EXACTECH **HIP**

Operative Technique

Spartan™ Hip Stem

exactech

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The Spartan Hip Stem is manufactured from forged titanium alloy (Ti6Al4V) as per ISO 5832-3 and ASTM F136. The Spartan Stem has a triple tapered geometry and features a titanium and hydroxyapatite plasma spray proximal coating below its resection line for cementless fixation in total hip arthroplasty.

The Spartan Instrument system is an optimized instrument set for implantation of the cementless hip stem. The Spartan instrument set features an adaptable broach handle that quick-connects to several instrument attachments to reduce the overall number of instruments and minimize the size and weight of the instrument tray.

INDICATIONS

Components of the Hip Replacement System are intended to replace a hip joint where bone stock is sufficient to support the implant. When a surgeon has selected prosthetic replacement as the preferred treatment, the devices are indicated for:

- Non-inflammatory degenerative joint disease including osteoarthritis or avascular necrosis
- Inflammatory joint disease including rheumatoid arthritis
- Correction of functional deformity including congenital hip dysplasia
- Traumatic injury involving the hip joint including traumatic arthritis or femoral head or neck fracture
- Failed previous hip surgery including internal fixation or joint fusion, reconstruction, hemiarthroplasty, surface replacement, or total replacement

Spartan Hip femoral stems and Logical Acetabular Cups are intended for cementless fixation only.

Logical constrained liner components are indicated particularly for patients at high risk of hip dislocation due to a history of prior dislocation, bone loss, joint or soft tissue laxity, neuromuscular disease or intraoperative instability.

CONTRAINDICATIONS

In general, prosthetic components require adequate bone support for correct fit and function. The use of prosthetic components is therefore contraindicated where any pathological condition may reduce the quantity and or strength of the bone which is supporting the prosthesis. Some contraindications are relative to the extent and severity of conditions and the benefits of prosthetic arthroplasty should be considered based on the patient's overall evaluation and the possibility of alternative treatment. Examples of such conditions include; osteoporosis, osteomalacia, osteogenesis imperfecta, or hypophosphatemia. Other contraindications include:

- Conditions limiting blood supply to the bone or joint.
- Systemic or local infection.
- Previous high dose radiotherapy.
- Psychological or neurological conditions which would restrict the patient's ability or compliance in restricting physical activity.
- Skeletal immaturity
- Conditions or activity which may place excessive load on the components such as; obesity, muscle, tendon & ligament deficiencies, multiple joint disabilities, and Charcot joints.

The Logical constrained liners are contraindicated particularly for active patients.

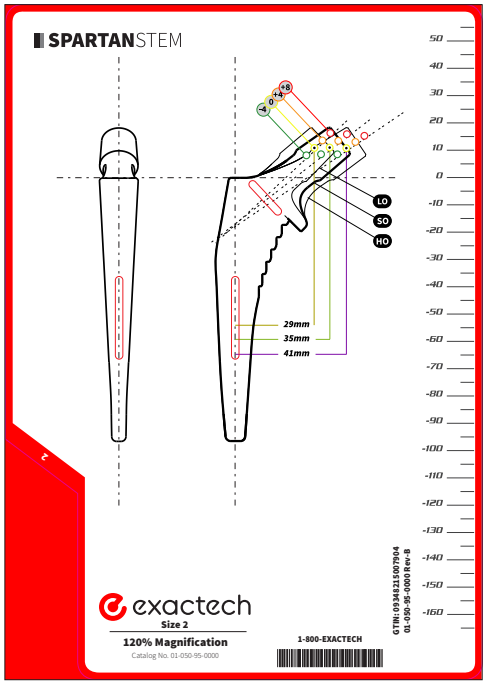


Figure 1

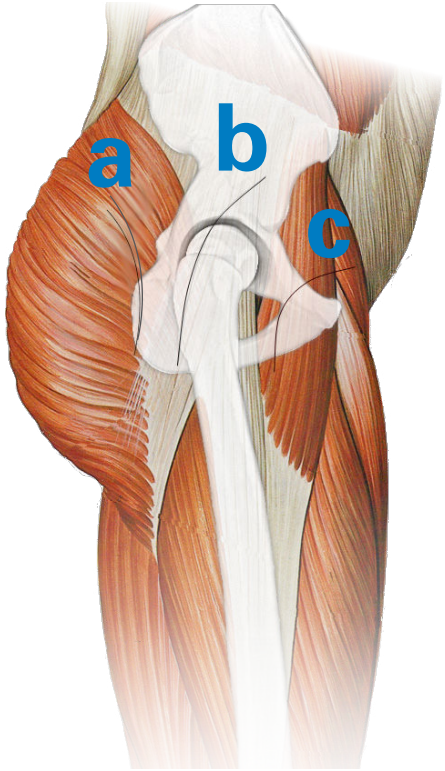


Figure 2

PREOPERATIVE PLANNING

Spartan X-Ray Templates can be used over anterior/posterior and lateral radiographs to help determine the correct size to restore the patient's anatomy. Templates are 120% magnification *(Figure 1)*.

The Spartan stem can be used with any surgical approach that the surgeon selects *(Figure 2)*:

a. Posterior approach

b. Posterolateral/anterolateral approach

c. Anterior approach

Note: *Prior to the following steps, complete all steps detailed in 00-0002670 for the Logical acetabular cup implantation.*

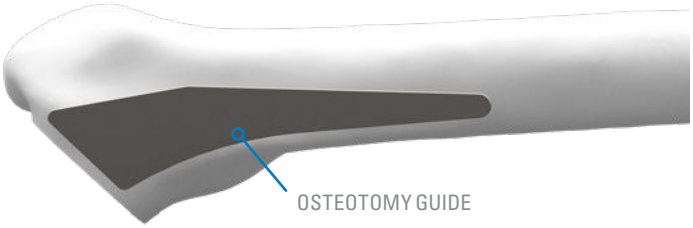


Figure 3

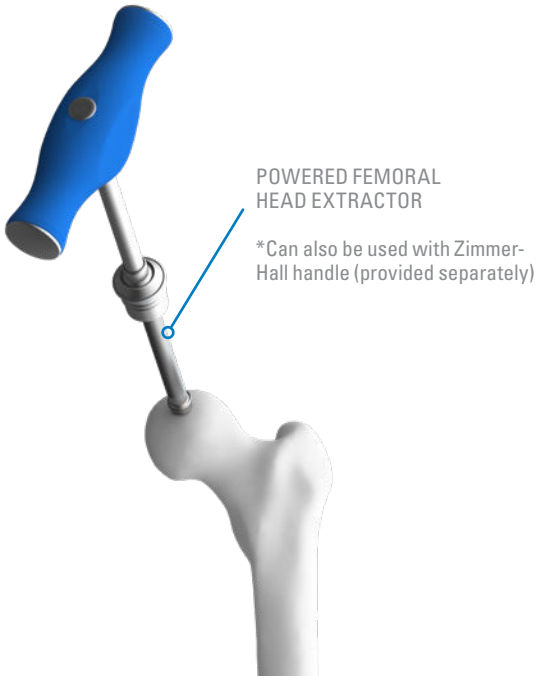


Figure 4

FEMORAL NECK RESECTION

The **Osteotomy Guide** should be used in conjunction with preoperative planning, to determine the level of the femoral neck resection. This can be performed in multiple steps, depending on surgeon preference *(Figure 3)*.

Optional technique:

The **Femoral Head Extractor** may be used with the T-handle or under power to aid in the removal of the resected head, especially during an anterior approach technique *(Figure 4)*.

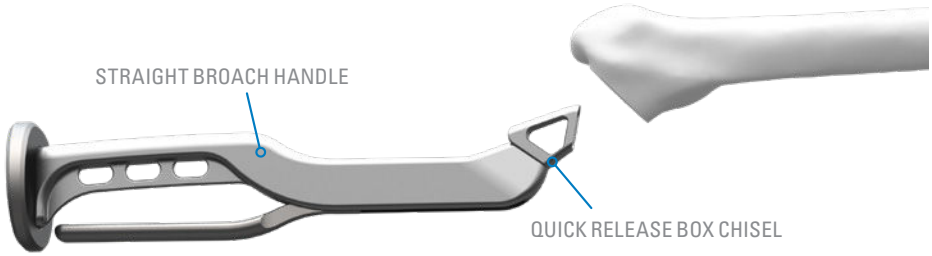


Figure 5

Figure 6a

Figure 6b

FEMORAL PREPARATION

Enter the femoral canal as laterally as possible with the **Box Osteotome** to initiate access to the medullary canal *(Figure 5)*. The **IM Drill** may be used as needed to open the natural axis of the femoral canal for broach preparation *(Figure 6a)*.

Optional Technique:

While the Spartan system is intended to be a broach-only system, the Spartan instrument tray contains instruments for optional use to ensure proper axial alignment along the femoral canal and to induce lateral bias where needed:

a. The IM Drill creates a guide hole for the distal end of the trochanteris reamer *(Figure 6a)*.

b. The Size 1 broach induces lateral bias by rasping beneath the greater trochanter *(Figure 6b)*.

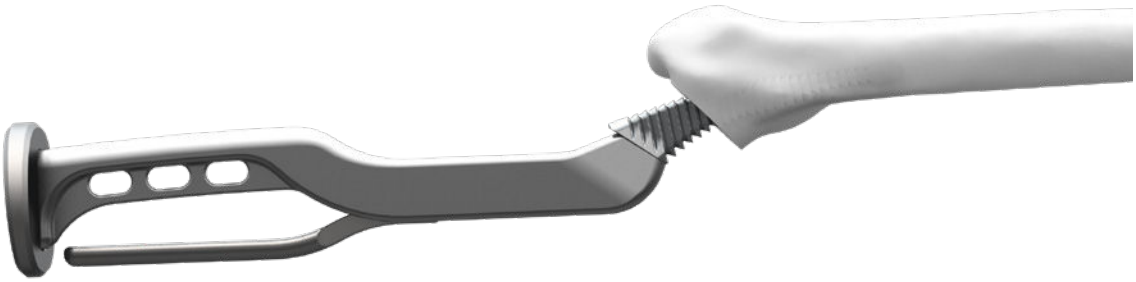


Figure 7

Figure 8

BROACHING

The **Broach** should run parallel to the posterior cortex following the natural anatomy of the femur *(Figure 7)*. Begin with the smallest broach and increase the size of the broach sequentially until longitudinal and rotational stability is achieved. Broaching should then be stopped.

Careful preoperative planning is key to help selection of the final broach size.

The version will be determined be the natural version of the femur.

CALCAR REAMING

With the broach in situ, use the **Calcar Reamer** to achieve a flat resection surface *(Figure 8)*.

Slide the **Reamer** over the broach quick-connect fitting to maintain the resection angle. Carefully advance the reamer towards the broach face and into the resected edge of the femur until it bottoms out against the broach face.

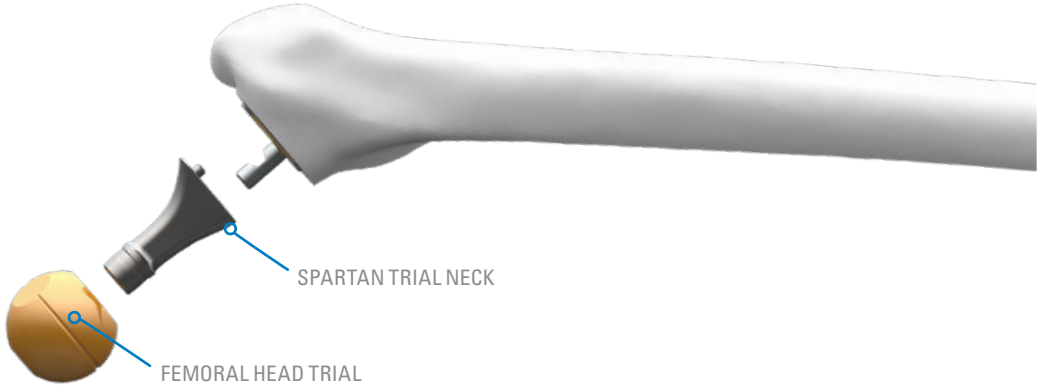


Figure 9

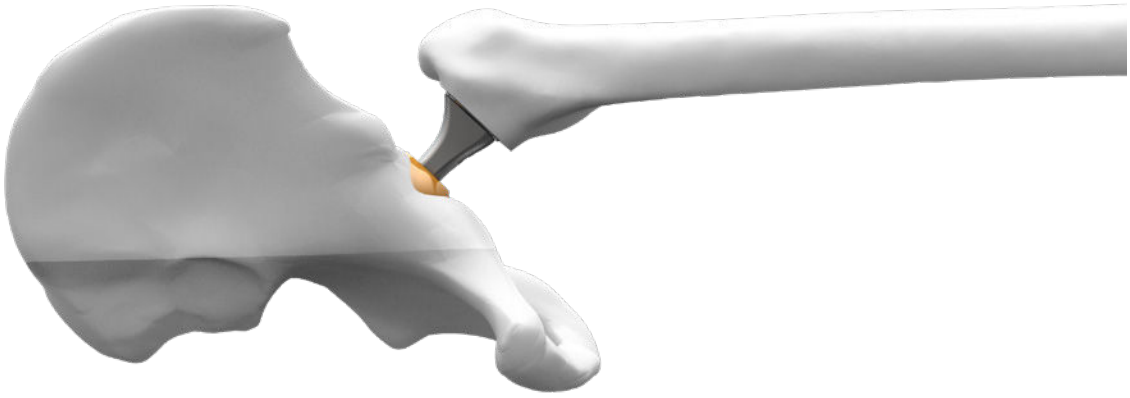


Figure 10

TRIAL REDUCTION

With the final broach still in situ, attach the appropriate trial neck and trial head *(Figure 9)*. Reduce the hip and assess what adjustments, if any, are required to provide stability through a full range of motion *(Figure 10)*. Remove the trial head, trial neck and final broach.

DO NOT irrigate or dry the femoral canal. This will help to preserve the compacted cancellous bone quality and encourage biological fixation of the stem.

Instrument Identification:

Trial heads and trial necks are color coded based on offset.

Refer to **Spartan Implants Sizing Guide** in this surgical technique for more details.

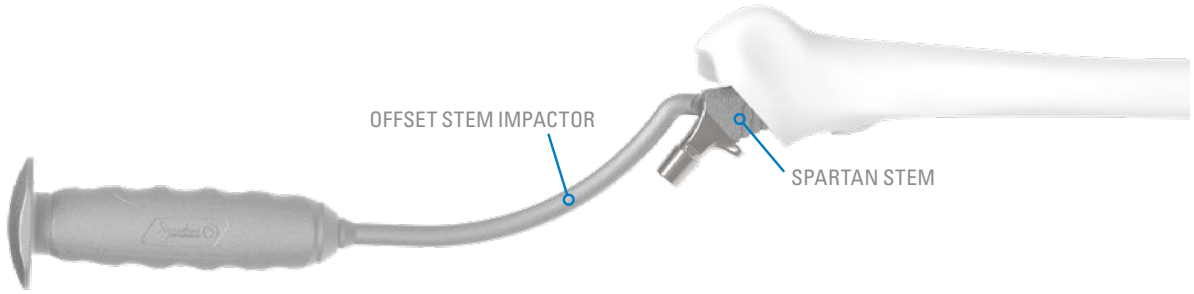


Figure 11

Figure 12

FEMORAL COMPONENT INSERTION

When implanting the definitive stem (same size as final broach) in the femoral canal, ensure that it is directed in by hand. This will help avoid changing the version as a precautionary measure. There should be no more than 15-20mm between the resection line and the top of the coating on the stem.

If the stem does not readily go down this far, the surgeon should broach again. Once the stem is placed, lightly tap the stem impactor to fully seat using either the Offset Stem Impactor *(Figure 11)* or the Monoblock Ball Stem Imactor *(Figure 12)*.

DO NOT over-impact as this may lead to splitting of the femur.

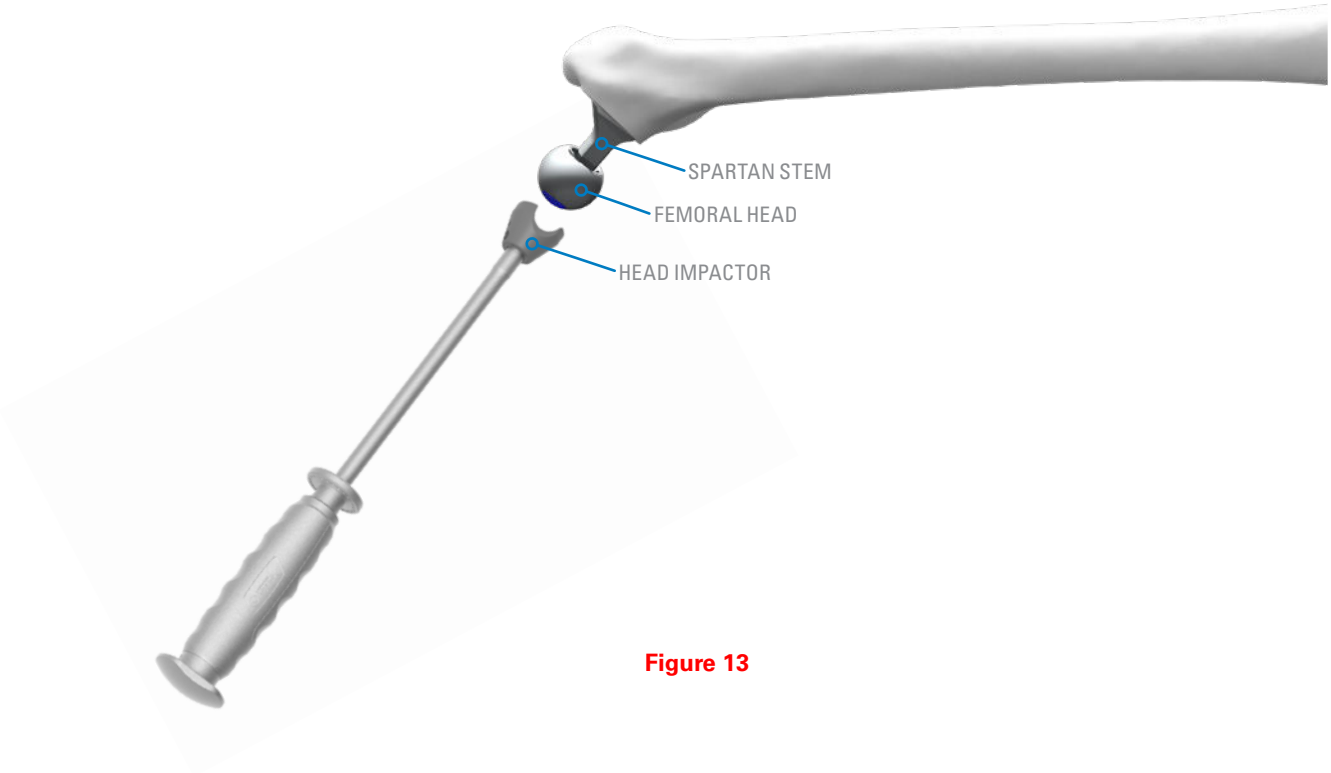
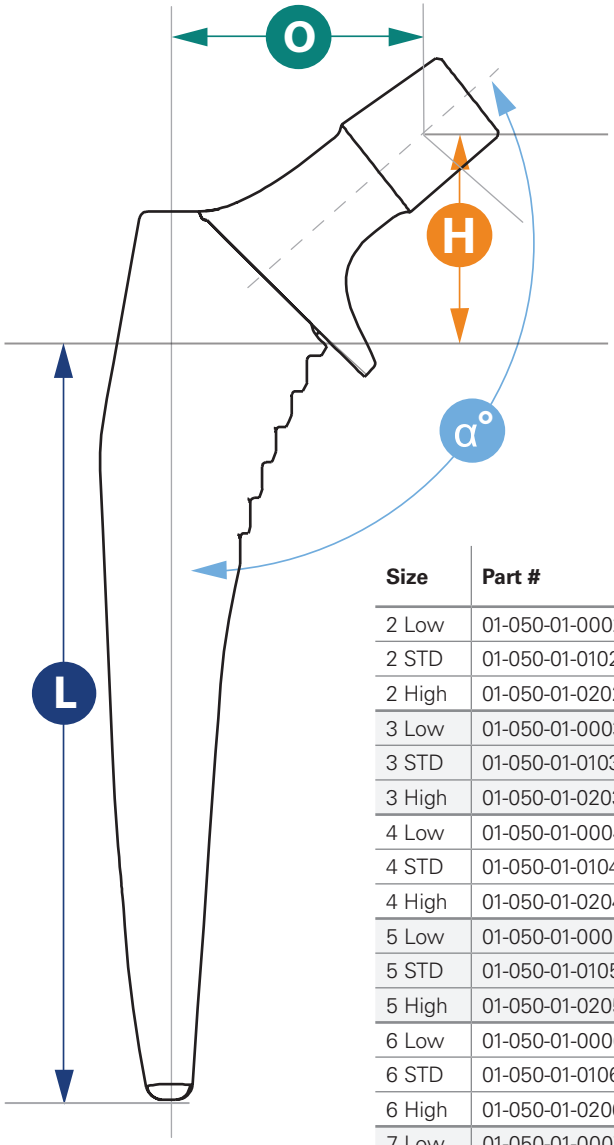


Figure 13

FEMORAL HEAD IMPACTION

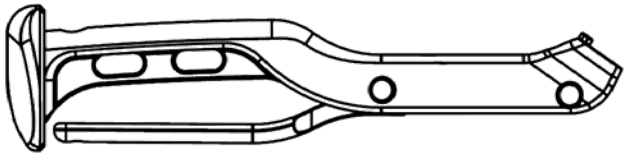
A final trial reduction is carried out to confirm joint stability and range of motion. Clean and dry the stem taper to remove any particulate matter or debris. Place the femoral head onto the taper and lightly tap it using the **Head Impactor** *(Figure 13)*. Ensure that bearing surfaces are clean and finally reduce the hip.

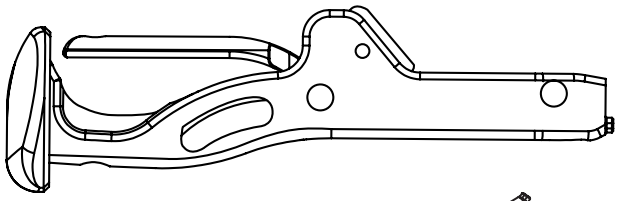


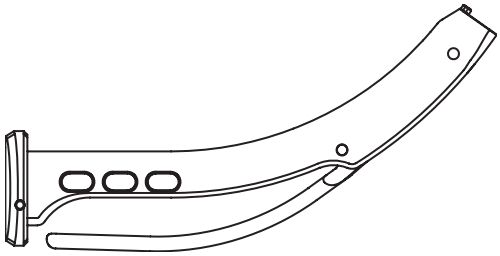
Size	Part #	L Stem Length	H Leg Length Adjustment	O Offset	α° Neck Angle
2 Low	01-050-01-0002	81	26.5	29	133
2 STD	01-050-01-0102	81	26.5	35	128
2 High	01-050-01-0202	81	26.5	41	124
3 Low	01-050-01-0003	96	28.5	29	133
3 STD	01-050-01-0103	96	28.5	35	128
3 High	01-050-01-0203	96	28.5	41	124
4 Low	01-050-01-0004	98	30.5	32	133
4 STD	01-050-01-0104	98	30.5	38	128
4 High	01-050-01-0204	98	30.5	44	124
5 Low	01-050-01-0005	100	32.5	32	133
5 STD	01-050-01-0105	100	32.5	38	128
5 High	01-050-01-0205	100	32.5	44	124
6 Low	01-050-01-0006	102	34.5	32	133
6 STD	01-050-01-0106	102	34.5	38	128
6 High	01-050-01-0206	102	34.5	44	124
7 Low	01-050-01-0007	104	36.5	35	133
7 STD	01-050-01-0107	104	36.5	41	128
7 High	01-050-01-0207	104	36.5	47	124
8 Low	01-050-01-0008	106	38.5	35	133
8 STD	01-050-01-0108	106	38.5	41	128
8 High	01-050-01-0208	106	38.5	47	124
9 Low	01-050-01-0009	108	40.5	35	133
9 STD	01-050-01-0109	108	40.5	41	128
9 High	01-050-01-0209	108	40.5	47	124
10 Low	01-050-01-0010	110	42.5	38	133
10 STD	01-050-01-0110	110	42.5	44	128
10 High	01-050-01-0210	110	42.5	50	124
11 Low	01-050-01-0011	112	44.5	38	133
11 STD	01-050-01-0111	112	44.5	44	128
11 High	01-050-01-0211	112	44.5	50	124
12 Low	01-050-01-0211	114	46.5	38	133
12 STD	01-050-01-0112	114	46.5	44	128
12 High	01-050-01-0212	114	46.5	50	124

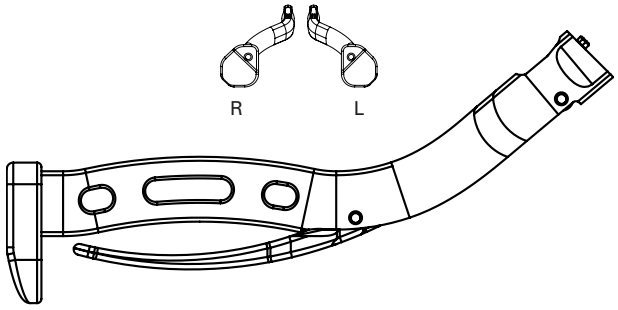
INSTRUMENT LISTING

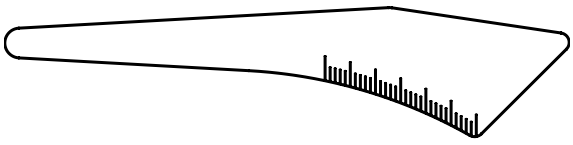
CATALOG NUMBER	PART DESCRIPTION
112-182-050	Straight Broach Handle
112-25-0146	Short Broach Handle
112-182-001	Curved Broach Handle
112-25-0044	Dual Offset Broach Handle, Left
112-25-0045	Dual Offset Broach Handle, Right
112-34-0002	Osteotomy Guide
111-44-1999	Box Chisel
P12-01-0025	Calcar Reamer Smooth Edge 45mm
P12-01-0027	Calcar Reamer Smooth Edge 35mm

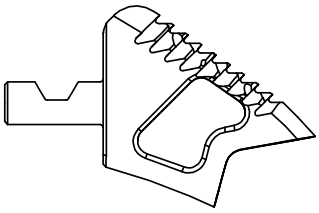


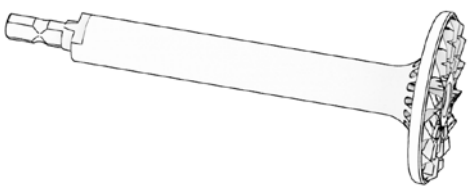




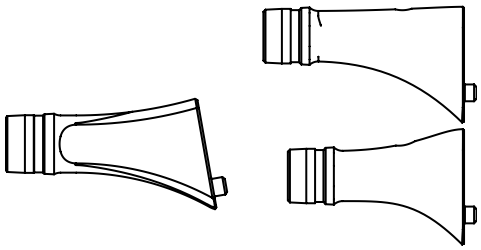








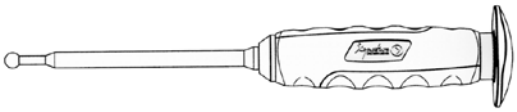
CATALOG NUMBER	PART DESCRIPTION
	Spartan Trial Neck
111-442-130	Size 1-3 Low Offset
111-442-131	Size 1-3 Standard Offset
111-442-132	Size 1-3 High Offset
111-442-460	Size 4-6 Low Offset
111-442-461	Size 4-6 Standard Offset
111-442-462	Size 4-6 High Offset
111-442-790	Size 7-9 Low Offset
111-442-791	Size 7-9 Standard Offset
111-442-792	Size 7-9 High Offset
111-442-100	Size 10-12 Low Offset
111-442-101	Size 10-12 Standard Offset
111-442-102	Size 10-12 High Offset



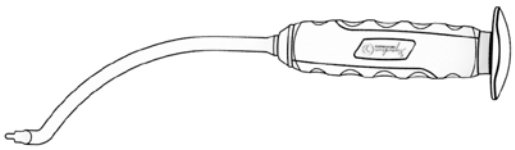
Color Coded Neck Trials
Yellow/Gold: Low Offset
Green: Standard Offset
Purple: High Offset

112-152-926	Head Impactor, 36mm
112-152-927	Head Impactor, 40mm

112-25-0181	Monoblock Ball Stem Impactor

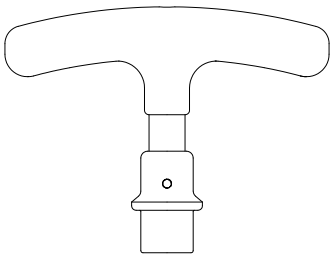


112-25-0182	Offset Stem Impactor with Grip

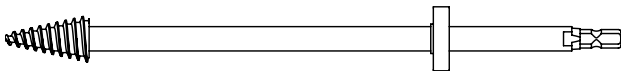


112-182-087	IM Drill

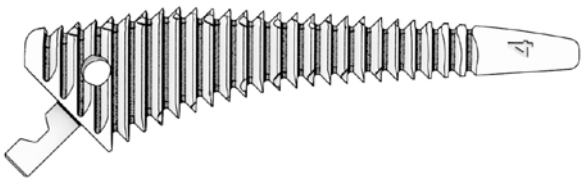
112-212-W03	Fixed Silicone T-Handle



112-25-1672	Femoral Head Extractor



111-44-2001	Spartan Broach, Size 1
111-44-2002	Spartan Broach, Size 2
111-44-2003	Spartan Broach, Size 3
111-44-2004	Spartan Broach, Size 4
111-44-2005	Spartan Broach, Size 5
111-44-2006	Spartan Broach, Size 6
111-44-2007	Spartan Broach, Size 7
111-44-2008	Spartan Broach, Size 8
111-44-2009	Spartan Broach, Size 9
111-44-2010	Spartan Broach, Size 10
111-44-2011	Spartan Broach, Size 11
111-44-2012	Spartan Broach, Size 12



INSTRUMENT LISTING

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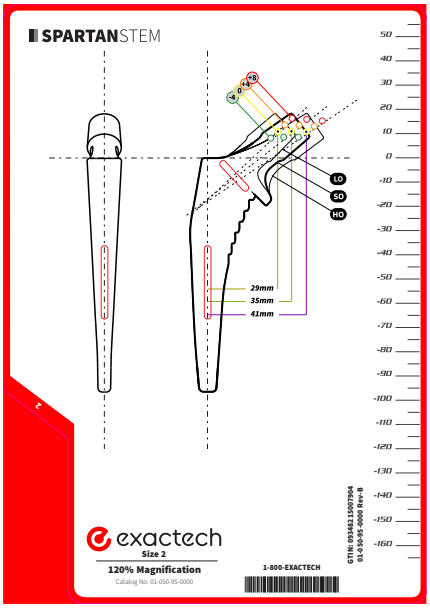
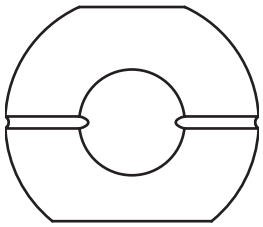
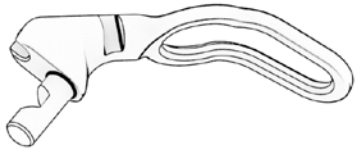


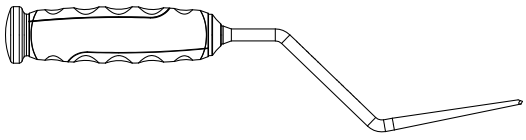
	Trial Femoral Heads
112-182-040	Ø28mm -3.5mm Green
112-182-041	Ø28mm 0.0mm Yellow
112-182-042	Ø28mm +3.5.0mm Orange
112-182-017	Ø32mm -4.0mm Green
112-182-018	Ø32mm 0.0mm Yellow
112-182-019	Ø32mm +4.0mm Orange
112-182-020	Ø32mm +8.0mm Red
112-182-021	Ø36mm -4.0mm Green
112-182-022	Ø36mm 0.0mm Yellow
112-182-023	Ø36mm +4.0mm Orange
112-182-024	Ø36mm +8.0mm Red
112-182-043	Ø40mm -4.0mm Green
112-182-044	Ø40mm 0.0mm Yellow
112-182-045	Ø40mm +4.0mm Orange
112-182-046	Ø40mm +8.0mm Red



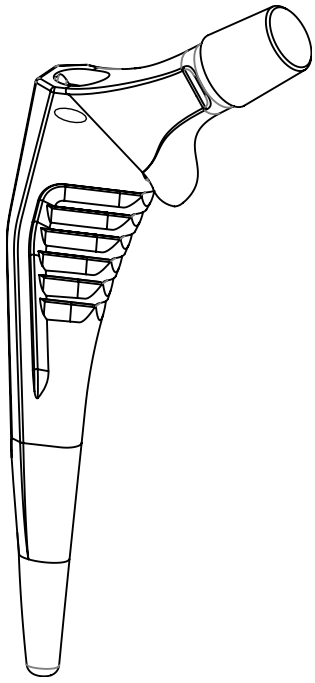
112-25-0123	Stem Extractor Loop

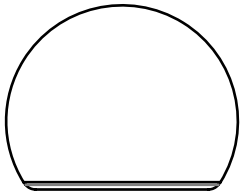


112-25-0183	Starter Rasp, Blue Handle



CATALOG NUMBER	PART DESCRIPTION
	Spartan Standard Collared
01-050-01-0002	Size 2 Low Offset Collared
01-050-01-0102	Size 2 Standard Offset Collared
01-050-01-0202	Size 2 High Offset Collared
01-050-01-0003	Size 3 Low Offset Collared
01-050-01-0103	Size 3 Standard Offset Collared
01-050-01-0203	Size 3 High Offset Collared
01-050-01-0004	Size 4 Low Offset Collared
01-050-01-0104	Size 4 Standard Offset Collared
01-050-01-0204	Size 4 High Offset Collared
01-050-01-0005	Size 5 Low Offset Collared
01-050-01-0105	Size 5 Standard Offset Collared
01-050-01-0205	Size 5 High Offset Collared
01-050-01-0006	Size 6 Low Offset Collared
01-050-01-0106	Size 6 Standard Offset Collared
01-050-01-0206	Size 6 High Offset Collared
01-050-01-0007	Size 7 Low Offset Collared
01-050-01-0107	Size 7 Standard Offset Collared
01-050-01-0207	Size 7 High Offset Collared
01-050-01-0008	Size 8 Low Offset Collared
01-050-01-0108	Size 8 Standard Offset Collared
01-050-01-0208	Size 8 High Offset Collared
01-050-01-0009	Size 9 Low Offset Collared
01-050-01-0109	Size 9 Standard Offset Collared
01-050-01-0209	Size 9 High Offset Collared
01-050-01-0010	Size 10 Low Offset Collared
01-050-01-0110	Size 10 Standard Offset Collared
01-050-01-0210	Size 10 High Offset Collared
01-050-01-0011	Size 11 Low Offset Collared
01-050-01-0111	Size 11 Standard Offset Collared
01-050-01-0211	Size 11 High Offset Collared
01-050-01-0012	Size 12 Low Offset Collared
01-050-01-0112	Size 12 Standard Offset Collared
01-050-01-0212	Size 12 High Offset Collared
	Femoral Heads
01-045-00-2894	Ø28mm -3.5mm Ceramic
01-045-00-2800	Ø28mm 0.0mm Ceramic
01-045-00-2804	Ø28mm +3.5mm Ceramic
01-045-00-3294	Ø32mm -4.0mm Ceramic
01-045-00-3200	Ø32mm 0.0mm Ceramic
01-045-00-3204	Ø32mm +4.0mm Ceramic
01-045-00-3208	Ø32mm +7.0mm Ceramic
01-045-00-3694	Ø36mm -4.0mm Ceramic
01-045-00-3600	Ø36mm 0.0mm Ceramic
01-045-00-3604	Ø36mm +4.0mm Ceramic
01-045-00-3608	Ø36mm +8.0mm Ceramic
01-045-00-4094	Ø40mm -4.0mm Ceramic
01-045-00-4000	Ø40mm 0.0mm Ceramic
01-045-00-4004	Ø40mm +4.0mm Ceramic
01-045-00-4008	Ø40mm +8.0mm Ceramic





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For additional device information, refer to the manufacturer's Instructions for Use for a device description, indications, contraindications, precautions and warnings. For further product information, please contact Customer Service, Exactech, Inc., 2320 NW 66th Court, Gainesville, Florida 32653-1630, USA. (352) 377-1140, (800) 392-2832 or FAX (352) 378-2617.

Exactech, as the distributor of this device, does not practice medicine, and is not responsible for recommending the appropriate surgical technique for use on a particular patient. These are intended to be solely informational and each surgeon must evaluate the appropriateness of these guidelines based on his or her personal medical training and experience. Prior to use of this system, the surgeon should refer to the product package insert for comprehensive warnings, precautions, indications for use, contraindications and adverse effects.

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