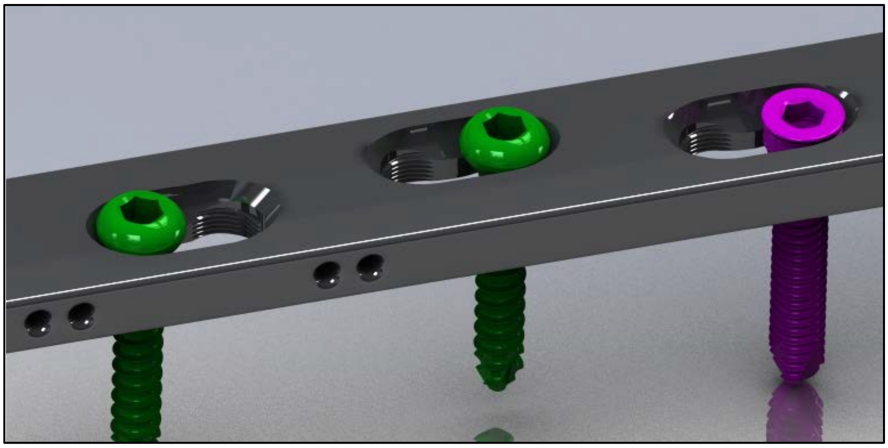
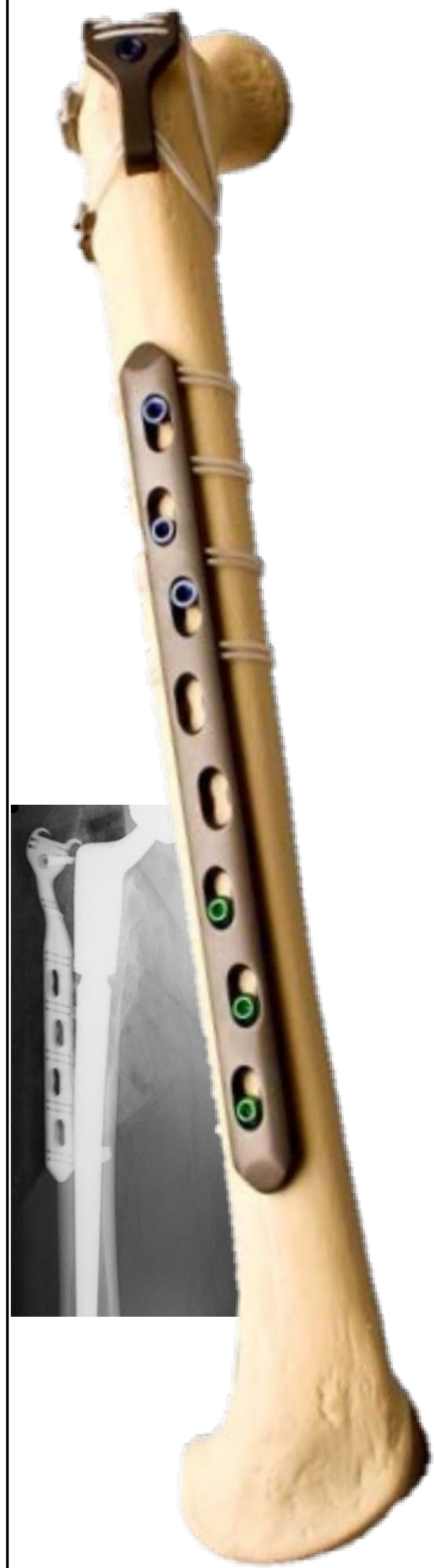
Surgical Technique

SuperCable®

Grip and Plate System





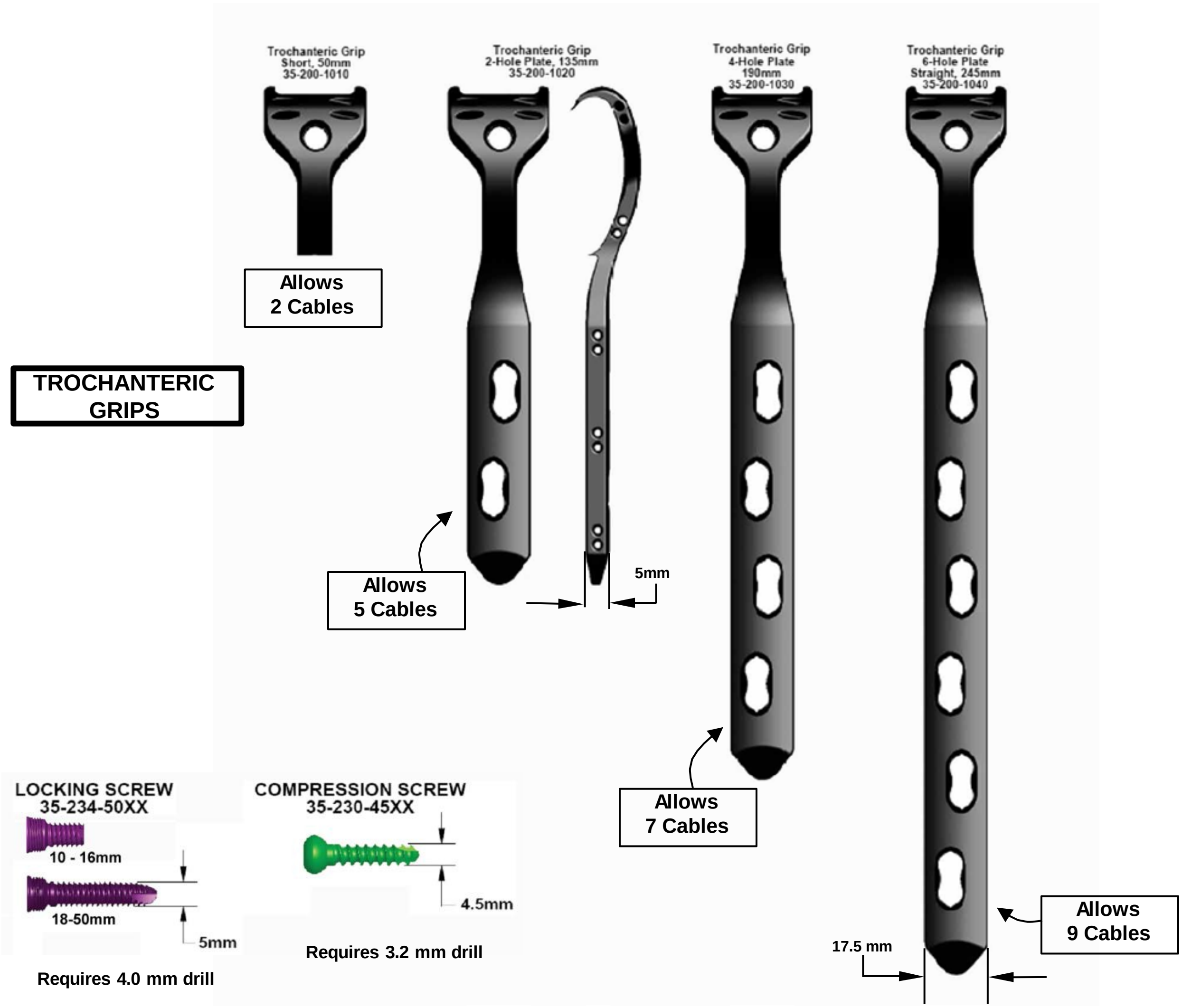
Radiographs courtesy of James Nicholson MD, Stony Brook, NY

KINAMED® INCORPORATED

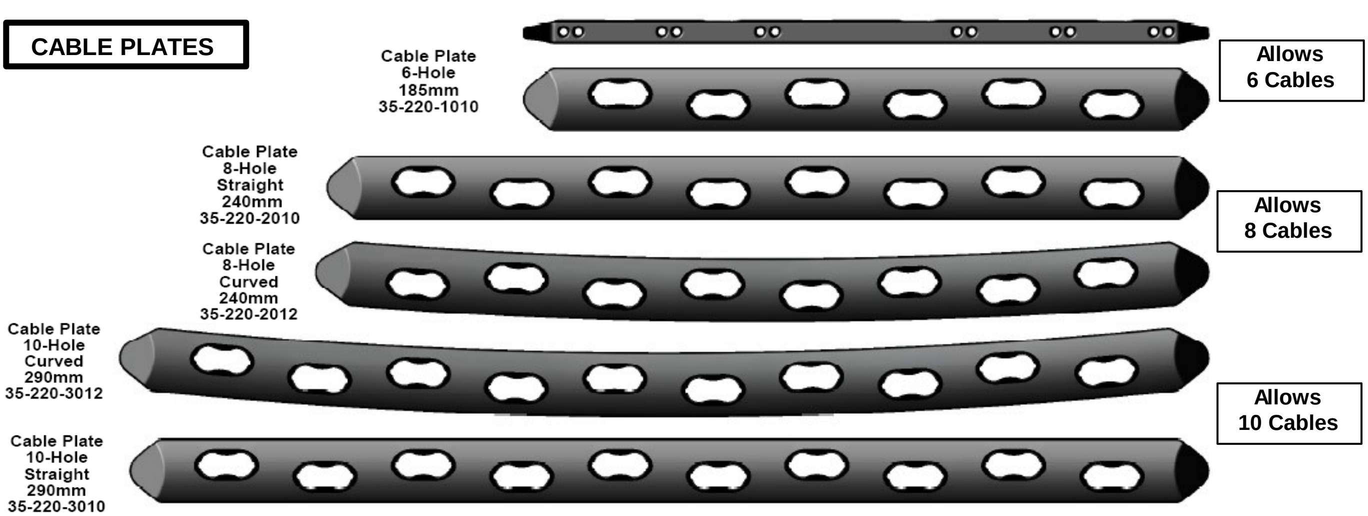
US Patent Nos. 6,589,246; 7,207,090; 8,469,967; 9,107,720. JP Pat. No. 4,829,236; 5,938,095. EU Pat. Nos. 1,389,940; 1,781,961; 2,117,452; 2,432,401; 3,103,268. TUR Pat. Nos. TR201309922T4; TR201405440T4. Additional US & World Patents Pending.

SuperCable Grip and Plate Implants

TROCHANTERIC GRIPS



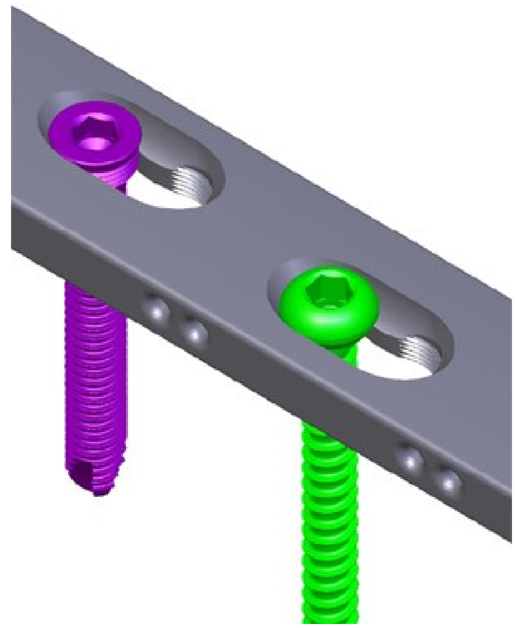
CABLE PLATES



⚠ ***CAUTION:*** *Refer to product package insert for additional details.*

Introduction

The Kinamed **SuperCable® Trochanteric Grip and Cable-Plate System** is designed specifically for use with the SuperCable Iso-Elastic™ polymer cerclage cable[36,37]. Holes integrated in the grips and plates allow passage of the SuperCable for secure fixation of the plate to bone. Screw fixation may be achieved using locking screws*, compression screws, or a combination of both. The unique figure-of-eight design of the screw fixation holes allows locking or compression screws to be used on either side, giving the surgeon greater flexibility in the management of complex fractures. Trochanteric grips and cable-plates are available in a variety of lengths in both straight and curved configurations for improved anatomic fixation.



Indications

- The SuperCable Grip and Plate System is indicated for use where cerclage is used in combination with a trochanteric grip or bone plate.
- The SuperCable Grip and Plate System is intended to be used in conjunction with the **SuperCable Iso-Elastic Cerclage System** for reattachment of the greater trochanter following osteotomy or fracture, and for fixation of long bone fractures.

The SuperCable Trochanteric Grips are primarily indicated for the following:

- **Trochanteric osteotomy**
- **Extended trochanteric osteotomy**
- **Trochanteric fracture**
- **Periprosthetic long bone fractures**

The SuperCable Cable-Plates are primarily indicated for the following:

- **Periprosthetic long bone fractures**
- **Comminuted long bone fractures**
- **Fractures in osteopenic bone**

*Featuring Agilock® Technology

Features

Trochanteric Grips

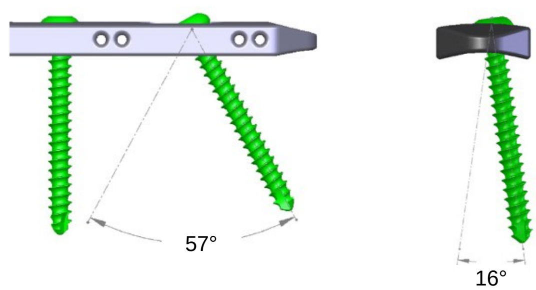
- Integrated holes designed specifically for use with SuperCable polymer cerclage cables
- Unique cable hole geometry minimizes cable stress
- Proximal tines designed to engage lateral cortex of trochanter
- Smaller distal tines provide additional stability
- Proximal screw hole allows for secure fixation of the greater trochanter using a locking or standard bone screw
- Extended grips allow additional cable placement and compression, locking, or combination screw fixation distal to the lesser trochanter
- Titanium construction

Cable-Plates

- Integrated holes designed specifically for use with SuperCable polymer cerclage cables
- Screw fixation holes allow for compression, locked, or combination plating
- Titanium construction

Screw fixation holes

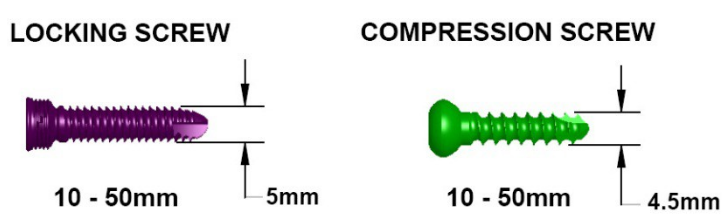
- Compression screws may be used on either side of the figure-of-eight hole to direct interfragmentary compression in either direction
    - 57° of longitudinal screw angulation
    - 16° of transverse screw angulation
- Locking screws may be used on either side of the figure-of-eight hole for increased placement options



Screws

- 5.0 mm diameter locking screw
- "Periprosthetic" locking screws (available in 10, 12, 14, and 16mm lengths) featuring blunt tips for unicortical fixation in the presence of an intramedullary implant

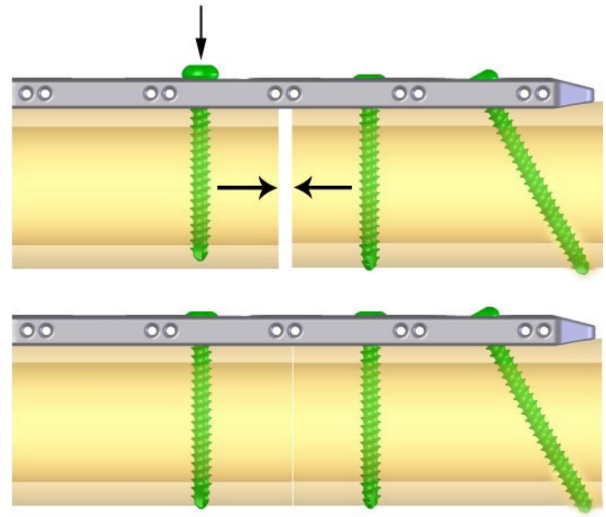
- 4.5 mm diameter compression (cortical) screw
- Available in lengths from 10 to 50 mm
- Self-tapping flutes
- Titanium construction



Fixation Principles

Compression Plating

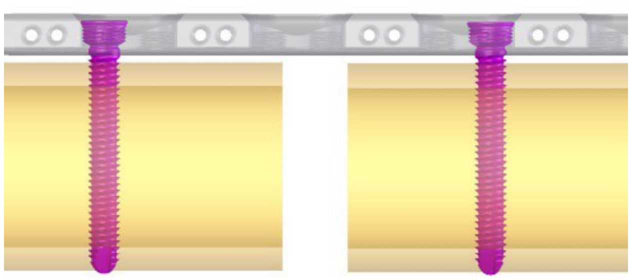
- Fracture is stabilized with the option of imparting interfragmentary compression
- Absolute stability of the fracture is necessary for primary healing response to occur[4,7,17, 37]
- Stability of the construct under loading is dependent on compression of the plate against bone resulting in friction between the plate and bone[4,7,25]
- Not a fixed angle construct; screws may toggle in the plate and loosen independently[4,7,14,32]
- Periosteum may be compressed beneath plate, limiting blood flow[4,26]
- Compression of the plate against bone may not be possible in osteoporotic bone because of poor screw purchase[4,7]
- Works well for healthy bone, simple fractures[26,32]



Simple fracture: Eccentrically placed Screw imparts dynamic interfragmentary compression.

Locked Plating

- Screw head and plate hole are threaded to create a fixed angle, single beam construct[4]
- Acts as an “internal fixator”[4,17,25,29]
- Plate does not need to contact bone for stability, thereby preserving the periosteal blood supply[4,26,32]
- Pullout strength is much greater than compression plating since plate and screws act as single construct[4,25]
- Healing is dependent on relative stability of the bone fragments and callus formation[4,19]
- Works well for comminuted fractures, osteoporotic bone[3,7,25,32]
- Pullout strength of a unicortical locking screw is approximately 70% of a bicortical compression screw[17]
- Screws placed too close to the fracture site may lead to fatigue failure of the plate



Comminuted fracture: Locking Screws create a bridging construct.

Combination Plating

- A combination of compression and locked plating techniques may be used for a simple fracture at one level (compression) with a comminuted fracture at a different level (locked)[6,25,28]
- A combination of compression and locking screws may be used in osteoporotic bone; compression screws are placed first to stabilize the fracture, followed by locking screws to provide additional fixation stability[14,31]
- A combination of screws may also be used in periprosthetic fractures around well fixed implants, with unicortical locking screws and cables placed proximally in the region of the implant, and either standard bicortical screw fixation or cerclage cables placed distally[21]

Grip Design Rationale
“Lateral vs. Over-the-Top”

Background

Unlike prior grip designs, in which the tines are intended to be placed "over the top” of the trochanter, SuperCable grips are designed to achieve trochanteric fixation laterally without violating the hip abductors. This approach generally requires less need for implant contouring. To enable lateral fixation, the grip has sharp proximal tines that are designed to penetrate the lateral trochanter as well as a proximal locking screw hole that allows for supplementary locking screw fixation.

The SuperCable Grip design offers several unique advantages:

1) SuperCable Grips **often do not require contouring** because the “plate” portion of the grip can be positioned against the lateral cortex of the femur distally, while allowing the proximal tines to penetrate the lateral aspect of the trochanter at their natural points of contact. “Over-the-top” grip designs often require complex contouring to prevent their proximal portion from projecting too far laterally. Intra-operative contouring can be time consuming and difficult.
2) The SuperCable Grip design **provides clearance for the abductor insertions** (Fig. 1) on the superior lateral aspect of the greater trochanter. Compare the proximal position of a SuperCable Grip (Fig. 2) to the position of an “over-the-top” design from another manufacturer (Fig. 3). Note how the over-the-top design covers the abductor insertion area, which can lead to soft-tissue impingement.
3) The proximal tines of the SuperCable Grip are **sharp**.
4) The proximal hole on the SuperCable Grip allows for **locking screw fixation** into the greater trochanter.
5) The SuperCable Grips are designed to be used with the SuperCable Iso-Elastic Cerclage System. When used together, this combination of implants offers a **versatile, biologic, and comprehensive** solution.
6) The SuperCable Grip and Plate System has been in clinical use since 2008 and is **proven to be safe and clinically effective** in challenging revision hip cases.[37]

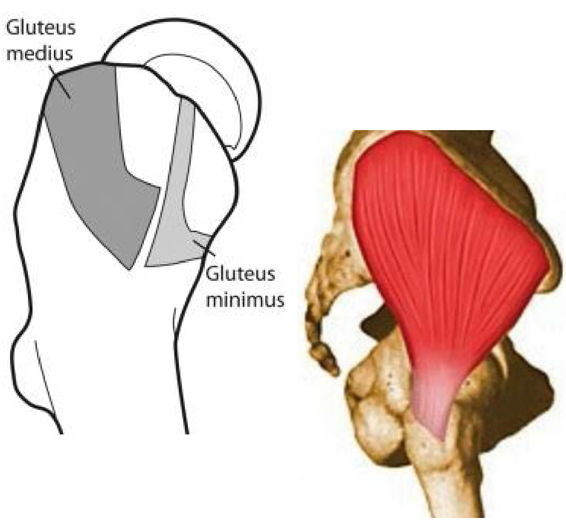


Fig. 1. Abductor Insertion Area

Fig 2. Lateral Fixation

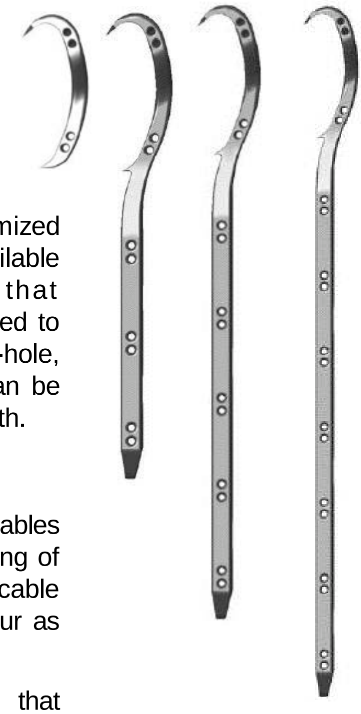
Fig 3. “Over the Top” design [20]

Click the following links (or scan the QR codes) to view a [peer-reviewed clinical study]() and [case examples]() involving the SuperCable Grip and Plate System. Visit [www.Kinamed.com]() for videos, case vignettes, and more.

Website: Clinical Study: Case Examples: Overview:

Surgical Technique

Trochanteric Grip Fixation Technique



Step 1. Select Grip

Choose the trochanteric grip that is most appropriate for the fractured or osteotomized trochanter fragment. Refer to page 2 for available grip options. A “trial” grip is available in the instrument set to assess fit and help select the best size option. Note that the trial has shortened and dulled tines such that the tines on the trial do not need to penetrate the trochanter to assess approximate fit. The trial is the length of a 2-hole, 135 mm grip implant and the requirement for a longer or shorter grip implant can be estimated by visualizing alternate lengths that are sized in 2-hole increments of length.

Step 2. Feed Cables Through Grip

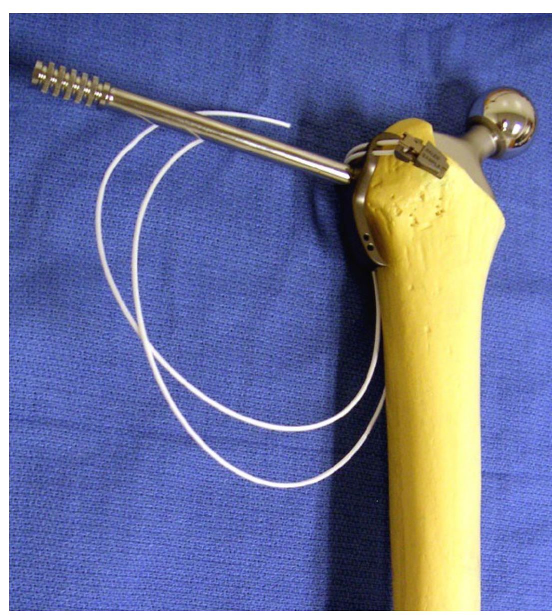
Open the desired number of sterile SuperCable Iso-Elastic Cerclage System cables and deliver to the sterile field. Feed cables through the grip prior to final positioning of the grip, taking note of the clasp orientation. Based on the surgical approach, the cable locking clasp should be positioned on the anterior or posterior surface of the femur as shown on the next page.

Pay particular attention to the resulting position of the locking clasp such that appropriate access is provided for the tensioning instrument. **Based on the planned surgical approach, determine in advance the direction that the cables will be tensioned.**

Feed cable through grip, with locking wedge facing towards grip.

Step 3. Position Grip

Screw the 4.0 mm Threaded Drill Guide, 120 mm (35-860-1070), into the threaded hole in the proximal portion of the grip so that it fully engages the grip. Use the drill guide as a handle to place the proximal tines of the grip into or above the greater trochanter and reduce the assembly into position on the bleeding bone of the femur. The guide handle may be lightly impacted to penetrate the grip tines into the trochanter.



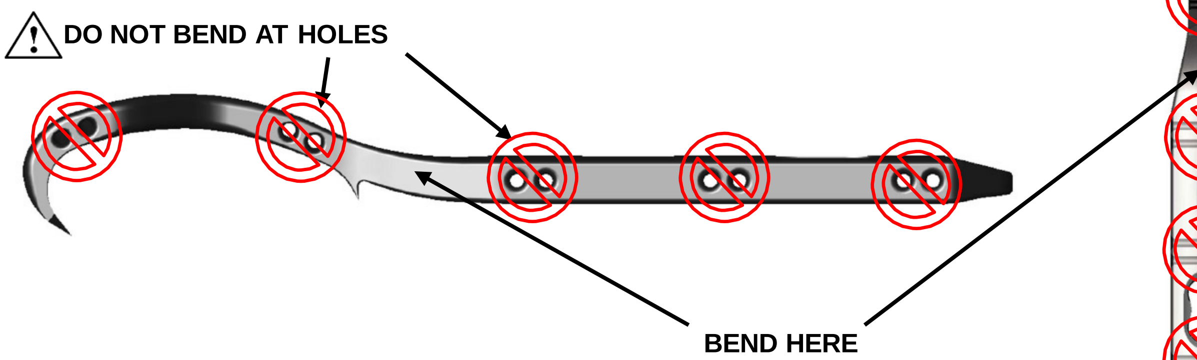
Position grip using Threaded Drill Guide as a handle.

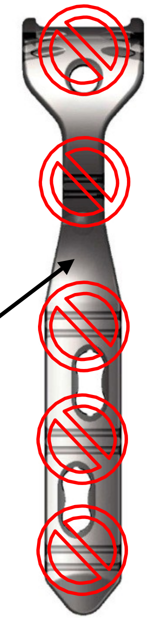
NOTE:

- *Consider advancement of the trochanteric fragment or osteotomy distally to increase bony contact. This also allows the cables to be tensioned more effectively by placing them more perpendicular to the femoral axis, thus decreasing the chance of superior escape (A common reason for trochanteric non-union is inadequate bone contact).*[13]

NOTE:

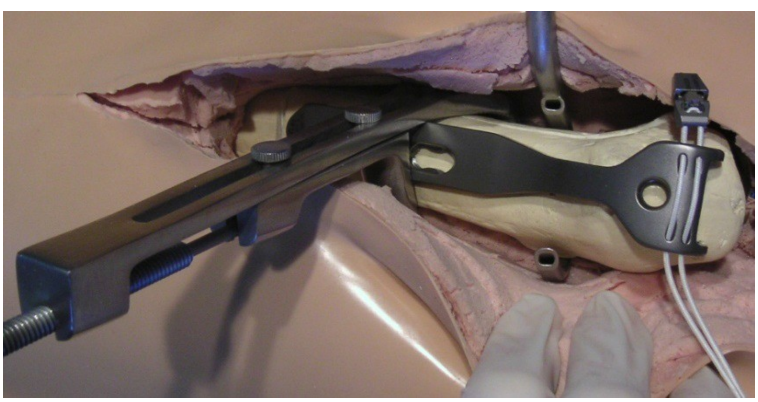
- ***Contouring of the grips is not recommended (see design rationale on Page 6). If contouring of the grip is necessary, use a bending press rather than plate bending irons. The optimal location for bending is in the "neck" region, between the second and third set of cable holes. Do not bend in the area of cable or screw holes.***





Step 4. Cable Passage

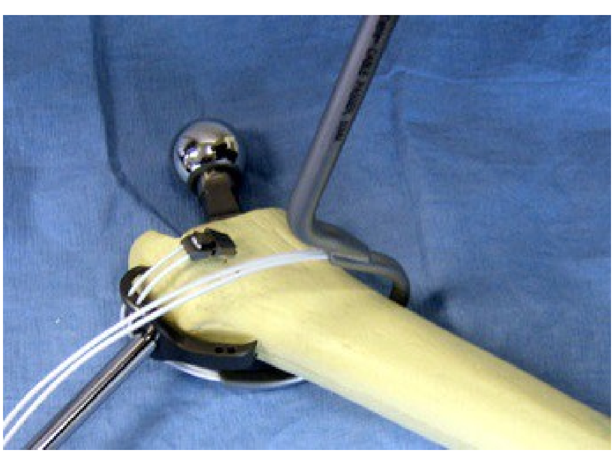
Introduce the Cable Passer such that the distal end of the cannula emerges on the operator's side of the bone. Introduce cable strands into distal end of the cannula and pass around the bone.



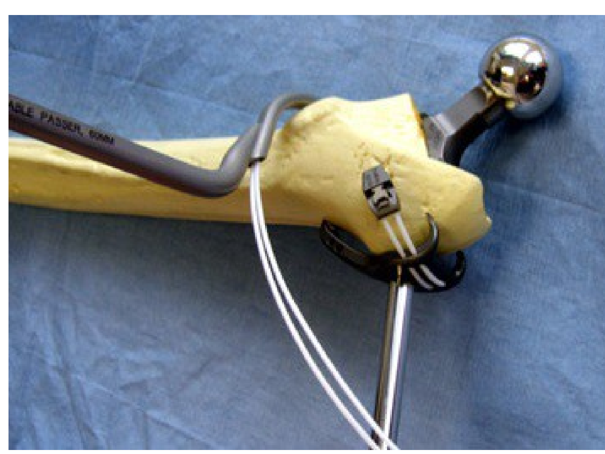
Introduce Cable Passer.

The strands of the proximal cable should be passed through or below the lesser trochanter. The 4.0 mm drill may be used to create a hole in the lesser trochanter through which both cable strands are passed. Distal cables may be passed below the lesser trochanter as an alternative.

CAUTION: *Exercise caution in using the cable passer or other instruments to avoid damage to neurovascular structures or grip/plate implants and to minimize soft tissue interposition that could affect proper cable tensioning.*



Clasp positioned on anterior surface.



Clasp positioned on posterior surface.

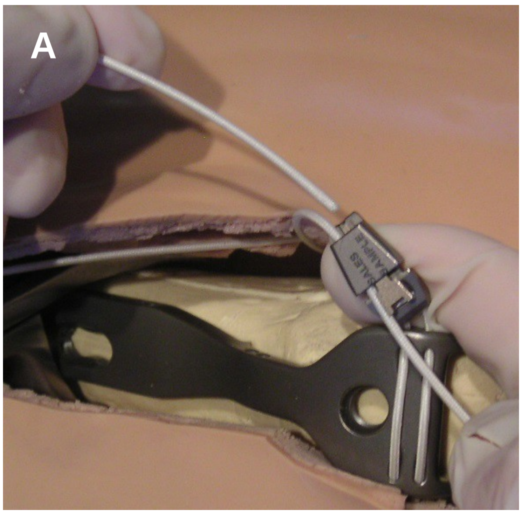
CAUTION: *Avoid wrapping the cable over sharp implant or bone graft edges or rough surfaces (e.g. porous coating). The locking clasp should not contact the trochanteric grip, screws, or prosthesis.*

Surgical Technique

Trochanteric Grip Fixation Technique (continued)

Step 5. Secure Cable and Apply Tension

Feed the ends of the cable through its locking clasp (A) and pull taut so that each cable strand is the same length (B). Tension in each cable strand should be equalized. After the two free cable ends are inserted into the tensioning instrument (C), the ends should be pulled taut so as to equalize their length and so the tensioner can be slid down into position (D), engaging the nosepiece into the slots on the clasp (E). Use thumb to push free cable ends into cleat to firmly grip cable ends (F).



Thread cable through locking clasp.

Pull cable ends to remove slack, equalizing lengths.

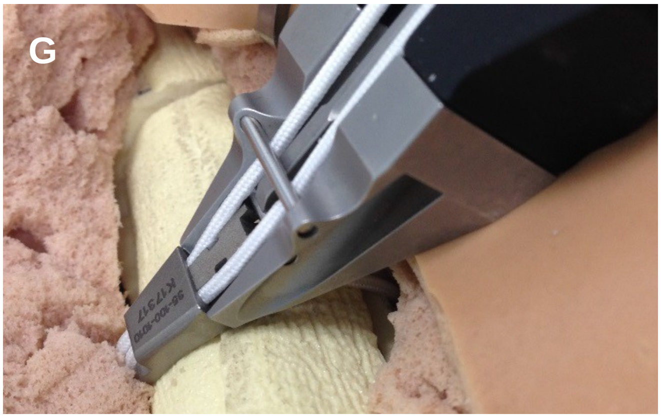
Insert free cable ends under cross-bar

Hold cable ends taut to equalize their length and slide tensioner down onto cable clasp.

Engage instrument's nosepiece into the slots on clasp.

Use thumb to push free cable ends into cleat

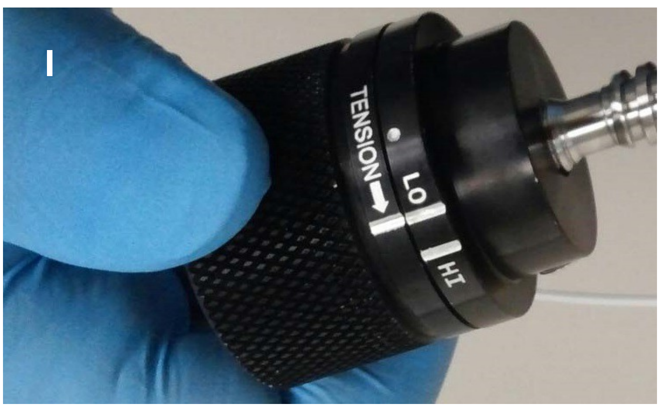
Step 5. cont'd:



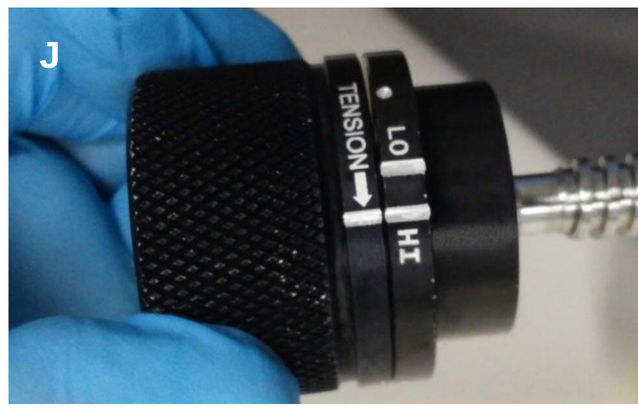
Maintain proper alignment with cable clasp.

Confirm zero alignment of knobs prior to tensioning.

- While maintaining engagement and proper alignment between the tensioning instrument and clasp (G), apply tension by turning the outer knob on the tensioning instrument clockwise. Be careful to grasp only the outer knurled (textured) part of the knob while turning. Confirm zero alignment of knobs prior to tensioning (H). Continue turning the knob until the desired compression is achieved. **The indicator marks (LO, HI) should be read while torque is applied to the outer knob (I and J) and the knob is slowly turned clockwise.**

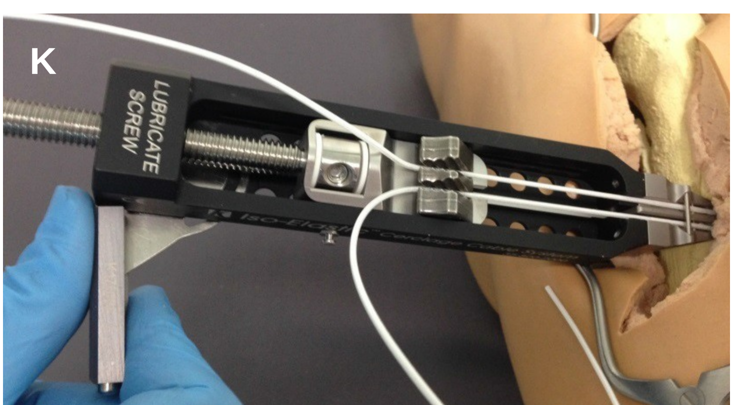


1st mark indicates 80 lbs (360 N) compressive force.



2nd mark indicates 120 lbs (530 N) compressive force.

- Lock the cable clasp by depressing the button in the end of the wedge insertion lever and pulling back on the lever fully to insert the wedge (K).



Deploy wedge insertion lever.

CAUTION:

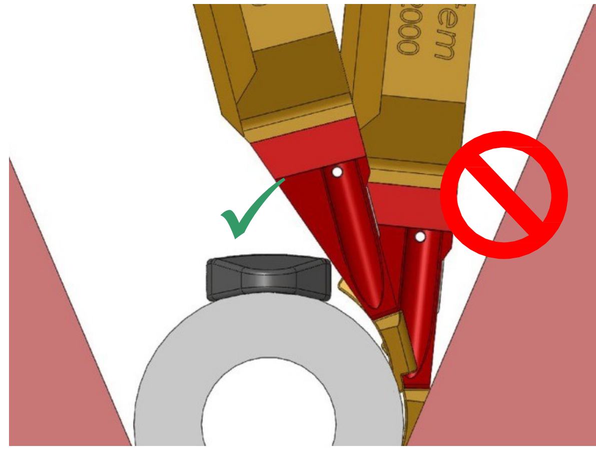
- *Recommended tensioner settings are meant to assist the surgeon in optimizing performance of the system, not to replace the surgeon's judgment. Care should be taken to control tension in patients with poor bone quality and ideal tension may vary with bone quality or geometry. Reduced bone quality may warrant a lower tension. Typically, with good bone quality, the cable can be tensioned to the "HI" mark.*
- *Do not tension the cable such that the line on the knob passes the second solid line, exceeding 120 lbs. (530 N) of compressive force (J).*

- To release the tensioning instrument from the cable, first turn the knob counter-clockwise to release tension. Then pull cable tails <u>straight back</u> towards knob and <u>then up</u> to disengage them from the cleat. The tensioning instrument may then be released from the clasp. **Do not cut the free cable ends yet, as these will allow for subsequent re-tightening.**

Step 5. cont'd:

NOTES:

- *It may be helpful to rotate the cable locking clasp to improve tensioner access. In general, position the locking clasp close to the grip or cable-plate at the 2 o'clock position as shown in the cross-sectional illustration in order to provide the best "approach angle" for the tensioner. Such positioning also reduces the amount of soft-tissue that could be impinged by the tensioner.*



NOTES:

- *Firmly secure the grip with cables or reduction clamps prior to drilling and placing locking screws. Failure to do so may prevent the threaded screw head from properly engaging the grip or plate.*
- *Utilize large bone clamps to hold bone fragments and grip or plate implants in place while cables are being passed and tightened.*
- *The cable clasp should be placed in a region of bone that maximizes the conformity between the clasp and underlying surface (bone or allograft).*
- *Consider placement of a locking screw in the proximal grip hole when medial bone is absent in the proximal femur and does not allow for placement of cables proximally.*

Surgical Technique

Trochanteric Grip Fixation Technique (continued)

Repeat steps 4 through 5 for additional cables and pairs of holes in the grip.

NOTE: Each cable should be tensioned sequentially so as to compensate for movement in the fracture construct as each cable is tensioned. Due to minor settling of the fracture construct, all cables should be checked for optimal tension prior to trimming their free ends.

If desired, each cable may be re-tightened by re-attaching the tensioning instrument to each clasp, re-tensioning the cable assembly, and fully re-seating the locking wedge (see diagrams A through K on pages 9-10).

Step 6. Screw Fixation (optional)

Grips accommodate bone screws in addition to cables. The most proximal fixation hole in the grips accepts a locking or standard compression bone screw. **Ensure that the grip is firmly secured with cables and/or reduction clamps prior to drilling and placing locking screws.** Drill to desired depth using the 4.0 mm Threaded Drill Guide 60 mm (35-860-1030) or 120 mm (35-860-1070) and Drill Bit, 4.0 x 205mm, AO (35-860-1020) as shown below. For placement of screws, refer to the Bone Screw Technique on pages 15-16.

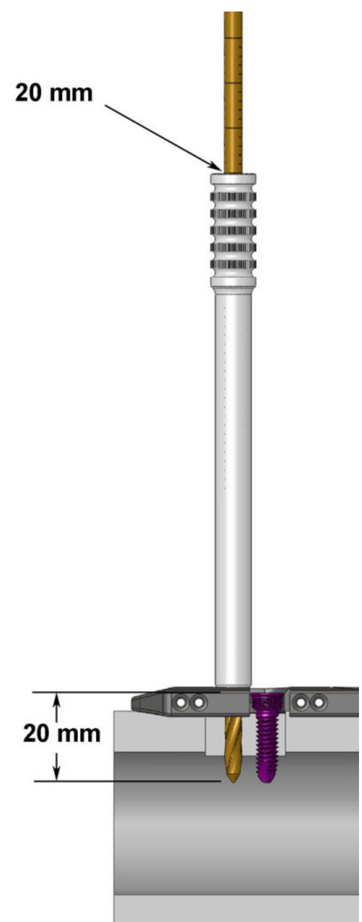
NOTE: It may be advantageous to employ a unicortical locking screw proximally for additional trochanteric fixation.

CAUTION: *If a bicortical screw is used, avoid placing the cable in the region of the screw tip. Screws protruding through the far cortex could potentially damage the cable.*

Step 7. Trim Cable Ends

After all cables have been sequentially tensioned as desired, use a scalpel or trauma shears to trim the free cable ends flush with the locking clasp. **Cables cannot be retensioned after free ends have been trimmed.**

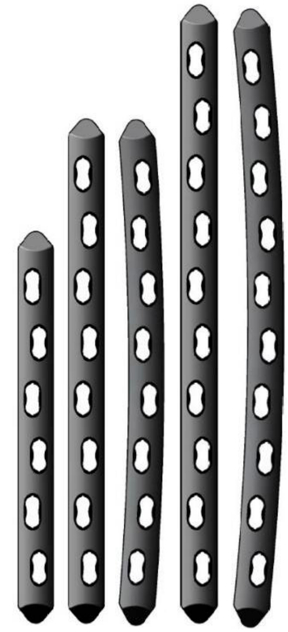
Trim cable ends.



Markings on drill indicate screw depth.

Surgical Technique

Cable-Plate Fixation Technique

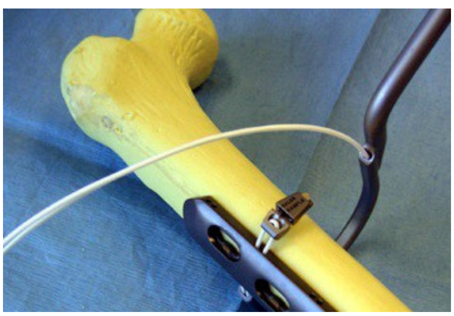


Step 1. Select Plate

Choose the cable-plate that is most appropriate for the fracture. Refer to page 2 for available cable-plate options. "Trial" plates are available in 8-hole straight and curved versions. The requirement for a longer or shorter plate implant can be estimated by visualizing alternate lengths that are sized in 2-hole increments of length.

NOTES:

- *For comminuted diaphyseal fractures, the recommended plate length is 2 to 3 times greater than the fracture length in a bridge plate technique.*[6,25]
- *For internal fixation of periprosthetic fractures around a well-fixed stem in which the implant is retained, the plate should be of sufficient length to overlap as much of the intramedullary implant as possible while allowing adequate screw or cerclage cable fixation distal to the implant and fracture.*[21,22,24]



Clasp positioned on anterior surface.

Clasp positioned on posterior surface.

Pull cable taut, equalizing lengths.

Step 2. Feed Cables Through Plate

Open the desired number of sterile SuperCable Iso-Elastic Cerclage System Cables and deliver to the sterile field. It may be advantageous to feed cables through the plate prior to positioning the plate, taking note of the clasp orientation. Based on the surgical approach, the cable locking clasp should be positioned on the anterior or posterior surface of the femur as shown to provide proper access for the tensioning instrument. **Determine in advance the direction that the cables will be tensioned and the best position for the locking clasp.**

Step 3. Position Plate

Position the plate accordingly and hold in place using plate holding forceps, clamps or other means.

Step 4. Secure Cable

Feed the ends of the cable through its locking clasp and pull taut. *Ensure that the locking clasp is in contact with bone or allograft, but not contacting the plate.*

NOTES:

- *Feed cable in the direction that results in the cable wedge facing towards the plate. This orientation will ensure proper directionality for the tensioning device.*
- *Use a bending press rather than plate bending irons if contouring of the plate is necessary. Do not bend in area of cable or screw holes.*

⚠ ***CAUTION:*** *Exercise caution in using the cable passer or other instruments to avoid damage to neurovascular structures or grip and plate implants and to minimize soft tissue interposition that could affect proper cable tensioning.*

⚠ ***CAUTION:*** *Avoid wrapping the cable over sharp implant or bone graft edges or rough surfaces (e.g. porous coating). The locking clasp should not contact the cable-plate, screws, or prosthesis.*

Cable-Plate Fixation Technique (continued)

Maintain proper alignment between tensioning instrument and locking clasp.

Step 5. Tension Cable

Apply tension and lock the cable clasp as described on pages 9-10. Do not cut the free cable ends yet, as these will allow for subsequent re-tightening.

Repeat steps 4 and 5 for additional cables and pairs of holes in the cable-plate.

<u>NOTE:</u> Each cable should be tensioned sequentially so as to compensate for movement in the fracture construct as each cable is tensioned. Due to minor settling of the fracture construct, all cables should be checked for optimal tension prior to trimming their free ends.

If desired, each cable may be re-tightened by re-attaching the tensioning instrument to each clasp, re-tensioning the cable assembly, and fully re-seating the locking wedge (see diagrams A through K on pages 9-10).

<u>CAUTION:</u> *Choose the amount of cable tension based on bone quality of the patient. Do not tension the cable such that the line on the knob passes the second solid line marked "HI", exceeding 120 lbs. (530 N) of compressive force (see page 10, Figure J). Typically, with good bone quality, the cable can be tensioned to the "HI" mark.*

Step 6. Screw Fixation (optional)

Cable-plates accommodate bone screws in addition to cables. **Ensure that the plate is firmly secured prior to drilling and placing locking screws.** For placement of screws, refer to the Bone Screw Technique on pages 15-16.

<u>NOTES:</u>

- *For periprosthetic fractures, a combination of cerclage cables and unicortical locking screws may be used in the zone of the intramedullary implant.*
- *To create a bridging construct and promote callus formation in the treatment of comminuted diaphyseal fractures, at least 2 to 3 screw holes should be left open at the level of the fracture when locking screws are placed on both sides of the fracture.*[3,6,25]

<u>CAUTION:</u> *If a bicortical screw is used, avoid placing the cable in the region of the screw tip. Screws protruding through the far cortex could potentially damage the cable.*

Step 7. Trim Cable Ends

After all cables have been sequentially tensioned as desired, use a scalpel or scissors to trim the free cable ends flush with the locking clasp. **Cable cannot be retensioned after free ends have been trimmed.**

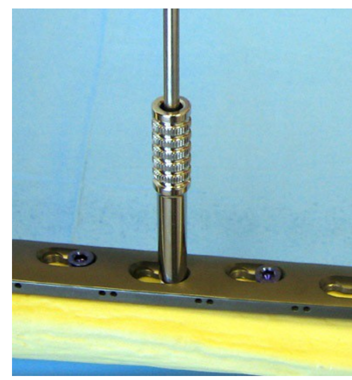
Surgical Technique

Bone Screw Fixation Technique

Based on the quality of bone and stability of the fracture construct, supplemental fixation may be accomplished with either conventional compression (cortical) screws, locking screws, or a combination of both types.

<u>*NOTES:*</u>

- *Firmly secure the grip or plate using cables and/or reduction clamps prior to drilling and inserting locking screws. Failure to do so may prevent the threaded screw head from properly engaging the grip or plate.*
- *Locking screws create a fixed-angle construct and will not promote anatomical reduction unless previously accomplished with compression screws, cables, or bone holding clamps. Always insert and tighten cables and/or compression screws prior to the insertion of locking screws.*
- *If a locking screw is inserted first, ensure that the plate is held securely by cables or by other means to avoid spinning of the plate as the locking screw is tightened into the plate.*
- *Locking screws should be inserted manually to avoid cross-threading, stripping, or over-torquing.*
- *Contouring or bending the plate at or near a threaded hole may deform the threads and prevent the insertion of a locking screw.*
- *The use of unicortical locking screws near an intramedullary implant may require supplementary fixation with cerclage cables at this level.*



Insert threaded drill guide and drill using 4.0 mm drill.

Locking Screw Fixation Technique

Fully screw the 4.0 mm Threaded Drill Guide 60 mm (35-860-1030) or 120 mm (35-860-1070) into the locking hole of the grip or plate. Ensure that the drill guide is fully threaded into and perpendicular to the grip or plate. Failure to do so will risk damaging the plate and screw threads.

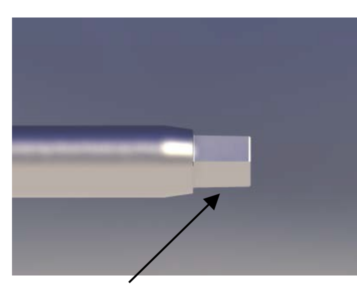
⚠ ***<u>CAUTION:</u>*** *Application of excessive force to the drill guide may result in stripping of the plate threads.*

With the drill guide in place, pre-drill the screw hole using the 4.0 mm Drill Bit 205 mm (35-860-1020). Markings on the drill bit indicate screw depth, as shown on page 11.

Insert locking screw.

Use the Hex Driver (35-860-2060) to manually thread and seat the head of the locking screw in the plate. The tip of the hex driver is tapered to capture the head of the screw.

Carefully hold the driver in line with the locking screw and perpendicular to the plate while seating the screw. Ensure that all locking screws are securely tightened. **Do not use power tools or excessive torque to seat the locking screw.**

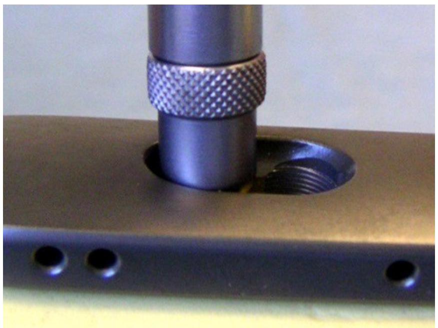


Tapered driver tip.

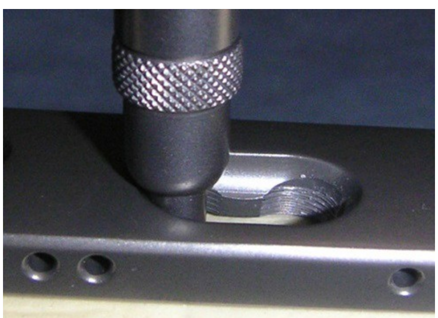
Bone Screw Fixation Technique (continued)

Compression Screw Fixation Technique

Use the Universal Drill Guide 3.2/4.5 mm (35-860-2080) to pre-drill the bone for the 4.5 mm compression head cortical bone screws in a neutral position or eccentrically to allow for dynamic compression. Use the 3.2 mm Drill Bit 145 mm (35-860-2020) to pre-drill for standard fixation or a 4.5 mm Drill Bit 145 mm (35-860-2030) for a lag screw effect.



Neutral insertion.



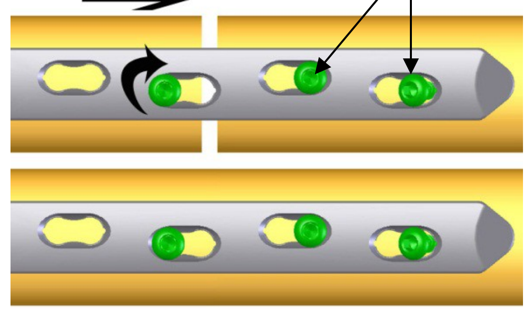
Dynamic compression.

For neutral (buttress) insertion, center the 3.2 mm guide (spring loaded) portion of the Universal Drill Guide in the screw hole for neutral pre-drilling by pressing the guide down on the edge of the hole. The drill guide will automatically center itself in the neutral drilling position.

To impart interfragmentary compression using dynamic compression (eccentric insertion), position the 3.2 mm guide portion (spring loaded) of the Universal Drill Guide eccentrically at the edge of the screw hole <u>without</u> pressing down so that pre-drilling will be offset from the center of the hole.

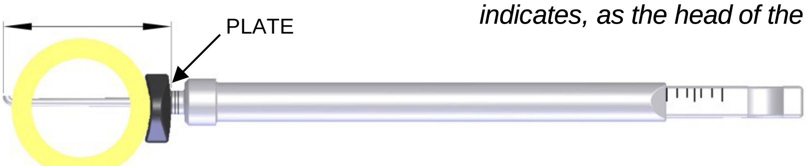
Universal Drill Guide

Eccentric dynamic compression technique showing bone movement relative to plate



After drilling, remove the drill guide and use the depth gage to determine the appropriate length of screw.

<u>NOTE:</u> Use a compression screw 2 mm longer than the depth gage indicates, as the head of the compression screw sits above the plate.



Depth gage reading indicates distance from the top of plate to the tip of gage

<u>NOTES:</u>

- *Each compression screw allows up to 1.0 mm of bone translation. If an additional screw is used in dynamic compression, the first screw must be loosened slightly to allow further movement of the plate.*
- *Do not place screws in directly adjacent positions in the figure-of-eight holes (for dynamic compression). For lag screw fixation, the lag screw must be inserted and tightened before any locking screws are inserted and locked.*

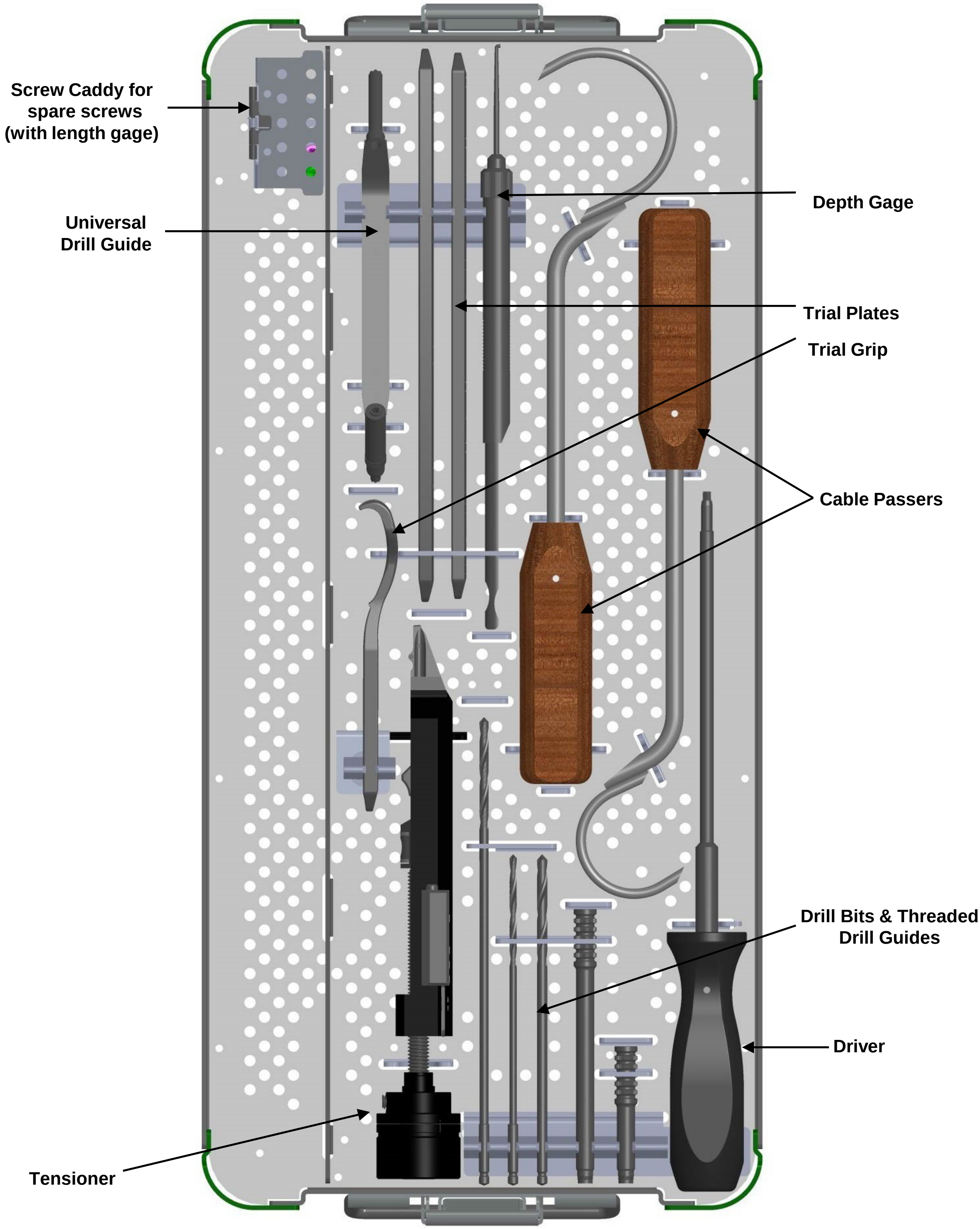
⚠ ***<u>CAUTION:</u>*** *With the exception of a lag screw technique, pre-drill using a 3.2 mm drill for 4.5 mm compression screws or with a 4.0 mm drill for 5.0 mm locking screws. Failure to do so may result in loss of fixation. For a lag screw effect, pre-drill both fragments using a 3.2 mm drill, then drill the near fragment with a 4.5 mm drill to allow insertion of a compression screw.*

Removal of Locking Screws

To avoid possible rotation of the plate, unlock all locking screws from the plate first and then remove each screw completely. Re-use of any threaded hole after a locking screw has been tightened and removed may lead to stripping of the threads.

SuperCable Grip and Plate Instrument Set

Single-Level Tray for Instruments Only
For Use With Sterile-Packed Implants
(Part No. 35-800-4030)

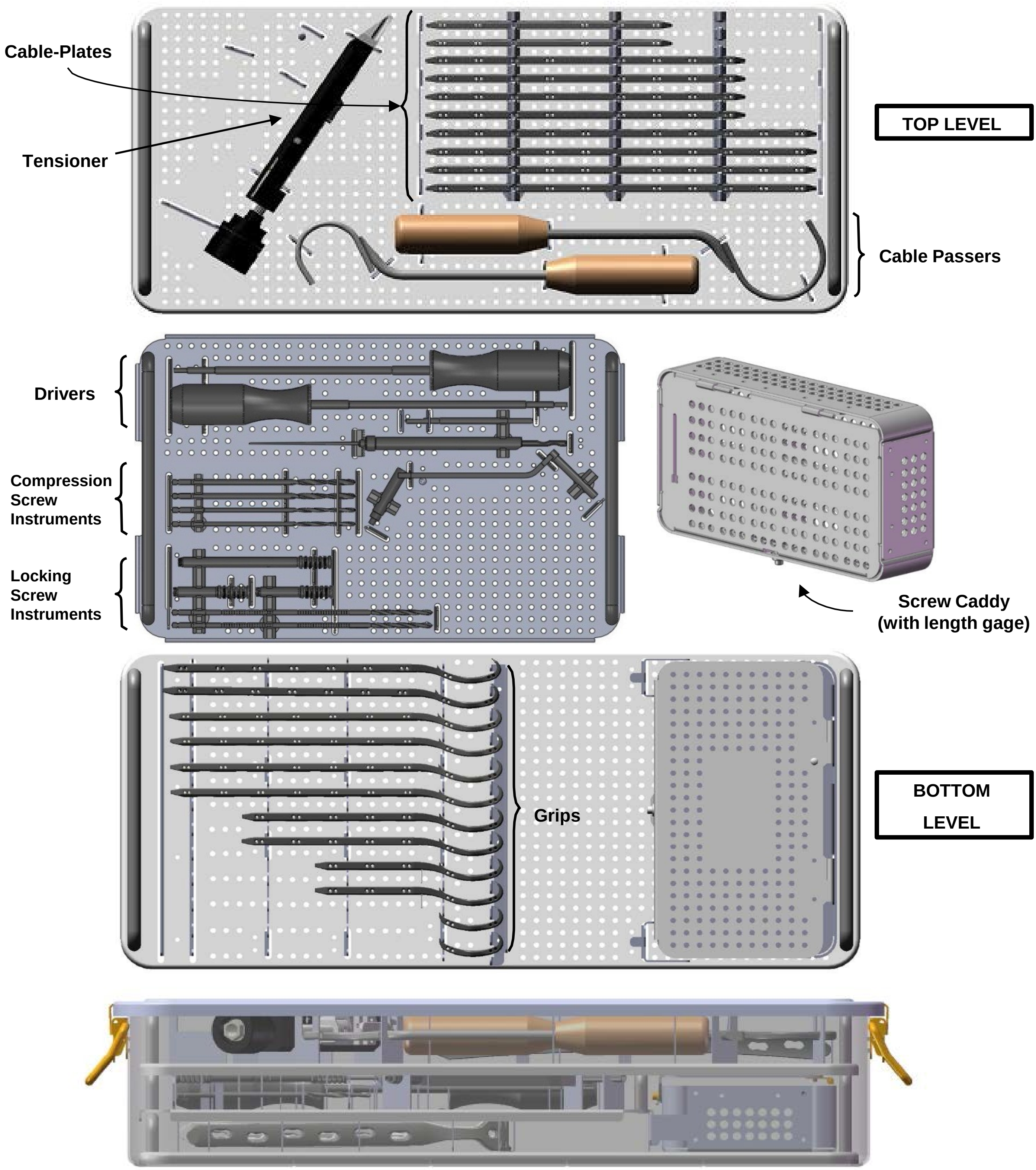


SuperCable Grip and Plate Instrument Set

Multi-Level Tray for Instruments & Implants

For Use With Non-Sterile Implants

(Note: this Tray is a legacy item that is no longer in production)



Relevant Literature

1. **Barrack and Butler.** 2005. Current status of trochanteric reattachment in complex total hip arthroplasty. Clin Orthop Relat Res 441:237-242.
2. **Brady et al.** 2000. The reliability and validity of the Vancouver classification of femoral fractures after hip replacement. J Arthroplasty 15:59-62.
3. **Cantu and Koval.** 2006. The use of locking plates in fracture care. J Am Acad Orthop Surg 14:183-190.
4. **Egol et al.** 2004. Biomechanics of locked plates and screws. J Orthop Trauma 18:488-493.
5. **Fulkerson et al.** 2006. Fixation of periprosthetic femoral shaft fractures associated with cemented femoral stems: a biomechanical comparison of locked plating and conventional cable plates. J Orthop Trauma 20:89-93.
6. **Gautier and Sommer.** 2003. Guidelines for the clinical application of the LCP. Injury 34 Suppl 2:B63-76.
7. **Greiwe and Archdeacon.** 2007. Locking plate technology: current concepts. J Knee Surg 20:50-55.
8. **Haddad et al.** 2002. Periprosthetic femoral fractures around well-fixed implants: use of cortical onlay allografts with or without a plate. J Bone Joint Surg Am 84-A:945-950.
9. **Hak and McElvany.** 2008. Removal of broken hardware. J Am Acad Orthop Surg 16:113-120.
10. **Hamadouche et al.** 2003. Reattachment of the ununited greater trochanter following total hip arthroplasty. The use of a trochanteric claw plate. J Bone Joint Surg Am 85-A:1330-1337.
11. **Hamadouche et al.** 2004**.** Reattachment of the ununited greater trochanter following total hip arthroplasty. J Bone Joint Surg Am 86-A Suppl 1:112-118.
12. **Gonzalez et al.** 2007. Early results with the new internal fixator systems LCP and LISS: a prospective study. Acta Orthop Belg 73:60-69.
13. **Jarit et al**. 2007. Fixation systems of greater trochanteric osteotomies: biomechanical and clinical outcomes. J Am Acad Orthop Surg 15:614-624.
14. **Kubiak et al.** 2006. The evolution of locked plates. J Bone Joint Surg Am 88 Suppl 4:189-200.
15. **Kurtz et al.** 2007. Projections of primary and revision hip and knee arthroplasty in the United States from 2005 to 2030. J Bone Joint Surg Am 89:780-785.
16. **McCarthy et al.** 1999. The outcome of trochanteric reattachment in revision total hip arthroplasty with a Cable Grip System: mean 6-year follow-up. J Arthroplasty 14:810-814.
17. **Niemeyer and Sudkamp.** 2006. Principles and clinical application of the locking compression plate (LCP). Acta Chir Orthop Traumatol Cech 73:221-228.
18. **Old et al.** 2006. Fixation of Vancouver B1 peri-prosthetic fractures by broad metal plates without the application of strut allografts. J Bone Joint Surg Br 88:1425-1429.
19. **Papakostidis et al.** 2006. Femoral biologic plate fixation. Clin Orthop Relat Res 450:193-202.
20. **Patel et al.** 2006. Treatment of periprosthetic femoral shaft nonunion. J Arthroplasty 21:435-442.
21. **Ricci et al.** 2005. Indirect reduction and plate fixation, without grafting, for periprosthetic femoral shaft fractures about a stable intramedullary implant. J Bone Joint Surg Am 87:2240-2245.
22. **Ricci et al.** 2006. Indirect reduction and plate fixation, without grafting, for periprosthetic femoral shaft fractures about a stable intramedullary implant. Surgical Technique. J Bone Joint Surg Am 88 Suppl 1 Pt 2:275-282.
23. **Sandhu et al.** 2005. Dall-Miles cable and plate fixation system in the treatment of periprosthetic femoral fractures: a review of 20 cases. J Orthop Surg (Hong Kong) 13:259-266.
24. **Schmidt.** 2006. Outcomes of Periprosthetic Hip Fractures. Seminars in Arthroplasty 17:18-24.
25. **Smith et al.** 2007. Locking plates: tips and tricks. J Bone Joint Surg Am 89:2298-2307.
26. **Sommer.** 2006. Biomechanics and clinical application principles of locking plates. Suomen Ortopedia ja Traumatologia 29:20-24.
27. **Sommer et al.** 2004. Locking compression plate loosening and plate breakage: a report of four cases. J Orthop Trauma 18:571-577.
28. **Sommer et al.** 2003. First clinical results of the Locking Compression Plate (LCP). Injury 34 Suppl 2:B43-54.
29. **Stoffel et al.** 2003. Biomechanical testing of the LCP--how can stability in locked internal fixators be controlled? Injury 34 Suppl 2:B11-19.
30. **Strauss et al.** 2008. The Current Status of Locked Plating: The Good, the Bad, and the Ugly. J Orthop Trauma 22: 479-486.
31. **Van Flandern.** 2005. Periprosthetic fractures in total hip arthroplasty. Orthopedics 28:s1089-1095.
32. **Wagner.** 2003. General principles for the clinical use of the LCP. Injury 34 Suppl 2:B31-42.
33. **Wagner et al.** 2004. New concepts for bone fracture treatment and the Locking Compression Plate. Surg Technol Int 12:271-277.
34. **Younger et al.** 1995. Extended proximal femoral osteotomy. A new technique for femoral revision arthroplasty. J Arthroplasty 10:329-338.
35. **Zdero et al.** 2008. Biomechanical Evaluation of Periprosthetic Femoral Fracture Fixation. J Bone Joint Surg Am 90: 1068-1077.
36. **Ting, Della Valle et al.** 2010. Early Experience with a Novel Nonmetallic Cable in Reconstructive Hip Surgery. Clin Orthop Relat Res. 468:2382-6.
37. **Berend, Lombardi et al.** 2014. Polymer Cable/Grip-Plate System with Locking Screws for Stable Fixation to Promote Healing of Trochanteric Osteotomies of Fractures in Revision Total Hip Arthroplasty. Surgical Technology Int. XXV: 227-231.

INDICATIONS

The SuperCable Grip and Plate System is indicated for use where wire, cable, or band cerclage is used in combination with a trochanteric grip or bone plate. The SuperCable Grip and Plate System is intended to be used in conjunction with the SuperCable Iso-Elastic Cerclage System for reattachment of the greater trochanter following osteotomy or fracture, and for fixation of long bone fractures.

STERILITY AND HANDLING

All instruments in the system are supplied non-sterile and must be cleaned and sterilized before use. Sterilization of instruments and, if applicable, implants is accomplished by autoclaving per the following recommended procedures:

Method	Cycle Type	Sterilization Temperature (Minimum)	Full Cycle Time (Minimum)	Dry Time (Minimum)
Steam Autoclave (Double wrapped in 1-ply polypropylene wrap[1])	Pre-Vacuum	132°C or 270°F	4 minutes	45 minutes
Steam Autoclave (Double wrapped in 1-ply polypropylene wrap[1])	Pre-Vacuum	134°C or 273°F	3 minutes	45 minutes

(Validated to the following standards: FDA's 21CFR58, ISO 17665-1:2006 and ANSI/AAMI ST79:2010)
[1]Kimguard KC600 used in validation.

Instruments must be thoroughly cleaned and inspected for dryness before autoclaving.

CLEANING and MAINTENANCE of INSTRUMENTS

All instruments intended for end-user sterilization must be free of packaging material and biocontaminants prior to sterilization. Cleaning, maintenance and mechanical inspection must be performed by authorized personnel trained in the general procedures of contaminant removal. See SuperCable IFU document B00154 for manual and automated cleaning instructions.

CARE and HANDLING

Use extreme care in handling and storage of implant components. Implants must be handled with care. Bending, notching, or scratching the implant surfaces may reduce the strength, fatigue resistance and/or wear characteristics of the implant system. These, in turn may induce internal stresses that are not obvious to the eye and may lead to fracture of the components. Implants and instruments should be protected during storage from corrosive environments, such as salt air, etc. Only instruments designed for use with this system should be used to ensure correct implantation. Review of these handling instructions is important. Damaged instruments may lead to improper implant position and result in implant failure. Thorough familiarity with the surgical technique is essential to ascertain their proper working condition. Do not disassemble any part of the tensioning instrument.

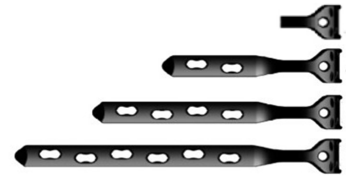
PART NUMBER INFORMATION

Catalog No.	Description

Cables

35-100-1010	SuperCable Cerclage Cable Assembly, 1.5mm
35-100-1040	SuperCable Cerclage Cable Assembly, 1.5mm

Trochanteric Grips (Titanium)



35-200-1010	Trochanteric Grip, Short, 50mm
35-200-1020	Trochanteric Grip, 2-Hole Plate, 135mm
35-200-1030	Trochanteric Grip, 4-Hole Plate, 190mm
35-200-1040	Trochanteric Grip, 6-Hole Plate, 245mm

Cable Plates (Titanium)

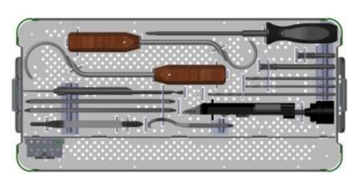
35-220-1010	Cable Plate, 6-Hole, 185mm
35-220-2010	Cable Plate, 8-Hole Straight, 240mm
35-220-2012	Cable Plate, 8-Hole Curved, 240mm
35-220-3012	Cable Plate, 10-Hole Curved, 290mm
35-220-3010	Cable Plate, 10-Hole Straight, 290mm

Bone Screws (Titanium) *Length is last two digits of Catalog No.*

35-230-45XX	Bone Screw, 4.5mm, Compression Head, (10 to 50mm length)
35-234-50XX	Bone Screw, 5.0mm, Locking Head, (10 to 50mm length)

Instrumentation

35-800-2020	SuperCable Cerclage, Tensioning Instrument w/ACME thread
35-800-3100	SuperCable Cerclage, Cable Passer 60mm Diameter
35-800-3000	SuperCable Cerclage, Cable Passer 40mm Diameter
35-860-2060	Driver, 3.5mm Hex
35-850-2010	TRIAL Cable Plate, 8-Hole Straight, 240mm
35-850-2012	TRIAL Cable Plate, 8-Hole Curved, 240mm
35-840-1020	TRIAL Trochanter Grip, 135mm
35-860-1070	Threaded Drill Guide, 4.0 x 120mm
35-860-1030	Threaded Drill Guide, 4.0 x 60mm
35-860-2080	Universal Drill Guide, 3.2/4.5mm
35-860-2020	Drill Bit, 3.2 x 145mm, AO
35-860-2030	Drill Bit, 4.5 x 145mm, AO
35-860-1020	Drill Bit, 4.0 x 205mm, AO
35-860-2070	Depth Gage
35-800-4030	Grip/Plate System Autoclave Case (Organizes Instruments Only)



KINAMED® INCORPORATED

Quality Care. Clinically Proven.

Phone 1-805-384-2748
Toll-Free 1-800-827-5775
Fax 1-805-384-2792
Website www.kinamed.com

820 Flynn Road, Camarillo, CA 93012-8701 USA

bsi. ISO 13485 Medical Devices Quality Management FM 75124

CE and CE 0086

B00161H

The CE mark is valid only if it is also printed on the product label.