

Zimmer® Natural Nail® System

Cephalomedullary Asia and Long Nail
Implanted with Asia Instrument Set

Surgical Technique



ZIMMER® NATURAL NAIL® SYSTEM CEPHALOMEDULLARY NAIL

Device Description

The *Zimmer Natural Nail System* Cephalomedullary Nails are intramedullary nails designed to restore the shape of preinjured bone and are available in a variety of lengths and diameters to meet assorted anatomical needs. Nail caps are available to protect the nail threads from tissue ingrowth and extend the nail length if necessary. Each of the intramedullary nails is secured by a series of screws that pass through holes in the nail. A set screw (with a polyethylene peg) allows guided rotational stability of the lag screw. Nails, nail caps and screws are made from Titanium Ti-6Al-4V Alloy. Set screws are made from Titanium Ti-6Al-4V Alloy and Polyethylene (PE).

Selected components of the *Zimmer Natural Nail System* are color coded to aid in identifying which components should be used together. The package label for each of the nails indicates which screw sizes should be used with that nail. Each section contains the color name that matches the color/color name on the label of the appropriate screw size for that section. Refer to the color coding chart and/or surgical technique for more detailed instructions on the use of *Zimmer Natural Nail System* components.

Intended Purpose

The *Zimmer Natural Nail System* Cephalomedullary Nails are intramedullary nails intended for temporary internal fixation and stabilization of femoral fractures or osteotomies.

Indications and Contraindications

Indications*

The Zimmer Natural Cephalomedullary Nails are intramedullary nails intended for temporary internal fixation and stabilization of femoral fractures or osteotomies.

Indications for the *Zimmer Natural Nail System* Cephalomedullary Nails (ZNN™ CMN) include:

- Compound and simple shaft fractures
- Proximal, metaphyseal and distal shaft fractures
- Segmental fractures
- Comminuted fractures
- Fractures involving osteopenic and osteoporotic bone
- Pathological fractures
- Fractures with bone loss
- Pseudoarthrosis, non-union, mal-union and delayed union
- Periprosthetic fractures
- Surgically created defects such as osteotomies
- Intertrochanteric and subtrochanteric fractures

**ZNN™ CMN Short Nails, including Asia Nails, are CE marked for the following indications: temporary stabilization and fixation of trochanteric fractures and osteotomies. The ZNN™ CMN Long Nails are additionally indicated for subtrochanteric as well as shaft fractures and osteotomies.*

Contraindications

- A medullary canal obliterated by a previous fracture or tumor
- Bone shaft having excessive bow or deformity
- Lack of bone substance or poor bone quality which makes stable seating of the implant impossible
- All concomitant diseases that may impair the fixation of the implant and/or the success of the intervention
- Severe muscular, neural or vascular diseases that endanger the extremities involved
- Acute or chronic, local or systemic infections
- Allergy to the implanted material

Table of Contents

Product Overview	2
Implant Overview	2
Surgical Technique	3
Preoperative Planning	3
Patient Positioning	3
Reduction.....	3
Starting Point Location	4
Proximal Reaming.....	7
Shaft Reaming	8
Implant Selection	8
Nail Assembly and Insertion	9
Lag Screw Placement.....	12
Distal Targeting For Asia Nails.....	21
Freehand Technique for Long Nails	23
Final Implant Placement	24
Postoperative Care	25
Nail Extraction.....	25
Cephalomedullary Asia Nail Details	26
Cephalomedullary Long Nail Details	27
Product Information	28

Product Overview

The Zimmer Natural Nail System is a system of intramedullary nails, screws, instruments and other associated implants that are designed to provide stable internal fixation for fractured long bones. The nails have been designed for specific applications to help restore the shape of the fractured bone to its natural, pre-injured state.

The cephalomedullary nail is designed to treat fractures of the femur, especially intertrochanteric and subtrochanteric fractures. The nail features a small proximal section that is designed to minimize the amount of bone that must be removed for nail insertion. A lag screw is placed through the nail into the femoral head to secure the nail in place proximally and help control the different segments of the bone while healing occurs. Screws are placed through the nail distally to further secure the implant in place and maintain length and alignment while healing occurs.

A choice of Asia and long nails, as well as nails of different diameters and centercolumn-diaphyseal (CCD) angles are available to best match the individual anatomy of the patient.

Implant Overview

Nail Diameters:

Asia: 9.3, 10, 11.5, 13, 14.5 mm

Long: 10, 11.5, 13 mm

Nail Lengths:

Asia: 18 cm

Long: 30 to 46 cm in 2 cm increments

CCD Angles:

125°, 130°

Lag Screw Diameter:

10.5 mm

Lag Screw Lengths:

70 to 130 mm in 5 mm increments

Distal Screw Diameter:

5.0 mm

Distal Screw Lengths:

20 to 60 mm in 2.5 mm increments

65 to 100 mm in 5 mm increments

Distal Screws available in fully- and partially-threaded configurations

Materials:

Ti-6Al-4V alloy

Precision instrumentation is provided to help implant the nail. Many of the instruments and implants feature a color coding system to help the surgical team use the system. Certain instruments are not color coded. The color coding system is referenced in the technique. A wall chart (97-2493-007-00) is also available to help explain the color coding system.

Surgical Technique

Preoperative Planning

Preoperative planning is recommended before beginning the surgical procedure. A/P and Lateral X-rays of the injured femur should be taken preoperatively and evaluated for length, canal size and implant suitability. A/P and Lateral X-rays of the contralateral uninjured femur can also be taken preoperatively to provide insight into the characteristics of the pre-injured femur.

Patient Positioning

Patients can be positioned either supine or in a lateral decubitus position. As the C-arm will be used during the procedure, care should be taken to orient the patient to allow for A/P and Lateral imaging of the proximal femur, the fracture and the distal femur. The use of a fracture table can be beneficial in helping to reduce fractures as well as to facilitate intraoperative imaging with a C-arm.

The patient should be positioned to allow for easy access to the greater trochanter of the femur with instrumentation. Adduction of the affected leg can also be helpful, especially in the supine position.

Drape the patient appropriately to allow the surgeon to work around the hip and full length of the femur (to the knee).

Reduction

It is critical to achieve anatomic reduction before beginning any of the steps to place the intramedullary nail. Traction should be used as necessary to help achieve fracture reduction. Several instruments are available to assist in fracture reduction including clamps, hemostatic forceps, ball spike pushers and Steinmann pins.

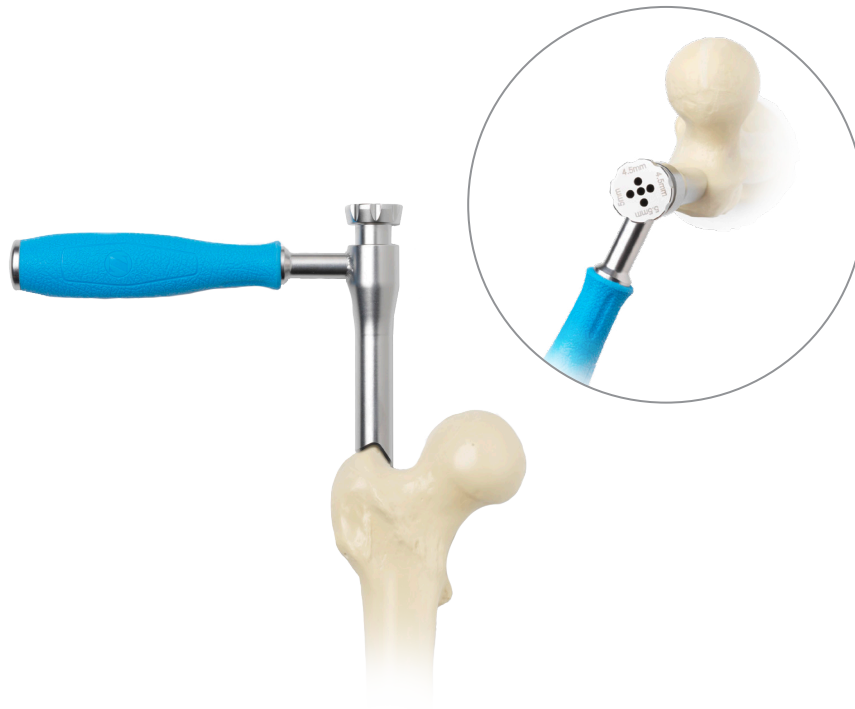


Figure 1

Starting Point Location

Palpate the greater trochanter manually. Incise the skin starting about 2 cm proximal to the tip of the greater trochanter and extending proximally 2-3 cm. Dissect through the tissues splitting the fascia lata down to the bone. Assemble the starting point locator inside the entry cannula. Place the tip of the starting point locator through the incision down to the tip of the greater trochanter (Figure 1).

Place the 3.0 mm pin through the center hole of the starting point locator.

Use the C-arm to visualize the pin's position from an A/P and Lateral view. The pin should be inserted at the tip of the greater trochanter in the posterior portion of the middle third of the trochanter. The pin should not be on the lateral portion of the greater trochanter, it must be on the tip. A starting point slightly medial to the tip of the trochanter is also acceptable.

Note: A starting point lateral to the tip of the greater trochanter may lead to a varus reduction following nail insertion.

If necessary, remove the pin and move it into the hole in the starting point locator that will align the pin correctly with the tip of the greater trochanter.

Technique Tip: It is recommended to take a true lateral view (femoral head, neck and shaft in straight line after insertion of the guide pin).



Figure 2



Figure 3

Starting Point Location (cont.)

Drive the pin through the tip of the greater trochanter down to the level of the lesser trochanter. Remove the starting point locator from the entry cannula. Use the 8 mm entry reamer to ream an entry portal into the proximal femur through the starting point on the tip of the greater trochanter (Figure 2). Remove the reamer and 3.0 mm pin.

Alternatively, a cannulated awl can be used to find the entry point and create the entry portal (Figure 3). Widening of fracture side and varus tilting of the proximal fragment should be avoided.



Figure 4



Figure 5

Starting Point Location (cont.)

Place a 3.0 mm x 100 cm ball tip guide wire or tear drop guide wire through the entry cannula, all the way into the distal femur (Figure 4). To aid in manipulation, bend the tip of the guide wire at about 10 degree angle 5 cm from the end.

► **Caution:** If the guide wire is bent shorter than 5 cm from the end of the wire and/or more than 10 degrees, it may be difficult to remove from the nail. If the wire becomes lodged inside the nail, utilize the guide wire gripper and mallet to remove the guide wire from the nail.

If you plan to ream the canal of the femur, the guide wire should be embedded in the distal femur at the level of the distal epiphyseal scar using the guide wire gripper and a mallet (Figure 5). Care should be taken not to drive the wire through the knee joint.



Figure 6

Starting Point Location (cont.)

A reduction finger is included in the set. The guide wire can be fed retrograde through the reduction finger. The reduction finger can then be placed into the femur and used to help reduce the femur from the inside as well as to help facilitate passage of the guide wire past the fracture site.

If a long nail is to be implanted, assemble the two piece nail length gauge. This step can be skipped if using an Asia nail (18 cm in length). Slide the tube portion of the gauge over the 3.0 mm x 100 cm guide wire until the tip of the tube is at the level of the tip of the greater trochanter (confirm position using fluoroscopy) (Figure 6). The proximal end of the guide wire indicates the length of the wire in the canal. When determining nail length, consideration should be taken as to how deep the nail will be inserted into the femur based upon the shape of the patient's proximal femur. A ruler is also included in the set which can be used to radiographically determine nail length.



Figure 7

Proximal Reaming

Use the 15.5 mm taper reamer (blue) to prepare the proximal femur for the proximal portion of the nail (Figure 7). The C-arm should be used to visualize the depth of the reamer in the proximal femur.

Technique Tip: For smaller Asian anatomy the proximal reaming should be done until the tip of the 15.5 mm taper reamer reaches the level of the lesser trochanter.

Care should be taken to keep the reamer in line with the shaft of the femur to avoid reaming through the medial cortex of the femur.

The 15.5 mm taper reamer has three grooves on it. The most proximal groove indicates the final position of the top of the nail. The two distal grooves help visualize the placement of the lag screw. Visualizing a line between these grooves on each side of the reamer (under fluoroscopic visualization) will indicate where a 130 degree CCD angle lag screw would be placed in the femoral neck and head.



Figure 8

Shaft Reaming

Reaming should be performed through the entry cannula. To reduce risk of enlarging the entry hole laterally push the entry cannula medially. Start with a small reamer, and increase the diameter of the reamer by 0.5 - 1.0 mm depending on the amount of resistance felt while reaming (Figure 8). When cortical chatter occurs, stop reaming. Choose a nail that is 1.5, 1.7 or 2.0 mm smaller than the last reamer used. If an Asia nail is to be used, it is only necessary to ream the proximal 18 cm of the canal. If a long nail is planned, ream the full length of the canal. The guide wire pusher can help prevent the ball tip guide wire from coming out of the femur during reaming.

ⓘ **Note:** If the guide wire becomes lodged within the reamer, use the guide wire pusher to push the guide wire back into the intramedullary canal.

Implant Selection

The diameter and length of the nail have already been determined (using nail length gauge and last size of reamer utilized). Visualizing the reduced femur and/or the contralateral femur, determine which CCD angle is appropriate for the patient.

🔧 **Technique Tip:** Lateral starting point pushes the lag screw tip to superior part of the femoral head. In that case an Asia Nail with less CCD angle is advantageous.



Figure 9



Figure 10



Figure 11

Nail Assembly and Insertion

The color code for the cephalomedullary nail is blue. Ti-6Al-4V alloy nails, the targeting guide and the connecting bolt all have blue colors on them, as well as the word BLUE on them.

The targeting guide Asia can be used for Asia and long nails.

Place the connecting bolt through the barrel of the targeting guide. The arrow on the nail (with an R for a Right Nail or an L for a Left Nail) will line up with the arrow on the barrel of the guide when the nail is correctly aligned (Figure 9).

Begin threading the connecting bolt (by hand or using the connecting bolt inserter) into the proximal portion of the nail. Orient the proximal portion of the nail so that the slots in the nail match up with the corresponding lines on the barrel of the targeting guide. Completely tighten the connecting bolt using the connection bolt inserter to secure the nail to the guide (Figure 10 and Figure 11).



Figure 12

Nail Assembly and Insertion (cont.)

Lay the guide attached to the nail over the femur. Confirm that the bow of the nail is anterior similar to the bow of the femur. Confirm also that the lag screw hole in the nail is oriented to guide a lag screw into the femoral head. Care must be taken to ensure that the correct nail is selected and that it is assembled correctly to the guide. If this is not the case, loosen and reattach the nail appropriately or choose the correct nail and attach it to the guide.

▶ **Warning:** Use a lag screw cannula and the lag screw reamer or a cannula, drill sleeve and drill to verify that the guide will target all required holes in the nail correctly. Hole indicators can be placed in static (ST) and dynamic (DY) holes of the targeting guide and in holes for CCD angles that will not be used to avoid the accidental use of those holes during the surgery. Use a pushand- twist motion when inserting the hole indicators to help ensure that they stay in place.

▶ **Warning:** The targeting guide Asia is designed to target the transverse distal static (ST) and dynamic (DY) holes in Asia nails. As the guide is designed to work with both left and right ST and

DY holes, care must be taken to ensure that the correct ST/DY holes will be used for the surgery (use the left holes when using a left nail, and vice versa). The holes that will be used to place screws into the distal portion of Asia nails are on the anterior side of the guide when the patient is in a supine position.

The targeting guide Asia has a built in locking mechanism for the lag screw cannula. To lock, the knob at the end of the guide has to be turned until the cannula is fixed.

Insert the nail over the guide wire with the arm of the guide facing anteriorly.

As the nail passes through the canal, it will naturally turn approximately 90° until the anterior bow of the nail is in line with the bow of the femur (Figure 12). Monitor the progression of the nail down the canal using the C-arm, especially as the nail is passing through or near the fracture site.

▶ **Caution:** Do not pry excessively on the targeting guide as damage may result.



Figure 13

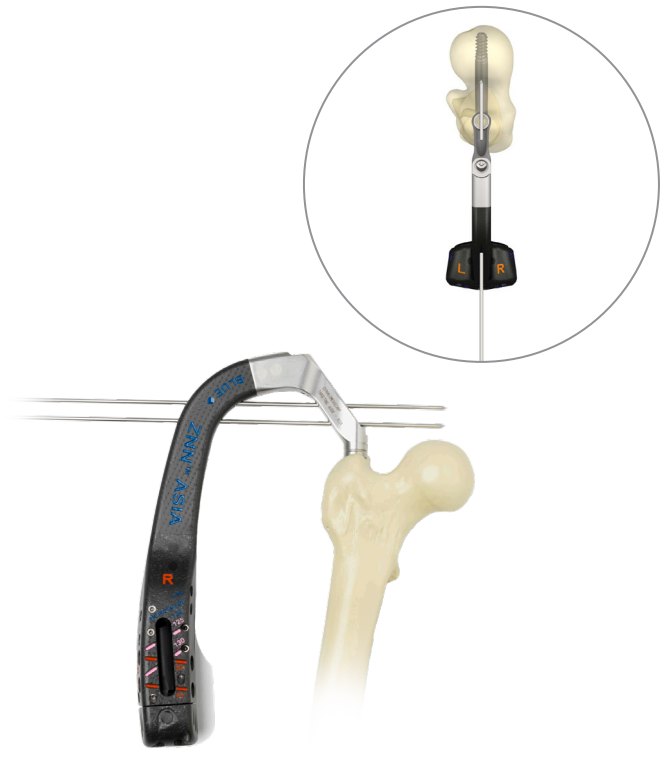


Figure 14

Nail Assembly and Insertion (cont.)

If the nail does not pass down the canal easily, attach the impaction head to the targeting guide. Using the mallet, impact gently on the impaction head (Figure 13).

Caution: Do not strike excessively as damage to the guide and bone may result. Verify that the connecting bolt is tight while and after impacting. Do not impact on any portion of the targeting guide as this may break the guide or cause it to lose its accuracy especially when locking mechanism is in the locked position.

If the nail will not advance with impaction, remove the nail and ream the canal to a larger diameter at additional 0.5 mm increments or consider using a smaller diameter nail.


Anteversion can be checked by pushing pins through the small holes proximal to the barrel (Figure 14). Alternatively, anteversion can also be verified by placing a threaded pin through the skin and soft tissue along the anterior axis of the femoral neck.

Remove the guide wire from the nail using the guide wire gripper.

Instrument Type	Asia
Double Cannula	Pink-Pink
Drill Sleeve (Optional) 4.3 mm	Pink-Pink-Red
Lag Screw Cannula	Pink-Pink
3.2 mm Lag Screw Pin Sleeve	Pink-Pink
Lag Screw Reamer	Pink-Pink
Lag Screw Tap	Pink-Pink
Lag Screw Insertter	Pink-Pink
Lag Screw Retaining Shaft	Pink-Pink

Lag Screw Placement

For the targeting guide Asia, instruments marked pink-pink are utilized to place the lag screw. The targeting guide Asia has a built in locking mechanism for the lag screw cannula. To lock, the knob at the end of the guide has to be turned until the cannula is fixed. Marks on the targeting guides near the holes indicate the color of cannula that should be passed through that specific hole. The chart shown above details the color coded instruments that are used to target and place the lag screw.

 **Caution:** Retighten the connecting bolt to the nail to maintain targeting accuracy.

The Tip-Apex Distance (TAD), the sum of the distances of the tip of the lag screw to the apex of the femoral head in the A/P and Lateral x-ray views, has been shown to be a key indicator in reducing cut-out of lag screws in the femoral head. The TAD should be less than 25 mm.¹

Position the targeting guide so that the trajectory of the lag screw cannula will place the lag screw in the appropriate position in the femoral head and neck. Pins can be held over the skin in line with the lag screw cannula to help estimate this position and correct CCD angle.


 **Note:** If planning to use an antirotation pin to further stabilize the femoral head, insert the double cannula instead of the lag screw cannula.



Figure 15



Figure 16

Lag Screw Placement (cont.)

Assemble the lag screw trocar into the lag screw cannula and pass through the correct hole in the targeting guide for the chosen CCD angle. The lag screw hole labeled 125 is designed to be used with the long and Asia nails containing a 125 degree CCD angle, the lag screw hole labeled 130 is designed to be used with the long and Asia nails containing a 130 degree CCD angle. Make a small skin incision, then dissect through the fascia and other soft tissues down to the bone. Advance the cannula and the trocar through the guide down to the bone (Figure 15).

Caution: Do not impact on the cannula, as the tip of the cannula may skive along the bone and prevent accurate targeting.

Another A/P C-arm image can be taken at this point to ensure that the guide is still aligned correctly by visualizing a line extending from the center of the cannula into the femoral head. Remove the trocar and insert the 3.2 mm lag screw pin sleeve. Insert a 3.2 mm pin through the pin sleeve. Under

fluoroscopy, drill the 3.2 mm pin to the level of the subchondral bone of the femoral head without penetrating the femoral cortex (Figure 16).

Assess the position of the pin using the C-arm in the A/P and Lateral planes. If the pin is appropriately placed, proceed with the next steps.

Note: If the pin is not appropriately placed, remove it, adjust the guide under fluoroscopy and perforate the lateral cortex with the specific 4.3 mm drill bit. After that replace the pin.

Technique Tip: If the 3.2 mm pin appears to be changing direction at the point it enters the lateral cortex of the femur, remove the pin and pin sleeve and perforate the lateral cortex using the specific 4.3 mm drill bit with the corresponding drill sleeve. Replace the pin sleeve in the cannula and drive the pin as previously stated to the level of the subchondral bone in the femoral head.



Figure 17



Figure 18



Figure 19

Lag Screw Placement (cont.)

If it is desired to utilize an antirotation pin to assist in stabilizing the femoral head during lag screw insertion, a 3.0 mm pin can be placed into the femoral neck and head using a double cannula. Use the smaller sleeve of the double cannula to place this pin at this time. The pin is passed so that it does not penetrate the femoral cortex in the femoral head or neck.

Note: Place the 3.2 mm pin prior to the antirotation pin to reduce mistargeting. Position the antirotation pin slightly proximal to the center-line of the femoral neck (Figure 17 and 18).

Alternatively, the pin can be placed using a freehand technique anterior to the nail and into the femoral neck and head.^{2,3}

Further, antirotation pins can be placed along the nail. Insert the antirotation pin sleeve into the corresponding hole of the targeting guide. Both sleeve and hole are color coded blue (Figure 19).

Technique Tip: Due to the shape of the femoral bone, predrilling is recommended to reduce the risk of skiving. Use the antirotation drill 3.0 mm to perforate the near cortex.

Warning: Insert antirotation pins anterior to the nail. Inserting them posterior to the nail may cause damage to the neurovascular structures.



Figure 20



Figure 21



Figure 22

Lag Screw Placement (cont.)

Remove the 3.2 mm lag screw pin sleeve from the lag screw cannula. Slide the cannulated depth gauge over the 3.2 mm guide pin down to the bone (Figure 20).

Confirm that the depth gauge is touching the lateral cortex of the femur using fluoroscopy to accurately determine the length of the lag screw to be used. The end of the guide pin in the depth gauge indicates the length of the lag screw to be used.

Slide the lag screw stop assembly onto the lag screw reamer (Figure 21). Place the window in the stop over the number measured with the cannulated depth gauge (Figure 22). If the measurement was between markings on the cannulated depth gauge, set the stop to the smaller number.



Figure 23



Figure 24

Lag Screw Placement (cont.)

Attach the lag screw reamer to the drill. Ream over the 3.2 mm pin to the level of the subchondral bone (Figure 23). While drilling, use the C-arm intermittently to verify position of the reamer and to make sure that the guide pin is not migrating through the femoral head. Remove the reamer. Push the end of the 3.2 mm pin while withdrawing the power tool.

The lag screw is self tapping. If preferred, tap the hole for the lag screw over the guide pin by hand using the T-handle. The stop can be used to indicate the appropriate depth to tap. Select the appropriate lag screw length based on previous measurements. The screw depth gauge can also be used to verify the length of lag screw that should be used.

Attach the lag screw to the lag screw inserter using the lag screw retaining shaft to fully secure the screw to the inserter (Figure 24).

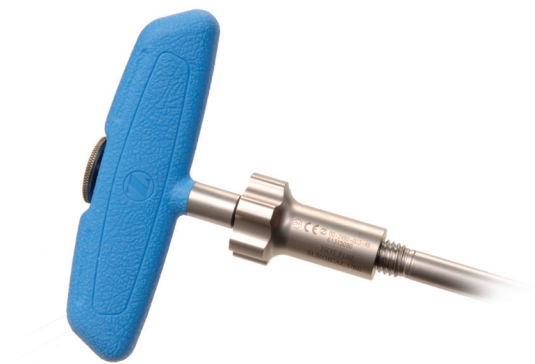


Figure 25



Figure 26

Lag Screw Placement (cont.)

If compression is planned, thread the compression device onto the lag screw inserter and twist it to the level of the handle (Figure 25). This may be done before or after attaching the lag screw.

Insert the lag screw over the 3.2 mm pin and into the femur (Figure 26). Confirm placement using the C-arm. The handle on the lag screw inserter must be parallel or perpendicular to the axis of the guide (indicated by colored dots between the holes for the lag screw cannulas).



Figure 27



Figure 28

Lag Screw Placement (cont.)

Rotate the lag screw inserter up to 90° in order to correctly orient the handle to the guide (Figure 27).

Note: Do not overtighten the lag screw. The distal edge must protrude laterally through the femur to ensure that sliding can occur.

Technique Tip: If using an antirotation pin through the nail, position the T-handle perpendicular to the guide. This reduces the risk of interference when removing the antirotation pin.

If compression is desired, twist the compression device in a clockwise fashion (Figure 28).



Figure 29



Figure 30



Figure 31

Lag Screw Placement (cont.)

As the device presses against the lag screw cannula, it will generate compression across the fracture (Figure 29). Compress as needed to reduce the fracture.

ⓘ **Note:** Remove the antirotation pin (if used).

A set screw (included in the lag screw package or packaged separately) must be used to prevent the lag screw from rotating post-operatively. Insert the tip of the fully flexible set screw inserter or 3.5 mm hex screwdriver into the 3.5 mm hex end of the set screw (Figure 30).

The set screw is then passed through the connecting bolt into the proximal portion of the nail (Figure 31).

ⓘ **Note:** Do not drive the set screw into the nail under power, as damage to the set screw or the nail could result.

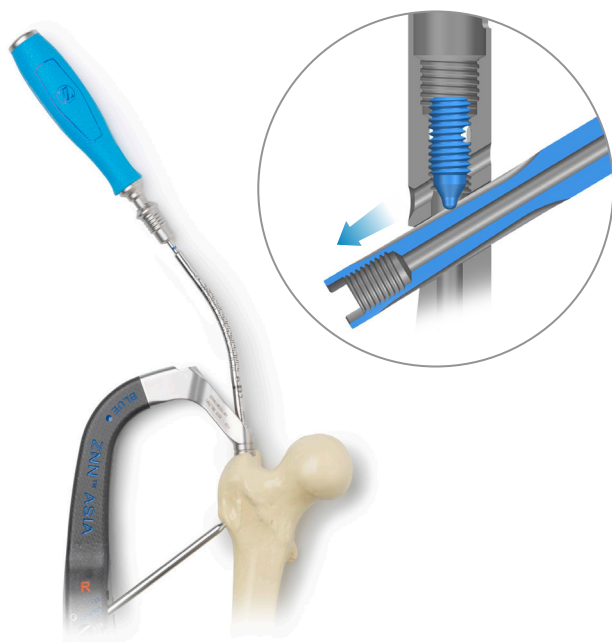


Figure 32



Figure 33

Lag Screw Placement (cont.)

Note: If using the flexible captured set screw driver make sure that it is not used at an angle greater than 40°. If it is used at an angle greater than 40°, it may be damaged.

The set screw should be tightened down into the groove in the lag screw. As noted above, the lag screw inserter must be positioned so that the handle on the inserter is parallel or perpendicular to the colored dots on the targeting guide in order for the set screw and lag screw grooves to engage properly. To verify engagement, attempt to twist the lag screw inserter. If it cannot be rotated using a reasonable amount of force, the construct is in the correct position. If rotation is possible, adjust the position of the lag screw (rotate slightly) so that the set screw can enter the groove in the lag screw (Figure 32).

Note: To achieve sliding, tighten the set screw and then rotate the set screw inserter counterclockwise one quarter turn. Do not unscrew the set screw more than one quarter turn.

Make sure that the set screw is still engaged in the groove by checking that it is still not possible to turn the lag screw with the lag screw inserter. Disengage the lag screw inserter from the lag screw. A 3.5 mm hex screwdriver may be used to disengage the lag screw retaining shaft from the lag screw.

The lag screw cannula can be left in place to aid in stabilizing the construct during distal screw placement in the short nails, if desired (Figure 33). Remove the set screw inserter.

Instrument Type	Asia Guide
8.0 mm Screw Cannula	Orange–Orange
4.3 mm Drill Sleeve	Orange–Orange–Red
4.3 mm Drill Bit	Orange–Orange–Red
Screwdriver	Orange–Orange
Screw Depth Gauge	Orange

Distal Targeting For Asia Nails

Color coded instruments are also used for distal targeting of short nails. For the targeting guide Asia, instruments marked orange are utilized to place the distal screws. The chart above details the color coded instruments that are used for distal targeting and distal screw placement.

► **Warning:** The targeting guide Asia is designed to target the distal static (ST) and dynamic (DY) holes in Asia nails. As the guide is designed to work with both left and right ST and DY holes, care must be taken to ensure that the correct targeting holes (left or right) are used for drilling and screw placement. At this point in the surgery, with the guide oriented horizontally and the nail in place, the correct holes are on the top (anterior) side of the guide. The letters “L” (left) and “R” (right) are embossed in orange on the appropriate side of the guide where the screw cannulas should be placed to insert these screws.

Assemble the 4.3 mm drill sleeve to the 8.0 mm screw cannula. Pass the cannula through the appropriate hole in the targeting guide to target

the distal hole or slot. The hole is labeled ST is for the Static Hole. The hole labeled DY is for the Dynamic Slot.

After pressing the tip of the screw cannula against the skin, make a small incision at that point through the skin and fascia lata. Spread the soft tissue down to the bone. Advance the cannula down to the bone.

► **Caution:** Do not impact on the cannula, as the tip of the cannula may skive along the bone and prevent accurate targeting.

Utilize the 4.3 mm drill bit to drill through both cortices of bone. The depth of the hole can be measured using calibrations on the drill bit. Another option is to remove the drill bit and the drill sleeve and then use the screw depth gauge to measure the depth of the hole.

► **Caution:** In cases where hard cortical bone is encountered, or at the surgeon’s preference, a 5.0 mm TAP can be used to ease insertion of the screws.

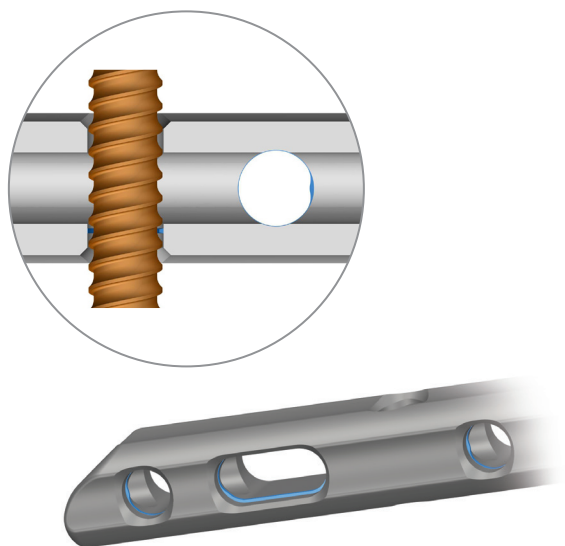


Figure 34

Distal Targeting For Asia Nails (cont.)

The nail utilizes a 5.0 mm screw distally. The screw packages are labeled with the color red. The distal hole and slot in the nail allows for standard or fixed angle locking. To achieve standard locking, choose a partially threaded 5.0 mm screw. To achieve a fixed angle construct, choose a fixed angle 5.0 mm screw (Figure 34, applicable for long nails only).

Choose the appropriate length screw based on the depth gauge or drill bit reading. Use the 3.5 mm hex screwdriver to place the screw bicortically through the bone.

If using the captured screwdriver, place the appropriate screw on the 3.5 mm hex and tighten the screw to the captured screwdriver by turning the knob next to the handle clockwise.

Caution: Do not drive the screws into the bone under power, as damage to the bone, screws and nail could result.

Remove the screwdriver and cannula. If desired, repeat these steps to place another screw in the other hole or slot. If not previously done, remove the lag screw cannula.

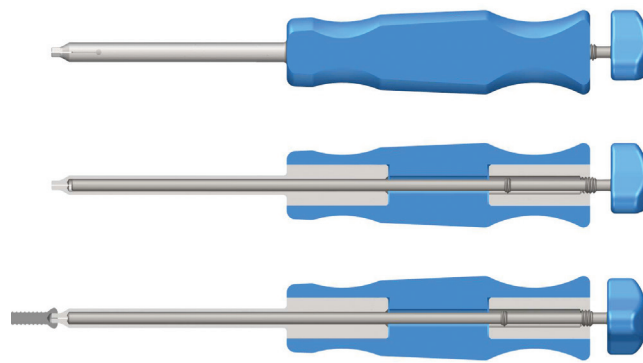


Figure 35

Freehand Technique for Long Nails

Insert the free hand 4.3 mm drill bit (red) into the distal targeting device. Finger tighten the set screw. Position the C-arm in order to get a lateral view of the distal femur. Adjust the angle of the C-arm so that the hole through the nail appears as a perfect circle on the monitor. Bring the tip of the drill bit to the skin and use the C-arm to center it over the hole that you desire to place a screw through. Make a stab wound at this point and dissect down to the bone. Place the tip of the drill bit against the bone. Verify that the tip of the drill bit is in the center of the hole. Align the drill bit with the C-arm beam. Tap the drill bit into the bone using the mallet.

Remove the distal targeting device. Slide the free hand tissue protection sleeve over the drill bit. Attach the drill to the free hand 4.3 mm drill bit and advance the drill bit through the bone. Verify that the drill bit has gone through the hole in the nail.

Remove the drill bit. Measure the depth of the hole using the free hand screw depth gauge. Insert the appropriate length screw using the screwdriver.

If using the captured screwdriver, place the appropriate screw on the 3.5 mm hex and tighten the screw to the captured screwdriver by turning the knob next to the handle clockwise (Figure 35).

➤ **Caution:** If using the captured screwdriver, do not torque the captured screwdriver beyond the calibration line next to the handle.

➤ **Caution:** Do not drive the screws into the bone under power, as damage to the bone, screws and nail could result.

Repeat these steps to insert additional distal screws.



Figure 36

Final Implant Placement

Observe the depth of the nail in the proximal femur. Ridges at 5 and 10 mm from the end of the targeting guide barrel indicate nail depth.

It is recommended to use a nail cap to close the proximal part of the nail to prevent bone ingrowth. Place a 2.0 mm pin through the connecting bolt and into the proximal portion of the nail. Loosen and remove the connecting bolt from the nail taking care to leave the 2.0 mm pin in place. If a nail cap will not be used, do not introduce the 2.0 mm pin.

Technique Tip: The 0 mm height nail cap can be placed through the targeting guide following removal of the connecting bolt. Other nail caps cannot be placed until the targeting guide is also removed.

Choose the appropriate height of nail cap. Secure the selected nail cap to the flexible nail cap inserter using the flexible nail cap retaining shaft (Figure 36).

Place the nail cap over the 2.0 mm pin and thread it into the top of the nail. Using the C-arm, verify that the cap is completely seated in the top of the nail.

Disengage the flexible nail cap inserter from the nail cap. Remove the 2.0 mm pin.

Close all wounds and apply the appropriate dressings.

Postoperative Care

Early range of motion exercises of the knee and ankle are encouraged. Allow toe-touch weight bearing to progress to full weight bearing as fracture callus increases on the x-ray films.*

Nail Extraction

Use the C-arm to locate any distal screws. Remove the screws using a 3.5 mm hex screwdriver. Remove the nail cap with a standard 5.0 mm hex screwdriver. Use a 3.5 mm hex screwdriver to remove the set screw. Expose the lag screw and use the lag screw inserter to remove it.

Note: To remove the lag screw it is not necessary that the set screw is completely removed. Turn the set screw two turns backwards and make sure that the set screw is still engaged in the threads of the nail.

Note: It is recommended to use the lag screw cannula as a guidance for the lag screw inserter while removing the lag screw. Assemble the lag screw inserter through the lag screw cannula into the lag screw. Use the compression device to push the lag screw cannula to the bone. Make sure that the lag screw inserter is fully seated. Hand tighten the lag screw retaining shaft with a 3.5 mm hex screwdriver.

To remove the nail, slide a 2.0 mm pin through the nail. Insert the cephalomedullary cannulated extraction adapter over the pin into the top of the nail. Tighten the adapter to the nail. Attach a slaphammer or other impaction device and impact to back out the nail. The nail should move with each impaction. Periodically retighten the adapter and/or slaphammer during extraction as needed. The nail may rotate as it passes through the canal during extraction.

If a secondary option is needed to remove the lag screw, the cephalomedullary lag screw extraction device can be used. To use the cephalomedullary lag screw extraction device, align its axis with the axis of the cephalomedullary lag screw that is being explanted. The conical thread of the cephalomedullary lag screw extraction device should then be engaged and rotated in a counter-clockwise motion into the exposed lateral threads of the cephalomedullary lag screw that is being explanted. The rotation direction is counter-clockwise as the cephalomedullary lag screw extraction device utilizes reverse-cutting flutes to enable mating to the cephalomedullary lag screw. While rotating, a constant axial force must be applied to maintain the tool driving into the cephalomedullary lag screw thread. While continuing to rotate the cephalomedullary lag screw extraction device counter-clockwise, the cephalomedullary lag screw that is being explanted will unseat from the bone and can be removed.

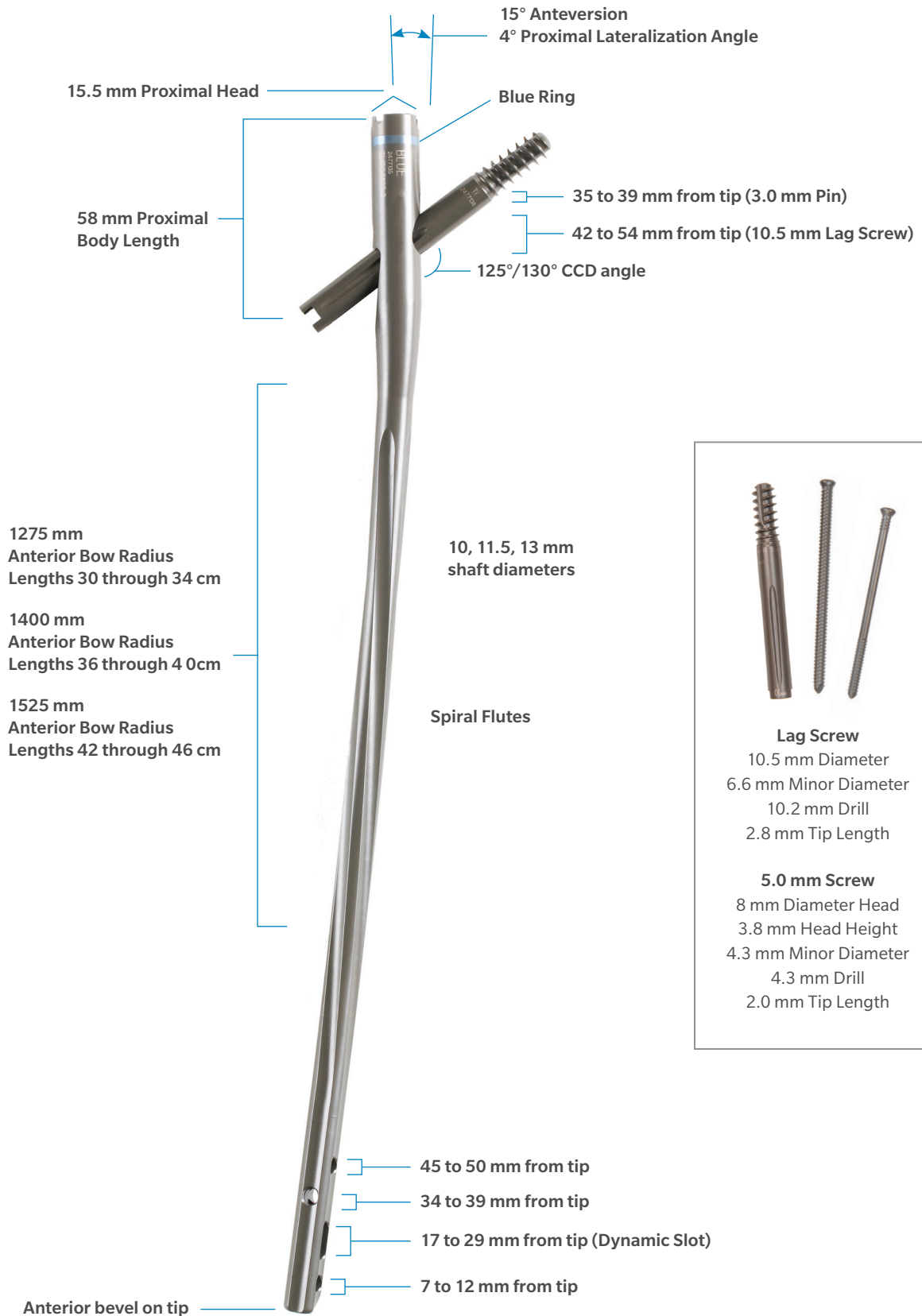
*It may be necessary to consider a postoperative treatment course that reduces the stress on the nail system. Full unassisted load bearing should never take place until fracture callus formation is visualized on X-ray. Close supervision of the patient is advised to ensure the patient's cooperation until bony union is achieved. After healing occurs, these devices serve no functional purpose and should be removed. Continued surveillance for new or recurrent infection should be continued as long as the device is in place. Device removal should be followed by adequate postoperative management to avoid refracture.

Cephalomedullary Asia Nail Details



Note: There is no locking tap (Stabilize Technology) for Cephalomedullary Asia nails.

Cephalomedullary Long Nail Details



Product Information



Cephalomedullary Asia Nails

Item Number	Product Description
47-2493-180-09	Cephalomedullary Asia Nail 9.3 mm X 18 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-181-09	Cephalomedullary Asia Nail 9.3 mm X 18 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-182-09	Cephalomedullary Asia Nail 9.3 mm X 18 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-183-09	Cephalomedullary Asia Nail 9.3 mm X 18 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-180-10	Cephalomedullary Asia Nail 10 mm X 18 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-181-10	Cephalomedullary Asia Nail 10 mm X 18 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-182-10	Cephalomedullary Asia Nail 10 mm X 18 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-183-10	Cephalomedullary Asia Nail 10 mm X 18 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-180-11	Cephalomedullary Asia Nail 11.5 mm X 18 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-181-11	Cephalomedullary Asia Nail 11.5 mm X 18 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-182-11	Cephalomedullary Asia Nail 11.5 mm X 18 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-183-11	Cephalomedullary Asia Nail 11.5 mm X 18 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-180-13	Cephalomedullary Asia Nail 13 mm X 18 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-181-13	Cephalomedullary Asia Nail 13 mm X 18 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-182-13	Cephalomedullary Asia Nail 13 mm X 18 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-183-13	Cephalomedullary Asia Nail 13 mm X 18 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-180-14	Cephalomedullary Asia Nail 14.5 mm X 18 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-181-14	Cephalomedullary Asia Nail 14.5 mm X 18 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-182-14	Cephalomedullary Asia Nail 14.5 mm X 18 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-183-14	Cephalomedullary Asia Nail 14.5 mm X 18 cm 130 CCD Left Ti-6Al-4V Alloy



Cephalomedullary Long Nails

Item Number	Product Description
47-2493-300-10	Cephalomedullary Long Nail 10 mm X 30 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-301-10	Cephalomedullary Long Nail 10 mm X 30 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-302-10	Cephalomedullary Long Nail 10 mm X 30 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-303-10	Cephalomedullary Long Nail 10 mm X 30 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-320-10	Cephalomedullary Long Nail 10 mm X 32 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-321-10	Cephalomedullary Long Nail 10 mm X 32 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-322-10	Cephalomedullary Long Nail 10 mm X 32 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-323-10	Cephalomedullary Long Nail 10 mm X 32 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-340-10	Cephalomedullary Long Nail 10 mm X 34 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-341-10	Cephalomedullary Long Nail 10 mm X 34 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-342-10	Cephalomedullary Long Nail 10 mm X 34 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-343-10	Cephalomedullary Long Nail 10 mm X 34 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-360-10	Cephalomedullary Long Nail 10 mm X 36 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-361-10	Cephalomedullary Long Nail 10 mm X 36 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-362-10	Cephalomedullary Long Nail 10 mm X 36 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-363-10	Cephalomedullary Long Nail 10 mm X 36 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-380-10	Cephalomedullary Long Nail 10 mm X 38 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-381-10	Cephalomedullary Long Nail 10 mm X 38 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-382-10	Cephalomedullary Long Nail 10 mm X 38 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-383-10	Cephalomedullary Long Nail 10 mm X 38 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-400-10	Cephalomedullary Long Nail 10 mm X 40 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-401-10	Cephalomedullary Long Nail 10 mm X 40 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-402-10	Cephalomedullary Long Nail 10 mm X 40 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-403-10	Cephalomedullary Long Nail 10 mm X 40 cm 130 CCD Left Ti-6Al-4V Alloy

Cephalomedullary Long Nails (cont.)

Item Number	Product Description
47-2493-420-10	Cephalomedullary Long Nail 10 mm X 42 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-421-10	Cephalomedullary Long Nail 10 mm X 42 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-422-10	Cephalomedullary Long Nail 10 mm X 42 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-423-10	Cephalomedullary Long Nail 10 mm X 42 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-440-10	Cephalomedullary Long Nail 10 mm X 44 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-441-10	Cephalomedullary Long Nail 10 mm X 44 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-442-10	Cephalomedullary Long Nail 10 mm X 44 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-443-10	Cephalomedullary Long Nail 10 mm X 44 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-460-10	Cephalomedullary Long Nail 10 mm X 46 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-461-10	Cephalomedullary Long Nail 10 mm X 46 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-462-10	Cephalomedullary Long Nail 10 mm X 46 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-463-10	Cephalomedullary Long Nail 10 mm X 46 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-300-11	Cephalomedullary Long Nail 11.5 mm X 30 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-301-11	Cephalomedullary Long Nail 11.5 mm X 30 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-302-11	Cephalomedullary Long Nail 11.5 mm X 30 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-303-11	Cephalomedullary Long Nail 11.5 mm X 30 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-320-11	Cephalomedullary Long Nail 11.5 mm X 32 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-321-11	Cephalomedullary Long Nail 11.5 mm X 32 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-322-11	Cephalomedullary Long Nail 11.5 mm X 32 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-323-11	Cephalomedullary Long Nail 11.5 mm X 32 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-340-11	Cephalomedullary Long Nail 11.5 mm X 34 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-341-11	Cephalomedullary Long Nail 11.5 mm X 34 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-342-11	Cephalomedullary Long Nail 11.5 mm X 34 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-343-11	Cephalomedullary Long Nail 11.5 mm X 34 cm 130 CCD Left Ti-6Al-4V Alloy

Item Number	Product Description
47-2493-360-11	Cephalomedullary Long Nail 11.5 mm X 36 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-361-11	Cephalomedullary Long Nail 11.5 mm X 36 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-362-11	Cephalomedullary Long Nail 11.5 mm X 36 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-363-11	Cephalomedullary Long Nail 11.5 mm X 36 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-380-11	Cephalomedullary Long Nail 11.5 mm X 38 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-381-11	Cephalomedullary Long Nail 11.5 mm X 38 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-382-11	Cephalomedullary Long Nail 11.5 mm X 38 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-383-11	Cephalomedullary Long Nail 11.5 mm X 38 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-400-11	Cephalomedullary Long Nail 11.5 mm X 40 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-401-11	Cephalomedullary Long Nail 11.5 mm X 40 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-402-11	Cephalomedullary Long Nail 11.5 mm X 40 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-403-11	Cephalomedullary Long Nail 11.5 mm X 40 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-420-11	Cephalomedullary Long Nail 11.5 mm X 42 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-421-11	Cephalomedullary Long Nail 11.5 mm X 42 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-422-11	Cephalomedullary Long Nail 11.5 mm X 42 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-423-11	Cephalomedullary Long Nail 11.5 mm X 42 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-440-11	Cephalomedullary Long Nail 11.5 mm X 44 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-441-11	Cephalomedullary Long Nail 11.5 mm X 44 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-442-11	Cephalomedullary Long Nail 11.5 mm X 44 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-443-11	Cephalomedullary Long Nail 11.5 mm X 44 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-460-11	Cephalomedullary Long Nail 11.5 mm X 46 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-461-11	Cephalomedullary Long Nail 11.5 mm X 46 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-462-11	Cephalomedullary Long Nail 11.5 mm X 46 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-463-11	Cephalomedullary Long Nail 11.5 mm X 46 cm 130 CCD Left Ti-6Al-4V Alloy

Cephalomedullary Long Nails (cont.)

Item Number	Product Description
47-2493-300-13	Cephalomedullary Long Nail 13 mm X 30 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-301-13	Cephalomedullary Long Nail 13 mm X 30 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-302-13	Cephalomedullary Long Nail 13 mm X 30 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-303-13	Cephalomedullary Long Nail 13 mm X 30 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-320-13	Cephalomedullary Long Nail 13 mm X 32 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-321-13	Cephalomedullary Long Nail 13 mm X 32 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-322-13	Cephalomedullary Long Nail 13 mm X 32 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-323-13	Cephalomedullary Long Nail 13 mm X 32 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-340-13	Cephalomedullary Long Nail 13 mm X 34 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-341-13	Cephalomedullary Long Nail 13 mm X 34 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-342-13	Cephalomedullary Long Nail 13 mm X 34 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-343-13	Cephalomedullary Long Nail 13 mm X 34 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-360-13	Cephalomedullary Long Nail 13 mm X 36 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-361-13	Cephalomedullary Long Nail 13 mm X 36 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-362-13	Cephalomedullary Long Nail 13 mm X 36 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-363-13	Cephalomedullary Long Nail 13 mm X 36 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-380-13	Cephalomedullary Long Nail 13 mm X 38 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-381-13	Cephalomedullary Long Nail 13 mm X 38 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-382-13	Cephalomedullary Long Nail 13 mm X 38 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-383-13	Cephalomedullary Long Nail 13 mm X 38 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-400-13	Cephalomedullary Long Nail 13 mm X 40 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-401-13	Cephalomedullary Long Nail 13 mm X 40 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-402-13	Cephalomedullary Long Nail 13 mm X 40 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-403-13	Cephalomedullary Long Nail 13 mm X 40 cm 130 CCD Left Ti-6Al-4V Alloy

Item Number	Product Description
47-2493-420-13	Cephalomedullary Long Nail 13 mm X 42 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-421-13	Cephalomedullary Long Nail 13 mm X 42 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-422-13	Cephalomedullary Long Nail 13 mm X 42 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-423-13	Cephalomedullary Long Nail 13 mm X 42 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-440-13	Cephalomedullary Long Nail 13 mm X 44 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-441-13	Cephalomedullary Long Nail 13 mm X 44 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-442-13	Cephalomedullary Long Nail 13 mm X 44 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-443-13	Cephalomedullary Long Nail 13 mm X 44 cm 130 CCD Left Ti-6Al-4V Alloy
47-2493-460-13	Cephalomedullary Long Nail 13 mm X 46 cm 125 CCD Right Ti-6Al-4V Alloy
47-2493-461-13	Cephalomedullary Long Nail 13 mm X 46 cm 125 CCD Left Ti-6Al-4V Alloy
47-2493-462-13	Cephalomedullary Long Nail 13 mm X 46 cm 130 CCD Right Ti-6Al-4V Alloy
47-2493-463-13	Cephalomedullary Long Nail 13 mm X 46 cm 130 CCD Left Ti-6Al-4V Alloy



10.5 mm Lag Screws

Item Number	Product Description
47-2485-070-10	10.5mm Lag Screw 70 mm Length Ti-6Al-4V Alloy
47-2485-075-10	10.5mm Lag Screw 75 mm Length Ti-6Al-4V Alloy
47-2485-080-10	10.5mm Lag Screw 80 mm Length Ti-6Al-4V Alloy
47-2485-085-10	10.5mm Lag Screw 85 mm Length Ti-6Al-4V Alloy
47-2485-090-10	10.5mm Lag Screw 90 mm Length Ti-6Al-4V Alloy
47-2485-095-10	10.5mm Lag Screw 95 mm Length Ti-6Al-4V Alloy
47-2485-100-10	10.5mm Lag Screw 100 mm Length Ti-6Al-4V Alloy
47-2485-105-10	10.5mm Lag Screw 105 mm Length Ti-6Al-4V Alloy
47-2485-110-10	10.5mm Lag Screw 110 mm Length Ti-6Al-4V Alloy
47-2485-115-10	10.5mm Lag Screw 115 mm Length Ti-6Al-4V Alloy
47-2485-120-10	10.5mm Lag Screw 120 mm Length Ti-6Al-4V Alloy
47-2485-125-10	10.5mm Lag Screw 125 mm Length Ti-6Al-4V Alloy
47-2485-130-10	10.5mm Lag Screw 130 mm Length Ti-6Al-4V Alloy



5.0 mm Screws (for distal screw holes)

Item Number	Product Description
47-2483-020-50	5.0 mm Cortical Screw 20 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-022-50	5.0 mm Cortical Screw 22.5 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-025-50	5.0 mm Cortical Screw 25 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-027-50	5.0 mm Cortical Screw 27.5 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-032-50	5.0 mm Cortical Screw 32.5 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-035-50	5.0 mm Cortical Screw 35 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-037-50	5.0 mm Cortical Screw 37.5 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head

Item Number	Product Description
47-2483-040-50	5.0 mm Cortical Screw 40 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-042-50	5.0 mm Cortical Screw 42.5 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-045-50	5.0 mm Cortical Screw 45 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-047-50	5.0 mm Cortical Screw 47.5 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-050-50	5.0 mm Cortical Screw 50 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-052-50	5.0 mm Cortical Screw 52.5 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-055-50	5.0 mm Cortical Screw 55 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-057-50	5.0 mm Cortical Screw 57.5 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-060-50	5.0 mm Cortical Screw 60 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-065-50	5.0 mm Cortical Screw 65 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-070-50	5.0 mm Cortical Screw 70 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-075-50	5.0 mm Cortical Screw 75 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-080-50	5.0 mm Cortical Screw 80 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-085-50	5.0 mm Cortical Screw 85 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-090-50	5.0 mm Cortical Screw 90 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-095-50	5.0 mm Cortical Screw 95 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head
47-2483-100-50	5.0 mm Cortical Screw 100 mm Length Ti-6Al-4V Alloy Partially Threaded 3.5 mm Hex Head



47-2484-020-50	5.0 mm Cortical Screw 20 mm Length Ti-6Al-4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-022-50	5.0 mm Cortical Screw 22.5 mm Length Ti-6Al-4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-025-50	5.0 mm Cortical Screw 25 mm Length Ti-6Al-4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-027-50	5.0 mm Cortical Screw 27.5 mm Length Ti-6Al-4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-030-50	5.0 mm Cortical Screw 30 mm Length Ti-6Al-4V Alloy Fixed Angle 3.5 mm Hex Head

5.0 mm Screws (for distal screw holes) (cont.)

Item Number	Product Description
47-2484-032-50	5.0 mm Cortical Screw 32.5 mm Length Ti- 6Al-4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-035-50	5.0 mm Cortical Screw 35 mm Length Ti-6Al- 4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-037-50	5.0 mm Cortical Screw 37.5 mm Length Ti- 6Al-4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-040-50	5.0 mm Cortical Screw 40 mm Length Ti-6Al- 4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-042-50	5.0 mm Cortical Screw 42.5 mm Length Ti- 6Al-4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-045-50	5.0 mm Cortical Screw 45 mm Length Ti-6Al- 4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-047-50	5.0 mm Cortical Screw 47.5 mm Length Ti- 6Al-4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-050-50	5.0 mm Cortical Screw 50 mm Length Ti-6Al- 4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-052-50	5.0 mm Cortical Screw 52.5 mm Length Ti- 6Al-4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-055-50	5.0 mm Cortical Screw 55 mm Length Ti-6Al- 4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-057-50	5.0 mm Cortical Screw 57.5 mm Length Ti- 6Al-4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-060-50	5.0 mm Cortical Screw 60 mm Length Ti-6Al- 4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-065-50	5.0 mm Cortical Screw 65 mm Length Ti-6Al- 4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-070-50	5.0 mm Cortical Screw 70 mm Length Ti-6Al- 4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-075-50	5.0 mm Cortical Screw 75 mm Length Ti-6Al- 4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-080-50	5.0 mm Cortical Screw 80 mm Length Ti-6Al- 4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-085-50	5.0 mm Cortical Screw 85 mm Length Ti-6Al- 4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-090-50	5.0 mm Cortical Screw 90 mm Length Ti-6Al- 4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-095-50	5.0 mm Cortical Screw 95 mm Length Ti-6Al- 4V Alloy Fixed Angle 3.5 mm Hex Head
47-2484-100-50	5.0 mm Cortical Screw 100 mm Length Ti- 6Al-4V Alloy Fixed Angle 3.5 mm Hex Head



Nail Caps / Set Screw

Item Number	Product Description
47-2487-002-00	Cephalomedullary Nail Cap 0 mm Height Ti-6Al-4V Alloy
47-2487-002-05	Cephalomedullary Nail Cap 5 mm Height Ti-6Al-4V Alloy
47-2487-002-10	Cephalomedullary Nail Cap 10 mm Height Ti-6Al-4V Alloy
47-2487-002-15	Cephalomedullary Nail Cap 15 mm Height Ti-6Al-4V Alloy
47-2493-000-00	Cephalomedullary Nail Set Screw Ti-6Al-4V Alloy

KT-2490-003-06 – Asia Cephalomedullary Nail Instrument Set

Item Number	Product Description	Qty
00-2490-000-30	Nail Diameter Gauge	1
00-2490-000-33	Ruler	1
00-2490-000-35	Nail Length Gauge	1
00-2490-000-41	Hole Indicator	1
00-2490-003-04	Cephalomedullary Connecting Bolt - Asia	2
00-2490-009-00	Cephalomedullary Targeting Guide - Asia	1
00-2490-003-45	Cephalomedullary Lag Screw Stop Assembly	2
00-2490-003-49	Cephalomedullary Lag Screw Compression Device	1
00-2490-004-50	Cephalomedullary Lag Screw Inserter - Asia	1
00-2490-004-51	Cephalomedullary Lag Screw Retaining Shaft - Asia	1
00-2490-003-57	Cephalomedullary Lag Screw Reamer - Asia	1
00-2490-003-56	Cephalomedullary Lag Screw Tap - Asia	1
00-2490-010-05	Entry Awl	1
00-2490-012-00	Guide Wire Gripper	1
00-2490-018-00	Entry Cannula - Asia	1
00-2490-019-00	Entry Cannula Starting Point Locator - Asia	1
00-2490-014-15	Cephalomedullary Taper Reamer 15.5 mm	1
00-2490-014-80	Entry Reamer 8 mm	1
00-2490-017-00	Guide Wire Pusher	1
00-2490-024-00	Reduction Finger	1
00-2490-031-05	11 mm Hex / Pin Wrench	2
00-2490-032-05	Slotted Mallet	1
00-2490-035-03	Modular Cephalomedullary Screwdriver, 3.5 mm Hex	1
00-2490-035-55	Cephalomedullary Fully Flexible Captured Set Screw Driver - Asia	1
00-2490-035-50	Modular Screwdriver 3.5 mm Hex	2
00-2490-035-62	Captured Screwdriver 3.5 mm Hex, Short	1
00-2490-035-72	Captured Screwdriver 3.5 mm Hex - Freehand	1
00-2490-035-75	Free Hand Mod 3.5 mm Hex Screwdriver	2
00-2490-003-70	Cephalomedullary Cannulated Screw Depth Gauge - Asia	1

Item Number	Product Description	Qty
00-2490-032-15	Cephalomedullary Impaction Head - Asia	1
00-2490-032-20	Cephalomedullary Slap Hammer Adapter - Asia	1
00-2490-040-90	Cephalomedullary Double Cannula - Asia	1
00-2490-041-08	Cephalomedullary Connecting Bolt Inserter 8 mm - Asia	1
00-2490-046-20	2.0 mm Pin	2
00-2490-046-32	Guide Pin Inserter / Extractor	1
00-2490-050-01	Modular Straight Handle AO	1
00-2490-051-05	Modular T-Handle, Hall	1
00-2490-033-55	Cephalomedullary Lag Screw Cannula - Asia	1
00-2490-042-90	Cephalomedullary Lag Screw Trocar - Asia	1
00-2490-051-80	Screw Cannula 8.0 mm	1
00-2490-052-80	Screw Trocar 8.0 mm	1
00-2490-043-20	Cephalomedullary Lag Screw Pin Sleeve 3.2 mm - Asia	1
00-2490-053-43	Drill Sleeve 4.3 mm	1
00-2490-054-43	Calibrated Drill 4.3 mm	2
00-2490-065-80	Screw Depth Gauge 8.0 mm, Short	1
00-2490-046-43	Cephalomedullary Calibrated Drill 4.3 mm - Asia	2
00-2490-320-30	3.0 mm Threaded Antirotation Pin L. 320 mm	4
00-2490-070-00	Free Hand Targeting Wand	1
00-2490-073-00	Free Hand Targeting Depth Gauge	1
00-2490-074-00	Free Hand Tissue Protection Sleeve	1
00-2490-075-43	4.3 mm Free Hand Drill 152.5 mm	2
00-2490-043-53	Cephalomedullary Lag Screw Drill Sleeve 4.3 mm - Asia	1
00-2490-090-11	Cephalomedullary Extraction Adapter Cannulated	1
00-2490-375-32	3.2 mm Threaded Pin L. 375 mm	3
00-2490-070-05	Cephalomedullary Antirotation Pin Sleeve 3.0 mm - Asia	2
00-2490-070-10	Cephalomedullary Antirotation Drill 3.0 mm - Asia	1
00-5900-099-00	Case Lid	2
00-2490-003-65	Flexible Nail Cap Inserter - Asia	1
00-2490-081-03	Flexible Nail Cap Retaining Shaft	1
00-2490-032-80	Cephalomedullary Connecting Bolt Inserter	1

Sterile Instruments

Item Number	Product Description
47-2490-375-32	3.2 mm Threaded Pin L. 375 mm
47-2490-046-43	Cephalomedullary Calibrated Drill 4.3 mm - Asia
47-2490-460-32	3.2 mm Non-Threaded Pin L. 375 mm
47-2490-320-30	3.0 mm Threaded Antirotation Pin L. 320 mm
47-2490-330-30	3.0 mm Non-Threaded Antirotation Pin L. 320 mm
47-2490-070-10	Cephalomedullary Antirotation Drill 3.0 mm - Asia

Optional Instruments

Item Number	Product Description
00-2490-050-04	Modular T-Handle AO
00-2490-460-32	3.2 mm Non-Threaded Pin L. 375 mm
00-2490-330-30	3.0 mm Non-Threaded Antirotation Pin L. 320 mm
00-2490-068-50	5 mm Tap - Short
00-2255-009-00	Slaphammer (M/DN® System)
47-2490-070-10	Cephalomedullary Antirotation Drill 3.0 mm - Asia
00-2490-090-12	Cephalomedullary Lag Screw Extraction Device

Cases

Item Number	Product Description	Qty
00-2490-046-00	Cephalomedullary Asia Case 1 Of 2 - Stainless Steel	1
00-2490-047-00	Cephalomedullary Asia Case 2 Of 2 - Stainless Steel	1

Tear Drop Guide Wire
(available separately)

Item Number	Product Description
47-2490-097-00	3.0 mm x 100 cm Tear Drop Guide Wire sterile
47-2490-097-01	2.4 mm x 100 cm Tear Drop Guide Wire sterile
47-2490-098-00	3.0 mm x 70 cm Tear Drop Guide Wire sterile
47-2490-098-01	2.4 mm x 70 cm Tear Drop Guide Wire sterile
47-2490-330-30	3.0 mm Non-Threaded Antirotation Pin L. 320 mm

Ball Tip Guide Wire
(available separately)

Item Number	Product Description
00-2255-008-01	3.0 mm Ball Tip Guide Wire 100 cm
47-2255-008-01	3.0 mm Ball Tip Guide Wire 100 cm (Sterile)
00-2255-008-00	2.4 mm Ball Tip Guide Wire 70 cm
47-2255-008-00	2.4 mm Ball Tip Guide Wire 70 cm (Sterile)

Wall Chart Lit. No.
97-2493-007-00

X-Ray Templates:
Asia - 02.60000.018
Long - 02.60000.019

References

1. Baumgaertner *et.al.*, The value of the tip-apex distance in predicting failure of fixation of peritrochanteric fractures of the hip, *J Bone Joint Surg Am.* 1995;77:1058-1064.
2. AO Principles of Fracture Management, Thieme, 2000
3. Browner *et.al.*, Skeletal Trauma Vol. 2, Basic Science, Management and Reconstruction, p.1929 – 1931, 2003

All content herein is protected by copyright, trademarks and other intellectual property rights, as applicable, owned by or licensed to Zimmer Biomet or its affiliates unless otherwise indicated, and must not be redistributed, duplicated or disclosed, in whole or in part, without the express written consent of Zimmer Biomet.

This material is intended for health care professionals. Distribution to any other recipient is prohibited. For product information, including indications, contraindications, warnings, precautions, potential adverse effects and patient counseling information, see the Instructions for Use (IFU) and www.zimmerbiomet.com. An electronic copy of the Instructions for Use (eIFU) and this Surgical Technique can be obtained from the Zimmer Biomet Electronic Labeling Service (E-labeling) website: <https://labeling.zimmerbiomet.com>

Zimmer Biomet does not practice medicine. This technique was developed in conjunction with [a] health care professional[s]. This document is intended for surgeons and is not intended for laypersons. Each surgeon should exercise his or her own independent judgment in the diagnosis and treatment of an individual patient, and this information does not purport to replace the comprehensive training surgeons have received. As with all surgical procedures, the technique used in each case will depend on the surgeon's medical judgment as the best treatment for each patient. Results will vary based on health, weight, activity and other variables. Not all patients are candidates for this product and/or procedure. Caution: Federal (USA) law restricts this device to sale by or on the order of a surgeon. Rx only.

Check for country product clearances and reference product specific Instructions for Use.

© 2016, 2023 Zimmer Biomet

For Instructions for Care, Cleaning, Maintenance and Sterilization Manual refer to 3455

For disassembly instructions (where applicable) refer to Disassembly Manual 1258

If damage or wear detected on instruments, please consult the Reusable Instrument Lifespan Manual 1219



4178.1-GLBL-en Issue Date 2023-12 A4
Lit. No. 97-2493-004-00



Legal Manufacturer

Zimmer Switzerland
Manufacturing GmbH
Sulzerallee 8,
8404 Winterthur, Switzerland
Telephone +41/ (0) 58 854 80 00
Fax +41/ (0) 52 244 86 70

Representative in the USA

Zimmer, Inc.
1800 West Center St.
Warsaw, Indiana 46580
USA



Legal Manufacturer

Zimmer, Inc.
1800 West Center St.
Warsaw, Indiana 46581-0708
USA
Telephone 574-267-6131

www.zimmerbiomet.com



CE mark on a surgical technique is not valid unless there is a CE mark on the product label.

Products with this surgical technique are under the design control of various manufacturers. Refer to the product labeling of each device for the legal manufacturer.