



ZMR®
**Over-the-Junction
Instruments for
Revision Hip
Arthroplasty**
Surgical Technique



Introduction

The *ZMR* Over-the-Junction (OTJ) Instrumentation includes four key components; 1) OTJ Proximal Reamers 2) OTJ Taper Protectors 3) OTJ Trochanteric Starter Reamers and 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 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 provisionals 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.

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 Reamers

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.

Metal Proximal Provisionals

ZMR metal proximal provisionals 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.

WARNING: The standard junction *ZMR* 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 the *ZMR* XL.

1 Distal Preparation

The ZMR OTJ reamers can be used after the distal trial stem or definitive distal implant has been fully seated in the femur. As such, follow the appropriate ZMR surgical technique from the beginning through the desired point when proximal preparation is initiated.

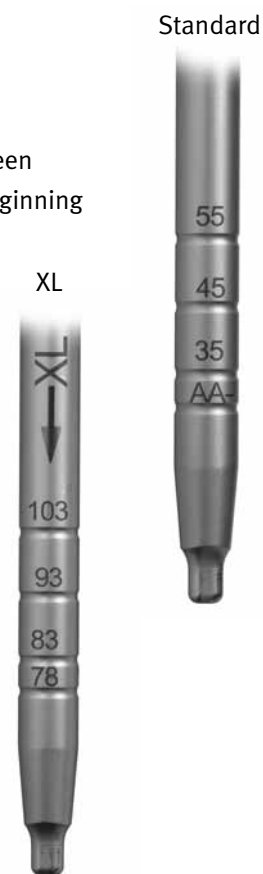
Refer to the current surgical techniques as indicated –

- For Porous, Porous Slotted and Splined Stems: *ZMR Porous Revision Hip Prosthesis Surgical Technique (97-9990-002-00)*
- For Tapered Distal Stems: *ZMR Crossover Instruments and Surgical Technique (97-9990-007-00)*
- For XL Junction Implants: *ZMR XL Taper and Porous Hip Prostheses Surgical Technique (97-9921-002-00)*.

When impacting the distal trial/stem, be sure to reference the depth marks on the stem inserter (# 00-9955-040-02) to the tip of the greater trochanter as these correspond to the +0mm head center of the various proximal body heights and will aid in selecting the appropriate proximal body.

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.

WARNING: The standard junction ZMR 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 the ZMR XL.



2 Using the Trochanteric Starter Reamer

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 (Item # 00-9975-007-04) for the standard junction stems/trials, and the XL size (Item # 00-9975-007-05) for the XL stems/trials. If preparing for a tapered distal 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 distal 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.

Note: 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.

3 Assembling the Taper Protector

Select the appropriately sized Taper Protector (Standard Junction Item #00-9975-007-00 / XL Junction Item #00-9975-007-01) and thread onto the proximal threads of the distal stem implant or the distal provisional. If unable to do so by hand, use the Stem Inserter (Item #00-9955-040-02) by placing it into the proximal inserter feature on the Taper Protector and turn in a clockwise motion until it stops.

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.

Note: 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.



4 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. 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.

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.

If choosing to implant a Cone Body, the preparation of the proximal femur is now complete. If selecting to use a Calcar or Spout body, please follow the preparation steps outlined in the ZMR Porous Revision Hip Prosthesis Surgical Technique.



Taper Protector is visible

5 Remove Taper Protector

Remove the Taper Protector from the distal implant either by hand or by inserting the Stem Inserter (Item #00-9955-040-02) into the proximal inserter feature and turning counter clockwise.



6 Using Proximal Provisionals for Determining Version, Offset, and Build-Up

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.

- If using the distal provisional, the non-metallic proximal provisionals must be used. For the Cone Body, select the appropriate body size from the Cone Body Provisional Instrument Kit #00-9970-000-02. For the Calcar Body, use Calcar Body Provisional Instrument Kit #00-9970-000-03 and for the Spout Bodies, use Spout Body Provisional Instrument Kit #00-9970-000-01. In all instances, select the proximal provisional which corresponds to the body size of the last proximal reamer used. Follow the steps outlined in the appropriate surgical technique and finish the surgery.
- If the definitive distal implant was used during proximal preparation, the surgeon may either use the non-metallic proximal provisionals as indicated above, or use the Metal Proximal Provisionals found in the ZMR OTJ Instrumentation Kit #KT-9975-000-00. Important 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, proceed to Step #7.



Proximal body
metal provisional

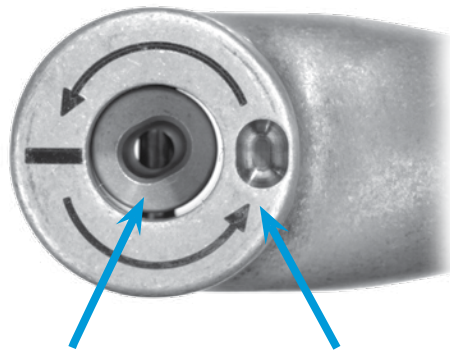
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Using Metal Proximal Provisionals

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. Perform trial reduction.

Note: The MPP 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.

Mark the desired stem version on the femur with a bovie or marking pen. Remove the MPP by inserting the Stem Inserter into the screw located within the proximal shoulder of the provisional and turn counter clockwise one-quarter to one-half turn. If the provisional becomes locked on, the provisional does have an extraction hole that can be used with the Extractor hook (Item #00-6601-002-00) which is found in the Porous Revision General Instrument Kit #00-9975-000-45.



Used to remove MPP from stem by turning counter clockwise

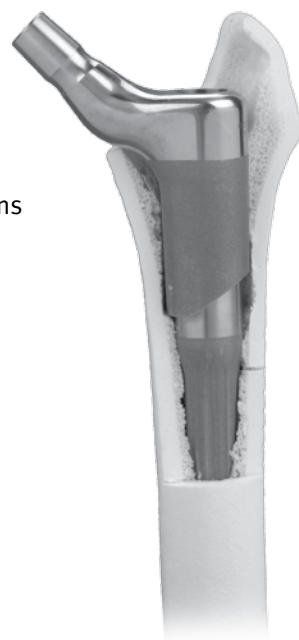
Used to secure MPP on stem

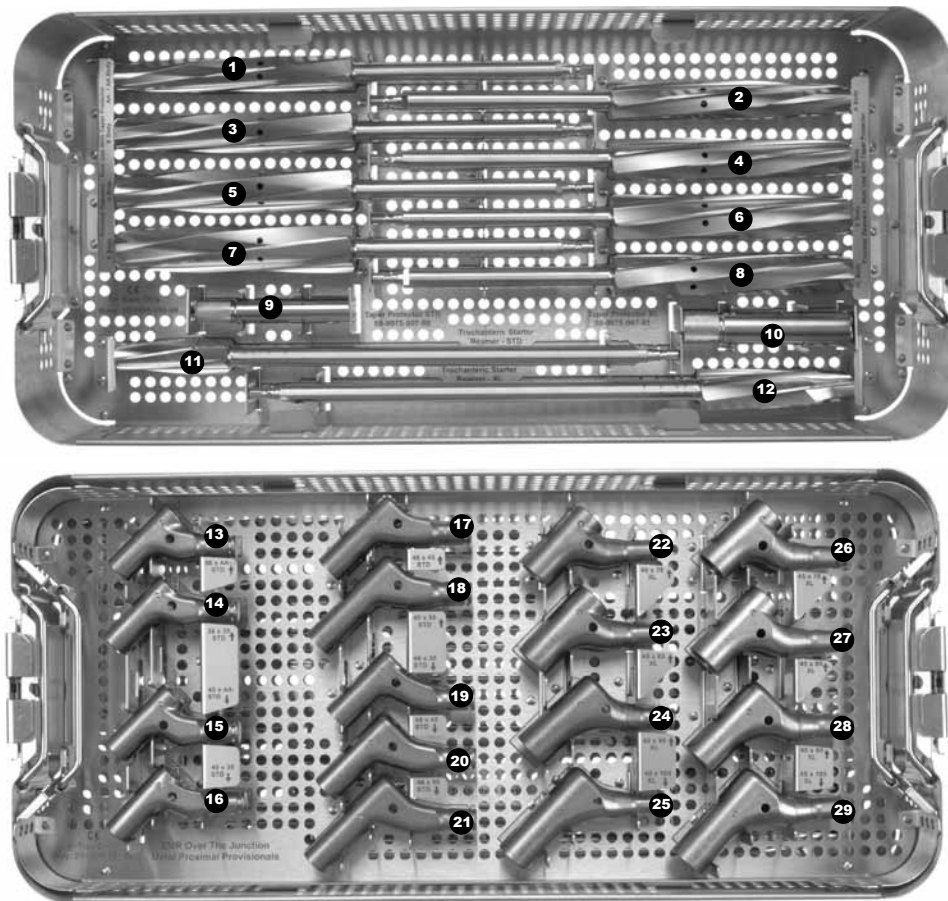


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Implant Assembly

Assemble the proximal body implant and finish the procedure per the instructions in the appropriate surgical technique.





Ordering Information

Instrument Scope List

ZMR Over-the-Junction Instrument Kit

Order: KT-9975-000-00 (Includes 1 each of the following)

Item Number	Description	Item Number	Description	Item Number	Description
1	00-9975-007-16 Proximal Reamer – AA Body	10	00-9975-007-01 Taper Protector - XL	20	00-9996-046-45 Proximal Provisional 46 x 45 STD
2	00-9975-007-17 Proximal Reamer – A Body	11	00-9975-007-04 Trochanteric Starter Reamer - STD	21	00-9996-046-55 Proximal Provisional 46 x 55 STD
3	00-9975-007-18 Proximal Reamer – B Body	12	00-9975-007-05 Trochanteric Starter Reamer - XL	22	00-9924-040-78 Proximal Provisional 40 x 78 XL
4	00-9975-007-19 Proximal Reamer – C Body	13	00-9996-036-30 Proximal Provisional 36 x AA- STD	23	00-9924-040-83 Proximal Provisional 40 x 83 XL
5	00-9975-007-20 Proximal Reamer – D Body	14	00-9996-036-35 Proximal Provisional 36 x 35 STD	24	00-9924-040-93 Proximal Provisional 40 x 93 XL
6	00-9975-007-21 Proximal Reamer – E Body	15	00-9996-040-30 Proximal Provisional 40 x AA- STD	25	00-9924-040-13 Proximal Provisional 40 x 103 XL
7	00-9975-007-23 Proximal Reamer – F Body	16	00-9996-040-35 Proximal Provisional 40 x 35 STD	26	00-9924-045-78 Proximal Provisional 45 x 78 XL
8	00-9975-007-02 Proximal Reamer – XL Body	17	00-9996-040-45 Proximal Provisional 40 x 45 STD	27	00-9924-045-83 Proximal Provisional 45 x 83 XL
9	00-9975-007-00 Taper Protector - STD	18	00-9996-040-55 Proximal Provisional 40 x 55 STD	28	00-9924-045-93 Proximal Provisional 45 x 93 XL
		19	00-9996-046-35 Proximal Provisional 46 x 35 STD	29	00-9924-045-13 Proximal Provisional 45 x 103 XL

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