

EXACTECH | SHOULDER

Operative Technique Addendum



equinox[®]

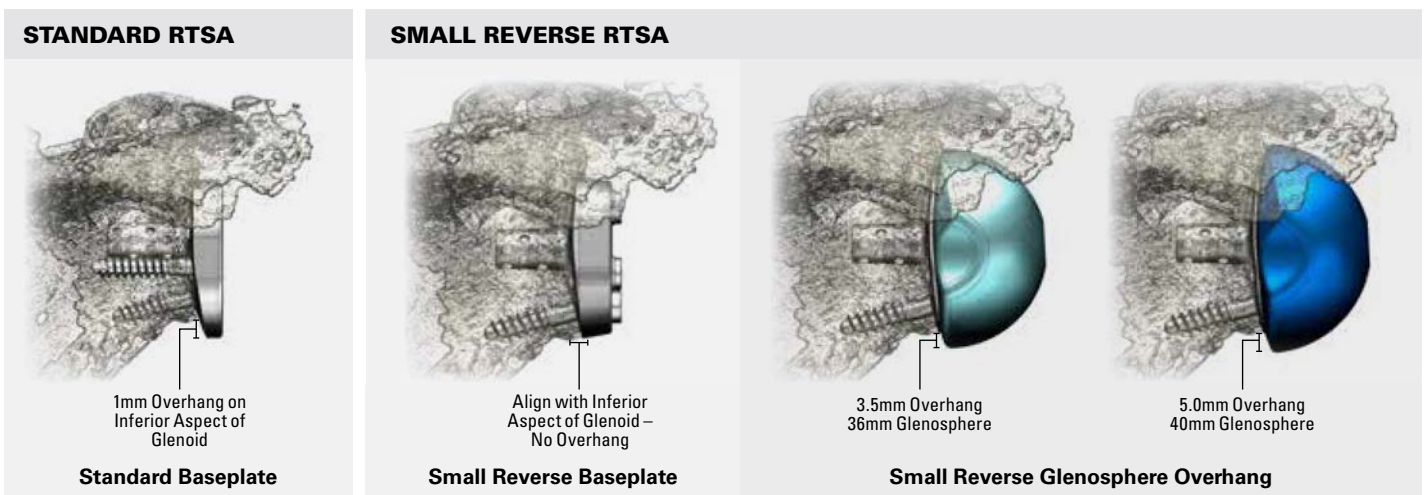
**Small Reverse Augment Glenoid Implant
Operative Technique Addendum
to Small Reverse Shoulder Addendum**

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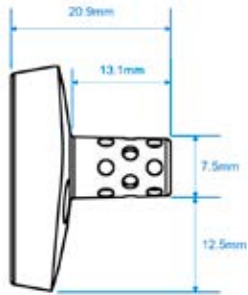
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INTRODUCTION

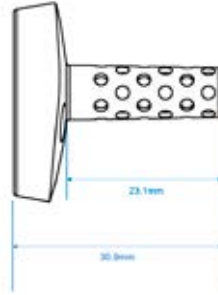
Thank you for considering the Equinox® Shoulder System. We have been committed to providing clinical solutions to challenges in shoulder arthroplasty since 2004. The Equinox System is unique because of its focus on anatomical replication and options for challenging glenoids and revisions. As a complement to this existing system, we are pleased to present the next generation of our glenoid implants. The Exactech Small Reverse implants were designed through collaboration with thought leaders worldwide; the result is a small baseplate that delivers an anatomic shape, a press-fit bone cage for strong initial fixation, and compatibility with the Equinox platform humeral components. It is our pleasure to present the Equinox Small Reverse Augment Shoulder operative technique.



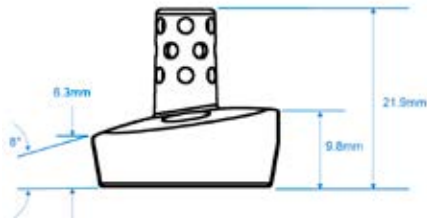
STANDARD CAGE GLENOID PLATE



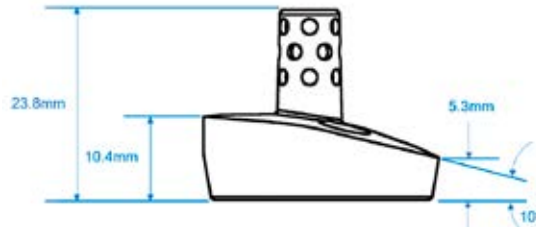
EXTENDED CAGE GLENOID PLATE, +10MM



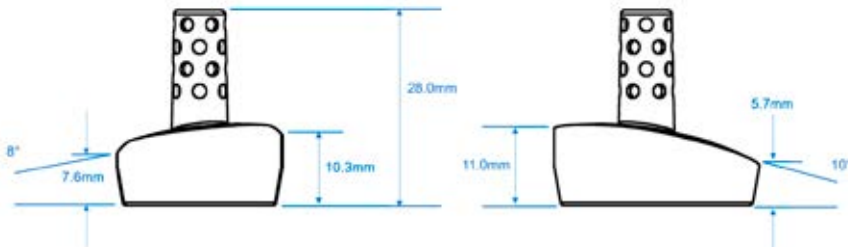
POSTERIOR AUGMENT GLENOID PLATE



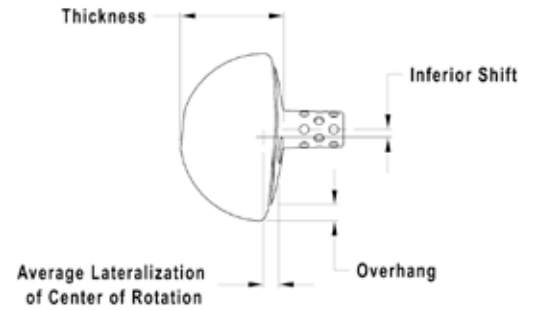
SUPERIOR AUGMENT GLENOID PLATE



SUPERIOR/POSTERIOR AUGMENT GLENOID BASEPLATE



GLENSPHERE



Small Reverse Glenosphere / Glenoid Baseplate

Part Number	Description	Glenosphere Diameter	Glenosphere Thickness	Glenosphere Inferior Overhang	Average Lateralization of Center of Rotation	Avg. Dist. from Standard Lat. of COR 10° Superior Augment	Avg. Dist. from Standard Lat. of COR 8° Posterior Augment	Avg. Dist. from Standard Lat. of COR 8° Superior/Posterior Augment
320-31-36	36mm Small Reverse Glenosphere	36mm	22.3mm	3.5mm	2.8mm	+3.5mm	+2.5mm	+4.0mm
320-31-40	40mm Small Reverse Glenosphere	40mm	24.3mm	5.0mm	2.8mm	+3.5mm	+2.5mm	+4.0mm
320-32-36	36mm Expanded Small Reverse Glenosphere	36mm	26.1mm	3.0mm	6.6mm	+3.5mm	+2.5mm	+4.0mm
320-32-40	40mm Expanded Small Reverse Glenosphere	40mm	28.1mm	5.0mm	6.6mm	+3.5mm	+2.5mm	+4.0mm

OVERVIEW TECHNIQUE
SMALL REVERSE EXTENDED CAGE BASEPLATE

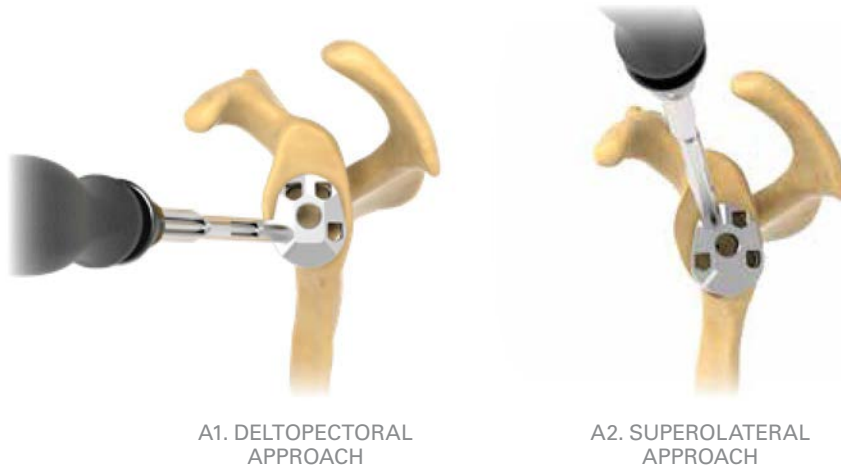


Figure A

Align Small Glenoid Plate Drill Guide and K-wire Guide Assembly on Inferior Aspect of Glenoid



Figure B

Drill Pilot Hole through K-wire Alignment Guide



Figure C

Ream the Glenoid



Figure D

Drill Using the Extended Cage Drill and Drill Guide for Central Cage

OVERVIEW TECHNIQUE
SMALL REVERSE POSTERIOR AUGMENT GLENOID PLATE



Figure A1
Align Small Glenoid Plate Drill Guide and K-wire Guide Assembly on Inferior Aspect of Glenoid



Figure B1
Insert Zero-Degree K-wire Through K-wire Alignment Guide

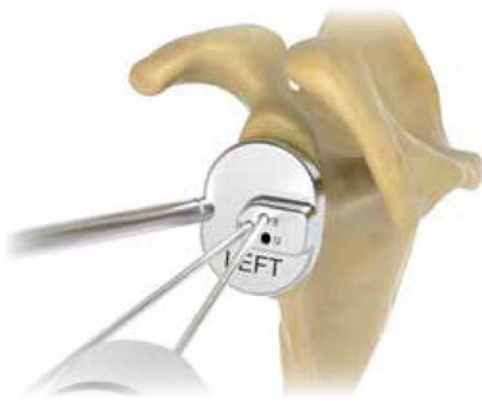


Figure C1
Insert Eight-Degree K-wire Using Zero-Degree K-wire as Reference



Figure D1
Ream the Glenoid Over the Eight-Degree K-Wire

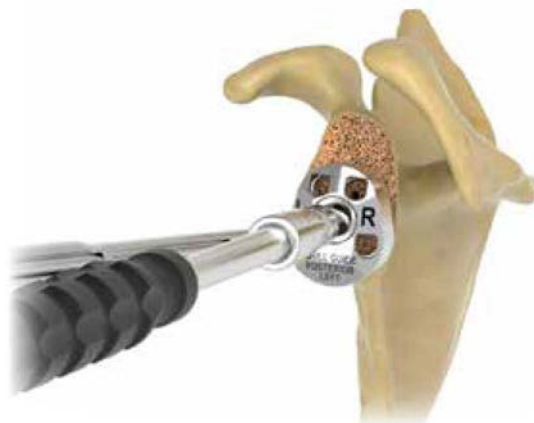


Figure E1
Drill Using Drill Guide for Central Cage

OVERVIEW TECHNIQUE

SMALL REVERSE SUPERIOR AUGMENT GLENOID PLATE



Figure A2

Align Small Glenoid Plate Drill Guide and K-wire Guide Assembly on Inferior Aspect of Glenoid



Figure B2

Insert Zero-Degree K-wire Through K-wire Alignment Guide



Figure C2

Insert 10-Degree K-wire Using Zero-Degree K-wire as Reference



Figure D2

Ream the Glenoid Over the 10-Degree K-wire



Figure E2

Drill Using Drill Guide for Central Cage

OVERVIEW TECHNIQUE
SMALL REVERSE SUPERIOR/POSTERIOR AUGMENT PLATE



Figure A3
Align Small Glenoid Plate Drill Guide and K-wire Guide Assembly on Inferior Aspect of Glenoid



Figure B3
Insert Zero-Degree K-wire Through K-wire Alignment Guide

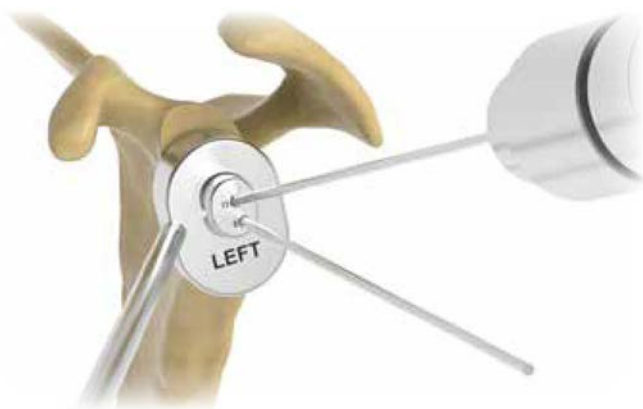


Figure C3
Insert 13-Degree K-wire Using Zero-Degree K-wire as Reference



Figure D3
Ream the Glenoid Over the 13-Degree K-wire



Figure E3
Drill Using the Extended Cage Drill and Drill Guide for Central Cage

DETAILED OPERATIVE TECHNIQUE

INDICATIONS FOR USE

The Equinox 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 Equinox 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.

CONTRAINDICATIONS FOR USE

Use of the Equinox 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

Align Small Glenoid Plate Drill Guide and K-wire Guide Assembly on Inferior Aspect of Glenoid

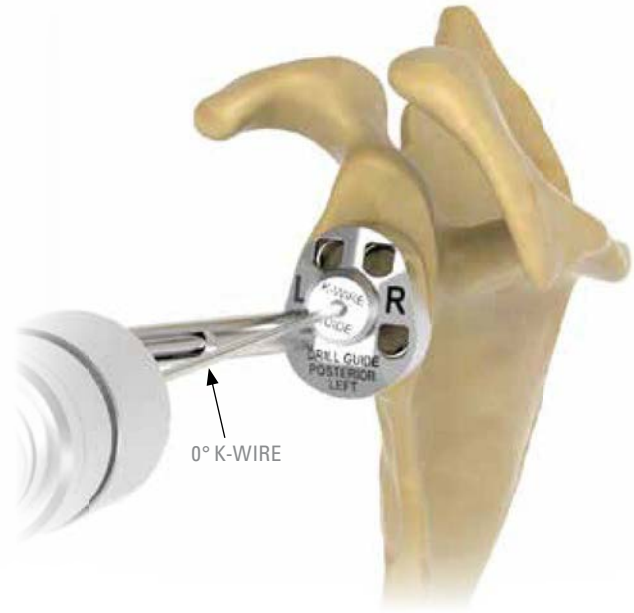


Figure 2

Insert Zero-Degree K-wire Through K-wire Alignment Guide

SMALL REVERSE SHOULDER POSTERIOR AUGMENT SMALL GLENOID PLATE TECHNIQUE

The **Small Reverse Standard Posterior Augment Small Glenoid Plate (320-35-03/04)** 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 **Small Reverse Standard Glenoid Plate (320-35-01)** and eccentrically ream as needed.

- If glenoid retroversion is between six degrees and 11 degrees, use the Posterior Augment Small Glenoid Plate.
- If glenoid retroversion is between 12 degrees and 18 degrees; use the Posterior Augment Small 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 (320-35-06)** and/or use the **Expanded Glenspheres (320-32-36/40)**.

Utilizing the **Posterior Drill Guide (321-35-03/04)** with **K-wire Alignment Guide (321-35-10)** inserted, align drill guide with the inferior rim of the glenoid and insert zero-degree K-wire (*Figures 1 and 2*).

DETAILED OPERATIVE TECHNIQUE

SMALL REVERSE SHOULDER POSTERIOR AUGMENT SMALL GLENOID PLATE TECHNIQUE

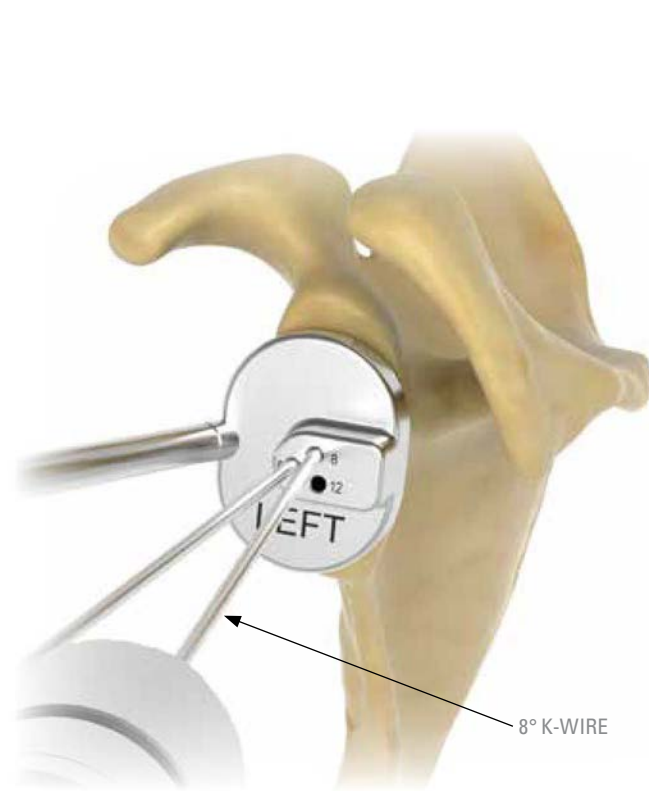


Figure 3

Insert Eight-Degree K-wire Using Zero-Degree K-wire as Reference



Figure 4

Bone Conservation

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 (321-17-22/23)** to establish the glenoid reaming axis (Figure 3).

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 Small Glenoid Plate.

Remove only 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).

Glenosphere for Small Glenoid Plate	Standard Reamer Size	Color of Standard Reamer
36mm	38mm	Blue
40mm	42mm	Yellow

Table 1

Standard Reamer Sizes for Small Reverse Shoulder Glenospheres



Figure 5

Ream the Glenoid over the Eight-Degree K-wire

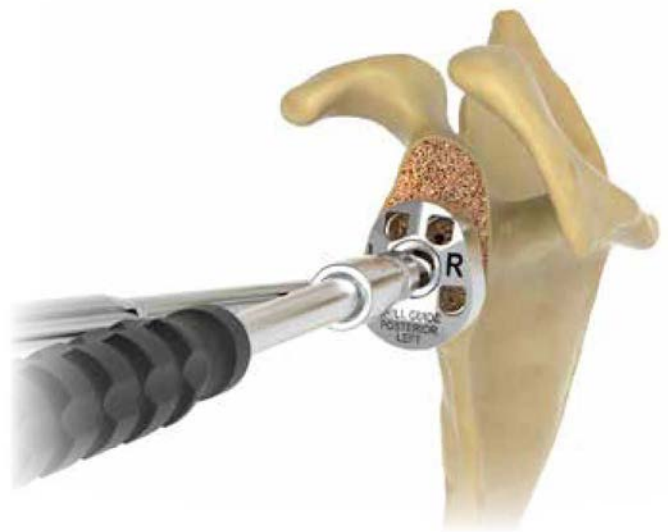


Figure 6

Drill Center Hole using Drill Guide

Ream the glenoid over the eight-degree K-wire using the appropriately sized cannulated reamer (*Figure 5*). *Table 1* shows the recommended standard reamer size for each Small Reverse glenosphere size.

It is critical to ream to the size of the largest potential glenosphere that the surgeon might use to ensure that the glenosphere will fit on the face of the glenoid without peripheral bony impingement (i.e. the Small Glenoid Plate will already be fixed to the glenoid and upsizing the glenosphere during trialing will not be possible if the corresponding reaming has not already been performed).

SURGICAL TIP

Start the reamer prior to engaging bone.

Remove the eight-degree K-wire.

Drill the hole for the Posterior Augment Small Glenoid Plate cage using the Small Reverse Shoulder **Posterior Augment Drill Guide (321-35-03/04)** and the **Pilot Tip Cage Drill (315-27-60)** (*Figure 6*).

Implant the Posterior Augment Small Glenoid Plate using the **Small Glenoid Plate Inserter (321-35-23)** and **Impactor Handle (321-07-05)** and continue with the existing **Small Reverse Operative Technique (Lit#718-04-45)**.

DETAILED OPERATIVE TECHNIQUE

SMALL REVERSE SHOULDER SUPERIOR AUGMENT GLENOID PLATE TECHNIQUE



Figure 7

Align Small Glenoid Plate Drill Guide and K-wire Guide Assembly on Inferior Aspect of Glenoid

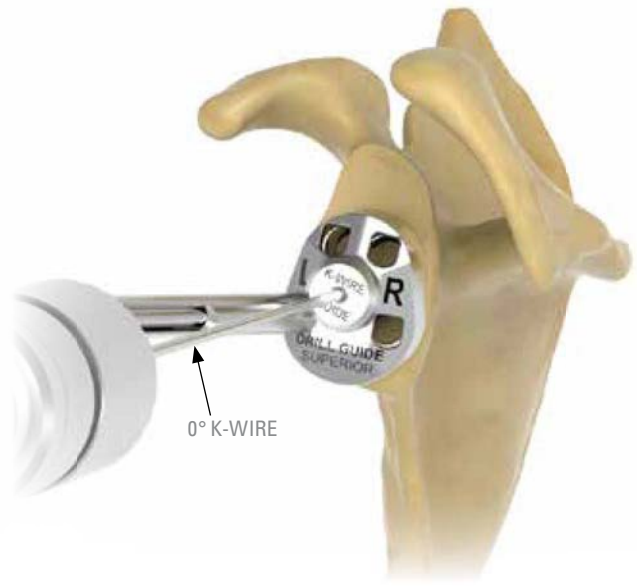


Figure 8

Insert Zero-Degree K-wire Through K-wire Alignment Guide

SMALL REVERSE SHOULDER SUPERIOR AUGMENT GLENOID PLATE TECHNIQUE

The Small Reverse Shoulder **Superior Augment Small Glenoid Plate (320-35-02)** 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 **Small Reverse Standard Glenoid Plate (320-35-01)** and eccentrically ream as needed.

- If the glenoid is superiorly worn between seven degrees and 10 degrees; use the Superior Augment Small 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 Small Glenoid Plate (320-35-06)** and/or use the **Expanded Glenspheres (320-32-36/40)**.

Utilizing the Small Reverse **Superior Drill Guide (321-35-02)** with **K-wire alignment guide (321-35-10)** inserted, align drill guide with the inferior rim of the glenoid, and insert zero-degree K-wire (*Figures 7 and 8*).

DETAILED OPERATIVE TECHNIQUE
SMALL REVERSE SHOULDER SUPERIOR AUGMENT GLENOID PLATE TECHNIQUE

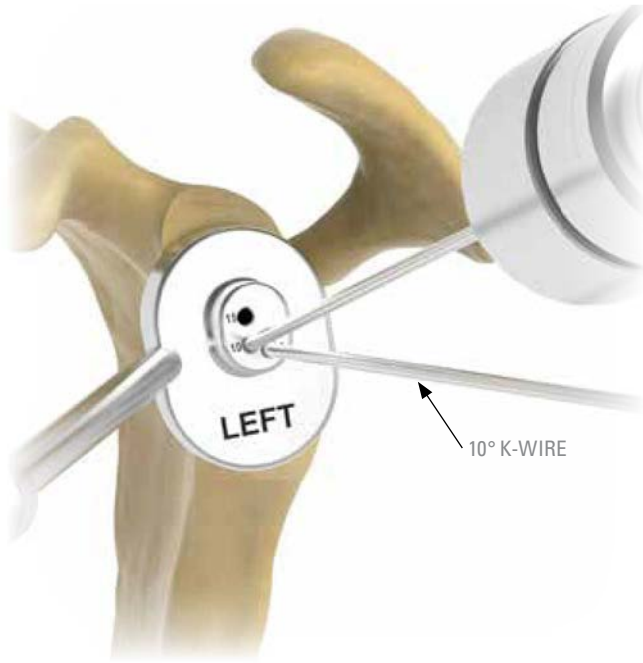


Figure 9

Insert 10-Degree K-wire Using Zero-Degree K-wire as Reference



Figure 10

Bone Conservation

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 (321-17-20/21)** to establish the glenoid reaming axis (Figure 9).

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.

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 10).

DETAILED OPERATIVE TECHNIQUE

SMALL REVERSE SHOULDER SUPERIOR AUGMENT GLENOID PLATE TECHNIQUE

Glenosphere for Small Glenoid Plate	Standard Reamer Size	Color of Standard Reamer
36mm	38mm	Blue
40mm	42mm	Yellow

Table 2

Standard Reamer Sizes for Small Reverse Shoulder Glenospheres

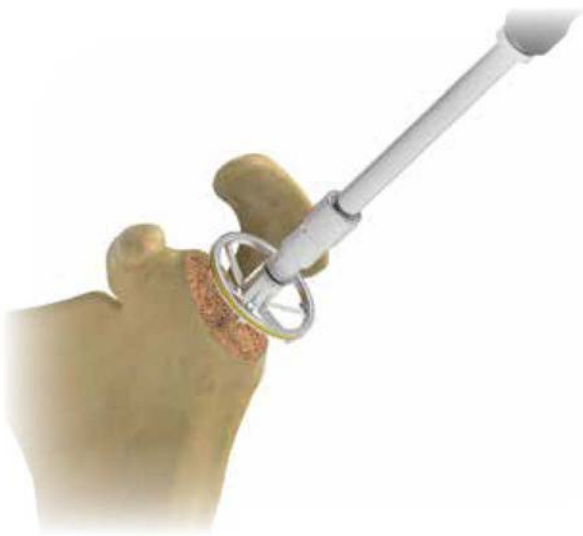


Figure 11

Ream the Glenoid Over the 10-Degree K-wire



Figure 12

Drill Center Hole Using Drill Guide

Ream the glenoid over the 10-degree K-wire using the appropriately sized cannulated reamer based upon the anticipated size of the glenosphere (Figure 11). Table 2 shows the recommended standard reamer size for each Small Reverse glenosphere size.

It is critical to ream to the size of the largest potential glenosphere that the surgeon might use to ensure that the glenosphere will fit on the face of the glenoid without peripheral bony impingement (i.e. the Small Glenoid Plate will already be fixed to the glenoid and upsizing the glenosphere during trialing will not be possible if the corresponding reaming has not already been performed).

SURGICAL TIP
Start the reamer prior to engaging bone.

Remove the 10-degree K-wire.

Drill the hole for the Superior Augment Small Glenoid Plate cage using the Small Reverse Shoulder **Superior Augment Drill Guide (321-35-02)** and the **Pilot Tip Cage Drill (315-27-60)** (Figure 12).

Implant the Superior Augment Small Glenoid Plate using the **Small Glenoid Plate Inserter (321-35-23)** and **Impactor Handle (321-07-05)** and continue with existing **Small Reverse Operative Technique (Lit#718-04-45)**.



Figure 13

Align Small Glenoid Plate Drill Guide and K-wire Guide Assembly on Inferior Aspect of Glenoid

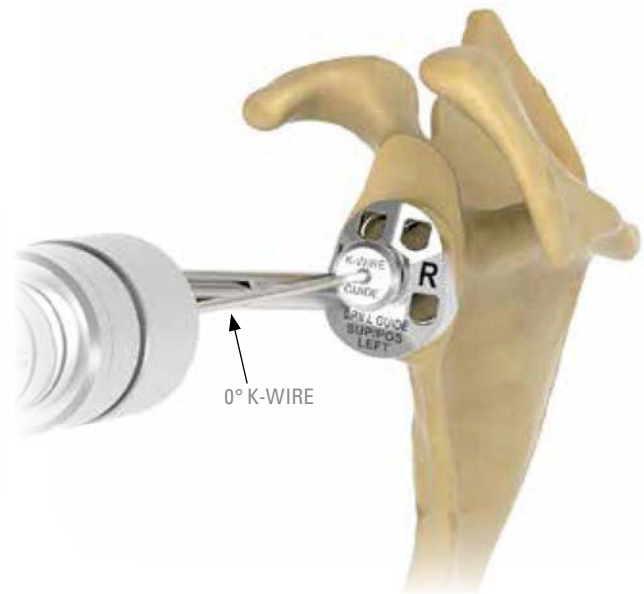


Figure 14

Insert Zero-Degree K-wire Through K-wire Alignment Guide

SMALL REVERSE SHOULDER SUPERIOR/POSTERIOR AUGMENT GLENOID PLATE TECHNIQUE

The Small Reverse Shoulder **Superior/Posterior Augment Small Glenoid Plate (320-35-07/08)** 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 **Small Reverse Standard Glenoid Plate (320-35-01)** and eccentrically ream as needed.
- If glenoid is superiorly worn between seven degrees and 10 degrees, and glenoid retroversion is between six degrees

and 11 degrees, use the Small Reverse 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 Small Reverse 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 Small Glenoid Plate (320-35-06)** and/or the **Small Reverse Expanded Glenosphere (320-32-36/40)**.

Utilizing the Small Reverse **Superior/Posterior Drill Guide (321-35-07/08)** with **K-wire alignment guide (321-35-10)** inserted, align drill guide with the inferior rim of the glenoid and insert zero-degree K-wire (*Figures 13 and 14*).

DETAILED OPERATIVE TECHNIQUE

SMALL REVERSE SHOULDER SUPERIOR/POSTERIOR AUGMENT GLENOID PLATE TECHNIQUE

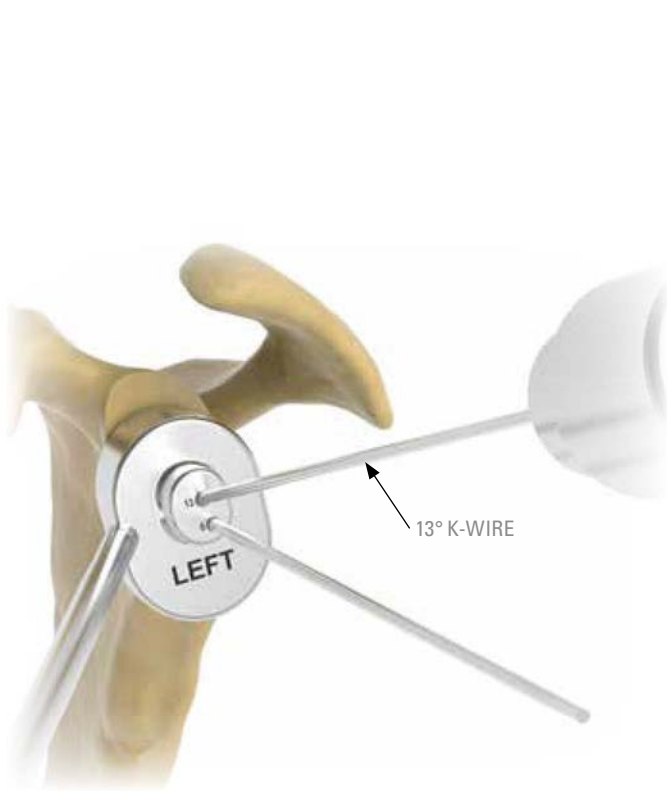


Figure 15

Insert 13-Degree K-wire Using Zero-Degree K-wire as Reference



Figure 16

Bone Conservation

Insert the 13-degree K-wire 13 degrees off-axis from the zero-degree K-wire using the **Small Reverse Superior/Posterior K-wire Alignment Guide (321-35-07/08)** to establish the glenoid reaming axis (Figure 15).

Remove zero-degree K-wire.

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 16).

Glenosphere for Small Glenoid Plate	Standard Reamer Size	Color of Standard Reamer
36mm	38mm	Blue
40mm	42mm	Yellow

Table 3

Standard Reamer Sizes for Small Reverse Shoulder Glenospheres



Figure 17

Ream the Glenoid Over the 13-Degree K-wire



Figure 18

Drill Center Hole Using the Extended Cage Drill and Drill Guide

Ream the glenoid over the 13-degree K-wire using the appropriately sized cannulated reamer (*Figure 17*). *Table 3* shows the recommended standard reamer size for each Small Reverse glenosphere size.

It is critical to ream to the size of the largest potential glenosphere that the surgeon might use to ensure that the glenosphere will fit on the face of the glenoid without peripheral bony impingement (i.e. the Small Glenoid Plate will already be fixed to the glenoid and upsizing the glenosphere during trialing will not be possible if the corresponding reaming has not already been performed).

SURGICAL TIP

Start the reamer prior to engaging bone.

Remove the 13-degree K-wire.

Drill the hole for the Superior/Posterior Augment Small Glenoid Plate cage using the Small Reverse Shoulder **Superior/Posterior Drill Guide (321-35-07/08)** and the **Extended Cage Drill (321-15-38)** (*Figure 18*).

Implant the Superior/Posterior Augment Small Glenoid Plate using the **Small Glenoid Plate Inserter (321-35-23)** and **Impactor Handle (321-07-05)** and continue with existing **Small Reverse Operative Technique (Lit#718-04-45)**.

SMALL REVERSE EQUINOXE IMPLANTS

CATALOG NUMBER DESCRIPTION

320-35-01 Small Reverse Glenoid Plate



320-35-02 Small Reverse Superior Augment Glenoid Plate, 10 Degrees



320-35-03 Small Reverse Posterior Augment Glenoid Plate, Eight Degrees, Left



320-35-04 Small Reverse Posterior Augment Glenoid Plate, Eight Degrees, Right



320-35-06 Small Reverse Extended Cage Glenoid Plate, +10mm



320-35-07 Small Reverse Superior/Posterior Augment Reverse Glenoid Plate, Left






320-35-08 Small Reverse Superior/Posterior Augment Reverse Glenoid Plate, Right







SMALL REVERSE EQUINOXE INSTRUMENTS

CATALOG NUMBER DESCRIPTION





INSTRUMENTS INCLUDED IN SMALL REVERSE AUGMENT KIT

321-35-02	Drill Guide, Small Glenoid Plate, Superior Augment	
321-35-03	Drill Guide, Small Glenoid Plate, Posterior Augment, Left	
321-35-04	Drill Guide, Small Glenoid Plate, Posterior Augment, Right	
321-35-07	Drill Guide, Small Glenoid Plate, Superior/Posterior Augment, Left	
321-35-08	Drill Guide, Small Glenoid Plate, Superior/Posterior Augment, Right	

INSTRUMENTS INCLUDED IN SMALL REVERSE STANDARD KIT

321-35-10	K-wire Alignment Guide	
321-35-20	Drill Guide, Small Glenoid Plate	
315-52-10	Modular Glenoid Guide Handle	
321-35-23	Insertor, Small Glenoid Plate	

INSTRUMENTS INCLUDED IN EQUINOXE STANDARD KIT

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	
321-15-38	Extended Cage Drill	
315-35-00	0.079 K-wire	

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.

Exactech, as the manufacturer of this device, does not practice medicine, and is not responsible for recommending the appropriate surgical technique for use on a particular patient. These guidelines 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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