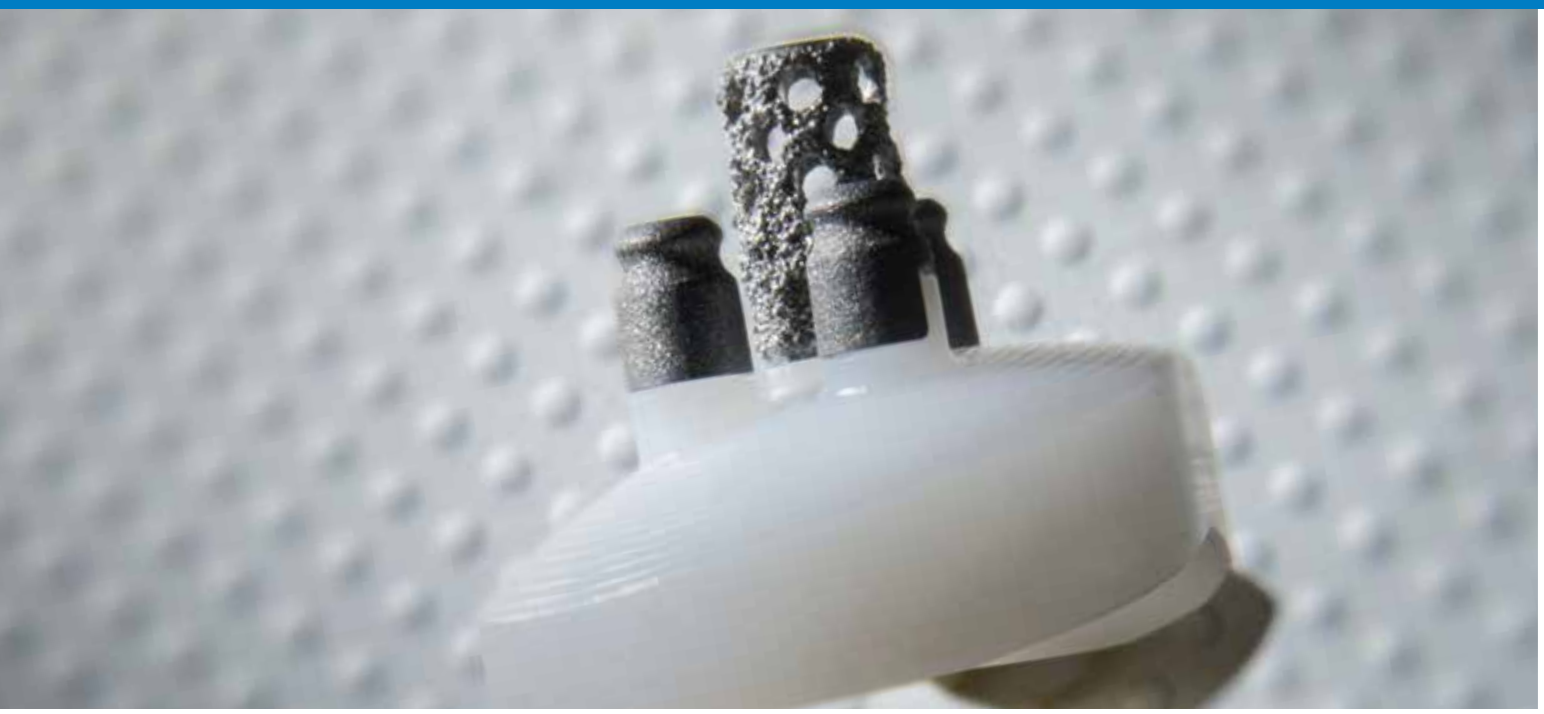
EXACTECH | SHOULDER

Operative Technique Addendum



equinoxe®

Posterior Augment Glenoids

INTRODUCTION

The Equinoxe® Shoulder System redefines "anatomical." The primary stem allows independent adjustability of all four anatomic parameters *in situ*. The reverse shoulder minimizes both scapular notching and torque on the glenoid while integrating with the platform and platform fracture stems. The platform fracture stem's offset anterior-lateral fin and asymmetric tuberosity beds define the next generation in complex fracture reconstruction. The platform nature of the Equinoxe primary and fracture stem allows the surgeon to have intra-operative flexibility to choose between a hemiarthroplasty, primary total shoulder or reverse total shoulder and seamlessly convert to a reverse should a revision become necessary.

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SYSTEM SPECIFICATIONS

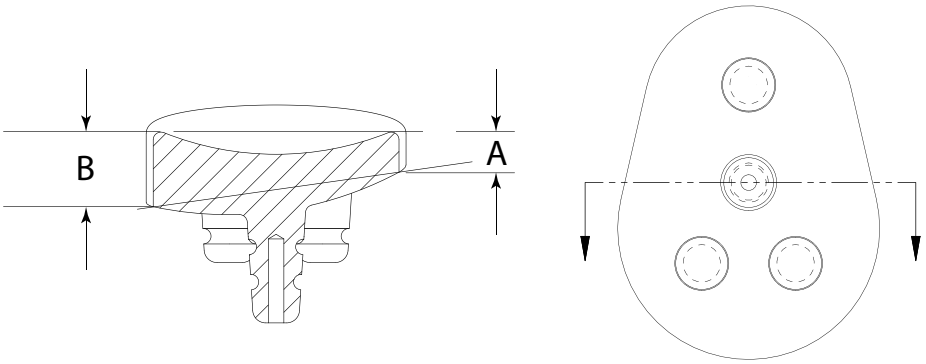
POSTERIOR AUGMENT GLENOIDS

POSTERIOR AUGMENT GLENOID, 8°

8 degrees	A Anterior Edge (mm)	B Posterior Edge (mm)
Small	4	6.8
Medium	4	7.3
Large	4	7.8
X-Large	4	8.3

POSTERIOR AUGMENT GLENOID, 16°

16 degrees	A Anterior Edge (mm)	B Posterior Edge (mm)
Small	4	9.9
Medium	4	10.9
Large	4	11.8
X-Large	4	12.7



RADIAL MISMATCH ASSOCIATED WITH GLENOID/HUMERAL HEAD PAIRINGS

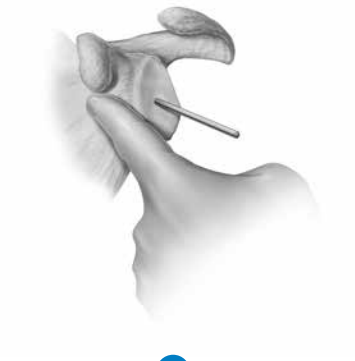
(Recommended Shaded)

Glenoid RoC	38mm HH	41mm HH	44mm HH	47mm HH	50mm HH	53mm HH
Alpha	7.72	5.87	4.27	2.66	1.05	-0.56
Beta	11.72	9.87	8.27	6.66	5.05	3.44
Post Aug S	8.27	6.42	4.82	3.21	1.60	0.00
Post Aug M	10.42	8.57	6.97	5.36	3.75	2.14
Post Aug L & XL	12.57	10.72	9.12	7.51	5.90	4.29

**Special Order*

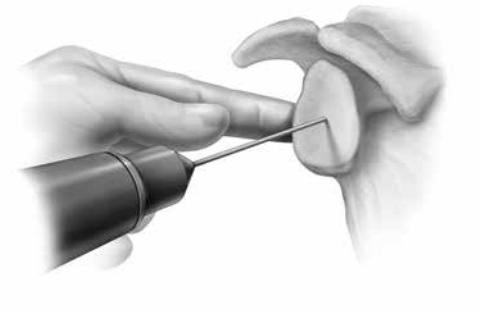
POSTERIOR AUGMENT GLENOID OPERATIVE TECHNIQUE OVERVIEW

CANNULATED METHOD



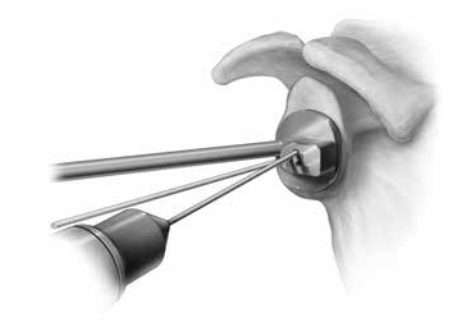
A

Establish Central Axis of the Scapula



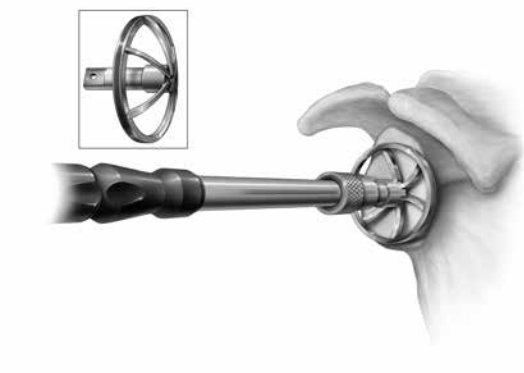
B

Insert Zero Degree K-wire Along Central Axis of Scapula



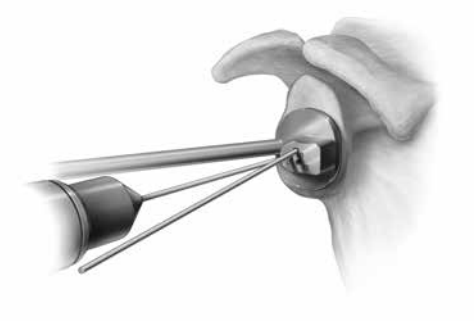
C

Insert Eight Degree K-wire from Central Axis of Scapula



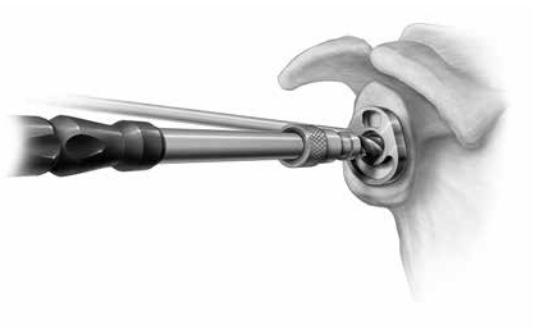
D

Ream the Glenoid Over the Eight Degree K-Wire



E

Re-insert Zero Degree K-wire

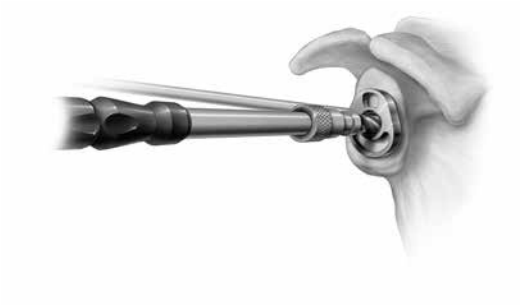


F

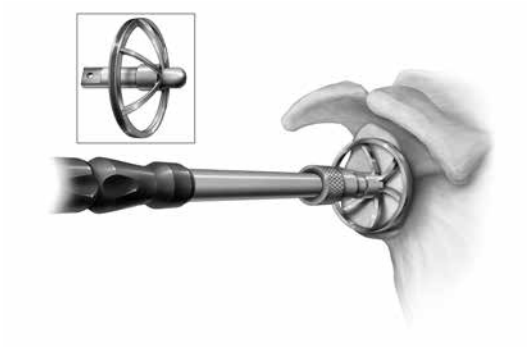
Drill Over Zero Degree K-wire to Establish Axis of Central Peg

POSTERIOR AUGMENT GLENOID OPERATIVE TECHNIQUE OVERVIEW

FREEHAND METHOD

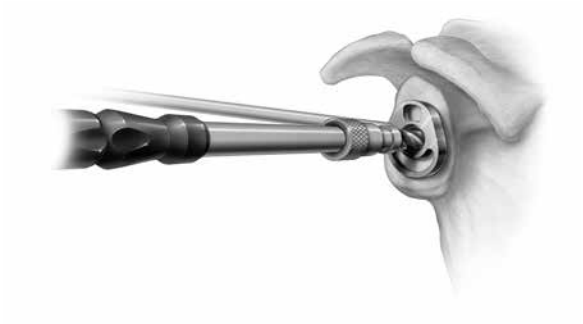


A
Drill Hole for Pilot Reamer



B
Ream Glenoid Eight Degrees from Normal

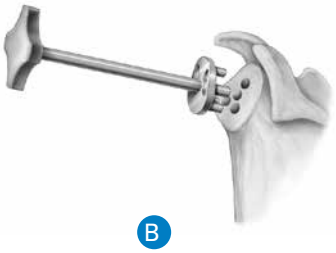
C
Use Reaming Guides for Verification



D
Re-drill Central Hole

CANNULATED AND FREEHAND METHOD

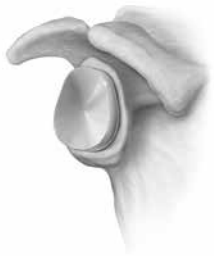
A
Drill Peripheral Holes



B
Depth Gauge for Cage Glenoid to Confirm Hole Depth

C
Trial the Posterior Augment Glenoid

D
Seat Cage Glenoid Component Using Spider Glenoid Impactor



E
Insert and Cement Posterior Augment Glenoid

DETAILED OPERATIVE TECHNIQUE

INDICATIONS FOR USE

The Equinoxe Shoulder System is indicated for use in skeletally mature individuals with degenerative diseases or fractures of the glenohumeral joint where total or hemi- arthroplasty is determined by the surgeon to be the preferred method of treatment.

- The cemented primary humeral stem, long/revision stem, fracture stems and all Equinoxe glenoids are intended for cemented fixation.
- The press-fit humeral stems are intended for press-fit applications but may be used with bone cement at the discretion the surgeon.
- The reverse humeral components are intended to be used in cemented applications or in revision cases when the humeral component is well-fixed/stable, as deemed by the orthopaedic surgeon.
- Humeral heads are intended for use in cemented and press-fit applications.

Clinical indications for the PRIMARY (P), LONG/REVISION (L/R) and FRACTURE (F) humeral components are as follows:

P	L/R	F	Indications
√	√	√	rheumatoid arthritis, osteoarthritis, osteonecrosis or post-traumatic degenerative problems
√	√		congenital abnormalities in the skeletally mature
√			primary and secondary necrosis of the humeral head
√		√	humeral head fracture with displacement of the tuberosities
√	√		pathologies where arthrodesis or resectional arthroplasty of the humeral head are not acceptable
√	√		revisions of humeral prostheses when other treatments or devices have failed (where adequate fixation can be achieved)
		√	displaced three-part and four-part upper humeral fractures
	√		spiral and other fractures of the mid-humerus (in combination with glenohumeral degenerative diseases)
	√		revision of failed previous reconstructions when distal anchorage is required
√	√		to restore mobility from previous procedures (e.g., previous fusion)

The Equinoxe Reverse Shoulder System is indicated for use in skeletally mature individuals with degenerative diseases of the glenohumeral joint and a grossly deficient, irreparable rotator cuff. The Equinoxe Reverse Shoulder is also indicated for a failed glenohumeral joint replacement with loss of rotator cuff function resulting in superior migration of the humeral head.

The Equinoxe Platform Fracture Stem is indicated for use in skeletally mature individuals with acute fracture of the proximal humerus and displacement of the tuberosities, displaced three and four part fractures of the proximal humerus (hemi-arthroplasty), or acute fracture of the proximal humerus with failure of the glenohumeral joint (primary total shoulder arthroplasty). The Equinoxe Platform Fracture Stem is also indicated for acute fracture of the proximal humerus in combination with degenerative diseases of the glenohumeral joint and a grossly deficient, irreparable rotator cuff resulting in superior migration of the humeral head (reverse total shoulder arthroplasty). The Equinoxe Platform Fracture Stem is indicated for cemented use only.

CONTRAINDICATIONS FOR USE

Use of the Equinoxe Shoulder System is contraindicated in the following situations:

- Osteomyelitis of the proximal humerus or scapula; if a systemic infection or a secondary remote infection is suspected or confirmed, implantation should be delayed until infection is resolved.
- Inadequate or malformed bone that precludes adequate support or fixation of the prosthesis.
- Neuromuscular disorders that do not allow control of the joint.
- Significant injury to the brachial plexus.
- Non-functional deltoid muscles.
- Patient's age, weight, or activity level would cause the surgeon to expect early failure of the system.
- The patient is unwilling or unable to comply with the post-operative care instructions.
- Alcohol, drug, or other substance abuse.

Any disease state that could adversely affect the function or longevity of the implant.

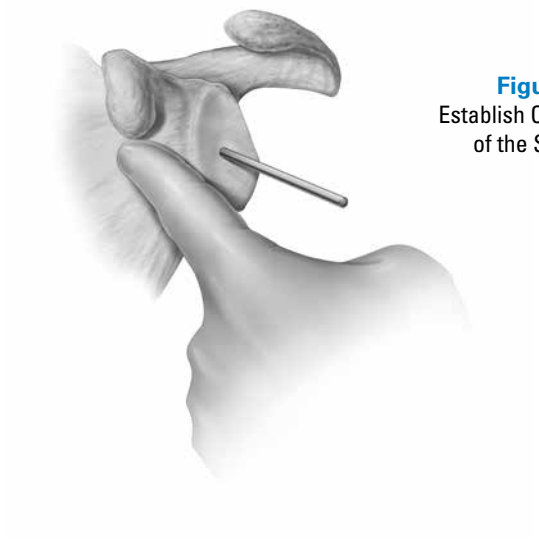


Figure 1
Establish Central Axis of the Scapula

Figure 2
Insert Zero-Degree K-wire Along Central Axis of the Scapula to Establish the Central Peg Axis

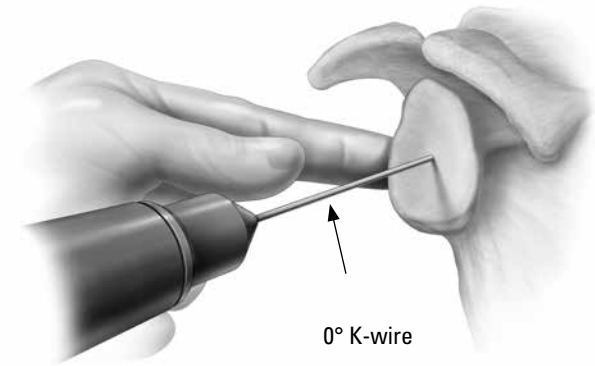
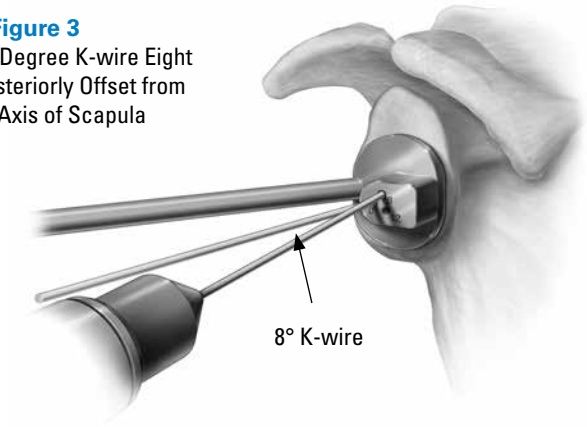


Figure 3
Insert Eight-Degree K-wire Eight Degrees Posteriorly Offset from Central Axis of Scapula



POSTERIOR AUGMENT GLENOID SUGGESTED USAGE

The **Posterior Augment Glenoid** is designed to minimize the removal of anterior cortical bone when reaming a posteriorly worn glenoid in order to correct its version.

Assuming the patient has posterior wear and the surgeon wants to correct the glenoid back to neutral version:

- If glenoid retroversion is less than six degrees, use the standard Glenoid implant and eccentrically ream as needed.
- If glenoid retroversion is between six degrees and 11 degrees, use the Posterior Augment Glenoid.
- If glenoid retroversion is between 12 degrees and 18 degrees, use the Posterior Augment Glenoid and eccentrically ream if there is sufficient bone stock.
- If the surgeon deems that there is insufficient glenoid bone stock to achieve fixation, bone graft.

There are two techniques to implant the Posterior Augment Glenoid: the cannulated method or the free-hand method; instrumentation is provided to facilitate each method.

CANNULATED METHOD

Insert the zero degree **K-wire** along the central axis of the glenoid to establish the axis of the glenoid pegs *(Figure 1 and 2)*.

Insert the eight degree K-wire eight degrees off-axis from the zero degree K-wire using the **Posterior Augment K-wire Alignment Guide** to establish the glenoid reaming axis *(Figure 3)*.

Note: *Eight degrees is used to off-axis ream the glenoid in order to correct for the posterior glenoid defect as this corresponds to the build-up of the Posteriorly Augmented Glenoid implant.*

Remove the zero-degree K-wire and Posterior Augment K-wire Alignment Guide.

Note: *Off-axis reaming removes less bone than would occur ordinarily during eccentric reaming to correct the same defect (i.e., reaming down the high side). For example, compare the bone removed between off-axis reaming and eccentric reaming of a defect (Figure 4).*

Ream the glenoid over the eight-degree K-wire using the appropriately sized cannulated reamer *(Figure 5)*. Use 16 degree K-wire hole if 16 degree implant will be used. Special order.

After reaming, re-insert the zero-degree K-wire to re-establish the axis of drilling the glenoid pegs. Remove the eight-degree K-wire and the Posterior Augment K-wire Alignment Guide *(Figure 6)*.

Drill the central hole for the Posterior Augment Glenoid over the zero-degree K-wire (e.g., central axis of the scapula) using the **Posterior Augment Center Hole Drill Guide**, the 2mm K-wire, and the **Cannulated Center Peg Drill** *(Figure 7)*.

Skip to Figure 13 on page 8.

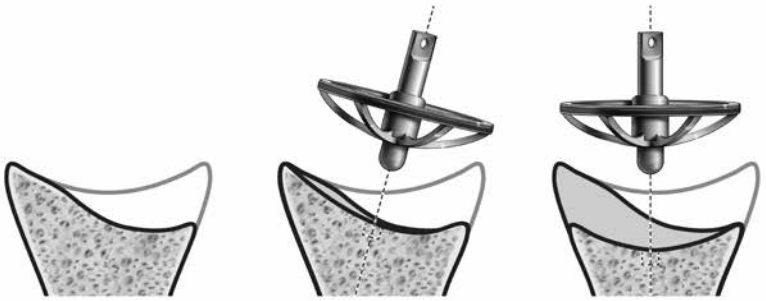


Figure 4
Bone Conservation

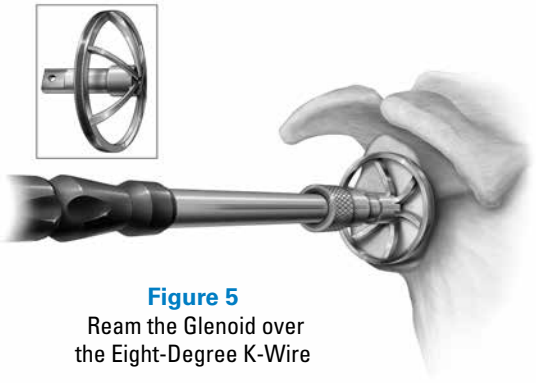


Figure 5
Ream the Glenoid over the Eight-Degree K-Wire

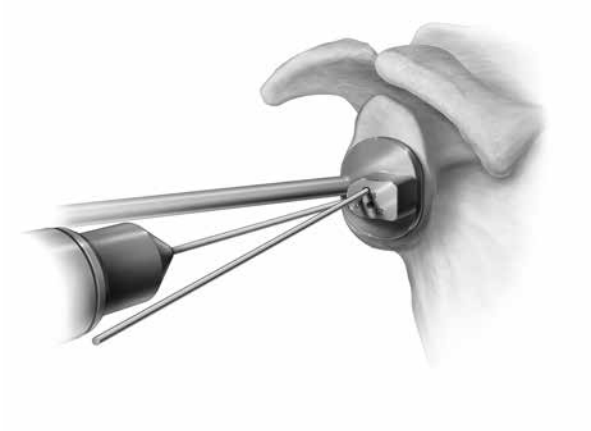


Figure 6
Re-insert Zero-Degree K-wire which Aligns with Central Axis of Scapula

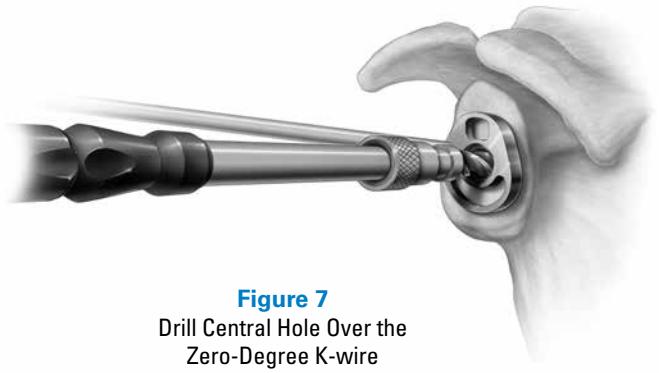
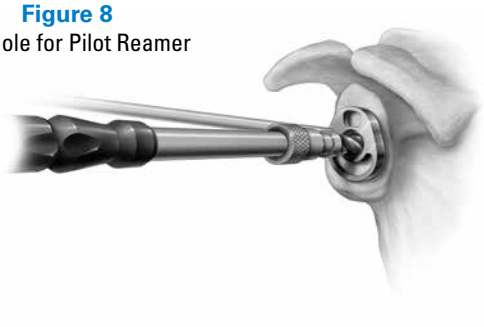
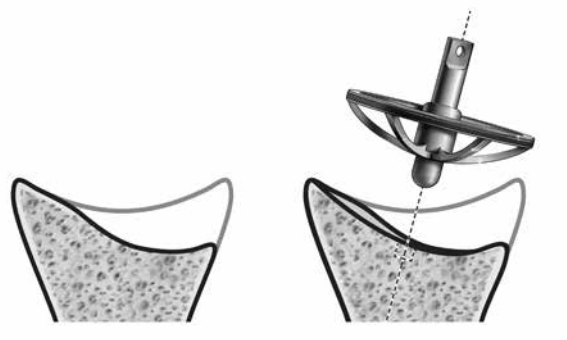


Figure 7
Drill Central Hole Over the Zero-Degree K-wire

Figure 8
Drill Hole for Pilot Reamer





Glenoid Defect

Off-Axis Reaming with Augmented Implant

Figure 9
Bone Conservation

FREEHAND METHOD

Drill the hole for the pilot reamer tip through the **Center Hole Drill Guide.** The drill hole only needs to be as deep as the length of the pilot reamer tip *(Figure 8)*.

Off-axis ream the glenoid using the appropriately sized pilot tip glenoid reamer. Attempt to ream the glenoid eight degrees off-axis from the central axis of the scapula *(Figures 9 and 10)*.

Use the clear radel glenoid reaming guides (attached to the inserter) to verify that the eccentrically reamed glenoid surface coincides with the eight degree Posterior Augment Glenoid *(Figure 11)*.

Note: *Avoid applying a bending force to the pilot tip reamer or using the reamer to retract the humeral head as this may cause fracture of the 2mm K-wire or pilot tip.*

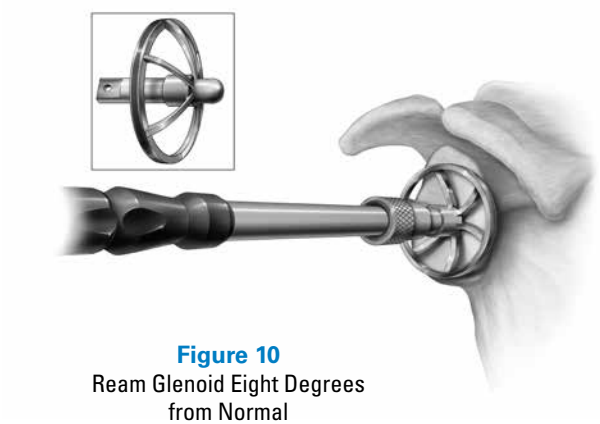


Figure 10
Ream Glenoid Eight Degrees from Normal

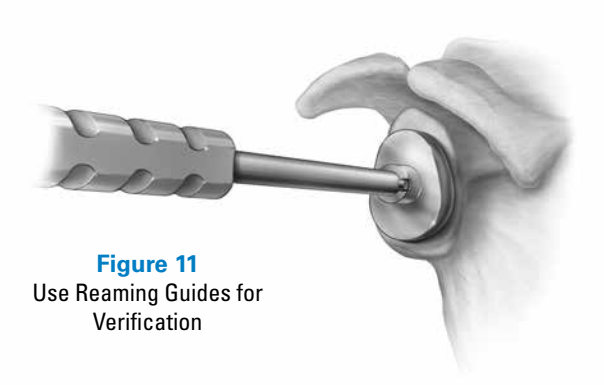


Figure 11
Use Reaming Guides for Verification

Re-drill the central hole for the Posterior Augment Glenoid using the Posterior Augment Center Hole Drill Guide and the **Non-Cannulated Center Peg Drill** *(Figure 12)*.

CANNULATED AND FREEHAND METHOD

Drill peripheral holes for the Posterior Augment Glenoid using the Posterior Augment Peripheral Hole Drill Guide and the Peripheral Peg Drill *(Figure 13)*. Peripheral pegs are provided to facilitate holding of the Drill Guide.

Note: *When using the Cage Glenoid:*

Prior to insertion of the trial, use the provided Depth Gauge to ensure that the holes were prepared to the defined depth (Figure 14). If the depth gauge is not fully seated, re-drill holes as needed.

When implanting the glenoid component, use the Spider Impactors and ensure straight line visibility for the cage insertion (Figure 16).

Use the eight-degree Posterior Augment Glenoid Trial to ensure the glenoid holes are drilled deep enough and that reamed surface of the implant coincides with the reamed surface of the bone *(Figure 15)*.

Insert bone cement and pressurize using the appropriately sized cement pressurizer (e.g. central peg or peripheral peg). Implant the Posterior Augment Glenoid *(Figure 16)*.

Figure 12
Re-drill Central Hole

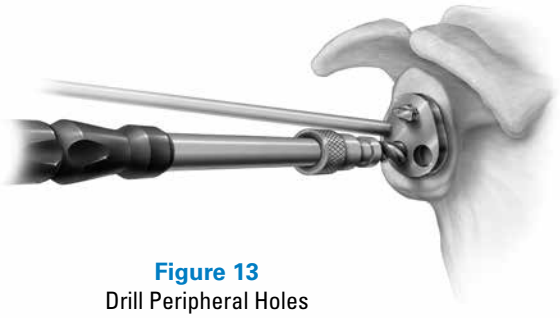


Figure 13
Drill Peripheral Holes

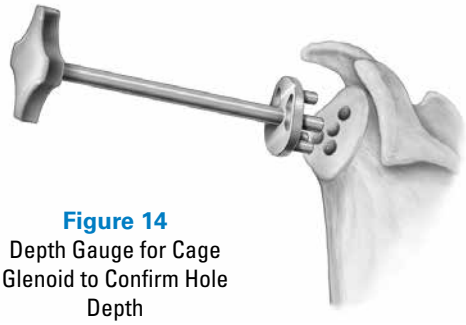


Figure 14
Depth Gauge for Cage Glenoid to Confirm Hole Depth

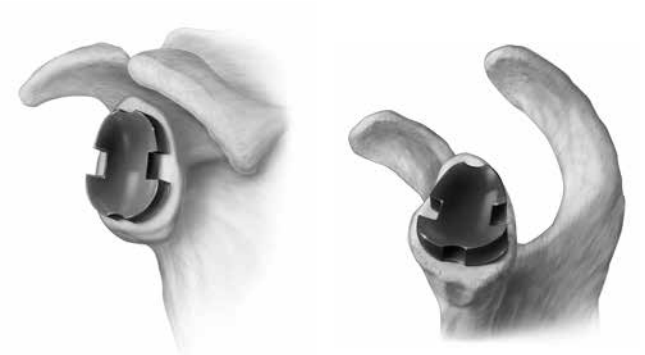


Figure 15
Trial the Posterior Augment Glenoid

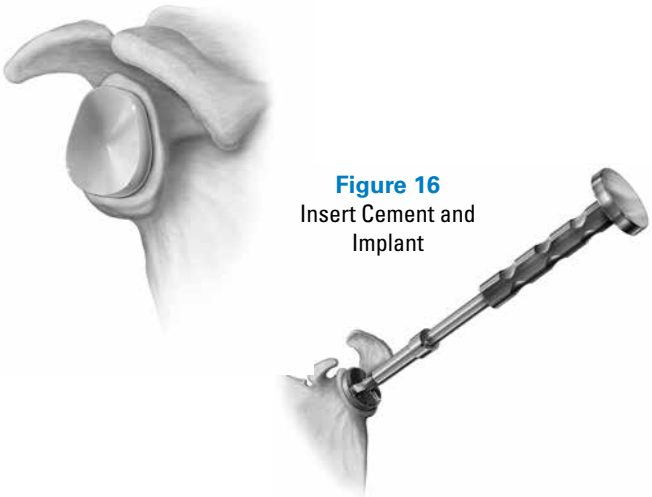


Figure 16
Insert Cement and Implant

EQUINOXE IMPLANTS

Catalog No.	Part Description
314-02-22	Posterior Augment Glenoid, 8 Degree, Small, Left
314-02-23	Posterior Augment Glenoid, 8 Degree, Medium, Left
314-02-24	Posterior Augment Glenoid, 8 Degree, Large, Left
314-02-25	Posterior Augment Glenoid, 8 Degree, Extra Large, Left
314-02-32	Posterior Augment Glenoid, 8 Degree, Small, Right
314-02-33	Posterior Augment Glenoid, 8 Degree, Medium, Right
314-02-34	Posterior Augment Glenoid, 8 Degree, Large, Right
314-02-35	Posterior Augment Glenoid, 8 Degree, Extra Large, Right
314-06-22	Posterior Augment Glenoid, 16 Degree, Small, Left*
314-06-23	Posterior Augment Glenoid, 16 Degree, Medium, Left*
314-06-24	Posterior Augment Glenoid, 16 Degree, Large, Left*
314-06-25	Posterior Augment Glenoid, 16 Degree, Extra Large, Left*
314-06-32	Posterior Augment Glenoid, 16 Degree, Small, Right*
314-06-33	Posterior Augment Glenoid, 16 Degree, Medium, Right*
314-06-34	Posterior Augment Glenoid, 16 Degree, Large, Right*
314-06-35	Posterior Augment Glenoid, 16 Degree, Extra Large, Right*

314-13-22	Cage Poly Augment, Small, Left
314-13-23	Cage Poly Augment, Medium, Left
314-13-24	Cage Poly Augment, Large, Left
314-13-25	Cage Poly Augment, Extra Large, Left
314-13-32	Cage Poly Augment, Small, Right
314-13-33	Cage Poly Augment, Medium, Right
314-13-34	Cage Poly Augment, Large, Right
314-13-35	Cage Poly Augment, Extra Large, Right

EQUINOXE INSTRUMENTS

Catalog No.	Part Description
315-12-22	Posterior Augment Trial, 8 Degree, Small, Left
315-12-23	Posterior Augment Trial, 8 Degree, Medium, Left
315-12-24	Posterior Augment Trial, 8 Degree, Large, Left
315-12-25	Posterior Augment Trial, 8 Degree, Extra Large, Left
315-12-32	Posterior Augment Trial, 8 Degree, Small, Right
315-12-33	Posterior Augment Trial, 8 Degree, Medium, Right
315-12-34	Posterior Augment Trial, 8 Degree, Large, Right
315-12-35	Posterior Augment Trial, 8 Degree, Extra Large, Right
315-06-22	Posterior Augment Trial, 16 Degree, Small, Left*
315-06-23	Posterior Augment Trial, 16 Degree, Medium, Left*
315-06-24	Posterior Augment Trial, 16 Degree, Large, Left*
315-06-25	Posterior Augment Trial, 16 Degree, Extra Large, Left*
315-06-32	Posterior Augment Trial, 16 Degree, Small, Right*
315-06-33	Posterior Augment Trial, 16 Degree, Medium, Right*
315-06-34	Posterior Augment Trial, 16 Degree, Large, Right*
315-06-35	Posterior Augment Trial, 16 Degree, Extra Large, Right*

315-26-21	Depth Gauge, Left
315-26-31	Depth Gauge, Right

315-27-11	Posterior Augment Glenoid K-wire Alignment Guide

EQUINOXE INSTRUMENTS

Catalog No.	Part Description
315-27-12	Posterior Augment Center Hole Drill Guide, 8 Degree, Left
315-27-13	Posterior Augment Center Hole Drill Guide, 8 Degree, Right
315-29-12	Posterior Augment Center Hole Drill Guide, 16 Degree, Left*
315-29-13	Posterior Augment Center Hole Drill Guide, 16 Degree, Right*

315-27-14	Posterior Augment Peripheral Hole Drill Guide, 8 Degree, Left
315-27-15	Posterior Augment Peripheral Hole Drill Guide, 8 Degree, Right
315-29-14	Posterior Augment Peripheral Hole Drill Guide, 16 Degree, Left*
315-29-15	Posterior Augment Peripheral Hole Drill Guide, 16 Degree, Right*

315-27-22	Posterior Augment Glenoid Reaming Guide, 8 Degree, Small, Left
315-27-23	Posterior Augment Glenoid Reaming Guide, 8 Degree, Medium, Left
315-27-24	Posterior Augment Glenoid Reaming Guide, 8 Degree, Large, Left
315-27-25	Posterior Augment Glenoid Reaming Guide, 8 Degree, Extra Large, Left
315-27-32	Posterior Augment Glenoid Reaming Guide, 8 Degree, Small, Right
315-27-33	Posterior Augment Glenoid Reaming Guide, 8 Degree, Medium, Right
315-27-34	Posterior Augment Glenoid Reaming Guide, 8 Degree, Large, Right
315-27-35	Posterior Augment Glenoid Reaming Guide, 8 Degree, Extra Large, Right
315-29-22	Posterior Augment Glenoid Reaming Guide, 16 Degree, Small, Left*
315-29-23	Posterior Augment Glenoid Reaming Guide, 16 Degree, Medium, Left*
315-29-24	Posterior Augment Glenoid Reaming Guide, 16 Degree, Large, Left*
315-29-25	Posterior Augment Glenoid Reaming Guide, 16 Degree, Extra Large, Left*
315-29-32	Posterior Augment Glenoid Reaming Guide, 16 Degree, Small, Right*
315-29-33	Posterior Augment Glenoid Reaming Guide, 16 Degree, Medium, Right*
315-29-34	Posterior Augment Glenoid Reaming Guide, 16 Degree, Large, Right*
315-29-35	Posterior Augment Glenoid Reaming Guide, 16 Degree, Extra Large, Right*

315-30-02	Spider Glenoid Inserter/Impactor Tip, Small Alpha
315-30-03	Spider Glenoid Inserter/Impactor Tip, Medium Alpha
315-30-04	Spider Glenoid Inserter/Impactor Tip, Large Alpha
315-30-13	Spider Glenoid Inserter/Impactor Tip, Medium Beta
315-30-14	Spider Glenoid Inserter/Impactor Tip, Large Beta
315-30-15	Spider Glenoid Inserter/Impactor Tip, Extra Large Beta

315-35-00	Glenoid K-wire

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For additional device information, refer to the Equinoxe Shoulder System–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. 718-01-32 Rev. D 0420

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