

Final Project: Foosball Table

Design, Assembly, and Analysis

Course:

MEMS 202: Computer-Aided Design – Section 1

Team Members:

Luis Garcia
Enrique Garcia
Alec Garcia
David Howard

Date:

December 4, 2023

Washington University in St. Louis
McKelvey School of Engineering

Project Overview

Our project focused on creating a foosball table that blended modern aesthetics with a user-friendly design. The goal was to produce a visually appealing and easy-to-assemble product that enhanced the gaming experience.

Project Components

The foosball table consists of several essential elements: the playing surface, player rods, players, legs, scoring unit, frame, and cup holders. The frame and playing surface form the structural core, while the rods, legs, and players define the functionality and user interaction.

Design Choices

We adopted a modular design philosophy that divided the table into manageable subsystems, allowing for simpler assembly and effective organization of responsibilities. While features such as electronic scorekeeping were initially considered, we ultimately prioritized smooth gameplay and mechanical simplicity to maintain ease of use and reliability.

Individual Contributions

Each team member focused on a different subsystem:

- **Luis Garcia:** Designed the table frame and supervised system integration.
- **Enrique Garcia:** Developed the player rods, led final assembly, and produced documentation.
- **Alec Garcia:** Designed the score counter and the frame mounting interface.
- **David Howard:** Designed the leg supports, player components, and rubber foot features.

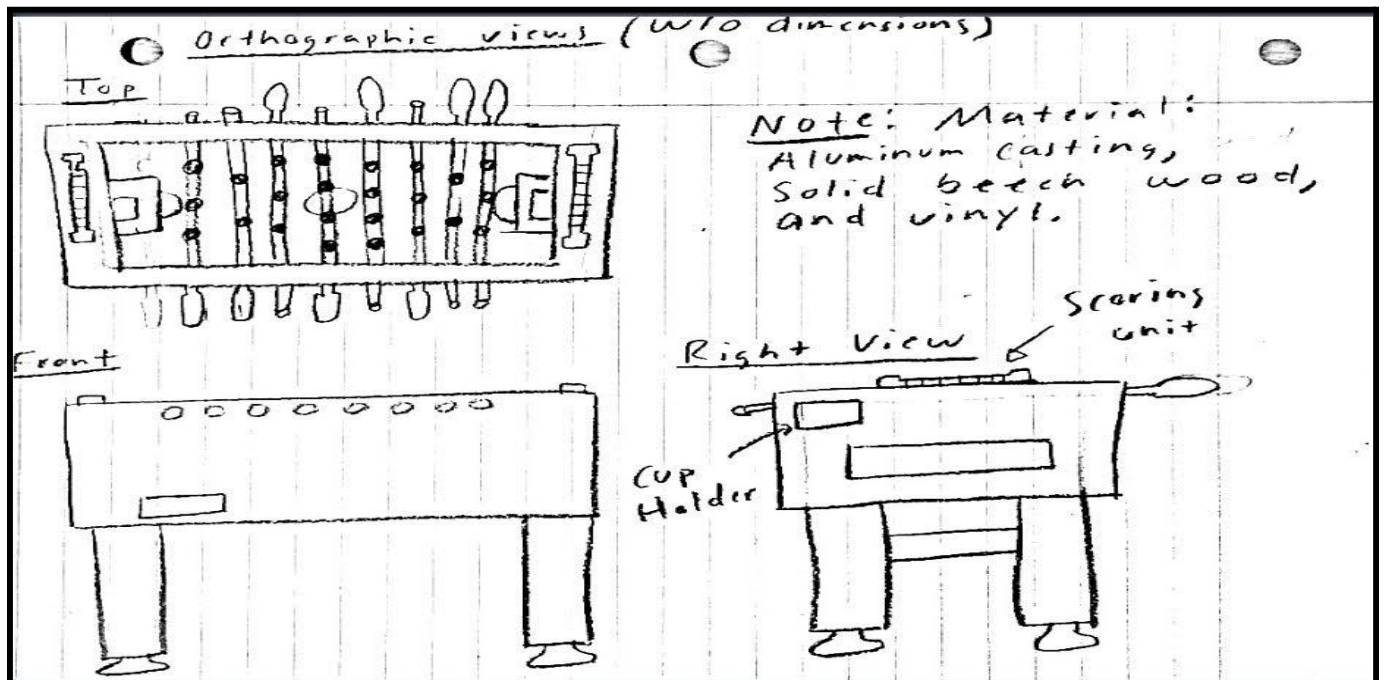
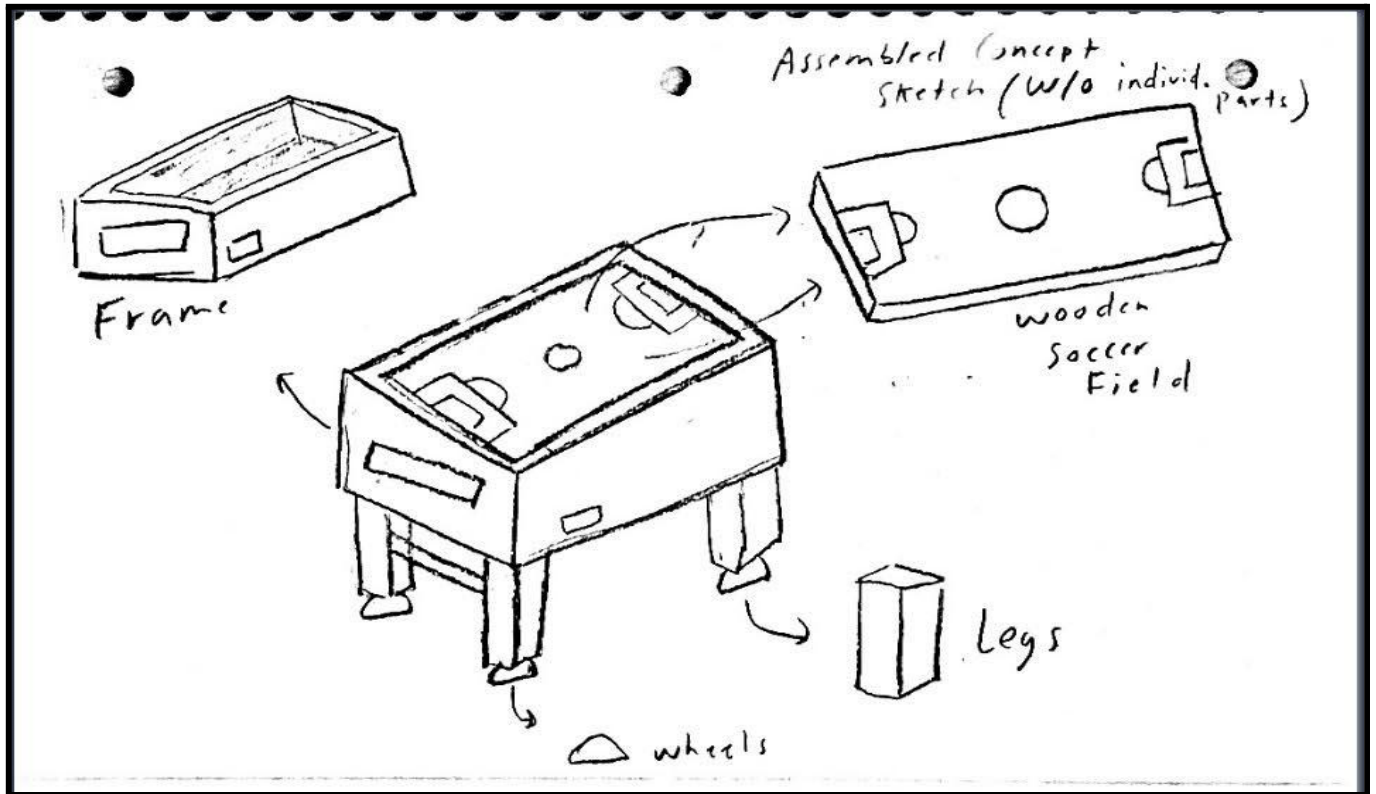
All members collaborated on assembly drawings, concept development, and design evaluation throughout the project.

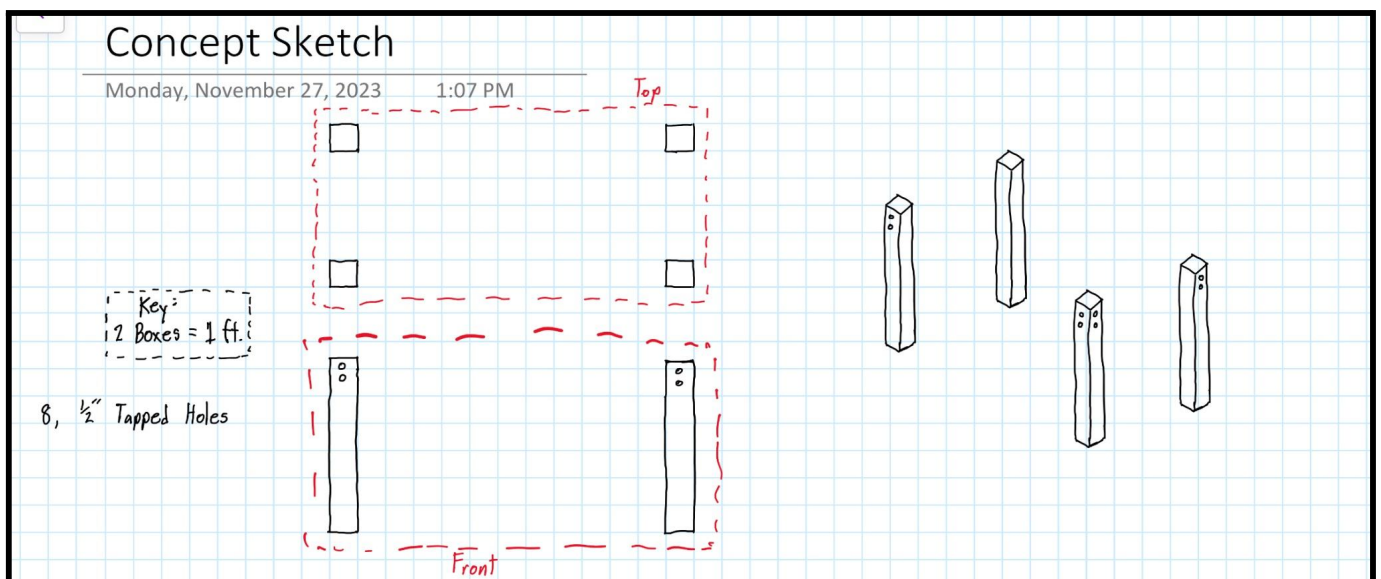
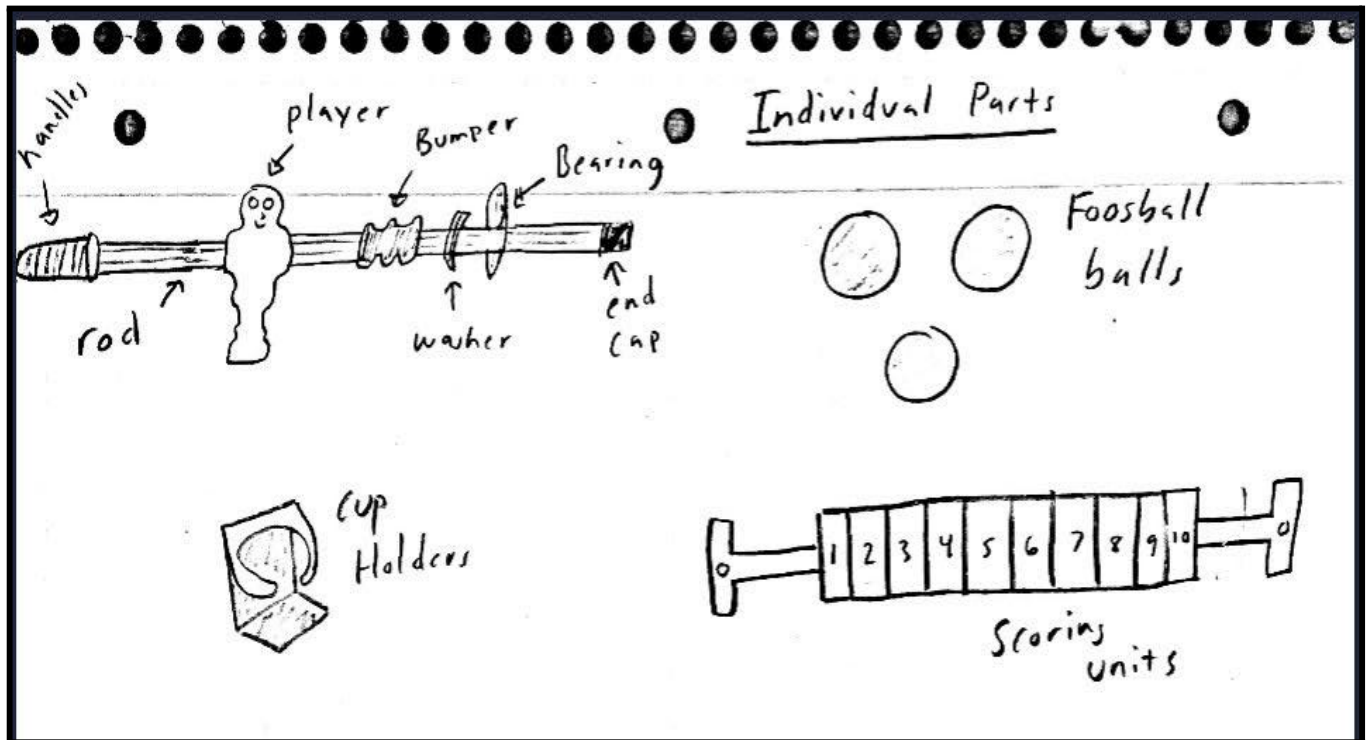
Challenges and Learnings

The assembly process revealed integration difficulties that stemmed from designing components in isolation early on. Although this approach simplified part development, it made final fit and alignment more challenging. This experience reinforced the importance of systems-level thinking and understanding how individual components interact. Overall, the project provided valuable insight into practical design considerations, tolerance planning, and effective teamwork—skills that will carry forward into future engineering work.

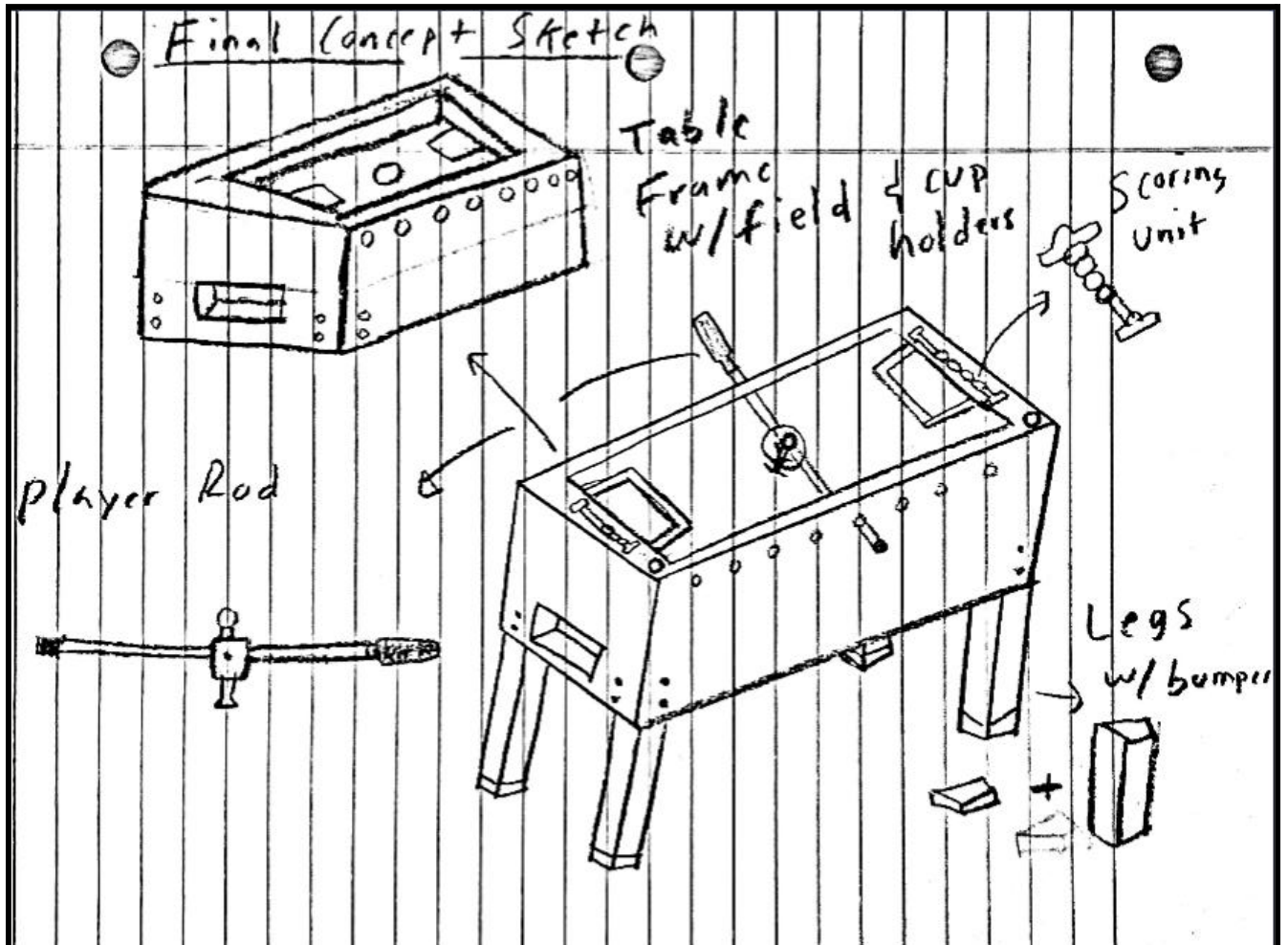
CONCEPT SKETCHES

Initial Concept Sketches

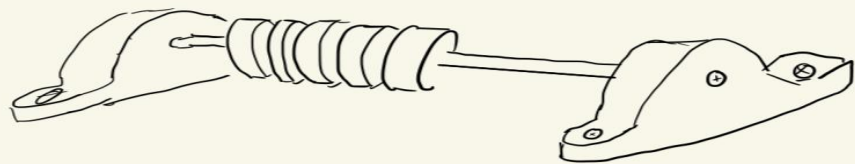




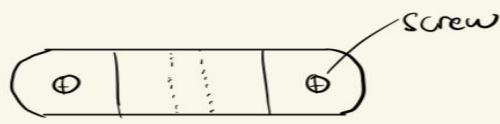
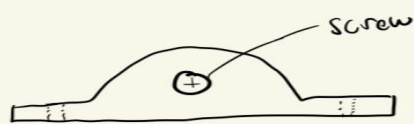
Final Concept Sketches



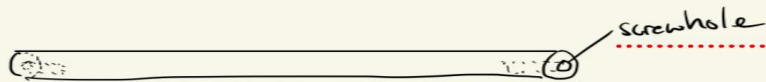
Score Counter



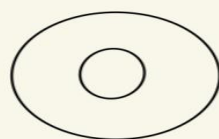
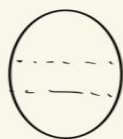
Individual Parts



base



rod



beads

2

1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Rod and End Cap	Foosball Pole and Cap	8
2	Player	Foosball Player	22
3	9546K521	Neoprene Bumper	16
4	Scoring Unit	Foosball Scoring Counter	2
5	Table Frame	Foosball Frame	1
6	Leg	Foosball Leg	4
7	Leg Bottom	Foosball Protective Rubber for leg	4
8	5909K44	0.032" Thick Washer for 1/2" Shaft Diameter Needle-Roller Thrust Bearing	32
9	97065K152	Foosball Hand Grip	8
10	93306A921	Aluminum Hex Head Screw	16

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL ±

ANGULAR: MACH ± BEND ±

TWO PLACE DECIMAL ±

THREE PLACE DECIMAL ±

INTERPRET GEOMETRIC TOLERANCING PER:

MATERIAL

FINISH

DO NOT SCALE DRAWING

DRAWN

CHECKED

ENG APPR.

MFG APPR.

Q. A.

COMMENTS:

NAME

DATE

Group 13

TITLE:

Foosball Table

SIZE DWG. NO. REV

A Main Assembly

SCALE: 1:28/WEIGHT: SHEET 1 OF 1

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NEXT ASSY

USED ON

APPLICATION

2

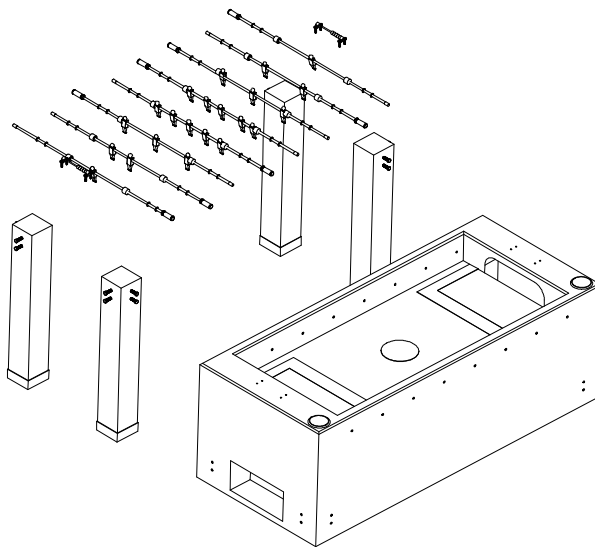
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B

B

A

A



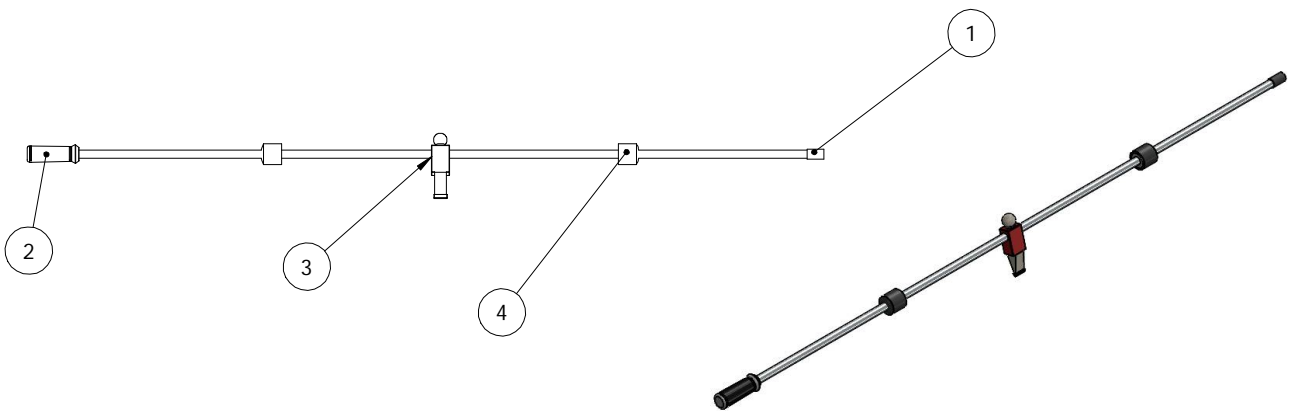
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		ANGULAR: MACH ± BEND ±		MFG APPR.			
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		THREE PLACE DECIMAL ±		COMMENTS:			
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		MATERIAL					
		FINISH					
NEXT ASSY	USED ON						
APPLICATION		DO NOT SCALE DRAWING					

2

1

Note: Foosball Rod, Endcap, and the Players were modeled through Solidworks.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1		Rod and End Cap	
2	97065K152	Foosball Handle Grip	8
3	Player	Foosball Player	22
4	9546K521	Neoprene Bumper	16

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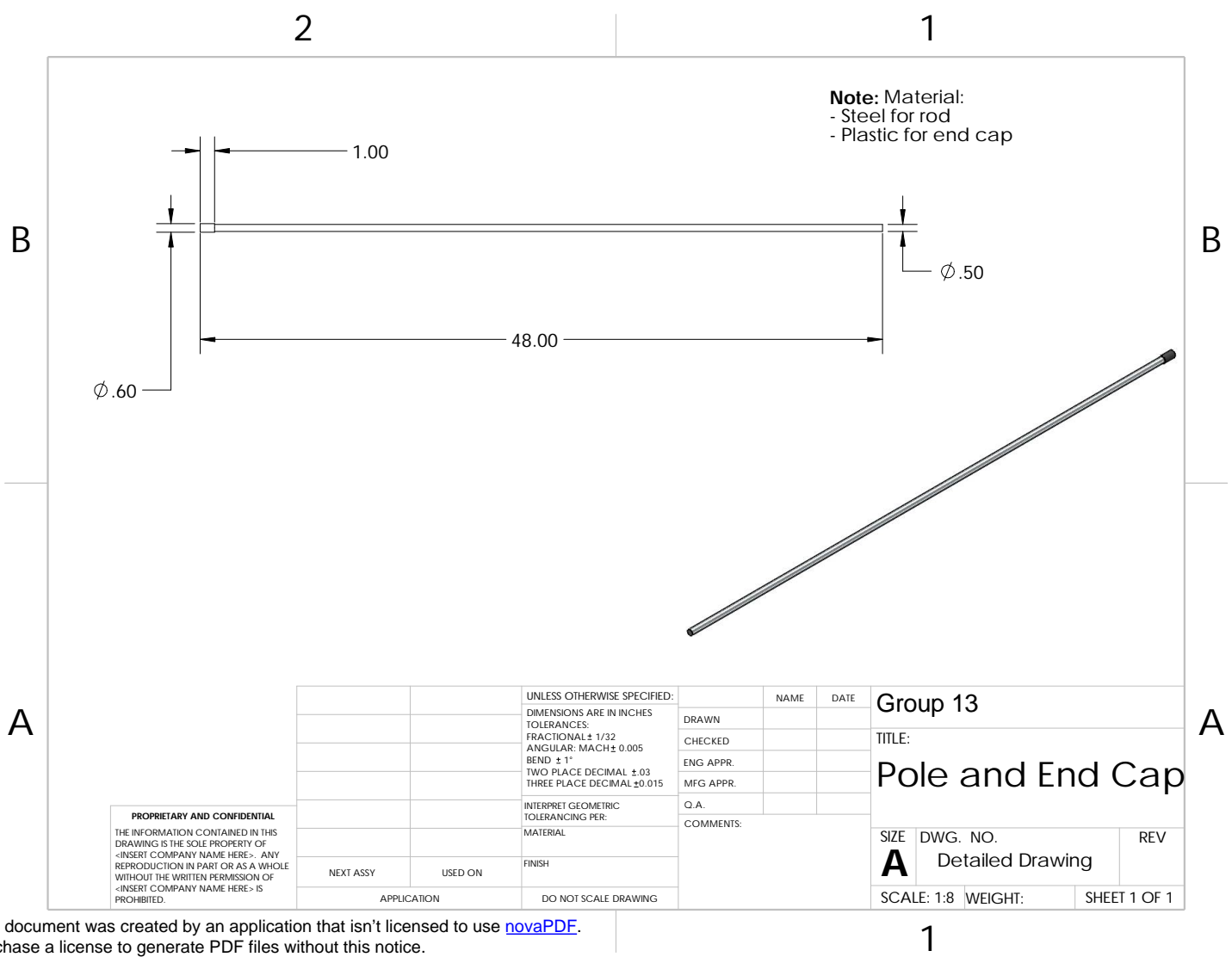
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		ANGULAR: MACH ± BEND ±		MFG APPR.	
		TWO PLACE DECIMAL ±			
		THREE PLACE DECIMAL ±			
		INTERPRET GEOMETRIC		Q. A.	
		TOLERANCING PER:		COMMENTS:	
		MATERIAL			
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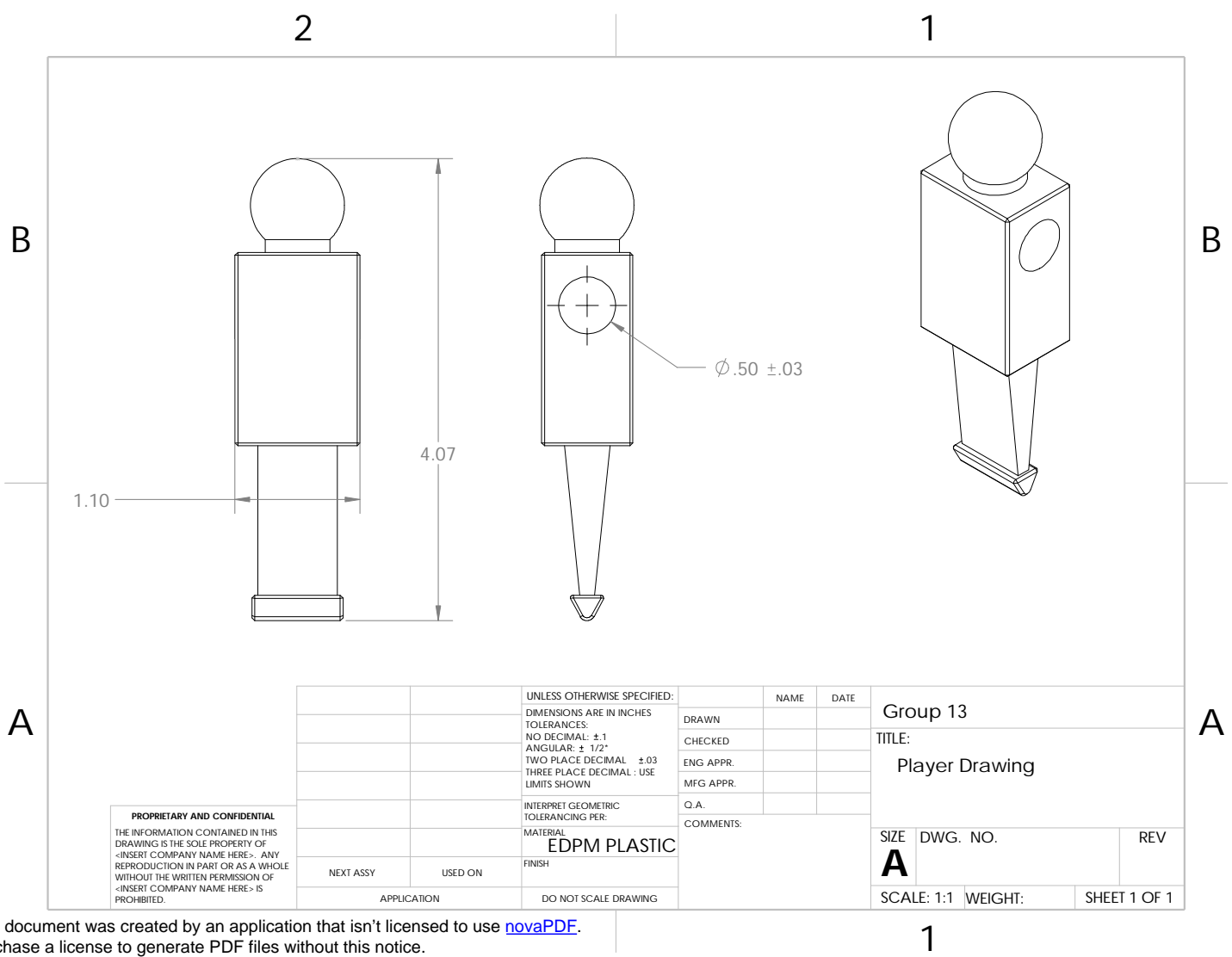
Group 13

TITLE:

Player Rod

SIZE	DWG. NO.	REV
A	Sub-Assembly	
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1



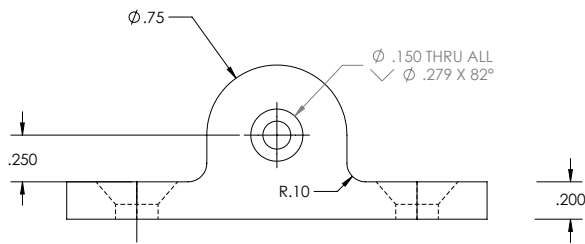
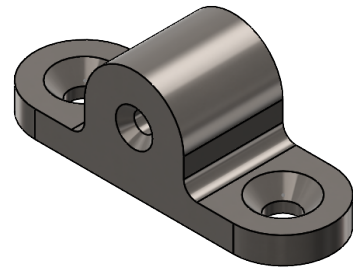
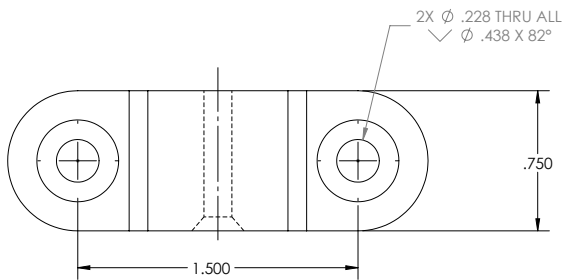


4

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2

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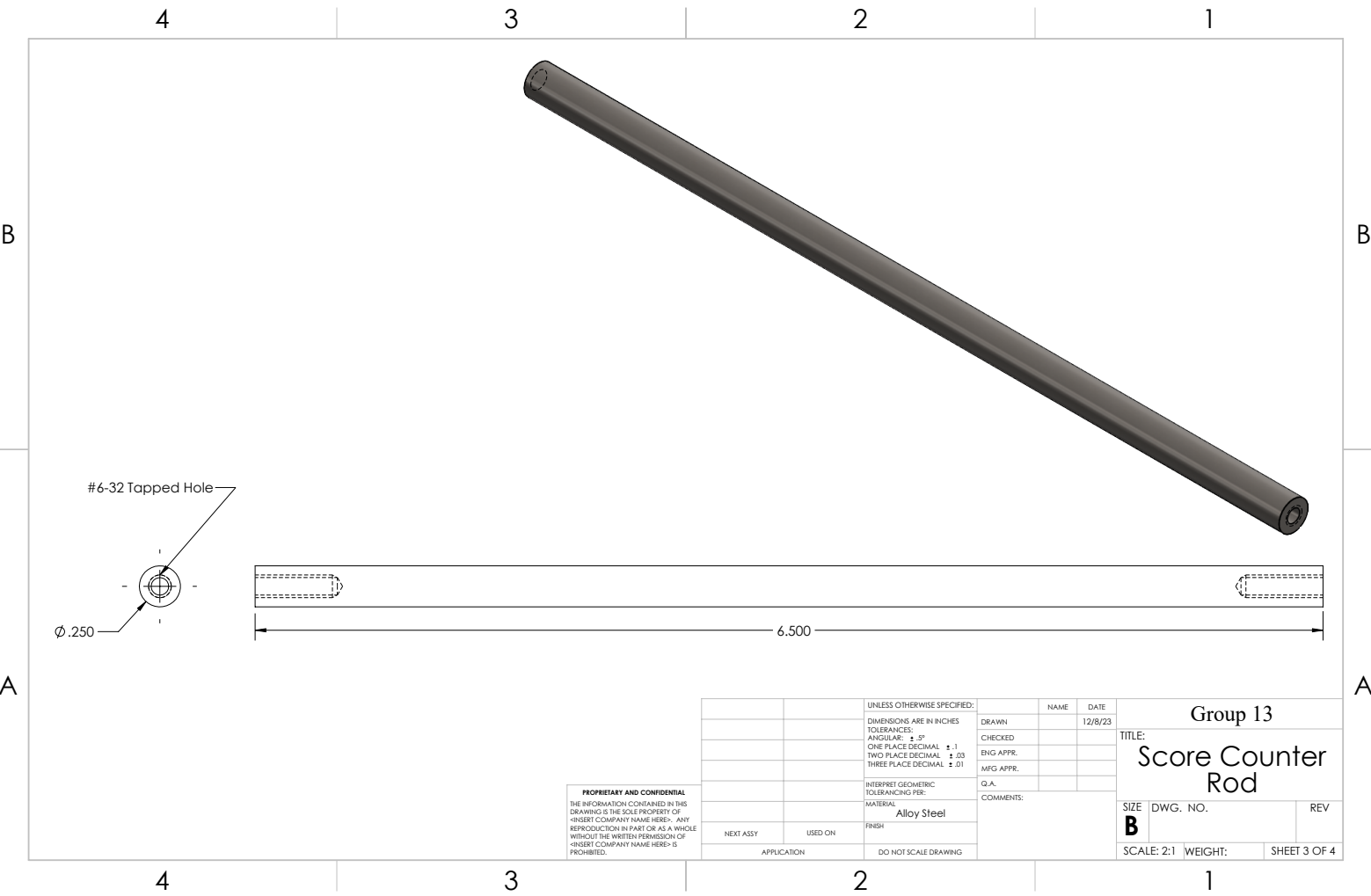
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				ENG APPR.					
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		INTERPRET GEOMETRIC TOLERANCING PER:		Q.A.					
		MATERIAL:		COMMENTS:					
		Alloy Steel							
		FINISH							
NEXT ASSY		USED ON						SIZE DWG. NO.	
								REV	
APPLICATION		DO NOT SCALE DRAWING						SCALE: 2:1 WEIGHT:	
								SHEET 2 OF 4	

4

3

2

1



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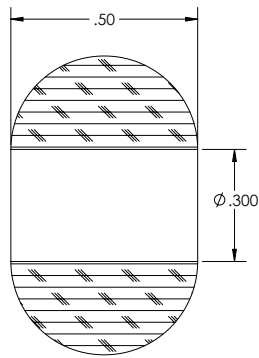
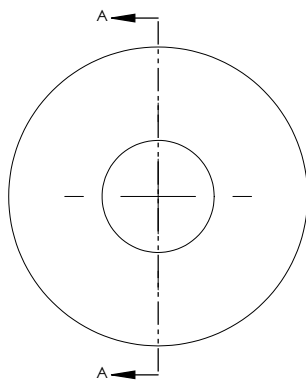
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			MFG APPR.						
			Q.A.						
		INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:			SIZE	DWG. NO.	REV	
		MATERIAL Alloy Steel				B			
		FINISH				SCALE: 2:1	WEIGHT:	SHEET 3 OF 4	
NEXT ASSY	USED ON								
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4

3

2

1



SECTION A-A



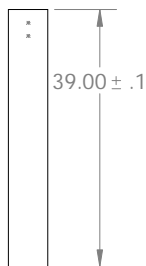
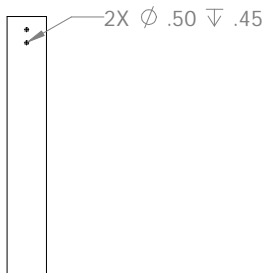
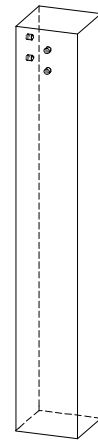
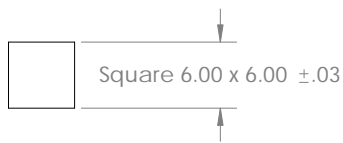
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				CHECKED						
				ENG APPR.						
				MFG APPR.						
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		MATERIAL: Oak Wood		COMMENTS:						
		FINISH						SIZE DWG. NO.		REV
		NEXT ASSY		USED ON				B		
		APPLICATION		DO NOT SCALE DRAWING				SCALE: 4:1		WEIGHT:
										SHEET 4 OF 4

2

1

2 holes per side, on 2 sides of a leg
- (each side of the frame)



B

B

A

A

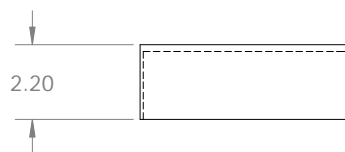
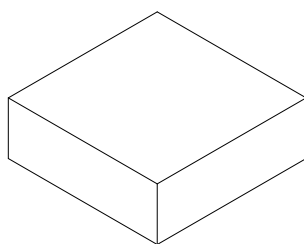
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		ANGULAR: ± 1/2°		MFG APPR.				
		TWO PLACE DECIMAL: ±.03		Q. A.				
		THREE PLACE DECIMAL: USE LIMITS SHOWN		COMMENTS:		SIZE	DWG. NO.	REV
		INTERPRET GEOMETRIC TOLERANCING PER:				A		
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SCALE: 1:12 WEIGHT: SHEET 1 OF 1

1

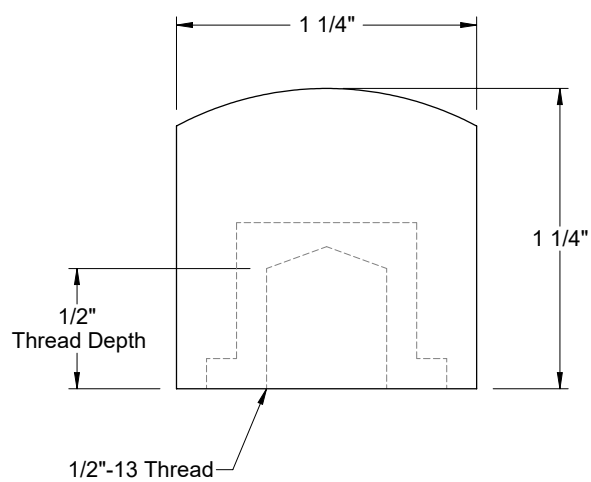
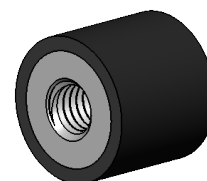
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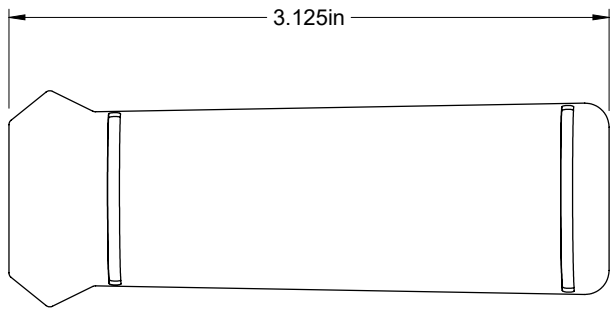
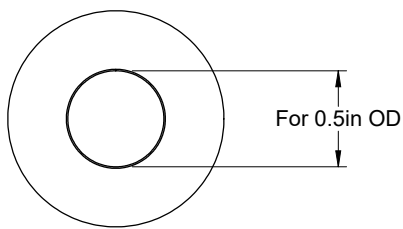
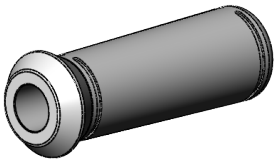
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				ENG APPR.						
				MFG APPR.						
				Q.A.						
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				MATERIAL						
				NATURAL RUBBER						
				FINISH						
	NEXT ASSY	USED ON					SIZE	DWG. NO.	REV	
							A			
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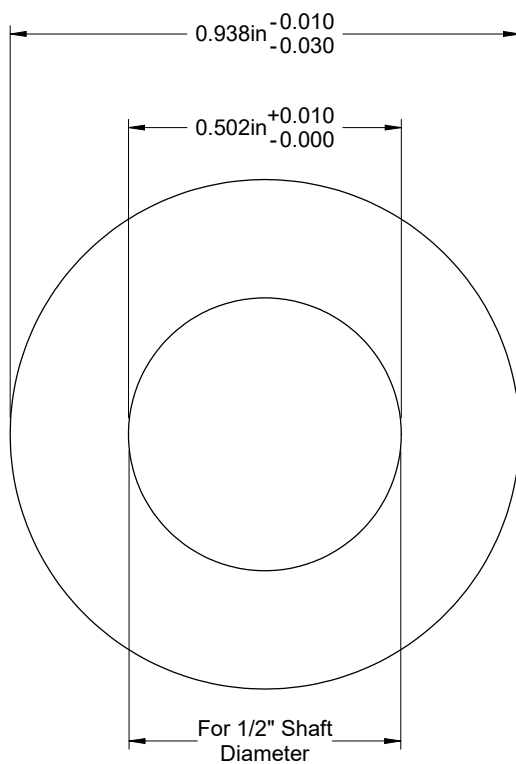
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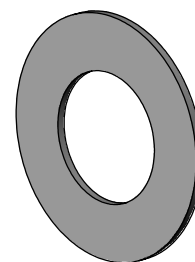
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http://www.mcmaster.com © 2021 McMaster-Carr Supply Company <small>Information in this drawing is provided for reference only.</small>	Neoprene Bumper




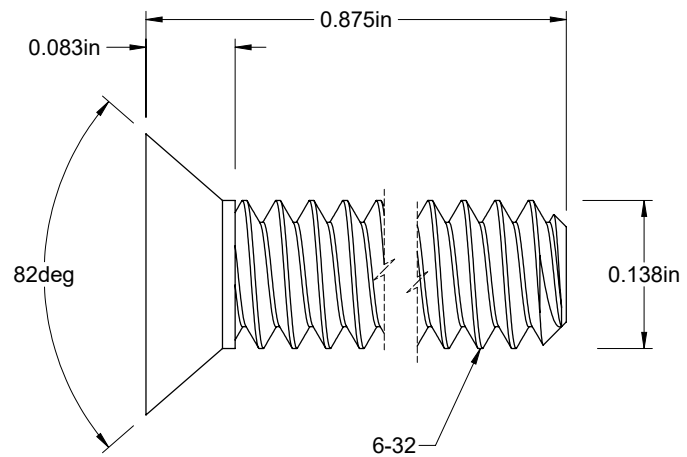
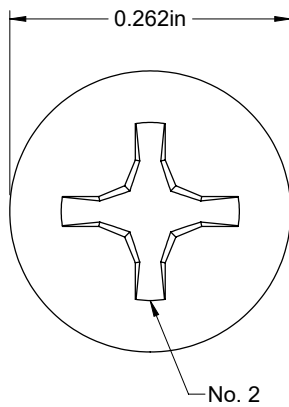
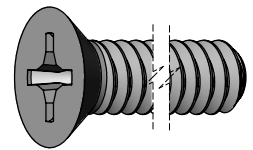
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http://www.mcmaster.com © 2023 McMaster-Carr Supply Company <small>Information in this drawing is provided for reference only.</small>	Round Grips




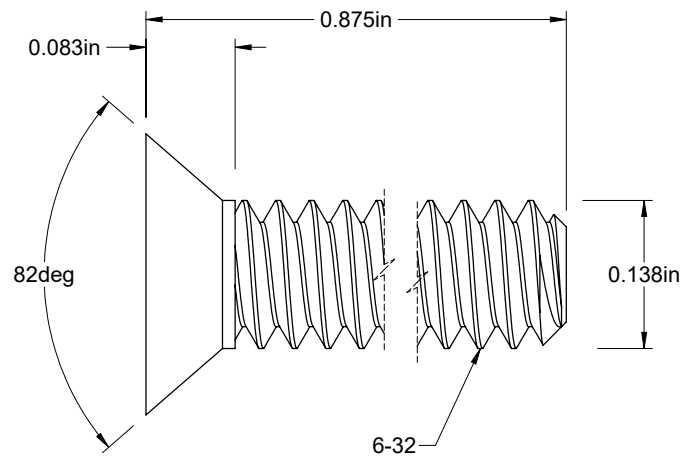
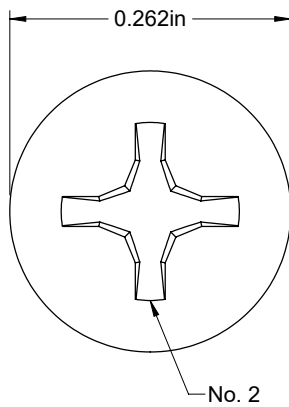
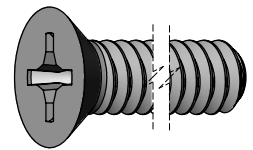
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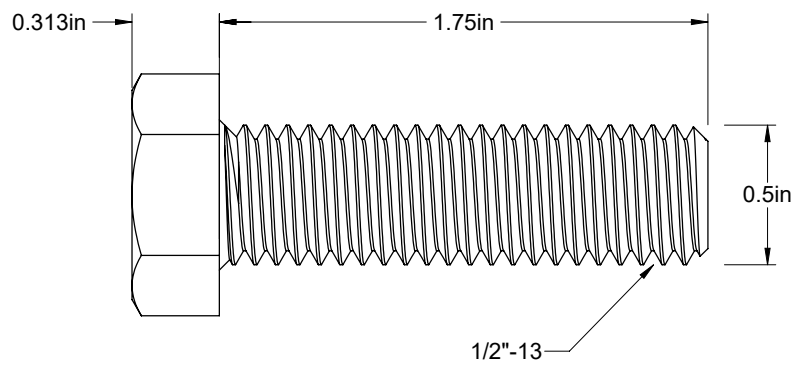
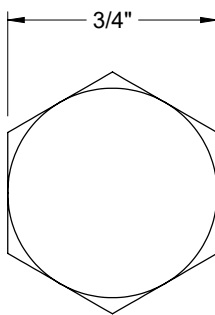
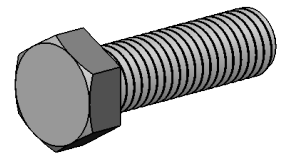
McMASTER-CARR  http://www.mcmaster.com © 2023 McMaster-Carr Supply Company <small>Information in this drawing is provided for reference only.</small>	PART NUMBER	5909K44
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


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http://www.mcmaster.com © 2022 McMaster-Carr Supply Company <small>Information in this drawing is provided for reference only.</small>	Zinc-Plated Steel Phillips Flat Head Screws



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