



# Cable-Ready® Greater Trochanteric Reattachment

Surgical Technique



Stabilization of the Greater Trochanter



## Cable-Ready Greater Trochanteric Reattachment Surgical Technique

Developed in conjunction with

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## Short Integral Crimp GTR Surgical Technique

### Cable Insertion

Individual cables may be inserted into the GTR before or after the GTR is attached to the bone. However, the cables must be inserted into the GTR prior to passing the cable around the femur. Two cables are included with the GTR device. Should the most distal cable be necessary, it is not packaged with the device but is available separately (item #2232-04-18).

In the usual lateral approach to the femur, insert the cable into the posterior side of the GTR (transverse hole **without** the set screw), and pull until the plug countersinks into the plate. Pass the large Cable Passer around the proximal femur from posterior to anterior. Insert the free end of the cable into the tip of the Cable Passer until the cable is seen exiting from the shaft of the Cable Passer (Fig. 1). Withdraw the Cable Passer, leaving the cable around the bone. Insert the cable through the transverse hole **with** the Cable Passer.

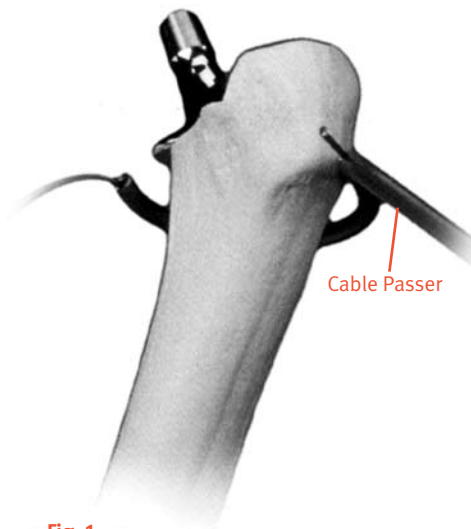


Fig. 1

**Note:** Cables can be passed from medial to lateral or lateral to medial depending on surgeon preference. Place the first cable just distal to the lesser trochanter, and the second cable distal to the first cable. Do not place the cable directly around the prosthesis.

### Impaction

Screw the Impact Driver into the GTR. Impact the GTR onto the greater trochanter. The upper hooks should engage and wrap around the superior portion of the trochanter (Fig. 2).

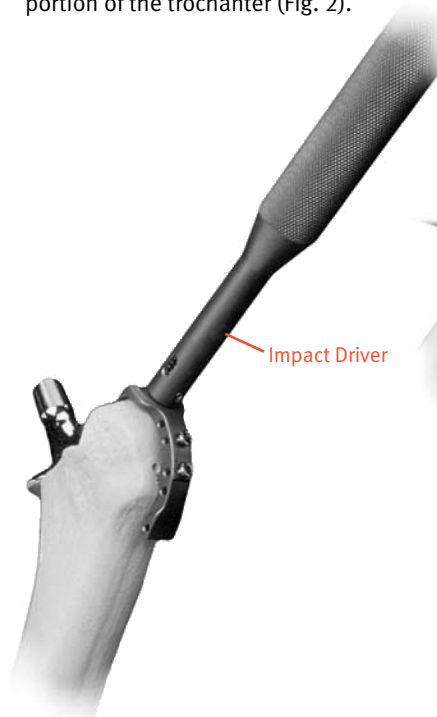


Fig. 2

If an osteotomy was performed, use the Impact Driver as a guide and advance the greater trochanter onto a good bed of bleeding bone.

**Note:** The most common reason for nonunion of the greater trochanter is poor or inadequate bone contact between the greater trochanter and proximal femur.

### Tensioning and Locking the Cable

It is recommended to use a cable at each transverse pair of holes. Whether or not a cable is utilized at a particular location in the GTR, **all set screws must be seated at completion of the procedure.**

To tension the cable, insert the Bone Plate Tensioner Bit (#2232-09) into the tensioner. Thread the cable completely through the tensioner and pull the slack out of the cable. Depress the lever at the back end of the tensioner to lock the cable. To remove any remaining slack in the cable, depress the button on the tensioner and pull out the excess slack. Rotate the handle of the tensioner clockwise until the desired tension is achieved (Fig. 3).

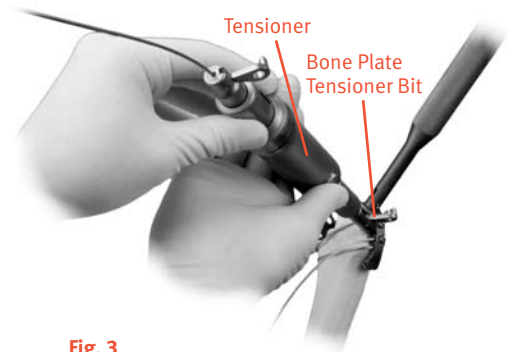


Fig. 3

The following tensioning sequence is recommended. Tension the cables in proximal to distal direction, using the tensioner bits to hold the tension. Note: If a third cable is desired when using the Short GTR, an externally crimped cerclage cable (#2232-04-18) can be passed through the distal hole, and tensioned using the Cerclage Attachment Bit (#2232-08).

Start proximally and work distally, tensioning each cable and locking by screwing in the appropriate set screw in the GTR.

**Note: Whether or not all cable locations are utilized, all set screws should be locked down at the completion of the procedure.**

After each set screw is firmly seated (Fig. 4), the tensioner and bits are removed and the excess cable is cut off flush with the GTR (Fig. 5).

## Long Integral Crimp GTR Surgical Technique

### Cable Insertion

Individual cables may be inserted into the GTR before or after the GTR is attached to the bone (Fig. 6). However, the cables must be inserted into the GTR prior to passing the cable around the femur.

Pass the large Cable Passer around the proximal femur from posterior to anterior. Insert the free end of the cable into the tip of the Cable Passer until the cable is seen exiting from the shaft of the Cable Passer. Withdraw the Cable Passer, leaving the cable around the bone. Insert the cable through the transverse hole **with** the set screw.

**Note: Cables can be passed from medial to lateral or lateral to medial depending on surgeon preference. Place the first cable just distal to the lesser trochanter, and the second cable distal to the first cable. Do not place the cable directly around the prosthesis.**

### Impaction

Screw the Impact Driver into the GTR. Impact the GTR onto the greater trochanter. The upper hooks should engage and wrap around the superior portion of the trochanter (Fig. 8).

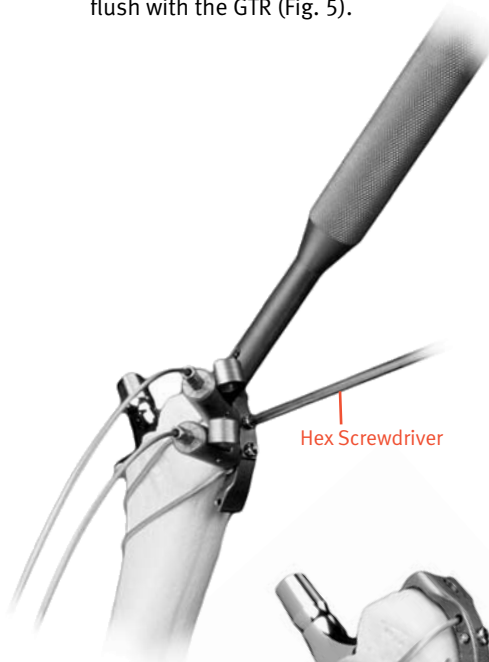


Fig. 4

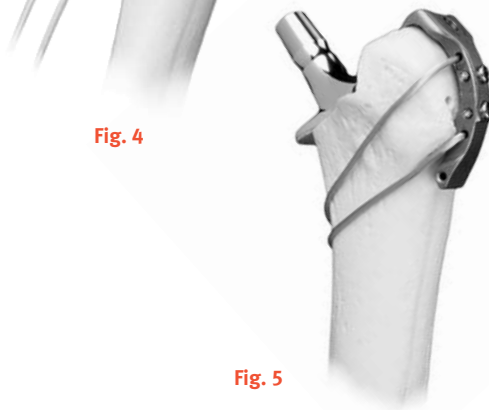


Fig. 5

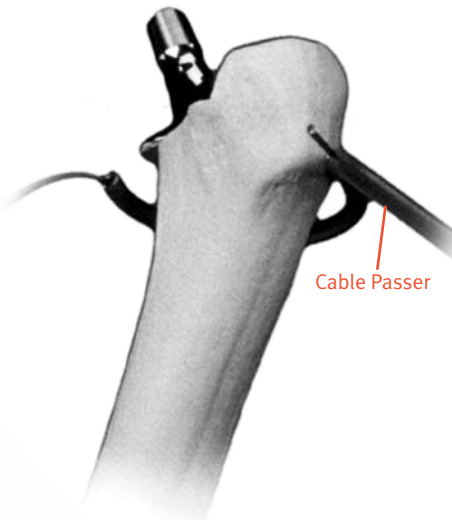


Fig. 6

In the usual lateral approach to the femur, insert the cable into the posterior side of the GTR (transverse hole **without** the set screw), and pull until the plug countersinks into the plate (Fig. 7).

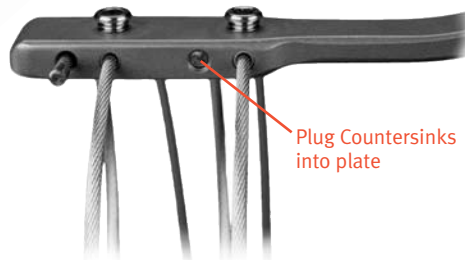


Fig. 7

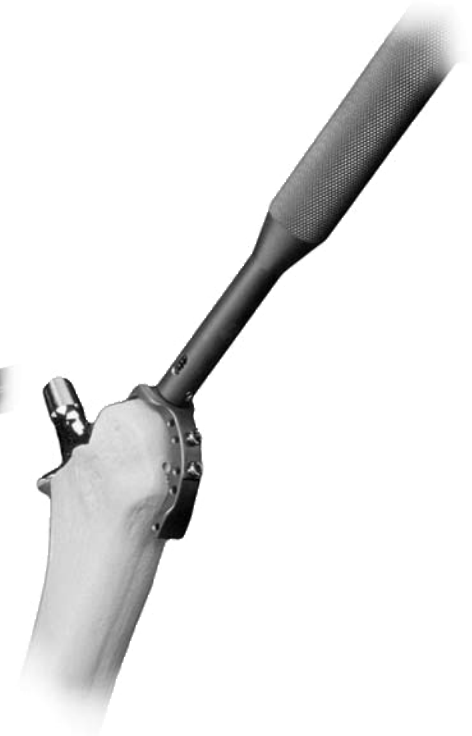


Fig. 8

If an osteotomy was performed, use the Impact Driver as a guide and advance the greater trochanter onto a good bed of bleeding bone.

**Note: The most common reason for nonunion of the greater trochanter is poor or inadequate bone contact between the greater trochanter and proximal femur.**

### Tensioning and Locking the Cable

It is recommended to use a cable at each transverse pair of holes. Whether or not a cable is utilized at a particular location in the GTR, **all set screws must be seated at completion of the procedure.**

To tension the cable, insert the Bone Plate Tensioner Bit (#2232-09) into the tensioner. Thread the cable completely through the tensioner and pull the slack out of the cable. Depress the lever at the back end of the tensioner to lock the cable. To remove any remaining slack in the cable, depress the button on the tensioner and pull out the excess slack. Rotate the handle of the tensioner clockwise until the desired tension is achieved (Fig. 9).

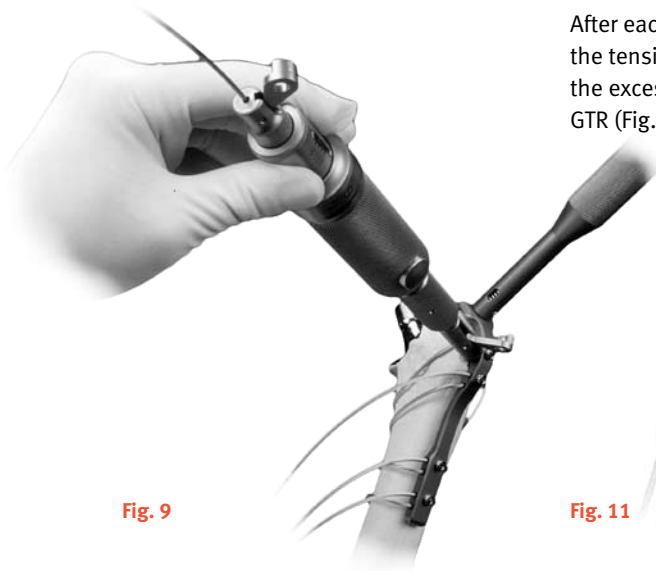


Fig. 9

The following tensioning sequence is recommended. Tension the two proximal cables first, using the tensioner bits to hold the tension. The distal cables in the plate section of the Long GTR can then be tensioned, again using the Bone Plate Tensioner Bits to hold the tension (Fig. 10). The set screws are **not** locked down at this time.

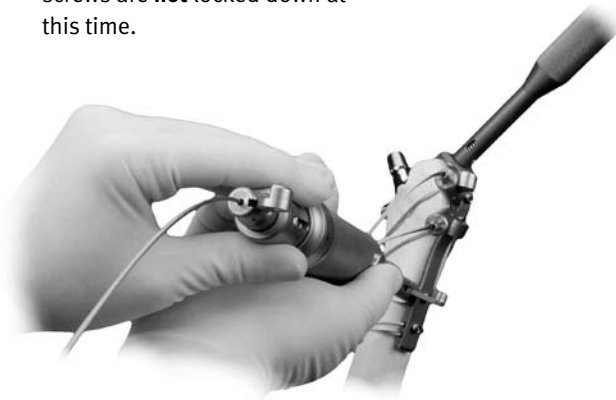


Fig. 10

Start proximally and work distally, tensioning each cable and locking by screwing in the appropriate set screw in the GTR.

**Note: Whether or not all cable locations are utilized, all set screws should be locked down at the completion of the procedure.**

After each set screw is firmly seated, the tensioner and bits are removed and the excess cable is cut off flush with the GTR (Fig. 11).

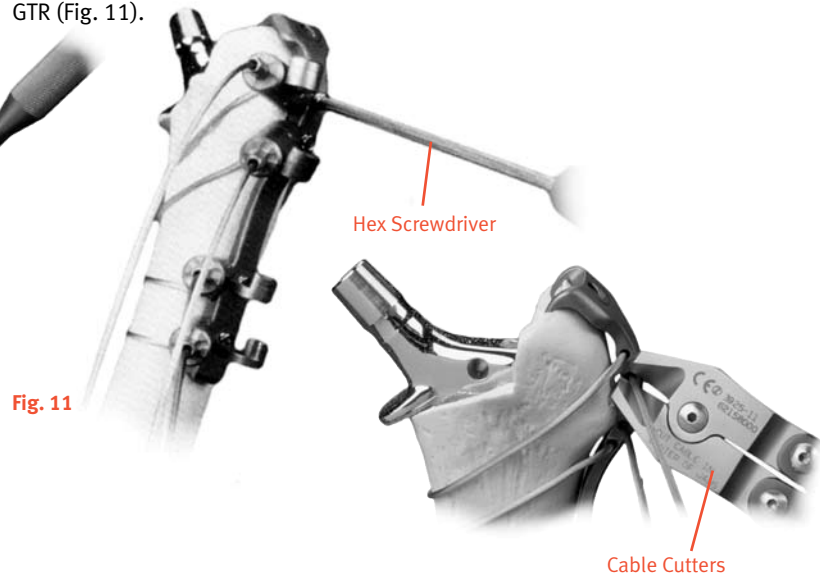


Fig. 11

Cable Cutters

## Extended Integral Crimp GTR Surgical Technique

### Cable Insertion

Individual cables may be inserted into the GTR before or after the GTR is attached to the bone (Fig. 12). However, the cables must be inserted into the GTR prior to passing the cable around the femur.

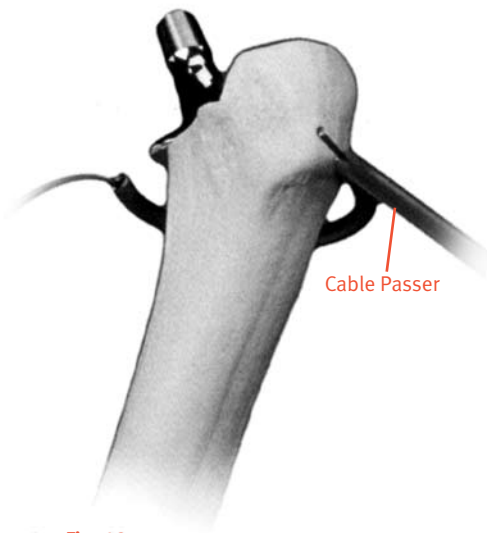


Fig. 12

In the usual lateral approach to the femur, insert the cable into the posterior side of the GTR (transverse hole **without** the set screw), and pull until the plug countersinks into the plate (Fig. 13).

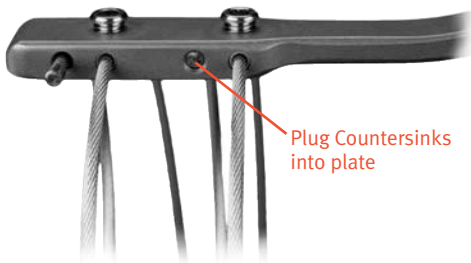


Fig. 13

Pass the large Cable Passer around the proximal femur from posterior to anterior. Insert the free end of the cable into the tip of the Cable Passer until the cable is seen exiting from the shaft of the Cable Passer. Withdraw the Cable Passer, leaving the cable around the bone. Insert the cable through the transverse hole **with** the set screw.

**Note: Cables can be passed from medial to lateral or lateral to medial depending on surgeon preference. Place the first cable just distal to the lesser trochanter, and the second cable distal to the first cable. Do not place the cable directly around the prosthesis.**

**Extended GTR Tech Tip #1** - the cables may be harder to insert at the distal end of the GTR if access is limited due to the muscles, so it may be easier to insert the distal cables into the GTR prior to inserting the GTR.

### Impaction

Screw the Impact Driver into the GTR. Impact the GTR onto the greater trochanter. The upper hooks should engage and wrap around the superior portion of the trochanter.

If an osteotomy was performed, use the Impact Driver as a guide and advance the greater trochanter onto a good bed of bleeding bone.

**Note: The most common reason for nonunion of the greater trochanter is poor or inadequate bone contact between the greater trochanter and proximal femur.**

### Fracture Reduction

The order of cable insertion depends upon the fracture pattern, particular use or situation. The cables can be loosely tensioned by hand and held with retensioning bits. The bone fragments are then manipulated and final reduction accomplished.

**Extended GTR Tech Tip #2** - If cables are inserted and pre-tensioned proximally and on each end of the plate section of the Extended GTR, the GTR and bone can be grossly stabilized (Fig. 14). The cables are very useful in holding the reduction while cortical bone screws are inserted.

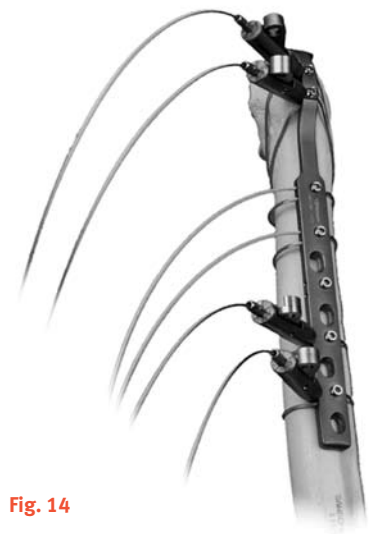


Fig. 14

### Tensioning and Locking the Cable

It is recommended to use a cable at each transverse pair of holes. Whether or not a cable is utilized at a particular location in the GTR, **all set screws must be seated at completion of the procedure.**

To tension the cable, insert the Bone Plate Tensioner Bit (#2232-09) into the tensioner. Thread the cable completely through the tensioner and pull the slack out of the cable (Fig. 15).

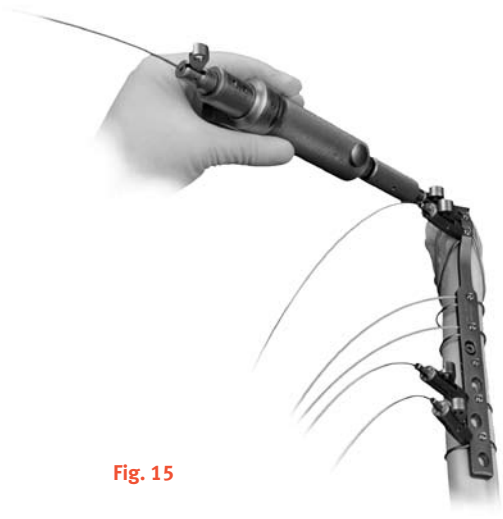


Fig. 15

Depress the lever at the back end of the tensioner to lock the cable. To remove any remaining slack in the cable, depress the button on the tensioner and pull out the excess slack. Rotate the handle of the tensioner clockwise until the desired tension is achieved.

The following tensioning sequence is recommended. Tension the two proximal cables first, using the tensioner bits to hold the tension. The distal cables in the plate section of the 4-hole and 5-hole Extended GTRs can then be tensioned, again using the Bone Plate Tensioner Bits to hold the tension. The set screws are not locked down at this time.

**Extended GTR Tech Tip #3** - Once the cables are pre-tensioned and the fracture is reduced, cortical screws can be inserted through the applicable slots in the GTR (Fig. 16). Screws add rotational stability, while cables add bending strength to the construct. Because cables do not provide rotational stability, cortical screws should always be used on both sides (proximal and distal) of the fracture, even if only unicortical screws are used (4.5mm Trilogy® Acetabular System Cortical Bone Screw Fixation or NexGen® Complete Knee Solution Osteotomy Screws are recommended). Cables should not be locked down until after screws are added, because the addition of screws will fixate the GTR to the bone and may loosen the tension in the cables.

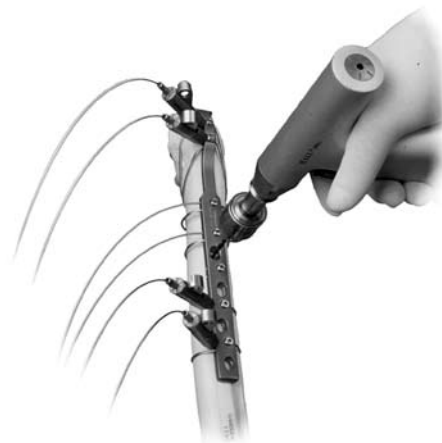


Fig. 16

After screws have been added to the GTR, the cables can be brought to final tension. Start proximally and work distally, tensioning each cable and locking by screwing in the appropriate set screw in the GTR (Fig. 17).

**Note: Whether or not all cable locations are utilized, all set screws should be locked down at the completion of the procedure.**

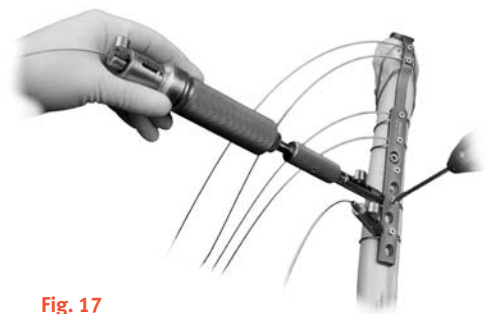


Fig. 17

After each set screw is firmly seated, the tensioner and bits are removed, and the excess cable is cut off flush with the GTR (Fig. 18).



Fig. 18



## Instruments and Implants

### Greater Trochanter Reattachment Device

Prod. No.	Description	Size
00-2232-002-04	Integral Short GTR w/2 Cables*	23 x 53mm
00-2232-002-05	Integral Long GTR w/4 Cables*	23 x 121mm
00-2232-002-06	Extended 4-hole GTR w/4 Cables*	23 x 232mm
00-2232-002-07	Extended 5-hole GTR w/4 Cables*	23 x 261mm
*Cable included is 00-2232-005-18		
00-2232-004-18	Cable Assembly, Cobalt-Chrome	1.8 x 635mm
00-2232-005-18	Integral Crimp GTR Cable, Cobalt-Chrome	1.8 x 635mm

### Bone Screws

Prod. No.	Description
00-6250-045-XX	<i>Trilogy</i> Acetabular 4.5mm Cortical Bone Screws
00-5250-045-XX	<i>NexGen</i> Osteotomy 4.5mm Cortical Bone Screws

### Cable Instrumentation

Prod. No.	Description
00-2232-000-01	Cable Instrumentation Set w/Case includes:
00-2232-005-00	Cable Tensioner for 1.8mm Cable
00-2232-006-00	Hex Head Screwdriver, 3.0mm
00-2232-007-20	Cable Passer, Medium
00-2232-008-30	Cable Passer, Large
00-2232-008-01	Cable Tensioner Bit
00-2232-009-00	Cable Plate Tensioner Bit
00-2232-011-00	GTR Impact Driver
00-3925-011-00	Cable Cutter
00-2232-095-00	Cable Instrument Case





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