ZMR® Revision Hip System

Surgical Technique

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Introduction

A Multitude of Options

The *ZMR* Revision Hip System can address a wide variety of situations, including some of the most demanding in femoral revision surgery. Various combinations of body and stem components offer many choices for fixation and restoration of joint kinematics. The proximal bodies also have varying build-up and offset options to help restore leg length and abductor muscle tensioning.

In femoral revision hip surgery, proximal support of the implant is desirable. If the surgeon is unable to achieve proximal support, then the *ZMR* XL System, which was designed for cases in which proximal support cannot be achieved, should be considered. As with any femoral stem, if proximal support is not obtained, the patient should be warned of the increased risk of fatigue fracture of the stem[1], even if a *ZMR* XL construct is used.

The *ZMR* XL option includes proximal body components in a variety of heights for use with either a tapered or porous stem component to accommodate individual patient anatomies.

Stems

A. Taper Stems *ZMR* Revision Taper Stems were designed to achieve secure distal fixation in the femur using a sharply splined and tapered distal stem with a roughened titanium surface. The tapered distal stem is designed to wedge into the femoral medullary canal, transferring axial and bending forces, while the splines are press-fit into the bone to provide rotational stability. The roughened *Tivanium*® Ti-6Al-4V Alloy surface allows bone ongrowth.[2,3,4] A bevel at the distal end of the stem is a design feature intended to increase the ease of insertion, to better accommodate the bow of the femur, help prevent distal impingement, and decrease the potential for distal femoral cortical perforation **(Fig. 1)**.

Fig. 1

B. XL Taper Stems The *ZMR* XL Taper Stems were designed with the same features as the Standard Taper Stems, and accommodate cases in which proximal support cannot be achieved.

C. Porous Stems *ZMR* Porous and Porous Slotted Stems were designed to achieve initial stem stability through intimate bone-prosthesis apposition. The plasma-sprayed *Tivanium* Ti-6Al-4V Alloy surface allows for bone ongrowth and biological fixation.[5,6] When used with the porous proximal body, the surgeon can expect a multitude of fixation options. Porous stems are available in straight and bowed versions **(Fig. 2)**.

Fig. 2

D. XL Porous Stems The *ZMR* XL Revision Porous Stems were designed to achieve initial stem stability through intimate bone-prosthesis apposition, and to accommodate cases in which proximal support cannot be achieved. Like standard Porous Stems, they have a plasma-sprayed *Tivanium*Ti-6Al-4V surface, and are available in both straight and bowed versions.

E. Spline Stems *ZMR* Spline Stems, when used with porous proximal bodies, enable the surgeon to achieve proximal fixation with distal rotational stability. The smooth surface resists bony ingrowth while the splines provide a press fit by engaging cortical bone in the femoral canal. Like the Porous Stems, bowed and straight Spline Stems are available **(Fig. 3)**.

Fig. 3

Porous Bodies

The *ZMR* Revision Hip System offers the surgeon four configurations when selecting the best proximal body for the patient. Three designs are offered in the standard junction implants and one style is available in the XL junction implant. Standard junction proximal body options include a Cone Body, Spout Body, and Calcar Body. The XL Body is offered in a cone design. Multiple sizes in each body type allow for metaphyseal filling, proximal fixation, and proximal support of the prosthesis. The bodies allow the version to be adjusted after the stem has been implanted. They are firmly locked to the stems through a taper lock and compression nut. With the exception of the AA Minus size bodies, a uniform core of *Tivanium* Alloy plasma-sprayed porous surface, measuring 45mm in height, is featured on all three styles of standard junction proximal bodies.

A. Cone Body The Cone Body addresses those situations where maximum version control is necessary **(Fig. 4)**.

B. Calcar Body The Calcar Body has a medial build-up to help resist subsidence and to physiologically load the proximal medial femur **(Fig. 5)**.

C. Spout Body The Spout Body helps achieve medial fill in the proximal femur when bone deficiencies are minimal and the patient's own version can be incorporated. This contributes to initial rotational stability **(Fig. 6)**.

D. XL Body The XL proximal body is used with either *ZMR* XL Stem design, providing excellent medial fill in the femur and contributing to initial rotational stability. It is offered in a cone design and has a roughened corundumized surface **(Fig. 7)**.

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Preoperative Planning

The Objectives of Preoperative Planning

1. Assess amount of bone loss to:
   - Select type(s) of implant(s) appropriate to reconstruct the femur
2. Determine if the proximal body will be fully supported in the area of the plasma-spray.
3. Obtain the anticipated component size necessary to provide structural stability.
4. Establish parameters of joint kinematic restoration that include:
   - Determination of Leg Length
   - Restoration of offset for abductor muscle tensioning
5. Assess the acetabulum to determine if any acetabular reconstruction is needed, and consider the potential impact of the acetabular reconstruction on the femoral side.

W **WARNING: The standard junction ZMR Revision Hip System should only be used when full proximal support will be achieved in the area of the plasma spray. This is necessary because without full proximal support, the mid-stem junction is vulnerable to fracture. If such proximal support cannot be achieved, evaluate the use of ZMR XL.**

Assessment of Bone Loss and Component Selection

To select the appropriate type of implant in femoral revision surgery, a number of factors must be evaluated. Reconstructing the femur based on the amount of femoral bone loss and the status of the remaining bone is important in determining the appropriate prosthesis.

The *ZMR* Revision Hip System is a versatile system that can address a wide range of femoral revision needs. It offers the surgeon multiple fixation options. These options include proximal fixation, and combined proximal and distal fixation (extensive fixation). The implant choice will depend on the individual patient and the surgeon's fixation preference.

Determination of Leg Length

Preoperative determination of leg length is essential for the restoration of the appropriate leg length during surgery. In femoral revision surgery, correction of leg length discrepancy is usually necessary because of bone and soft tissue changes resulting from the failed prosthesis.

An anterior/posterior (A/P) pelvic radiograph often provides enough detail of leg length inequality to proceed with surgery. If more information is needed, a full-length femoral radiograph view may be helpful. From the clinical examination and radiographic information on leg length, the needed correction, if any, can be determined.

If leg length is to be maintained or minimally increased, it is usually possible to perform the operation successfully without osteotomy of the greater trochanter, unless extensive exposure of the acetabulum or femur is necessary. However, if there is some major anatomic abnormality, osteotomy of the greater trochanter may be helpful and safer.

In the unusual situation where the limb is to be significantly shortened, subtrochanteric osteotomy, or osteotomy and advancement of the greater trochanter are mandatory. If the limb is shortened without one of these techniques, the abductors will be lax postoperatively, and the risk of dislocation will be high. Also, gait will be compromised by the laxity of the abductors.

Determination of Femoral Offset and Abductor Muscle Tension

After establishing the desired leg length requirements, abductor muscle tensioning through femoral offset must be considered. Restoring adductor tension places the abductor muscles at their optimal mechanical advantage, and results in improved functioning with less chance of dislocation and limp.

When the patient has a very large offset between the femoral head center of rotation and the line that bisects the medullary canal, the insertion of a femoral component with a lesser offset will, in effect, medialize the femoral shaft. To the extent that this occurs, laxity in the abductor will result.

Using the *ZMR* Revision Hip System Templates on the preoperative radiograph film allows the surgeon to estimate the amount of offset needed for the new femoral component to either improve or reproduce the patient's anatomical offset.

Templating for the ZMR Revision Hip System

Preoperative planning for the insertion of the *ZMR* Revision Hip System Femoral Component requires at least two views of the involved femur: an A/P view of the pelvis centered on the pubic symphysis, and a Frog-Leg lateral view on an 11" x 17" cassette. Both views should show the full length of the femur. In addition, it may be helpful to obtain an A/P view of the involved side with the femur internally rotated. This compensates for naturally occurring femoral version, and provides a more accurate representation of the true medial-to-lateral dimension of the metaphysis.

When templating, magnification of the femur will vary depending on the distance from the radiograph source to the film, and the distance from the patient to the film. The ZMR Revision Hip System Templates use 15 and 20 percent magnification. Large patients and obese patients may have greater magnification because osseous structures are farther away from the surface of the film. Likewise, smaller patients may have less magnification. If necessary, to better determine the magnification of any radiograph film, use a standardized marker at the level of the femur.

Preoperative planning is important in choosing the acetabular component if it is also being revised. Acetabular preoperative planning is beyond the scope of this document, but must be considered in conjunction with the use of the *ZMR* Revision Hip System.

The Objectives of Templating for the ZMR Revision Hip System Include:

1. Determining the type, size, position, length, and offset of the modular proximal body.
2. Choosing the type, size, length, and position of the distal stem.
3. Developing a plan for adjunctive support of the proximal body superior to the mid-stem modular junction.

The *ZMR* Revision Hip System Templates include separate proximal body and distal stem templates. These templates are used together to help determine the final implant components.

- The Cone Bodies, which are conical in shape, are designed for accurate fit at the metaphyseal/diaphyseal junction. They provide a wide range of version adjustments.
- The Calcar Bodies are conical in shape. They have a collar that is designed to rest on the medial area of the femur for accurate fit at the metaphyseal/diaphyseal junction.
- The Spout Bodies are designed with a medial spout (curve) to provide fill for proximal fixation.
- The XL Bodies are a Cone design, and feature a lateral relief on the distal portion of the body. Known as a cutout, this area further enhances the fatigue strength at the mid-stem junction.

The build-up heights available with these proximal bodies, combined with femoral head-neck length options help restore leg length. In addition, the body offset options, in combination with the modular femoral heads, assist in adjusting lateral offset and abductor muscle tensioning.

Another way to restore or compensate for offset is osteotomy and advancement of the greater trochanter to increase tension in the abductor muscles. In addition, the use of special acetabular liners can change the placement of the joint center of rotation.

ZMR and ZMR XL Taper Stems use templates specific to their design. The distal stem templates show the modular junction level as well as the various stem lengths and diameters. The spline peaks on the ZMR and ZMR XL Taper Stems are 0.75mm per side proud from the reamer diameter, giving a total press-fit of 1.5mm.

The distal templates for the ZMR Porous Revision Hip Components are used for splined and fully porous coated options. The templates indicate porous and splined stem sizes that have both straight and bowed options. The diameter measurements on the splined stem templates include the height of the splines. The diameter measurements of the porous stem templates are the approximate measurements taken over the porous coating. The ZMR XL Porous Stem Templates are used for both straight and bowed stems.

Determining the Type, Size, Build-up, and Offset of the Modular Proximal Body

Once the hip joint center of rotation has been established by templating the acetabulum, the modular proximal porous femoral body should be templated first. This allows the selected proximal body to determine where the mid-stem modular junction level will be prior to templating the distal stem component.

Selection of the proximal body type is determined in part by the femoral bone deficiency assessed on the A/P radiograph. When the femoral tube is intact, the Spout Body can be used if proximal fill is desired. However, the Cone Body can also be used, particularly if special consideration must be given to version. When there is medial segmental femoral bone loss, either the Calcar Body or the Cone Body can be used. The various body heights allow the prosthesis to be deeply sealed in the canal so it can be anchored in viable bone stock.

W **WARNING: The standard junction ZMR Revision Hip System should only be used when full proximal support will be achieved in the area of the plasma spray. This is necessary because without full proximal support, the mid-stem junction is vulnerable to fracture. If such proximal support cannot be achieved, evaluate the use of ZMR XL.**

Each body option is available in sizes that increase progressively in the A/P and M/L dimensions. Both A/P and lateral radiographs are essential in determining the appropriately sized implant. Lay the selected proximal body template over the A/P radiograph film to determine the fit (Fig. 8).

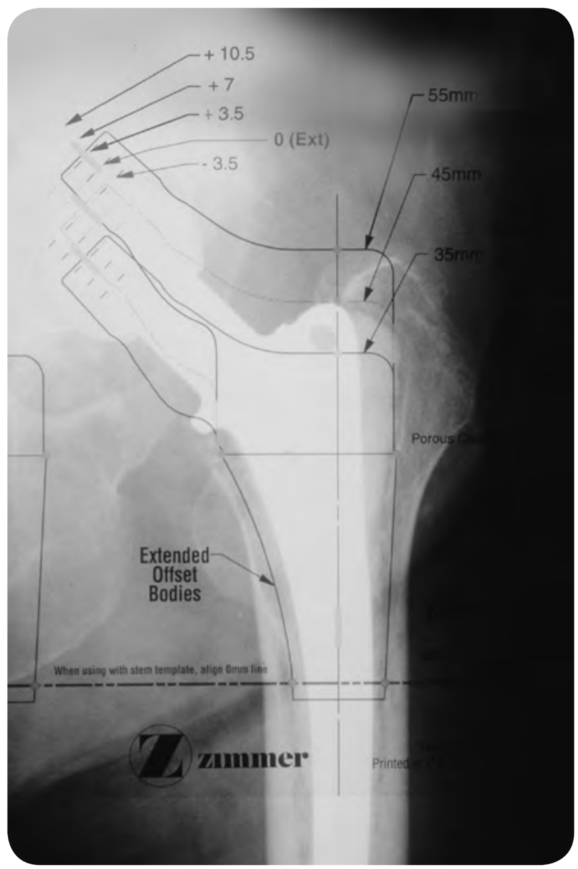


Fig. 8

At all times consider the position of the femoral head center of rotation relative to the hip center in assessing leg length and offset rotation. Tight apposition of the implant to bone at the metaphyseal/diaphyseal junction is important with all the proximal bodies; however, it is especially crucial to provide stability with the Cone and Calcar Bodies because they rely on the flare of the distal portion of the proximal body to provide support against axial load. Use the lateral radiograph to further assess the fit of the proximal body **(Fig. 9)**.

The A/P radiograph is useful in determining the correct leg length and offset needed for reconstruction. The various build-up options (35mm, 45mm, 55mm for Standard and 78mm, 83mm, 93mm, and 103mm for XL) available with the modular bodies and femoral heads will allow for adjustment of leg length. The Standard *ZMR* Proximal Bodies are available with reduced (36mm), standard (40mm), and extended (46mm) offsets. The reduced offset bodies offer medial translation at 4mm. The extended offset bodies offer lateral translation of 6mm. This allows for an offset increase of 6mm without changing the vertical height or leg length. The XL Proximal bodies are available with standard (40mm) and extended (45mm) offsets. The femoral head lengths will also affect leg length and offset **(Table 1)**.

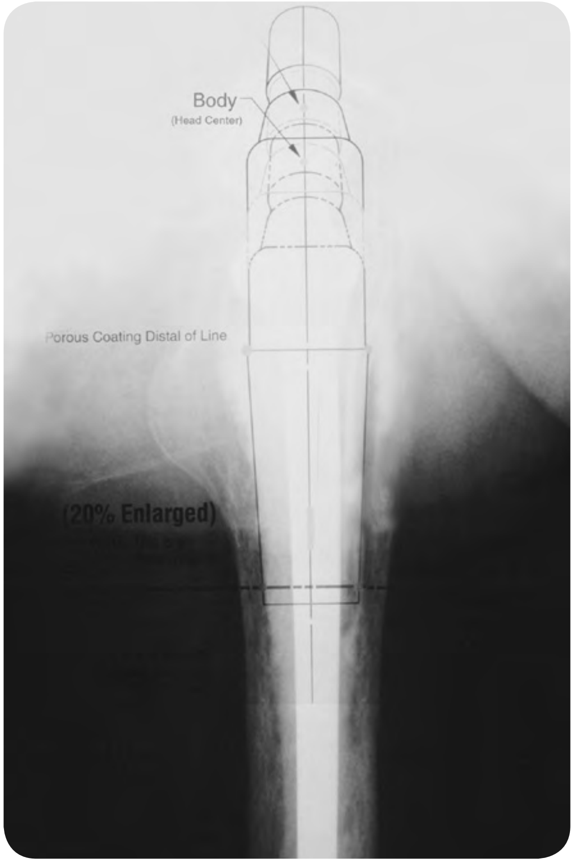


Fig. 9

Table 1: Adjustments available with the implant for restoring joint kinematics

Adjustments	Body	Head
Offset	Using reduced, standard and extended offset bodies will change offset only (up to 10mm).	Using varying head lengths will change both offset and leg length (up to 10mm in 2.5mm increments).†
Leg Length	Using 35mm, 45mm, and 55mm body heights will change leg length only (up to 20mm in 10mm increments).	Using varying head lengths will change both leg length and offset (up to 10mm in 2.5mm increments).
Version	Adjustment is possible by rotating body on the stem for Calcar and Cone Body options.	No adjustment is possible.

† Using *VerSys*® Hip System 12/14 cobalt chrome heads

Determining the Modular Distal Stem Size and Length

A – For Taper Stems

Initial templating begins with the A/P and lateral radiographs. Superimpose the template on the isthmus to estimate the appropriate size and length distal stem. Using the minor diameter (solid lines) on the template, the distal stem should fill, or nearly fill, the medullary canal in the isthmus area on the A/P radiograph image **(Fig. 10)**. Next, view the lateral radiograph with the template overlaid to assess fill and appropriate stem length, taking the anterior bow of the femur into consideration. If the chosen stem length causes impingement that could make seating of the stem difficult, the surgeon may consider evaluating the next size smaller template to evaluate distal fit. For maximum implant stability, the stem should achieve three-point contact within the femur in this view. The anterior bevel shown on the template matches the anterior bevel of the distal stem implant to help minimize impingement of the anterior cortex **(Fig. 11)**.

Next, overlay the proximal body and distal stem templates on the lateral radiograph to assess fill and appropriate stem length while taking the anterior bow of the femur into consideration. Again, it is important that the distal stem template be aligned correctly with the +0mm red line on the proximal body template.

It is also important to have adequate stem length when bypassing any femoral defects. When bypassing a cortical defect, the implant should extend past the defect by a minimum of two and one-half times the measured canal diameter to provide adequate support.

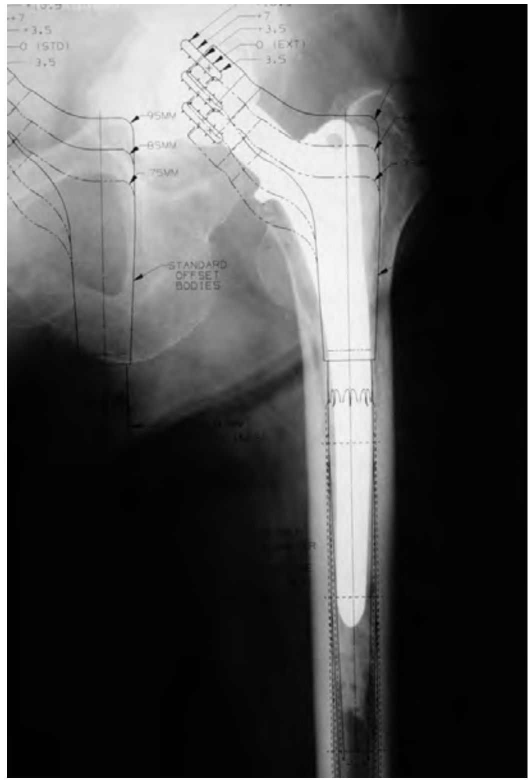


Fig. 10

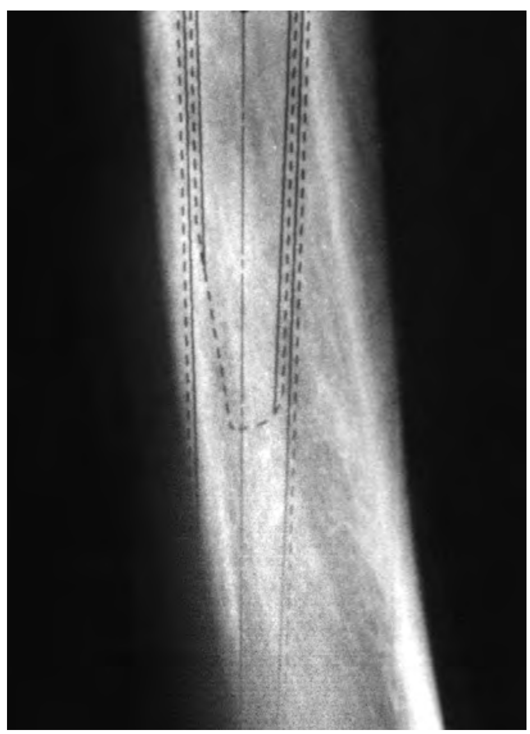


Fig. 11

B – Porous and Spline Stems

Use the distal stem templates in conjunction with the selected proximal body template to estimate the appropriate size and length of the distal stem. With the proximal body template still in position on the A/P radiograph film, or marked through the template holes, superimpose the distal stem template on the isthmus, making sure it aligns with the +0mm red line on the proximal body template. This will correctly align the mid-stem modular junction of the proximal body and distal stem.

Estimate the size and length of the distal stem **(Fig. 12)**. The distal stem should fill, or nearly fill, the medullary canal in the isthmus area on the A/P radiograph view.

Note: To provide for adequate stability, the stem length should be sufficient to engage at least 50mm of intact disphyseal bone.

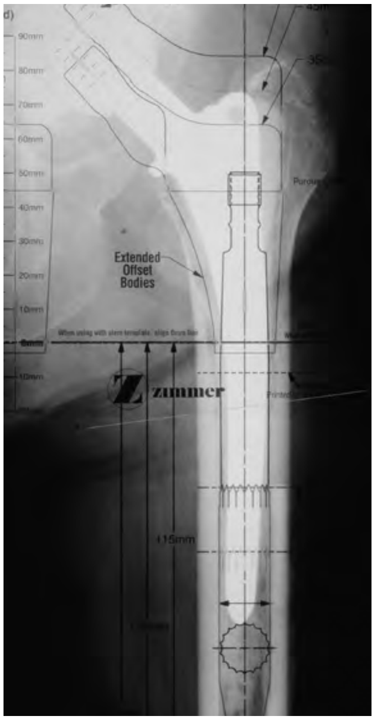


Fig. 12

Next, overlay the proximal and distal stem templates on the lateral radiograph to assess fill and appropriate stem length while taking the anterior bow of the femur into consideration **(Fig. 13)**. Again, it is important that the distal stem template be aligned correctly with the +0mm red line on the proximal body template. In a femur with a pronounced anterior bow, the bowed stem should be considered. Another option is to use a shorter straight stem if there is adequate femoral canal engagement. The Spline Stems have a coronal slot, which facilitates insertion of a longer straight stem.

It is also important to have adequate stem length when bypassing any femoral defects.

Note: When bypassing a cortical defect, the implant should extend past the defect by a minimum of two and one-half times the measured canal diameter to provide adequate support and to decrease the risk of femoral fracture.

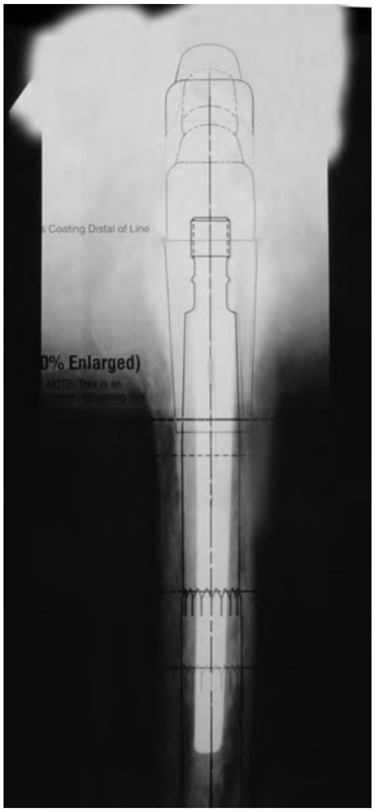


Fig. 13

A. Taper Stem Femoral Canal Preparation 13

B. XL Taper Stem Femoral Canal Preparation 14

C. Straight Porous and Spline Stem Femoral Canal Preparation 15

D. Bowed Porous and Spline Stem, and Slotted Porous Stem Femoral Canal Preparation 16

1. Distal Canal Preparation

The distal femoral canal must be prepared to accept the distal femoral stem. The Taper Stems provide rotational stability and distal fixation without subsiding, and can be used with Cone, Calcar, and Spout Bodies. The Porous Stems provide distal fixation and can be used with any of the standard proximal bodies for an extensive fixation option. The Spline Stems, which can be used with any standard proximal body, provide rotational stability. This facilitates the proximal fixation of the Spout Body. XL Porous and XL Taper Stems offer the same benefits as the standard sizes, but can be used in situations when full proximal support cannot be achieved. XL Stems can only be used with XL Bodies.

W **WARNING: The standard junction ZMR Revision Hip System should only be used when full proximal support will be achieved in the area of the plasma spray. This is necessary because without full proximal support, the mid-stem junction is vulnerable to fracture. If such proximal support cannot be achieved, evaluate the use of ZMR XL.**

A – Taper Stem Femoral Canal Preparation

To prepare the distal femur for a Standard Taper Stem, use the *ZMR* Crossover Instruments. The Crossover Instruments consist of proximal and distal reamers, and are contained in one additional tray.

Note: The Distal Crossover Reamer can be identified by its titanium nitride (gold color) cutting flutes.

For Taper Stems, hand reaming is recommended for tactile feedback. Assemble the T-handle onto the Distal Crossover Reamer. Use a Distal Crossover Reamer two sizes smaller than the size of the preoperatively planned distal stem. Carefully advance the reamers in increasing sequential order to the planned distal stem diameter or until adequate endosteal engagement is achieved. Reaming should be oriented straight down the femoral canal to avoid varus positioning **(Fig. 14)**.

The depth of reaming should be determined by the preoperatively planned distal stem; however, intraoperatively planned assessment when reaming the femoral canal may change the final reamer depth. Reamer depth is indicated by the set of depth marks on the Distal Crossover Reamer shaft that corresponds to the distal stem implant lengths. The rings of each set of marks correspond to the three proximal body lengths (35mm, 45mm, and 55mm) at the zero head center location **(Fig. 15)**.

Seat the Distal Crossover Reamer, aligning the appropriate depth mark with the top of the greater trochanter **(Fig. 15)**. Advance the final reamer until it corresponds to one of the three body heights (35mm, 45mm, or 55mm) and leave the reamer in place. Remove the T-handle from the reamer and note the stem length chosen. Consider obtaining a cross-table A/P radiograph to confirm proper sizing and positioning in the femur.

Fig. 14

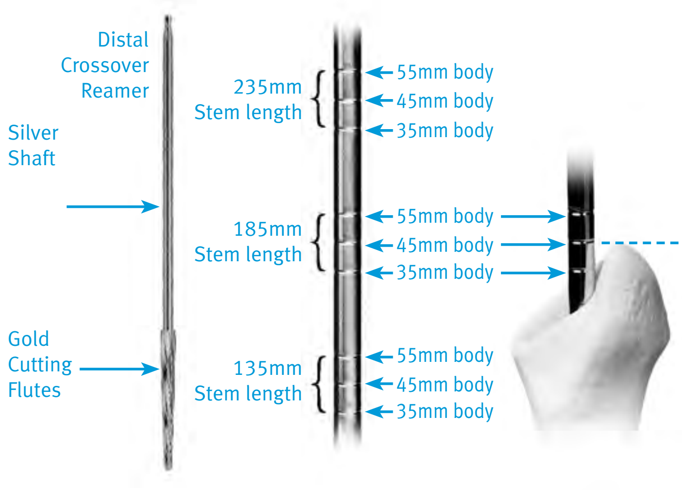


Fig.15

B – XL Taper Stem Femoral Canal Preparation

To prepare the distal femur for a XL Taper Stem, use the *ZMR* XL Distal Taper Reamers.

Use a XL Distal Taper Reamer that is two sizes smaller than the preoperatively planned distal stem if available. Hand reaming is recommended for tactile feedback. Assemble the T-handle onto the XL Distal Taper Reamer. Carefully advance the reamers in increasing sequential order to the planned distal stem diameter or until adequate endosteal engagement is achieved. Reaming should be oriented straight down the femoral canal to avoid varus positioning **(Fig. 16a & 16b)**.

Advance the final reamer until it corresponds to the appropriate body height indication on the reamer **(Fig. 16c)**. **Leave the reamer in place** and remove the T-handle and note the stem length chosen.

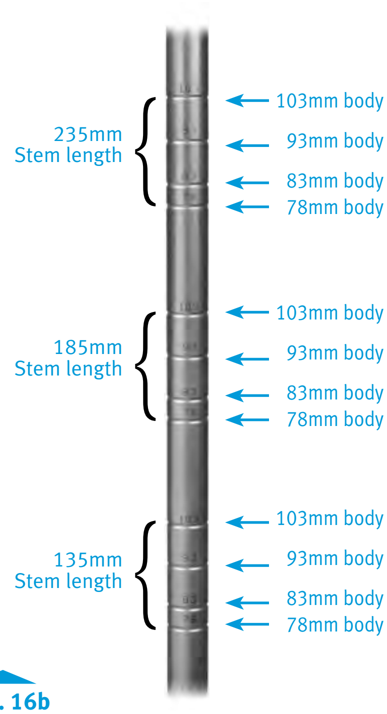


Fig. 16b

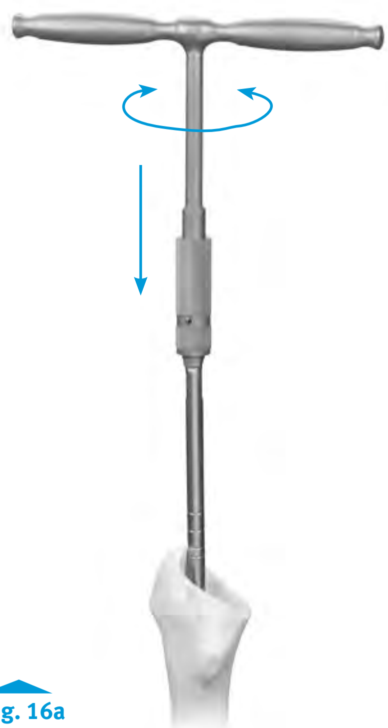


Fig. 16a

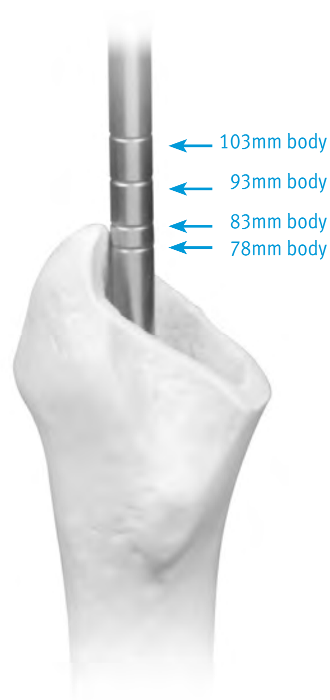


Fig. 16c

C – Straight Porous and Spline Stem Femoral Canal Preparation

When preparing the distal femoral canal for a straight distal stem component, Standard or XL, use the *VerSys®* Straight Intramedullary (IM) Reamers **(Fig. 17)**. Another option is to use the T-handle with the straight reamers for hand reaming. It is important to ream to the proper depth to assure adequate seating of the implant. The reaming depth should be greater than the preoperatively planned length. This will accommodate any change to the planned components.

Begin reaming with a straight reamer that is 4mm or 5mm smaller than the anticipated prosthesis size. Sequentially increase the reamer size by 0.5mm increments, making sure that each reamer is fully advanced to its appropriate depth and centered in the medullary canal.

The appropriate reamer depth should be determined preoperatively when assessing the length of implant required. However, to accommodate for any possible changes to the planned components, the reaming depth should be greater than the preoperatively planned length. The *VerSys* IM Reamer depth markings **DO NOT** directly correspond to the *ZMR* stem length options. These markings are provided as guides to be referenced against anatomical land marks in the proximal femur (e.g. tip of greater trochanter) to aid in achieving proper depth of reaming. Avoid varus positioning of the reamers. If the greater trochanter or lateral neck tends to push the reamer medially, use a small conical reamer (trochanteric router) to clear the obstruction and then resume the straight distal reaming. Ream until adequate cortical contact has been achieved.

Straight Porous Stems

If a Straight Porous Stem is chosen to provide axial stability, the canal should be underreamed by 0.5mm or reamed line-to-line. It is good practice to measure the diameter of the last reamer used and compare it to the diameter of the actual prosthesis. Use an accurately calibrated caliper to perform this task.

Straight Spline Stems

When using the Spline Stem option, underreaming of the canal by 0.5mm less than the implant (e.g., ream to 14.5mm to implant a size 15mm distal stem) will provide for additional apposition of the distal splines with the femoral canal. The Spline Stem can be reamed line-to-line based on surgeon preference.

Ultimately, the reaming decision is based on the patient's anatomy, length of stem, bone quality, and the surgeon's judgment and experience.

Fig. 17

D – Bowed Porous and Spline Stem, and Slotted Porous Stem Femoral Canal Preparation

When preparing the femoral canal to accept a Bowed Stem, Standard or XL, flexible reamers must be used because they more closely follow the natural bow of the femur. The *Pressure Sentinel*® Intramedullary Reaming System has flexible reamers that result in lower intramedullary pressure levels and lower temperature levels that are at or below those of competitive systems.[7]

C **Caution: Tactile feedback with these flexible reamers is different than straight reamers. Fluoroscopy can be used, if desired, to monitor the reaming process.**

Insert a ball-tipped guide wire into the canal, and begin reaming 2mm or 3mm below the anticipated implant size **(Fig. 18)**. Sequentially increase the reamer size by 0.5mm increments, making sure the reamer is fully advanced by passing through the femoral diaphysis. Ream until the desired canal diameter has been achieved.

Bowed Spline Stem

When reaming for the Bowed Spline Stem, line-to-line to 1.0mm overreaming techniques can be used, depending on the patient's anatomy, bone quality, and surgeon judgment. The Spline Stem has a distal coronal slot design that makes the stem more flexible to accommodate the bow of the femur.

Bowed Porous Stem and Porous Slotted Stem

When reaming for the Bowed Porous Stem, it may be necessary to overream by as much as 1.0mm to accommodate the bow of the femur. In revision surgery, where the primary axial stability is achieved distally with an extensively porous coated stem, it may be necessary to ream line-to-line or overream 0.5mm to achieve this goal. The bowed Porous Stems do not have a coronal slot and are not as accommodating to the bow of the femur as slotted stems. Therefore, over reaming will facilitate the insertion of these stems.

Fig. 18

A. Crossover Instruments, Taper Stems 18

B. Proximal Preparation Instrument Kits-
Standard Porous, Spline, and
Slotted Stems 21

C. XL Taper Proximal Preparation Set,
XL Taper Stem 25

D. XL Porous Proximal Preparation Set,
XL Porous Stem 26

E. Over-the-Junction Instrumentation,
All Stems and Bodies 27

2. Proximal Femur Preparation

Bone must be cleared from the proximal femur to allow for intimate apposition of the proximal body with bone.

The Cone Bodies, which are conical in shape, are designed for accurate fit at the metaphyseal/diaphyseal junction. They provide a wide range of version adjustments.

The Calcar Bodies are conical in shape. They have a collar that is designed to rest on the medial area of the femur for accurate fit at the metaphyseal/diaphyseal junction.

The Spout Bodies are designed with a medial spout (curve) to provide fill for proximal fixation.

The XL Bodies are similar in design to the cone bodies, but have a larger distal junction to provide more strength for situations when proximal support cannot be achieved.

Regardless of which body style is used, proper preparation of the body's conical region helps secure the body at the femoral metaphyseal/diaphyseal junction and provides resistance to axial loading. When using the Spout Body, additional bone must be removed from the medial calcar region of the femur to match the spout geometry.

The Instrument Set Options table on page 52 outlines the instrumentation options available based on the distal stem and proximal body for implantation. Specific instructions for each method can be found below.

W **WARNING: The standard junction ZMR Revision Hip System should only be used when full proximal support will be achieved in the area of the plasma spray. This is necessary because without full proximal support, the mid-stem junction is vulnerable to fracture. If such proximal support cannot be achieved, evaluate the use of ZMR XL.**

A – Crossover Instruments, Taper Stems

There are two methods that can be used to prepare the proximal femur for Taper Stems. The instructions for using the Crossover Instruments are described below. For instructions for the Over-the-Junction Instrumentation, please refer to section E - Over-the-Junction Instrumentation, All Stems and Bodies on page 27.

The *ZMR* Crossover Instruments facilitate the combination of any Porous Proximal Body with any Taper Stem in the *ZMR* System, thus allowing extensive fixation in the femur. The instrumentation and implant combinations provide the opportunity to treat wide variances in patient anatomy.

Crossover Instruments, consisting of proximal and distal reamers, are contained in just one additional tray, facilitating ease of the surgical procedure.

N **Note: The Proximal Crossover Reamer is discernible from the standard Porous Proximal Reamer by its titanium nitride (gold color) shaft.**

With the distal reamer still in place, determine if a sleeve is required to provide a mechanical stop to prevent reaming too deep for the stem length selected. For a 135mm stem, no sleeve is needed. For a 185mm stem, one sleeve is needed. For a 235mm stem, two sleeves are needed **(Fig. 19)**. Place the appropriate Crossover Reamer Sleeve(s) on the distal reamer. Three Crossover Reamer Sleeves are included in the Crossover Instrument Set.

Starting with a cannulated proximal cone reamer one or two sizes smaller than the templated size, ream the proximal femur to the appropriate size. Match the depth of the reamer noted during distal reaming **(Fig. 20)**.

Cone and Calcar Bodies

If preparing for a Cone or Calcar Body, preparation of the proximal femur is now complete. Please proceed to the Trial Reduction section on page 33.

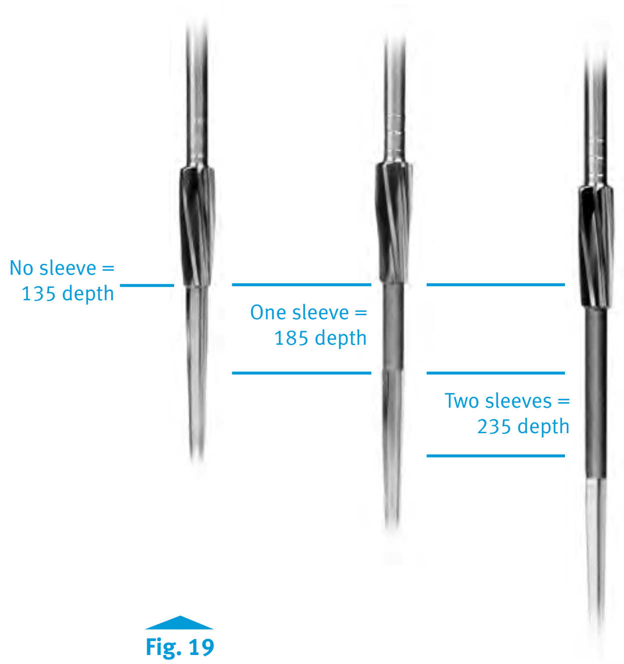


Fig. 19

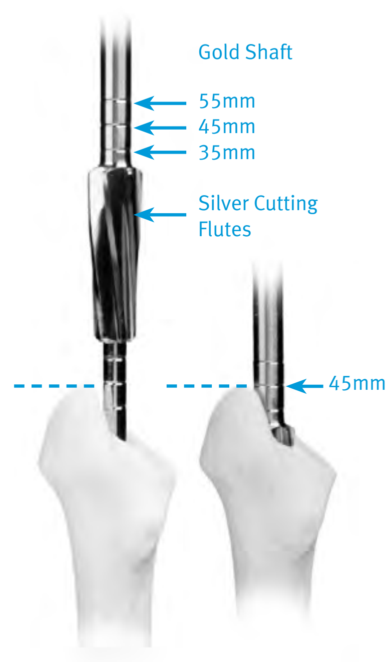


Fig. 20

Spout Bodies

If preparing for a Spout Body, the Porous Body Conical Reamer (non-cannulated) must be used to ream the shelf for the Spout Mill Guide. **(Fig. 21)**.

The Spout Mill Guide and Spout Mill Cutter can then be used to prepare the medial metaphysis. The 12mm Distal Pilot should be used to center the Guide in the canal. Tighten it with the Distal Pilot Wrench **(Fig. 22)**.

Pass the Spout Mill Guide/Distal Pilot assembly down the femoral canal to the appropriate level using the markings on the lateral side of the guide. The lines on the Spout Mill Guide match the 35mm, 45mm, and 55mm body heights and align with the top of the greater trochanter **(Fig. 23)**. Insert the Spout Mill Guide to the same depth as the last Porous Body Conical Reamer used. For example, if the reamer reached the 45mm depth mark, then the 45mm depth mark on the Spout Mill Guide should be aligned with the top of the greater trochanter. The assembly should seat without force. Use the Stem Impactor to control rotation of the Spout Mill Guide during insertion. This will determine the final anteversion of the femoral prosthesis. It is important to maintain the proper rotational orientation of the Spout Mill Guide in order to achieve proper femoral anteversion.

Fig. 22

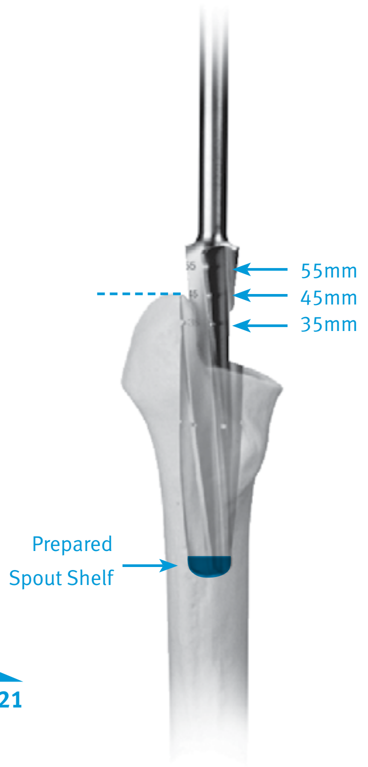


Fig. 21

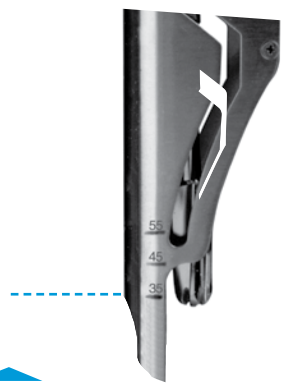


Fig. 23

Spout Bodies Continued

Attach the Spout Mill Cutter to a power drill/driver. Align the two round projections on the mill cutter with the top slot of the Spout Mill Guide. Check the version of the Spout Mill Guide by moving the Spout Mill Cutter down the guide and assessing the position of the cutter relative to the proximal medial calcar **(Fig. 24)**.

When the orientation of the Spout Mill Guide is satisfactory, turn on the drill/driver. Pass the Spout Mill Cutter down the femur while maintaining lateral pressure on the cutter. The slots in the Spout Mill Guide will direct the cutter in a path that matches the geometry of the proximal body spout **(Fig. 25)**. When the cutter reaches the bottom of the guide, turn off the drill/driver power and remove the Spout Mill Assembly. Do not remove the cutter while the power is on as this may remove additional bone. Preparation of the proximal femur is now complete.

The ZMR Over-the-Junction Instrumentation may also be used to prepare the proximal femur for Taper Stems. For instructions, see page 27.

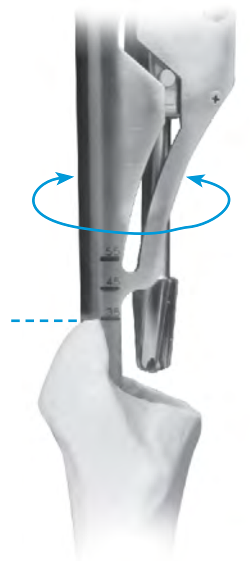


Fig. 24

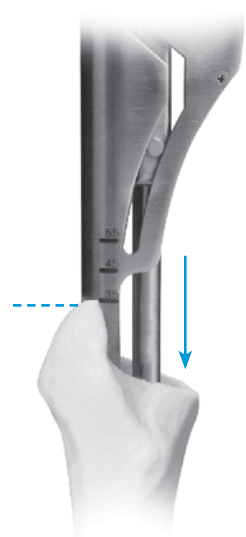


Fig. 25

B – Proximal Preparation Instrument Kits - Standard Porous, Spline, and Slotted Stems

There are two methods that can be used to prepare the proximal femur for Porous and Spline Stems. The instructions for use for Porous Proximal Preparation Instrument Kits 1 & 2 are described below. For instructions for the Over-the-Junction Instrumentation, please refer to section E - Over-the-Junction Instruments, All Stems and Bodies on page 27.

Calcar Body

When preparing for a Calcar Body, use the Osteotomy Guide as a reference when determining the level of the cut for the selected Calcar Body. The Osteotomy Guide has two notches that align with the level of the 45mm and 55mm Calcar Body build-up lengths. These notches are referenced off the tip of the greater trochanter. The guide also has markings to align the +0mm head center with each body build-up height. These markings are also referenced off the tip of the greater trochanter **(Fig. 26)**.

To prepare the proximal femur for the conical portion of any proximal body style, choose a Distal Pilot that matches the size of the distal implant that will be used. For example, if the distal femoral canal was prepared for a 15mm distal stem, select the size 15 Distal Pilot. The Distal Pilot diameter is 14.3mm, or 0.7mm smaller than the implant diameter to allow for clearance down the canal while maintaining a secure fit. If, however, the diaphysis is over reamed (e.g., for a bowed stem), choose a Distal Pilot that more closely matches the final reamed size as the pilot is used to help center the Porous Body Conical Reamer.

Thread the **proper** Distal Pilot onto a Porous Body Conical Reamer that is 1 or 2 sizes below the anticipated body size and tighten it with the Distal Pilot Wrench **(Fig. 27)**. The instrument tray contains three of each size Distal Pilot so they can be attached in advance to incrementally sized Porous Body Conical Reamers. Sequentially ream to the desired size proximal body and appropriate depth.

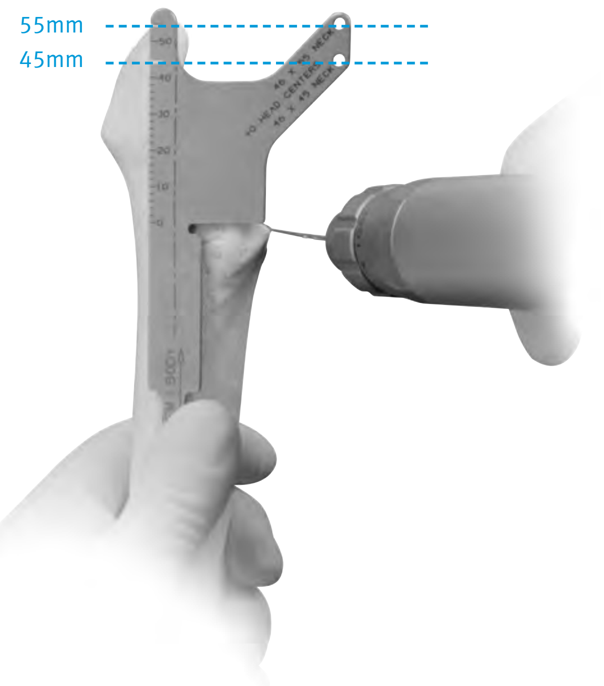


Fig. 26

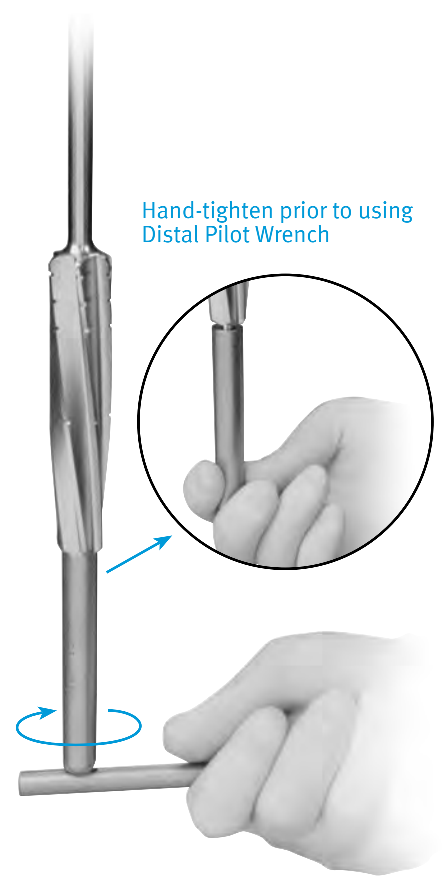


Fig. 27

Apply lateral and slight posterior pressure on the reamer to help maintain a centered orientation when reaming. The three most proximal marks on the Porous Body Conical Reamer, which match the 35mm, 45mm, and 55mm body build-up heights of the implants, are aligned with the +0mm femoral head center and are referenced off the tip of the greater trochanter **(Fig. 28)**.

Calcar Body

If using a Calcar Body, advance the Porous Body Conical Reamer only to the most distal line on the reamer. This line should be referenced to the level of the osteotomy **(Fig. 29)**.

To help avoid disassociation of the Distal Pilot from the reamer, do not run the Porous Body Conical Reamer in reverse. (If the reamer is used in reverse and the Distal Pilot disassociates from the reamer, use the threaded end of the Distal Pilot Wrench to retrieve the Distal Pilot). To help facilitate removal of the Distal Pilot from the Porous Body Conical Reamer, attach the T-handle to the reamer and loosen with the Distal Pilot Wrench.

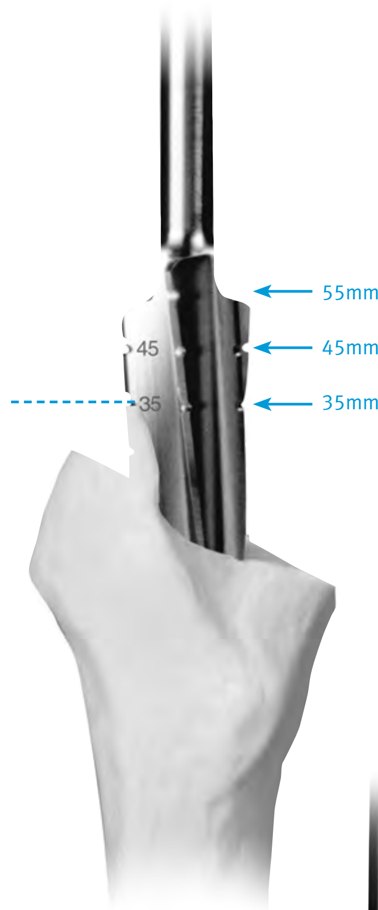


Fig. 28

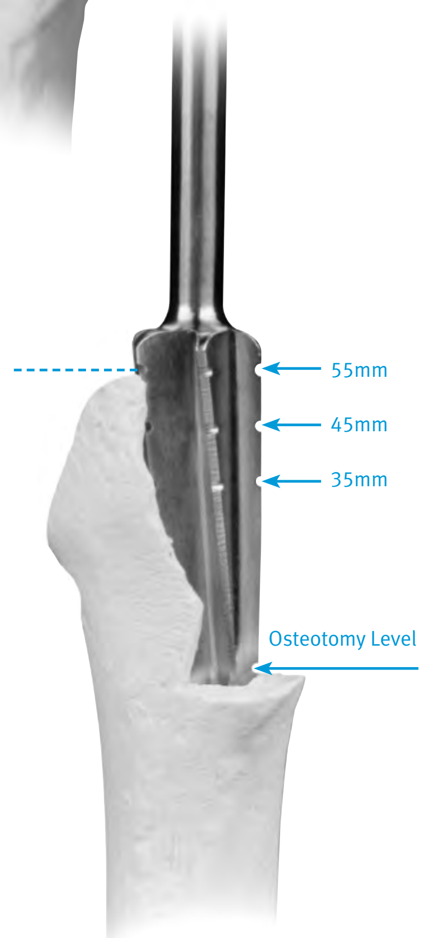


Fig. 29

Cone and Calcar Bodies

If using the Cone or Calcar Body, preparation of the proximal femur is now complete.

Spout Body

If using the Spout Body, preparation of the medial calcar area must be completed. Select the appropriate Distal Pilot and thread it onto the appropriate size Spout Mill Guide **(Fig. 30)**. Tighten it with the Distal Pilot Wrench. The final Porous Body Conical Reamer used will dictate which Spout Mill Guide to select and the final Distal Reamer size used will dictate the appropriate Distal Pilot **(Table 2)**.

Fig. 30

Table 2:

	Spout Mill Assembly	
Conical Reamer Selected AA/AA-	**Spout Mill Guide Required** AA/AA-	**Spout Mill Cutter Required** AA/AA-
A	A	A-B
B	B	A-B
C	C	C-D
D	D	C-D
E	E	E-F
F	F	E-F

Pass the Spout Mill Guide/Distal Pilot assembly down the femoral canal to the appropriate level using the markings on the lateral side of the guide. The lines on the Spout Mill Guide match the 35mm, 45mm, and 55mm body heights and align with the top of the greater trochanter **(Fig. 31)**. Insert the Spout Mill Guide to the same depth as the last Porous Body Conical reamer used. For example, if the reamer reached the 45mm depth mark, then the 45mm depth mark on the Spout Mill Guide should be aligned with the top of the greater trochanter. The assembly should seat without force. Use the Stem Impactor to control rotation of the Spout Mill Guide during insertion. This will determine the final anteversion of the femoral prosthesis. It is important to maintain the proper rotational orientation of the Spout Mill Guide in order to achieve proper femoral anteversion.

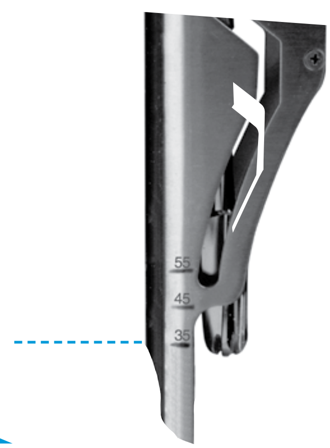


Fig. 31

Spout Bodies Continued

Attach the Spout Mill Cutter to a power drill/driver. Align the two round projections on the mill cutter with the top slot of the Spout Mill Guide. Check the version of the Spout Mill Guide by moving the Spout Mill Cutter down the guide and assessing the position of the cutter relative to the proximal medial calcar **(Fig. 32)**.

When the orientation of the Spout Mill Guide is satisfactory, turn on the drill/driver. Pass the Spout Mill Cutter down the femur while maintaining lateral pressure on the cutter. The slots in the Spout Mill Guide will direct the cutter in a path that matches the geometry of the proximal body spout **(Fig. 33)**. When the cutter reaches the bottom of the guide, turn off the drill/driver power and remove the Spout Mill Assembly. Do not remove the cutter while the power is on as this may remove additional bone. Preparation of the proximal femur is now complete.

The ZMR Over-the-Junction Instrumentation may also be used to prepare the proximal femur for Porous and Spline Stems. For instructions, see page 27.

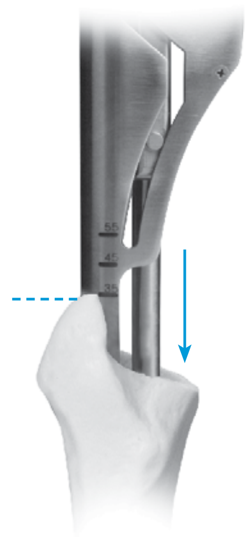


Fig. 33

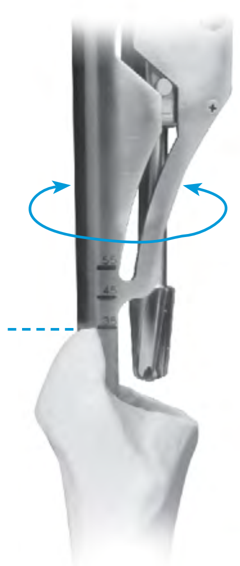


Fig. 32

C – XL Taper Proximal Preparation Set, XL Taper Stem

From the stem length selected, determine if a sleeve is required to provide a mechanical stop to prevent reaming too deep. For a 135mm stem, no sleeve is needed. For a 185mm stem, one sleeve is needed. For a 235mm stem, two sleeves are needed **(Fig. 34)**. Place the appropriate number of sleeves on the distal reamer.

Use the *ZMR* XL Cannulated Taper Proximal Reamer to ream the proximal femur to the depth noted during distal canal preparation.

The four most proximal marks on the *ZMR* XL Cannulated Taper Proximal Reamer correspond to the 78mm, 83mm, 93mm, and 103mm XL Body build up heights and are referenced off the greater trochanter **(Fig. 35)**.

The ZMR Over-the-Junction Instrumentation may also be used to prepare the proximal femur for XL Taper Stems. For instructions, see page 27.

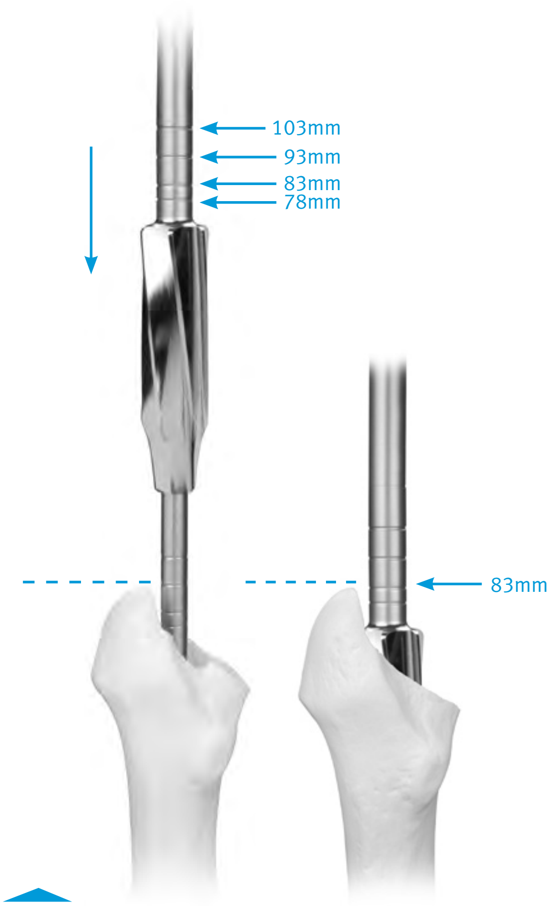


Fig. 35

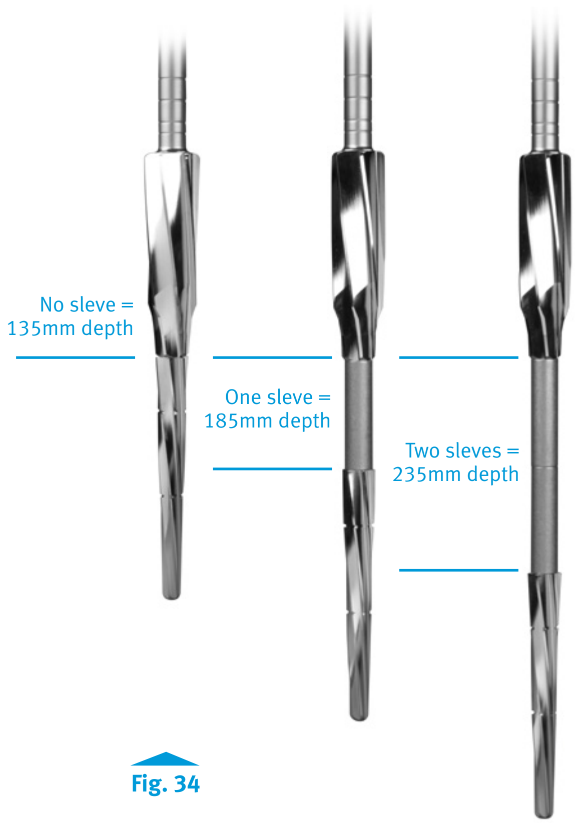


Fig. 34

D – XL Porous Proximal Preparation Set, XL Porous Stem

To prepare the proximal femur for the conical portion of the XL Body, choose a XL Distal Pilot that matches the size of the distal implant that will be used.

N **Note: Only use XL Distal Pilots.**

Use the *ZMR* XL Porous Proximal Reamer to ream the proximal femur to the depth noted when reaming the distal femur.

Apply lateral and slight posterior pressure to the reamer to maintain a centered orientation when reaming. The four most proximal marks on the *ZMR* XL Porous Proximal Reamer correspond to the 78mm, 83mm, 93mm, and 103mm XL Body build up heights and are referenced off the greater trochanter **(Fig. 36)**.

To help avoid disassociation of the Distal Pilot from the reamer, do not run the XL Porous Proximal Reamer in reverse. (If the reamer is used in reverse and the Distal Pilot disassociates from the reamer, use the threaded end of the Distal Pilot Wrench to retrieve the Distal Pilot). To help facilitate removal of the XL Distal Pilot from the XL Porous Proximal Reamer, attach the T-handle to the reamer and loosen using the Distal Pilot Wrench.

The ZMR Over-the-Junction Instrumentation may also be used to prepare the proximal femur for XL Porous Stems. For instructions, see page 27.

Fig. 36

E – Over-the-Junction Instrumentation, All Stems and Bodies

The *ZMR* Over-the-Junction (OTJ) Instrumentation includes four key components:

1) OTJ Taper Protectors
2) OTJ Trochanteric Starter Reamers
3) OTJ Proximal Reamers
4) Metal Proximal Provisionals.

These instruments can be used with any combination of *ZMR* standard junction or *ZMR* XL junction implants. *ZMR* Over-the-Junction Instrumentation is designed to increase the predictability of otherwise unpredictable femoral revision hip surgery.

OTJ Taper Protectors

ZMR OTJ Instrumentation includes taper protectors that are unique to the *ZMR* OTJ System. Not only do these unique instruments completely protect the locking taper junction from inadvertent reamer strikes or damage from bone fragments, they also serve as a solid and safe alignment guide for the proximal reamers to follow.

OTJ Trochanteric Starter Reamer

It is not uncommon for the greater trochanter to protrude over the femoral canal, which could impede proper placement of the distal implant/Taper Protector assembly or the distal provisional and Taper Protector. For this reason, Trochanteric Starter reamers are an integral part of the OTJ Instrumentation, providing the surgeon with an effective tool to use when removing trochanteric or metaphyseal bone.

OTJ Proximal Reamers

The OTJ Proximal Reamers are designed to provide a consistent and reproducible mechanism for preparing the proximal femur and may be used in conjunction with either the distal provisional or the final distal stem implant. They are matched for each proximal body size for both *ZMR* standard and *ZMR* XL junction stems. Visualization windows in the cutting flute area of each reamer allow the surgeon to accurately determine complete reaming depth.

Metal Proximal Provisionals

ZMR Metal Proximal Provisionals (MPP) are radiographically visible and are designed to safely lock onto the definitive distal implant. They resist twisting on the distal implant, and can be easily removed or repositioned if necessary. These trials help the surgeon determine the proper implant version, build-up, and offset to effectively maximize joint stability and to optimize the biomechanical restoration of the hip joint function.

W **WARNING: The standard junction ZMR Revision Hip System should only be used when full proximal support will be achieved in the area of the plasma spray. This is necessary because without full proximal support, the mid-stem junction is vulnerable to fracture. If such proximal support cannot be achieved, evaluate the use of ZMR XL.**

If the distal femur was prepared for a standard or XL Taper Stem, remove distal reamer.

The *ZMR* OTJ Reamers can be used after the distal trial stem or definitive distal implant has been fully seated in the femur. Please refer to either the Trial Reduction section on page 33 or the Implantation section on page 38 for instructions on seating the distal trial stem or the definitive distal implant before proceeding.

N **Note: If selecting the ZMR Spout Bodies, OTJ reaming must be initiated using the distal trial as milling must occur prior to implantation of the definitive stem implant.**

Using the Trochanteric Starter Reamers

Ensure there is adequate space to allow the Taper Protector to be attached to the distal stem or trial. Use the Trochanteric Starter Reamer to clear away any part of the greater trochanter and metaphyseal bone that impedes this process. Be sure to use only the standard size Trochanteric Starter Reamer for the standard junction stems/trials, and the XL size for the XL stems/trials. If preparing for a Taper Stem, leave the last distal reamer in place and position the Trochanteric Starter Reamer over the distal reamer's shaft. This will function as a guide. When using a Porous Stem, attach the reamer to power, start rotation of the reamer, then gently move the reamer down the axis of the femoral canal to remove the impeding bone. Stop advancing the reamer when the markings on the shaft align with the tip of the greater trochanter.

C **Caution: If using the Trochanteric Starter Reamer after the insertion of the distal implant, care must be taken to avoid reamer contact with the distal stem taper as this could compromise the integrity of the locking junction.**

Assembling the Taper Protector

Select the appropriately sized Taper Protector and thread onto the proximal threads of the distal stem implant or the distal provisional **(Fig. 37)**. If unable to do so by hand, use the Stem Inserter by placing it into the proximal inserter feature on the Taper Protector and turn in a clockwise motion until it stops.

N **Note: Do not over-tighten. If the Taper Protector will not fully thread onto the distal stem/provisional or stops advancing, remove the Taper Protector. Visually inspect all of the threads of the protector and stem/provisional to ensure there is no debris or damage and re-attach.**

C **Caution: Do not use the Taper Protector to impact or further seat the distal stem as damage to the threads or the distal stem may result.**

Proximal Reaming

Select a Proximal Reamer that matches the taper junction size (Standard or XL) and Taper Protector. Surgeons have the option of either starting one size smaller than the templated size of the proximal body implant to be used (Example – The templated body size is “C”; start reaming with the size “B” reamer) or proceeding directly to the templated size. This is surgeon preference and may be based upon familiarization with the instruments, surgical technique, and their assessment of the patient’s bone quality. Position the reamer over the Taper Protector and on power with gentle pressure, insert the reamer until it fully seats to the hard-stop provided by the Taper Protector **(Fig. 38)**.

Fig. 37

Fig. 38

To prevent the risk of the reamer binding on the greater trochanter, be sure the reamer is rotating before engaging the femur. Windows in the reamer flutes allow the surgeon to visualize when the reamer has fully bottomed out against the Taper Protector **(Fig. 39)**.

W **WARNING: Only ream over a properly attached Taper Protector. Reaming without the Taper Protector may cause damage to the implant's locking taper and will compromise implant function and durability. Do not use the XL OTJ Proximal Reamer in combination with the standard size Taper Protector. This mismatch in sizing could compromise prepared fit between the proximal femur and the proximal body as well as potentially damage the instruments.**

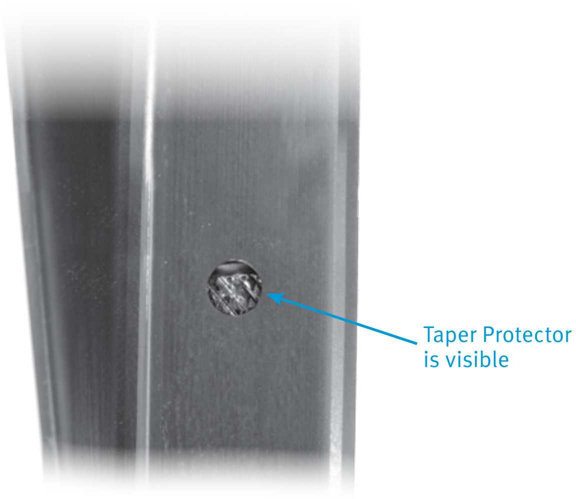


Fig. 39

Remove Taper Protector

Remove the Taper Protector from the distal implant either by hand or by inserting the Stem Inserter into the proximal inserter feature and turning counter clockwise **(Fig. 40)**.

Fig. 40

Cone Body

If choosing to implant a Cone Body, the preparation of the proximal femur is now complete. Please proceed to the Trial Reduction section on page 33.

Calcar Body

N **Note: When using the OTJ Instrumentation remove the distal provisional for proximal preparation for a Calcar Body. Do not attempt proximal preparation for a Calcar Body if the distal stem has been implanted.**

When preparing for a Calcar Body, use the Osteotomy Guide as a reference when determining the level of the cut for the selected Calcar Body. The Osteotomy Guide has two notches that align with the level of the 45mm and 55mm Calcar Body build-up lengths. These notches are referenced off the tip of the greater trochanter. The guide also has markings to align the +0mm head center with each body build-up height. These markings are also referenced off the tip of the greater trochanter **(Fig. 41)**.

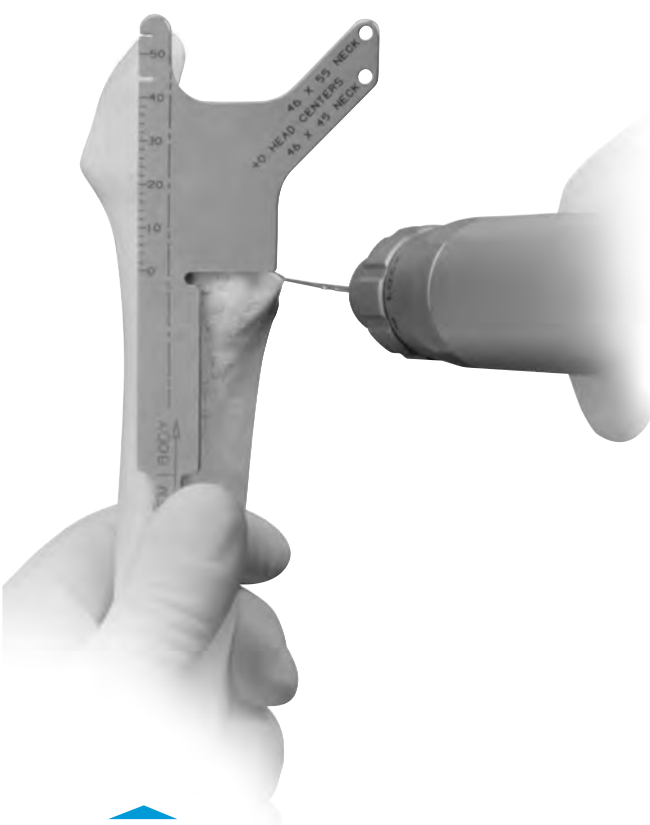


Fig. 41

Advance the Porous Body Conical Reamer only to the most distal line on the reamer. This line should be referenced to the level of the osteotomy **(Fig. 42)**.

If choosing to implant a Calcar Body, the preparation of the proximal femur is now complete.

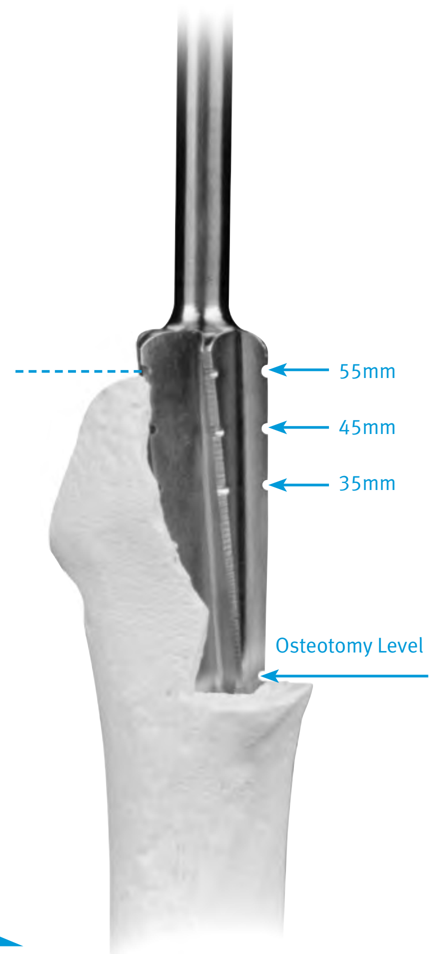


Fig. 42

Spout Body

Note: When using the OTJ Instrumentation, remove the distal provisional for proximal preparation for a Spout Body. Do not attempt proximal preparation for a Spout Body if the distal stem has been implanted.

If using the Spout Body, preparation of the medial calcar area must be completed. Select the appropriate Distal Pilot and thread it onto the appropriate size Spout Mill Guide **(Fig. 43)**. Tighten it with the Distal Pilot Wrench. The final Porous Body Conical reamer used will dictate which Spout Mill Guide to select and the final Distal Reamer size used will dictate the appropriate Distal Pilot **(Table 2, page 23)**.

Fig. 43

Spout Bodies Continued

Pass the Spout Mill Guide/Distal Pilot assembly down the femoral canal to the appropriate level using the markings on the lateral side of the guide. The lines on the Spout Mill Guide match the 35mm, 45mm, and 55mm body heights and align with the top of the greater trochanter **(Fig. 44)**. Insert the Spout Mill Guide to the same depth as the last Porous Body Conical reamer used. For example, if the reamer reached the 45mm depth mark, then the 45mm depth mark on the Spout Mill Guide should be aligned with the top of the greater trochanter. The assembly should seat without force. Use the Stem Impactor to control rotation of the Spout Mill Guide during insertion. This will determine the final anteversion of the femoral prosthesis. It is important to maintain the proper rotational orientation of the Spout Mill Guide in order to achieve proper femoral anteversion.

Attach the Spout Mill Cutter to a power drill/driver. Align the two round projections on the mill cutter with the top slot of the Spout Mill Guide. Check the version of the Spout Mill Guide by moving the Spout Mill Cutter down the guide and assessing the position of the cutter relative to the proximal medial calcar **(Fig. 45)**.

When the orientation of the Spout Mill Guide is satisfactory, turn on the drill/driver. Pass the Spout Mill Cutter down the femur while maintaining lateral pressure on the cutter. The slots in the Spout Mill Guide will direct the cutter in a path that matches the geometry of the proximal body spout **(Fig. 46)**. When the cutter reaches the bottom of the guide, turn off the drill/driver power and remove the Spout Mill Assembly. Do not remove the cutter while the power is on as this may remove additional bone.

If choosing to implant a Spout Body, preparation of the proximal femur is now complete.

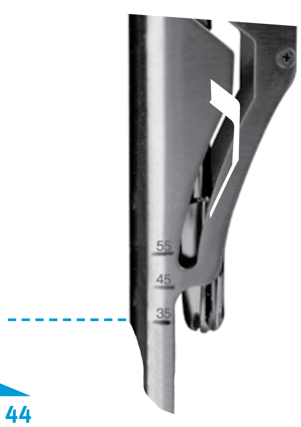


Fig. 44

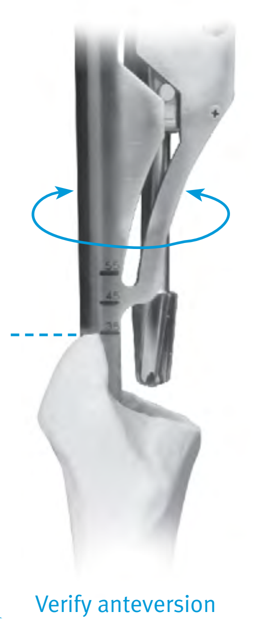


Fig. 45

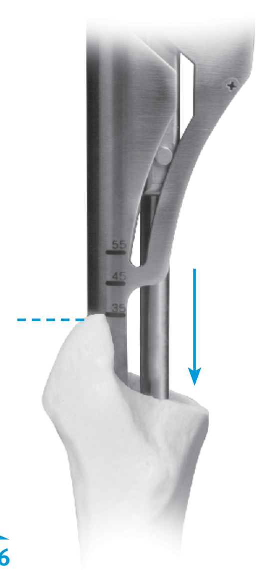


Fig. 46

A. Trial Reduction Using Distal Stem Provisional 34

B. Over-the-Junction Trial Reduction Using Distal Stem Implant 36

3. Trial Reduction

Before inserting the final prosthesis, perform a trial reduction to assess leg length, abductor muscle tension, joint stability, and range of motion. If it is difficult to seat the provisional in the femur, there may be need for additional reaming and/or milling to remove impinging bone. Assess the fit again with the provisional construct. The Stem Provisionals are undersized one millimeter compared to the actual implants of the same size, so it is not possible to judge the ease of insertion of the definitive implant with the provisionals.

There are Distal Stem Provisionals and Proximal Body Provisionals that match all the implants in the *ZMR* Hip System. Based on the instruments used to prepare the femur, choose the corresponding provisional body and stem.

There are two methods that can be used for the trial reduction. One involves using a Distal Stem Provisional with a Proximal Body Provisional. The second method is the Over-the-Junction Trial Reduction, which uses the definitive Distal Stem Implant with a Metal Proximal Provisional Body. The method of trial reduction is determined based on the Proximal Femur Preparation method used. If a definitive Stem Implant was used to prepare the proximal femur, it should be used in the trial reduction.

N **Note: If using a *VerSys*® Trial Head, refer to the Zimmer *VerSys* Trial Head Surgical Technique 97-8018-001-00 for additional information.**

A – Trial Reduction Using Distal Stem Provisional

Attach the Proximal Body Provisional to the Distal Stem Provisional using the captured Compression Nut. While securing the Proximal Body Provisional with the Proximal Body Wrench, use the Nut Driver and Torque Wrench to torque the nut clockwise to 15N-m (130 in.-lbs) **(Fig. 47)**. Attach the preoperatively planned Femoral Head Provisional to the trunnion of the Proximal Body Provisional. Insert the provisional construct into the femoral canal and perform a trial reduction. To evaluate joint stability, leg length, and offset, insert different provisional femoral head/neck combinations and body options, if needed. With the provisional construct in place, assess the ability of the femur to support the proximal body above the mid-stem modular junction. If using a standard *ZMR* body and stem and the proximal body cannot be adequately supported, evaluate the use of *ZMR* XL.

If using ZMR XL Porous Stems, insert the ZMR XL Provisional Body Adapter into the ZMR XL Proximal Body Provisional and assemble the provisional onto the appropriate Straight or Bowed Stem Provisional.

N **Note: The ZMR XL Provisional Body Adapter is used with the standard ZMR Straight and Bowed Porous Stem Provisionals.**

Taper Stems

If using a Taper Stem, assemble the appropriate proximal body and distal stem provisionals so that the distal tip bevel is positioned anteriorly.

Fig. 47

Bowed Stems

If a bowed distal stem component will be used, follow the same procedure as above, with one exception: in order to orient the proximal body in the correct version relative to the bow of the distal stem, the provisional body and stem should be loosely secured prior to insertion down the femoral canal. Once the provisional construct is placed in the femur, adjust the Proximal Body Provisional to the correct orientation in relation to the Distal Stem Provisional. Use the Stem Alignment Guide to check the orientation of the bow **(Fig. 48)**.

When the position is acceptable, tightly secure the Proximal Body Provisional to the Distal Stem Provisional by using the Proximal Body Wrench, Nut Driver, and Torque Wrench. Tighten the Compression Nut to 15N-m (130 in.-lbs) while the provisional assembly is in the femur **(Fig. 49)**.

Using the Provisional Body Wrench will counter the tightening torque and minimize the risk of fracturing the femur during in situ tightening. Once tightened, proceed with the trial reduction.

Mark the orientation of the body on the bone as a reference to achieve the same version with the final implant. Then remove the provisional components and note the position of the proximal body relative to the bow of the distal stem.

Evaluating joint stability, leg length, and offset can be accomplished by trying different body/femoral head combinations.

With the provisional construct in place, assess the ability of the femur to support the proximal body above the mid-stem modular junction. If the proximal body cannot be adequately supported by bone grafting or other adjunctive reinforcement, an alternative implant may be appropriate.

W **WARNING: The standard junction ZMR Revision Hip System should only be used when full proximal support will be achieved in the area of the plasma spray. This is necessary because without full proximal support, the mid-stem junction is vulnerable to fracture. If such proximal support cannot be achieved, evaluate the use of ZMR XL.**

Fig. 48

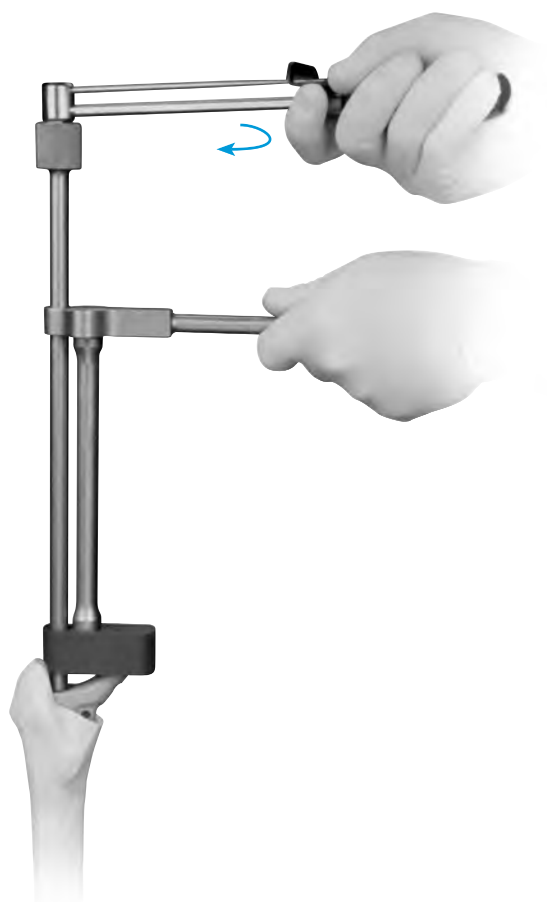


Fig. 49

B – Over-the-Junction Trial Reduction Using Distal Stem Implant

The surgeon has two main Proximal Body Provisional options, and selection depends on whether a distal provisional was inserted and used for proximal preparation or the actual distal implant was placed and used.

Proximal Femur Prepared Using Distal Provisional

If using the distal provisional, the non-metallic proximal provisionals must be used. Select the proximal provisional which corresponds to the body size of the last proximal reamer used. Follow the steps outlined in the appropriate section above.

Proximal Femur Prepared Using Definitive Distal Implant

If the definitive distal implant was used during proximal preparation, the surgeon may either use the non-metallic proximal provisional as indicated above, or use the Metal Proximal Provisionals found in the *ZMR* OTJ Instrumentation Kit **(Fig. 50)**.

N **Note: The Metal Proximal Provisionals only replicate the head center height (build-up) and offset. The bodies are smaller in diameter than the actual implants, and therefore should not be used to assess the proximal fill of the final implant.**

If the metal provisionals are to be used on the final distal stem, select the desired Metal Proximal Provisional (MPP), identify the desired proximal version, and place the provisional on the distal implant. Place the Stem Inserter in the inserter feature located on the proximal lateral aspect of the provisional neck and, **using only the heel of the hand, tap onto the stem. Do not strike with a mallet (Fig. 51)**. Perform trial reduction.

N **Note: The Metal Proximal Provisional locks onto the taper of the definitive distal stem. As such, there may be a small mark left on the proximal stem taper. This will NOT affect performance of the stem taper as the proximal implant body locks in an area distal to this mark.**

Fig. 50

Fig. 51

Mark the desired stem version on the femur with a bovie or marking pen. Remove the MPP by inserting the Provisional Body Separator into the hex screw located within the proximal shoulder of the provisional and turn counter clockwise one-quarter to one-half turn **(Fig. 52)**. It may be necessary to use the stem inserter as a tommy bar with the Provisional Body Separator to increase leverage. The Counter Torque Tool should be used to prevent the Metal Proximal Provisional from moving during this process
(Fig. 53). If the provisional becomes locked on, the provisional does have an extraction hole that can be used with the Extractor hook.

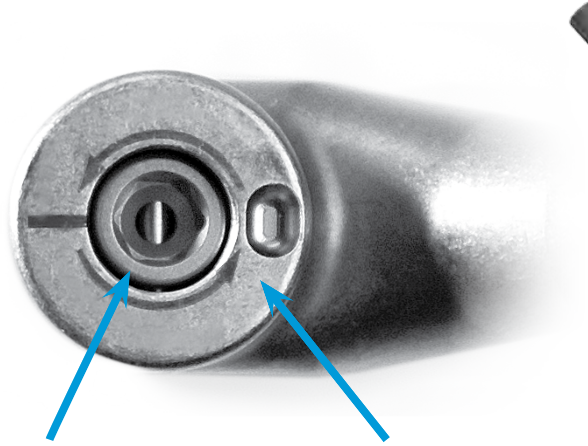


Fig. 52

Fig. 53

A. Back Table Assembly Technique 38

B. "Loose" Assembly Technique.................... 42

C. In Vivo Assembly Technique 44

D. Implant Separation 45

4. Implantation

A – Back Table Assembly Technique

If desired, the implant can be completely assembled before insertion. This back-table assembly is typically used for straight stems, but can also be used for taper and bowed stems if the orientation of the distal stem and proximal body is certain.

Before assembling the implant on the back table, inspect the body and stem tapers to make sure they are clean and dry.

Taper Stems

With a Taper Stem, the modular proximal body must engage the distal stem in the correct version. This is accomplished by replicating the alignment of the Provisional Taper Stem and Body. The stem must be rotated relative to the proximal body so that the bevel at the tip of the stem will face anteriorly when inserted into the canal.

Bowed Stems

With a bowed stem, it is particularly important to orient the proximal body component in the correct position relative to the distal stem component. The short axis of the oval indent on top of the stem is aligned with the bow. Place the proximal body component loosely onto the distal stem component so the alignment matches that of the provisional construct used earlier. Insert the Stem Alignment Guide into the stem and rotate the stem until proper version is achieved.

Press the body and stem components together by hand for initial locking. Insert the Junction Assembly Instrument through the body counterbore, and secure it by engaging the threads of the distal stem and turning the knurled handle of the Junction Assembly Instrument.

If the Junction Assembly Instrument does not easily thread onto the stem, do not force it. Instead, remove the Junction Assembly Instrument and realign it to prevent cross threading. Once the assembly instrument is securely fastened, confirm the rotation between the proximal body and distal stem. Squeeze the two handles together until the needle deflects to the indicator mark on the handle **(Fig. 54)**. If the handles squeeze completely together before the needle is adequately deflected, tighten the knurled handle more to spread the handles further apart. Then reapply pressure to the handles until the needle deflects to the indicator mark.

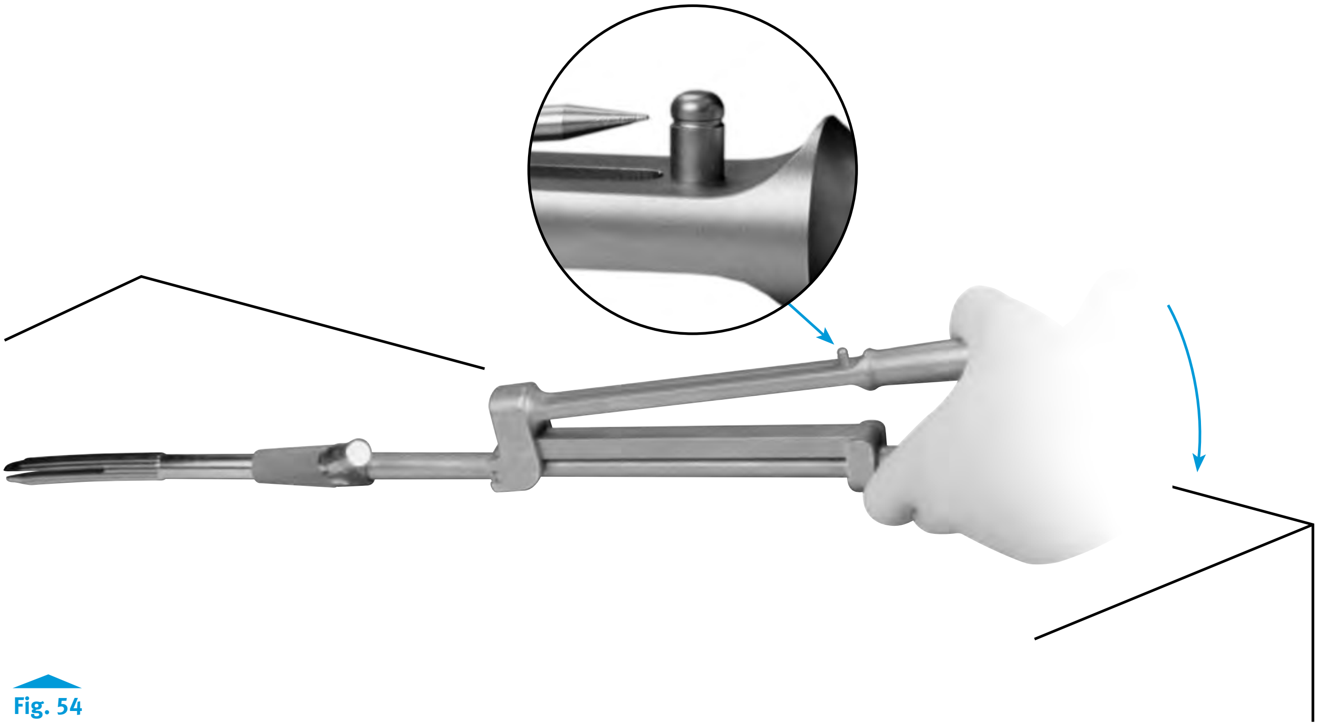


Fig. 54

After the mid-stem modular junction has been securely locked, insert and tighten the Compression Nut, which is packaged with the distal stem. Use the Proximal Body Wrench to secure the proximal body, and insert the Torque Wrench with Nut Driver into the body counterbore to engage the Compression Nut. Turn the Torque Wrench clockwise to 15N-m (130 in.-lbs.) **(Fig. 55)**. Do not over tighten the Compression Nut as this could compromise its function. The assembled construct is now ready for insertion down the femoral canal.

Insert the construct down the femoral canal by hand until it will no longer advance. Assess the implant for proper rotational alignment before impacting **(Fig. 56)**. Then insert the Stem Impactor into the counterbore of the body, aligning it with the oval slot of the distal stem. Use the Mallet to drive the Stem Impactor and seat the implant in the femur.

Fig. 55

Fig. 56

The markings on the impactor serve as a reference (keyed off the greater trochanter) to the corresponding body height to assess the proper implant depth **(Fig. 57)**. If the implant does not advance with each blow of the Mallet, stop insertion and remove the component. Then ream or mill additional bone from the areas that are preventing insertion and insert the component again.

With the implant construct in place, assess the support of the proximal body to ensure full proximal support has been achieved.

W **WARNING: The standard junction ZMR Revision Hip System should only be used when full proximal support will be achieved in the area of the plasma spray. This is necessary because without full proximal support, the mid-stem junction is vulnerable to fracture. If such proximal support cannot be achieved, evaluate the use of ZMR XL.**

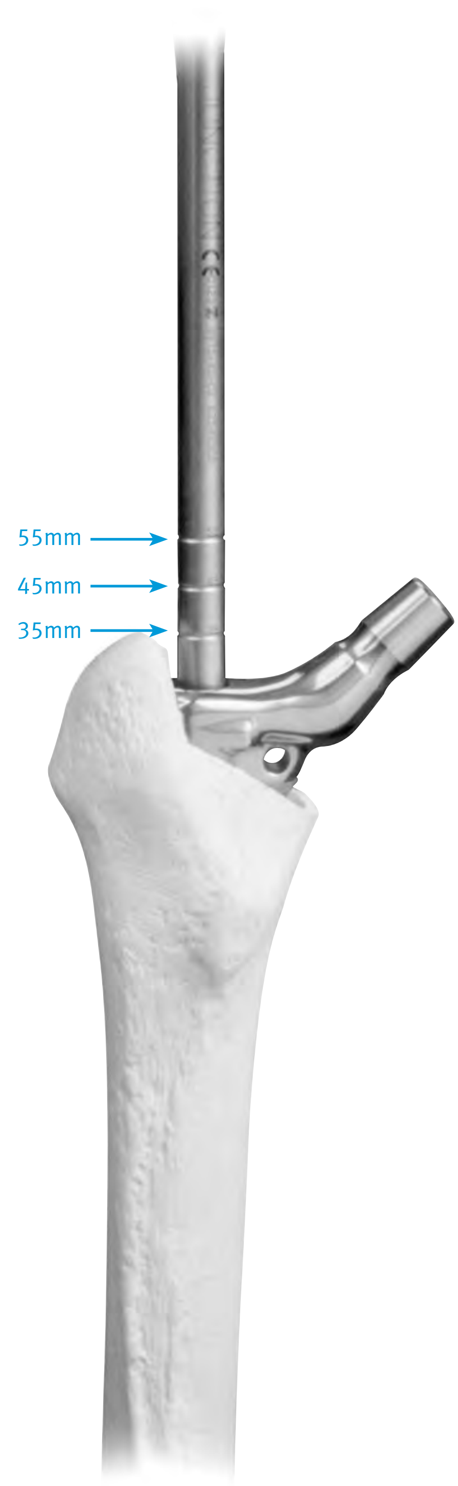


Fig. 57

B – "Loose" Assembly Technique

If the alignment of the proximal body and the distal stem is uncertain, assemble the components loosely. Do not engage the taper, but loosely thread the Compression Nut, which is packaged with the distal stem, onto the distal stem.

Insert the loosely assembled prosthesis into the canal, allowing the proximal body to rotate into the appropriate orientation relative to the distal stem. Use the Stem Impactor and Mallet to impact the prosthesis to its final position. The markings on the impactor serve as a reference (keyed off the greater trochanter) to the corresponding body height to assess the proper implant depth **(Fig. 58)**. The implant should advance with each moderate blow of the Mallet. If it does not, remove the implant and perform additional reaming.

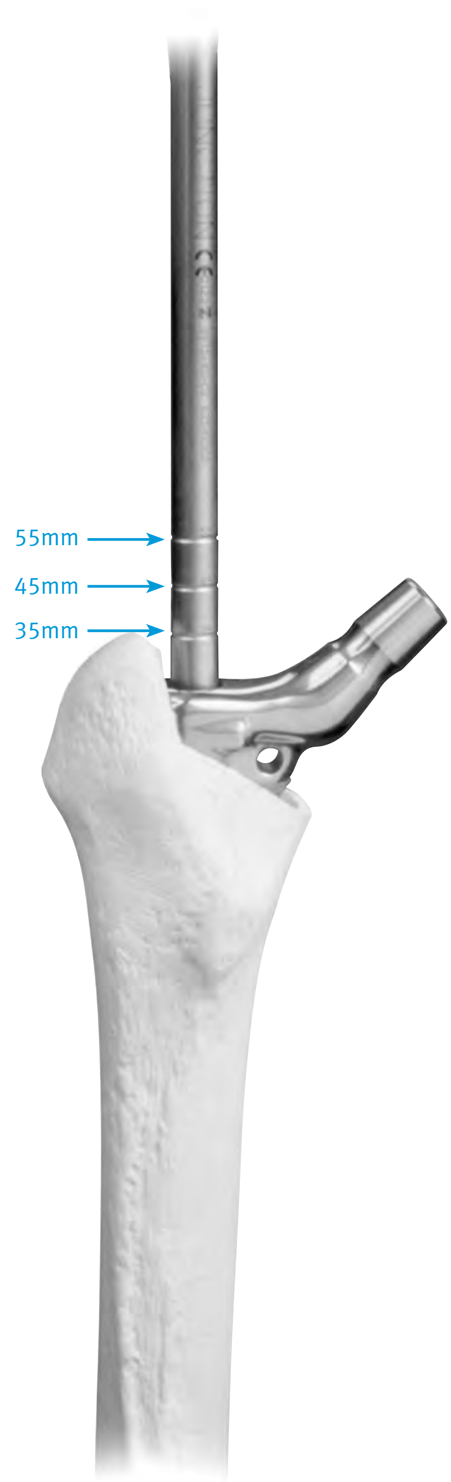


Fig. 58

Rotate the proximal body into the desired version. Then use the Nut Driver to remove the Compression Nut. Insert the Junction Assembly Instrument through the body counterbore and secure it by engaging the threads of the distal stem and turning the knurled handle.

When securely fastened, squeeze the two handles together until the needle deflects to the indicator mark on the handle **(Fig. 59)**. If this is not achieved on the first attempt, retighten the assembly and repeat this step.

Remove the Junction Assembly Instrument. Then re-insert and tighten the Compression Nut. Use the Proximal Body Wrench to secure the proximal body, and insert the Torque Wrench with the Nut Driver into the body counterbore to engage the nut. Turn the Torque Wrench clockwise to 15N-m (130 in.-lbs) **(Fig. 60)**. Do not over tighten the Compression Nut as this could compromise its function.

With the implant construct in place, assess the support of the proximal body to ensure full proximal support has been achieved.

W **WARNING: The standard junction ZMR Revision Hip System should only be used when full proximal support will be achieved in the area of the plasma spray. This is necessary because without full proximal support, the mid-stem junction is vulnerable to fracture. If such proximal support cannot be achieved, evaluate the use of ZMR XL.**

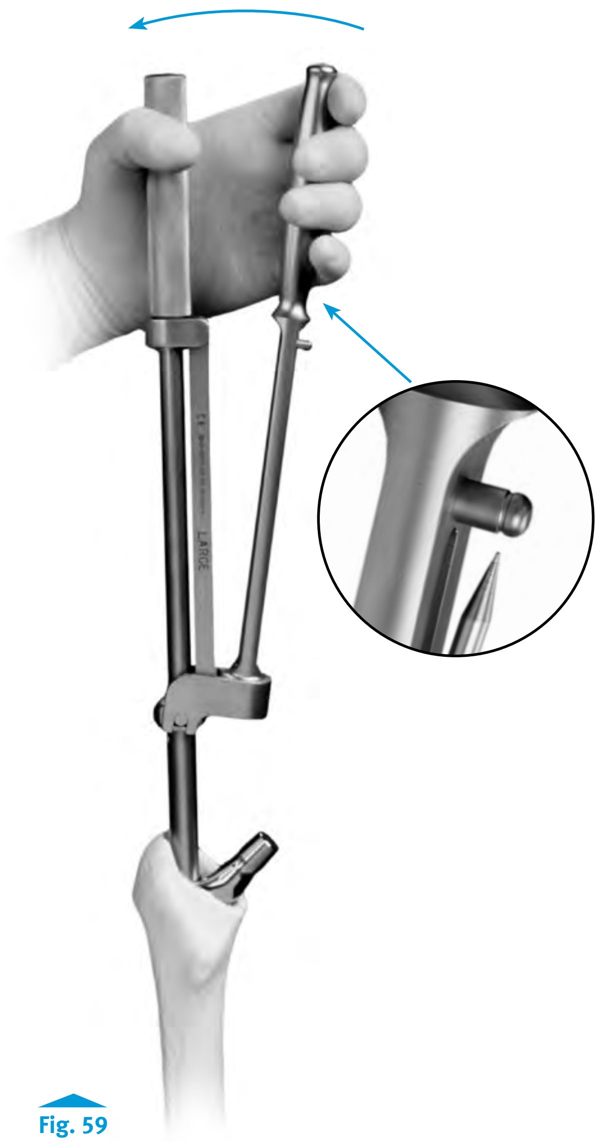


Fig. 59

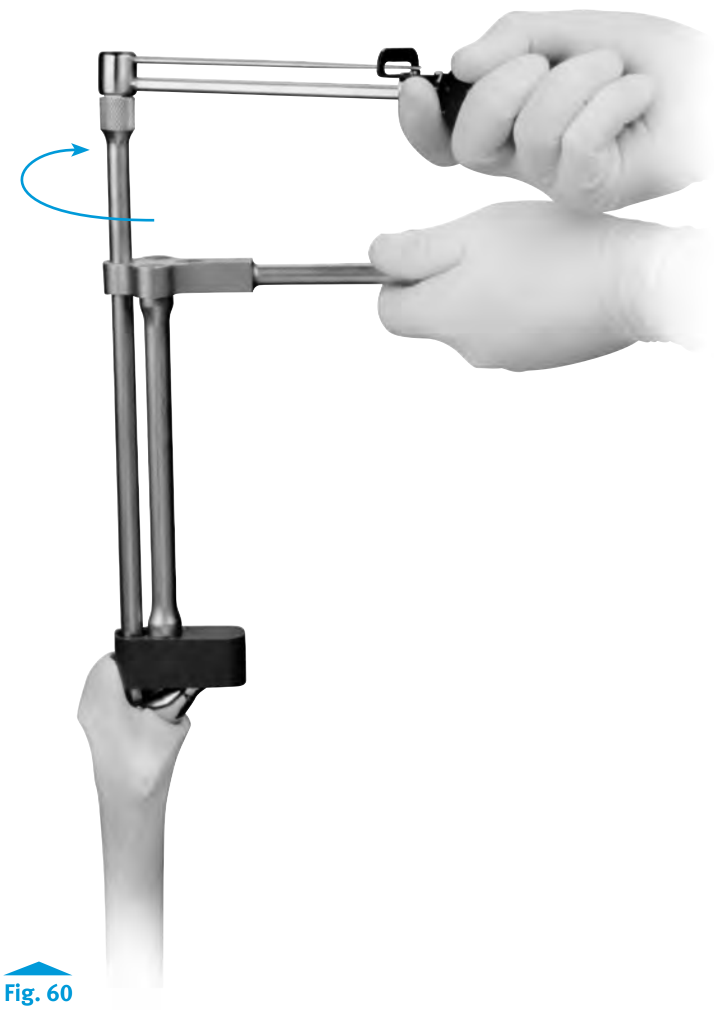


Fig. 60

C – In Vivo Assembly Technique

The In Vivo Assembly Technique is used when the distal stem has already been implanted and used for the trial reduction. Thoroughly clean any debris or body fluids from the stem taper. Place the proximal body into the femur to engage the stem in the canal. The body should not hang up on bone before locking on the stem taper. Set the body in the correct version.

Insert the Junction Assembly Instrument through the body counterbore, and secure it to the distal stem threads by turning the knurled handle clockwise. If the device does not easily thread onto the stem, do not force it. Instead, remove the assembly instrument and realign it to prevent cross-threading. Squeeze the two handles of the assembly instrument until the needle deflects to the indicator mark on the handle **(Fig. 61)**. If the handles squeeze completely together before the needle is adequately deflected, tighten the knurled knob more to spread the handles further apart. Then reapply pressure to the handles until the needle deflects to the indicator mark. Pull on the body to assess the junction lock.

After the mid-stem junction has been securely locked, insert and tighten the Compression Nut which is packaged with the distal stem. Use the Proximal Body Wrench to secure the proximal body, and insert the Torque Wrench with Nut Driver into the body counterbore to engage the Compression Nut. Turn the Torque Wrench clockwise to 15N-m (130 in.-lbs.) **(Fig. 62)**. Do not overtighten the Compression Nut as this could compromise its function.

It is important to note that the use of the Proximal Body Wrench is very important to stabilize the implant and not stress the femur when securing the Compression Nut with the Torque Wrench. Failure to correctly use the Proximal Body Wrench may place excessive torsional force on the femur that could result in femoral fracture.

With the implant construct in place, assess the support of the proximal body to ensure full proximal support has been achieved.

W **WARNING: The standard junction ZMR Revision Hip System should only be used when full proximal support will be achieved in the area of the plasma spray. This is necessary because without full proximal support, the mid-stem junction is vulnerable to fracture. If such proximal support cannot be achieved, evaluate the use of ZMR XL.**

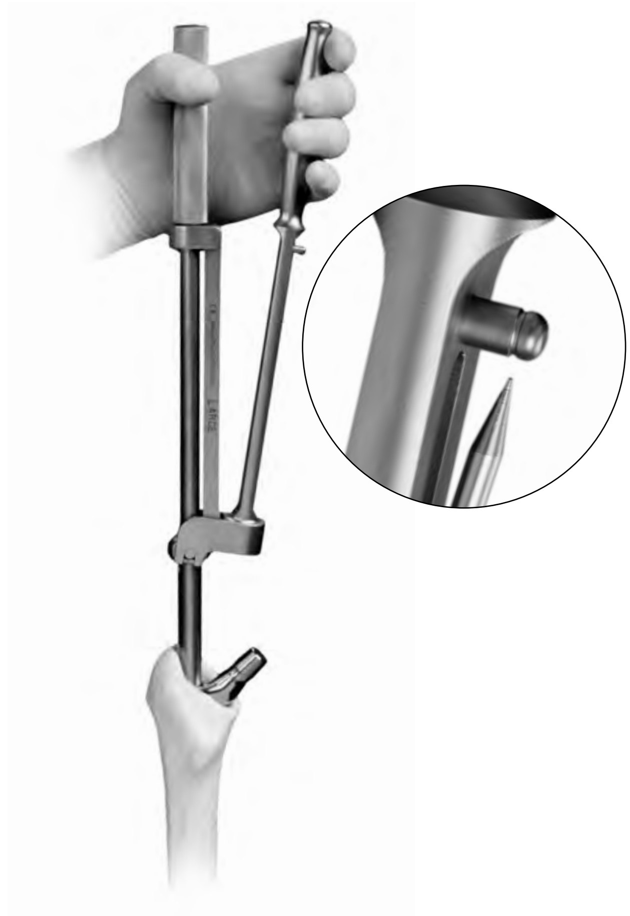


Fig. 61

Fig. 62

D – Implant Separation

In the event that intraoperative separation of newly implanted modular components is needed, the Stem Separator Assembly was designed to allow surgeons the ability to separate a *ZMR* Body from a *ZMR* Stem.

N **Note: The Stem Separator Assembly is for intraoperative use only, and must only be used in situations where a ZMR Body is being removed and discarded.**

The Stem Separator instrument is designed to tap into the implant body and create enough force to disassemble the implant body/stem construct. The instrument will indelibly mark the implant body. The mark is a reminder that the implant is not to be reused.

The stem may be left in place with the following precautions:

- A new body implant of similar size is used.
- Only OTJ Reamers can be used, as other proximal reamers and cutting tools could damage the taper junction.
- The offset can be increased without additional steps.
- The resection height can be increased without additional steps.
- The taper junction area must be well irrigated and properly cleaned prior to new implant body insertion.
- Loose assembly technique must be followed in vivo.
- A new junction nut must be used to ensure proper modular junction assembly.

Remove the femoral head if it has already been assembled.

Remove the Compression Nut with the Torque Wrench, Nut Driver, and Proximal Body Wrench. It is important to use the Proximal Body Wrench to stabilize the implant and not stress the femur when using the Torque Wrench and Nut Driver to loosen the nut. **Failure to do so may result in fracture of the femur.** Once the Proximal Body Wrench has secured the implant body, attach the Nut Driver to the Torque Wrench and insert it into the body counterbore to engage the Compression Nut. Then turn the Torque Wrench counterclockwise to loosen the nut **(Fig. 63)**.

Insert the Counter-torque Tool onto the 12/14 neck taper of the implant **(Fig. 64)**. **The Counter-torque Tool must be held in place to prevent the implant, as well as the patient's leg, from rotating during the remainder of the procedure.**

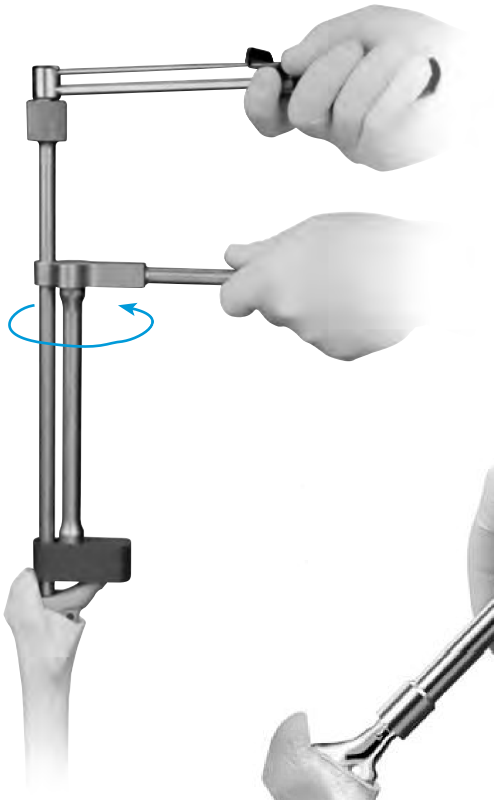


Fig. 63

Fig. 64

Insert the cannulated Separator Tap of the Stem Separator Assembly into the counterbore opening of the implant body and hand-tighten by turning it clockwise. The sharp threads of the Separator Tap will begin to engage the walls of the implant body **(Fig. 65)**.

Insert the Stem Impactor through the transverse hole in the Separator Tap. Use the impactor as a lever to turn the tap clockwise until the tap is seated in the implant body. This will require several complete rotations. After each full rotation, rotate the tap counterclockwise about one-half turn to break the chips that have formed, then continue to turn the tap clockwise **(Fig. 66)**.

Fig. 65

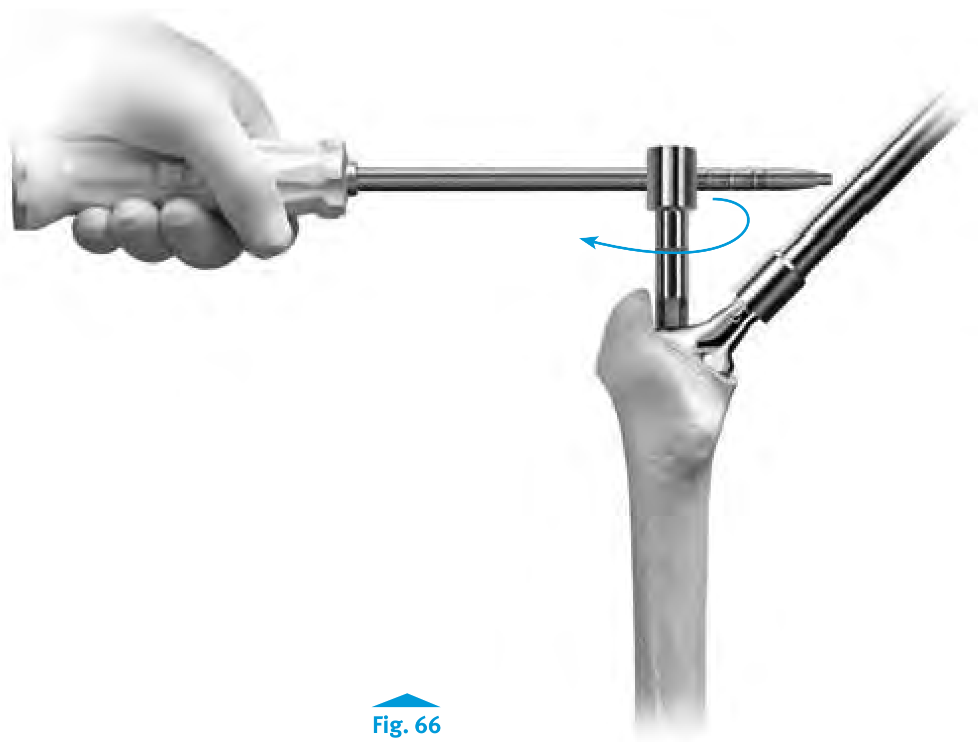


Fig. 66

Insert the Separator Bolt of the Stem Separator Assembly into the cannula of the Separator Tap and hand tighten by turning it clockwise until it bottoms out on the top of the distal stem implant **(Fig. 67)**.

Insert the Porous Stem Impactor through the transverse hole in the Separator Bolt and use the impactor as a lever to slightly tighten the bolt. This will preload the bolt and aid in removing the body **(Fig. 68)**.

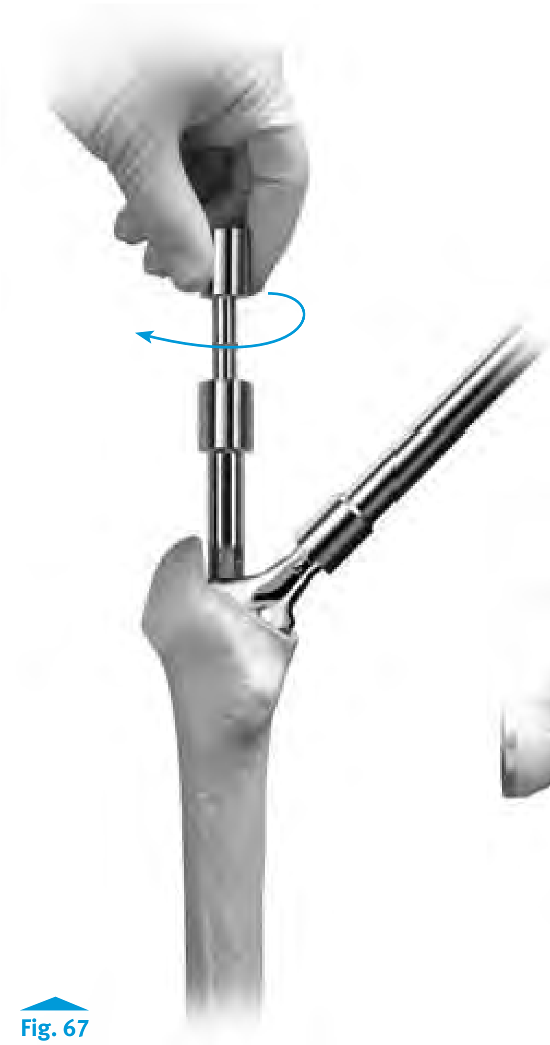


Fig. 67

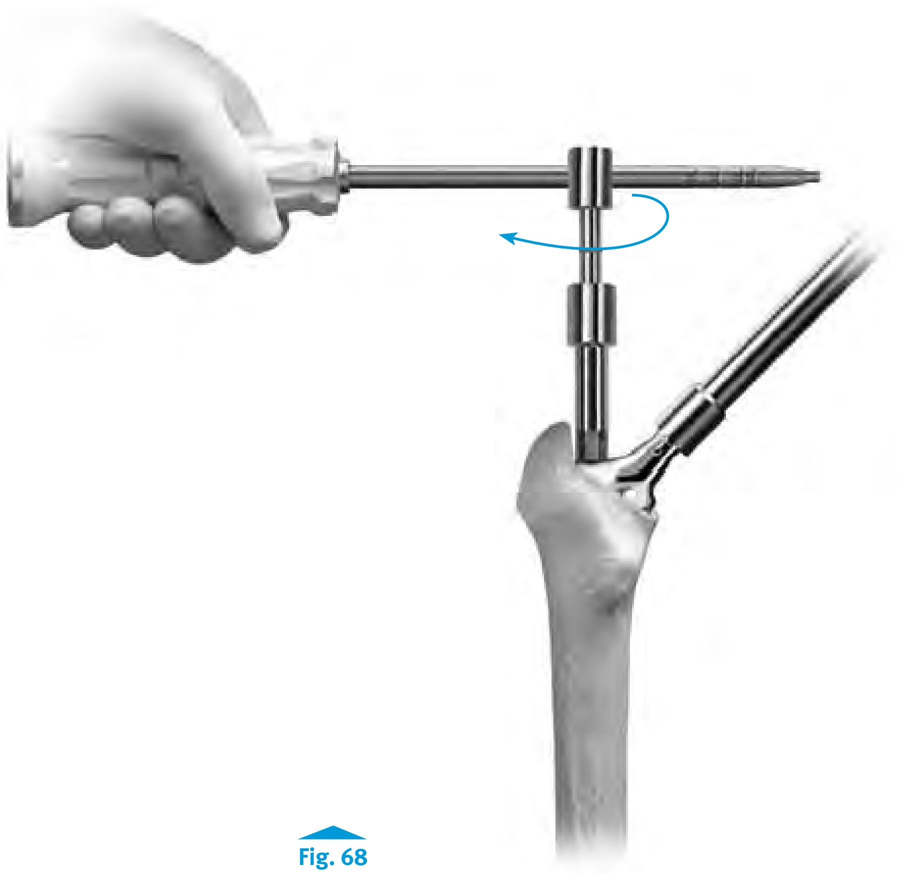


Fig. 68

Use a mallet to strike the top of the Separator Bolt with ONE sharp blow. This will transmit a vibration through the implant that will help loosen the taper connection between the distal stem and the proximal body **(Fig. 69)**.

If the taper connection is not broken at this time, repeat the steps depicted in Figures 68 and 69.

Fig. 69

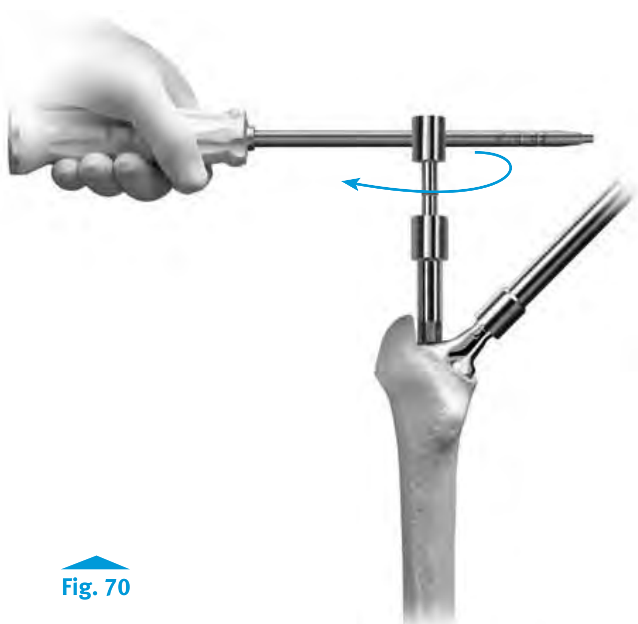


Fig. 70

Using the Porous Stem Impactor as a lever, turn the Separator Bolt clockwise until the implant body is separated from the distal stem **(Fig. 70)**.

If the body is still fixed in the canal after it is separated from the distal stem, the Slaphammer can be used to extract the implant body/Stem Separator assembly construct **(Fig. 71)**.

Fig. 71

5. Femoral Head Assembly

Once the implant is fully seated in the femoral canal, place the selected Femoral Head Provisional onto the taper of the implant. Perform a trial reduction to assess joint stability, range of motion, and restoration of leg length and offset.

N **Note: If using *VerSys* Trial Heads, refer to the *Zimmer® VerSys* Trial Head Surgical Technique 97-8018-001-00 for more information.**

When the appropriate femoral head implant is confirmed, remove the Femoral Head Provisional. Clean and dry the 12/14 neck taper and remove the femoral head from its sterile packaging and ensure its taper is clean and dry. Assemble the femoral head on the taper and impact the head with the femoral head impactor. Test the security of the head fixation by trying to remove it by hand.

Reduce the hip and assess leg length, range of motion, stability, and abductor tension.

C **Caution: Always check that the neck taper and inside taper of the femoral head are clean and dry before impaction. Also do not impact the femoral head onto the taper before driving the prosthesis down the femoral canal as the femoral head may loosen during impaction of the implant.**

6. Wound Closure

After obtaining hemostasis, insert a *Hemovac®* Wound Drainage Device, if desired. Then close the wound in layers.

Postoperative Management

The postoperative management of patients with the *ZMR* Revision Hip System is determined by the surgical technique, patient bone quality, patient activity level, fit of the implant, and the surgeon's judgment. Weight bearing after revision surgery requires more external support for a longer period due to the nature of the extensive surgery and bone disruption.

N **Note: Accepted practices of postoperative care should be followed. The patient must be informed and made aware of the limitations of total joint reconstruction and the necessity of limiting weight and physical activity to protect the femoral stem from unnecessary stresses. See package insert for full patient counseling information.**

Implant Removal

In the event that the *ZMR* Revision Hip System must be removed, specially designed instruments are available to remove the implant. Make sure that all bone and soft tissue proximal to the implant are removed. Begin by removing the Compression Nut from the implant. It is important to use the Proximal Body Wrench to apply a counter-rotating force to stabilize the implant and not stress the femur when using the Torque Wrench and Nut Driver to loosen the nut **(Fig. 72)**. Failure to do so may result in fracture of the femur. Once the proximal Body Wrench has secured the implant body, attach the Nut Driver to the Torque Wrench and insert it into the body counterbore to engage the Compression Nut. Then turn the Torque Wrench counterclockwise to loosen the nut.

Remove the Compression Nut and attach the Distal Stem Extractor to the distal stem through the counterbore in the body by threading the extractor onto the threads in a clockwise direction. Engage as many threads as possible until tight **(Fig. 73)**. **Be careful not to cross-thread the Distal Stem Extractor and stem.** If the Distal Stem Extractor is difficult to turn while threading it onto the stem, remove and realign the extractor.

Fig. 72

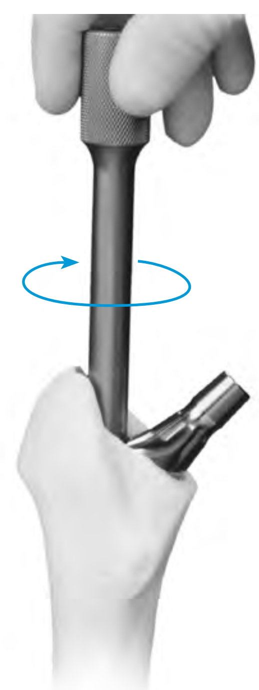


Fig. 73

When the Distal Stem Extractor is completely engaged, attach the Slap Hammer to the extractor by turning the Slap Hammer handle clockwise to engage the threads of the extractor. Turn the handle until tight. Reverse the impact of the stem from the canal by moving the Slap Hammer weight **(Fig. 74)**.

The leg should be firmly held and the direction of force of the Slap Hammer should be in line with the implant and femur. Extracting in a direction that is not in line with the femur may cause fracture of the femur.

Fig. 74

An additional option using an extractor hook is available for use only with the Spout or Calcar Bodies. The Spout Bodies and Calcar Bodies have extraction holes to accept the Extractor Hook **(Fig. 75)**. Thread the Extractor Hook to the Slap Hammer by turning the hook in a clockwise direction. Then reverse impact the stem from the canal by moving the Slap Hammer weight.

N **Note: If the Compression Nut cannot be removed, impact a carbide punch into the inferior surface of the implant neck and drive the implant out of the canal with a Mallet.**

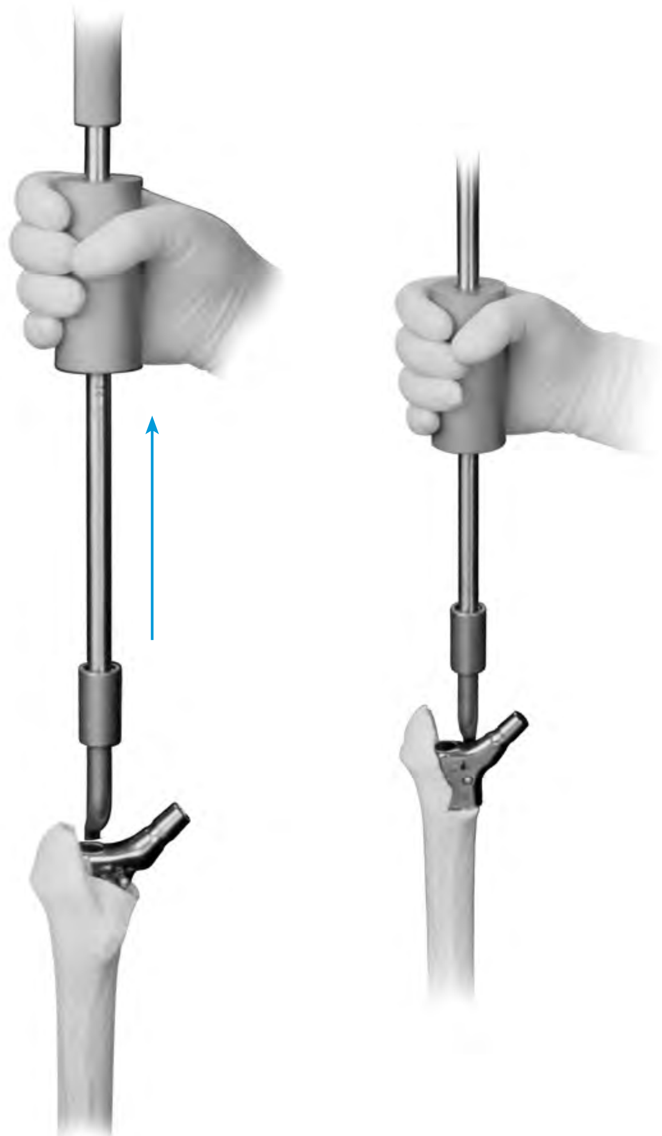


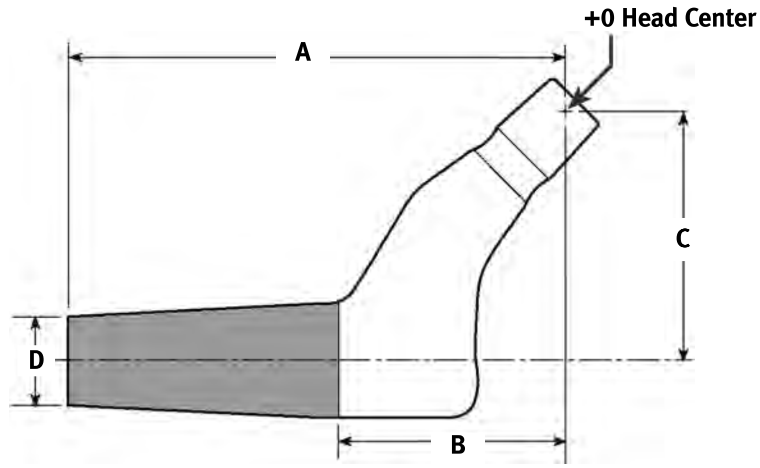
Fig. 75

Product Information

Instrument Set Options

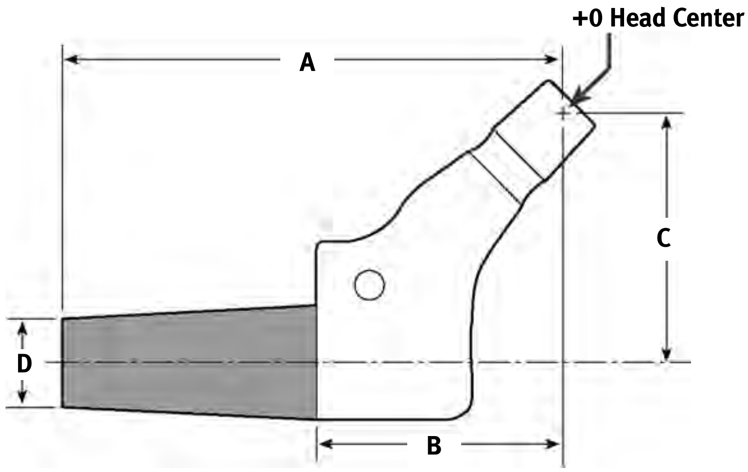
	ZMR General Instrument Set	Over-the-Junction Instrumentation Kit	ZMR Crossover Instrument Kit	Cone Body Provisional Instrument Kit	Spout Body Provisional Instrument Kit	Calcar Body Provisional Instrument Kit	Taper Provisional Instrument Kit	Straight Stem Provisional Instrument Kit	Bowed Stem Provisional Instrument Kit	Porous Proximal Preparation Instrument Kit #1	Porous Proximal Preparation Kit #2	Straight IM Reamer 10-19.5mm Instrument Kit	Straight IM Reamer 20-26 Instrument Kit	Pressure Sentinel Intramedullary Reamers Instrument Kit	ZMR XL Porous Proximal Preparation Set	ZMR XL Taper Proximal Preparation Set	ZMR XL Provisional Taper Stem Set	ZMR XL Distal Taper Reamer Set	
	X	X	X	X			X			X									Cone Body
Taper Stem	X	X	X		X		X				X								Spout Body
	X	X	X			X	X			X									Calcar Body
	X	X		X				X		X		X	X						Cone Body
Straight Porous Stem	X	X			X			X			X	X	X						Spout Body
	X	X				X		X		X		X	X						Calcar Body
	X	X		X					X	X				X					Cone Body
Bowed Porous Stem	X	X			X				X		X			X					Spout Body
	X	X				X			X	X				X					Calcar Body
	X	X		X					X	X				X					Cone Body
Slotted Porous Stem	X	X			X				X		X			X					Spout Body
	X	X				X			X	X				X					Calcar Body
	X	X		X				X		X		X	X						Cone Body
Straight Spline Stem	X	X			X			X			X	X	X						Spout Body
	X	X				X		X		X		X	X						Calcar Body
	X	X		X					X	X				X					Cone Body
Bowed Spline Stem	X	X			X				X		X			X					Spout Body
	X	X				X			X	X				X					Calcar Body
XL Taper Stem	X	X													X	X	X	X	XL Body
XL Straight Porous Stem	X	X						X				X	X		X				XL Body
XL Bowed Porous Stem	X	X							X					X	X				XL Body

ZMR Cone Bodies



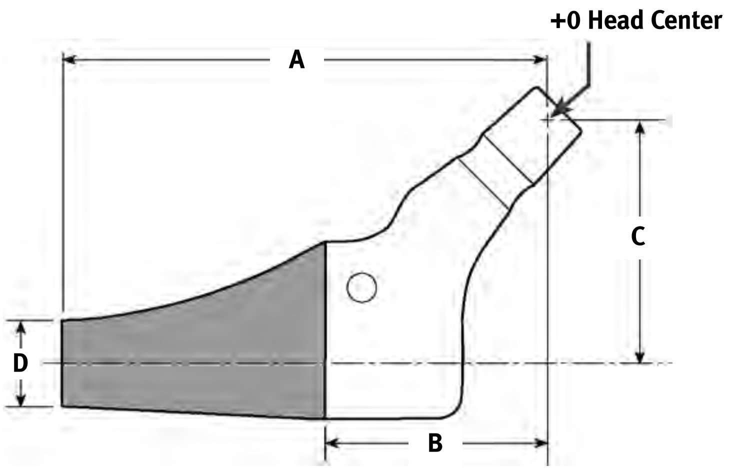
Prod. No.	Description	A Body Length (mm)	B Calcar Height (mm)	C Offset (mm) When Head/Neck Component Selected is: -3.5	+0	+3.5	+7	+10.5	D Body Size w/Plasma (mm)
00-9942-016-35	Cone AA- Body, 36 x 35mm Neck	75	35	33.5	36	38.5	41	43.5	16.6
00-9943-016-35	Cone AA- Body, 40 x 35mm Neck	75	35	37.5	40	42.5	45	47.5	16.6
00-9941-016-35	Cone AA Body, 36 x 35mm Neck	80	35	33.5	36	38.5	41	43.5	16.6
00-9996-016-35	Cone AA Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	16.6
00-9996-017-35	Cone A Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	17.7
00-9993-017-35	Cone A Body, 46 x 35mm Neck	80	35	43.5	46	48.5	51	53.5	17.7
00-9996-018-35	Cone B Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	18.9
00-9993-018-35	Cone B Body, 46 x 35mm Neck	80	35	43.5	46	48.5	51	53.5	18.9
00-9996-019-35	Cone C Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	20.0
00-9993-019-35	Cone C Body, 46 x 35mm Neck	80	35	43.5	46	48.5	51	53.5	20.0
00-9996-020-35	Cone D Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	21.2
00-9993-020-35	Cone D Body, 46 x 35mm Neck	80	35	43.5	46	48.5	51	53.5	21.2
00-9996-021-35	Cone E Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	22.5
00-9993-021-35	Cone E Body, 46 x 35mm Neck	80	35	43.5	46	48.5	51	53.5	22.5
00-9996-023-35	Cone F Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	23.7
00-9993-023-35	Cone F Body, 46 x 35mm Neck	80	35	43.5	46	48.5	51	53.5	23.7
00-9996-017-45	Cone A Body, 40 x 45mm Neck	90	45	37.5	40	42.5	45	47.5	17.7
00-9993-017-45	Cone A Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	17.7
00-9996-018-45	Cone B Body, 40 x 45mm Neck	90	45	37.5	40	42.5	45	47.5	18.9
00-9993-018-45	Cone B Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	18.9
00-9996-019-45	Cone C Body, 40 x 45mm Neck	90	45	37.5	40	42.5	45	47.5	20.0
00-9993-019-45	Cone C Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	20.0
00-9993-020-45	Cone D Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	21.2
00-9993-021-45	Cone E Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	22.5
00-9993-023-45	Cone F Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	23.7
00-9996-017-55	Cone A Body, 40 x 55mm Neck	100	55	37.5	40	42.5	45	47.5	17.7
00-9993-017-55	Cone A Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	17.7
00-9996-018-55	Cone B Body, 40 x 55mm Neck	100	55	37.5	40	42.5	45	47.5	18.9
00-9993-018-55	Cone B Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	18.9
00-9996-019-55	Cone C Body, 40 x 55mm Neck	100	55	37.5	40	42.5	45	47.5	20.0
00-9993-019-55	Cone C Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	20.0
00-9993-020-55	Cone D Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	21.2
00-9993-021-55	Cone E Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	22.5
00-9993-023-55	Cone F Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	23.7

ZMR Calcar Bodies



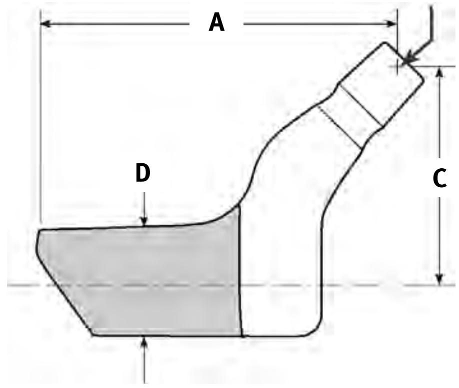
Prod. No.	Description	A Body Length (mm)	B Calcar Height (mm)	C Offset (mm) When Head/Neck Component Selected is: -3.5	+0	+3.5	+7	+10.5	D Body Size w/Plasma (mm)
00-9947-016-35	Calcar AA- Body, 36 x 35mm Neck	75	35	33.5	36	38.5	41	43.5	16.6
00-9948-016-35	Calcar AA- Body, 40 x 35mm Neck	75	35	37.5	40	42.5	45	47.5	16.6
00-9946-016-35	Calcar AA Body, 36 x 35mm Neck	80	35	33.5	36	38.5	41	43.5	16.6
00-9998-016-35	Calcar AA Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	16.6
00-9998-017-35	Calcar A Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	17.7
00-9998-018-35	Calcar B Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	18.9
00-9998-019-35	Calcar C Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	20.0
00-9998-017-45	Calcar A Body, 40 x 45mm Neck	90	45	37.5	40	42.5	45	47.5	17.7
00-9994-017-45	Calcar A Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	17.7
00-9998-018-45	Calcar B Body, 40 x 45mm Neck	90	45	37.5	40	42.5	45	47.5	18.9
00-9994-018-45	Calcar B Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	18.9
00-9998-019-45	Calcar C Body, 40 x 45mm Neck	90	45	37.5	40	42.5	45	47.5	20.0
00-9994-019-45	Calcar C Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	20.0
00-9994-020-45	Calcar D Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	21.2
00-9994-021-45	Calcar E Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	22.5
00-9994-023-45	Calcar F Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	23.7
00-9998-017-55	Calcar A Body, 40 x 55mm Neck	100	55	37.5	40	42.5	45	47.5	17.7
00-9994-017-55	Calcar A Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	17.7
00-9998-018-55	Calcar B Body, 40 x 55mm Neck	100	55	37.5	40	42.5	45	47.5	18.9
00-9994-018-55	Calcar B Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	18.9
00-9998-019-55	Calcar C Body, 40 x 55mm Neck	100	55	37.5	40	42.5	45	47.5	20.0
00-9994-019-55	Calcar C Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	20.0
00-9994-020-55	Calcar D Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	21.2
00-9994-021-55	Calcar E Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	22.5
00-9994-023-55	Calcar F Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	23.7

ZMR Spout Bodies



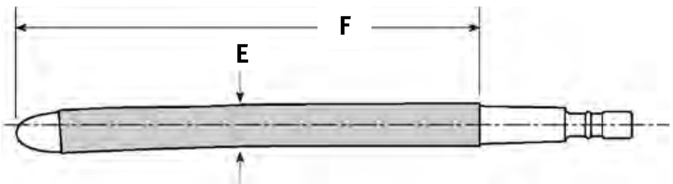
Prod. No.	Description	A Body Length (mm)	B Calcar Height (mm)	C Offset (mm) When Head/Neck Component Selected is: -3.5	+0	+3.5	+7	+10.5	D Body Size w/Plasma (mm)
00-9940-016-36	Spout AA- Body, 36 x 35mm Neck	75	35	33.5	36	38.5	41	43.5	16.6
00-9940-016-40	Spout AA- Body, 40 x 35mm Neck	75	35	37.5	40	42.5	45	47.5	16.6
00-9990-016-36	Spout AA Body, 36 x 35mm Neck	80	35	33.5	36	38.5	41	43.5	16.6
00-9990-016-40	Spout AA Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	16.6
00-9990-017-40	Spout A Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	17.7
00-9990-017-46	Spout A Body, 46 x 35mm Neck	80	35	43.5	46	48.5	51	53.5	17.7
00-9990-018-40	Spout B Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	18.9
00-9990-018-46	Spout B Body, 46 x 35mm Neck	80	35	43.5	46	48.5	51	53.5	18.9
00-9990-019-40	Spout C Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	20.0
00-9990-019-46	Spout C Body, 46 x 35mm Neck	80	35	43.5	46	48.5	51	53.5	20.0
00-9990-020-40	Spout D Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	21.2
00-9990-020-46	Spout D Body, 46 x 35mm Neck	80	35	43.5	46	48.5	51	53.5	21.2
00-9990-021-40	Spout E Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	22.5
00-9990-021-46	Spout E Body, 46 x 35mm Neck	80	35	43.5	46	48.5	51	53.5	22.5
00-9990-023-40	Spout F Body, 40 x 35mm Neck	80	35	37.5	40	42.5	45	47.5	23.7
00-9990-023-46	Spout F Body, 46 x 35mm Neck	80	35	43.5	46	48.5	51	53.5	23.7
00-9997-017-45	Spout A Body, 40 x 45mm Neck	90	45	37.5	40	42.5	45	47.5	17.7
00-9991-017-45	Spout A Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	17.7
00-9997-018-45	Spout B Body, 40 x 45mm Neck	90	45	37.5	40	42.5	45	47.5	18.9
00-9991-018-45	Spout B Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	18.9
00-9997-019-45	Spout C Body, 40 x 45mm Neck	90	45	37.5	40	42.5	45	47.5	20.0
00-9991-019-45	Spout C Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	20.0
00-9991-020-45	Spout D Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	21.2
00-9991-021-45	Spout E Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	22.5
00-9991-023-45	Spout F Body, 46 x 45mm Neck	90	45	43.5	46	48.5	51	53.5	23.7
00-9997-017-55	Spout A Body, 40 x 55mm Neck	100	55	37.5	40	42.5	45	47.5	17.7
00-9991-017-55	Spout A Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	17.7
00-9997-018-55	Spout B Body, 40 x 55mm Neck	100	55	37.5	40	42.5	45	47.5	18.9
00-9991-018-55	Spout B Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	18.9
00-9997-019-55	Spout C Body, 40 x 55mm Neck	100	55	37.5	40	42.5	45	47.5	20.0
00-9991-019-55	Spout C Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	20.0
00-9991-020-55	Spout D Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	21.2
00-9991-021-55	Spout E Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	22.5
00-9991-023-55	Spout F Body, 46 x 55mm Neck	100	55	43.5	46	48.5	51	53.5	23.7

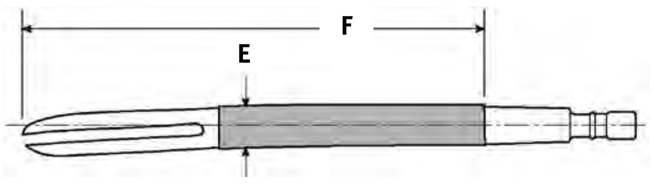
ZMR XL Bodies



Prod. No.	Description	A Body Length (mm)	Reference Standard ZMR Body Size	C Offset (mm) When Head/Neck Component Selected is: -3.5	+0	+3.5	+7	+10.5	D Body Size (mm)
00-9923-078-40	78mm, XL Body, Std Offset	78	AA-	37.5	40	42.5	45	47.5	23.0
00-9923-083-40	83mm, XL Body, Std Offset	83	35	37.5	40	42.5	45	47.5	23.0
00-9923-093-40	93mm, XL Body, Std Offset	93	45	37.5	40	42.5	45	47.5	23.0
00-9923-103-40	103mm, XL Body, Std Offset	103	55	37.5	40	42.5	45	47.5	23.0
00-9923-078-45	78mm, XL Body, Ext Offset	78	AA-	42.5	45	47.5	50	52.5	23.0
00-9923-083-45	83mm, XL Body, Ext Offset	83	35	42.5	45	47.5	50	52.5	23.0
00-9923-093-45	93mm, XL Body, Ext Offset	93	45	42.5	45	47.5	50	52.5	23.0
00-9923-103-45	103mm, XL Body, Ext Offset	103	55	42.5	45	47.5	50	52.5	23.0

ZMR Stems





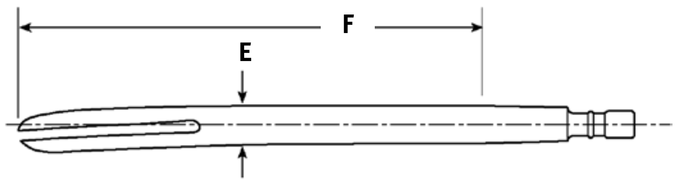
Porous Stems

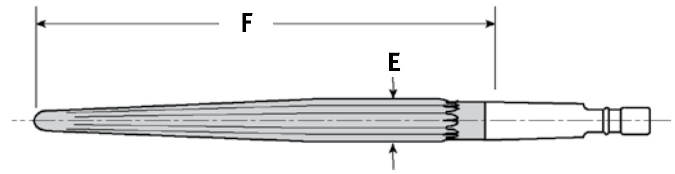
Prod. No.	Description	E Stem Dia. (mm)	F Stem Length (mm)
00-9981-120-21	Porous Stem, 12.0 x 115mm, Straight	12.0	115
00-9981-120-22	Porous Stem, 12.0 x 170mm, Straight	12.0	170
00-9981-120-32	Porous Stem, 12.0 x 170mm, Bow	12.0	170
00-9981-135-21	Porous Stem, 13.5 x 115mm, Straight	13.5	115
00-9981-135-22	Porous Stem, 13.5 x 170mm, Straight	13.5	170
00-9981-135-32	Porous Stem, 13.5 x 170mm, Bow	13.5	170
00-9981-135-33	Porous Stem, 13.5 x 220mm, Bow	13.5	220
00-9981-150-21	Porous Stem, 15.0 x 115mm, Straight	15.0	115
00-9981-150-22	Porous Stem, 15.0 x 170mm, Straight	15.0	170
00-9981-150-32	Porous Stem, 15.0 x 170mm, Bow	15.0	170
00-9981-150-33	Porous Stem, 15.0 x 220mm, Bow	15.0	220
00-9981-165-21	Porous Stem, 16.5 x 115mm, Straight	16.5	115
00-9981-165-22	Porous Stem, 16.5 x 170mm, Straight	16.5	170
00-9981-165-32	Porous Stem, 16.5 x 170mm, Bow	16.5	170
00-9981-165-33	Porous Stem, 16.5 x 220mm, Bow	16.5	220
00-9981-180-21	Porous Stem, 18.0 x 115mm, Straight	18.0	115
00-9981-180-22	Porous Stem, 18.0 x 170mm, Straight	18.0	170
00-9981-180-32	Porous Stem, 18.0 x 170mm, Bow	18.0	170
00-9981-180-33	Porous Stem, 18.0 x 220mm, Bow	18.0	220
00-9981-195-21	Porous Stem, 19.5 x 115mm, Straight	19.5	115
00-9981-195-22	Porous Stem, 19.5 x 170mm, Straight	19.5	170
00-9981-195-32	Porous Stem, 19.5 x 170mm, Bow	19.5	170
00-9981-195-33	Porous Stem, 19.5 x 220mm, Bow	19.5	220
00-9981-210-22	Porous Stem, 21.0 x 170mm, Straight	21.0	170
00-9981-210-32	Porous Stem, 21.0 x 170mm, Bow	21.0	170
00-9981-210-33	Porous Stem, 21.0 x 220mm, Bow	21.0	220
00-9981-225-22	Porous Stem, 22.5 x 170mm, Straight	22.5	170
00-9981-225-32	Porous Stem, 22.5 x 170mm, Bow	22.5	170
00-9981-225-33	Porous Stem, 22.5 x 220mm, Bow	22.5	220
00-9981-240-22	Porous Stem, 24.0 x 170mm, Straight	24.0	170
00-9981-240-32	Porous Stem, 24.0 x 170mm, Bow	24.0	170
00-9981-240-33	Porous Stem, 24.0 x 220mm, Bow	24.0	220
00-9981-255-22	Porous Stem, 25.5 x 170mm, Straight	25.5	170
00-9981-255-32	Porous Stem, 25.5 x 170mm, Bow	25.5	170
00-9981-255-33	Porous Stem, 25.5 x 220mm, Bow	25.5	220

Slotted Porous Stems

Prod. No.	Description	E Stem Dia. (mm)	F Stem Length (mm)
00-9983-120-32	Slotted Porous Stem, 12.0 x 170mm, Bow	12.0	170
00-9983-135-32	Slotted Porous Stem, 13.5 x 170mm, Bow	13.5	170
00-9983-135-33	Slotted Porous Stem, 13.5 x 220mm, Bow	13.5	220
00-9983-150-32	Slotted Porous Stem, 15.0 x 170mm, Bow	15.0	170
00-9983-150-33	Slotted Porous Stem, 15.0 x 220mm, Bow	15.0	220
00-9983-150-34	Slotted Porous Stem, 15.0 x 260mm, Bow	15.0	260
00-9983-165-32	Slotted Porous Stem, 16.5 x 170mm, Bow	16.5	170
00-9983-165-33	Slotted Porous Stem, 16.5 x 220mm, Bow	16.5	220
00-9983-165-34	Slotted Porous Stem, 16.5 x 260mm, Bow	16.5	260
00-9983-180-32	Slotted Porous Stem, 18.0 x 170mm, Bow	18.0	170
00-9983-180-33	Slotted Porous Stem, 18.0 x 220mm, Bow	18.0	220
00-9983-180-34	Slotted Porous Stem, 18.0 x 260mm, Bow	18.0	260
00-9983-195-32	Slotted Porous Stem, 19.5 x 170mm, Bow	19.5	170
00-9983-195-33	Slotted Porous Stem, 19.5 x 220mm, Bow	19.5	220
00-9983-195-34	Slotted Porous Stem, 19.5 x 260mm, Bow	19.5	260
00-9983-210-32	Slotted Porous Stem, 21.0 x 170mm, Bow	21.0	170
00-9983-210-33	Slotted Porous Stem, 21.0 x 220mm, Bow	21.0	220
00-9983-210-34	Slotted Porous Stem, 21.0 x 260mm, Bow	21.0	260
00-9983-225-32	Slotted Porous Stem, 22.5 x 170mm, Bow	22.5	170
00-9983-225-33	Slotted Porous Stem, 22.5 x 220mm, Bow	22.5	220
00-9983-225-34	Slotted Porous Stem, 22.5 x 260mm, Bow	22.5	260
00-9983-240-32	Slotted Porous Stem, 24.0 x 170mm, Bow	24.0	170
00-9983-240-33	Slotted Porous Stem, 24.0 x 220mm, Bow	24.0	220
00-9983-240-34	Slotted Porous Stem, 24.0 x 260mm, Bow	24.0	260
00-9983-255-32	Slotted Porous Stem, 25.5 x 170mm, Bow	25.5	170
00-9983-255-33	Slotted Porous Stem, 25.5 x 220mm, Bow	25.5	220
00-9983-255-34	Slotted Porous Stem, 25.5 x 260mm, Bow	25.5	260

ZMR Stems





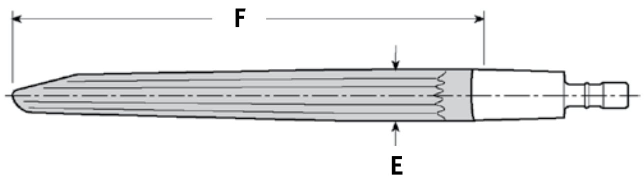
Spline Stems

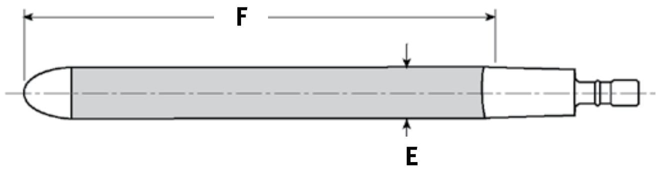
Prod. No.	Description	E Stem Dia. (mm)	F Stem Length (mm)
00-9980-120-21	Spline Stem, 12.0 x 115mm, Straight	12.0	115
00-9980-120-22	Spline Stem, 12.0 x 170mm, Straight	12.0	170
00-9980-120-32	Spline Stem, 12.0 x 170mm, Bow	12.0	170
00-9980-135-21	Spline Stem, 13.5 x 115mm, Straight	13.5	115
00-9980-135-22	Spline Stem, 13.5 x 170mm, Straight	13.5	170
00-9980-135-32	Spline Stem, 13.5 x 170mm, Bow	13.5	170
00-9980-135-33	Spline Stem, 13.5 x 220mm, Bow	13.5	220
00-9980-150-21	Spline Stem, 15.0 x 115mm, Straight	15.0	115
00-9980-150-22	Spline Stem, 15.0 x 170mm, Straight	15.0	170
00-9980-150-32	Spline Stem, 15.0 x 170mm, Bow	15.0	170
00-9980-150-33	Spline Stem, 15.0 x 220mm, Bow	15.0	220
00-9980-165-21	Spline Stem, 16.5 x 115mm, Straight	16.5	115
00-9980-165-22	Spline Stem, 16.5 x 170mm, Straight	16.5	170
00-9980-165-32	Spline Stem, 16.5 x 170mm, Bow	16.5	170
00-9980-165-33	Spline Stem, 16.5 x 220mm, Bow	16.5	220
00-9980-180-21	Spline Stem, 18.0 x 115mm, Straight	18.0	115
00-9980-180-22	Spline Stem, 18.0 x 170mm, Straight	18.0	170
00-9980-180-32	Spline Stem, 18.0 x 170mm, Bow	18.0	170
00-9980-180-33	Spline Stem, 18.0 x 220mm, Bow	18.0	220
00-9980-195-21	Spline Stem, 19.5 x 115mm, Straight	19.5	115
00-9980-195-22	Spline Stem, 19.5 x 170mm, Straight	19.5	170
00-9980-195-32	Spline Stem, 19.5 x 170mm, Bow	19.5	170
00-9980-195-33	Spline Stem, 19.5 x 220mm, Bow	19.5	220
00-9980-210-22	Spline Stem, 21.0 x 170mm, Straight	21.0	170
00-9980-210-32	Spline Stem, 21.0 x 170mm, Bow	21.0	170
00-9980-210-33	Spline Stem, 21.0 x 220mm, Bow	21.0	220
00-9980-225-22	Spline Stem, 22.5 x 170mm, Straight	22.5	170
00-9980-225-32	Spline Stem, 22.5 x 170mm, Bow	22.5	170
00-9980-225-33	Spline Stem, 22.5 x 220mm, Bow	22.5	220
00-9980-240-22	Spline Stem, 24.0 x 170mm, Straight	24.0	170
00-9980-240-32	Spline Stem, 24.0 x 170mm, Bow	24.0	170
00-9980-240-33	Spline Stem, 24.0 x 220mm, Bow	24.0	220
00-9980-255-22	Spline Stem, 25.5 x 170mm, Straight	25.5	170
00-9980-255-32	Spline Stem, 25.5 x 170mm, Bow	25.5	170
00-9980-255-33	Spline Stem, 25.5 x 220mm, Bow	25.5	220

Taper Stems

Prod. No.	Description	E Stem Diameter (mm)	F Stem Length (mm)
00-9982-014-13	Taper Stem, 14mm x 135mm	14	135
00-9982-014-18	Taper Stem, 14mm x 185mm	14	185
00-9982-015-13	Taper Stem, 15mm x 135mm	15	135
00-9982-015-18	Taper Stem, 15mm x 185mm	15	185
00-9982-016-13	Taper Stem, 16mm x 135mm	16	135
00-9982-016-18	Taper Stem, 16mm x 185mm	16	185
00-9982-016-23	Taper Stem, 16mm x 235mm	16	235
00-9982-017-13	Taper Stem, 17mm x 135mm	17	135
00-9982-017-18	Taper Stem, 17mm x 185mm	17	185
00-9982-017-23	Taper Stem, 17mm x 235mm	17	235
00-9982-018-13	Taper Stem, 18mm x 135mm	18	135
00-9982-018-18	Taper Stem, 18mm x 185mm	18	185
00-9982-018-23	Taper Stem, 18mm x 235mm	18	235
00-9982-019-13	Taper Stem, 19mm x 135mm	19	135
00-9982-019-18	Taper Stem, 19mm x 185mm	19	185
00-9982-019-23	Taper Stem, 19mm x 235mm	19	235
00-9982-020-18	Taper Stem, 20mm x 185mm	20	185
00-9982-020-23	Taper Stem, 20mm x 235mm	20	235
00-9982-022-18	Taper Stem, 22mm x 185mm	22	185
00-9982-022-23	Taper Stem, 22mm x 235mm	22	235

ZMR XL Stems





XL Taper Stems

Prod. No.	Description	E Stem Dia. (mm)	F Stem Length (mm)
00-9922-017-13	XL Taper Stem, 17mm X 135mm	17	135
00-9922-017-18	XL Taper Stem, 17mm X 185mm	17	185
00-9922-017-23	XL Taper Stem, 17mm X 235mm	17	235
00-9922-018-13	XL Taper Stem, 18mm X 135mm	18	135
00-9922-018-18	XL Taper Stem, 18mm X 185mm	18	185
00-9922-018-23	XL Taper Stem, 18mm X 235mm	18	235
00-9922-019-13	XL Taper Stem, 19mm X 135mm	19	135
00-9922-019-18	XL Taper Stem, 19mm X 185mm	19	185
00-9922-019-23	XL Taper Stem, 19mm X 235mm	19	235
00-9922-020-13	XL Taper Stem, 20mm X 135mm	20	135
00-9922-020-18	XL Taper Stem, 20mm X 185mm	20	185
00-9922-020-23	XL Taper Stem, 20mm X 235mm	20	235
00-9922-021-13	XL Taper Stem, 21mm X 135mm	21	135
00-9922-021-18	XL Taper Stem, 21mm X 185mm	21	185
00-9922-021-23	XL Taper Stem, 21mm X 235mm	21	235
00-9922-022-13	XL Taper Stem, 22mm X 135mm	22	135
00-9922-022-18	XL Taper Stem, 22mm X 185mm	22	185
00-9922-022-23	XL Taper Stem, 22mm X 235mm	22	235
00-9922-023-18	XL Taper Stem, 23mm X 185mm	23	185
00-9922-023-23	XL Taper Stem, 23mm X 235mm	23	235
00-9922-024-18	XL Taper Stem, 24mm X 185mm	24	185
00-9922-024-23	XL Taper Stem, 24mm X 235mm	24	235

XL Porous Stems

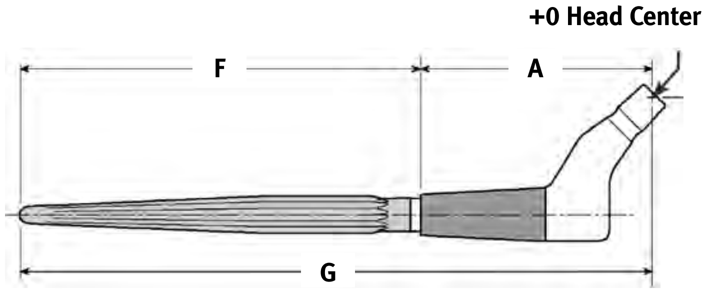
Prod. No.	Description	E Stem Dia. (mm)	F Stem Length (mm)
00-9921-165-22	XL Porous Stem, 16.5 X 170mm, Straight	16.5	170
00-9921-165-32	XL Porous Stem, 16.5 X 170mm, Bowed	16.5	170
00-9921-165-33	XL Porous Stem, 16.5 X 220mm, Bowed	16.5	220
00-9921-165-34	XL Porous Stem, 16.5 X 260mm, Bowed	16.5	260
00-9921-180-22	XL Porous Stem, 18.0 X 170mm, Straight	18.0	170
00-9921-180-32	XL Porous Stem, 18.0 X 170mm, Bowed	18.0	170
00-9921-180-33	XL Porous Stem, 18.0 X 220mm, Bowed	18.0	220
00-9921-180-34	XL Porous Stem, 18.0 X 260mm, Bowed	18.0	260
00-9921-195-22	XL Porous Stem, 19.5 X 170mm, Straight	19.5	170
00-9921-195-32	XL Porous Stem, 19.5 X 170mm, Bowed	19.5	170
00-9921-195-33	XL Porous Stem, 19.5 X 220mm, Bowed	19.5	220
00-9921-195-34	XL Porous Stem, 19.5 X 260mm, Bowed	19.5	260
00-9921-210-22	XL Porous Stem, 21.0 X 170mm, Straight	21.0	170
00-9921-210-32	XL Porous Stem, 21.0 X 170mm, Bowed	21.0	170
00-9921-210-33	XL Porous Stem, 21.0 X 220mm, Bowed	21.0	220
00-9921-210-34	XL Porous Stem, 21.0 X 260mm, Bowed	21.0	260
00-9921-225-22	XL Porous Stem, 22.5 X 170mm, Straight	22.5	170
00-9921-225-32	XL Porous Stem, 22.5 X 170mm, Bowed	22.5	170
00-9921-225-33	XL Porous Stem, 22.5 X 220mm, Bowed	22.5	220
00-9921-225-34	XL Porous Stem, 22.5 X 260mm, Bowed	22.5	260
00-9921-240-22	XL Porous Stem, 24.0 X 170mm, Straight	24.0	170
00-9921-240-32	XL Porous Stem, 24.0 X 170mm, Bowed	24.0	170
00-9921-240-33	XL Porous Stem, 24.0 X 220mm, Bowed	24.0	220
00-9921-240-34	XL Porous Stem, 24.0 X 260mm, Bowed	24.0	260
00-9921-255-22	XL Porous Stem, 25.5 X 170mm, Straight	25.5	170
00-9921-255-32	XL Porous Stem, 25.5 X 170mm, Bowed	25.5	170
00-9921-255-33	XL Porous Stem, 25.5 X 220mm, Bowed	25.5	220
00-9921-255-34	XL Porous Stem, 25.5 X 260mm, Bowed	25.5	260

Compression Nut*

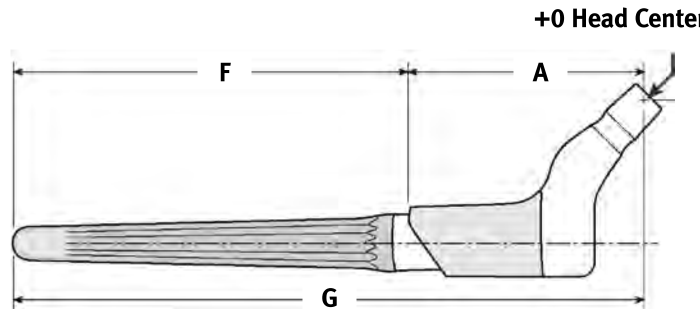
Prod. No.	Description
00-9982-099-02	Large Junction Nut

** Compression nuts are also packed with distal stems.*

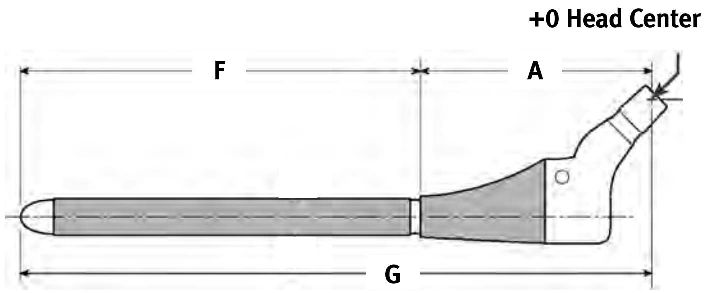
ZMR Taper Hip

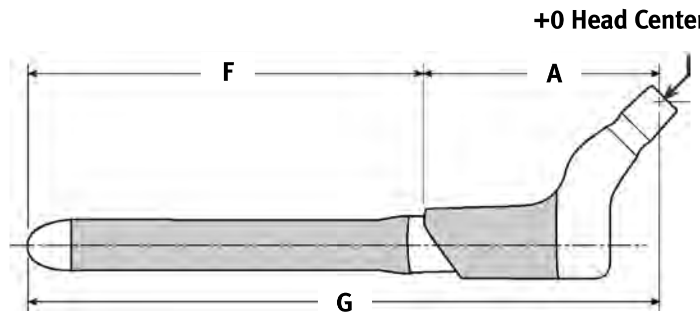


ZMR XL Hip



ZMR Porous Hip





Assembled Implant Length

A Body Length (mm)	+	F Stem Length (mm)	=	G Implant Length (mm)
75		115		190
75		135		210
75		170		245
75		185		260
75		220		295
75		235		310
75		260		335
80		115		195
80		135		215
80		170		250
80		185		265
80		220		300
80		235		315
80		260		340
90		115		205
90		135		225
90		170		260
90		185		275
90		220		310
90		235		325
90		260		350
100		115		215
100		135		235
100		170		270
100		185		285
100		220		320
100		235		335
100		260		360

A Body Length (mm)	+	F Stem Length (mm)	=	G Implant Length (mm)
78		135		213
78		170		248
78		185		263
78		220		298
78		235		313
78		260		338
83		135		218
83		170		253
83		185		268
83		220		303
83		235		318
83		260		343
93		135		228
93		170		263
93		185		278
93		220		313
93		235		328
93		260		353
103		135		238
103		170		273
103		185		288
103		220		323
103		235		338
103		260		363

ZMR Instrument

ZMR General Instrument Set

00-9975-000-45

DCS:

Prod. No.	Description
00-9976-025-00	ZMR General Instrument Case
00-9976-026-00	Base
00-9975-055-00	Tray
00-9975-099-00	Lid
00-6551-006-00	Slap Hammer
00-6601-002-00	Anatomic Stem Extractor
00-7895-028-01	28mm *VerSys* Femoral Head Provisional (-3.5)
00-7895-028-02	28mm *VerSys* Femoral Head Provisional (0)
00-7895-028-03	28mm *VerSys* Femoral Head Provisional (+3.5)
00-7895-028-04	28mm *VerSys* Femoral Head Provisional (+7)
00-7895-028-05	28mm *VerSys* Femoral Head Provisional (+10.5)
00-7895-032-01	32mm *VerSys* Femoral Head Provisional (-3.5)
00-7895-032-02	32mm *VerSys* Femoral Head Provisional (0)
00-7895-032-03	32mm *VerSys* Femoral Head Provisional (+3.5)
00-7895-032-04	32mm *VerSys* Femoral Head Provisional (+7)
00-7895-032-05	32mm *VerSys* Femoral Head Provisional (+10.5)
00-9027-058-00	Femoral Head Impactror
00-9975-031-02	Distal Stem Extractor
00-9975-033-02	Junction Assembly Pliers
00-9975-035-02	Nut Driver
00-9975-036-00	Proximal Body Wrench Socket
00-9975-038-00	T-Handle
00-9975-041-00	Torque Wrench
00-9975-042-00	Osteotomy Guide
00-9965-140-00	Stem Alignement Guide
00-9955-040-02	Stem Impactor
00-9955-071-03	Loose Assembly Sleeve

ZMR Crossover Instrument Kit

00-9965-000-02

DCS:

Prod. No.	Description
00-9976-010-00	ZMR Reamer Case
00-9976-012-00	Tray
00-9976-011-00	Base
00-9975-099-00	Lid
00-9965-001-16	ZMR LE Proximal Crossover Reamer Size AA Body
00-9965-001-17	ZMR LE Proximal Crossover Reamer Size A Body
00-9965-001-18	ZME LE Proximal Crossover Reamer Size B Body
00-9965-001-19	ZMR LE Proximal Crossover Reamer Size C Body
00-9965-001-20	ZMR LE Proximal Crossover Reamer Size D Body
00-9965-001-21	ZMR LE Proximal Crossover Reamer Size E Body
00-9965-001-23	ZMR LE Proximal Crossover Reamer Size F Body
00-9965-013-13	Distal Crossover Reamer Size 13
00-9965-014-13	Distal Crossover Reamer Size 14
00-9965-015-13	Distal Crossover Reamer Size 15
00-9965-016-13	Distal Crossover Reamer Size 16
00-9965-017-13	Distal Crossover Reamer Size 17
00-9965-018-13	Distal Crossover Reamer Size 18
00-9965-019-13	Distal Crossover Reamer Size 19
00-9965-020-18	Distal Crossover Reamer Size 20
00-9965-022-18	Distal Crossover Reamer Size 22
00-9975-037-05	ZMR Conical Reamer Sleeve (Includes 3)

Over-the-Junction Instrumentation Kit

KT-9975-000-00

DCS:

Prod. No.	Description
00-9996-052-00	ZMR Upgrade Instrumentation Case
00-9996-050-00	ZMR OTJ Instrumentation Base
00-9996-051-00	ZMR OTJ Instrumentation Tray
00-9975-007-16	ZMR OTJ Proximal Reamer AA Body
00-9975-007-17	ZMR OTJ Proximal Reamer A Body
00-9975-007-18	ZMR OTJ Proximal Reamer B Body
00-9975-007-19	ZMR OTJ Proximal Reamer C Body
00-9975-007-20	ZMR OTJ Proximal Reamer D Body
00-9975-007-21	ZMR OTJ Proximal Reamer E Body
00-9975-007-23	ZMR OTJ Proximal Reamer F Body
00-9975-007-02	ZMR OTJ Proximal Reamer XL Body
00-9975-007-00	ZMR OTJ Taper Protector STD
00-9975-007-01	ZMR OTJ Taper Protector XL
00-9996-036-30	ZMR OTJ Proximal Provisional 36 x AA STD
00-9996-036-35	ZMR OTJ Proximal Provisional 36 x 35 STD
00-9996-040-30	ZMR OTJ Proximal Provisional 40 x AA STD
00-9996-040-35	ZMR OTJ Proximal Provisional 40 x 35 STD
00-9996-040-45	ZMR OTJ Proximal Provisional 40 x 45 STD
00-9996-040-55	ZMR OTJ Proximal Provisional 40 x 55 STD
00-9996-046-35	ZMR OTJ Proximal Provisional 46 x 35 STD
00-9996-046-45	ZMR OTJ Proximal Provisional 46 x 45 STD
00-9996-046-55	ZMR OTJ Proximal Provisional 46 x 55 STD
00-9924-040-78	ZMR OTJ Proximal Provisioanl 40 x 78 XL
00-9924-040-83	ZMR OTJ Proximal Provisional 40 x 83 XL
00-9924-040-93	ZMR OTJ Proximal Provisional 40 x 93 XL
00-9924-040-13	ZMR OTJ Proximal Provisional 40 x 103 XL
00-9924-045-78	ZMR OTJ Proximal Provisional 45 x 78 XL
00-9924-045-83	ZMR OTJ Proximal Provisional 45 x 83 XL
00-9924-045-93	ZMR OTJ Proximal Provisional 45 x 93 XL
00-9924-045-13	ZMR OTJ Proximal Provisional 45 x 103 XL
00-9975-007-04	ZMR OTJ Trochanteric Starter Reamer STD
00-9975-007-05	ZMR OTJ Trochanteric Starter Reamer XL
00-9975-007-10	ZMR Provisional Body Separator
00-9965-073-04	Counter Torque Tool

Set includes case and contents without the 00-9975-099-00 Case Lid.
The Case Lid must be ordered separately.

ZMR Instrument

Spout Body Provisional Instrument Kit

00-9970-000-01

DCS:

Prod. No.	Description
00-9976-040-00	Case
00-9976-041-00	Base
00-9976-042-00	Tray 1
00-9976-043-00	Tray 2
00-9976-044-00	Tray 3
00-9975-099-00	Lid
00-9930-016-36	Provisional Spout Body AA- Body Reduced Offset, 36 x 35 Neck
00-9970-016-36	Provisional Spout Body AA Body Reduced Offset, 36 x 35 Neck
00-9930-016-40	Provisional Spout Body AA- Body Standard Offset, 40 x 35 Neck
00-9970-016-40	Provisional Spout Body AA Body Standard Offset, 40 x 35 Neck
00-9970-017-40	Provisional Spout Body A Body Standard Offset, 40 x 35 Neck
00-9977-017-45	Provisional Spout Body A Body Standard Offset, 40 x 45 Neck
00-9977-017-55	Provisional Spout Body A Body Standard Offset 40 x 55 Neck
00-9970-018-40	Provisional Spout Body B Body Standard Offset 40 x 35 Neck
00-9977-018-45	Provisional Spout Body B Body Standard Offset 40 x 45 Neck
00-9977-018-55	Provisional Spout Body B Body Standard Offset 40 x 55 Neck
00-9970-019-40	Provisional Spout Body C Body Standard Offset 40 x 35 Neck
00-9977-019-45	Provisional Spout Body C Body Standard Offset 40 x 45 Neck
00-9977-019-55	Provisional Spout Body C Body Standard Offset 40 x 55 Neck
00-9970-020-40	Provisional Spout Body D Body Standard Offset 40 x 35 Neck
00-9970-021-40	Provisional Spout Body E Body Standard Offset 40 x 35 Body
00-9970-023-40	Provisional Spout Body F Body Standard Offset 40 x 35 Neck
00-9970-017-46	Provisional Spout Body A Body Extended Offset 46 x 35 Neck
00-9971-017-45	Provisional Spout Body A Body Extended Offset 46 x 45 Neck
00-9971-017-55	Provisional Spout Body A Body Extended Offset 46 x 55 Neck
00-9970-018-46	Provisional Spout Body B Body Extended Offset 46 x 35 Neck
00-9971-018-45	Provisional Spout Body B Body Extended Offset 46 x 45 Neck
00-9971-018-55	Provisional Spout Body B Body Extended Offset 46 x 55 Neck
00-9970-019-46	Provisional Spout Body C Body Extended Offset 46 x 35 Neck
00-9971-019-45	Provisional Spout Body C Body Extended Offset 46 x 45 Neck
00-9971-019-55	Provisional Spout Body C Body Extended Offset 46 x 55 Neck
00-9970-020-46	Provisional Spout Body D Body Extended Offset 46 x 35 Neck
00-9971-020-45	Provisional Spout Body D Body Extended Offset 46 x 45 Neck
00-9971-020-55	Provisional Spout Body D Body Extended Offset 46 x 55 Neck
00-9970-021-46	Provisional Spout Body E Body Extended Offset 46 x 35 Neck
00-9971-021-45	Provisional Spout Body E Body Extended Offset 46 x 45 Neck
00-9971-021-55	Provisional Spout Body E Body Extended Offset 46 x 55 Neck
00-9970-023-46	Provisional Spout Body F Body Extended Offset 46 x 35 Neck
00-9971-023-45	Provisional Spout Body F Body Extended Offset 46 x 45 Neck
00-9971-023-55	Provisional Spout Body F Body Extended Offset 46 x 55 Neck

Cone Body Provisional Instrument Kit

00-9970-000-02

DCS:

Prod. No.	Description
00-9976-035-00	ZMR Cone Body Provisional Case
00-9976-036-00	Base
00-9976-037-00	Tray 1
00-9976-038-00	Tray 2
00-9976-039-00	Tray 3
00-9975-099-00	Lid
00-9932-016-35	Provisional Cone AA- Body Reduced Offset 36 x 35 Neck
00-9931-016-35	Provisional Cone AA Body Reduced Offset 36 x 35 Neck
00-9933-016-35	Provisional Cone AA- Body Standard Offset 40 x 35 Neck
00-9976-016-35	Provisional Cone AA Body Standard Offset 40 x 35 Neck
00-9976-017-35	Provisional Cone A Body Standard Offset 40 x 35 Neck
00-9976-017-45	Provisional Cone A Body Standard Offset 40 x 45 Neck
00-9976-017-55	Provisional Cone A Body Standard Offset 40 x 55 Neck
00-9976-018-35	Provisional Cone B Body Standard Offset 40 x 35 Neck
00-9976-018-45	Provisional Cone B Body Standard Offset 40 x 45 Neck
00-9976-018-55	Provisional Cone B Body Standard Offset 40 x 55 Neck
00-9976-019-35	Provisional Cone C Body Standard Offset 40 x 35 Neck
00-9976-019-45	Provisional Cone C Body Standard Offset 40 x 45 Neck
00-9976-019-55	Provisional Cone C Body Standard Offset 40 x 55 Neck
00-9976-020-35	Provisional Cone D Body Standard Offset 40 x 35 Neck
00-9976-021-35	Provisional Cone E Body Standard Offset 40 x 35 Neck
00-9976-023-35	Provisional Cone F Body Standard Offset 40 x 35 Neck
00-9973-017-35	Provisional Cone A Body Extended Offset 46 x 35 Neck
00-9973-017-45	Provisional Cone A Body Extended Offset 46 x 45 Neck
00-9973-017-55	Provisional Cone A Body Extended Offset 46 x 55 Neck
00-9973-018-35	Provisional Cone B Body Extended Offset 46 x 35 Neck
00-9973-018-45	Provisional Cone B Body Extended Offset 46 x 45 Neck
00-9973-018-55	Provisional Cone B Body Extended Offset 46 x 55 Neck
00-9973-019-35	Provisional Cone C Body Extended Offset 46 x 35 Neck
00-9973-019-45	Provisional Cone C Body Extended Offset 46 x 45 Neck
00-9973-019-55	Provisional Cone C Body Extended Offset 46 x 55 Neck
00-9973-020-35	Provisional Cone D Body Extended Offset 46 x 35 Neck
00-9973-020-45	Provisional Cone D Body Extended Offset 46 x 45 Neck
00-9973-020-55	Provisional Cone D Body Extended Offset 46 x 55 Neck
00-9973-021-35	Provisional Cone E Body Extended Offset 46 x 35 Neck
00-9973-021-45	Provisional Cone E Body Extended Offset 46 x 45 Neck
00-9973-021-55	Provisional Cone E Body Extended Offset 46 x 55 Neck
00-9973-023-35	Provisional Cone F Body Extended Offset 46 x 35 Neck
00-9973-023-45	Provisional Cone F Body Extended Offset 46 x 45 Neck
00-9973-023-55	Provisional Cone F Body Extended Offset 46 x 55 Neck

ZMR Instrument

Calcar Body Provisional Instrument Kit

00-9970-000-03

DCS:

Prod. No.	Description
00-9976-030-00	ZMR Calcar Body Provisional Case
00-9976-031-00	Base
00-9976-032-00	Tray 1
00-9976-033-00	Tray 2
00-9975-099-00	Lid
00-9937-016-35	Calcar Provisional AA- Body Reduced Offset 36 x 35 Neck
00-9936-016-35	Calcar Provisional AA Body Reduced Offset 36 x 35 Neck
00-9938-016-35	Calcar Provisional AA- Body Standard Offset 40 x 35 Neck
00-9978-016-35	Calcar Provisional AA Body Standard Offset 40 x 35 Neck
00-9978-017-35	Calcar Provisional A Body Standard Offset 40 x 35 Necl
00-9978-017-45	Calcar Provisional A Body Standard Offset 40 x 45 Neck
00-9978-017-55	Calcar Provisional A Body Standard Offset 40 x 55 Neck
00-9978-018-35	Calcar Provisional B Body Standard Offset 40 x 35 Neck
00-9978-018-45	Calcar Provisional B Body Standard Offset 40 x 45 Neck
00-9978-018-55	Calcar Provisional B Body Standard Offset 40 x 55 Neck
00-9978-019-35	Calcar Provisional C Body Standard Offset 40 x 35 Neck
00-9978-019-45	Calcar Provisional C Body Standard Offset 40 x 45 Neck
00-9978-019-55	Calcar Provisional C Body Standard Offset 40 x 55 Neck
00-9974-017-45	Calcar Provisional A Body Extended Offset 46 x 45 Neck
00-9974-017-55	Calcar Provisional A Body Extended Offset 46 x 55 Neck
00-9974-018-45	Calcar Provisional B Body Extended Offset 46 x 45 Neck
00-9974-018-55	Calcar Provisional B Body Extended Offset 46 x 55 Neck
00-9974-019-45	Calcar Provisional C Body Extended Offset 46 x 45 Neck
00-9974-019-55	Calcar Provisional C Body Extended Offset 46 x 55 Neck
00-9974-020-45	Calcar Provisional D Body Extended Offset 46 x 45 Neck
00-9974-020-55	Calcar Provisional D Body Extended Offset 46 x 55 Neck
00-9974-021-45	Calcar Provisional E Body Extended Offset 46 x 45 Neck
00-9974-021-55	Calcar Provisional E Body Extended Offset 46 x 55 Neck
00-9974-023-45	Calcar Provisional F Body Extended Offset 46 x 45 Neck
00-9974-023-55	Calcar Provisional F Body Extended Offset 46 x 55 Neck

Straight Stem Provisional Instrument Kit

00-9961-000-03

DCS:

Prod. No.	Description
00-9976-045-00	ZMR Straight Stem Provisional Case
00-9976-046-00	Base
00-9975-099-00	Lid
00-9961-120-21	ZMR Straight Stem Provisional 12.0mm x 115mm
00-9961-135-21	ZMR Straight Stem Provisional 13.5mm x 115mm
00-9961-150-21	ZMR Straight Stem Provisional 15.0mm x 115mm
00-9961-165-21	ZMR Straight Stem Provisional 16.5mm x 115mm
00-9961-180-21	ZMR Straight Stem Provisional 18.0mm x 115mm
00-9961-195-21	ZMR Straight Stem Provisional 19.5mm x 115mm
00-9961-120-22	ZMR Straight Stem Provisional 12.0mm x 170mm
00-9961-135-22	ZMR Straight Stem Provisional 13.5mm x 170mm
00-9961-150-22	ZMR Straight Stem Provisional 15.0mm x 170mm
00-9961-165-22	ZMR Straight Stem Provisional 16.5mm x 170mm
00-9961-180-22	ZMR Straight Stem Provisional 18.0mm x 170mm
00-9961-195-22	ZMR Straight Stem Provisional 19.5mm x 170mm
00-9961-210-22	ZMR Straight Spline Stem Provisional 21.0 x 170mm
00-9961-225-22	ZMR Straight Spline Stem Provisoinal 22.5mm x 170mm
00-9961-240-22	ZMR Straight Spline Stem Provisional 24.0mm x 170mm
00-9961-255-22	ZMR Straight Spline Stem Provisional 25.5mm x 170mm

Bowed Stem Provisional Instrument Kit

00-9961-000-02

DCS:

Prod. No.	Description
00-9976-050-00	ZMR Bowed Stem Provisional Case
00-9976-051-00	Base
00-9976-052-00	Tray 1
00-9976-053-00	Tray 2
00-9975-099-00	Lid
00-9961-120-32	ZMR Bowed Stem Provisional 12.0mm x 170mm
00-9961-135-32	ZMR Bowed Stem Provisional 13.5mm x 170mm
00-9961-150-32	ZMR Bowed Stem Provisional 15.0mm x 170mm
00-9961-165-32	ZMR Bowed Stem Provisional 16.5mm x 170mm
00-9961-180-32	ZMR Bowed Stem Provisional 18.0mm x 170mm
00-9961-195-32	ZMR Bowed Stem Provisional 19.5mm x 170mm
00-9961-210-32	ZMR Bowed Stem Provisional 21.0mm x 170mm
00-9961-225-32	ZMR Bowed Stem Provisional 22.5mm x 170mm
00-9961-240-32	ZMR Bowed Stem Provisional 24.0mm x 170mm
00-9961-255-32	ZMR Bowed Stem Provisional 25.5mm x 170mm
00-9961-135-33	ZMR Bowed Stem Provisional 13.5mm x 220mm
00-9961-150-33	ZMR Bowed Stem Provisional 15.0mm x 220mm
00-9961-165-33	ZMR Bowed Stem Provisional 16.5mm x 220mm
00-9961-180-33	ZMR Bowed Stem Provisional 18.0mm x 220mm
00-9961-195-33	ZMR Bowed Stem Provisional 19.5mm x 220mm
00-9961-210-33	ZMR Bowed Stem Provisoinal 21.0mm x 220mm
00-9961-225-33	ZMR Bowed Stem Provisional 22.5mm x 220mm
00-9961-240-33	ZMR Bowed Spline Stem Provisional 24.0mm x 220mm
00-9961-255-33	ZMR Bowed Spline Stem Provisional 25.5mm x 220mm
00-9963-150-34	ZMR Bowed Stem Provisional 15.0mm x 260mm
00-9963-165-34	ZMR Bowed Stem Provisional 16.5mm x 260mm
00-9963-180-34	ZMR Bowed Stem Provisional 18.0mm x 260mm
00-9963-195-34	ZMR Bowed Stem Provisional 19.5mm x 260mm
00-9963-210-34	ZMR Bowed Stem Provisional 21.0mm x 260mm
00-9963-225-34	ZMR Bowed Stem Provisional 22.5mm x 260mm
00-9963-240-34	ZMR Bowed Stem Provisional 24.0mm x 260mm
00-9963-255-34	ZMR Bowed Stem Provisional 25.5mm x 260mm

ZMR Instrument

Porous Proximal Preparation Instrument Kit #1
00-9975-000-39

DCS:

Prod. No.	Description
00-9976-055-00	Case
00-9976-056-00	Base
00-9976-057-00	Tray
00-9975-099-00	Lid
00-9975-001-16	ZMR AA/AA- Body Conical Reamer
00-9975-001-17	ZMR A Body Conical Reamer
00-9975-001-18	ZMR B Body Conical Reamer
00-9975-001-19	ZMR C Body Conical Reamer
00-9975-001-20	ZMR D Body Conical Reamer
00-9975-001-21	ZMR E Body Conical Reamer
00-9975-001-23	ZMR F Body Conical Reamer
00-9975-002-12	Distal Pilot Size 12.0 (2)
00-9975-002-13	Distal Pilot Size 13.5 (2)
00-9975-002-15	Distal Pilot Size 15.0 (2)
00-9975-002-16	Distal Pilot Size 16.5 (2)
00-9975-002-18	Distal Pilot Size 18.0 (2)
00-9975-002-19	Distal Pilot Size 19.5 (2)
00-9975-002-21	Distal Pilot Size 21.0 (2)
00-9975-002-22	Distal Pilot Size 22.5 (2)
00-9975-002-24	Distal Pilot Size 24.0 (2)
00-9975-002-25	Distal Pilot Size 25.5 (2)
00-9975-039-00	ZMR Distal Pilot Wrench

Porous Proximal Preparation Instrument Kit #2
00-9975-000-40

DCS:

Prod. No.	Description
00-9976-060-00	Case
00-9976-061-00	Base
00-9976-062-00	Tray
00-9975-099-00	Lid
00-9975-003-16	ZMR AA/AA- Body Spout Mill Cutter
00-9975-003-17	ZMR A-B Body Spout Mill Cutter
00-9975-003-19	ZMR C-D Body Spout Mill Cutter
00-9975-003-21	ZMR E-F Body Spout Mill Cutter
00-9975-005-16	AA/AA- Body Spout Mill Guide
00-9975-005-17	ZMR A Body Spout Mill Guide
00-9975-005-18	ZMR B Body Spout Mill Guide
00-9975-005-19	ZMR C Body Spout Mill Guide
00-9975-005-20	ZMR D Body Spout Mill Guide
00-9975-005-21	ZMR E Body Spout Mill Guide
00-9975-005-23	ZMR F Body Spout Mill Guide
00-9975-002-12	Distal Pilot Size 12.0
00-9975-002-13	Distal Pilot Size 13.5
00-9975-002-15	Distal Pilot Size 15.0
00-9975-002-16	Distal Pilot Size 16.5
00-9975-002-18	Distal Pilot Size 18.0
00-9975-002-19	Distal Pilot Size 19.5
00-9975-002-21	Distal Pilot Size 21
00-9975-002-22	Distal Pilot Size 22.5
00-9975-002-24	Distal Pilot Size 24.0
00-9975-002-25	Distal Pilot Size 25.5

Straight IM Reamer 10-19.5mm Instrument Kit
00-9975-000-06

DCS:

Prod. No.	Description
00-9976-065-00	Case
00-9976-066-00	Base
00-9976-067-00	Tray
00-9975-099-00	Lid
00-7891-010-00	*VerSys* Straight IM Reamer 10.0mm
00-7891-010-05	*VerSys* Straight IM Reamer 10.5mm
00-7891-011-00	*VerSys* Straight IM Reamer 11.0mm
00-7891-011-05	*VerSys* Straight IM Reamer 11.5mm
00-7891-012-00	*VerSys* Straight IM Reamer 12.0mm
00-7891-012-05	*VerSys* Straight IM Reamer 12.5mm
00-7891-013-00	*VerSys* Straight IM Reamer 13.0mm
00-7891-013-05	*VerSys* Straight IM Reamer 13.5mm
00-7891-014-00	*VerSys* Straight IM Reamer 14.0mm
00-7891-014-05	*VerSys* Straight IM Reamer 14.5mm
00-7891-015-00	*VerSys* Straight IM Reamer 15.0mm
00-7891-015-05	*VerSys* Straight IM Reamer 15.5mm
00-7891-016-00	*VerSys* Straight IM Reamer 16.0mm
00-7891-016-05	*VerSys* Straight IM Reamer 16.5mm
00-7891-017-00	*VerSys* Straight IM Reamer 17.0mm
00-7891-017-05	*VerSys* Straight IM Reamer 17.5mm
00-7891-018-00	*VerSys* Straight IM Reamer 18.0mm
00-7891-018-05	*VerSys* Straight IM Reamer 18.5mm
00-7891-019-00	*VerSys* Straight IM Reamer 19.0mm
00-7891-019-05	*VerSys* Straight IM Reamer 19.5mm

Straight IM Reamer 20-26 Instrument Kit
00-9975-000-07

DCS:

Prod. No.	Description
00-7891-020-00	*VerSys* Straight IM Reamer 20.0mm
00-7891-020-05	*VerSys* Straight IM Reamer 20.5mm
00-7891-021-00	*VerSys* Straight IM Reamer 21.0mm
00-7891-021-05	*VerSys* Straight IM Reamer 21.5mm
00-7891-022-00	*VerSys* Straight IM Reamer 22.0mm
00-7891-022-05	*VerSys* Straight IM Reamer 22.5mm
00-7891-023-00	*VerSys* Straight IM Reamer 23.0mm
00-7891-023-05	*VerSys* Straight IM Reamer 23.5mm
00-7891-024-00	*VerSys* Straight IM Reamer 24.0mm
00-7891-024-05	*VerSys* Straight IM Reamer 24.5mm
00-7891-025-00	*VerSys* Straight IM Reamer 25.0mm
00-7891-025-05	*VerSys* Straight IM Reamer 25.5mm
00-7891-026-00	*VerSys* Straight IM Reamer 26.0mm
00-9976-015-00	Case

ZMR Instrument

Taper Provisional Instrument Kit
00-9972-000-00

DCS:

Prod. No.	Description
00-9975-090-00	Base
00-9975-591-00	Taper Stem Tray
00-9975-099-00	Lid
00-7895-028-01	*VerSys* 28mm Femoral Head Provisional (-3.5)
00-7895-028-02	*VerSys* 28mm Femoral Head Provisional (0)
00-7895-028-03	*VerSys* 28mm Femoral Head Provisional (+3.5)
00-7895-028-04	*VerSys* 28mm Femoral Head Provisional (+7)
00-7895-028-05	*VerSys* 28mm Femoral Head Provisional (+10.5)
00-7895-032-01	*VerSys* 32mm Femoral Head Provisional (-3.5)
00-7895-032-02	*VerSys* 32mm Femoral Head Provisional (0)
00-7895-032-03	*VerSys* 32mm Femoral Head Provisional (+3.5)
00-7895-032-04	*VerSys* 32mm Femoral Head Provisional (+7)
00-7895-032-05	*VerSys* 32mm Femoral Head Provisional (+10.5)
00-9962-014-13	ZMR Taper Stem Provisional 14mm x 135mm
00-9962-014-18	ZMR Taper Stem Provisional 14mm x 185mm
00-9962-015-13	ZMR Taper Stem Provisional 15mm x 135mm
00-9962-015-18	ZMR Taper Stem Provisional 15mm x 185mm
00-9962-016-13	ZMR Taper Stem Provisional 16mm x 135mm
00-9962-016-18	ZMR Taper Stem Provisional 16mm x 185mm
00-9962-016-23	ZMR Taper Stem Provisional 16mm x 235mm
00-9962-017-13	ZMR Taper Stem Provisional 17mm x 135mm
00-9962-017-18	ZMR Taper Stem Provisional 17mm x 185mm
00-9962-017-23	ZMR Taper Stem Provisional 17mm x 235mm
00-9962-018-13	ZMR Taper Stem Provisoinal 18mm x 135mm
00-9962-018-18	ZMR Taper Stem Provisional 18mm x 185mm
00-9962-018-23	ZMR Taper Stem Provisional 18mm x 235mm
00-9962-019-13	ZMR Taper Stem Provisional 19mm x 135mm
00-9962-019-18	ZMR Taper Stem Provisional 19mm x 185mm
00-9962-019-23	ZMR Taper Stem Provisional 19mm x 235mm
00-9962-020-18	ZMR Taper Stem Provisional 20mm x 185mm
00-9962-020-23	ZMR Taper Stem Provisional 20mm x 235mm
00-9962-022-18	ZMR Taper Stem Provisional 22mm x 185mm
00-9962-022-23	ZMR Taper Stem Provisional 22mm x 235mm
00-9955-040-02	Stem Impactor

Pressure Sentinel Intramedullary Reamers Instrument Kit
00-9975-000-11

DCS:

Prod. No.	Description
00-2228-040-00	Case
00-2228-041-00	Base
00-2228-042-00	Tray 1
00-2228-043-00	Tray 2
00-2228-044-00	Tray 3
00-2228-045-00	Tray 4
00-9975-099-00	Lid
00-2228-008-00	Pressure Sentinel Flex Reamer 8.0mm
00-2228-008-05	Pressure Sentinel Flex Reamer 8.5mm
00-2228-009-00	Pressure Sentinel Flex Reamer 9.0mm
00-2228-009-05	Pressure Sentinel Flex Reamer 9.5mm
00-2228-010-00	Pressure Sentinel Flex Reamer 10.0mm
00-2228-010-05	Pressure Sentinel Flex Reamer 10.5mm
00-2228-011-00	Pressure Sentinel Flex Reamer 11.0mm
00-2228-011-05	Pressure Sentinel Flex Reamer 11.5mm
00-2228-012-00	Pressure Sentinel Flex Reamer 12.0mm
00-2228-012-05	Pressure Sentinel Flex Reamer 12.5mm
00-2228-013-00	Pressure Sentinel Flex Reamer 13.0mm
00-2228-013-05	Pressure Sentinel Flex Reamer 13.5mm
00-2228-014-00	Pressure Sentinel Flex Reamer 14.0mm
00-2228-014-05	Pressure Sentinel Flex Reamer 14.5mm
00-2228-015-00	Pressure Sentinel Flex Reamer 15.0mm
00-2228-015-05	Pressure Sentinel Flex Reamer 15.5mm
00-2228-016-00	Pressure Sentinel Flex Reamer 16.0mm
00-2228-016-05	Pressure Sentinel Flex Reamer 16.5mm
00-2228-017-00	Pressure Sentinel Flex Reamer 17.0mm
00-2228-017-05	Pressure Sentinel Flex Reamer 17.5mm
00-2228-018-00	Pressure Sentinel Flex Reamer 18.0mm
00-2228-018-05	Pressure Sentinel Flex Reamer 18.5mm
00-2228-019-00	Pressure Sentinel Flex Reamer 19.0mm
00-2228-019-05	Pressure Sentinel Flex Reamer 19.5mm
00-2228-020-00	Pressure Sentinel Flex Reamer 20.0mm
00-2228-020-05	Pressure Sentinel Flex Reamer 20.5mm
00-2228-021-00	Pressure Sentinel Flex Reamer 21.0mm
00-2228-021-05	Pressure Sentinel Flex Reamer 21.5mm
00-2228-022-00	Pressure Sentinel Flex Reamer 22.0mm
00-2228-022-05	Pressure Sentinel Flex Reamer 22.5mm
00-2228-023-00	Pressure Sentinel Flex Reamer 23.0mm
00-2228-023-05	Pressure Sentinel Flex Reamer 23.5mm
00-2228-024-01	Pressure Sentinel Flex Reamer 24.0mm
00-2228-024-05	Pressure Sentinel Flex Reamer 24.5mm
00-2228-025-01	Pressure Sentinel Flex Reamer 25.0mm
00-2228-025-05	Pressure Sentinel Flex Reamer 25.5mm
00-2228-026-01	Pressure Sentinel Flex Reamer 26.0mm
00-2228-026-05	Pressure Sentinel Flex Reamer 26.5mm
00-2228-027-01	Pressure Sentinel Flex Reamer 27.0mm
00-9965-081-10	Diameter Gauge
00-2228-030-00	T-Handle Extractor
00-5044-012-00	Universal 3 Jaw Chuck Adapters (2)

ZMR Instrument

ZMR XL Porous Proximal Preparation Set
00-9975-000-21

DCS:

Prod. No.	Description
00-9976-070-00	ZMR XL Proximal Preparation Case
00-9976-071-00	Base
00-9975-099-00	Lid
00-9952-001-00	ZMR XL Provisional Body Adapter
00-9953-078-40	ZMR XL Provisional Body Standard Offset 78mm
00-9953-078-45	ZMR XL Provisional Body Extended Offset 78mm
00-9953-083-40	ZMR XL Provisional Body Standard Offset 83mm
00-9953-083-45	ZMR XL Provisional Body Extended Offset 83mm
00-9953-093-40	ZMR XL Provisional Body Standard Offset 93mm
00-9953-093-45	ZMR XL Provisional Body Extended Offset 93mm
00-9953-103-40	ZMR XL Provisional Body Standard Offset 103mm
00-9953-103-45	ZMR XL Provisional Body Extended Offset 103mm
00-9965-002-16	ZMR XL Porous Distal Pilot Size 16.5
00-9965-002-18	ZMR XL Porous Distal Pilot Size 18.0
00-9965-002-19	ZMR XL Porous Distal Pilot Size 19.5
00-9975-002-21	ZMR XL Porous Distal Pilot Size 21.0
00-9975-002-22	ZMR XL Porous Distal Pilot Size 22.5
00-9975-002-24	ZMR XL Porous Distal Pilot Size 24.0
00-9975-002-25	ZMR XL Porous Distal Pilot Size 25.5
00-9975-037-05	ZMR Conical Reamer Spacer
00-9975-039-00	Distal Pilot Wrench
00-9975-047-02	ZMR XL Taper Proximal Reamer
00-9975-057-02	ZMR XL Porous Proximal Reamer

ZMR XL Provisional Taper Stem Set
00-9975-000-23

DCS:

Prod. No.	Description
00-9976-075-00	ZMR XL Taper Stem Provisional Case
00-9976-076-00	Base
00-9976-077-00	Tray
00-9976-099-00	Lid
00-9952-017-13	ZMR XL Provisional Taper Stem 17x135
00-9952-017-18	ZMR XL Provisional Taper Stem 17x185
00-9952-017-23	ZMR XL Provisional Taper Stem 17x235
00-9952-018-13	ZMR XL Provisional Taper Stem 18x135
00-9952-018-18	ZMR XL Provisional Taper Stem 18x185
00-9952-018-23	ZMR XL Provisional Taper Stem 18x235
00-9952-019-13	ZMR XL Provisional Taper Stem 19x135
00-9952-019-18	ZMR XL Provisional Taper Stem 19x185
00-9952-019-23	ZMR XL Provisional Taper Stem 19x235
00-9952-020-13	ZMR XL Provisional Taper Stem 20x135
00-9952-020-18	ZMR XL Provisional Taper Stem 20x185
00-9952-020-23	ZMR XL Provisional Taper Stem 20x235
00-9952-021-13	ZMR XL Provisional Taper Stem 21x135
00-9952-021-18	ZMR XL Provisional Taper Stem 21x185
00-9952-021-23	ZMR XL Provisional Taper Stem 21x235
00-9952-022-13	ZMR XL Provisional Taper Stem 22x135
00-9952-022-18	ZMR XL Provisional Taper Stem 22x185
00-9952-022-23	ZMR XL Provisional Taper Stem 22x235
00-9952-023-18	ZMR XL Provisional Taper Stem 23x185
00-9952-023-23	ZMR XL Provisional Taper Stem 23x235
00-9952-024-18	ZMR XL Provisional Taper Stem 24x185
00-9952-024-23	ZMR XL Provisional Taper Stem 24x235

ZMR XL Taper Proximal Preparation Set
00-9975-000-22

DCS:

Prod. No.	Description
00-9976-070-00	ZMR XL Proximal Preparation Case
00-9976-071-00	Base
00-9975-099-00	Lid
00-9953-078-40	ZMR XL Provisional Body Standard Offset 78mm
00-9953-078-45	ZMR XL Provisional Body Extended Offset 78mm
00-9953-083-40	ZMR XL Provisional Body Standard Offset 83mm
00-9953-083-45	ZMR XL Provisional Body Extended Offset 83mm
00-9953-093-40	ZMR XL Provisional Body Standard Offset 93mm
00-9953-093-45	ZMR XL Provisional Body Extended Offset 93mm
00-9953-103-40	ZMR XL Provisional Body Standard Offset 103mm
00-9953-103-45	ZMR XL Provisional Body Extended Offset 103mm
00-9975-047-02	ZMR XL Taper Proximal Reamer
00-9975-037-05	ZMR Conical Reamer Spacer
00-9975-039-00	Distal Pilot Wrench
00-9965-002-16	ZMR XL Porous Distal Pilot Size 16.5
00-9965-002-18	ZMR XL Porous Distal Pilot Size 18.0
00-9965-002-19	ZMR XL Porous Distal Pilot Size 19.5
00-9975-002-21	ZMR XL Porous Distal Pilot Size 21.0
00-9975-002-22	ZMR XL Porous Distal Pilot Size 22.5
00-9975-002-24	ZMR Distal Pilot Size 24.0
00-9975-002-25	ZMR Distal Pilot Size 25.5
00-9975-057-02	ZMR XL Porous Proximal Reamer

ZMR XL Distal Taper Reamer Set
00-9975-000-24

DCS:

Prod. No.	Description
00-9976-080-00	ZMR XL Taper Reamer Case
00-9976-081-00	Base
00-9975-099-00	Lid
00-9955-017-10	ZMR XL Taper Reamer Size 17
00-9955-018-10	ZMR XL Taper Reamer Size 18
00-9955-019-10	ZMR XL Taper Reamer Size 19
00-9955-020-10	ZMR XL Taper Reamer Size 20
00-9955-021-10	ZMR XL Taper Reamer Size 21
00-9955-022-10	ZMR XL Taper Reamer Size 22
00-9955-023-10	ZMR XL Taper Reamer Size 23
00-9955-024-10	ZMR XL Taper Reamer Size 24

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