

External Elbow Fixator



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External Elbow Fixator Design

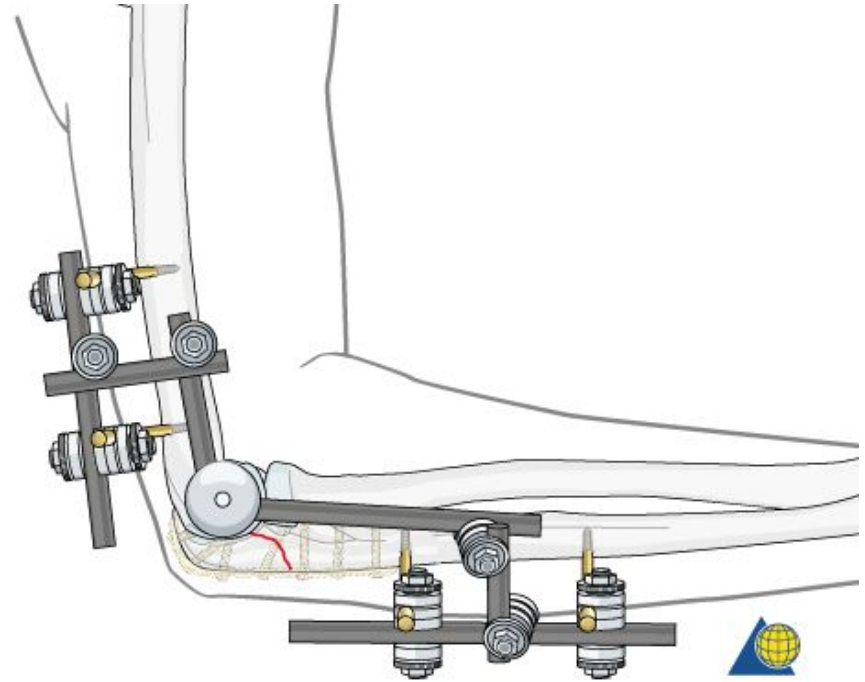


Fig. 1. External Fixation for Elbow Fracture

What is our design for?

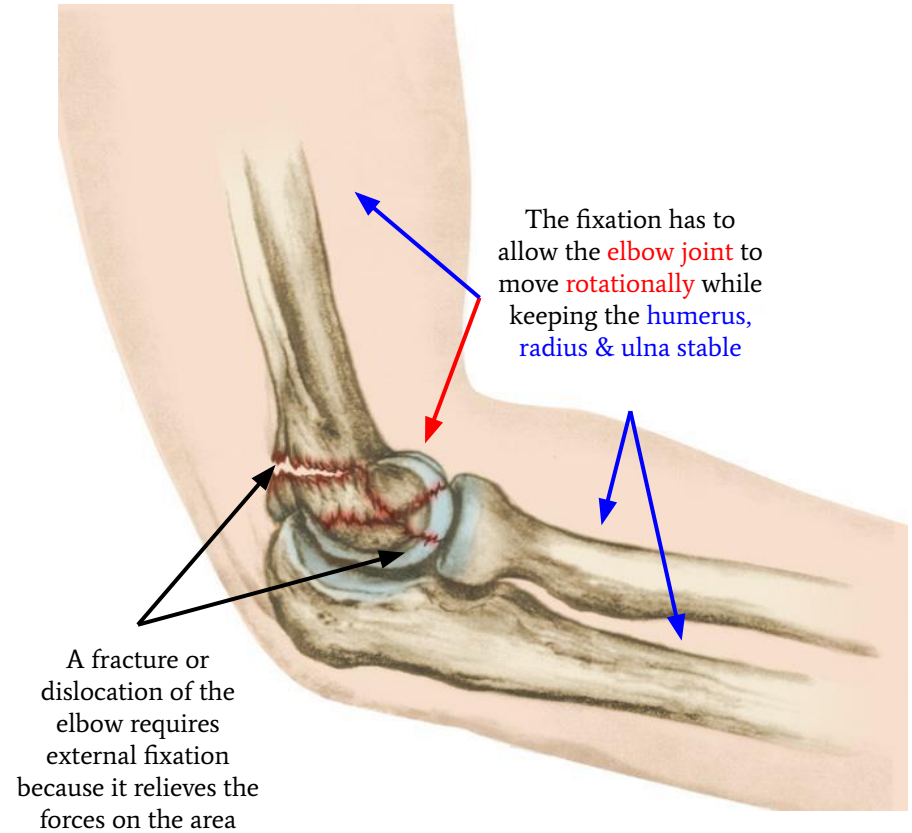


Fig. 2. Distal Humerus Break

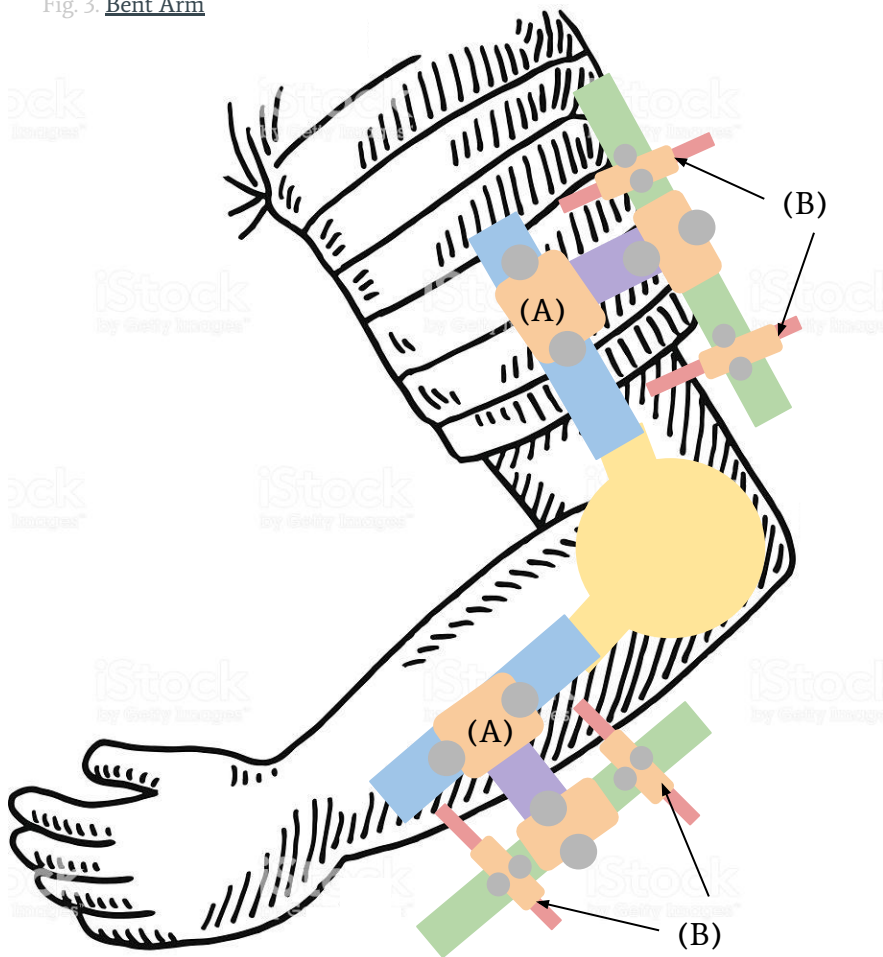
Printed Parts

- **Clamp (A)** connect the rods together (x4)
- **Clamp (B)** connect the rods to the Schanz screw (x4)
- **Ball and socket joint** (x1)

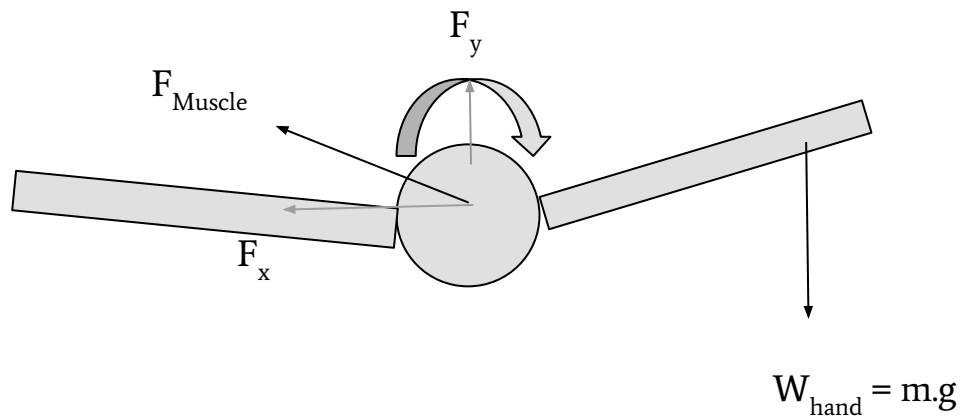
Off the Shelf Parts

- **11mm x 400mm Solid Metal Rod** (x2)
- **11mm x 100mm Solid Metal Rod** (x2)
- **4mm x 100mm Schanz Screw** (x4)
- **M4 x 0.7mm Screw** (x12)

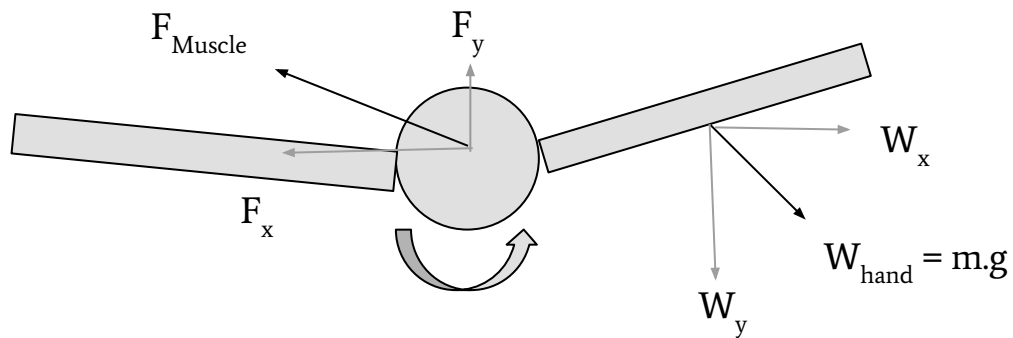
Fig. 3 Bent Arm



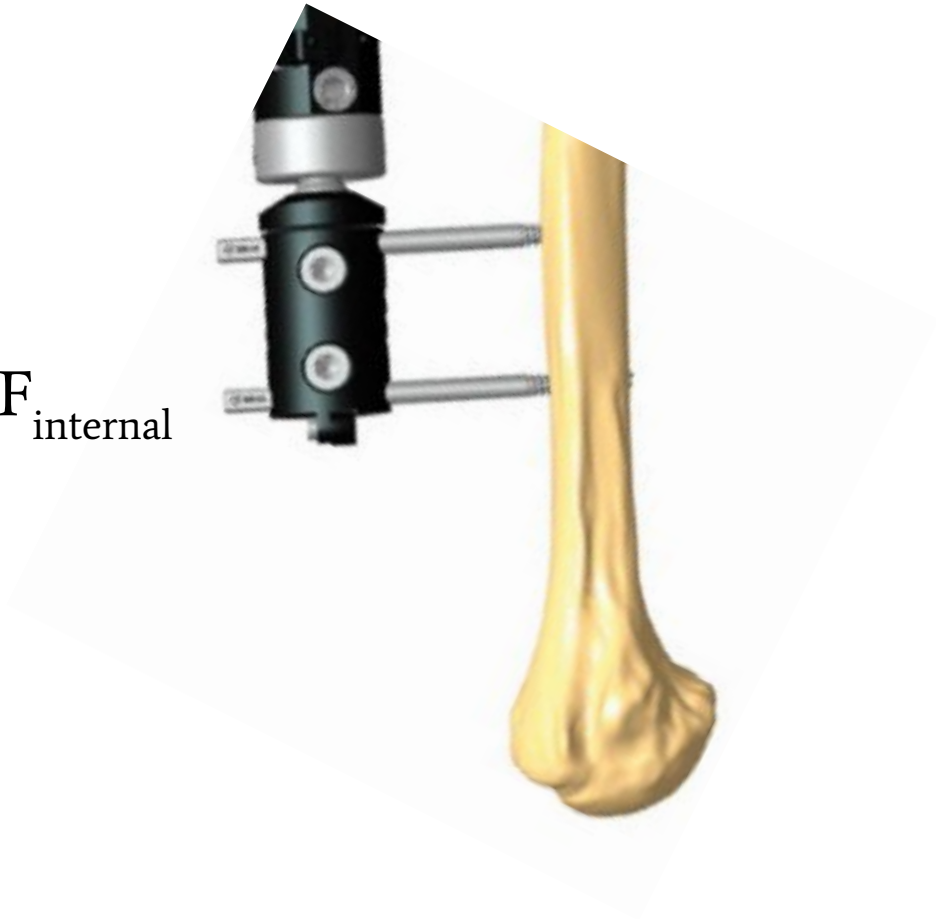
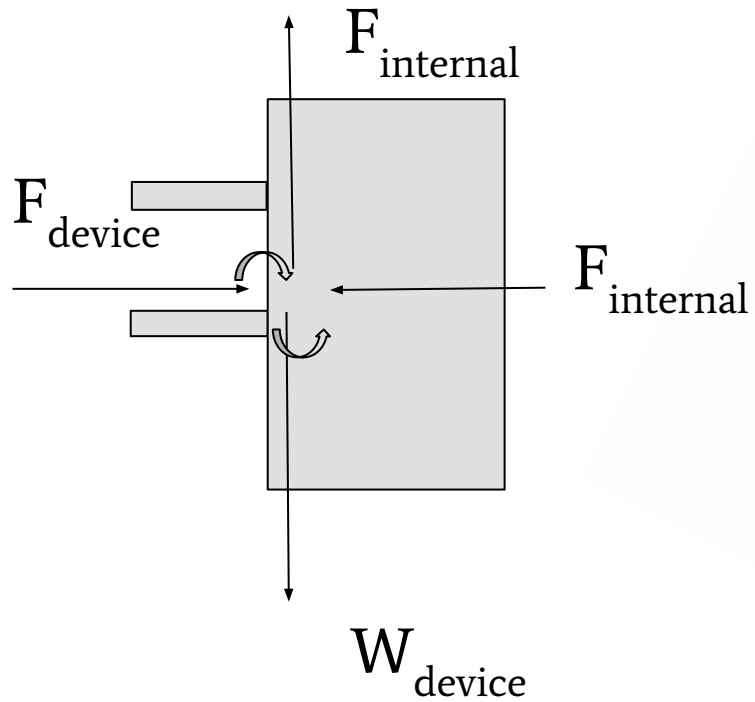
Component FBD

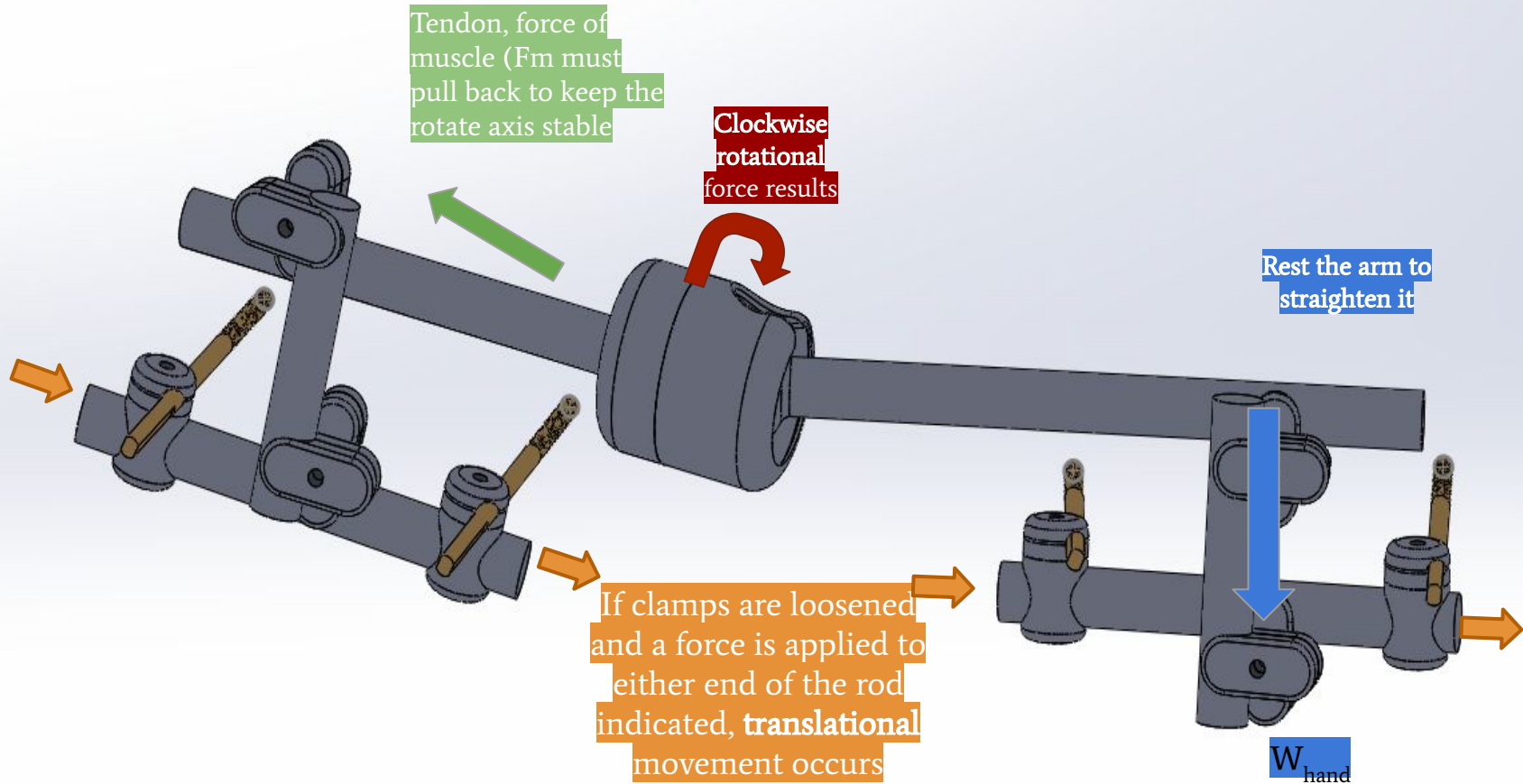


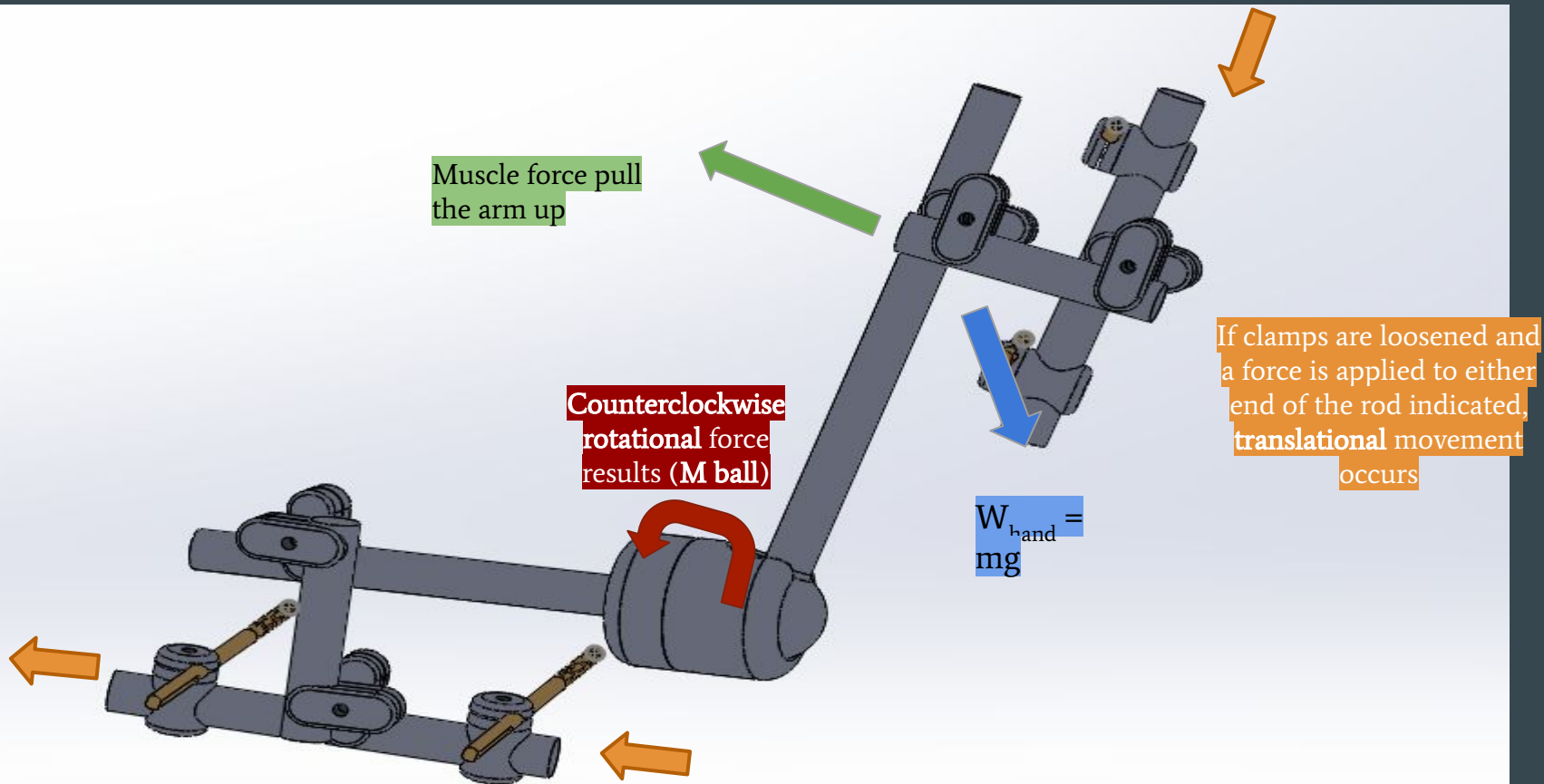
Rotate
axis



Component FBD







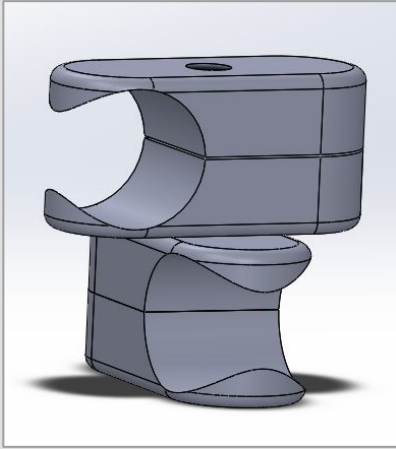
Basic components

Rods:



Schanz screw:



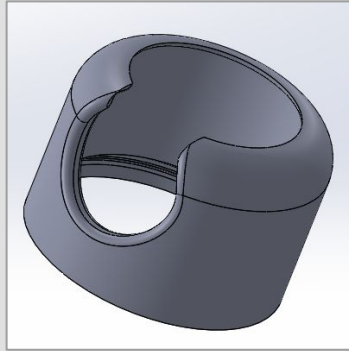
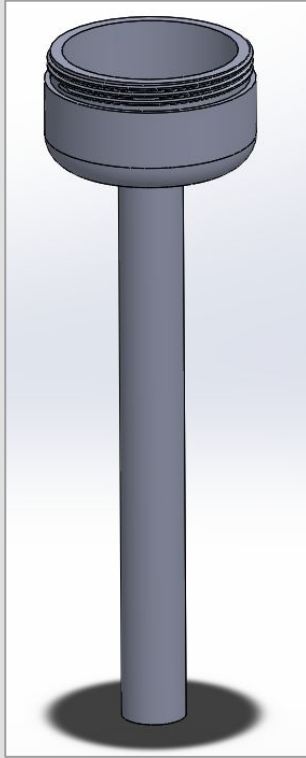
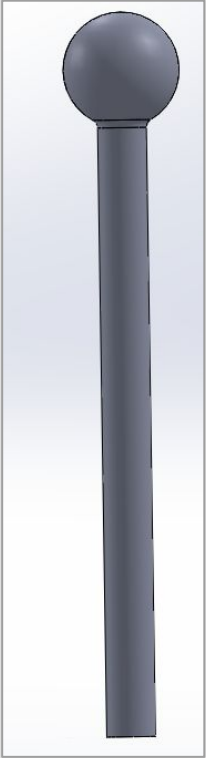


Clamp A (connect the rods together)



Clamp B (connect the rods to the Schanz screw)

Ball and socket joint

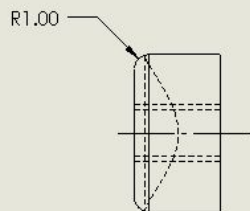
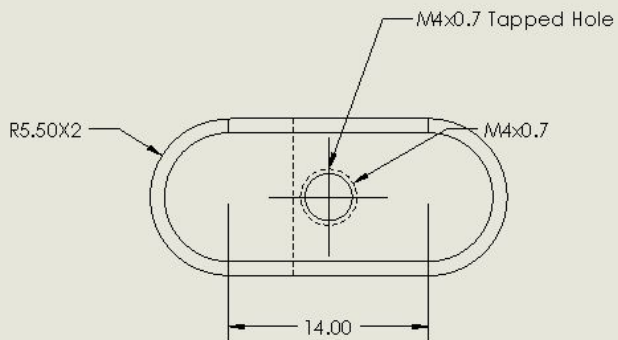
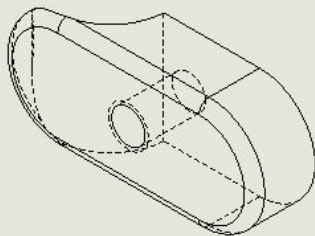
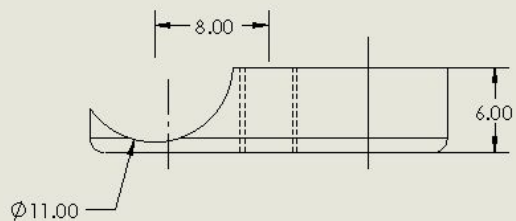


2

1

B

B



A

A

2

1

TITLE:		
Clamp A		
SIZE	DWG. NO.	REV
A		
SCALE: 3:1	WEIGHT:	SHEET 1 OF 1

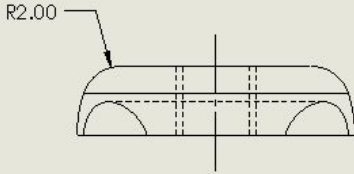
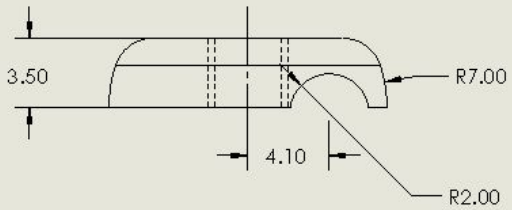
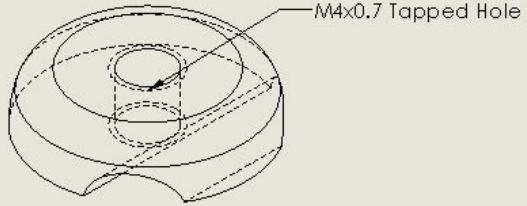
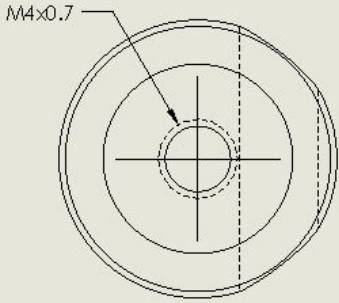
UNIT:MMGS

2

1

B

B



A

A

2

1

TITLE:		
Clamp B - part 1 (top)		
SIZE	DWG. NO.	REV
A		
SCALE: 4:1	WEIGHT:	SHEET 1 OF 1

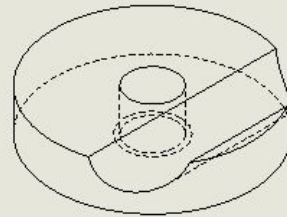
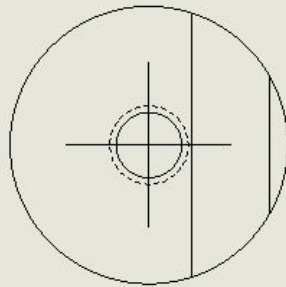
UNIT: MMGS

2

1

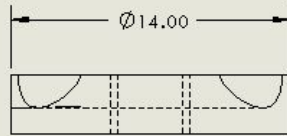
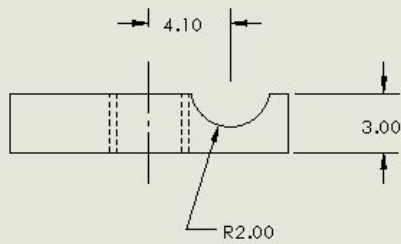
B

B



A

A



TITLE:		
Clamp B - part 1 (bottom)		
SIZE	DWG. NO.	REV
A		
SCALE: 4:1	WEIGHT:	SHEET 1 OF 1

Unit: MMGS

2

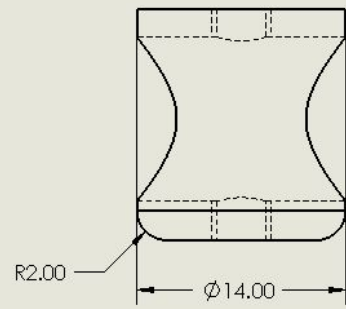
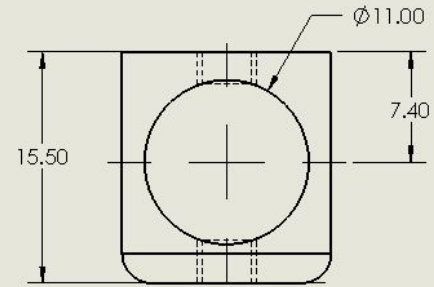
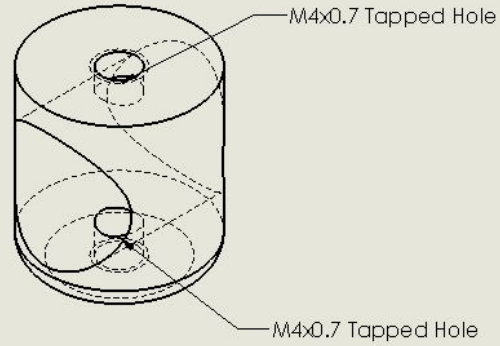
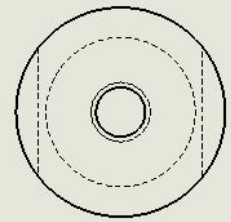
1

2

1

B

B



A

A

2

1

TITLE:		
Clamp B - part 2		
SIZE	DWG. NO.	REV
A		
WEIGHT:		SHEET 1 OF 1

Unit: MMGS

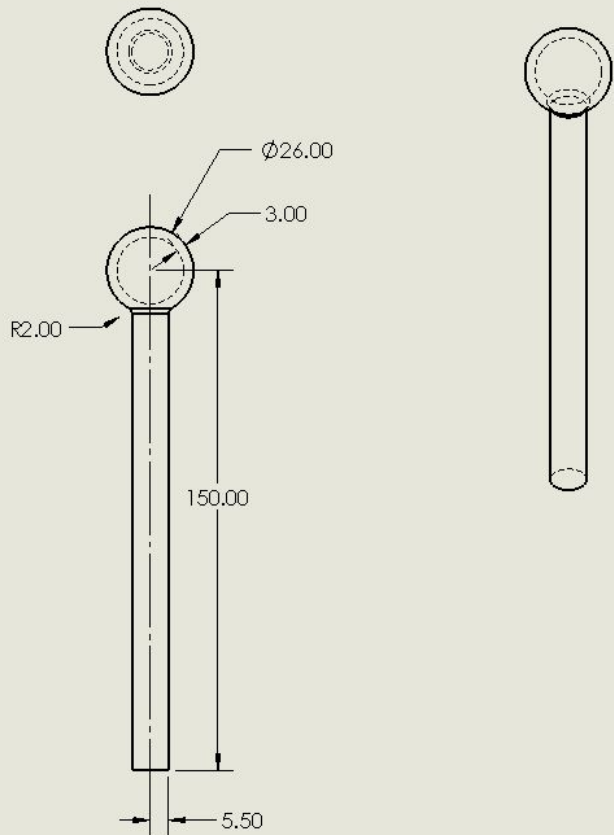
APPLICATION DO NOT SCALE DRAWING

2

1

B

B



A

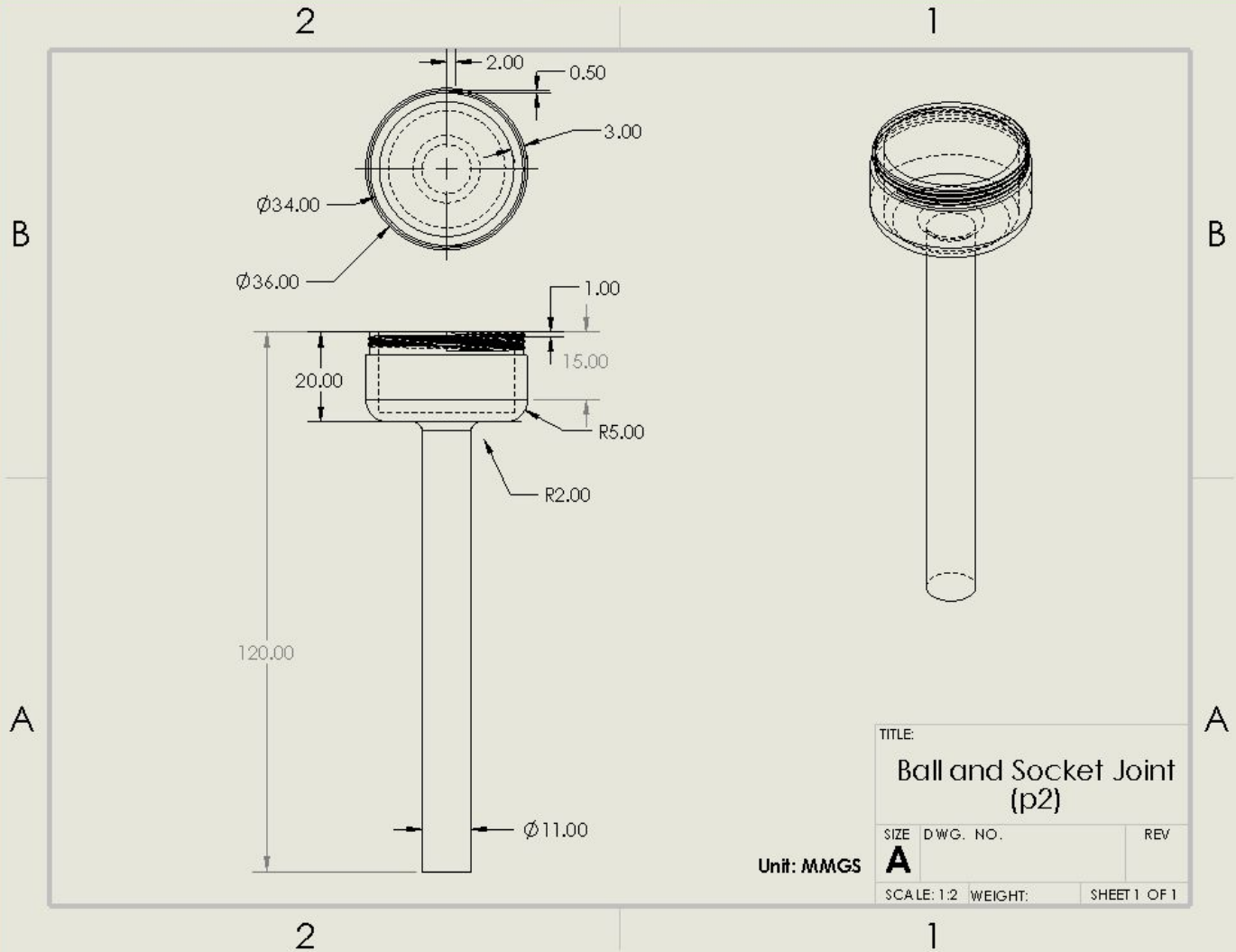
A

2

1

TITLE:		
Ball and Socket Joint (p1)		
SIZE	DWG. NO.	REV
A		
SCALE: 1:2	WEIGHT:	SHEET 1 OF 1

Unit: MMGS



TITLE:		
Ball and Socket Joint (p2)		
SIZE	DWG. NO.	REV
A		
SCALE: 1:2	WEIGHT:	SHEET 1 OF 1

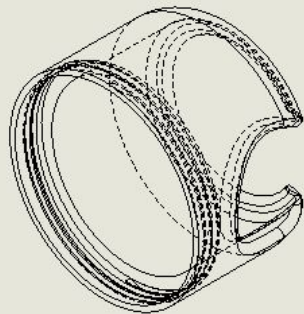
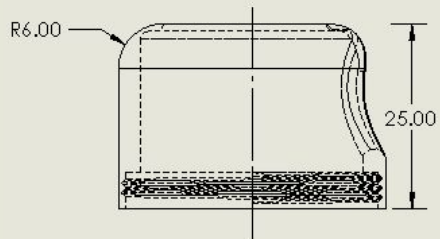
Unit: MMGS

2

1

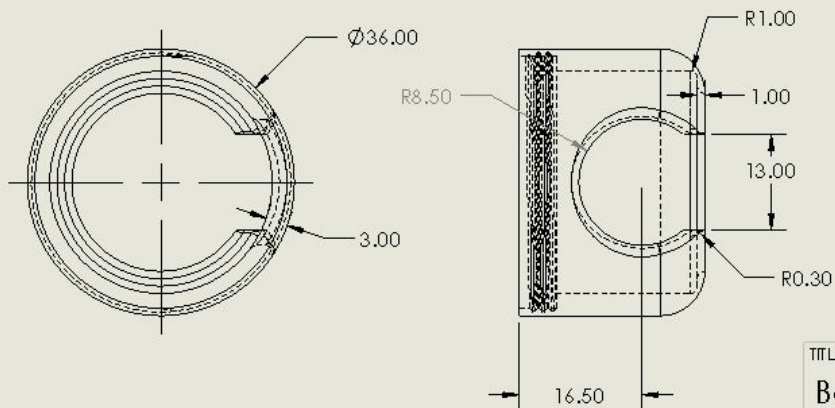
B

B



A

A



TITLE:

Ball and Socket Joint
(p3)

SIZE	DWG. NO.	REV
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A		
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SCALE: 1:1	WEIGHT:	SHEET 1 OF 1
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Unit: MMGS

2

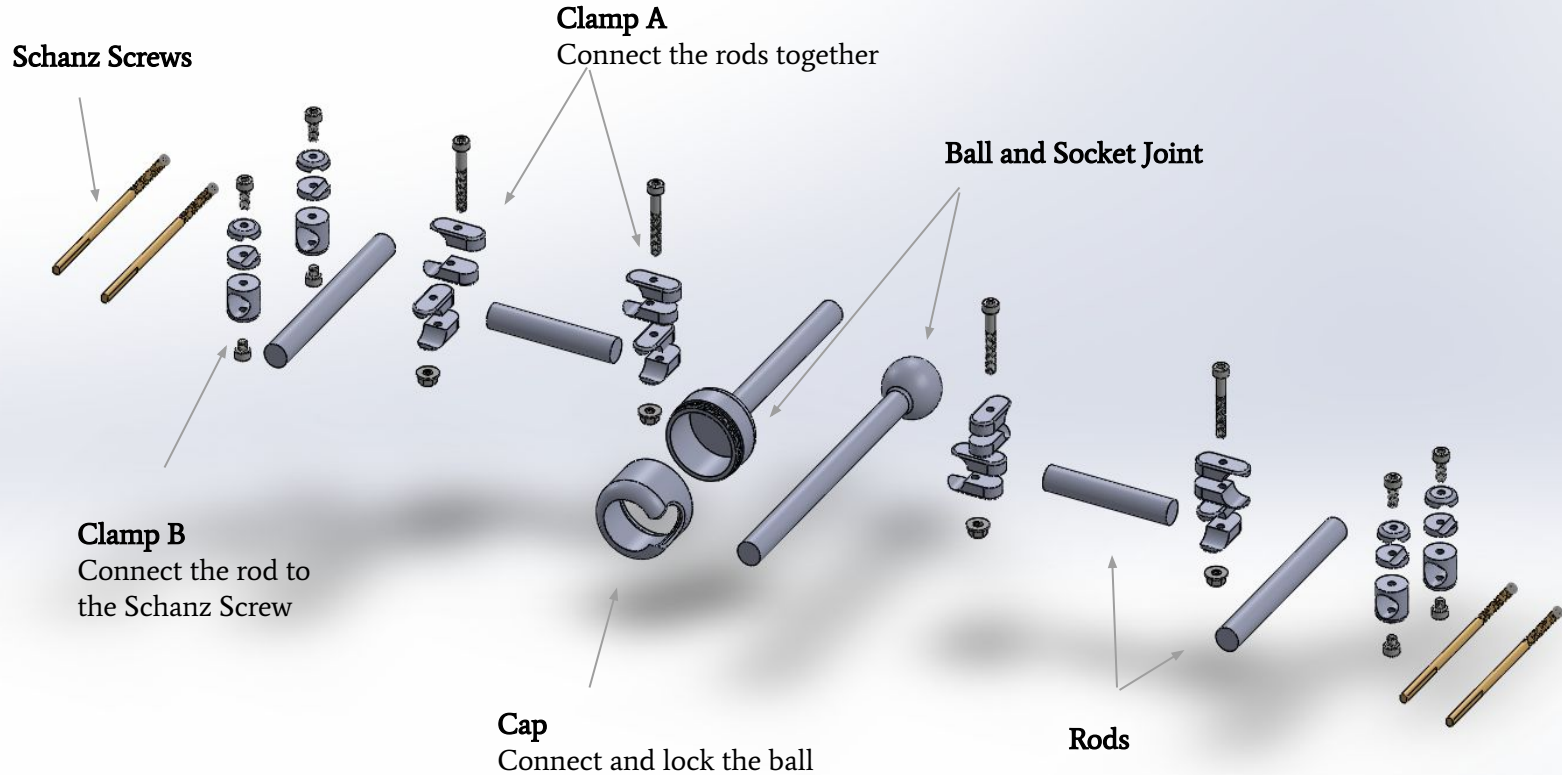
1

Steps for Assembly



Part Collection	Test Assembly 1	Alterations 1	Test Assembly 2	Final Assembly
Print out 1st round of clamps (adjusted w/ clearance tolerance) & submit budget sheet to be ordered.	Attach the rods to the ball and socket joint and then fit each designated clamp to its specified rod. Test the expected movement. Adjust printed measurements.	Reprint clamps if needed for a higher tolerance. Trim rod length for the bicep/forearm to be less intrusive.	Reattach the bicep/forearm rods to the ball and socket joint and realign newly printed clamps. Test the expected movement.	Realign the final printed clamps to their designated rods. The complete design is finished.

Unfinished Assembly Of Our Draft Design



Detailed Flow Chart

