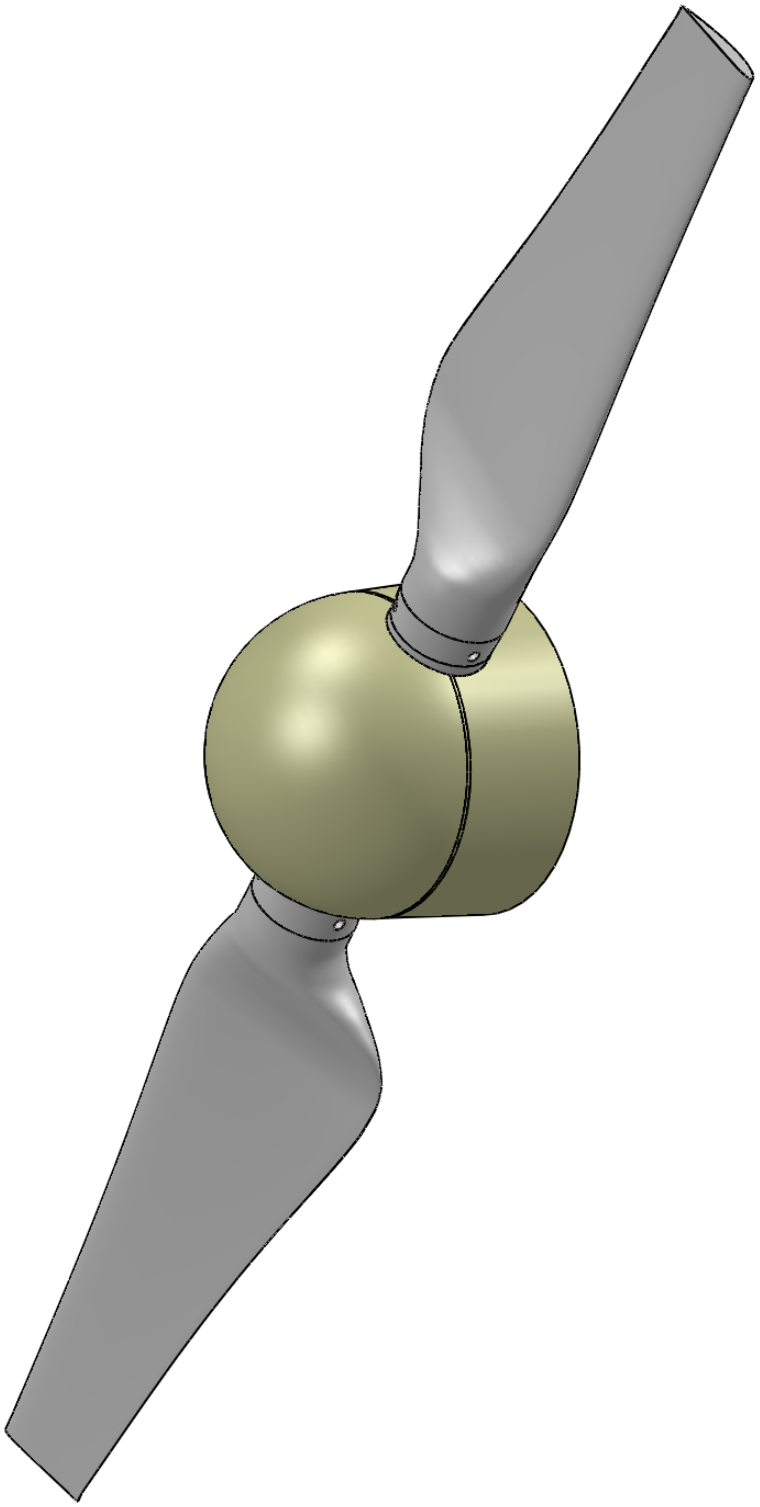

VIEW: Hub Assembly

NOTES: The hub assembly houses the torque sensor and consists of several pieces, either machined out of aluminum, custom CNC machined (blades), or rapid prototyped using a resin material (the hub exterior shell is the only piece made this way). Set screws allow manual blade pitch control.

	NAME	DATE
DRAWN BY	[illegible]	[illegible]

MATERIAL: Various

PART: Tidal Turbine Hub and Blade Assembly

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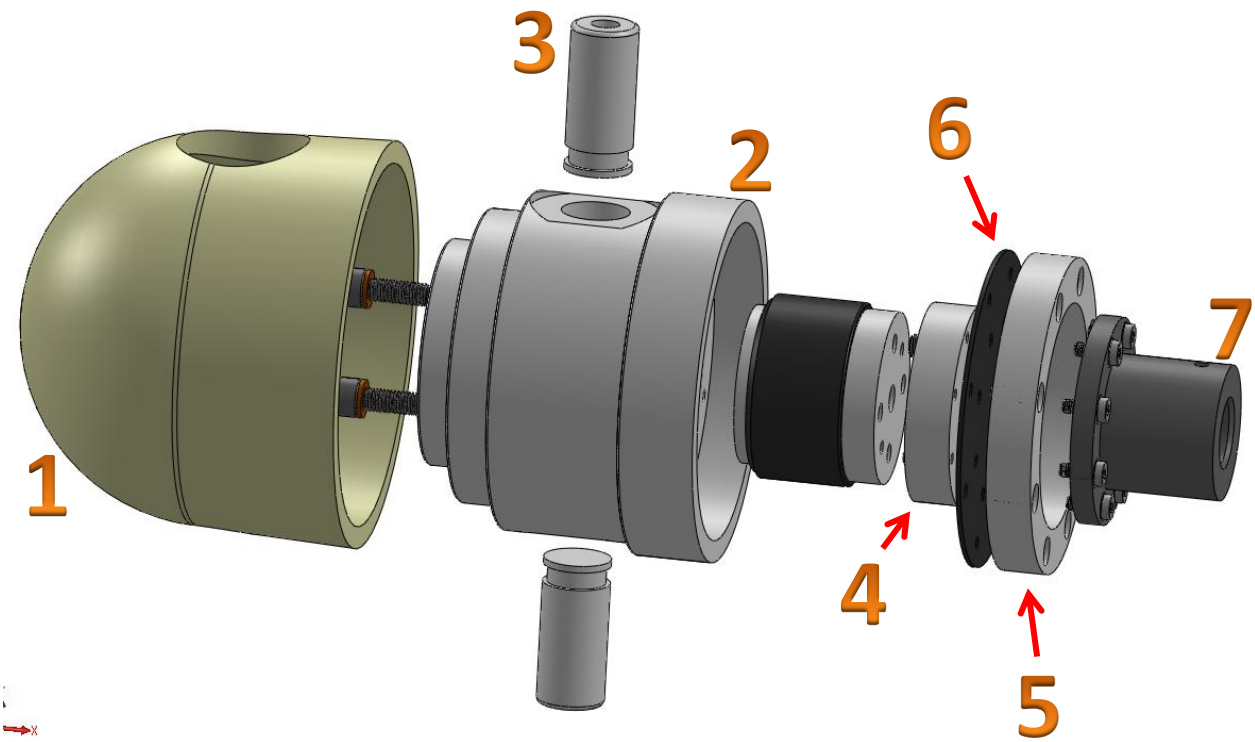
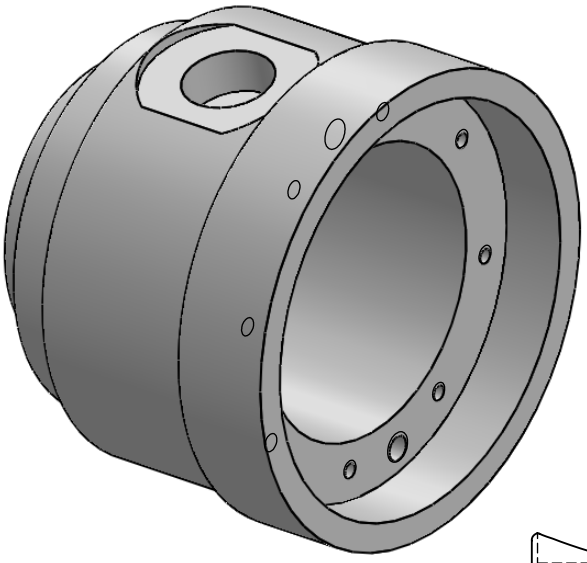
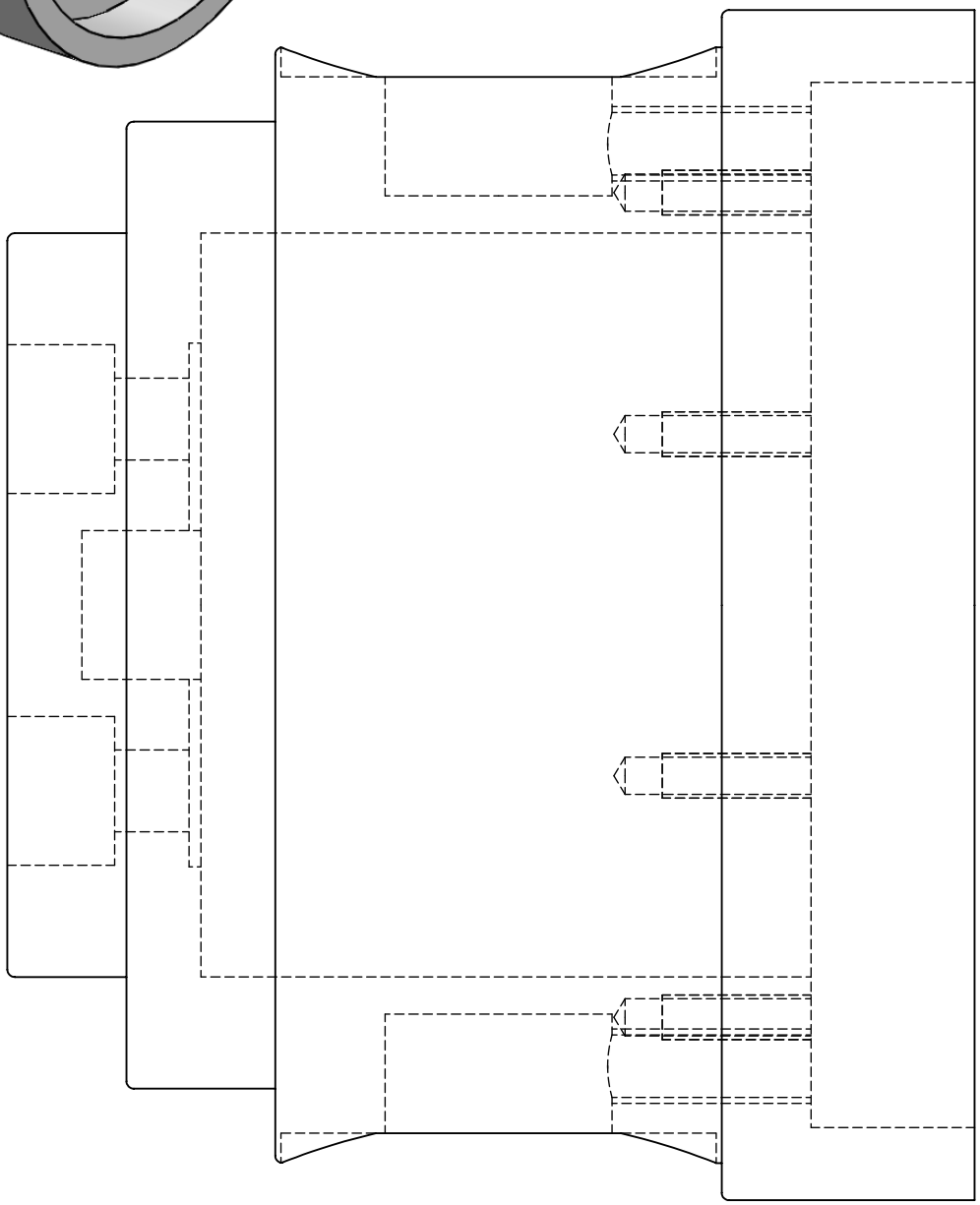


QUANTITIES NEEDED:

1. Hub Shell (2) – rapid prototype fabrication at UMD
2. Hub Insert (2)
3. Blade Mounting Pins (4)
4. Inside Gasket Plate (2)
5. Outer Gasket Ring Clamp (2)
6. Rubber Gasket (4)
7. Outside Gasket Shaft Clamp (2)





VIEW: SIDE	NOTES: Transparent view of the hub insert without any dimensions.	
	NAME	DATE
DRAWN BY	[illegible]	[illegible]
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	MATERIAL: Aluminum	PART: Hub Insert
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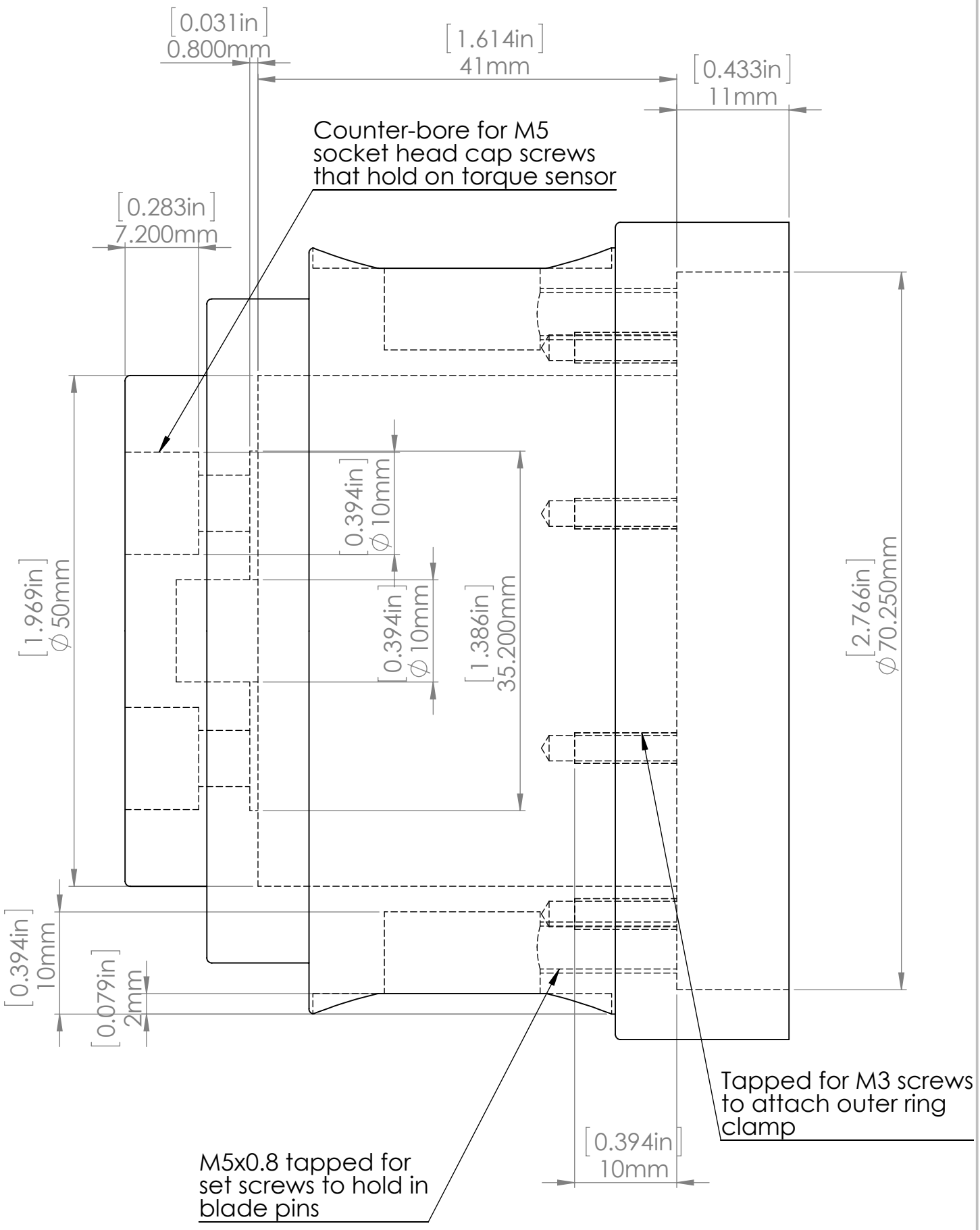

VIEW: SIDE	NOTES: This shows the exterior dimensions of the hub insert from the side.	
	NAME	DATE
DRAWN BY	[illegible]	[illegible]
	MATERIAL: Aluminum	PART: Hub Insert

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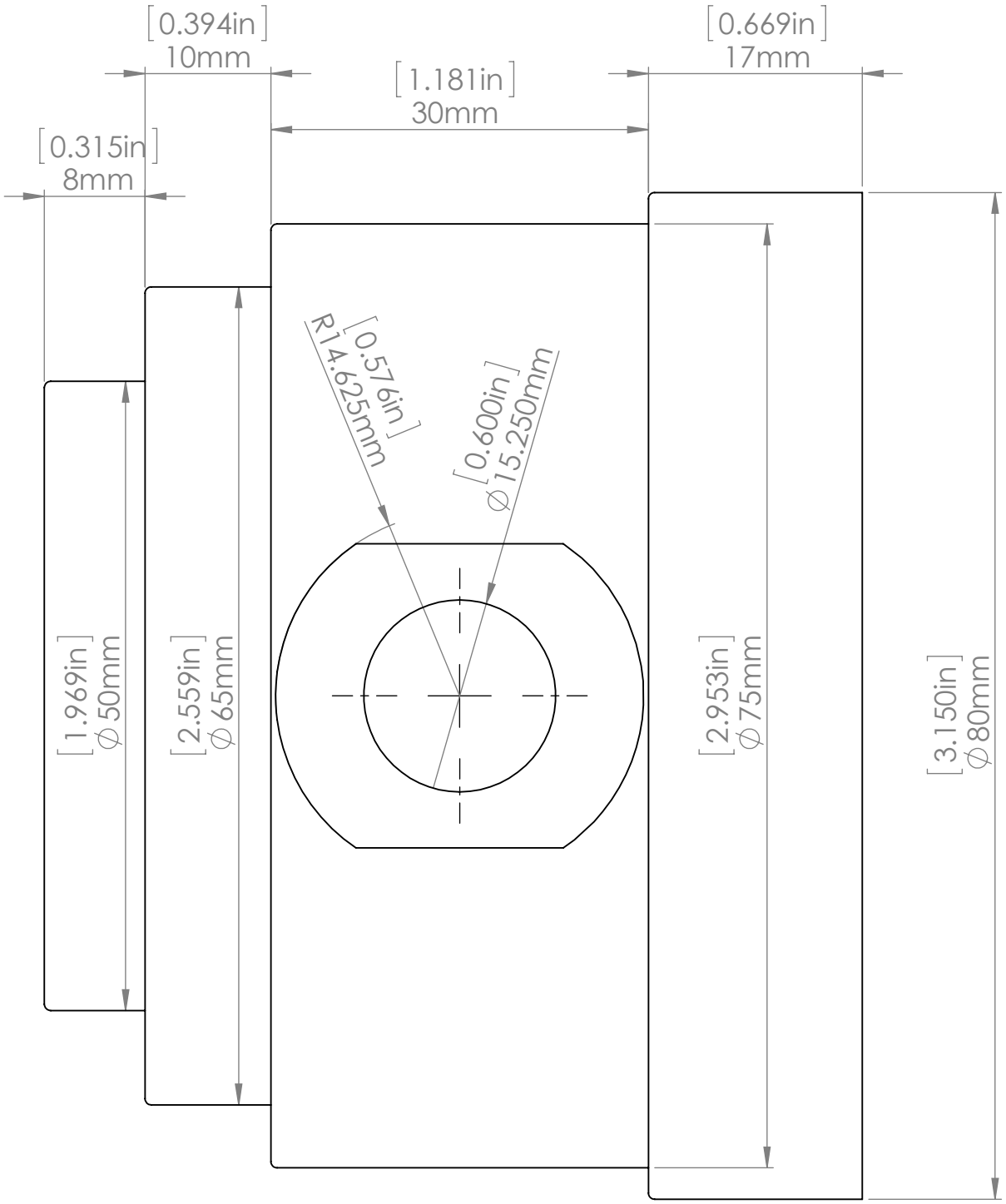

VIEW: TOP	NOTES: Top view and exterior dimensions of the hub insert. Interior bore dimesions are shown in other views.	
	NAME	DATE
DRAWN BY	[illegible]	[illegible]
	MATERIAL: Aluminum	PART: Hub Insert
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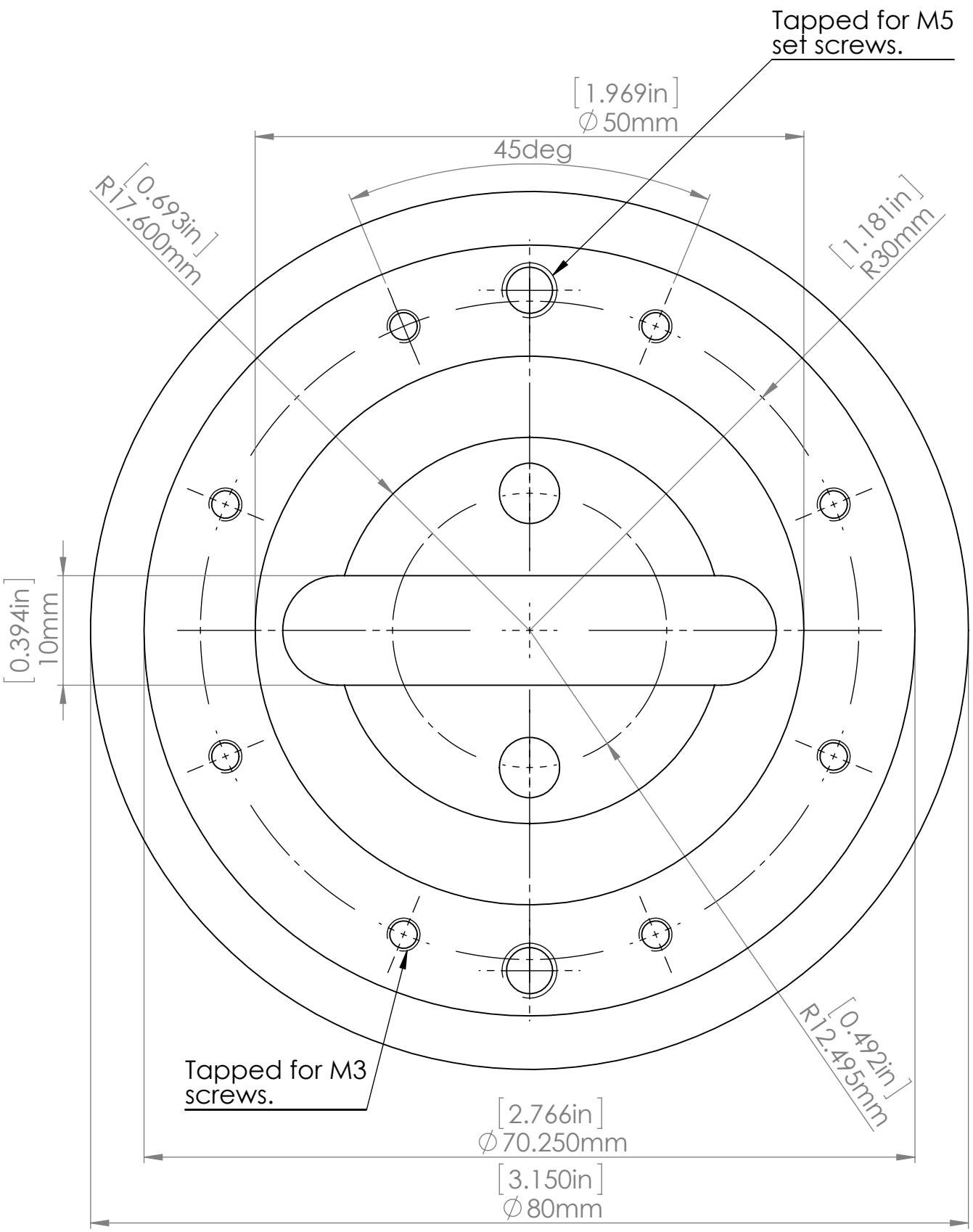

VIEW: END	NOTES: End view of hub insert.	
	NAME	DATE
DRAWN BY		
MATERIAL: Aluminum	PART: Hub Insert	

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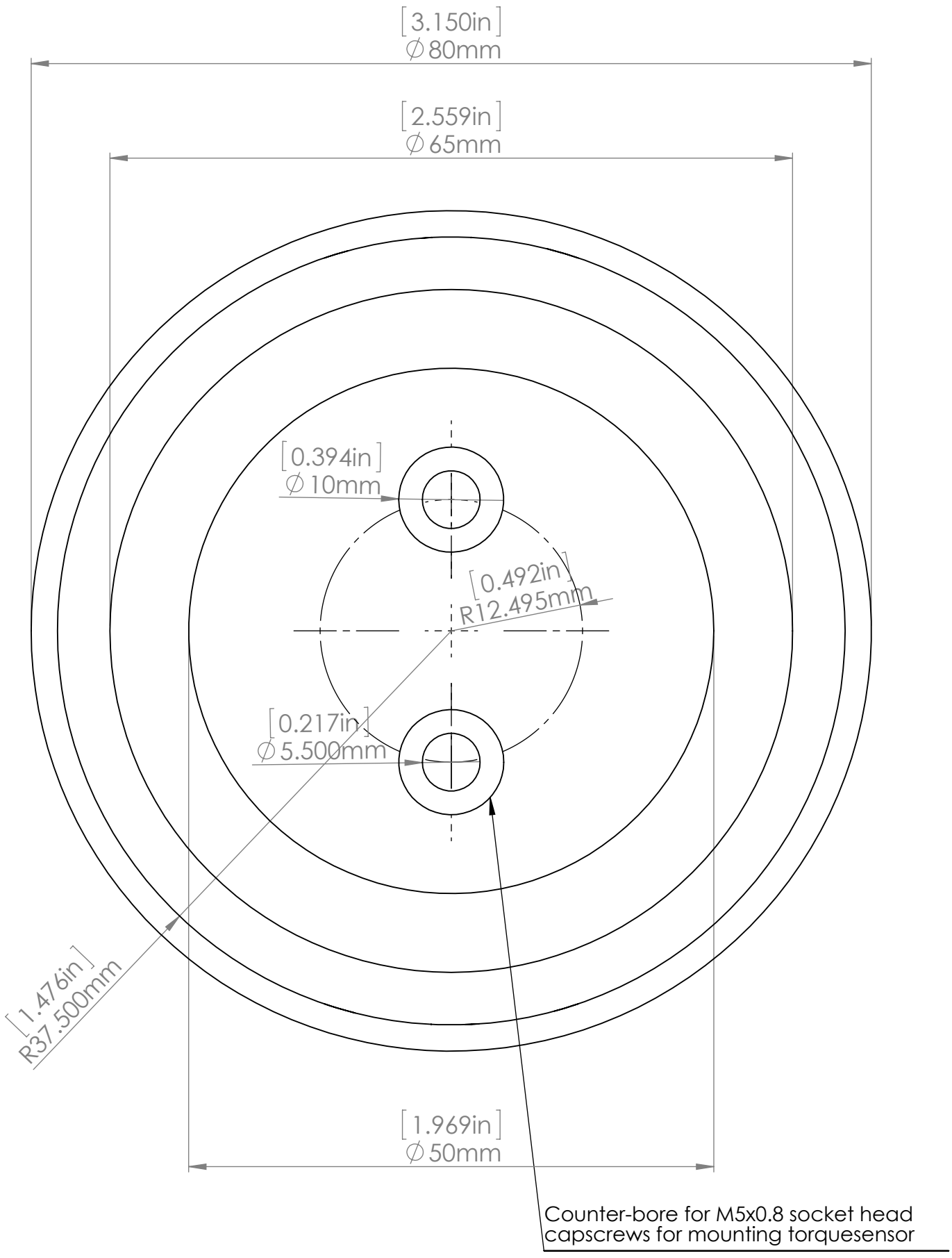

VIEW: LEFT	NOTES:	
	NAME	DATE
DRAWN BY	[illegible]	[illegible]
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	MATERIAL: Aluminum	PART: Hub Insert
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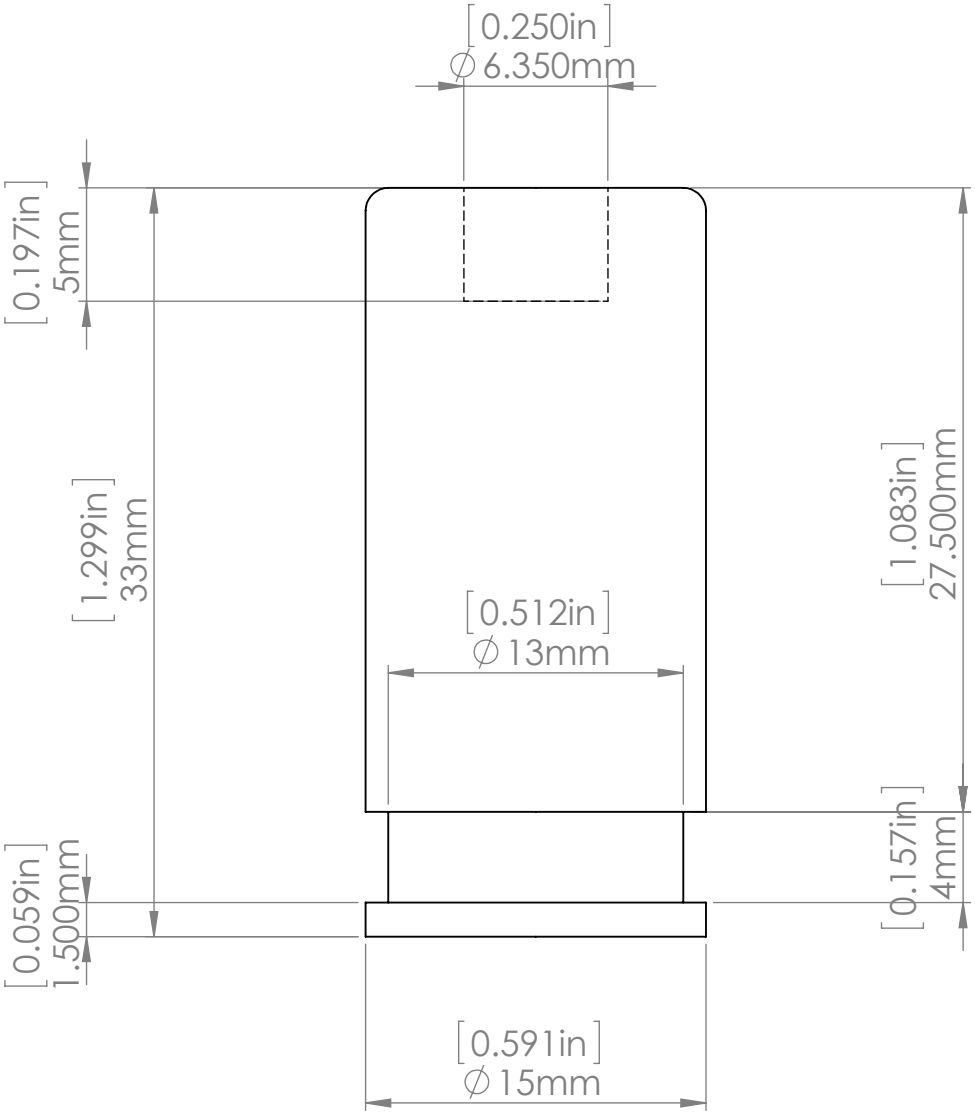
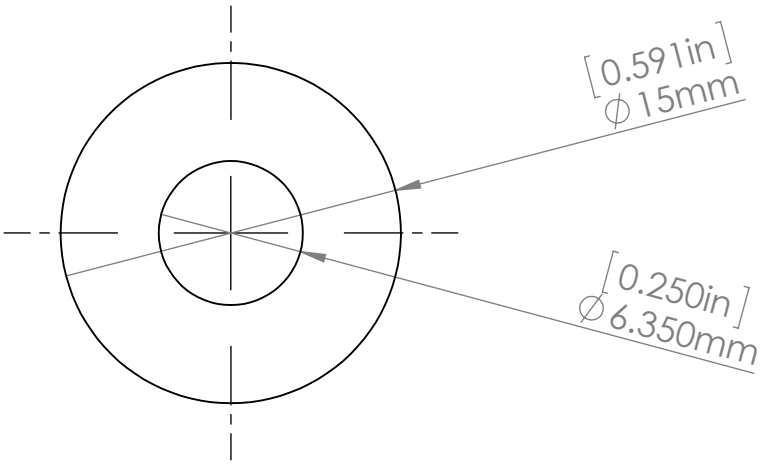
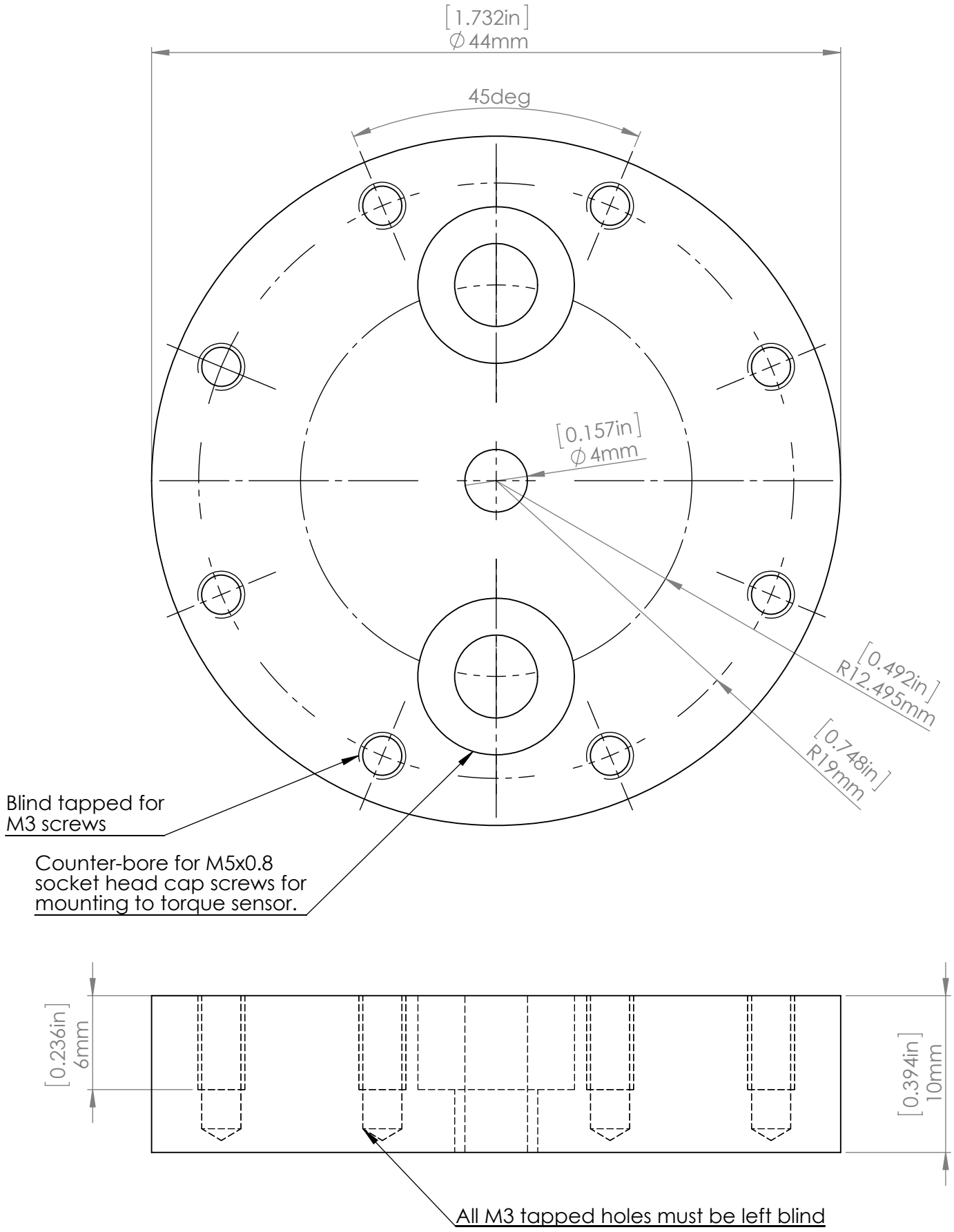




VIEW: SIDE		NOTES: Inserts into root of blade. Three set screws from blade set the pitch angle. The recessed portion is where the set screw through the hub insert hits the blade mounting pin to hold it in place. If easier, we can just dimple the blade mount pin.	
	NAME	DATE	
DRAWN BY	[illegible]	[illegible]	
			MATERIAL: Aluminum
			PART: Blade mounting pin



VIEW: TOP, SIDE	NOTES: Mounts to torque sensor and provides a mounting surface for the exterior shaft clamp. M3 screw holes must be left blank.	
	NAME	DATE
DRAWN BY	[illegible]	[illegible]
MATERIAL: Stainless Steel		PART: Inside Gasket Plate

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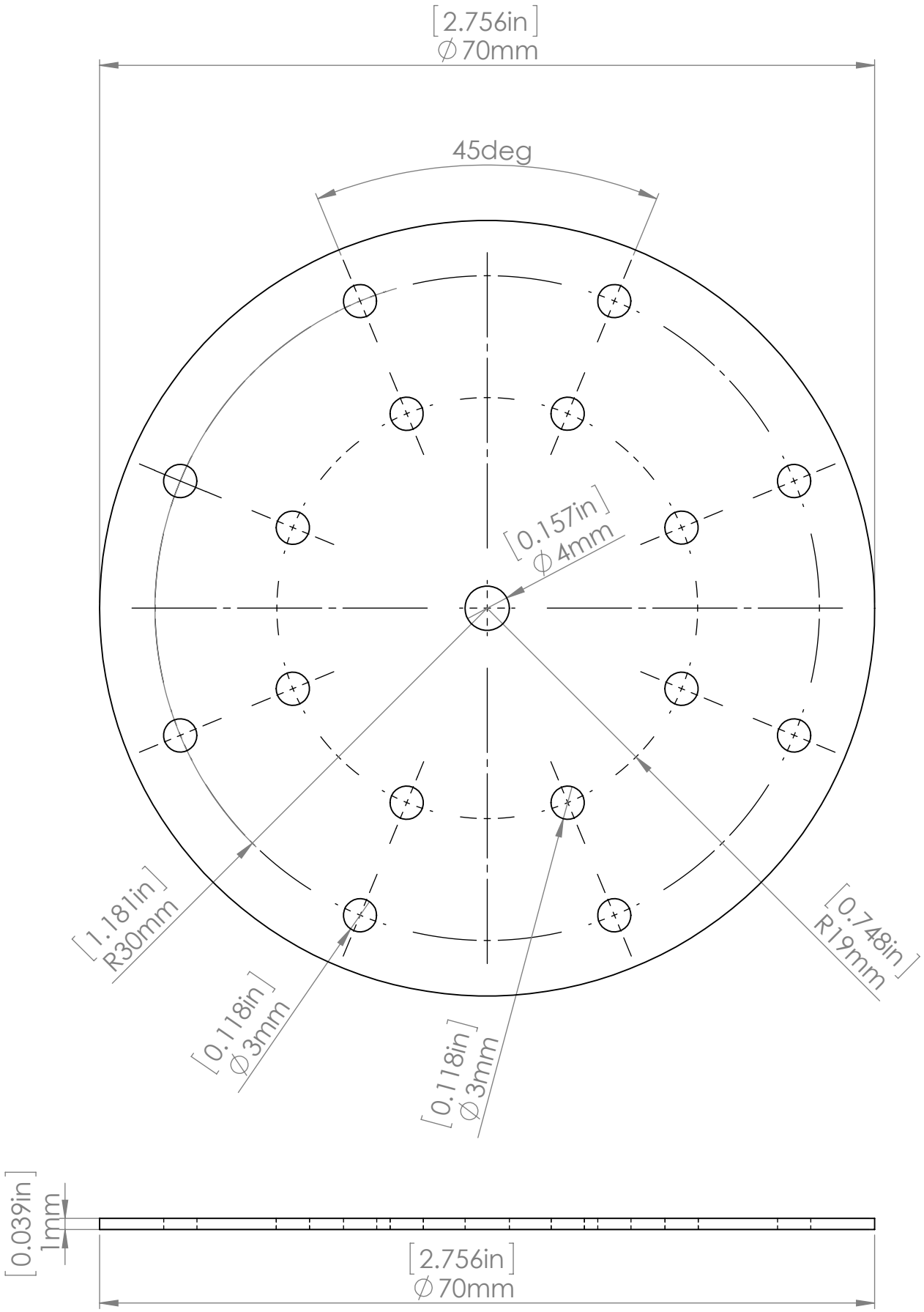

VIEW: TOP	NOTES: 1mm thick rubber. Rubber gasket with through-holes for mounting screws. Make extras to have on hand (~4).	
	NAME	DATE
DRAWN BY	[illegible]	[illegible]
	MATERIAL: Rubber	PART: Hub Rubber Gasket
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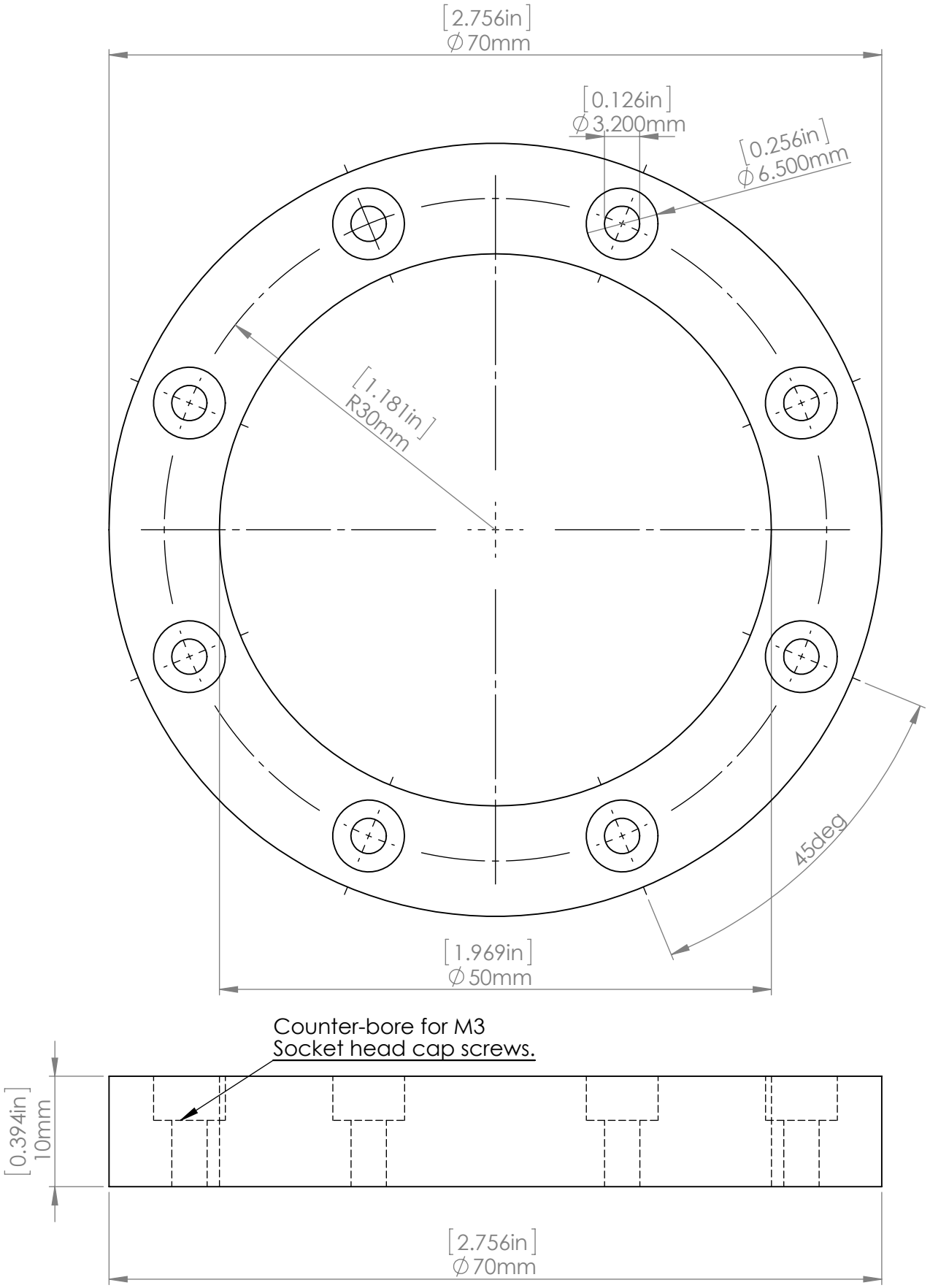

VIEW: TOP, SIDE	NOTES: Attaches to Hub Insert and clamps rubber gasket in place	
	NAME	DATE
DRAWN BY	[illegible]	[illegible]
	MATERIAL: Aluminum	PART: Outside Gasket Ring Clamp
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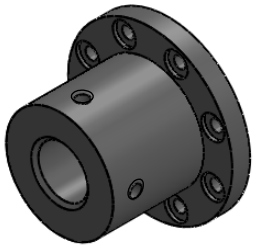

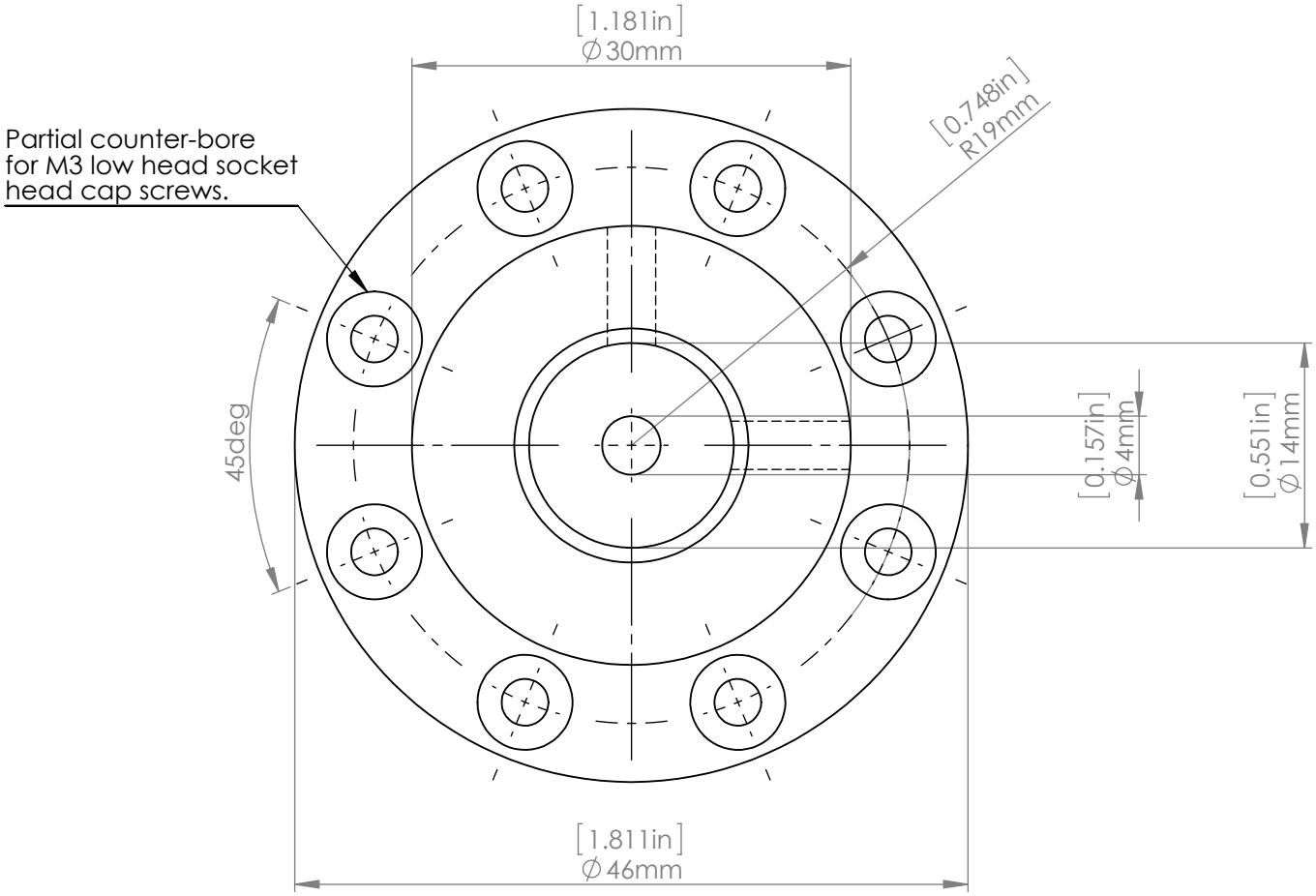

VIEW: TOP, SIDE	NOTES: Custom shaft clamp. M3 screws mount this piece, through the rubber gasket, to the inner gasket plate. 2 set screws (M4) set the shaft in place. Dimple shaft after initial installation. Shaft has 2 O-rings on it, so chamfer is needed to prevent O-ring damage when mounting.	
	NAME	DATE
DRAWN BY	[illegible]	[illegible]
	SolidWorks Student Edition. For Academic Use Only.	
SAFL / University of Minnesota	MATERIAL: Stainless Steel	PART: Outside Gasket Shaft Clamp
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