 10mm x 32cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3034</td>
<td>META-NAIL Retrograde 10mm x 34cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3036</td>
<td>META-NAIL Retrograde 10mm x 36cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3038</td>
<td>META-NAIL Retrograde 10mm x 38cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3040</td>
<td>META-NAIL Retrograde 10mm x 40cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3042</td>
<td>META-NAIL Retrograde 10mm x 42cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3044</td>
<td>META-NAIL Retrograde 10mm x 44cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3046*</td>
<td>META-NAIL Retrograde 10mm x 46cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3048*</td>
<td>META-NAIL Retrograde 10mm x 48cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3050*</td>
<td>META-NAIL Retrograde 10mm x 50cm</td>
<td>Outlier</td>
</tr>
</tbody>
</table>

* Available through special order
<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Length</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>7165-3218*</td>
<td>META-NAIL Retrograde 11.5mm x 18cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3220*</td>
<td>META-NAIL Retrograde 11.5mm x 20cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3222*</td>
<td>META-NAIL Retrograde 11.5mm x 22cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3224*</td>
<td>META-NAIL Retrograde 11.5mm x 24cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3226</td>
<td>META-NAIL Retrograde 11.5mm x 26cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3228</td>
<td>META-NAIL Retrograde 11.5mm x 28cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3230</td>
<td>META-NAIL Retrograde 11.5mm x 30cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3232</td>
<td>META-NAIL Retrograde 11.5mm x 32cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3234</td>
<td>META-NAIL Retrograde 11.5mm x 34cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3236</td>
<td>META-NAIL Retrograde 11.5mm x 36cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3238</td>
<td>META-NAIL Retrograde 11.5mm x 38cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3240</td>
<td>META-NAIL Retrograde 11.5mm x 40cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3242</td>
<td>META-NAIL Retrograde 11.5mm x 42cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3244</td>
<td>META-NAIL Retrograde 11.5mm x 44cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3246*</td>
<td>META-NAIL Retrograde 11.5mm x 46cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3248*</td>
<td>META-NAIL Retrograde 11.5mm x 48cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3250*</td>
<td>META-NAIL Retrograde 11.5mm x 50cm</td>
<td>Outlier</td>
</tr>
</tbody>
</table>

* Available through special order
### TRIGEN ™META-NAIL™ 13mm Retrograde Femoral

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Length</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>7165-3418*</td>
<td>13mm x 18cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3420*</td>
<td>13mm x 20cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3422*</td>
<td>13mm x 22cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3424*</td>
<td>13mm x 24cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3426*</td>
<td>13mm x 26cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3428*</td>
<td>13mm x 28cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3430</td>
<td>13mm x 30cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3432</td>
<td>13mm x 32cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3434</td>
<td>13mm x 34cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3436</td>
<td>13mm x 36cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3438</td>
<td>13mm x 38cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3440</td>
<td>13mm x 40cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3442</td>
<td>13mm x 42cm</td>
<td>Implant set</td>
</tr>
<tr>
<td>7165-3444</td>
<td>13mm x 44cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3446*</td>
<td>13mm x 46cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3448*</td>
<td>13mm x 48cm</td>
<td>Outlier</td>
</tr>
<tr>
<td>7165-3450*</td>
<td>13mm x 50cm</td>
<td>Outlier</td>
</tr>
</tbody>
</table>

* Available through special order

### Nail Cap Set Screw

Cat. No. 7165-6000

### TRIGEN Nail Caps

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>7163-4000</td>
<td>0mm</td>
</tr>
<tr>
<td>7163-4005</td>
<td>5mm</td>
</tr>
<tr>
<td>7163-4010</td>
<td>10mm</td>
</tr>
<tr>
<td>7163-4015</td>
<td>15mm</td>
</tr>
<tr>
<td>7163-4020</td>
<td>20mm</td>
</tr>
</tbody>
</table>
Catalog Information – Instruments (continued)

TRIGEN™ META-NAIL™ Blocking Screw Instruments
Set No. 7165-4001

Blocking Screw Device
Cat. No. 7155-4515

Tibia Blocking Screw Attachment*
Cat. No. 7155-4509

110mm T-Handle Awl
Cat. No. 7155-4522

8.5mm/10mm Blocking Screw Cartridge
Cat. No. 7155-4511

11.5mm/13mm Blocking Screw Cartridge
Cat. No. 7155-4513

Offset Blocking Screw Cartridge
Cat. No. 7155-4514

Blocking Screw Alignment Pin
Cat. No. 7155-4523

Retrograde Femoral Blocking Screw Attachment
Cat. No. 7155-4508

Blocking Screw Instrument Case
Cat. No. 7155-4552

Blocking Screw Instrument Lid
Cat. No. 7155-4553

* Not used in META-NAIL tibial technique
TRIGEN™ META-NAIL™ Blocking Screw Instruments
Set No. 7165-4002

META-NAIL Anterior Drop
Cat. No. 7165-4501

META-NAIL Drill Guide
Cat. No. 7165-4502

META-NAIL Extension Drill Guide
Cat. No. 7165-4503

Extension Guide Bolt (23mm)
Cat. No. 7165-4505

Guide Bolt Long (51mm)
Cat. No. 7165-4506

META-NAIL Instrument Case
Cat. No. 7165-4551

META-NAIL Instrument Lid
Cat. No. 7165-4550

Long Screw Length Sleeve
Cat. No. 7165-4520

Short Impactor
Cat. No. 7165-4521
Catalog Information – Instruments (continued)

Instruments used if you have TRIGEN™ Base
Set No. 7167-4012

Medium Hexdriver
Cat. No. 7163-1066

Short Hexdriver
Cat. No. 7163-1068

Entry Reamer
Cat. No. 7163-1116

Guide Bolt Wrench
Cat. No. 7163-1140

9.0mm Drill Sleeve
Cat. No. 7163-1152

Multipurpose Driver
Cat. No. 7163-1161

Mini Connector
Cat. No. 7163-1186

Screw Depth Gauge
Cat. No. 7163-1189

Cannulated Awl
Cat. No. 7167-4000

Entry Portal Tube
Cat. No. 7167-4060

3.2mm T-Handle Trocar
Cat. No. 7167-4074

Honeycomb
Cat. No. 7167-4075

Reamer Shaft
Cat. No. 7111-8200

Reamer Heads
Cat. No. 7111-8231-8246
T-Handle  
Cat. No. 7167-4076

Reducer  
Cat. No. 7167-4077

Obturator  
Cat. No. 7167-4078

Ruler  
Cat. No. 7167-4079

Gripper  
Cat. No. 7167-4080

Impactor  
Cat. No. 7167-4081

Slotted Hammer  
Cat. No. 7167-4082

4.0mm Drill Sleeve  
Cat. No. 7167-4083

Screwdriver Release  
Cat. No. 7167-4084

Screw Length Sleeve  
Cat. No. 7167-4085

Entry Portal Handle  
Cat. No. 7167-4092
Instruments used if you have existing TRIGEN ™set
Set No. 7163-1326

Medium Hexdriver
Cat. No. 7163-1066

Short Hexdriver
Cat. No. 7163-1068

Gripper
Cat. No. 7163-1100

Entry Tool
Cat. No. 7163-1114

Connector
Cat. No. 7163-1120

12.5mm Entry Reamer
Cat. No. 7163-1116

Obturator
Cat. No. 7163-1122

Reducer
Cat. No. 7163-1124

Ruler
Cat. No. 7163-1128

Guide Bolt Wrench
Cat. No. 7163-1140

Hammer
Cat. No. 7163-1150

9.0mm Drill Sleeve
Cat. No. 7163-1152

4.0mm Drill Sleeve
Cat. No. 7163-1156

Multipurpose Driver
Cat. No. 7163-1151
T-Handle  
Cat. No. 7163-1172

Mini Connector  
Cat. No. 7163-1286

Screw Depth Gauge  
Cat. No. 7163-1289

Screw Driver Release Handle  
Cat. No. 7163-1208

One Piece Impactor  
Cat. No. 7163-1185

Reamer Shaft  
Cat. No. 7111-8200

Reamer Heads  
Cat. No. 7111-8231-8246
**META-NAIL™ Disposables**

Set No. 7165-4003

4.0mm Long Pilot Drill*
Cat. No. 7163-1110

4.0mm Short Drill**
Cat. No. 7163-1117

3.0mm x 1000mm Ball Tip Guide Rod
Cat. No. 7163-1626

3.2mm Tip Threaded Guide Wire
Cat. No. 7163-1690

TRIGEN™ META-NAIL Disposable Compression Driver
Cat. No. 7165-4517

Disposable Nail Extractor***
Cat. No. 7163-1320

---

* 4.0mm Long Pilot Drill (7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)
** 4.0mm Short Drill (7163-1117) is interchangeable with 4.0mm AO Short Drill (7163-1123)
*** The Disposable Nail Extractor (7163-1320) is interchangeable with the Large Nail Extractor located in the original TRIGEN Instrument Set (7163-1226) and the HFN™ Instrument Set (7170-0001)