SHOULDER

Operative Technique Addendum



equinoxe®

Equinoxe Central Screw Baseplate (CSB)

Augmented Baseplates

advita ORTHO

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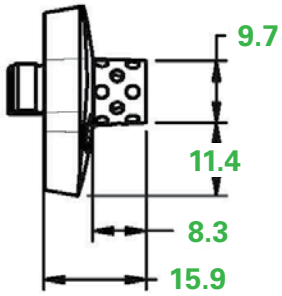
INTRODUCTION

This document presents an addendum to the Equinoxe Platform Shoulder System with Ergo® Instruments operative technique and the Small Reverse operative technique addendum. The steps described in this addendum address the steps specific to the Equinoxe CSB and related instrumentation.

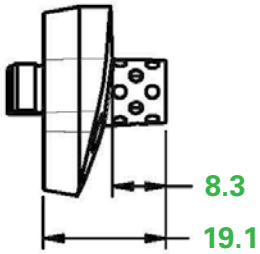
This document details an operative technique for the CS baseplate augments with the use of either an adjustable angle reamer driver (Option 1), or the small reverse augment guides (Option 2).

CSB DIMENSIONS

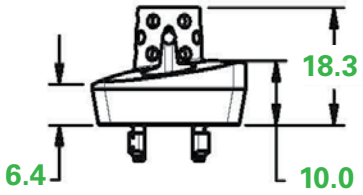
Central Screw Baseplate, Neutral



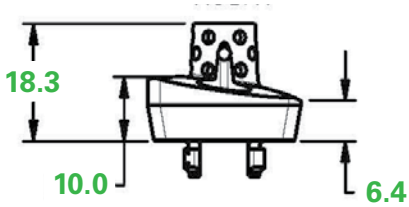
Central Screw Baseplate, 10 Deg Superior Augment



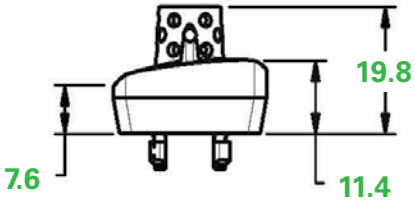
Central Screw Baseplate, 8 Deg Posterior Augment, Left



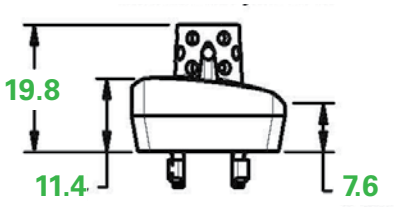
Central Screw Baseplate, 8 Deg Posterior Augment, Right



Central Screw Baseplate, 8/10 Deg Posterior/Superior Augment, Left



Central Screw Baseplate, 8/10 Deg Posterior/Superior Augment, Right



OPERATIVE TECHNIQUE OVERVIEW

There are two options for drilling the pilot hole and reaming the glenoid. Option 1 involves using the Adjustable Angle Reamer Driver, while option 2 utilizes the Small Reverse Drill Guides.

Option 1: Ergo Adjustable Angle Reamer Driver (AARD)



Figure A
Drill a 3.2mm Drill Bit Through a K-Wire Bullet and Small Reverse Drill Guide

Option 2: Small Reverse Augment Drill Guide



Alternative: Establish Central Axis of the Scapula via Matsen's point

Figure B
Establish the Off Axis with a 3.2mm Drill Bit and 0 degree glenoid guide



Figure C
Ream over the 3.2mm Drill Bit



Figure D
Drill the Central Screw Hole

Complete the Technique



Figure E
Cannulated Drilling



Figure F
Insert the Central Screw Baseplate



Figure G
Insert Central
Compression Screw



Figure H
Drill Compression Screw Holes



Figure I
Manually Insert the One-Lock
Plate onto the Baseplate

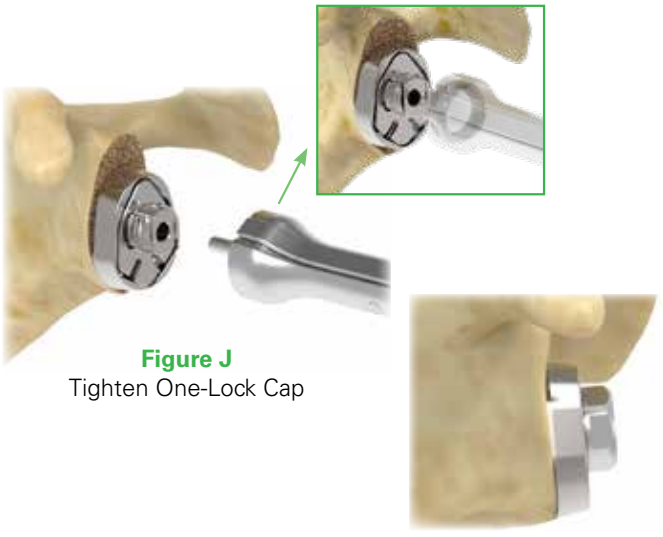


Figure J
Tighten One-Lock Cap

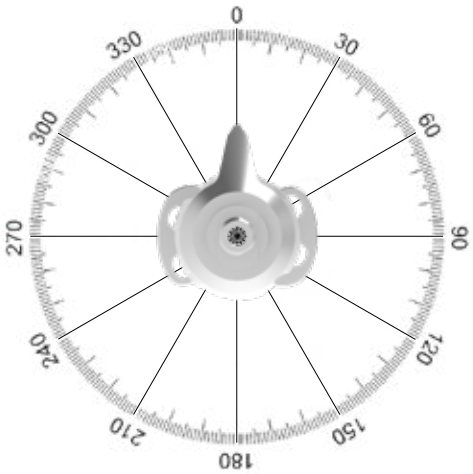


Figure K
Insert the Glenosphere and
Glenosphere Locking Screw

Option 1: Ergo Adjustable Angle Reamer Driver (AARD)



Figure 1
Drill a 3.2mm Drill Bit Through a K-Wire Bullet and Small Reverse Drill Guide



AARD Reference Angle



Figure 2
Reaming with an Adjustable Angle Reamer (AARD)

Steps 1 and 2: Drill Central Screw Hole and Ream Glenoid

Reaming With The Adjustable Angle Reamer Driver

Choose a **Glenoid Plate Drill Guide** corresponding to the desired level of correction (e.g. **321-35-03** for 8 degree posterior left).

Connect the guide to the **Modular Glenoid Guide Handle (315-52-11)** and **K-Wire Adapter (315-51-10)**.

Align the Glenoid Plate Drill Guide with the inferior glenoid rim to ensure the glenosphere is properly positioned in a superior-inferior position.

Insert the **3.2mm K-wire** or **3.2mm Drill Bit (321-52-11)** and drill to anchor it into the glenoid *(Figure 1)*. This drill bit is to be the focal point for the **AARD (301-11-10)**. With the AARD, the surgeon can ream the glenoid at angle independent of the driven/anchor axis. This is accomplished by reaming over the 3.2mm K-wire or 3.2mm Drill Bit.

To adjust the reaming angle on the AARD, rotate the Angle Adjustment Knob to reflect the desired augment to be used; ensure the arrow is pointing at the desired augment number/ degree on the Angle Adjustment Knob *(Figure 2)*. Connect the AARD to power, via Zimmer Hudson connection.

Point the fin on the AARD handle in the direction of the glenoid defect. The proper orientation of the fin varies relative to the selected baseplate augment *(Table 1)*:

- **Superior Augment (320-55-02)** - the fin should be pointing in the superior direction, parallel to the Coronal Plane.
- **Posterior Augment (320-55-03 or 320-55-04)** - the fin should be pointing 90 degrees from the Coronal Plane in the posterior direction for left shoulder and 270 degrees for right shoulder.

Option 1: Ergo Adjustable Angle Reamer Driver (AARD)



IMPLANT	LEFT SHOULDER	RIGHT SHOULDER
Superior/Posterior	40 degrees	320 degrees
Posterior	90 degrees	270 degrees
Superior	0 degrees	0 degrees

Table 1
Position of the AARD Fin

- **Superior/Posterior Augment (320-55-07 or 320-55-08)** - the fin should be pointing 40 degrees from the Coronal Plane in the posterior direction for left shoulder and 220 degrees for right shoulder.

Reaming begins with the **Reverse Shoulder Starter Reamer (321-59-00)** and progresses to the **36/38mm reamer (321-59-38)** and **40/42mm reamer (321-59-42)** sizes based upon the anticipated size of the glenosphere. Sequentially ream the glenoid over the K-wire until any pre-identified glenoid erosions are corrected and the glenoid surface has been fully contoured.

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 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).

Important: Make sure that the alignment fin remains aimed at the defect throughout the reaming process.

Note: *An rTSA Starter Reamer is provided to aid the surgeon in the initial glenoid preparation.*

Note: *Check that the reamer is engaged on the driver before starting. The reamer's back face should be parallel to the front surface of the pivoting body.*

Note: *Start the reamer prior to engaging bone.*

Note: *Avoid applying a bending force to the AARD (e.g. using the AARD to assist with exposure). This could lead to fracture or deformation of the pilot tip or 3.2mm drill bit.*

Option 1: Ergo Adjustable Angle Reamer Driver (AARD)

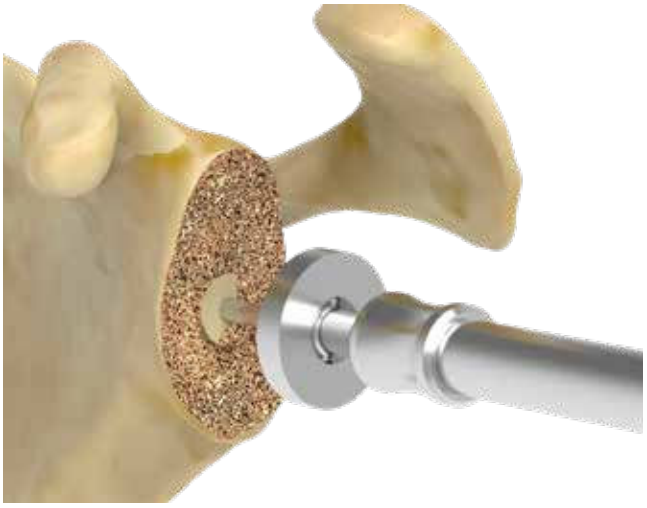


Figure 3a
Finishing Reamer to Remove Bone Shelf



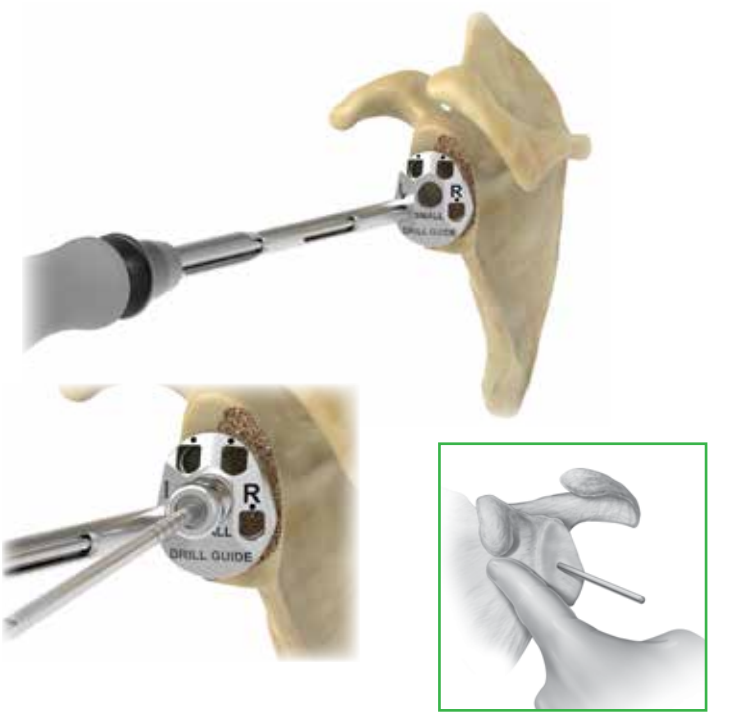
Figure 3b
Finishing Reamer

Finishing Reamer

A secondary reaming step is then completed to clean up the bone shelf remaining after reaming with the AARD (and that would otherwise not be removed with the Central Drill). This step is completed through the use of the **rTSA Finishing Reamer (321-59-09)** connected to the **Cannulated Glenoid Reamer Driver (315-50-12)**. The finishing reamer will ream the resultant bone shelf down to the previously reamed surface *(Figures 3a and 3b)*.

The Finishing Reamer will pivot to match the reamed glenoid surface and a stop is built-in to prevent over-reaming. Ream the glenoid over the 3.2mm K-wire until contact with the previously reamed surface.

Option 2: Small Reverse Augment Drill Guide



Alternative: Establish Central Axis of the Scapula via Matsen's point

Figure 4
Establish the Off Axis with a 3.2mm Drill Bit and 0 degree glenoid guide



Figure 5
Connect the appropriately-sized Modular Cannulated Reamer to the Modular Cannulated Driver



Figure 6
Ream over the 3.2mm Drill Bit

Establish Reaming Angle

Establish the augment corrective reaming angle using the **0° Small Reverse Drill Guide (321-35-20)** *(Figure 4)*.

Attach the K-wire Adapter to the Small Reverse Drill Guide and position the guide such that the inferior aspect of the guide aligns with the inferior glenoid rim. Drill the 3.2mm Drill Bit through the K-wire Adapter. This drill bit is the focal point for reaming.

Connect the appropriately-sized **Modular Cannulated Reamer (321-50-01/38/42)** to the **Modular Cannulated Driver (315-50-12)** *(Figure 5)*.

Sequentially ream the glenoid over the 3.2mm drill bit until any pre-identified glenoid erosions are corrected and the glenoid surface has been fully contoured *(Figure 6)*. Reaming begins with the Reverse Shoulder Starter Reamer and progresses to the 36/38mm Reamer and 40/42mm Reamer sizes based upon the anticipated size of the glenosphere.

The surgeon may also establish a neutral axis via Matsen's point *(Fig. 4 inset)* and then ream at their own discretion based off of this neutral axis.

Note: *Check that the reamer is engaged on the driver handle before starting.*

Note: *Start the reamer prior to engaging bone.*

Note: *Avoid applying a bending force to the 3.2mm Drill Bit as this may cause fracture.*

Option 2: Small Reverse Augment Drill Guide



Figure 7
Drill the Central Screw Hole



Figure 8
Central Screw Length Indication

Drill Neutral Axis for Central Screw

After reaming the glenoid, remove the 3.2mm Drill Bit and choose a **Glenoid Plate Drill Guide** (e.g., **321-35-03** for posterior 8°, Left) corresponding to the desired level of correction and connect it with the Modular Glenoid Guide Handle and K-Wire Adapter.

Align the guide directly on the inferior aspect of the glenoid. Insert the 3.2mm Drill Bit through the K-Wire Adapter *(Figure 7)*.

Drill the central screw hole until contact is made with cortical bone.

The length of the Central Compression Screw is indicated by the 3.2mm drill bit. The laser marking should be flush with the back face of the K-Wire Adapter *(Figure 8)*.

Leave the drill bit in position for the following steps: reaming and drilling the cage.

Complete the Technique

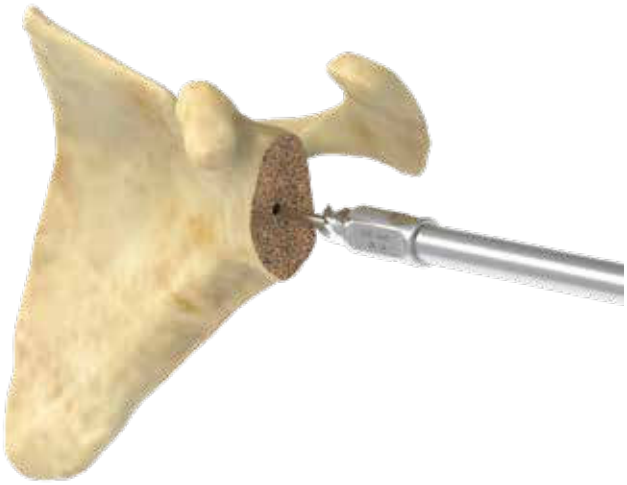


Figure 9a
Cannulated Drilling

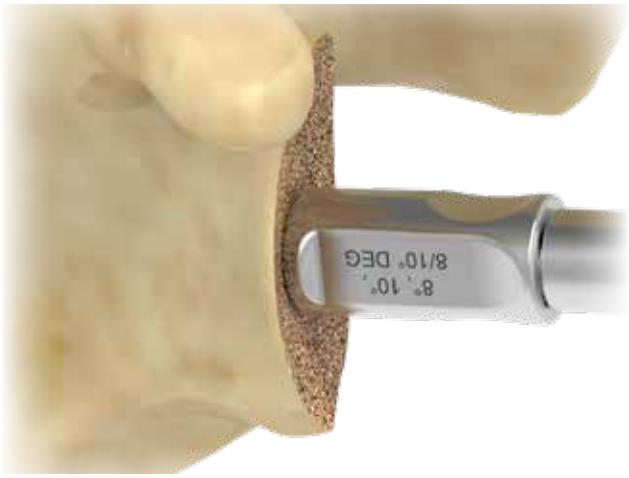


Figure 9b
Cannulated Drilling

STEP 3: DRILL THE CAGE

Attach the **CSB 8, 10, 8/10 Degree Cage Drill (321-52-67)** to the Modular Cannulated Driver *(Figures 9a and 9b)*.

Note: *Check that the drill is engaged on the driver handle before starting.*

Drill the CSB cage hole through the 3.2mm drill bit. A built-in stop on the drill bit prevents over-drilling beyond the required depth for the cage.

After drilling the cage, remove the 3.2mm drill bit.

Complete the Technique



Figure 10a
Insert the Central Screw Baseplate onto the Inserter

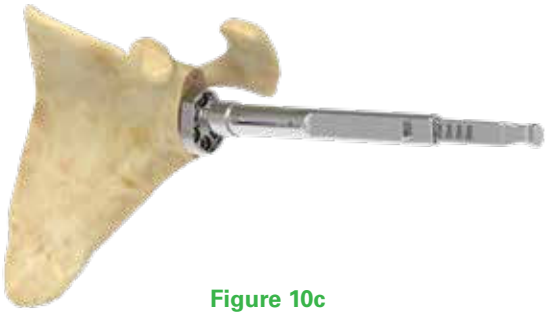


Figure 10c
Central Screw Hole Depth Check



Figure 10b
Insert the Central Screw Baseplate



Figure 10d
Depth Gauge Readings

STEP 4: IMPLANT THE CENTRAL SCREW BASEPLATE

Attach the baseplate to the **CS Baseplate inserter (321-19-34)**, that is connected to the **CSB Impactor Handle (321-07-15)** *(Figure 10a)*.

Align the baseplate with the cage hole and insert it onto the glenoid *(Figure 10b)*.

Re-measure the depth of the central compression screw hole with the **Depth Gauge (321-19-19)** to confirm the length *(Figures 10c and 10d)*. **To ensure optimal fixation, if the Depth Gauge readings fall between sizes, always choose the larger size.**

Complete the Technique



Figure 11
Insert Central Compression Screw



Figure 12
The central screw is visible through a side window of the Central Screw Baseplate inserter

STEP 5: IMPLANT & TIGHTEN THE CENTRAL SCREW

Insert the **6.5mm Central Compression Screw** through the Impactor Handle and Baseplate Inserter (321-19-34) using the **CSB Tapered Hex Driver (321-19-18) or CSB Non-Tapered Hex Driver (321-19-28)** *(Figures 11 and 12)*.

Note: *When the Central Compression Screw is fully seated, the laser mark line on the end of the CSB Hex Driver will align with the back face of the Impactor Handle.*

Tighten the screw until achieving compression.

Note: *Take care to prevent debris from getting on the screw-hole as this could prevent adequate screw engagement.*

Note: *Do not overtighten the Central Compression Screw.*

Complete the Technique



Figure 13
Drill Compression Screw Holes

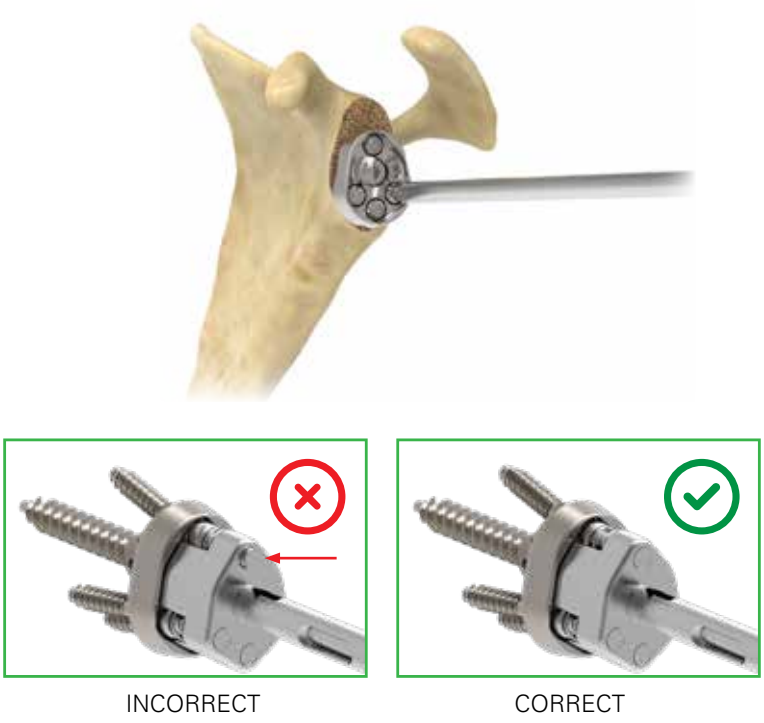


Figure 14
Drill and Implant Peripheral Screws

STEP 6: DRILL & IMPLANT THE PERIPHERAL COMPRESSION SCREWS

NOTE: *It is recommended to implant all four peripheral compression screws.*

The peripheral screw holes should be drilled using the **CSB Adjustable Angle Drill Guide (321-19-15)** and the **Ergo 3.2mm Drill (321-52-07)**. Each hole on the CSB allows for angular variability so the orientation of the screws can be selected to maximize bone purchase *(Figures 13 and 14)*.

Note: *The Ergo Drill Guide (321-19-05) is compatible with the CSB system but limits the angular variability. The central screw can also limit the angular variability for converging screws.*

Determine the depth of each hole using the **Glenoid Screw Depth Gauge (321-19-09)**. Select the appropriately sized Compression Screws and insert into the drilled holes. Tighten the peripheral screws to achieve fixation and compression of the CSB to the glenoid. If power is used to initially insert the screws, the final seating should be performed by hand as this will maximize fixation.

Note: *Take care to prevent debris from getting on the screw hole as this could prevent adequate screw engagement.*

The peripheral compression screws must be fully inserted to ensure the One-Lock Plate is properly seated. To check the depth of the peripheral compression screws, attach the **Peripheral Screw Depth Checker (321-19-20)** to the Modular Glenoid Guide Handle and push onto the construct. If any of the spring-loaded arms are protruding, re-tighten the corresponding screws until the front face of the instrument is completely flush *(Figure 14)*.

If necessary, re-tighten the central compression screw using the Hex driver after the peripheral screws have been inserted.

Complete the Technique



Figure 15
Manually Insert the One-Lock Plate onto the Baseplate

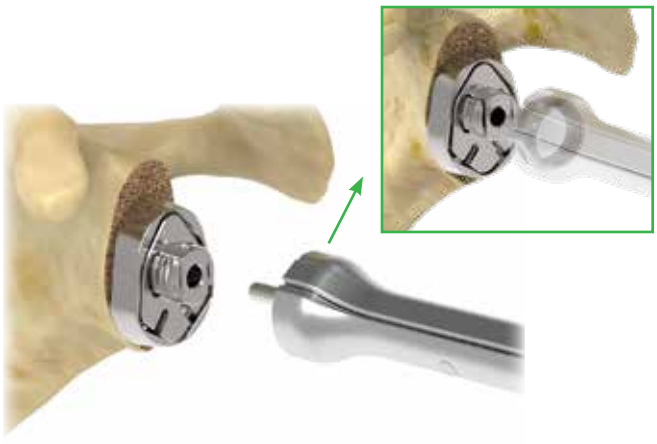




Figure 16
Place the One-Lock Cap into the Inserter



Figure 17
Tighten One-Lock Cap

STEP 7: INSERT THE ONE-LOCK PLATE AND ONE-LOCK CAP

Ensure that all the peripheral screws are properly seated and that their heads are not protruding. The One-Lock Plate can be inserted onto the baseplate using forceps or by hand *(Figure 15)*.

Load the **One-Lock Cap (320-55-98)** onto the **CSB One-Lock Cap Inserter (321-19-35)** *(Figure 16)*.

Position the inserter so that it is on the same axis as the cage of the CSB. It is important that the alignment is on axis to prevent cross threading *(Figure 17)*. Tighten the One-Lock cap.

Note: *Ensure that the One-Lock plate is flush with the edge of the baseplate.*

Complete the Technique

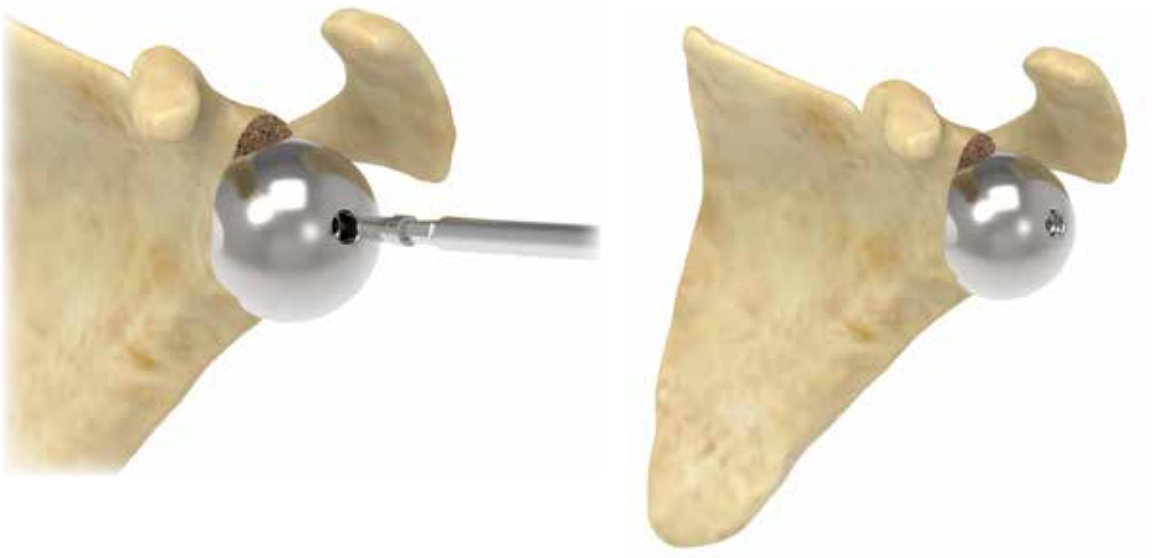


Figure 18
Insert the Glenosphere and Glenosphere Locking Screw

STEP 8: IMPLANT THE GLENOSPHERE

The appropriately-sized glenosphere is defined by implanting the largest one that can be inserted based upon exposure and the coracoacromial arch anatomy ensuring that it was reamed up to that size during the glenoid reaming step.

Note: *Unlike circular baseplates, the anatomical shape of the Equinoxe CS Baseplate mandates that the glenosphere can only fit in one specific orientation.*

Standard and Ergo Equinoxe glenosphere inserters can be used for insertion of the Small Reverse Glenosphere Trials and Glenospheres. Glenosphere does not have a taper connection and should not be impacted. The glenosphere is secured with a **CSB Glenosphere Locking Screw (320-55-99)** using the 3.5mm Hex Driver *(Figure 18)*.

Note: *The CSB Glenosphere Locking Screw (320-55-99) is shorter than the standard Glenosphere Locking Screw (320-15-05). These screws are not interchangeable.*

Complete the Technique

Should the implants need to be removed after implantation for any reason, follow these steps:

STEP 9: REMOVING THE CS BASEPLATE CONSTRUCT

Glenosphere Removal

Remove the CSB Glenosphere Locking Screw from the construct using the CSB Hex Driver or any other 3.5mm Hex Driver by turning the driver counterclockwise. Once the CSB Glenosphere Locking Screw has been removed, disengage the Glenosphere by hand or using the Ergo Glenosphere Inserter (321-01-52).

Note: *The connection between the Glenosphere and the CS Baseplate is not a tapered fit.*

One-Lock Cap And Plate Removal

Using the CSB One-Lock Cap Inserter, unthread the One-Lock Cap from the CS Baseplate by turning the instrument counterclockwise until it is fully disengaged. Once the One-Lock Cap has been removed, remove the One-Lock Plate by hand or using forceps.

Screws And Baseplate Removal

Remove the peripheral screws using the CSB Hex Driver or any other 3.5mm Hex Driver. Using the CS Baseplate Inserter and CSB Impactor Handle to provide a counter torque, remove the Central Compression Screw through the CS Baseplate Inserter using the CSB Hex Driver.

Once the Peripheral and Central Screws have been removed, disengage the CS Baseplate from the bone by twisting the CS Baseplate Inserter back and forth to break off any adhesions. Extract the CS Baseplate from the glenoid bone using the CS Baseplate Inserter or forceps.

IMPLANT LISTING

CATALOG NO.	PART DESCRIPTION
320-55-02	Central Screw Baseplate, 10 Degree Superior Augment
320-55-03	Central Screw Baseplate, 8 Degree Posterior Augment, Left
320-55-04	Central Screw Baseplate, 8 Degree Posterior Augment, Right
320-55-07	Central Screw Baseplate, 8/10 Degree Superior/Posterior Augment, Left
320-55-08	Central Screw Baseplate, 8/10 Degree Superior/Posterior Augment, Right



320-55-30	Central Compression Screw, 6.5mmx30mm
320-55-35	Central Compression Screw, 6.5mmx35mm
320-55-40	Central Compression Screw, 6.5mmx40mm
320-55-45	Central Compression Screw, 6.5mmx45mm
320-55-50	Central Compression Screw, 6.5mmx50mm
320-55-55	Central Compression Screw, 6.5mmx55mm*
320-55-60	Central Compression Screw, 6.5mmx60mm*



320-55-98	Central Screw Baseplate One-Lock Plate/Cap



320-55-99	Glenosphere Locking Screw, Central Screw Baseplate



INSTRUMENT LISTING

CSB INSTRUMENTS

321-19-35	CSB One-Lock Cap inserter



321-19-18	CSB Tapered Hex Driver

321-19-28	CSB Non-Tapered Hex Driver



321-52-11	CSB 3.2mm Drill

321-19-34	CSB Inserter



321-07-15	CSB Modular Inserter/Impactor Handle



321-19-19	CSB Depth Gauge



321-52-67	CSB Cage Drill, 8,10,8/10 Degree



321-19-15	CSB Adjustable Angle Drill Guide



321-19-20	CSB Peripheral Screw Depth Checker



**Special order.*

CATALOG NO.	PART DESCRIPTION	
AARD INSTRUMENTS		
301-11-10	Adjustable Angle Reamer Driver (AARD)	
301-12-01	Finger Vault Guide	
321-59-00	rTSA Starter Reamer	
321-59-38	rTSA Reamer, 36/38mm	
321-59-42	rTSA Reamer, 40/42mm	
321-59-09	rTSA Finishing Reamer	
ERGO INSTRUMENTS		
321-35-20	Drill Guide, Small Glenoid Plate	
321-50-01	Modular Reverse Reamer Starter	
321-50-38	Modular Reverse Reamer, 38mm	
321-50-42	Modular Reverse Reamer, 42mm	
315-50-12	Cannulated Glenoid Reamer Driver	
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	

INSTRUMENT LISTING

CATALOG NO.	PART DESCRIPTION	
315-51-10	Ergo K-Wire Adapter	
315-52-11	Modular Glenoid Guide Handle	
321-52-07	3.2mm Drill W/AO	
301-09-80	Ratcheting Screw Driver Handle	

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