EXACTECH | SHOULDER

Operative Technique Addendum

equinoxe®

Augmented Reverse Glenoid Implants

Exactech®

Surgeon focused. Patient driven.™

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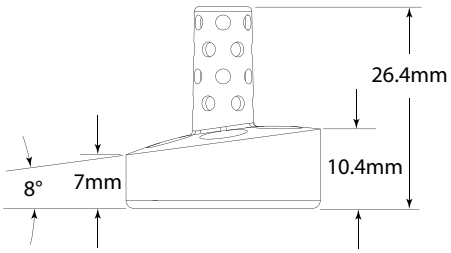
INTRODUCTION

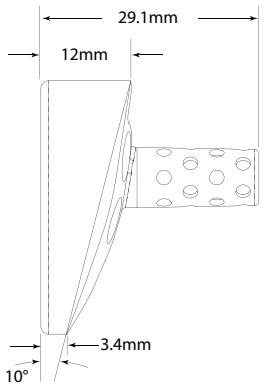
The Equinoxe® Shoulder System redefines "anatomical." The primary stem allows independent adjustability of all four anatomic parameters *in situ*. The reverse shoulder minimizes both scapular notching and torque on the glenoid while integrating with the platform and platform fracture stems. The platform 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 treat patients requiring a hemiarthroplasty, primary total shoulder or reverse total shoulder.

SYSTEM SPECIFICATIONS

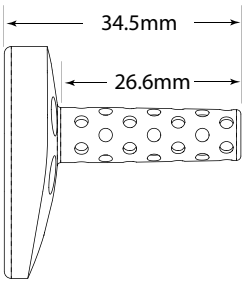
POSTERIOR AUGMENT GLENOID PLATE



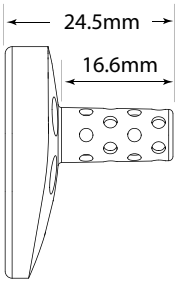
SUPERIOR AUGMENT GLENOID PLATE



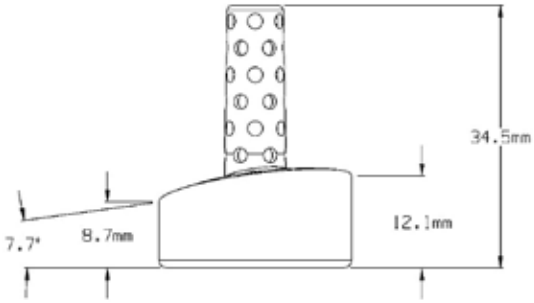
EXTENDED CAGE GLENOID PLATE, +10MM

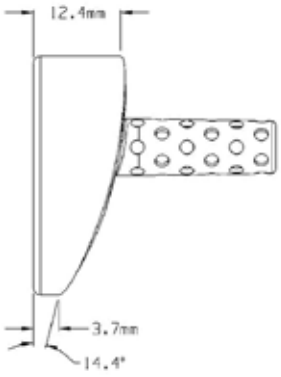


STANDARD CAGE GLENOID PLATE

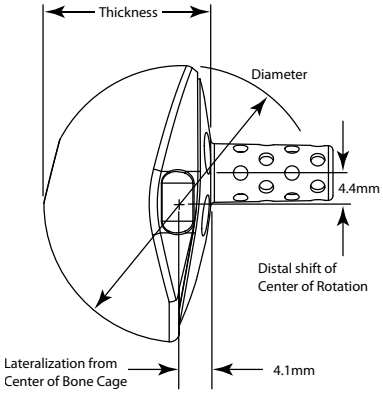


SUPERIOR/POSTERIOR AUGMENT GLENOID BASEPLATE

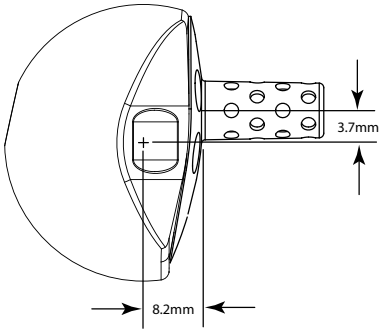




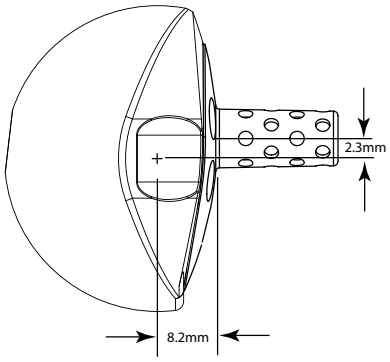
GLENOSPHERES



Standard Glenosphere

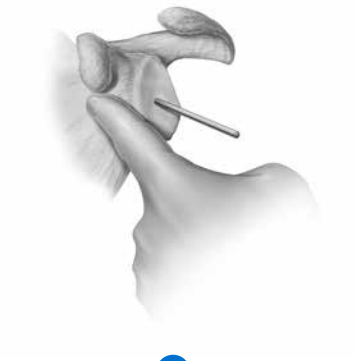


38mm Expanded Glenosphere

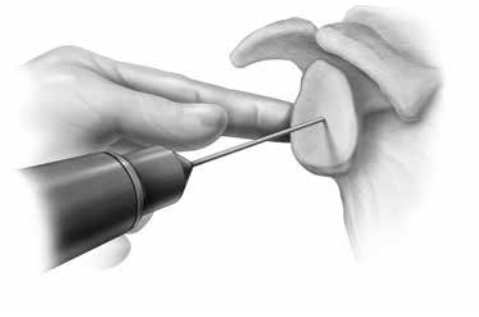


42mm Expanded Glenosphere

POSTERIOR AUGMENT GLENOID PLATE OVERVIEW TECHNIQUE

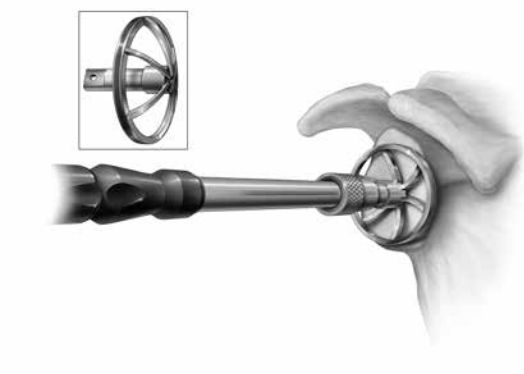


A
Establish Central Axis of the Scapula

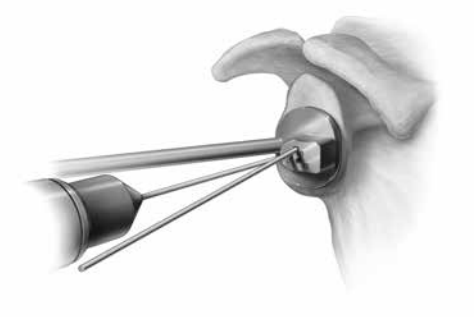


B
Insert Zero-Degree K-wire Along Central Axis of Scapula

C
Insert Eight-Degree K-wire from Central Axis of Scapula



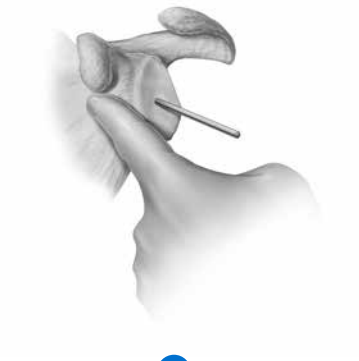
D
Ream the Glenoid Over the Eight-Degree K-Wire



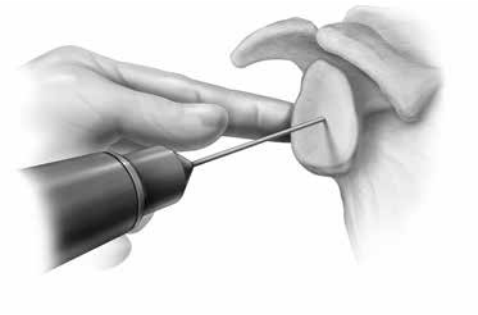
E
Re-insert Zero-Degree K-wire

F
Drill Over Zero-Degree K-wire to Establish Axis of Cage

SUPERIOR AUGMENT GLENOID PLATE OVERVIEW TECHNIQUE

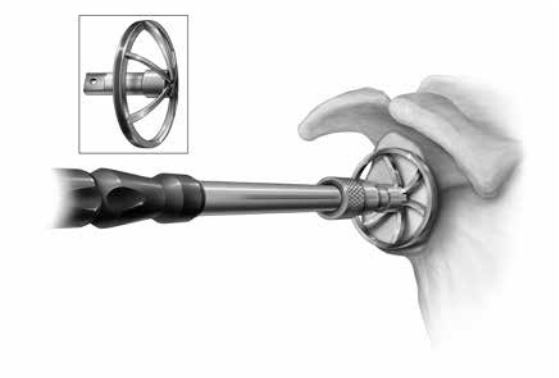


A
Establish Central Axis of the Scapula



B
Insert Zero-Degree K-wire Along Central Axis of Scapula

C
Insert 10-Degree K-wire from Central Axis of Scapula

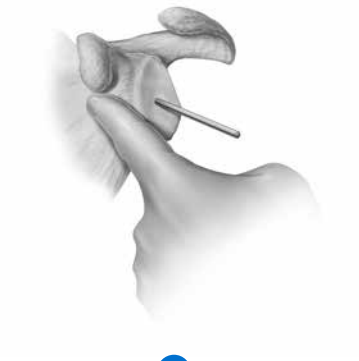


D
Ream the Glenoid Over the 10-Degree K-wire

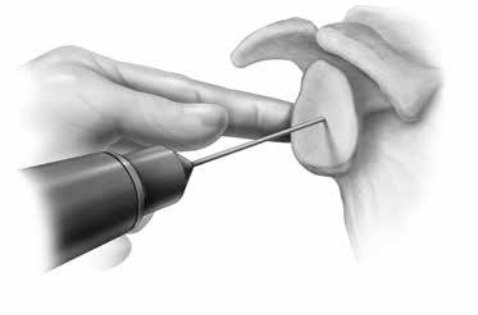
E
Re-insert Zero-Degree K-wire

F
Drill Over Zero-Degree K-wire to Establish Axis of Cage

SUPERIOR/POSTERIOR AUGMENT PLATE OVERVIEW TECHNIQUE

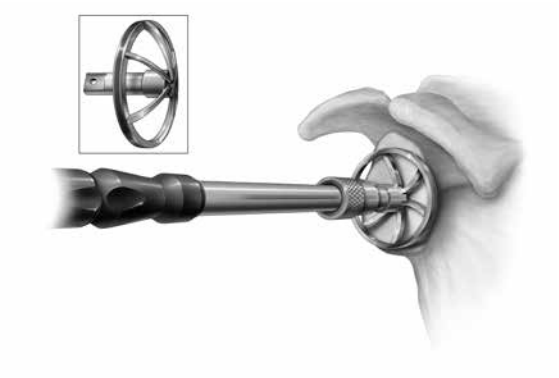


A
Establish Central Axis of the Scapula



B
Insert Zero-Degree K-wire Along Central Axis of Scapula

C
Insert 10-Degree K-wire from Central Axis of Scapula



D
Ream the Glenoid Over the 10-Degree K-wire

E
Re-insert Zero-Degree K-wire

F
Drill Over Zero-Degree K-wire to Establish Axis of Cage

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.

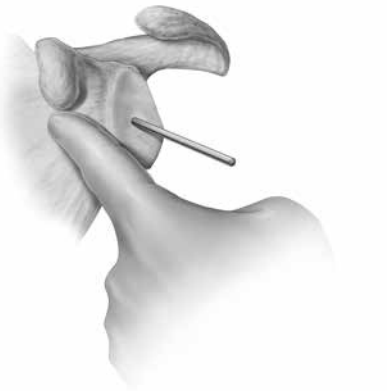
CONTRAINDICATIONS FOR USE

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



REVERSE SHOULDER POSTERIOR AUGMENT GLENOID PLATE TECHNIQUE

The reverse shoulder **Posterior Augment Glenoid Plate** 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, an irreparable rotator cuff tear and the surgeon wants to correct the glenoid back to neutral version:

- If glenoid retroversion is less than six degrees; use the **standard Glenoid Plate** and eccentrically ream as needed.
- If glenoid retroversion is between six degrees and 11 degrees, use the Posterior Augment Glenoid Plate.
- If glenoid retroversion is between 12 degrees and 18 degrees; use the Posterior Augment Glenoid Plate 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 and use the **+10mm Extended Cage Glenoid Plate** and/or use the **Expanded Glenospheres**.

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

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

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

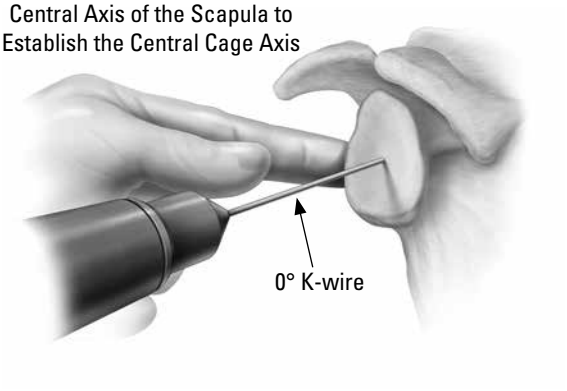


Figure 3
Insert Eight-Degree K-wire Eight Degrees Posteriorly Offset from Central Axis of Scapula

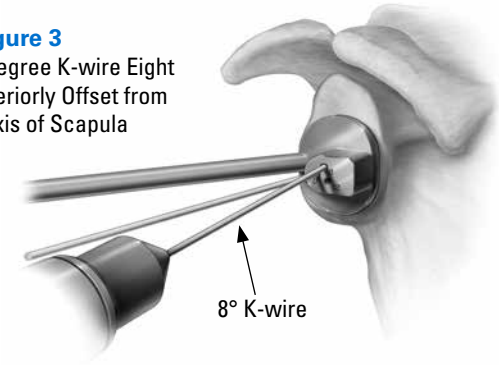
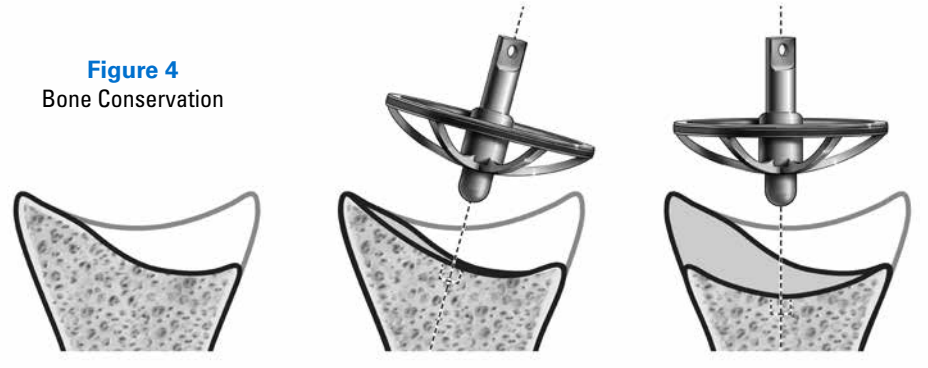


Figure 4
Bone Conservation



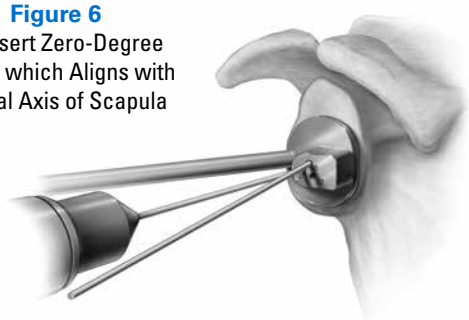
Glenoid Defect

Off-Axis Reaming with Augmented Implant

Eccentric Reaming

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



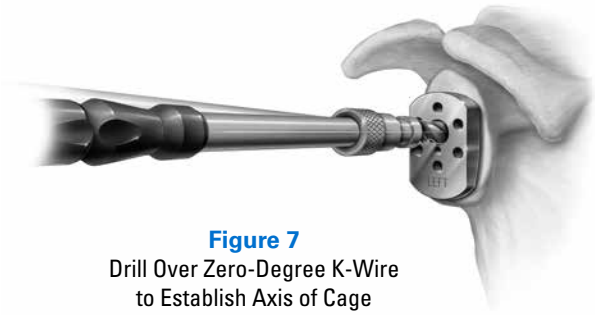


Figure 7
Drill Over Zero-Degree K-Wire to Establish Axis of Cage

Note: *Eight degrees is used to eccentrically ream the glenoid in order to correct for the posterior glenoid defect as this corresponds to the build-up of the Posterior Augment Glenoid Plate.*

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).*

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

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

Impact the Posterior Augment Glenoid Plate and continue with the existing **Primary/Reverse Operative Technique (Lit#718-01-30).**

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.*

REVERSE SHOULDER SUPERIOR AUGMENT GLENOID PLATE TECHNIQUE

The reverse shoulder **Superior Augment Glenoid Plate** is designed to minimize the removal of the inferior cortical bone when reaming a superiorly worn glenoid in order to correct its inclination.

Assuming the patient has superior wear, an irreparable rotator cuff tear and the surgeon wants to correct the glenoid back to neutral inclination:

- If the glenoid is superiorly worn less than seven degrees, use the standard Glenoid Plate and eccentrically ream as needed.
- If the glenoid is superiorly worn between seven degrees and 13 degrees; use the Superior Augment Glenoid Plate.
- If the glenoid is superiorly worn between 14 degrees and 18 degrees; use the Superior Augment Glenoid Plate 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 and use the **+10mm Extended Cage Glenoid Plate** and/or use the **Expanded Glenospheres**.

Insert the zero-degree K-wire along the central axis of the glenoid to establish the axis of the glenoid plate cage *(Figure 8 and 9).*

Insert the 10-degree K-wire 10 degrees superiorly off-axis from the zero-degree K-wire using the **Superior Augment K-wire Alignment Guide** to establish the glenoid reaming axis *(Figure 10).*

Note: *10 degrees is used to off-axis ream the glenoid in order to correct for the superior glenoid defect as this corresponds to the build-up of the Superior Augment Glenoid Plate.*

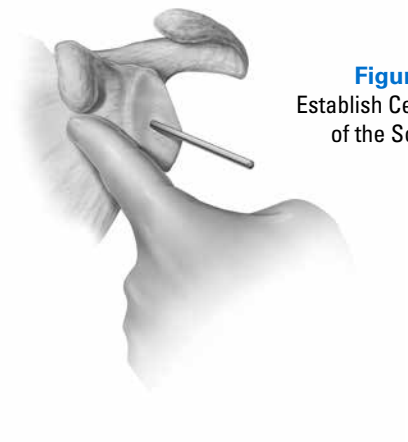


Figure 8
Establish Central Axis of the Scapula

Figure 9
Insert Zero-Degree K-wire Along Central Axis of the Scapula to Establish the Cage Axis

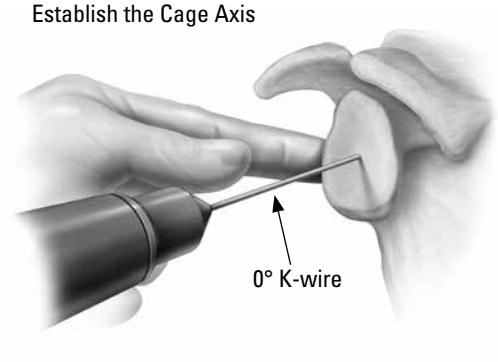


Figure 10
Insert 10-Degree K-wire 10 Degrees Superiorly Offset from Central Axis of Scapula

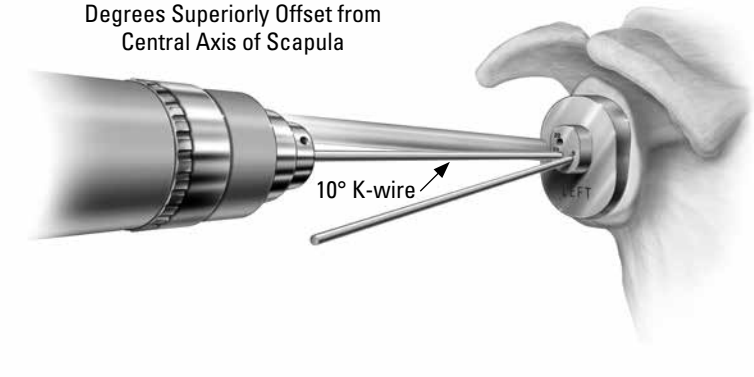
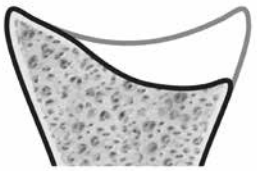
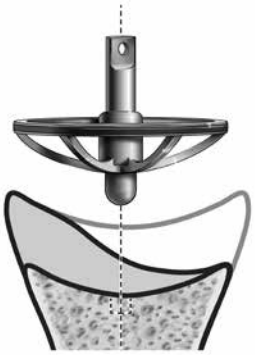


Figure 11
Bone Conservation



Glenoid Defect

Off-Axis Reaming with Augmented Implant



Eccentric Reaming

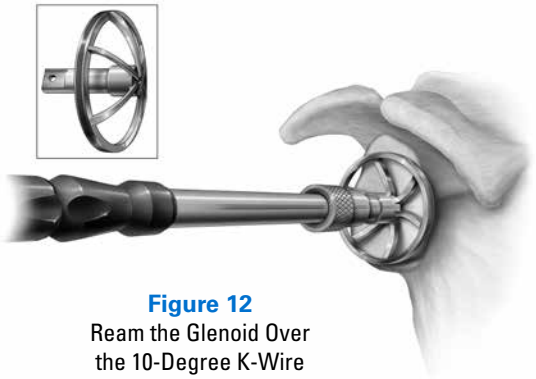


Figure 12
Ream the Glenoid Over the 10-Degree K-Wire

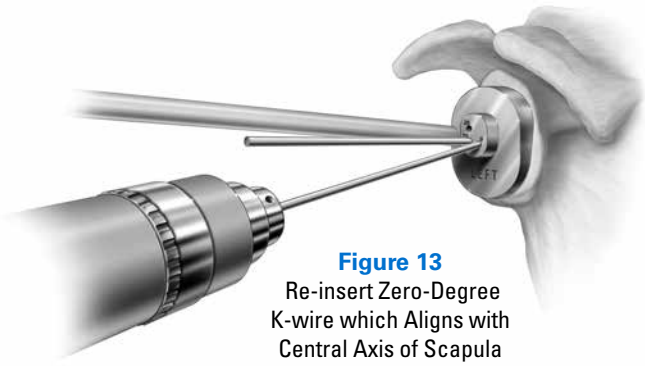


Figure 13
Re-insert Zero-Degree K-wire which Aligns with Central Axis of Scapula

Figure 14
Drill Center Hole Over Zero-Degree K-wire to Establish Axis of Cage

Remove the zero-degree K-wire and Superior 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 11).*

Ream the glenoid over the 10-degree K-wire using the appropriately sized cannulated reamer *(Figure 12).*

After reaming, re-insert the zero-degree K-wire to re-establish the axis of drilling the Superior Augment Glenoid Plate cage. Remove the 10-degree K-wire and the Superior Augment K-wire Alignment Guide *(Figure 13).*

Drill the hole for the Superior Augment Glenoid Plate cage over the zero-degree K-wire (e.g., central axis of the scapula) using the reverse shoulder **Superior Augment Drill Guide**, the 2mm K-wire, and the **Cannulated Center Cage Drill** *(Figure 14).*

Implant the Superior Augment Glenoid Plate and continue with existing **Primary/Reverse Operative Technique (Lit#718-01-30).**

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.*

REVERSESHOULDER SUPERIOR/POSTERIOR AUGMENT GLENOID PLATE TECHNIQUE

The reverse shoulder **Superior/Posterior Augment Glenoid Plate** is designed to minimize the removal of the inferior cortical bone and anterior cortical bone when reaming a superiorly and posteriorly worn glenoid in order to correct its inclination and version.

Assuming the patient has superior and posterior wear, an irreparable rotator cuff tear and the surgeon wants to correct the glenoid back to neutral inclination and version:

- If glenoid wear is less than six degrees in both superior and retroversion planes, use the standard glenoid plate (320-15-01) and eccentrically ream as needed.
- If glenoid is superiorly worn between seven degrees and 13 degrees, and glenoid retroversion is between six degrees and 11 degrees, use the Superior/Posterior Augment Plate.
- If the glenoid is superiorly worn between 14 degrees and 18 degrees and retroversion is between 12 degrees and 18 degrees, use the Superior/Posterior Augment Plate 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 and use the +10mm Extended Cage Glenoid Plate and/or the Expanded Glenosphere.

Insert the zero-degree K-wire along the central axis of the glenoid to establish the axis of the glenoid plate cage *(Figures 15 and 16)*.

Insert the 10 degree K-wire 10 degrees superiorly off-axis from the zero-degree K-wire using the **Superior/Posterior K-wire Alignment Guide** to establish the glenoid reaming axis *(Figure 17)*.

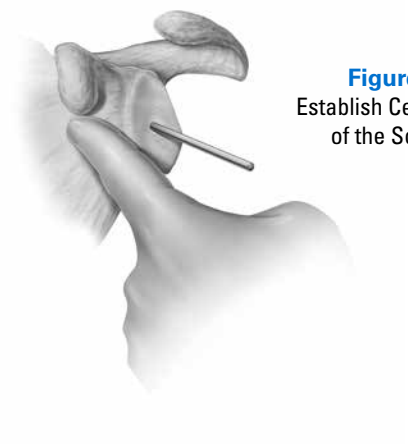


Figure 15
Establish Central Axis of the Scapula

Figure 16
Insert Zero-Degree K-wire Along Central Axis of the Scapula to Establish the Cage Axis

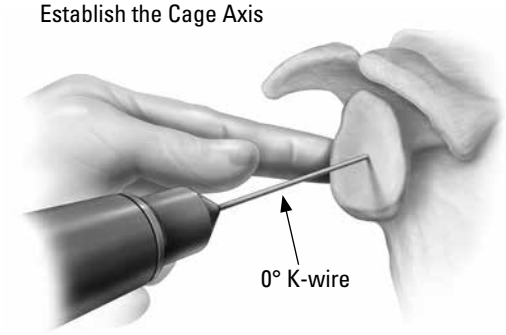


Figure 17
Insert 10-Degree K-wire 10 Degrees Superiorly Offset from Central Axis of Scapula

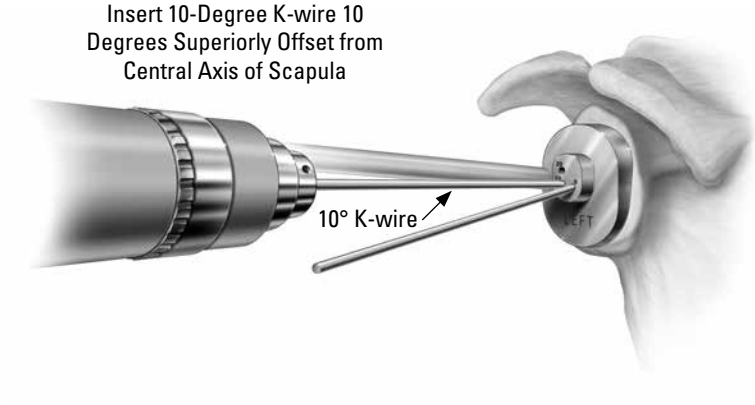
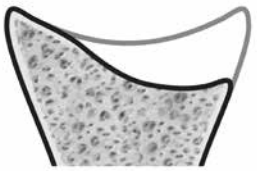
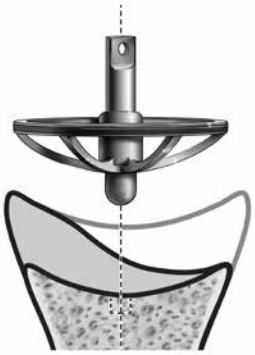


Figure 18
Bone Conservation



Glenoid Defect

Off-Axis Reaming with Augmented Implant



Eccentric Reaming

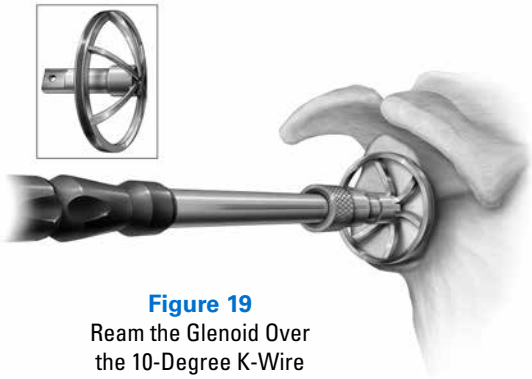


Figure 19
Ream the Glenoid Over the 10-Degree K-Wire

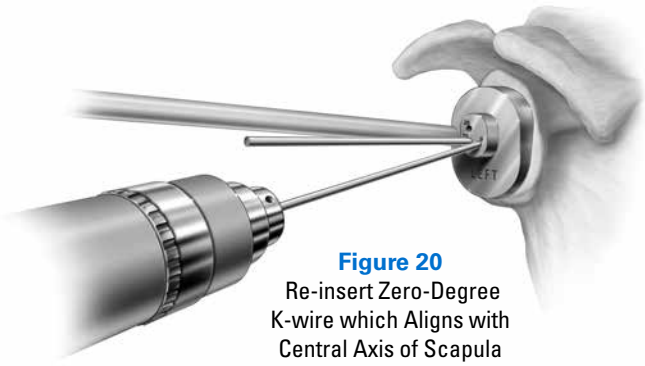


Figure 20
Re-insert Zero-Degree K-wire which Aligns with Central Axis of Scapula

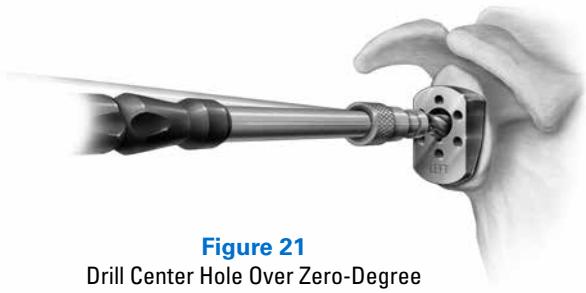


Figure 21
Drill Center Hole Over Zero-Degree K-wire to Establish Axis of Cage

Remove the K-wire and 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 18).*

Ream the glenoid over the 10-degree K-wire using the appropriately sized cannulated reamer *(Figure 19)*.

After reaming, re-insert the zero-degree K-wire to re-establish the axis of drilling the Superior/Posterior Glenoid Plate cage. Remove the 10-degree K-wire and Superior/Posterior Augment K-wire Alignment Guide *(Figure 20)*.

Drill the hole for the Superior/Posterior Augment Glenoid Plate cage over the central axis of the scapula using the reverse shoulder **Superior/ Posterior Drill Guide and the Extended Cage Drill** (321-15-38) *(Figure 21)*.

Implant the Superior/Posterior Augment Glenoid Plate and continue with existing **Primary/Reverse Operative Technique (Lit#718-01-30)**.

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.*

EQUINOXE IMPLANTS*

Catalog No.	Part Description	
320-02-38 320-02-42	38mm Expanded Glenosphere, +4mm lateral offset 42mm Expanded Glenosphere, +4mm lateral offset	
320-15-01	Standard Glenoid Plate	
320-15-02	Superior Augment Glenoid Plate, 10 Degrees	
320-15-03 320-15-04	Posterior Augment Glenoid Plate, Eight Degrees, Left Posterior Augment Glenoid Plate, Eight Degrees, Right	
320-15-06	Extended Cage Glenoid Plate, +10mm	
320-15-07 320-15-08	Superior/Posterior Augment Reverse Glenoid Plate, Left Superior/Posterior Augment Reverse Glenoid Plate, Right	

EQUINOXE INSTRUMENTS*

Catalog No.	Part Description
321-15-38	Extended Cage Drill
321-17-20	RS Superior Augment Glenoid K-wire Alignment Guide, Left
321-17-21	RS Superior Augment Glenoid K-wire Alignment Guide, Right
321-17-22	RS Posterior Augment Glenoid K-wire Alignment Guide, Left
321-17-23	RS Posterior Augment Glenoid K-wire Alignment Guide, Right
321-17-24	Superior/Posterior Augment Glenoid K-wire Alignment Guide, Left
321-17-25	Superior/Posterior Augment Glenoid K-wire Alignment Guide, Right
321-17-30	RS Superior Augment Glenoid Plate Drill Guide, Left
321-17-31	RS Superior Augment Glenoid Plate Drill Guide, Right
321-17-32	RS Posterior Augment Glenoid Plate Drill, Left
321-17-33	RS Posterior Augment Glenoid Plate Drill, Right
321-17-34	Superior/Posterior Augment Glenoid Plate Drill Guide, Left
321-17-35	Superior/Posterior Augment Glenoid Plate Drill Guide, Right
315-35-00	0.079 K-wire

*Special Order

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For additional device information, refer to the Exactech 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.

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 718-04-37 Rev. E 0420

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GLOBAL HEADQUARTERS:
2320 NW 66TH COURT
GAINESVILLE, FL 32653 USA

+1 352.377.1140
+1 800.EXACTECH
+1 352.378.2617 (FAX)
www.exac.com