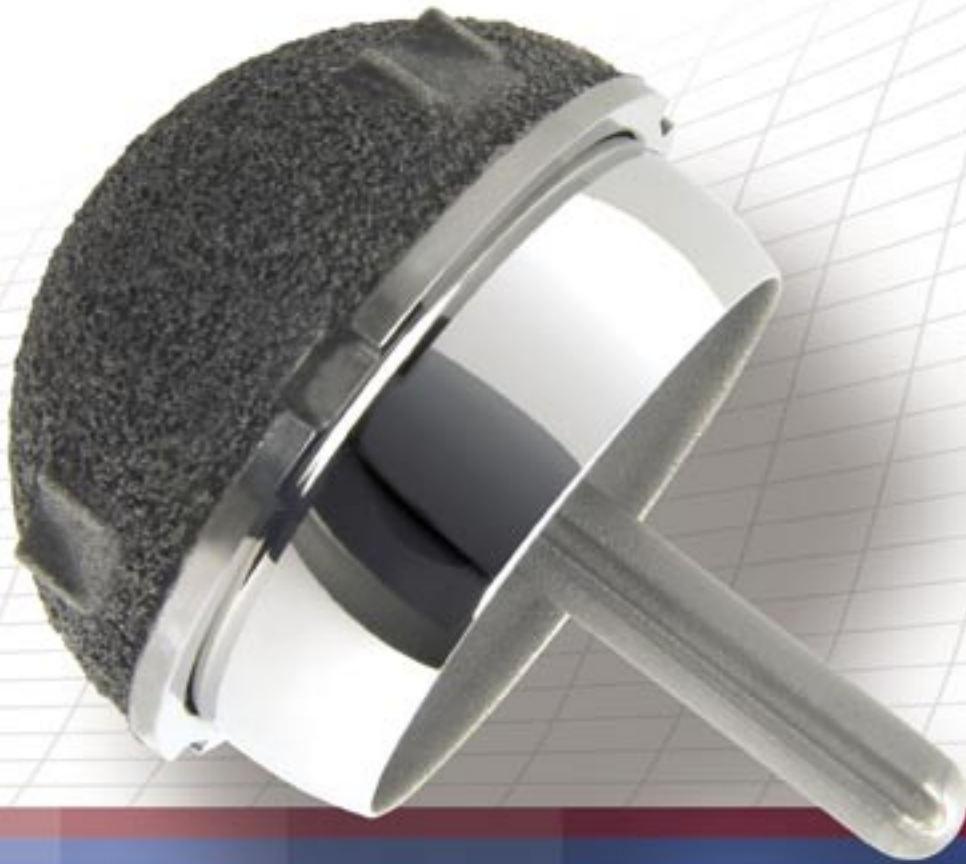




Total Resurfacing System



Spine

Trauma

BioMaterials

Cement

Joint Replacement

## Operative Technique

## ReCap<sup>®</sup> Hip Total Resurfacing System

The accumulated experience has shown that wear particles of polyethylene are the principle cause of interface failure. This is particularly important in young, high activity individuals where long term fixation is needed. The time has come when the use of optimally designed Metal on Metal bearings with virtually no wear debris generation should be considered in such patients.

Biomet's commitment to manufacturing Gold Standard Metal on Metal implants dates back to 1961, with the Stanmore Total Hip System. Followed shortly after by the McKee Farrah Total Hip, and more recently with the M<sup>2</sup>a Hip System.

In response to this, Biomet, alongside Key Development Centres world-wide, have developed the ReCap<sup>™</sup> Total Resurfacing System.



Total Resurfacing System



### Disclaimer

Biomet UK Ltd., as the manufacturer of this device, does not practice medicine and does not recommend any particular surgical technique for use on a specific patient. The surgeon who performs any implant procedure is responsible for determining and utilising the appropriate techniques for implanting the prosthesis in each individual patient. Biomet UK Ltd. is not responsible for selection of the appropriate surgical technique to be utilised on an individual patient.

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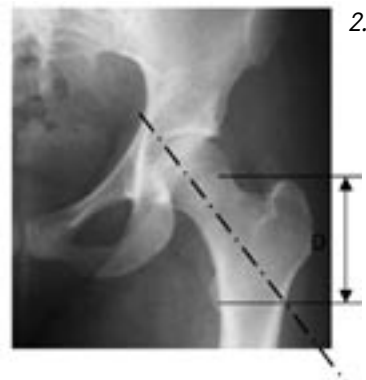
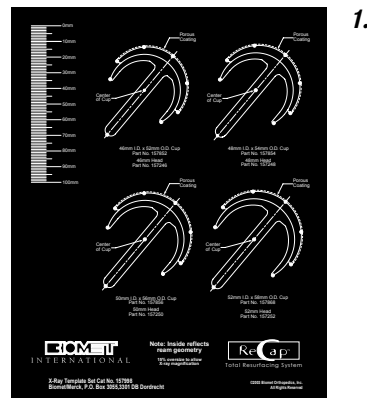
## Step 1

### Templating

The femoral head is templated on Anterior/Posterior and Lateral x-rays for size and position (*see diag. 1*). The implant template is to match the circumference of the original femoral head. The template should be positioned so that the stem of the implant is **NOT** in varus (take note of the colour-coded markings on the chosen template as they will correspond to colour-coded instrumentation during surgery).

**Note: The following step is only necessary if you intend to use the external alignment frame with a lateral positioned steinmann pin.**

Before surgery can commence, the position of the laterally positioned steinmann pin must be determined. This is completed by first taking radiographs at the same magnification as the x-ray template to be used. When the correct size implant has been selected that best suits the patient anatomy and the femoral component positioned in a neutral or slightly valgus angle, a line is drawn on the x-ray along the axis of the femoral neck that bisects the lateral cortex of the femur (*see diag. 2*). The dimension "D" from the tip of the greater trochanter to the intersection point is then recorded.



## Step 2

### Surgical Approach

Expose the femoral head through standard surgical incision.

## Step 3

### Femoral Head/Neck Sizing

The head sizing gauge is placed over the femoral head until appropriate size is identified. The neck sizing gauge on opposite end of head sizing gauge is placed around the femoral neck and rotated to determine if contact with the femoral neck will occur when cylindrical reaming commences. If the neck sizing gauge does not fit around the femoral neck or is tight, select the next larger size until the neck sizing gauge fits loosely (*see diag. 3*).

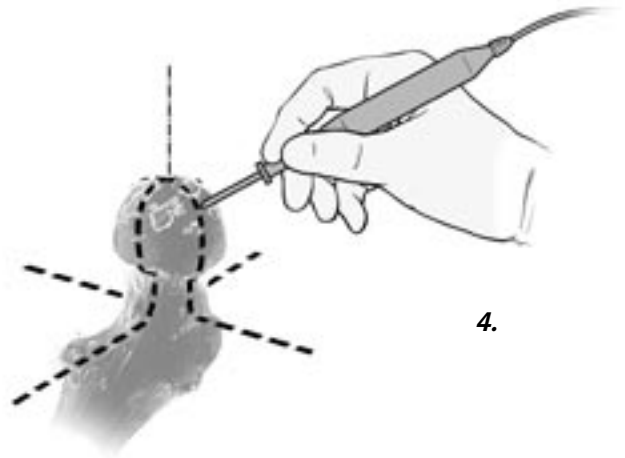


## Step 4

### Identifying the Femoral Neck Centre

Using a cauterising marker, draw lines bisecting the femoral neck into two planes (anterior/posterior and medial/lateral). These lines should extend until they intersect at the top of the femoral head (see *diag. 4*).

**Note:** The femoral head should be ignored when determining the location of the lines, as the femoral neck is to be used for referencing.




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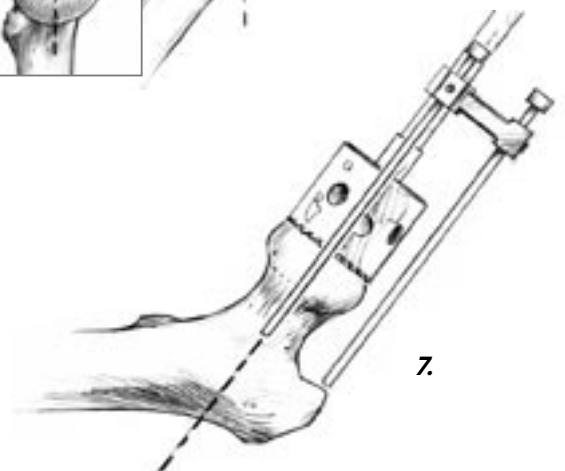
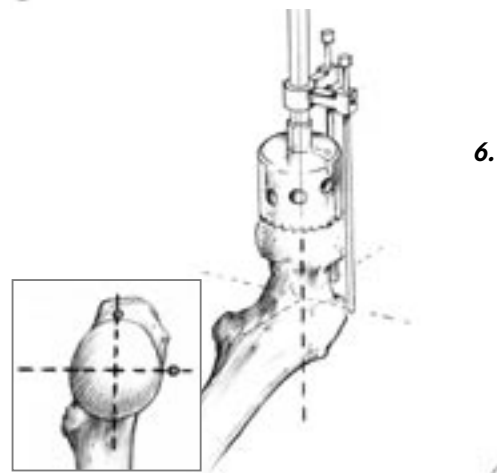
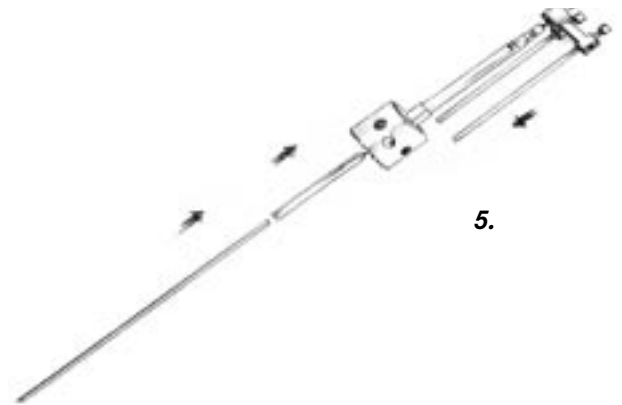
## Option 1

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## Step 5:1

### Identifying the Femoral Neck Centre

The alignment guide may then be used to verify the location of the femoral neck centre (see *diag. 5*). This is determined through visualization of the right angle rods extending from the alignment guide and their relationship to the previously cauterised marks bisecting the femoral neck (see *diag. 6*) (the location of the entry point for the guide wire is usually superior and anterior to the perceived center of the femoral head).



## Step 6:1

### Guide Wire Placement

The guide wire may then be drilled through the femoral head into the perceived centre of the femoral neck (see *diag 7*). The wire should stop upon reaching the lateral cortex (it is common to have to reset the position of the wire, and the lateral cortex should not be perforated until the surgeon is satisfied with the wire's location).

## Option 2

### Step 5:2

#### Identifying the Femoral Neck Centre

The joint is then exposed and femur manipulated to allow adequate visualisation of the lateral femur and femoral head.

Using a stainless steel measuring rule the dimension obtained during step 1 is marked on the lateral cortex and one short steinmann pin (3.2mm x 40mm) is gently inserted into the lateral cortex at this same position. The pin is now the anchor point to which the guide wire alignment device will locate (*see diag. 8*).

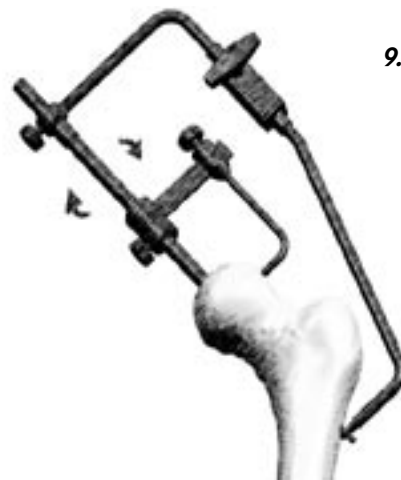


### Step 6:2

#### Guide Wire Placement

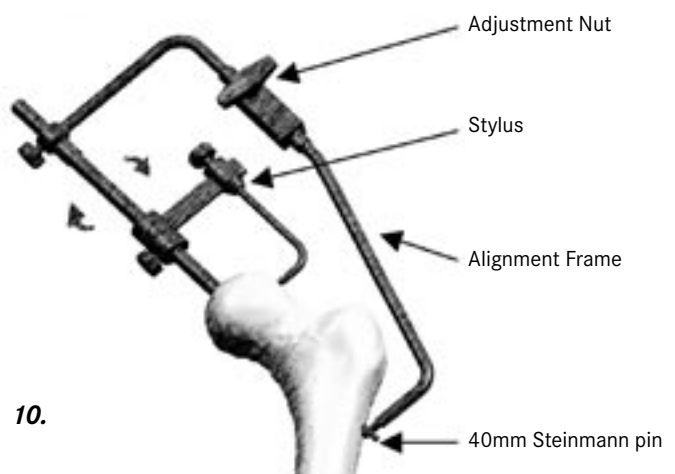
The guide pin alignment frame is attached to the lateral steinmann pin and located onto the femoral head as shown (*see diag 9*).

It is important to ensure that the alignment device is correctly positioned and secured on the femoral head as this frame acts as the guide for the long steinmen pin over which all subsequent femoral machining operations will take place. It is not unusual for the alignment frame to be relocated on the femoral head a number of times before the desired position is achieved (*see diag 10*).



When the desired guide wire entry point has been located and the frame locked in position, move the stylus position to the diameter that coincides with the selected femoral head selection. The stylus is then rotated around the femoral neck to check that the frame has been position centrally to the femoral neck. This generally tends to be slightly superior and anterior to the centre of the head. This step also checks that the selected head diameter does not notch the femoral neck. Any notching of the femoral neck will seriously reduce the outcome of the operation.

When the centre of the neck has been determined the long steinmann pin is driven into the femoral head and through the femoral neck.

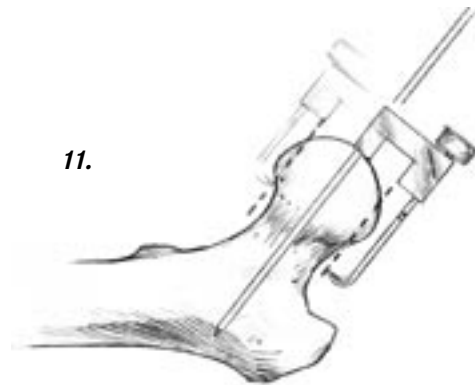




## Step 7

### Neck Feeler Gauge

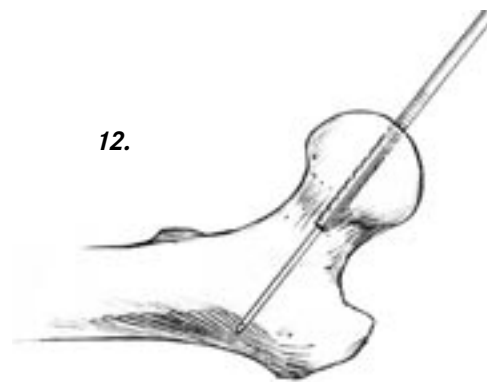
Slide the colour-coded neck feeler gauge onto the guide wire. Rotate the feeler gauge around the neck to ensure that the cylindrical reamer will not contact the femoral neck (*see diag. 11*). If the feeler gauge contacts the femoral neck, the guide wire will need to be repositioned (The anterior/superior region of the femoral neck has a ridge of bone. It is important that the neck feeler gauge clear this ridge of bone, in order to avoid notching with the cylindrical reamer).



## Step 8

### Cannulated Drilling

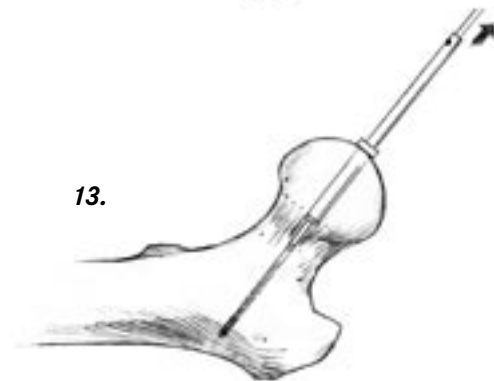
The cannulated drill is placed over the guide wire. The cannulated drill is advanced into the femoral head stopping at the colour-coded depth marking on the drill shaft (*see diag. 12*). The cannulated drill and guide wire may now be removed.



## Step 9

### Placement of the Guide Rod

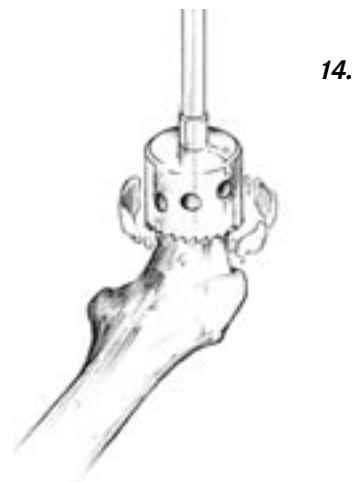
The standard length guide rod (6.5mm cut) may now be inserted into the hole created by the cannulated drill (*see diag. 13*), stopping when the collar rests on top of the femoral head (-3mm, 8mm, 9.5mm and 11mm cuts are also available to adjust the cut depth in order to restore leg length).



## Step 10

### Cylindrical Reaming

Advance the appropriately sized cylindrical reamer over the guide rod and begin reaming the femoral head. It is often better to be conservative and cut one size larger than the expected size of the final femoral component as this leaves room to adjust the femoral size to the acetabular component if necessary. Use the holes on the side of the cylindrical reamer to verify when the reamer has bottomed on the guide rod collar. The tip of the cylindrical ream depth, with the standard guide rod in place, will extend 5mm beyond the outer edge of the implant's articulating surface (*see diag 14*). Be sure not to advance the reamer too far, or notch the femoral neck (should notching of the femoral neck occur, it is necessary to convert the resurfacing procedure to a total hip procedure, as notching of the femoral neck may negatively affect the survivorship of the resurfacing implant).



## Step 11 Spherical Reaming

Advance the appropriately sized spherical reamer over the guide rod. The spherical reamer is advanced until the spherical reamer bottoms on the collar of the guide rod (see *diag 15*). The window at the base of the spherical reamer may also be used to verify when the spherical reamer has bottomed out. Upon removal of the spherical reamer and guide rod, take a rongeur and remove the small peg of bone left on top of the femoral head.



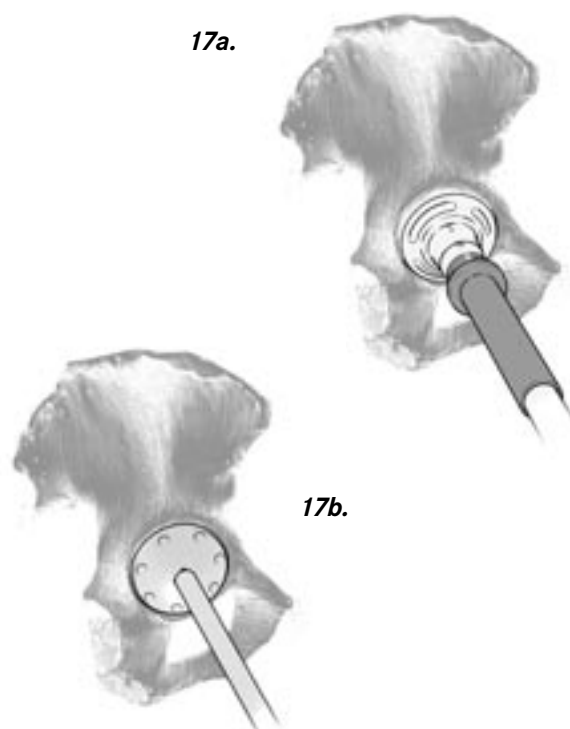
## Step 12 Trialing the Femoral Implant

The appropriately sized head trial is placed over the freshly prepared femoral head to check the fit of the implant and to perform a trial reduction (see *diag 16*). The head trial has the 0.5mm cement mantle built-in. The holes in the head trial are used to visualize component coverage and can also be used as a guide for cement key hole preparation. It is recommended to mark the margin of the trial at this time. This will help in final implant positioning.



## Step 13 Acetabular Preparation and Implant Insertion

Standard preparation of the acetabulum should commence at this point (see *diag 17a*). The porous coated, hemispherical metal-on-metal cup used with the ReCap™ Total Resurfacing System is designed to achieve stable fixation with a 2mm under ream (ream to 54mm, implant a 56mm cup). Preparation of the acetabulum at this stage allows for adjustment of the femoral cylindrical reamer size to accommodate changes in cup size during preparation of the acetabulum (see step 11). There is a 6mm relationship between the cup size and the femoral implant size, a 56mm cup will mate with a 6mm smaller femoral implant, or size 50mm. Occasionally, it may also be necessary to ream up the acetabulum 2mm to allow for the appropriate femoral size. Face plate and ball impactors are available for acetabular component impaction. The acetabular implant is then impacted with a standard orientation of 45 degrees anteversion and 20 degrees inclination (see *diag 17b*).





**NOTE:** It is recommended a two stage impaction technique. Use the gripping impaction/extraction plate to implant the acetabular component into it's correct orientation and impact the shell until the peripheral fins have engaged into the acetabulum. Once this has been achieved disengage the plate (this gives you the opportunity to reveal your shell placement), and use corresponding ball impactor to fully seat the component the component into the acetabulum.

## Step 14

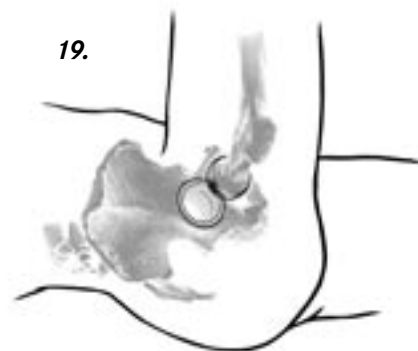
### Placing the Femoral Implant

A thin layer of low **Palamed' G** bone cement is applied to the Interlok<sup>®</sup> surface on the inside of the femoral implant as well as to the femoral head (*see diag 18*) (cement should not be allowed to flow inside of the stem hole on the femoral head). The author also recommends inserting a suction tip into the stem hole in the femoral head via the lesser trochanter in order to draw the cement into the porous bone. The femoral implant is then placed onto the femoral head and impacted until seated with the femoral head impactor (there is a 0.5mm cement mantle built into the cemented implant).

## Step 15

### Reduction:

The ReCap<sup>™</sup> femoral resurfacing implant is then gently reduced into the ReCap<sup>™</sup> acetabular cup where it is designed to articulate as a metal-on-metal bearing. It is also recommended to reduce the joint with excess fluid in place (*see diag 19*).



# Ordering Information

## Implants

### ReCap™ Resurfacing Heads

Cemented Part No.	Size
157238	38mm
157240	40mm
157242	42mm
157244	44mm
157246	46mm
157248	48mm
157250	50mm
157252	52mm
157254	54mm
157256	56mm
157258	58mm
157260	60mm

### M<sup>2</sup>a-Magnum™ M-M Acetabular Cups

Press-Fit Part No.	Press-Fit w/HA Part No.	Size
157844	157944	44mm
157846	157946	46mm
157848	157948	48mm
157850	157950	50mm
157852	157952	52mm
157854	157954	54mm
157856	157956	56mm
157858	157958	58mm
157860	157960	60mm
157862	157962	62mm
157864	157964	64mm
157866	157966	66mm

## Instrumentation

### Head Sizing Gauges

31-500038	38mm
31-500040	40mm
31-500042	42mm
31-500044	44mm
31-500046	46mm
31-500048	48mm
31-500050	50mm
31-500052	52mm
31-500054	54mm
31-500056	56mm
31-500058	58mm
31-500060	60mm

### Neck Sizing Gauges

31-500238	38-39mm
31-500240	40-41mm
31-500242	42-43mm
31-500244	44-45mm
31-500246	46-47mm
31-500248	48-49mm
31-500250	50-51mm
31-500252	52-53mm
31-500254	54-55mm
31-500256	56-57mm
31-500258	58-59mm
31-500260	60mm

### Neck Alignment Guides

31-500330	Small
31-500331	Medium
31-500332	Large
31-600205	Alignment Frame (3 parts)

### Cannulated Instruments

31-500401	Stem Drill
31-500402	Sleeve
31-500500	Standard Guide Rod
31-500501	+1.5mm Guide Rod
31-500502	+3.0mm Guide Rod
31-500503	+4.5mm Guide Rod
31-500504	+6.0mm Guide Rod
31-500499	-3mm Guide Rod

### Oxford™ Phase 3 Rod Removal Hook

US32-401111

### Steinmann Pins (pkg/6)

27-361678	1/8" x 9"
4152-132-310	12" Steinmann Pin
31-600368	14mm Steinmann Pin

### Femoral Head Impactor Handle

31-500900

### Cylindrical Reamer

31-500638	38mm
31-500640	40mm
31-500642	42mm
31-500644	44mm
31-500646	46mm
31-500648	48mm
31-500650	50mm
31-500652	52mm
31-500654	54mm
31-500656	56mm
31-500658	58mm
31-500660	60mm

### Spherical Reamer

31-500738	38mm
31-500740	40mm
31-500742	42mm
31-500744	44mm
31-500746	46mm
31-500748	48mm
31-500750	50mm
31-500752	52mm
31-500754	54mm
31-500756	56mm
31-500758	58mm
31-500760	60mm

### Femoral Head Trial

31-500938	38mm
31-500940	40mm
31-500942	42mm
31-500944	44mm
31-500946	46mm
31-500948	48mm
31-500950	50mm
31-500952	52mm
31-500954	54mm
31-500956	56mm
31-500958	58mm
31-500960	60mm

### Acetabular Ball Impactors

31-131008	38mm
31-131040	40mm
31-131042	42mm
31-131044	44mm
31-131046	46mm
31-131048	48mm
31-131050	50mm
31-131052	52mm
31-131054	54mm
31-131056	56mm
31-131058	58mm
31-131060	60mm

### M<sup>2</sup>a-Magnum™ M-M Cup Inserter Handle

31-157940

### M<sup>2</sup>a-Magnum™ M-M Cup Inserter Plates

31-157944	44mm
31-157946	46mm
31-157948	48mm
31-157950	50mm
31-157952	52mm
31-157954	54mm
31-157956	56mm
31-157958	58mm
31-157960	60mm
31-157962	62mm
31-157964	64mm
31-157966	66mm



Total Resurfacing System



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