

Ryan Zambrowski, Matthew Caputo, Annabelle Hazell  
Product: Chinatera Clockwork Wind Up Pink Dog

Original Product



Rendering of Product



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## Visual Analysis



Isometric

- Uses regular rhythm: consistent in using same colors and lines to shape animal
- Uses curved lines, bright and dark colors, organic shapes, has a glossy smooth texture



Right

- Proportions of parts to each other are balanced, contrast in darker pink and lighter pink, emphasis on crank by having white cap on it/sticking out of the dog.
- Uses curved lines, bright and dark colors, organic shapes



Front

- Contrast in colors, uses symmetrical balance, emphasis on the eyes and mouth via color.
- Uses curved lines, bright and dark colors, organic shapes, has glossy/smooth texture

# Functional Analysis

1. What is the purpose or primary function of your product?

Purpose: To entertain little kids.

Primary function: crank wind up key, the dog will start moving forward, tilting its head, and wagging its tail.

2. Isometric pictorial of the product with all components labeled.



3. Hypothesis for how the product operates.

When the white wind-up key is twisted, something inside gets tighter and stores the energy and when the white wind-up key is released, the energy is released and the toy starts moving and shaking.

4. Identify the system inputs, intended product function, and outputs using a Black Box Systems Model.

INPUTS	PRODUCT FUNCTION	OUTPUTS
<ul style="list-style-type: none"> <li>• White wind-up key is twisted</li> <li>• White wind-up key is released</li> </ul>	<ul style="list-style-type: none"> <li>• Energy is stored when the white wind-up key is twisted. Energy is released in the form of the dog moving forward and the head and tail shaking when the white wind-up key is released.</li> </ul>	<ul style="list-style-type: none"> <li>• Dog's wheels roll forward</li> <li>• Dog's head shakes back and forth</li> <li>• Dog's tail shakes back and forth</li> </ul>

5. Discuss visible mechanical components that you cannot identify because you cannot see the components hidden inside the product.

There has to be something inside that stores the energy when the white wind-up key is twisted.

6. What can you not identify about the function of the wind up toy because some components are hidden from plain view?

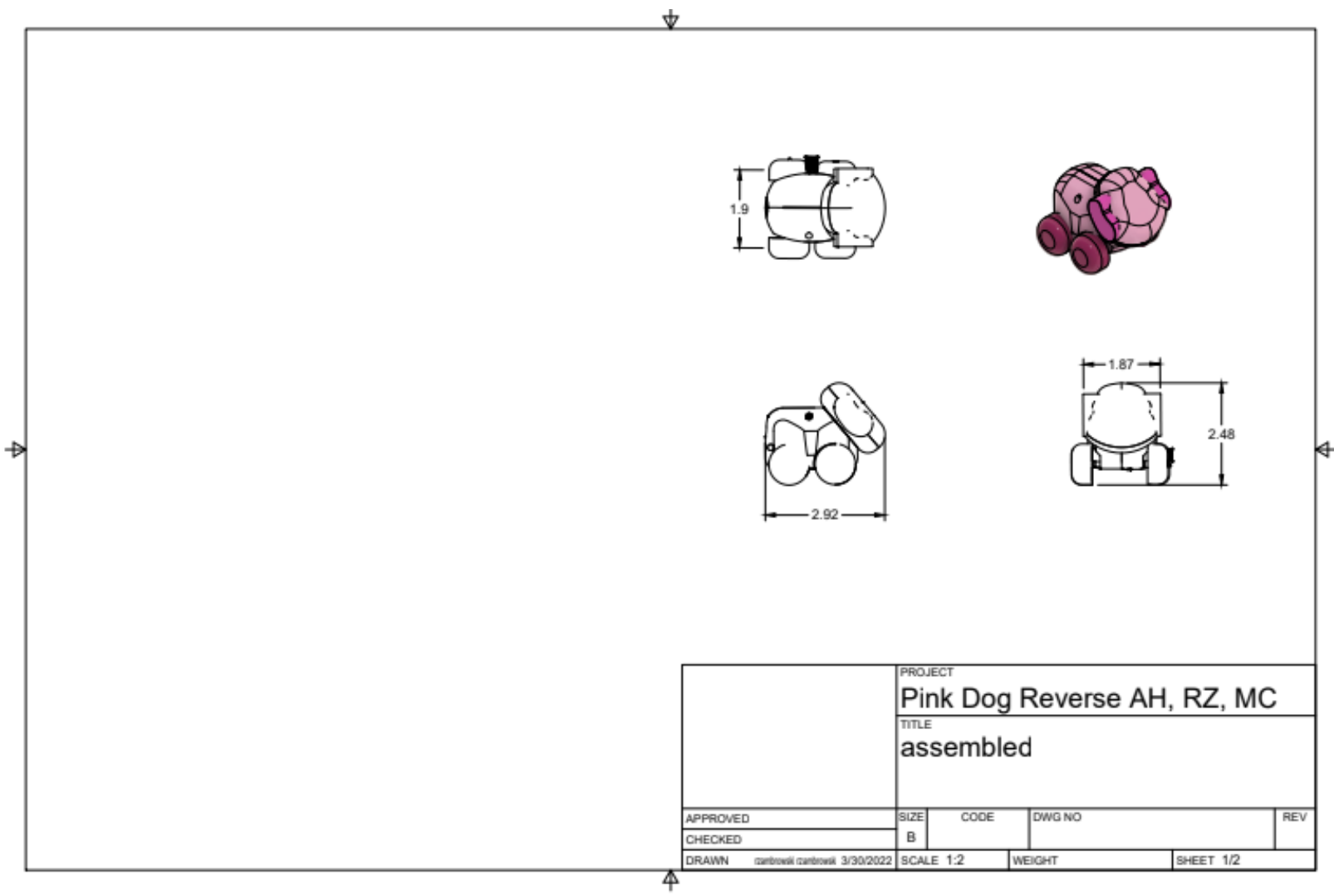
We can't identify the function of the gearbox inside the wind up dog, since it is hidden inside the components.



## 3D Model Link, Drawings, Renderings

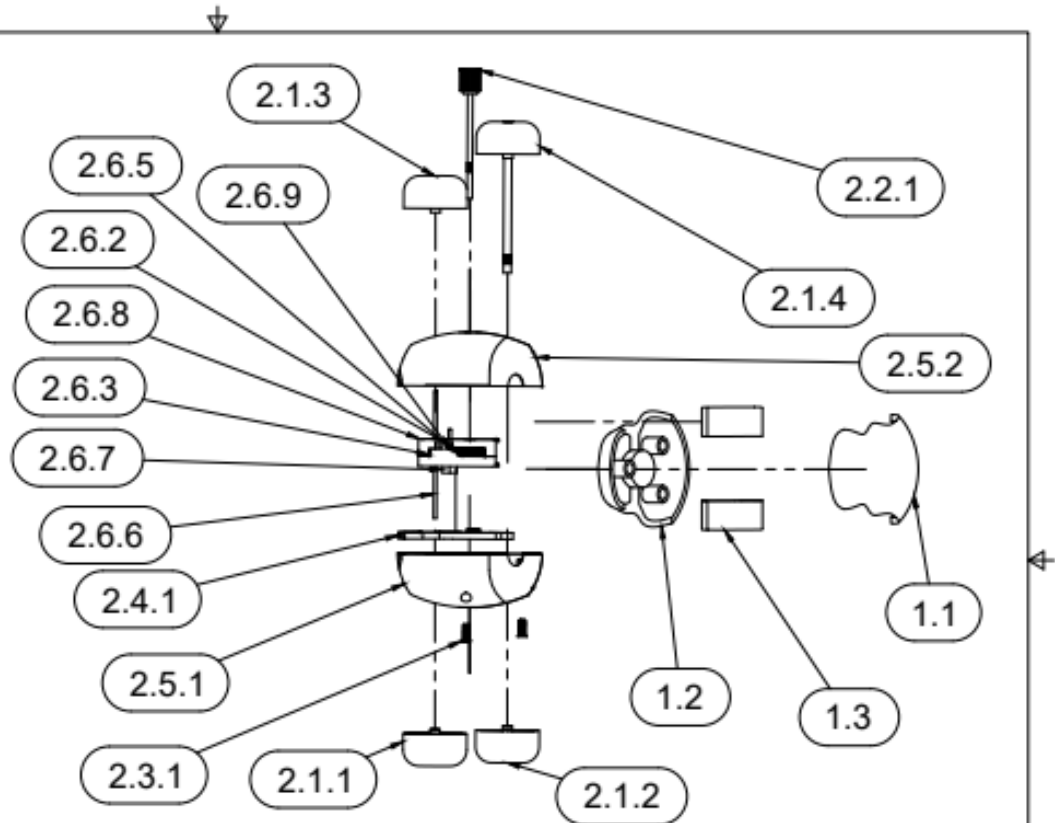
3D modeled version: <https://a360.co/3DEWy6z>





		PROJECT		
		Pink Dog Reverse AH, RZ, MC		
		TITLE		
		assembled		
APPROVED	SIZE	CODE	DWG NO	REV
CHECKED	B			
DRAWN	cantrowik cantrowik 3/30/2022		SCALE 1:2	WEIGHT
				SHEET 1/2

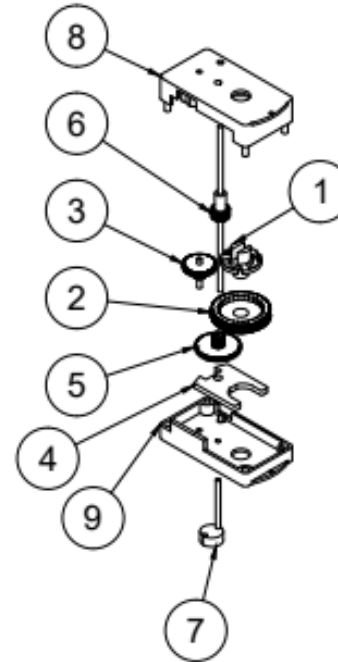
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1.1	1	COMPONENT1	ABS PLASTIC
1.2	1	COMPONENT2	ABS PLASTIC
1.3	1	COMPONENT3	ABS PLASTIC
2	1	SUBASSEMBLY	
2.1	1	WHEELS	STEEL
2.1.1	1	WHEEL	STEEL
2.1.2	1	WHEEL (1)	STEEL
2.1.3	1	WHEEL (2)	STEEL
2.1.4	1	WHEEL WITH AXIS	STEEL
2.2	1	KEY	
2.2.1	1	KEY	
2.3	1	SCREWS	60SN40PB
2.3.1	2	SCREW	60SN40PB
2.4	1	HEART	
2.4.1	1	HEART	ABS PLASTIC
2.4.2	1	COMPONENT2	
2.5	1	BODY	STEEL
2.5.1	1	COMPONENT1	STEEL
2.5.2	1	COMPONENT2	STEEL
2.6	1	SUBASSEMBLY	
2.6.1	1	BEYBLADE	PLASTIC, OPAQUE WHITE
2.6.2	1	BIG WHITE GEAR	ABS PLASTIC
2.6.3	1	GREEN GEAR	ABS PLASTIC
2.6.4	1	GREEN TOOTH	ABS PLASTIC
2.6.5	1	MEDIUM WHITE GEAR	ABS PLASTIC
2.6.6	1	SMALL GEAR ON POLE	
2.6.7	1	SMALL KEY	
2.6.8	1	GEAR BOX HALF + SPRING	
2.6.9	1	GEARBOX HALVE NO SPRING	PLASTIC, OPAQUE BLACK



PROJECT		Pink Dog Reverse AH, RZ, MC		
TITLE		assembled		
APPROVED	SIZE	CODE	DWG NO	REV
CHECKED	B			
DRAWN	carbowik carbowik	3/30/2022	SCALE 1.25:2	WEIGHT SHEET 2/2



PARTS LIST				
ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
1	1	BEYBLADE		PLASTIC, OPAQUE WHITE
2	1	BIG WHITE GEAR		ABS PLASTIC
3	1	GREEN GEAR		ABS PLASTIC
4	1	GREEN TOOTH		ABS PLASTIC
5	1	MEDIUM WHITE GEAR		ABS PLASTIC
6	1	SMALL GEAR ON POLE		
7	1	SMALL KEY		
8	1	GEAR BOX HALF + SPRING		
9	1	GEARBOX HALVE NO SPRING		PLASTIC, OPAQUE BLACK



		PROJECT		
		Pink Dog Reverse AH, RZ, MC		
		TITLE		
		Subassembly		
APPROVED	SIZE	CODE	DWG NO	REV
CHECKED	B			
DRAWN	canbowski canbowski 4/7/2022	SCALE 1:1	WEIGHT	SHEET 1/1

# Discussion

## **Quirks in the model:**

The gearbox was too big. The shell of the body was too thin. The body was too small. The gear in the gearbox are most likely not the correct ratio.

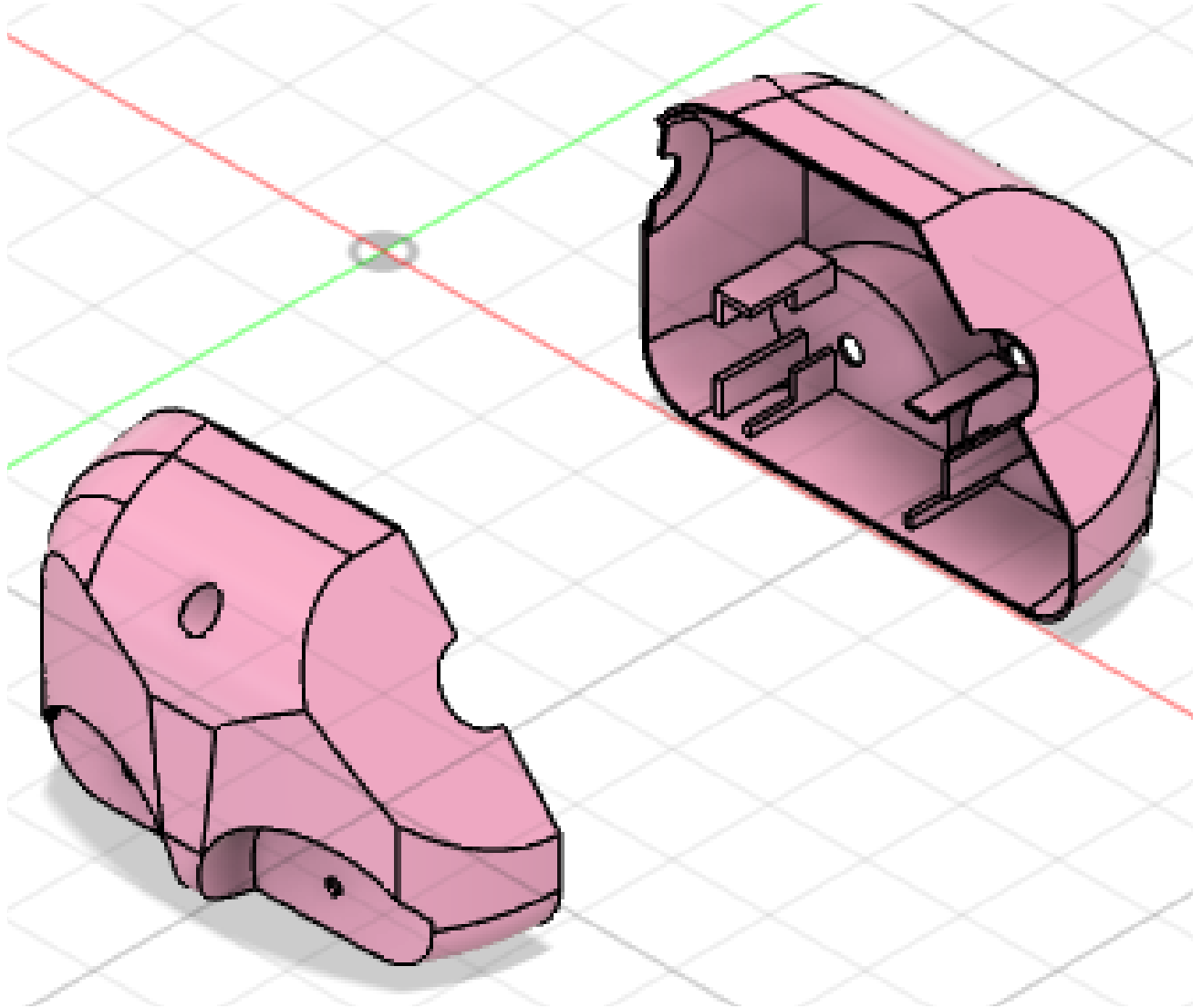
## **Ways it may differ from the real product:**

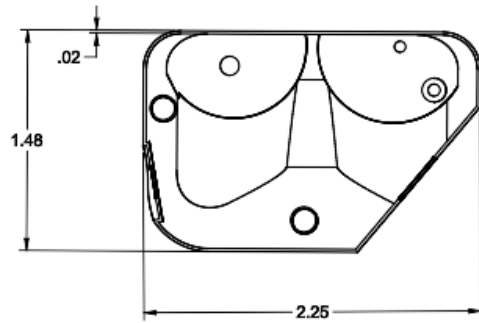
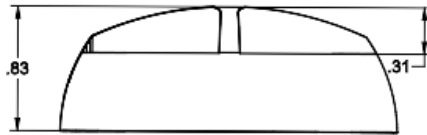
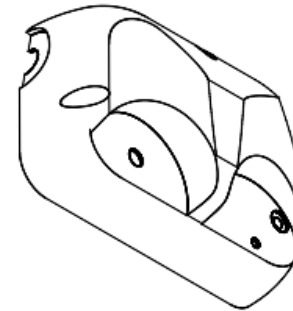
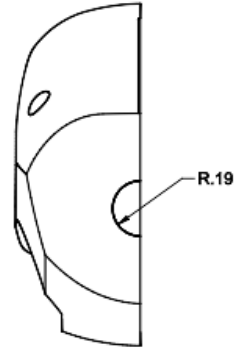
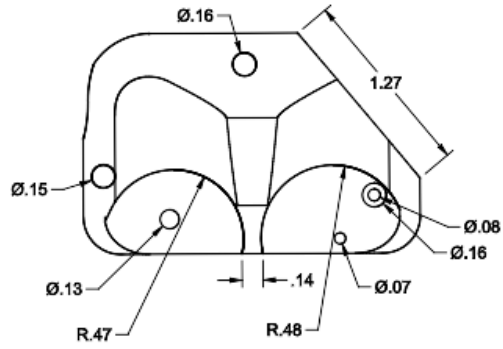
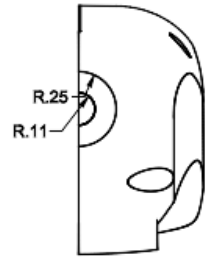
The model doesn't have a tail, neck or a face and the real product does. The size of certain parts are not the same size as the real product. The gearbox does not fit the body of the product and some gears are too big too.

## **Next steps given more time:**

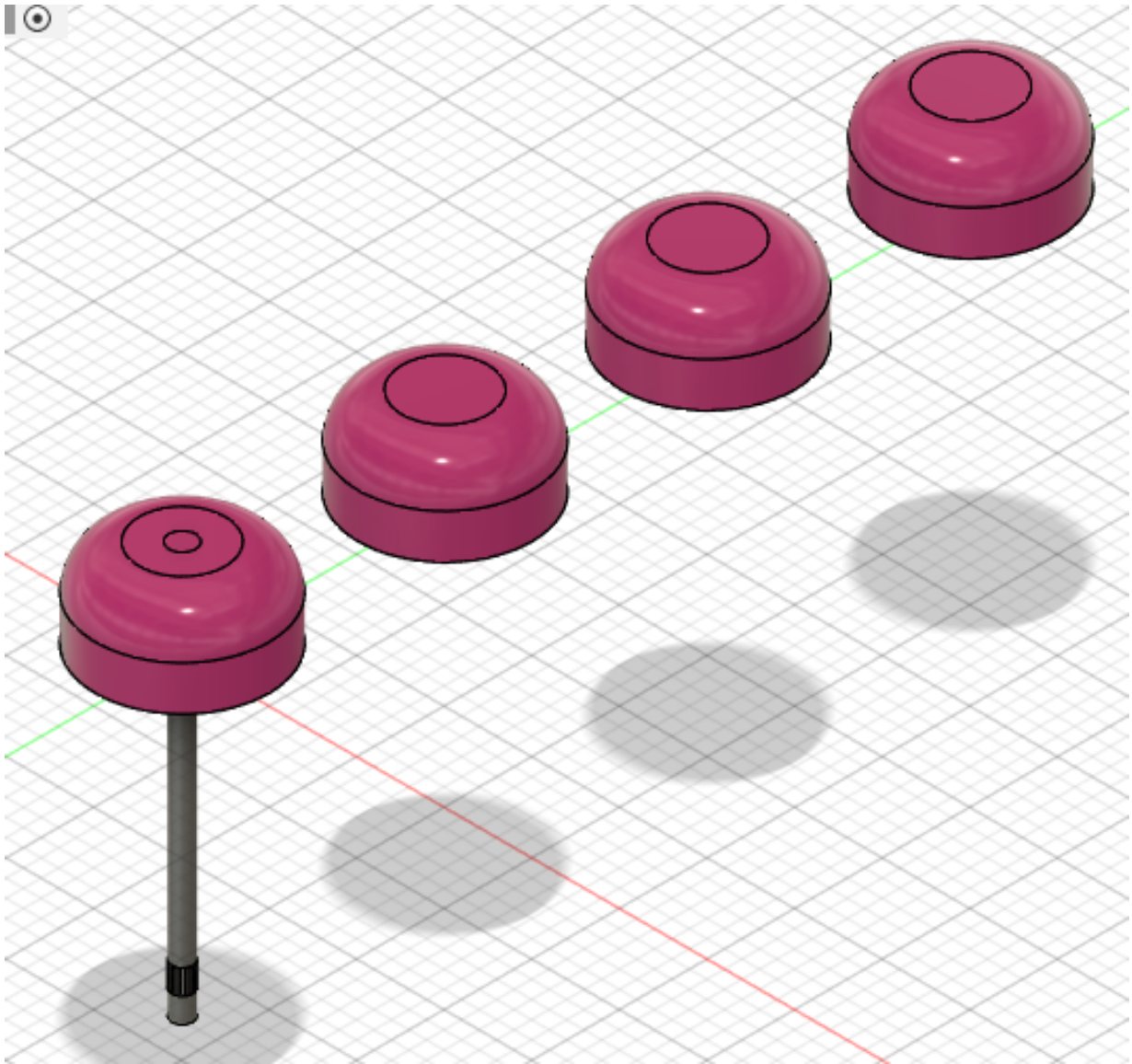
Resize the modeled parts to fit the gearbox better. Fix the size of the gearbox and body. Make the tail and part of the head that makes the head wiggle. Also make it so that the product actually has a face, not just a blank canvas.

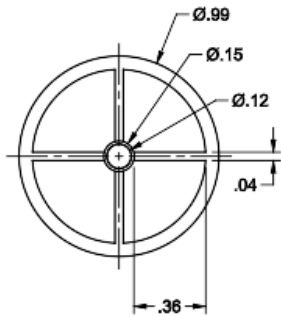
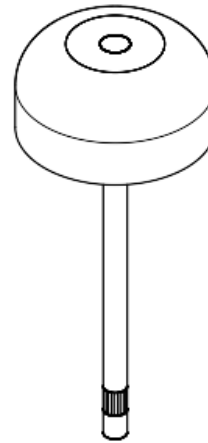
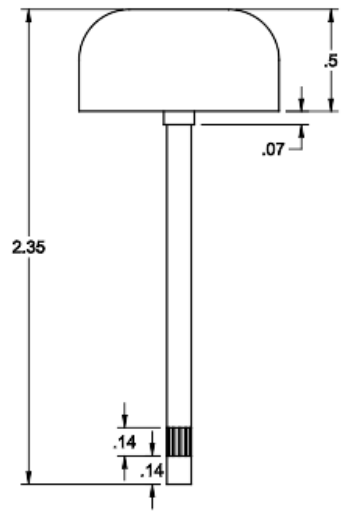
## Part Models and Drawings



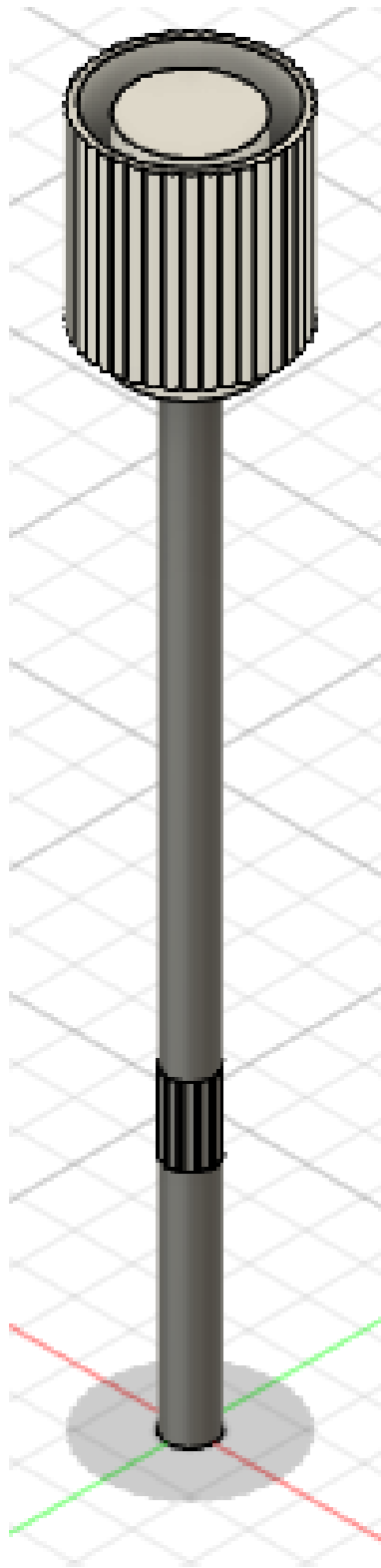


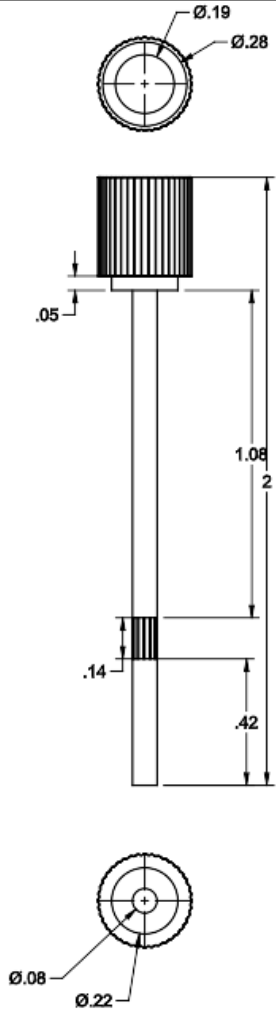
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		TITLE		
		Body		
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CHECKED	B			
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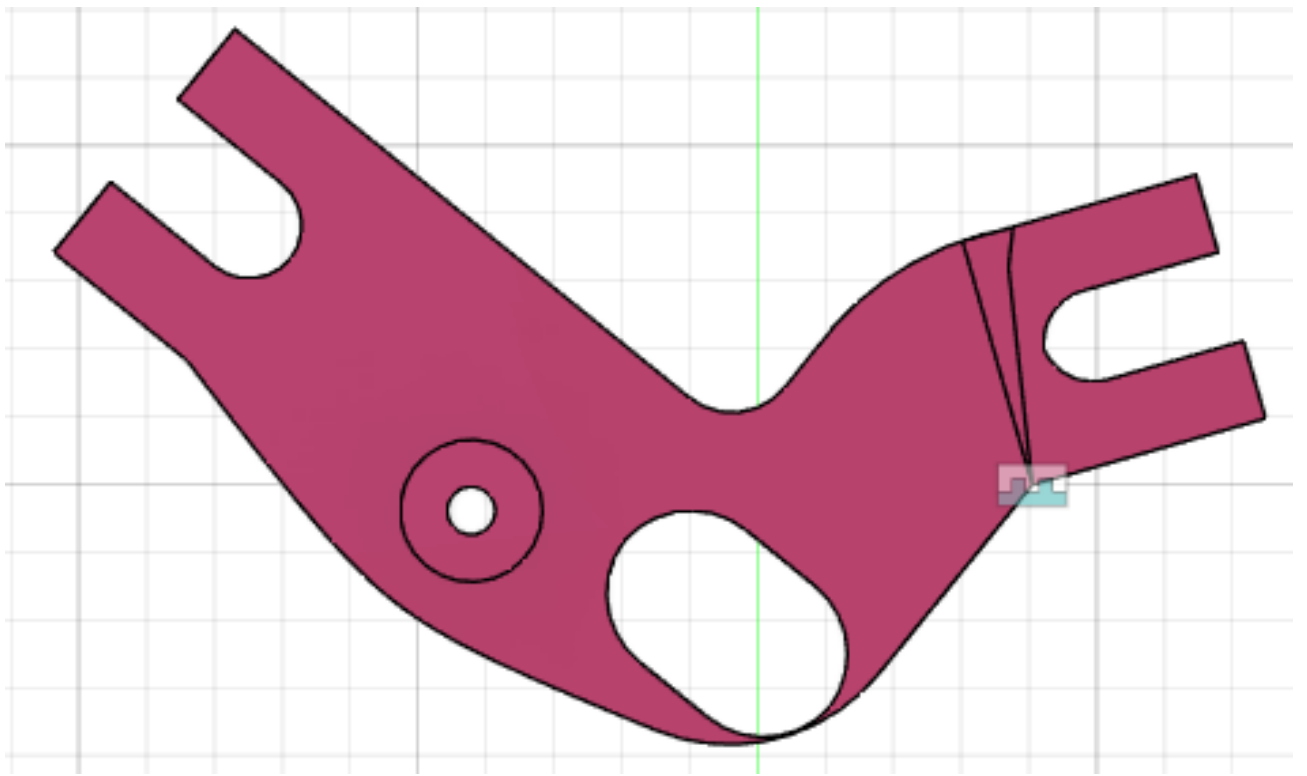
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TITLE		Wheels		
APPROVED	SIZE	CODE	DWG NO	REV
CHECKED	B			
DRAWN Annabelle Hazell 3/24/2022	SCALE 1:1	WEIGHT	SHEET 1/1	

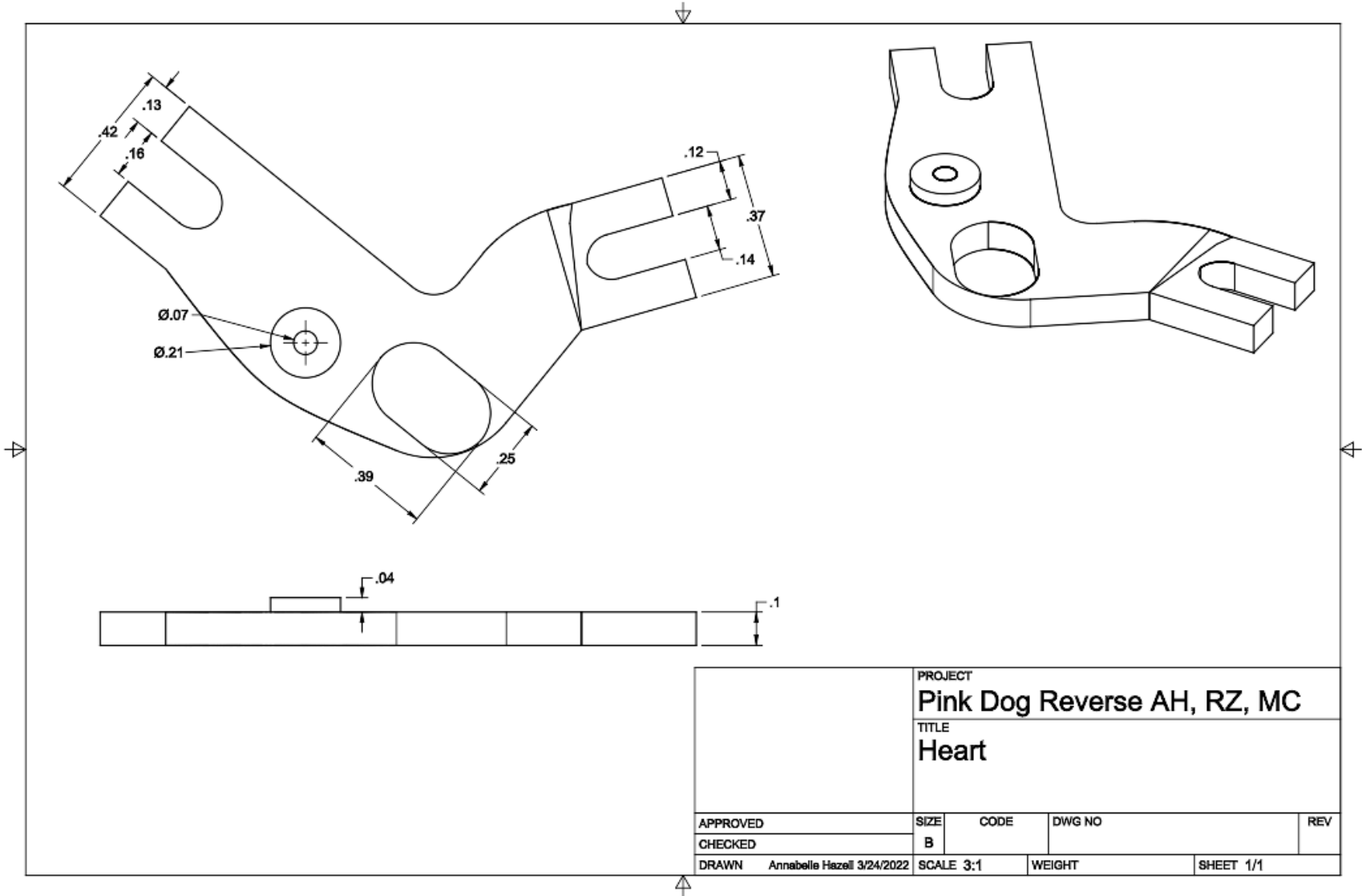




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TITLE		Key		
APPROVED	SIZE	CODE	DWG NO	REV
CHECKED	B			
DRAWN Annabelle Hazell 3/24/2022	SCALE 3:1	WEIGHT	SHEET 1/1	



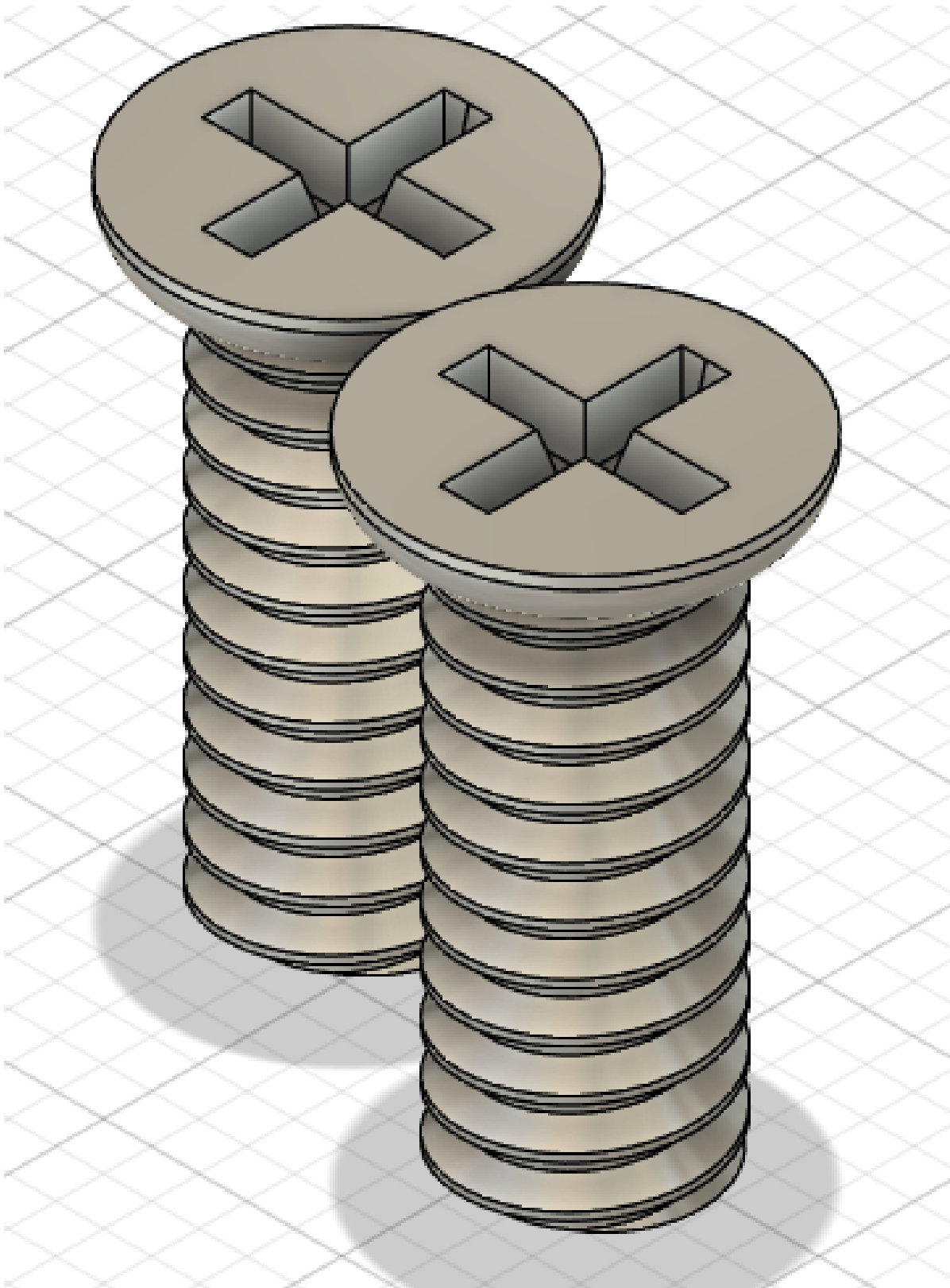


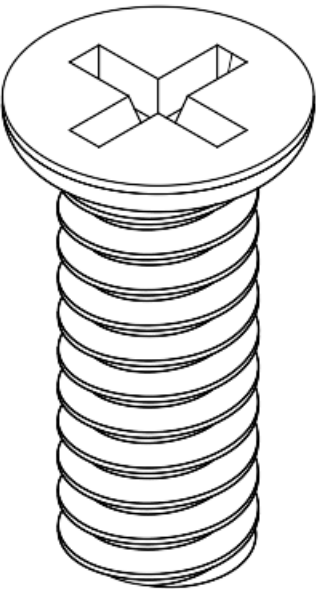
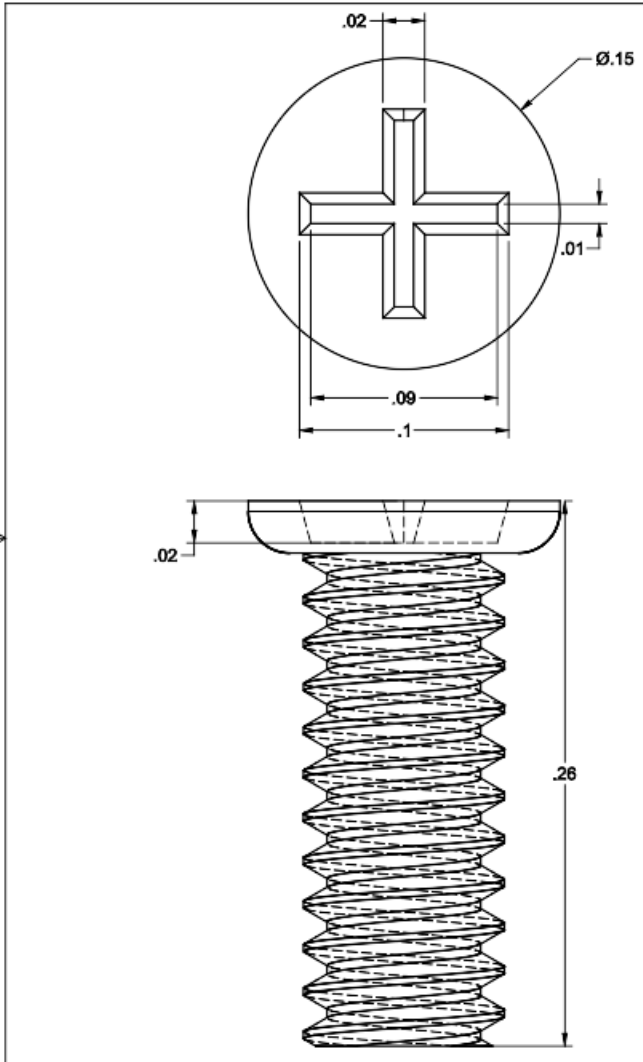


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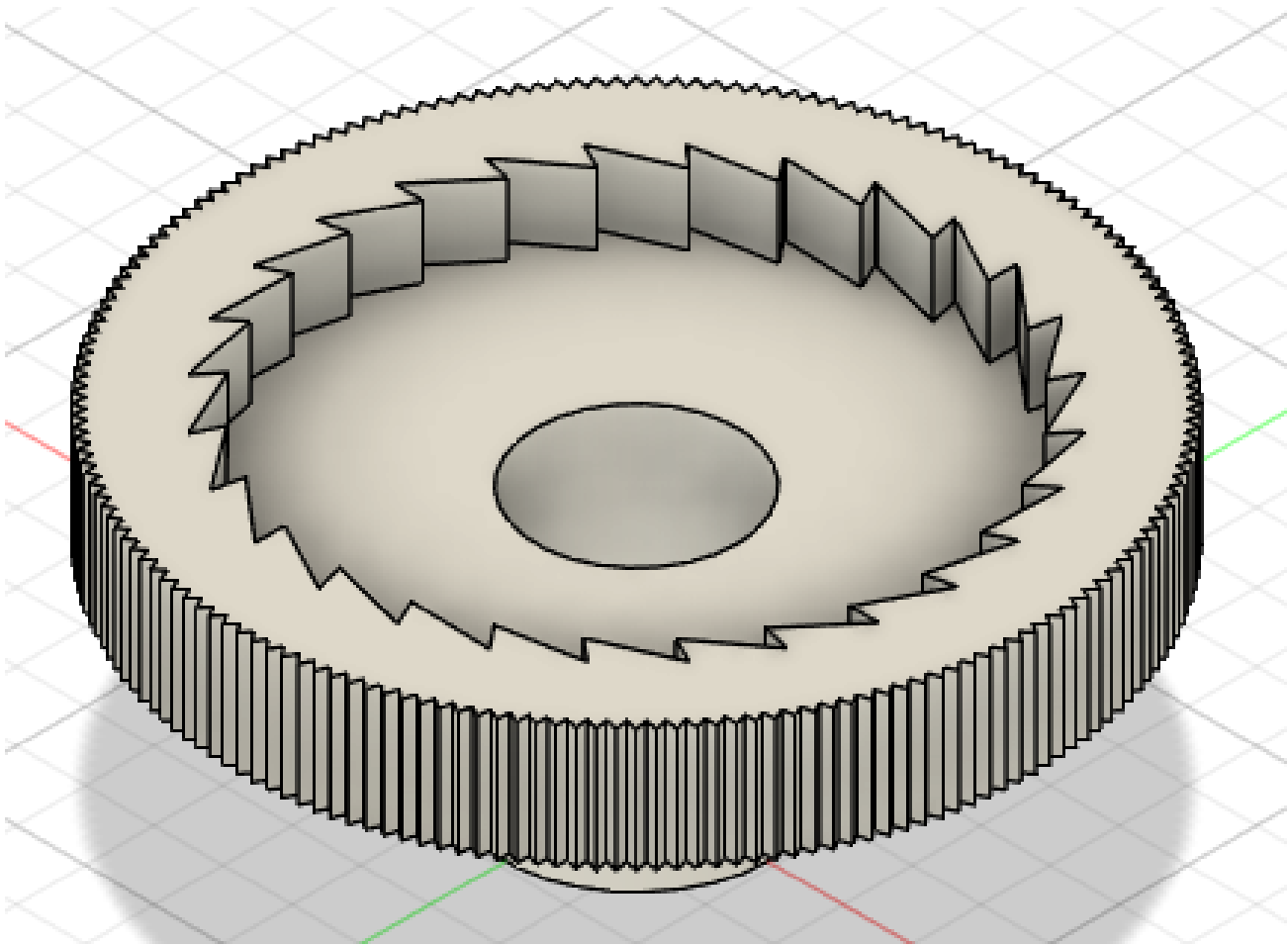
TITLE  
**Heart**

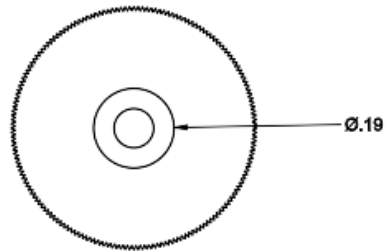
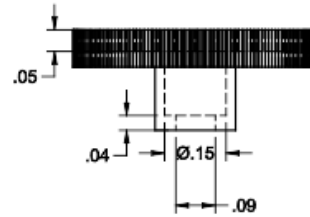
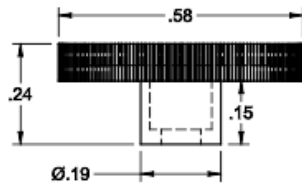
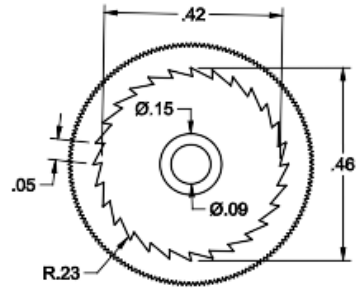
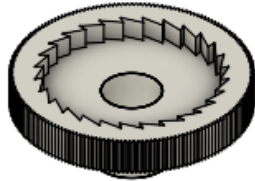
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CHECKED	B			
DRAWN Annabelle Hazell 3/24/2022	SCALE 3:1	WEIGHT	SHEET 1/1	



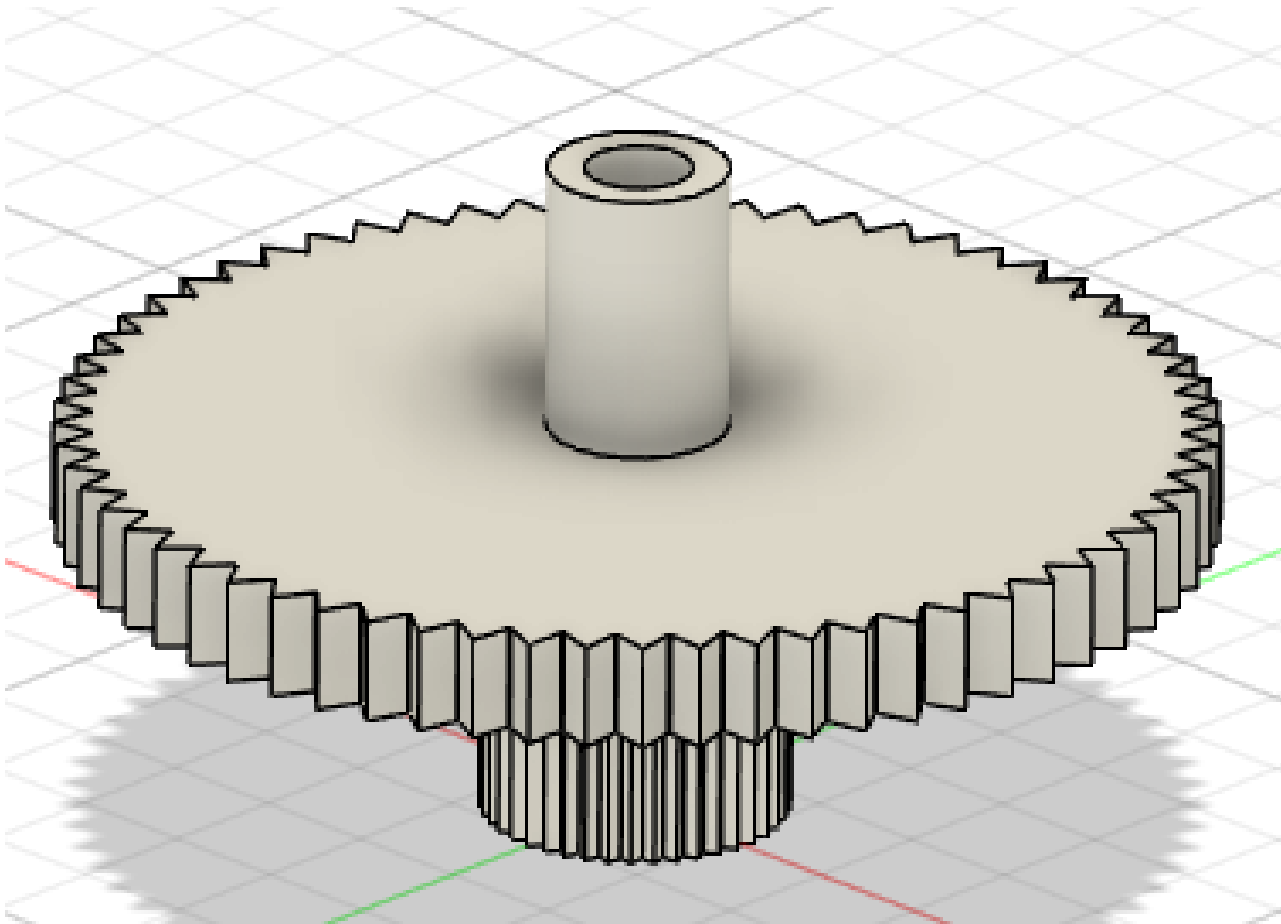


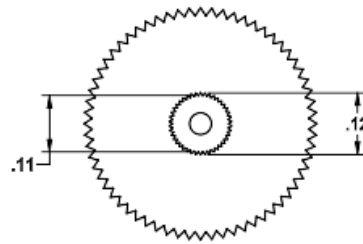
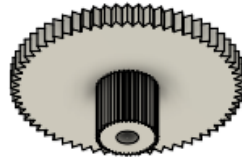
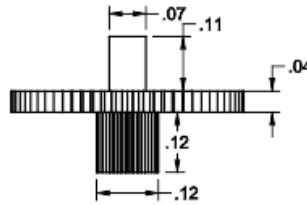
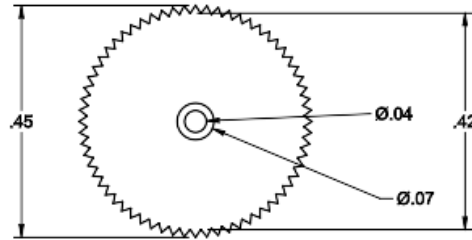
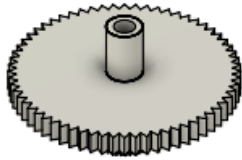
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		TITLE		
		Screws		
APPROVED	SIZE	CODE	DWG NO	REV
CHECKED	B			
DRAWN	Annabelle Hazell 3/24/2022	SCALE 20:1	WEIGHT	SHEET 1/1





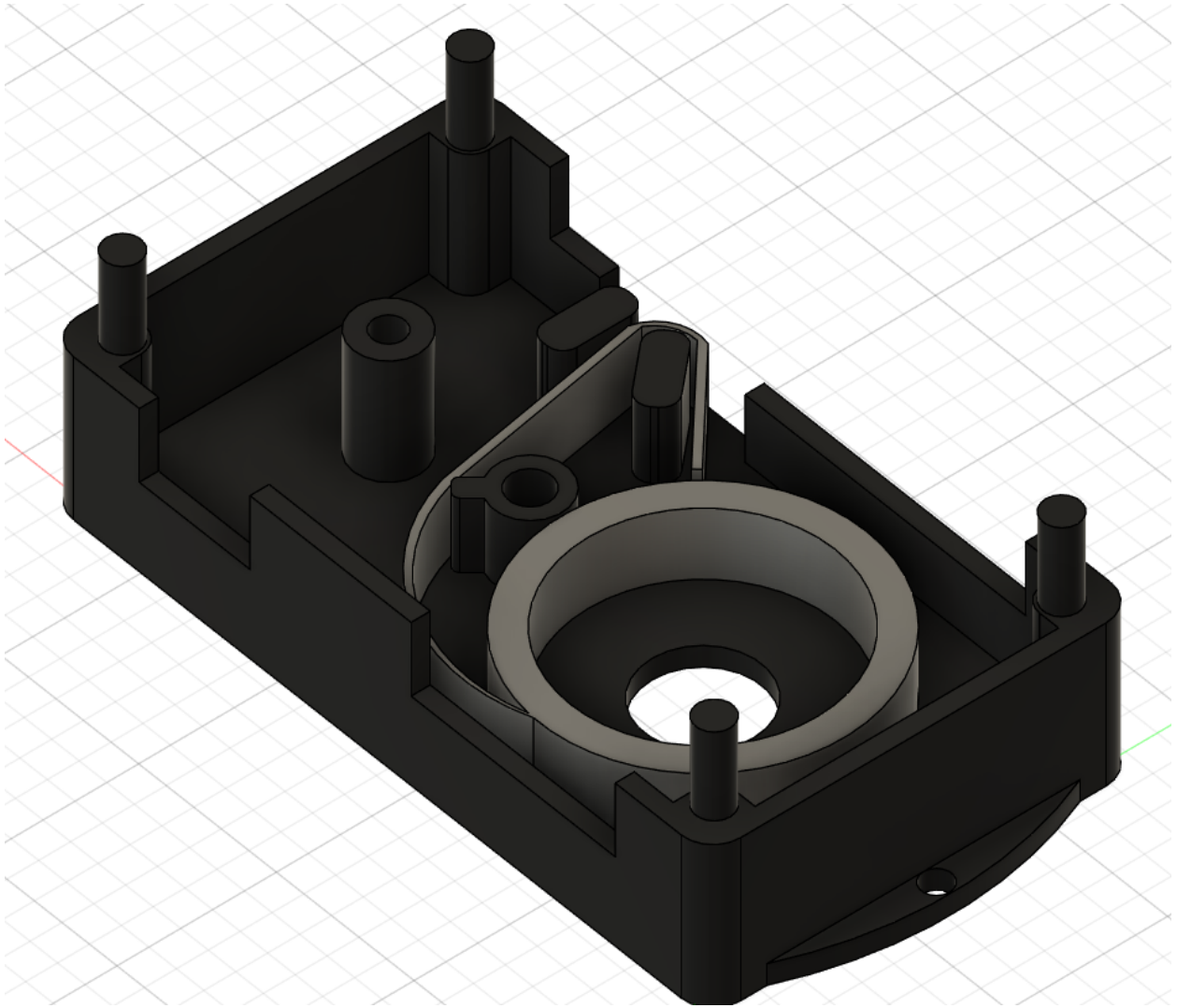
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CHECKED	B			
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				SHEET 1/1



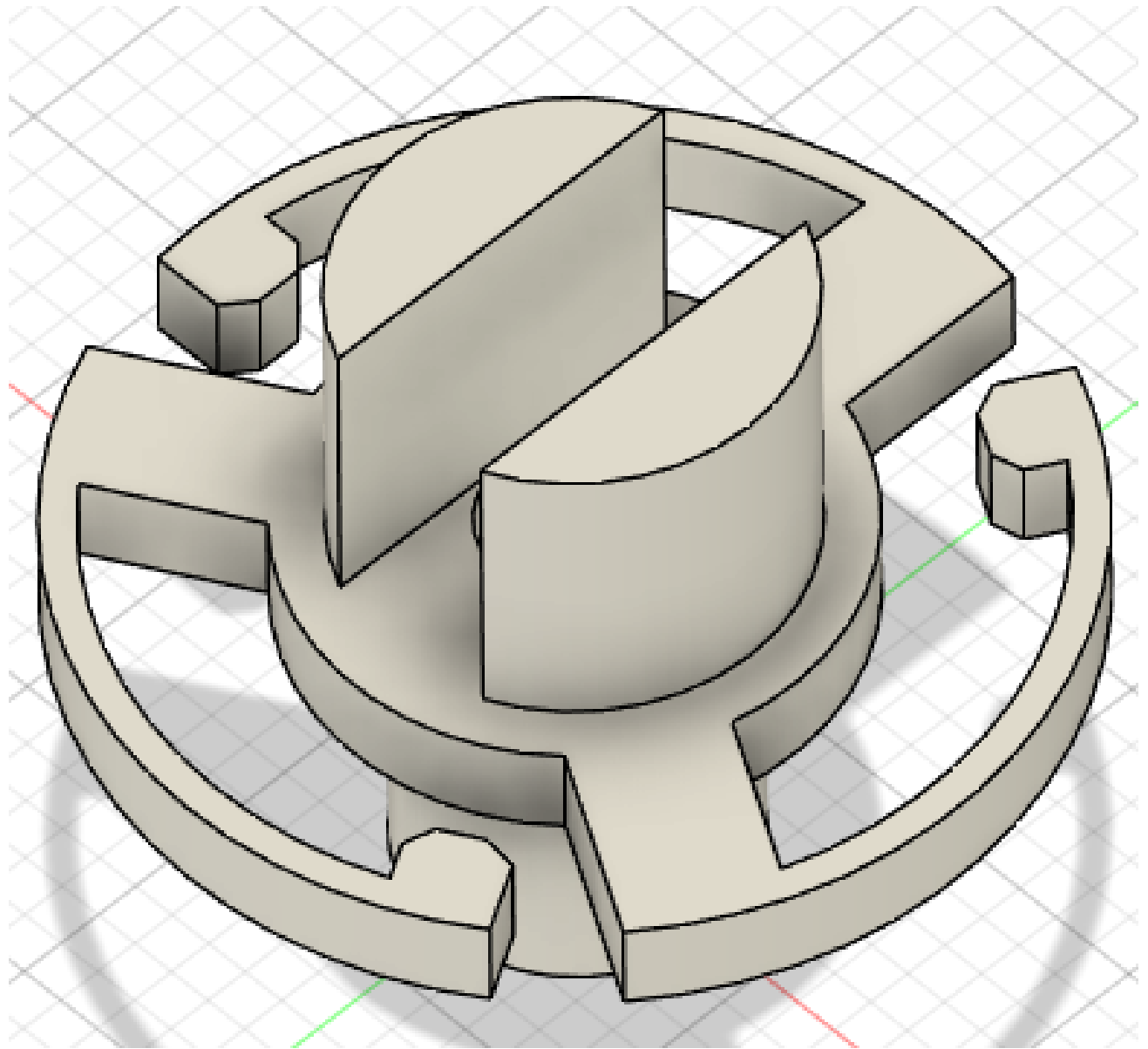


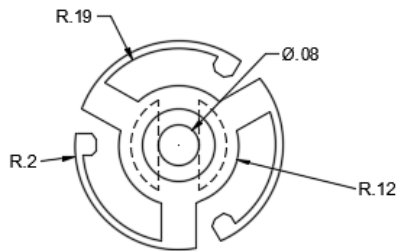
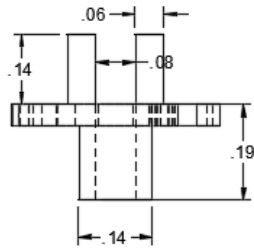
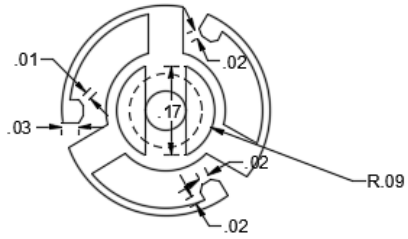
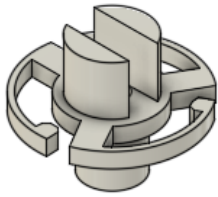
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TITLE				
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CHECKED	B			
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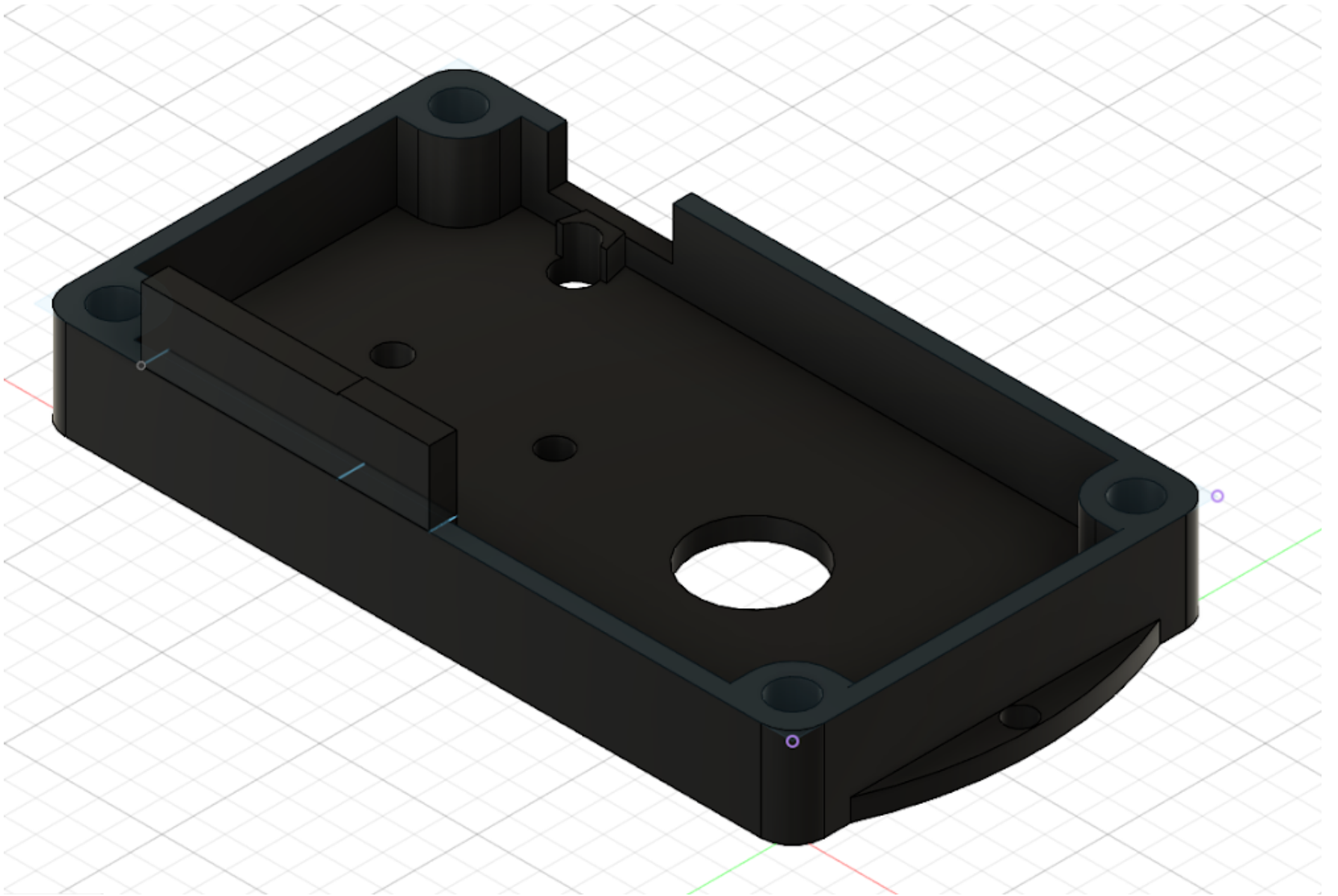




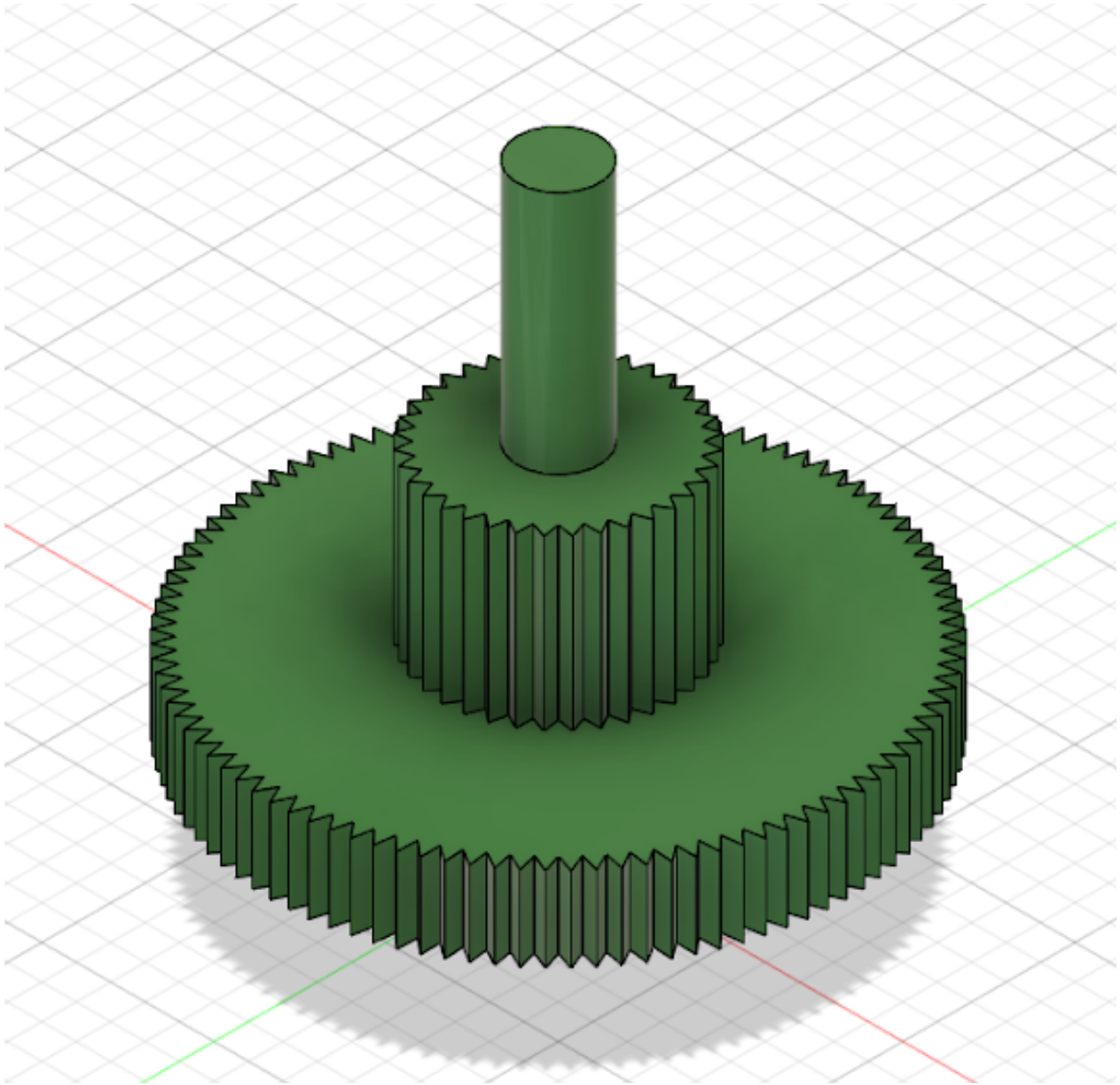


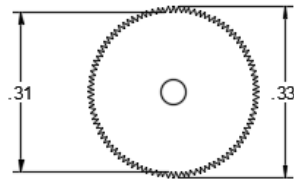
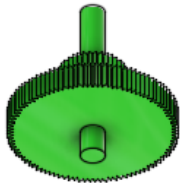
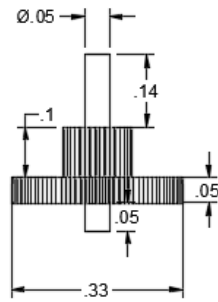
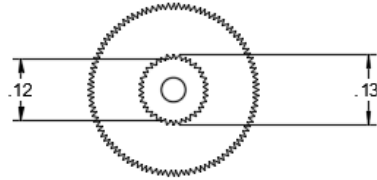
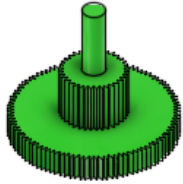


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		TITLE		
		beyblade		
APPROVED	SIZE	CODE	DWG NO	REV
CHECKED	B			
DRAWN	zambrowski/zambrowski	3/14/2022	SCALE 5:1	WEIGHT
			SHEET 1/1	



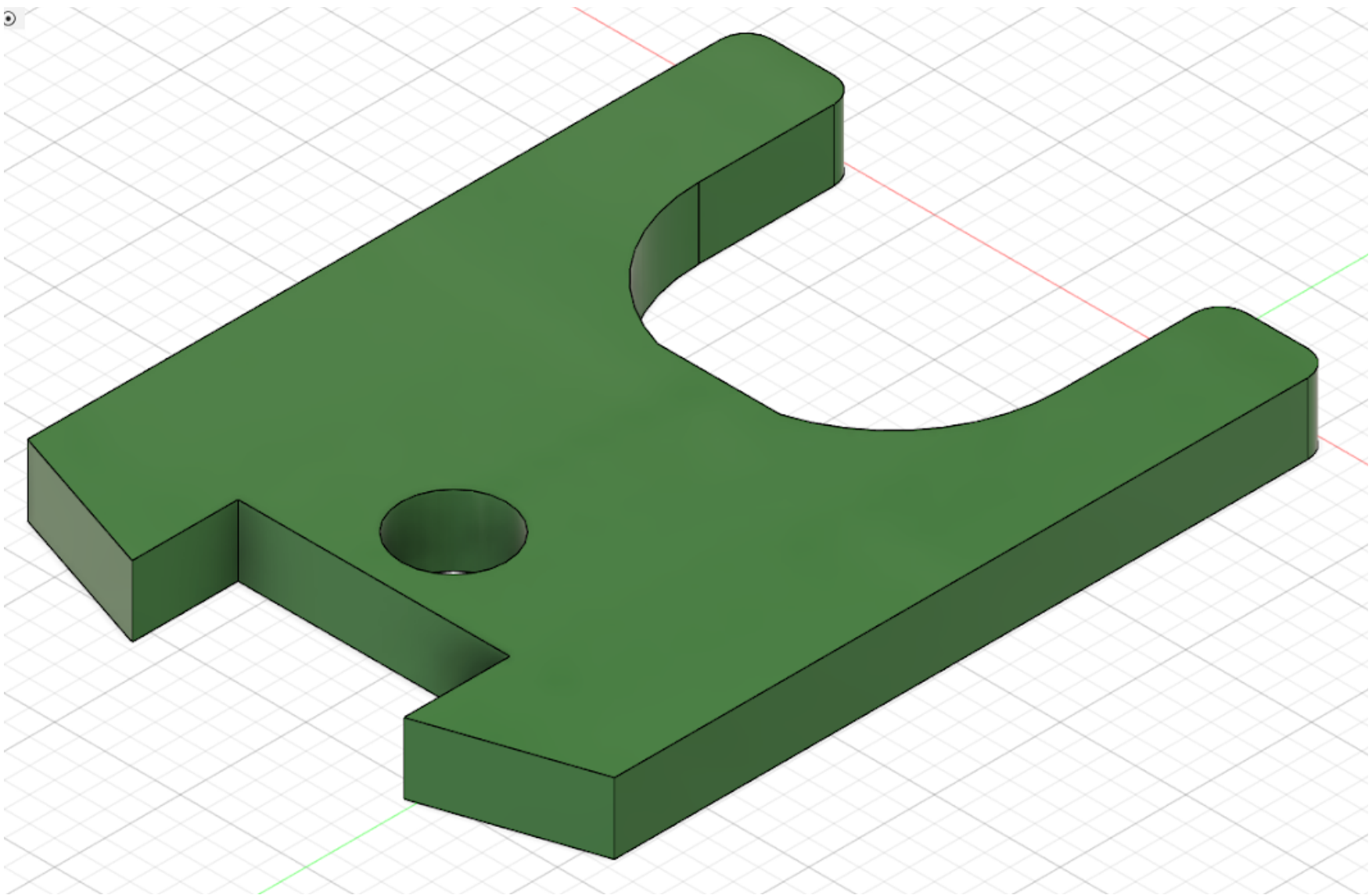


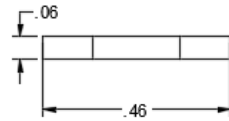
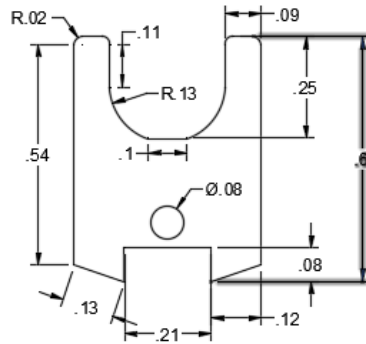
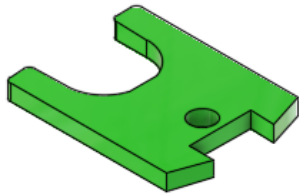




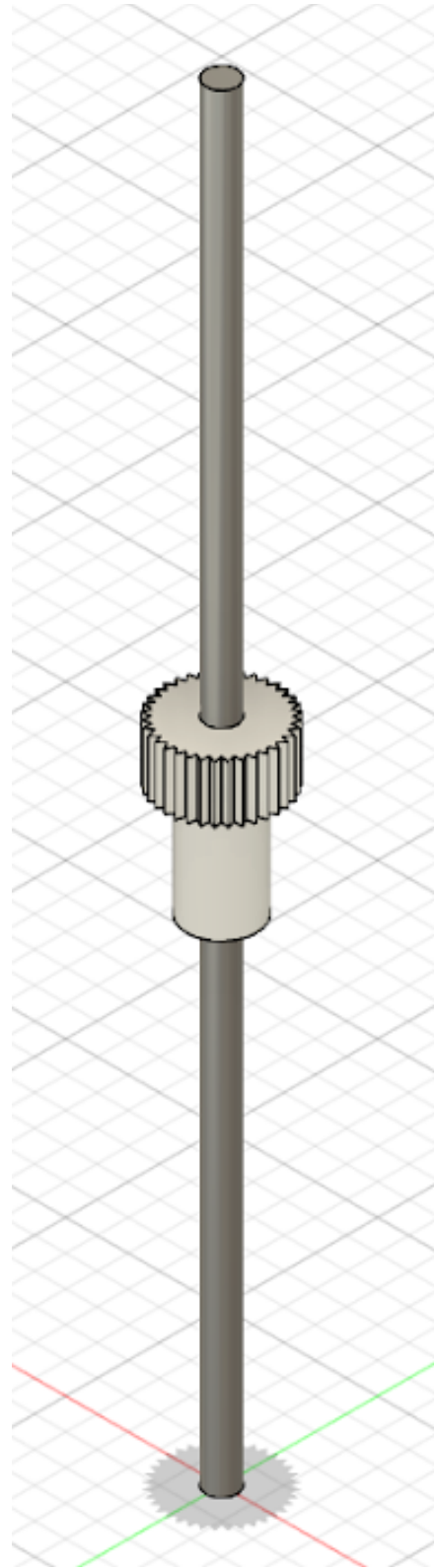
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Pink Dog Reverse AH, RZ, MC				
TITLE				
green gear				
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CHECKED	B			
DRAWN	3/22/2022	SCALE 5:1	WEIGHT	SHEET 1/1

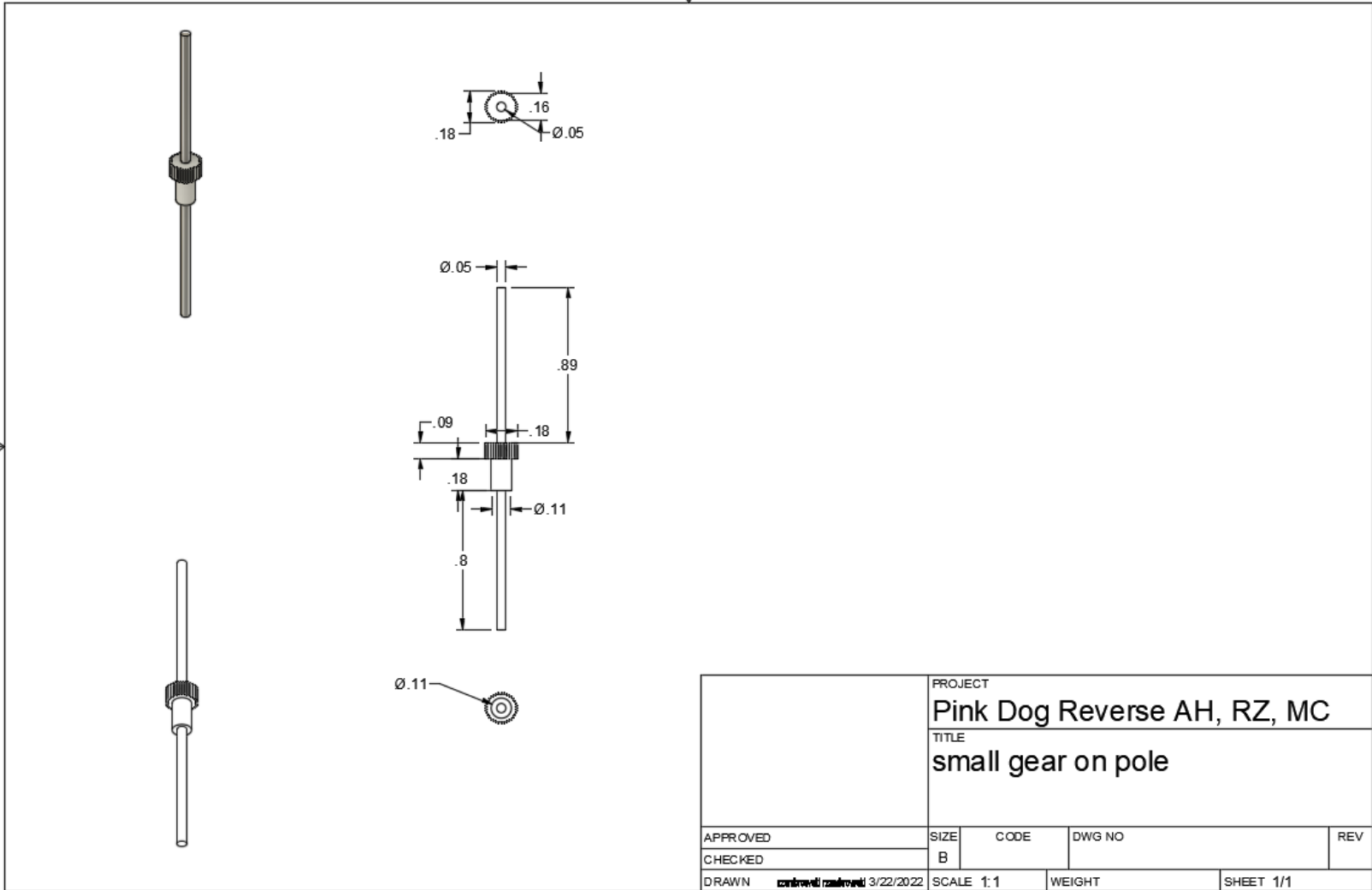




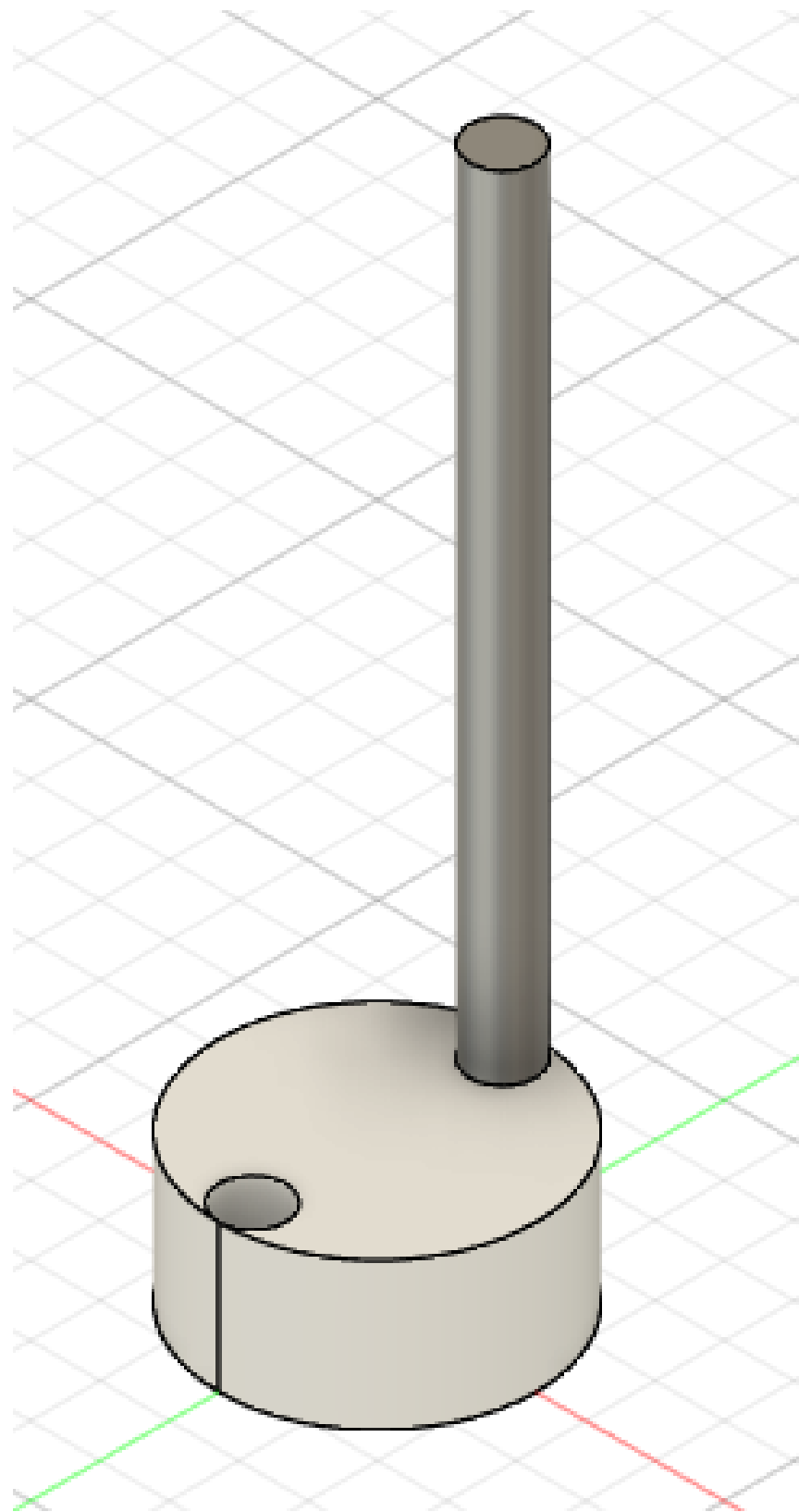


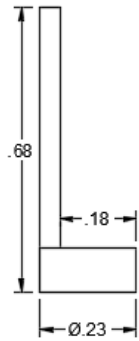
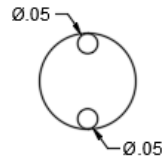
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		TITLE		
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APPROVED	SIZE	CODE	DWG NO	REV
CHECKED	B			
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			SHEET 1/1	



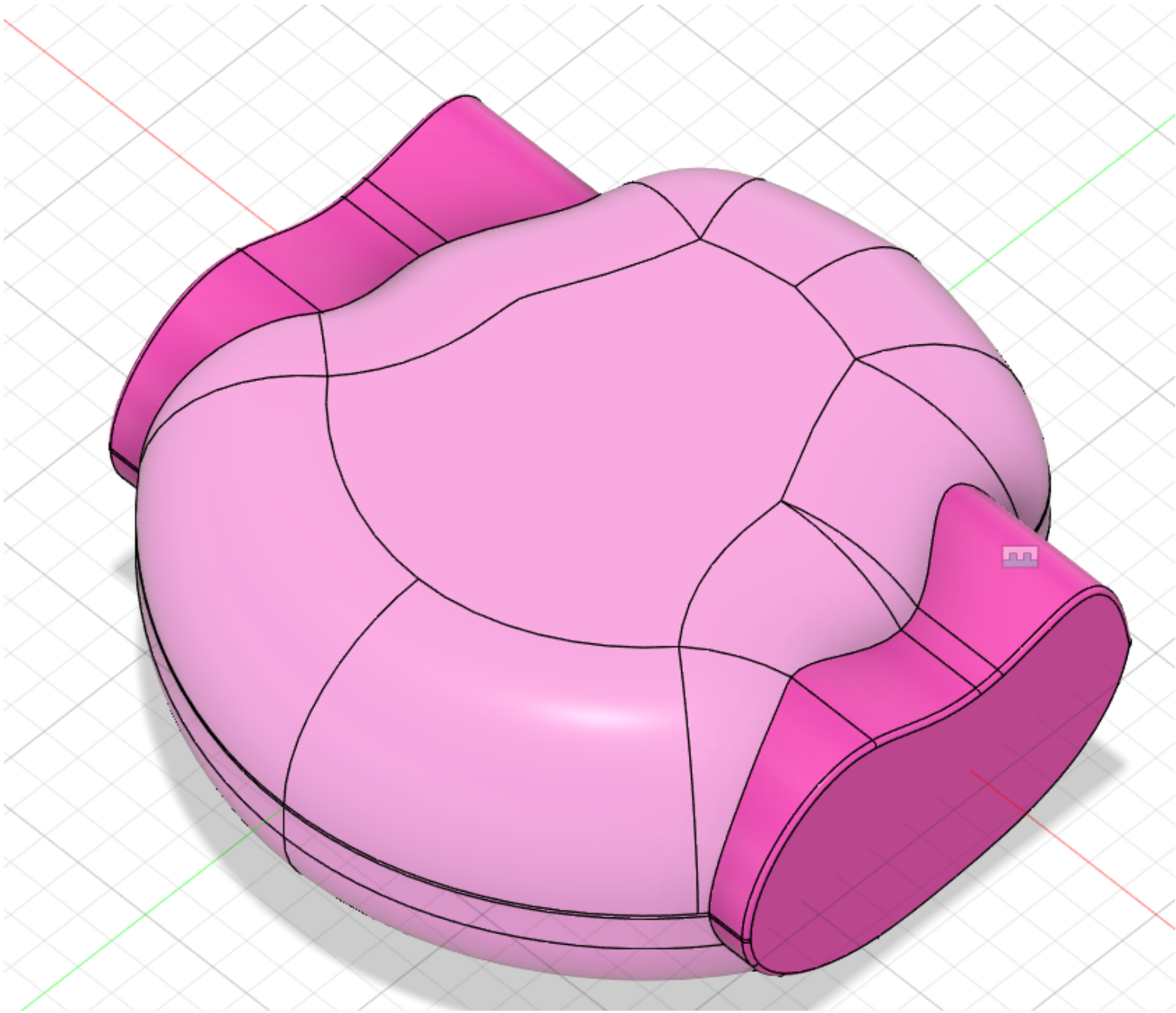


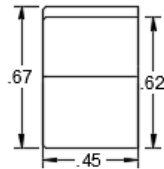
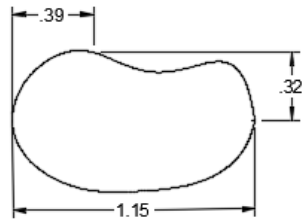
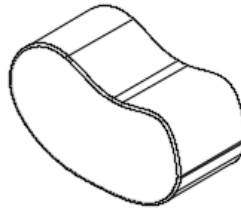
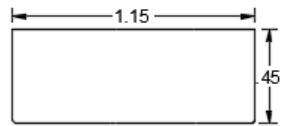
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APPROVED	SIZE	CODE	DWG NO	REV
CHECKED	B			
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			SHEET 1/1	





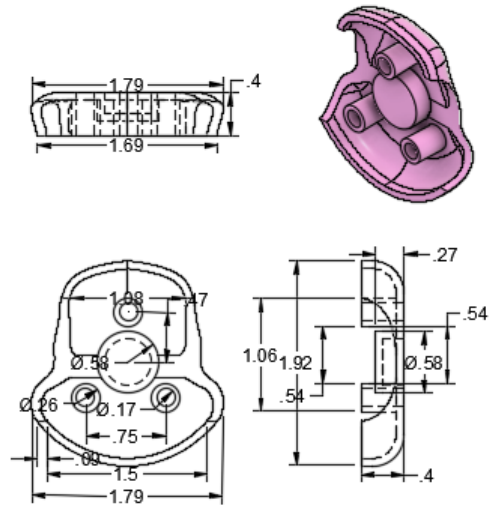
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				Pink Dog Reverse AH, RZ, MC	
				TITLE	
				Small Key	
APPROVED	SIZE	CODE	DWG NO	REV	
CHECKED	B				
DRAWN	candrewd candrewd 3/24/2022		SCALE 4:1	WEIGHT	SHEET 1/1



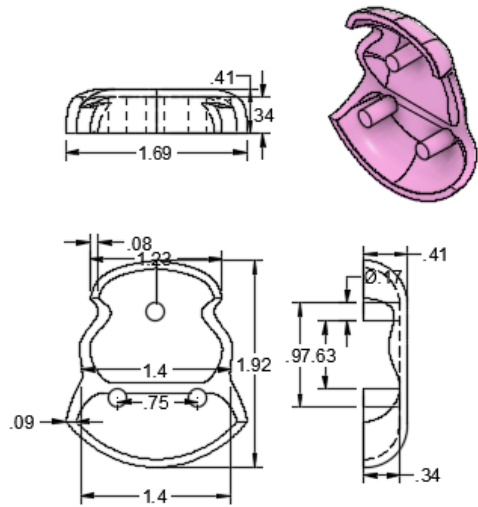


		PROJECT		
		Pink Dog Reverse AH, RZ, MC		
		TITLE		
		Dog Face v16		
APPROVED	SIZE	CODE	DWG NO	REV
CHECKED	B			
DRAWN	Mathew Caputo	4/4/2022	SCALE 2:1	WEIGHT
				SHEET 1/1





		PROJECT		
		Pink Dog Reverse AH, RZ, MC		
		TITLE		
		Dog Face v16		
APPROVED	SIZE	CODE	DWG NO	REV
CHECKED	B			
DRAWN	Mathew Caputo	4/1/2022	SCALE 1:1	WEIGHT
				SHEET 1/1



		PROJECT		
		Pink Dog Reverse AH, RZ, MC		
		TITLE		
		Dog Face v16		
APPROVED	SIZE	C CODE	DWG NO	REV
CHECKED	B			
DRAWN Matthew Caputo 3/30/2022	SCALE 1:1	WEIGHT	SHEET 1/1	