



**Escola Politècnica Superior  
d'Enginyeria de Vilanova i la Geltrú**

UNIVERSITAT POLITÈCNICA DE CATALUNYA

# PLANS

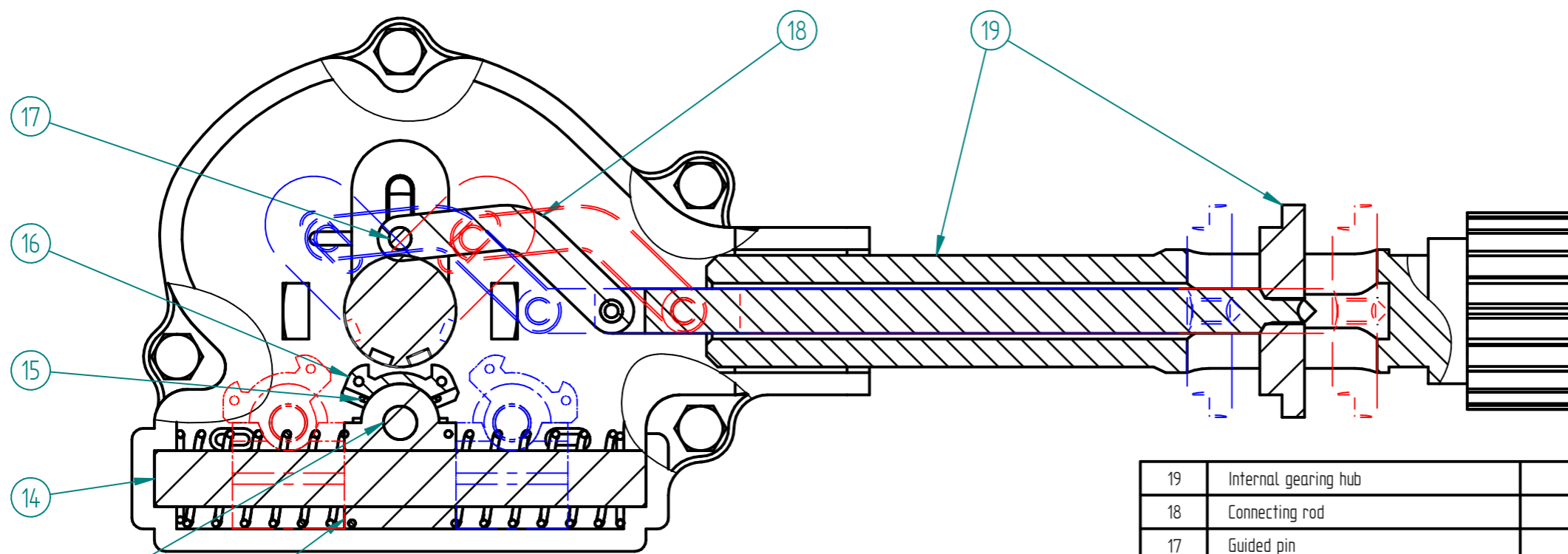
**TITLE: DESIGN OF A GEAR SHIFTING SYSTEM FOR BICYCLES**

**AUTHORS: ZAMBRANO BRAVO, RONEY EMANUEL**

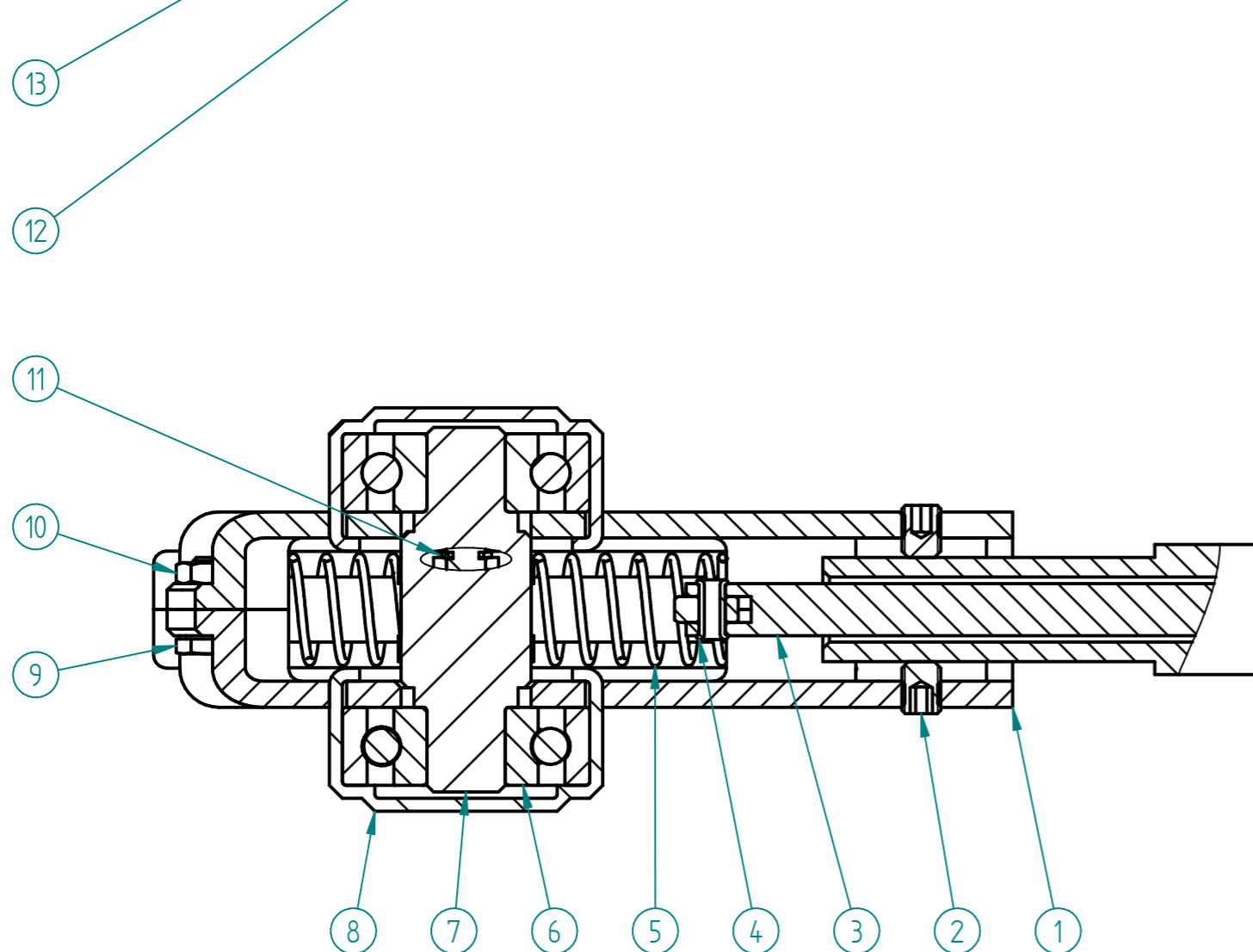
**PRESENTATION DATE: July, 2023**

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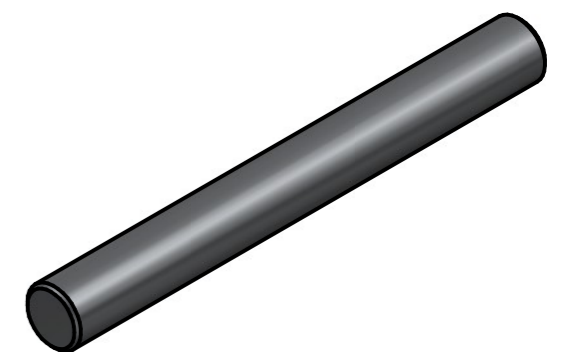
Working states of the shifting mechanism	
	First speed assembly
	Second speed assembly
	Third speed assembly
	Reductor shifting move
	Amplifier shifting move





19	Internal gearing hub	1				
18	Connecting rod	1	AISI 1006 Steel			1,5
17	Guided pin	1	AISI 1006 Steel			0,3
16	Switching pawl	1	AISI 1006 Steel			1,7
15	Torque spring	2	EN 10270-3 1.4310			
14	Slider axle	1	AISI 1010 Steel			6,8
13	Joint pin	1	AISI 1006 Steel			0,6
12	Switching slider	1	AISI 1006 Steel			3,9
11	Seeger ring	1			M3 DIN 471	
10	Nut	4	A2 Stainless Steel		M2 DIN 934	
9	Bolt	4	A2 Stainless Steel		M2x6 DIN 933	
8	Bearing case	2	Stainless Steel			6,1
7	Ratchet drum	1	AISI 1006 Steel			13,5
6	Bearing	2			626	
5	Compression spring	2	EN 10270-1 SH		S/DIN 2095	
4	Tubular rivet	1	Aluminium		Φ2x7 DIN 7339A	
3	Indicator rod	1	AISI 51B60H Steel			5,9
2	Stud	2	45H Steel	Blued steel	M3x4 DIN 913	
1	Main case (2 symmetric parts)	2	Stainless Steel			44
Mark	Part name	Number of parts	Material	Treatment	Size	Weight (g)

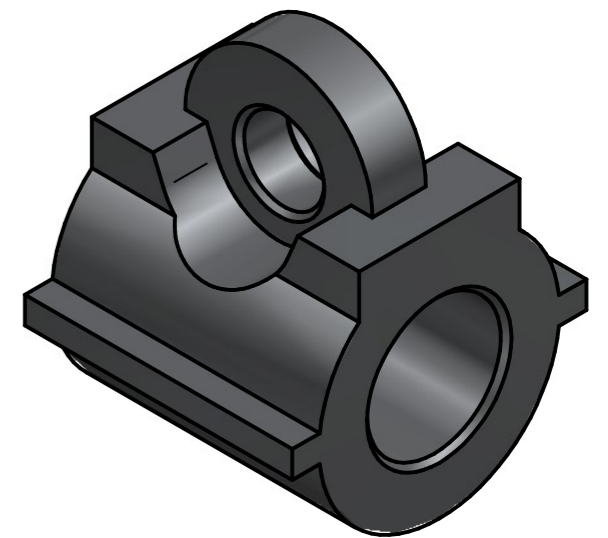
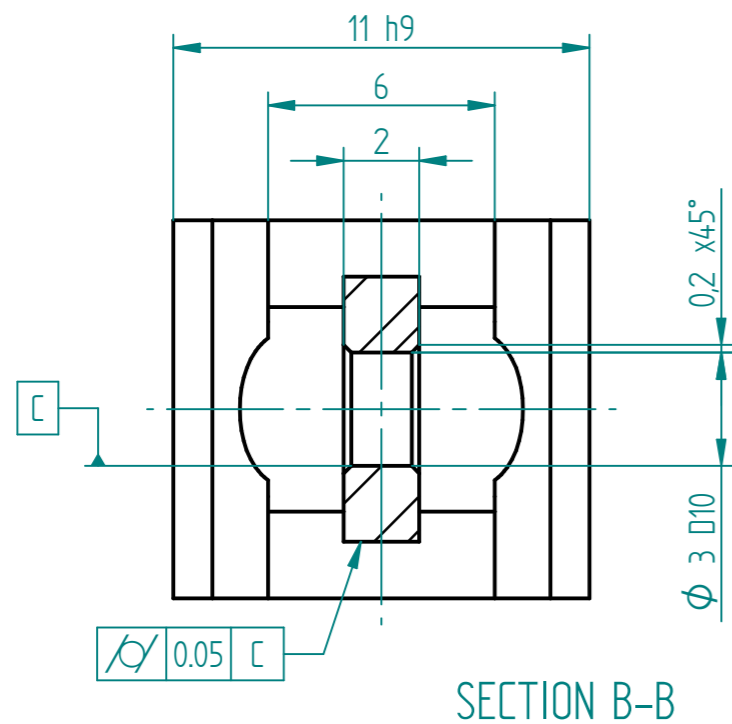
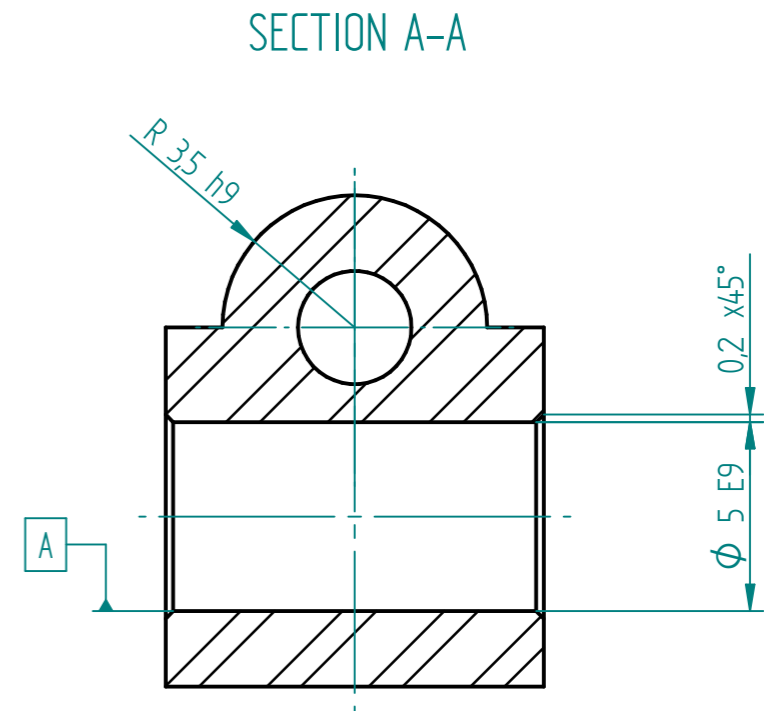
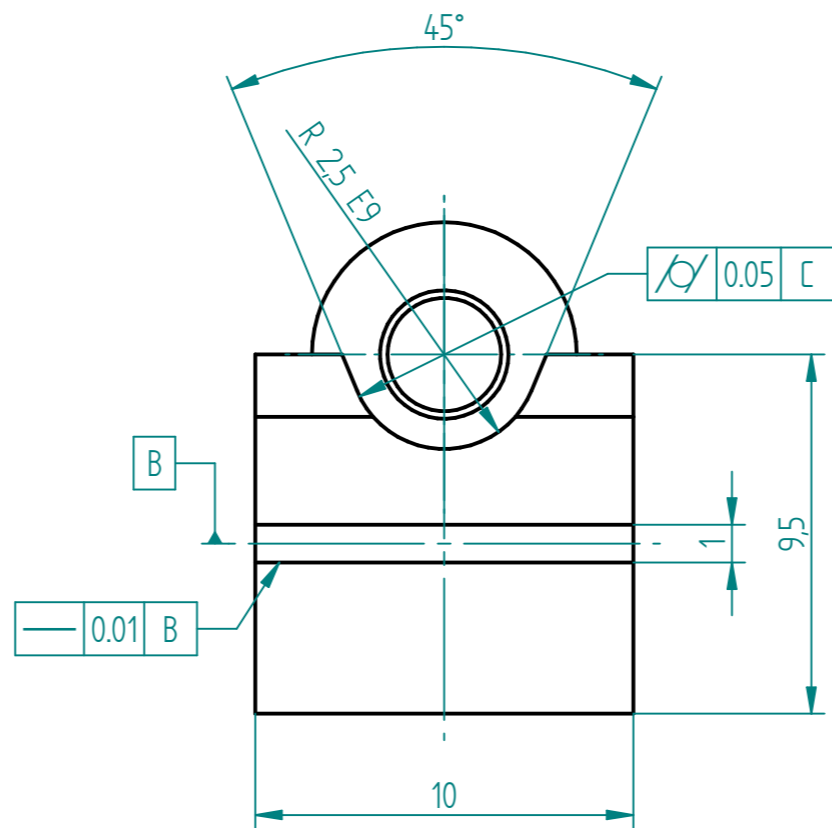
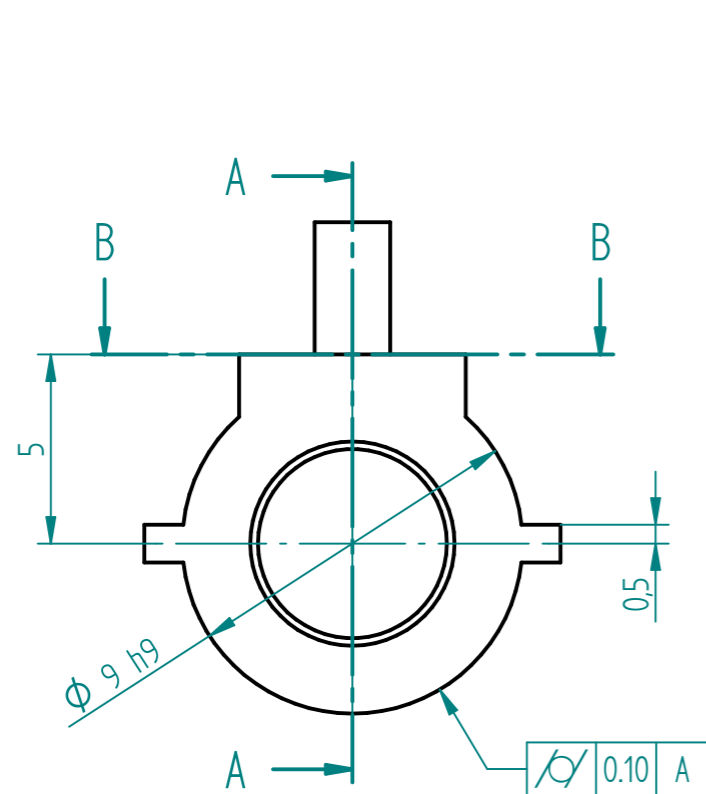
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Drawn by	04-06-2023	Zambrano Bravo, Roney Emanuel			
Professor					
Id. Se. Nor					
Projection	<h1 style="text-align: center;">Ratchet Shifting Assembly</h1>			Speciality: Mechanics	Year: 2022-23
ESCALE				2 : 1	Subject: Final Degree Project
				Material:	

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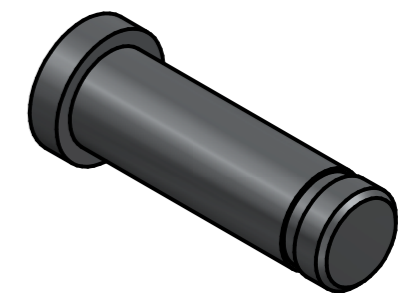
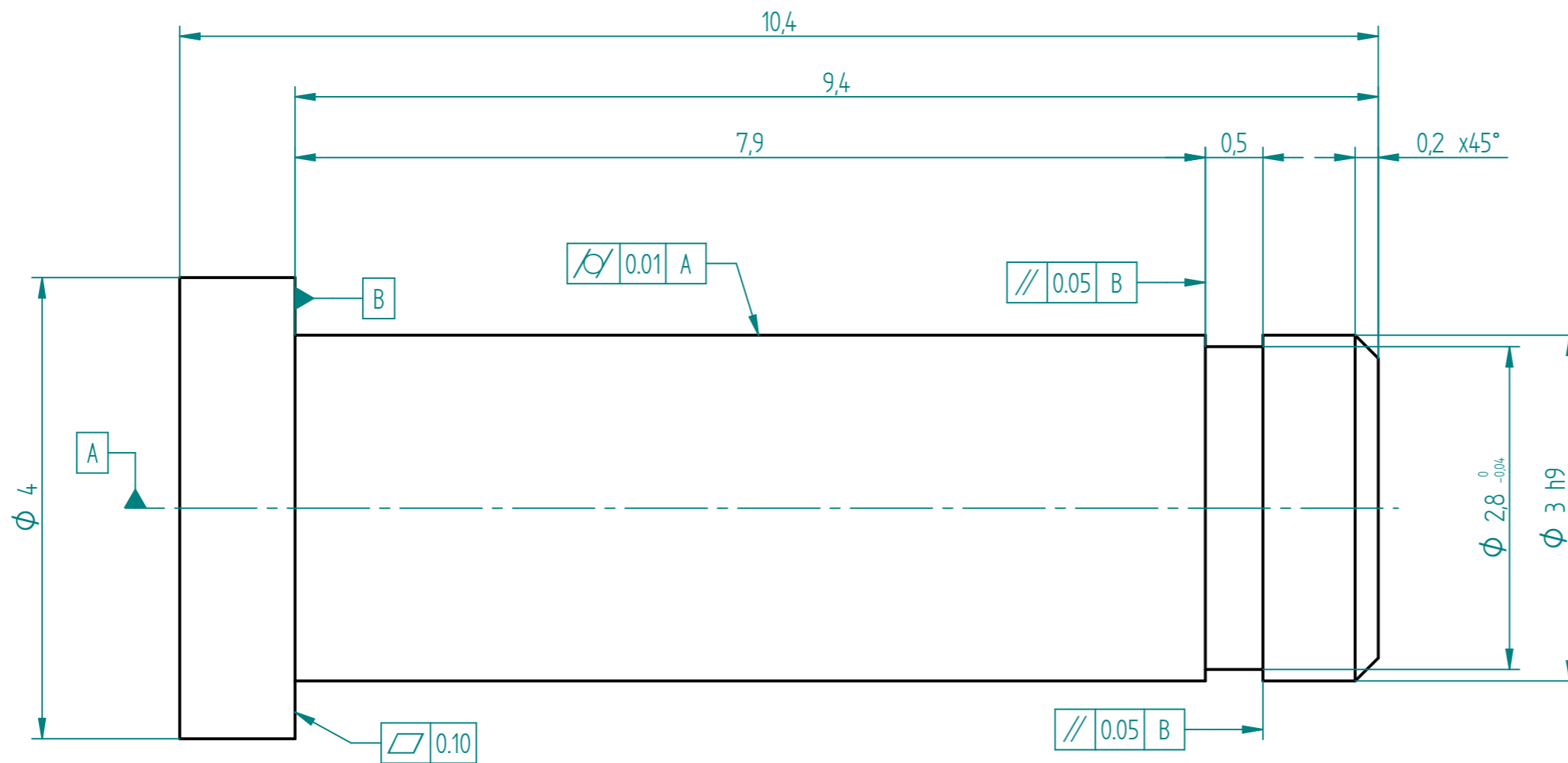
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Drawn by	04-06-2023	Zambrano Bravo, Roney Emanuel			
Professor					
Id. Se. Nor					
Projection	<h1>Slider axle</h1>			Speciality: Mechanics Year: 2022-23	
ESCALE				5 : 1	Subject: Final Degree Project
					Project: Ratchet Shifting Clutch
			Plan nº: 01-01		
			Material: AISI 1010 Steel		





N9

	DATE	SURNAME, NAME	Signature	  Escola Politècnica Superior d'Enginyeria de Vilanova i la Geltrú UNIVERSITAT POLITÈCNICA DE CATALUNYA EPSEVG
Drawn by	15-05-2023	Zambrano Bravo, Roney Emanuel		
Professor				
Id. Se. Nor				
Projection	Switching slider			Speciality: Mechanics Year: 2022-23
ESCALE 5 : 1				Subject: Final Degree Project
				Project: Ratchet Shifting Clutch
				Plan nº: 01-02
				Material: AISI 1006 Steel

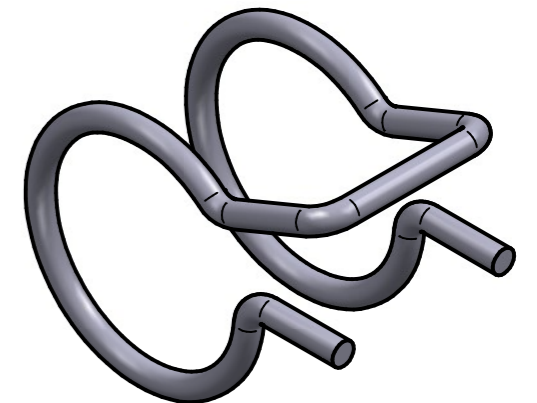
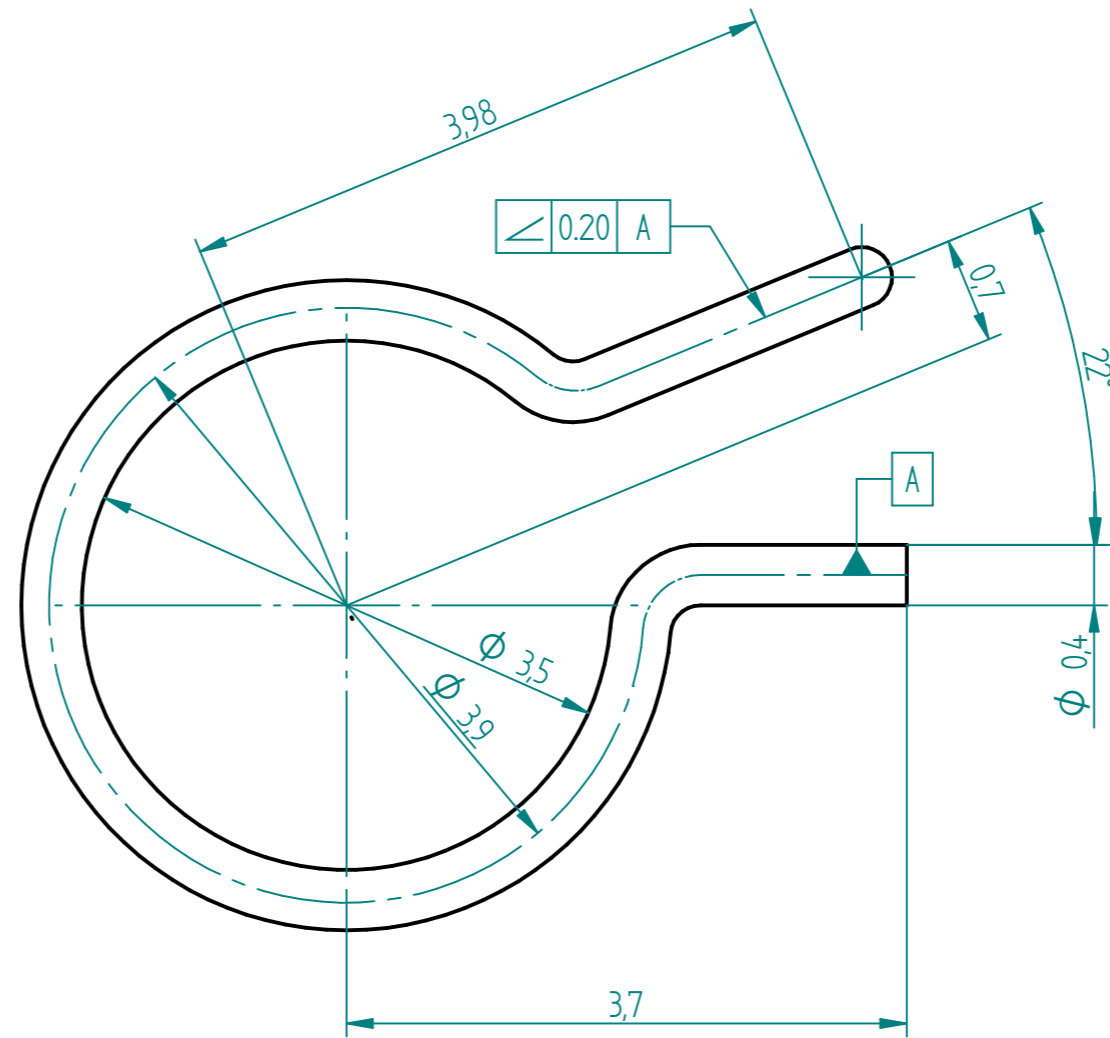
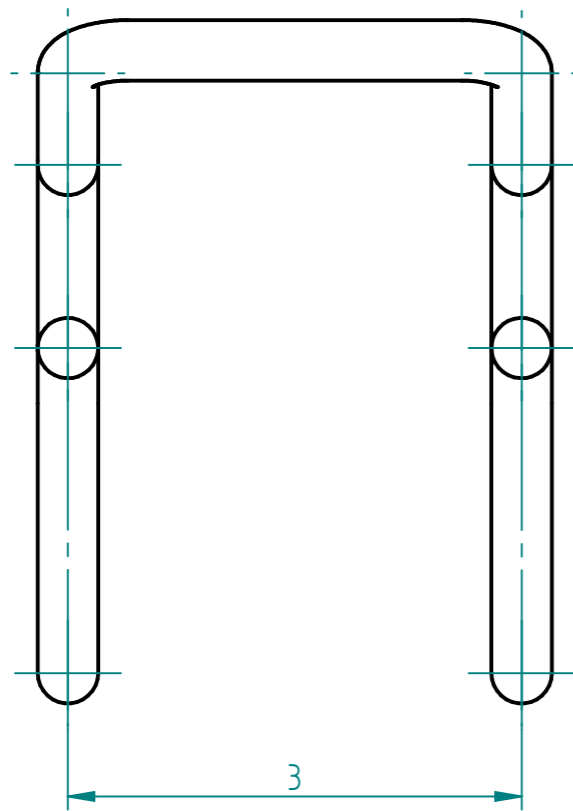
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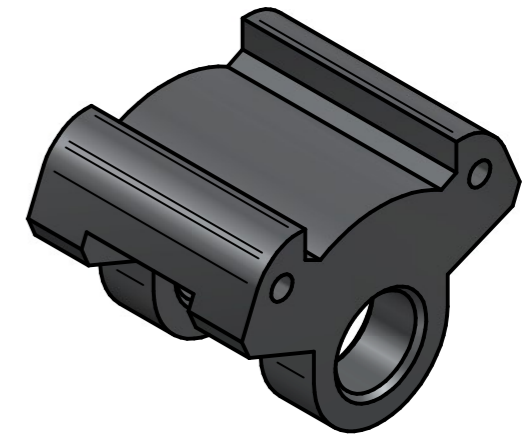
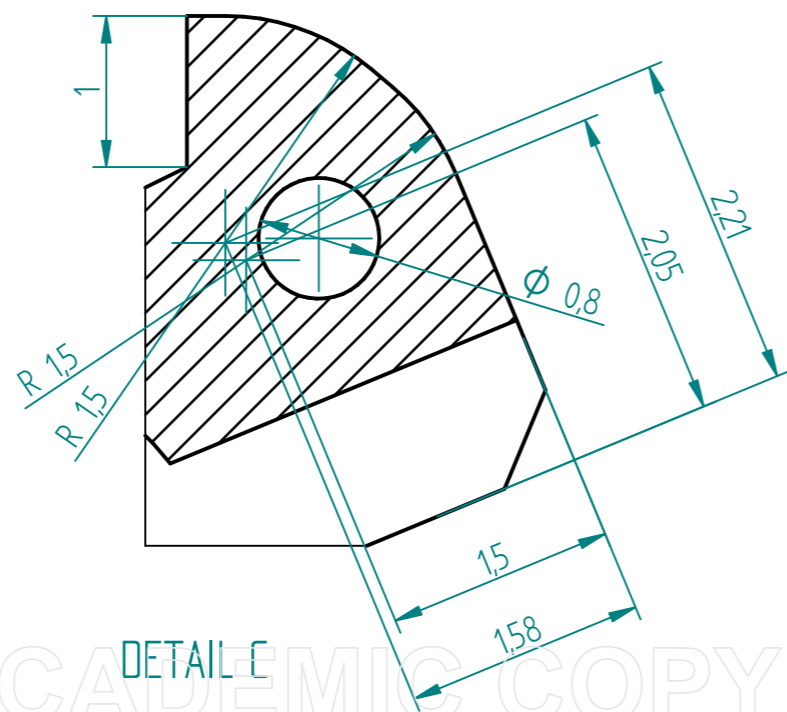
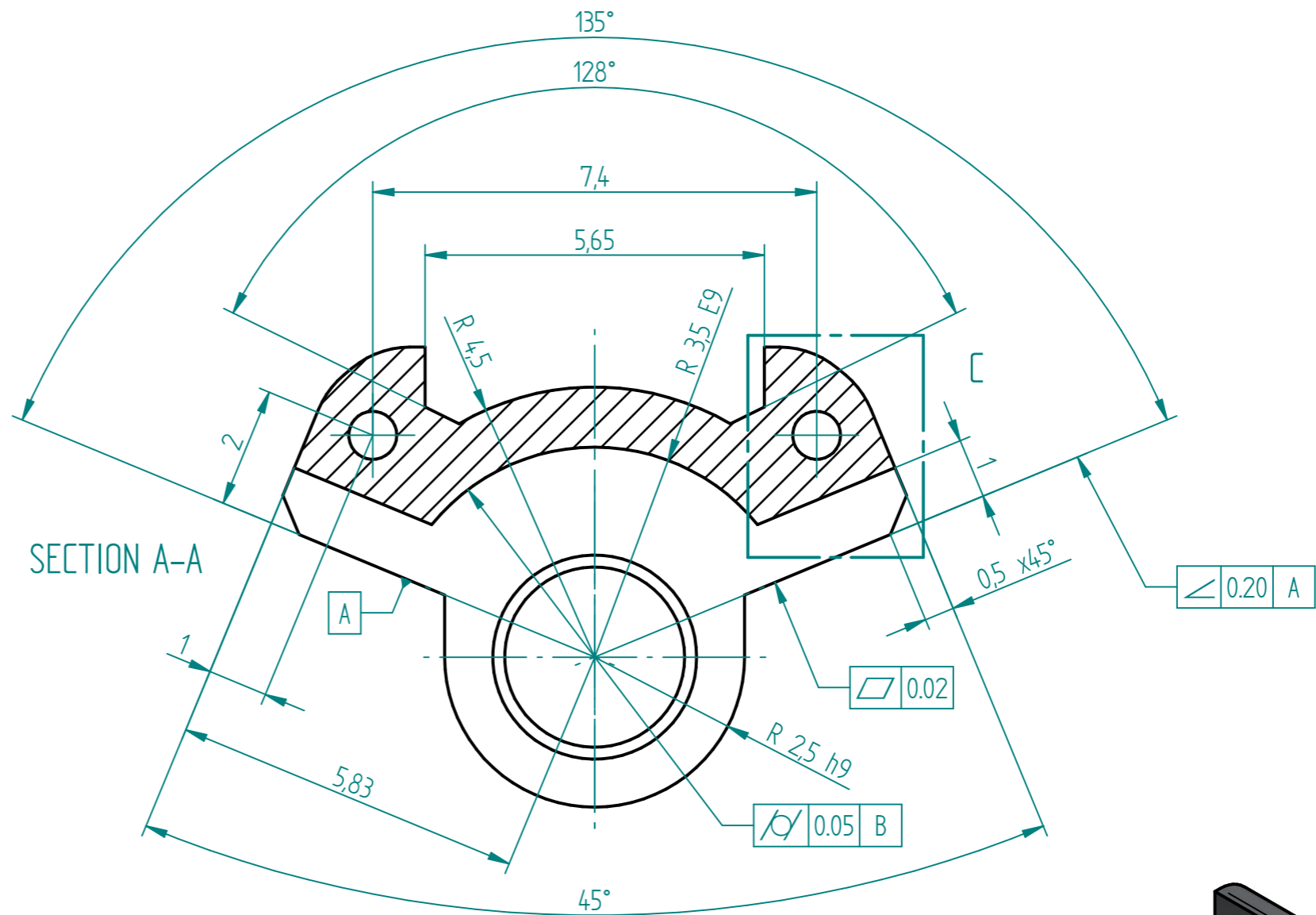
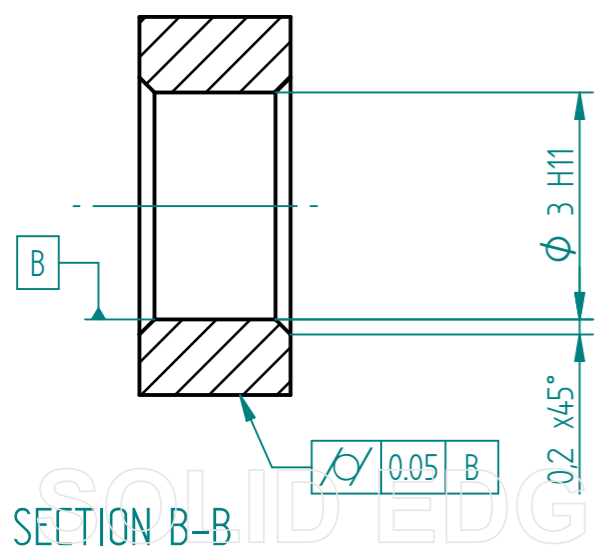
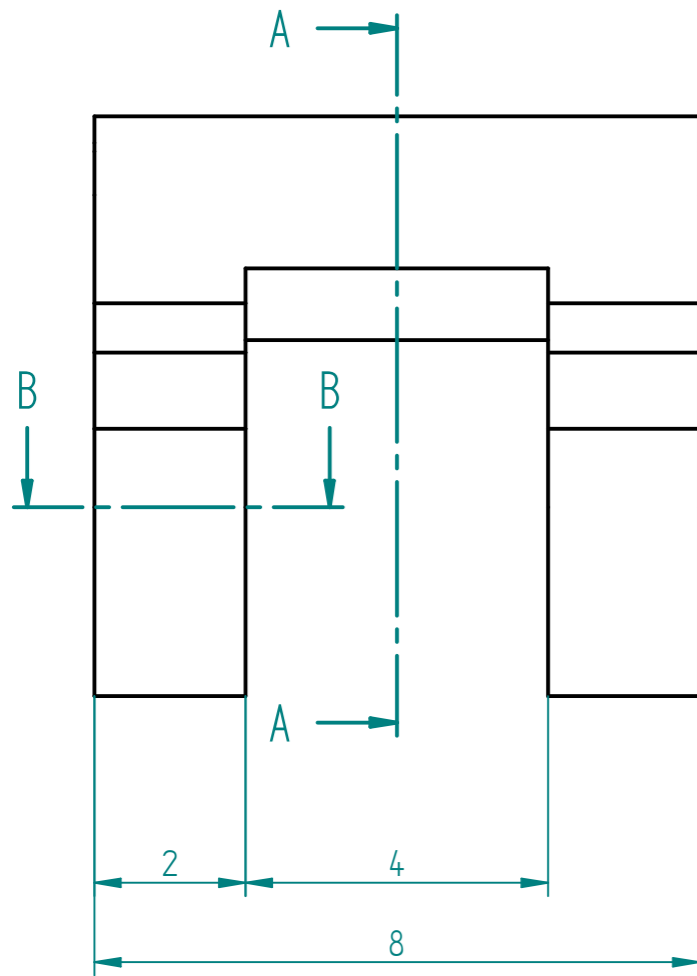
	DATE	SURNAME, NAME	Signature
Drawn by	15-05-2023	Zambrano Bravo, Roney Emanuel	  Escola Politècnica Superior d'Enginyeria de Vilanova i la Geltrú UNIVERSITAT POLITÈCNICA DE CATALUNYA EPSEVG
Professor			
Id. Se. Nor			
Projection	<p style="text-align: center;">Joint Shaft</p>		Speciality: Mechanics Year: 2022-23
ESCALE 20 : 1			Subject: Final Degree Project
			Project: Ratchet Shifting Clutch
			Plan nº: 01-03
			Material: AISI 1006 Steel



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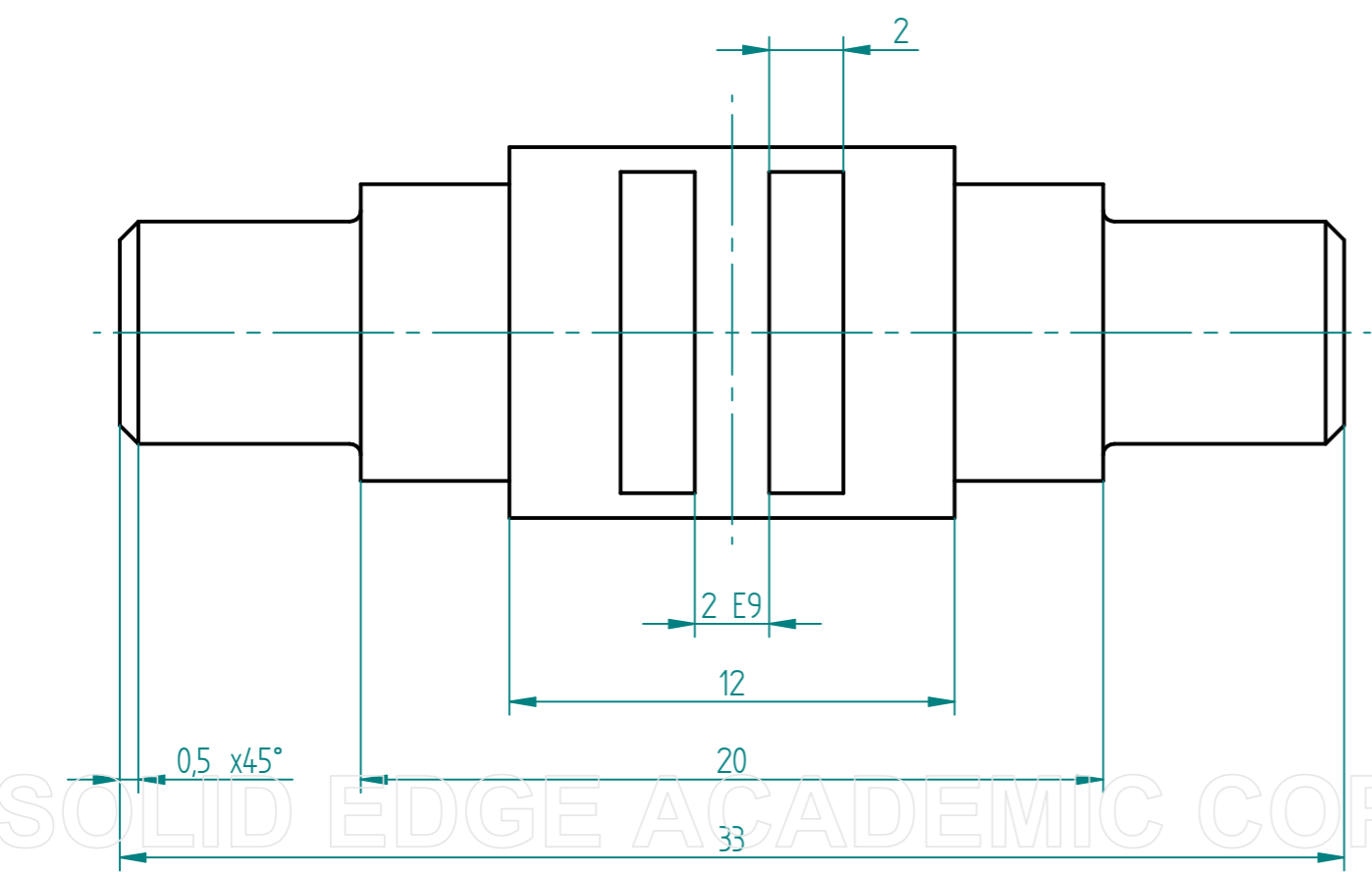
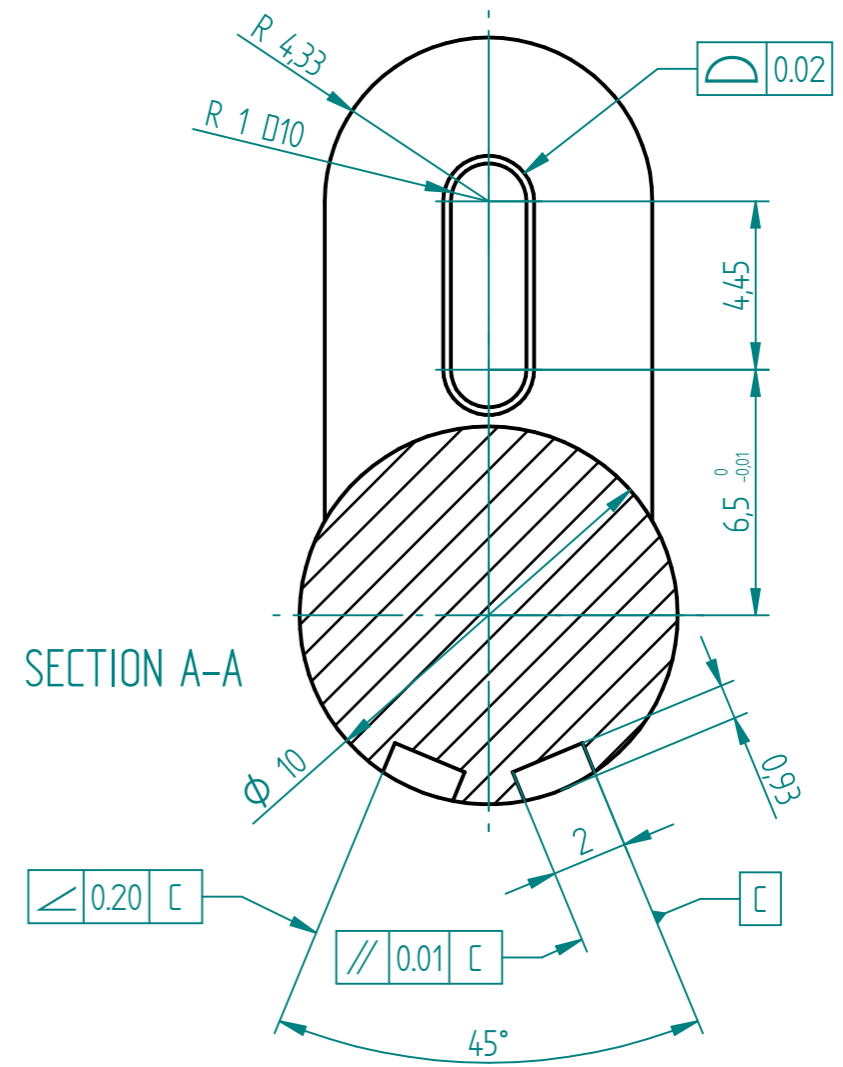
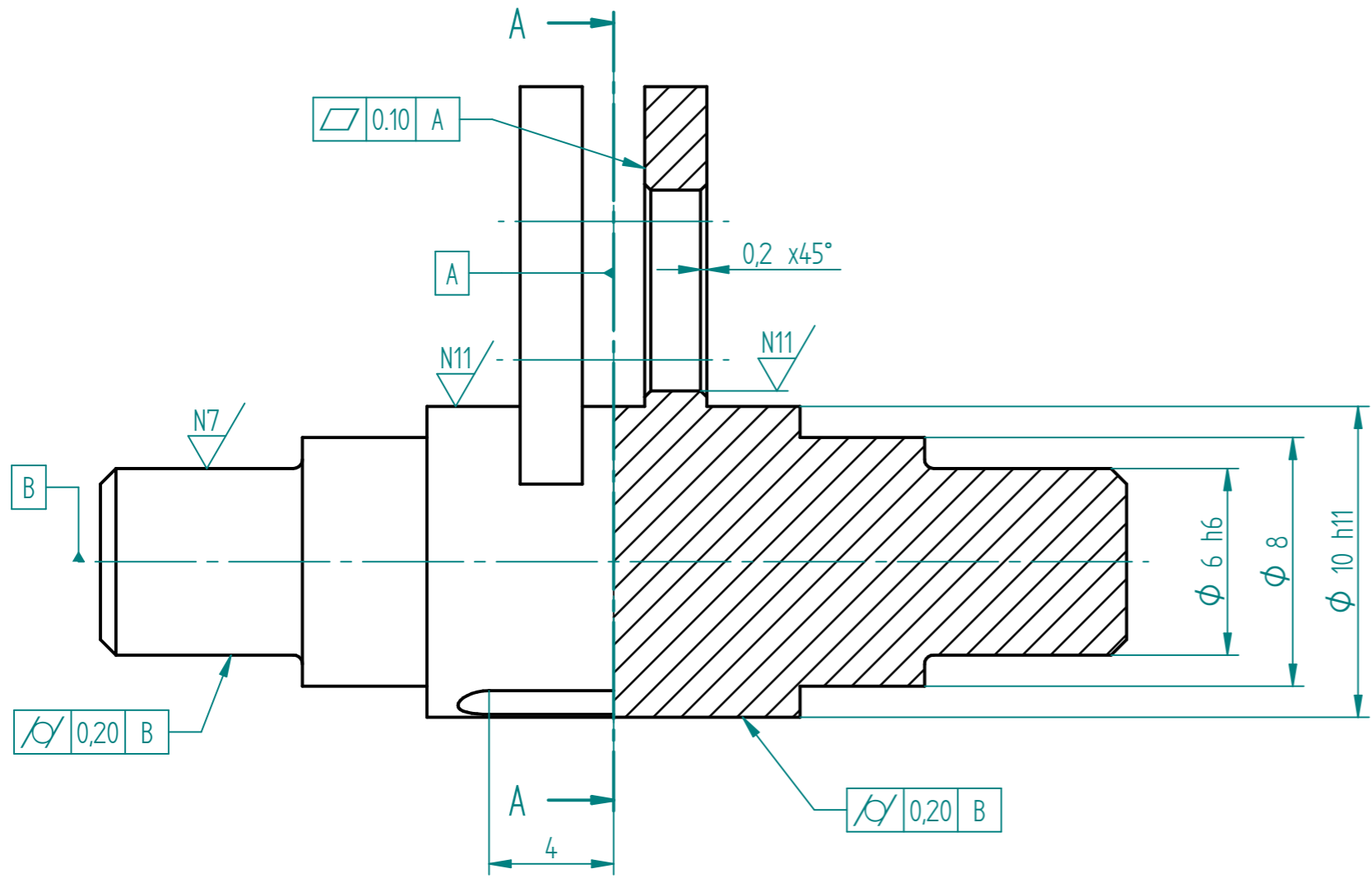
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Drawn by	15-05-2023	Zambrano Bravo, Roney Emanuel		
Professor				
Id. Se. Nor				
Projection	<h1>Torque spring</h1>			Speciality: Mechanics Year: 2022-23
				Subject: Final Degree Project
				Project: Ratchet Shifting Clutch
ESCALE 20 : 1				Plan nº: 01-04
				Material: EN 10270-3 1.4310



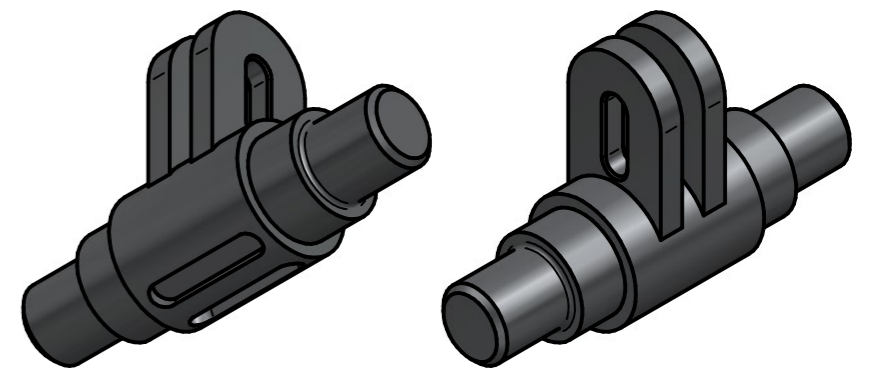
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Drawn by	15-05-2023	Zambrano Bravo, Roney Emanuel		
Professor				
Id. Se. Nor				
Projection	Switching pawl			Speciality: Mechanics Year: 2022-23
ESCALE 10 : 1				Subject: Final Degree Project
				Project: Ratchet Shifting Clutch
				Plan nº: 01-05
				Material: AISI 1006 Steel


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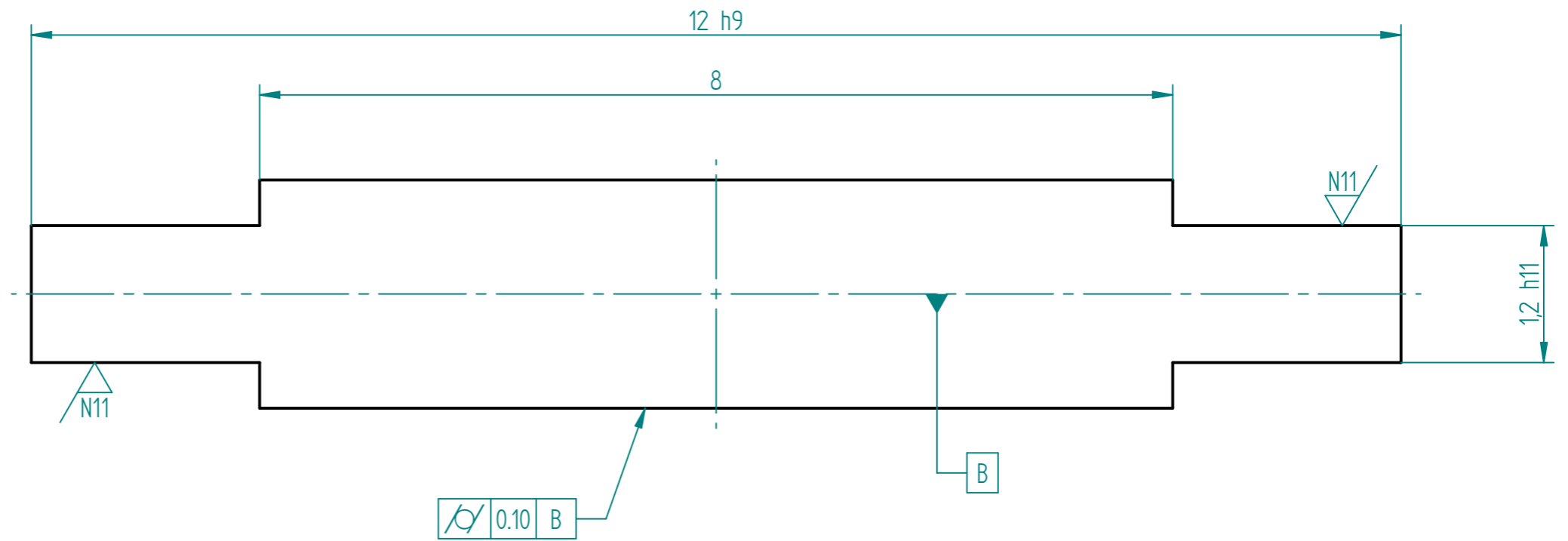
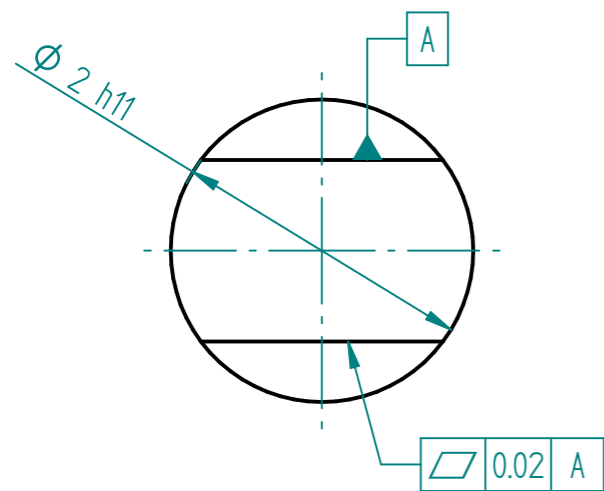


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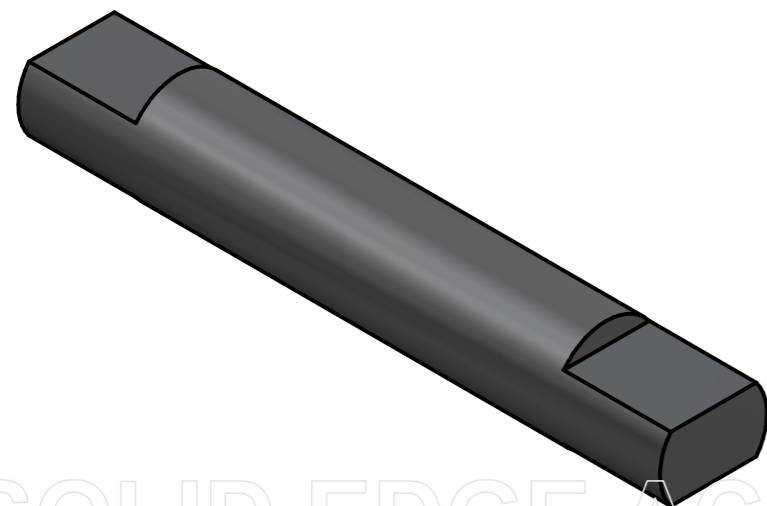


	DATE	SURNAME, NAME	Signature	 Escola Politècnica Superior d'Enginyeria de Vilanova i la Geltrú UNIVERSITAT POLITÈCNICA DE CATALUNYA EPSEVG	
Drawn by	27-05-2023	Zambrano Bravo, Roney Emanuel			
Professor					
Id. Se. Nor					
Projection	Selector ratchet drum			Speciality: Mechanics Year: 2022-23	
ESCALE				5 : 1	Subject: Final Degree Project
					Project: Ratchet Shifting Clutch
			Plan nº: 02-01		
			Material: AISI 1006 Steel		



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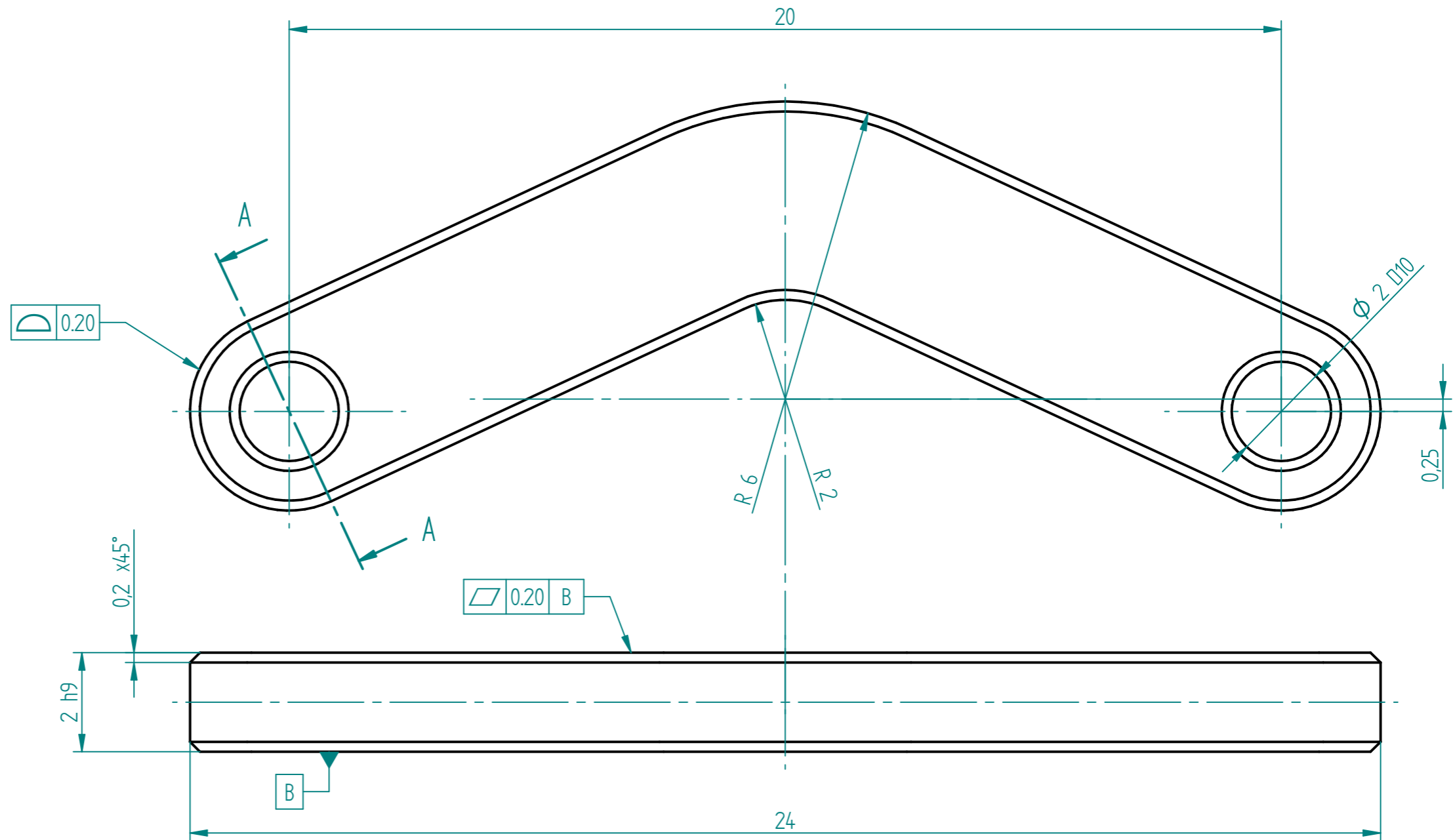


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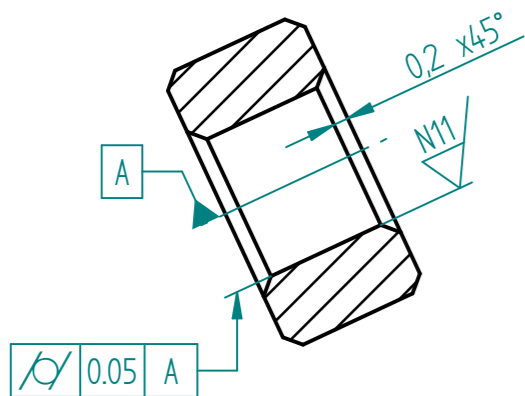


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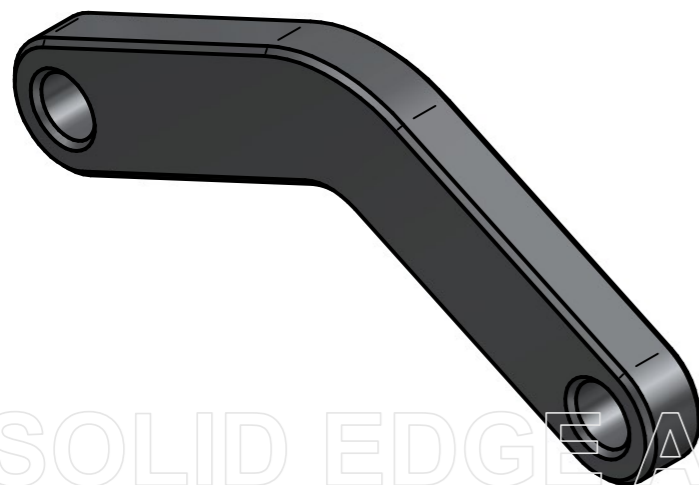
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Drawn by	27-05-2023	Zambrano Bravo, Roney Emanuel			
Professor					
Id. Se. Nor					
Projection	<h1>Guided pin</h1>			Speciality: Mechanics Year: 2022-23	
ESCALE				20 : 1	Subject: Final Degree Project
					Project: Ratchet Shifting Clutch
			Plan nº: 02-02		
			Material: AISI 1006 Steel		




SECTION A-A

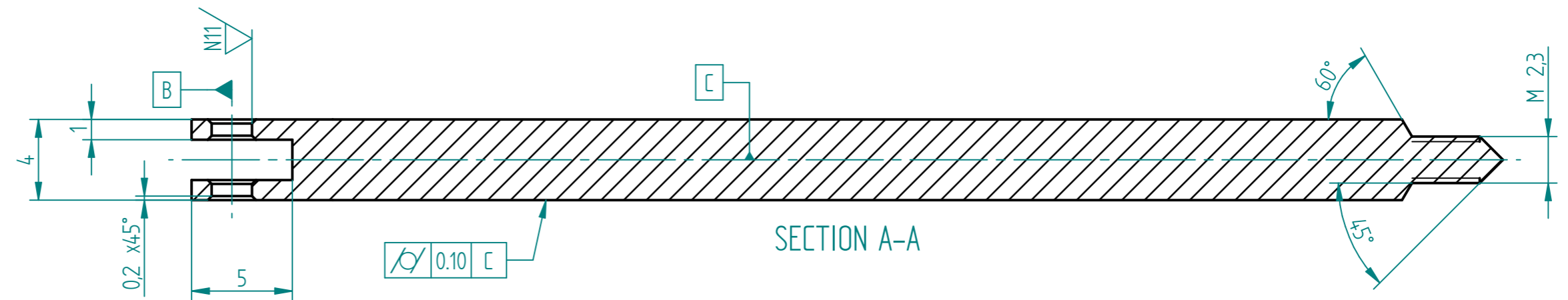


N9 / ( N11 / )

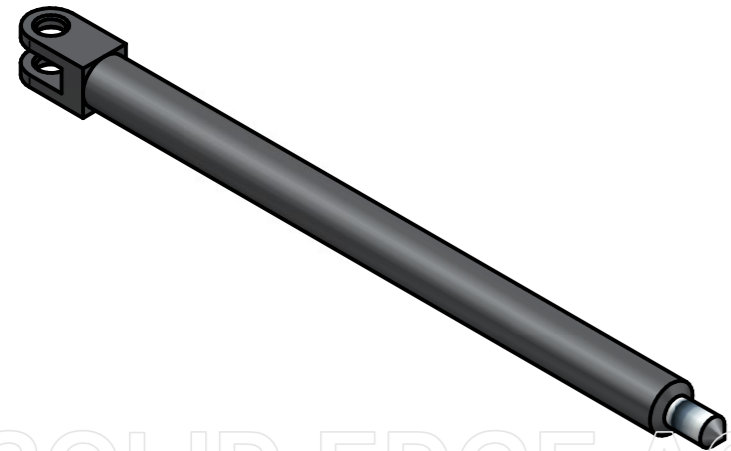


	DATE	SURNAME, NAME	Signature	 Escola Politècnica Superior d'Enginyeria de Vilanova i la Geltrú UNIVERSITAT POLITÈCNICA DE CATALUNYA
Drawn by	27-05-2023	Zambrano Bravo, Roney Emanuel		
Professor				
Id. Se. Nor				EPSEVG
Projection	<h1>Connecting rod</h1>			Speciality: Mechanics Year: 2022-23
ESCALE				Subject: Final Degree Project
10 : 1				Project: Ratchet Shifting Clutch
				Plan nº: 02-03
				Material: AISI 1006 Steel


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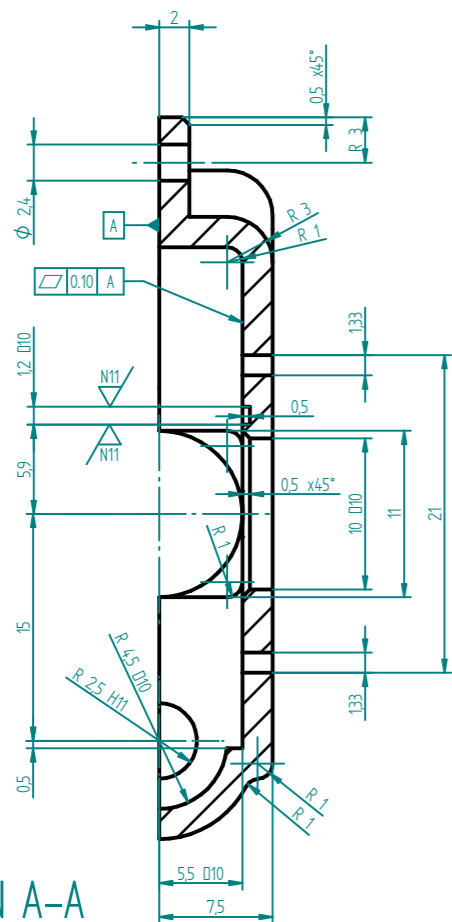


N9 / ( N11 / )

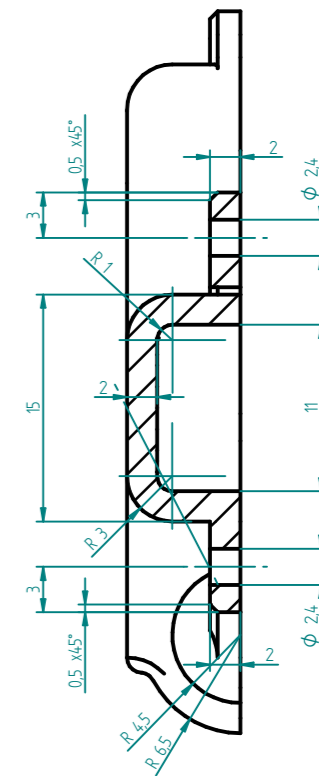
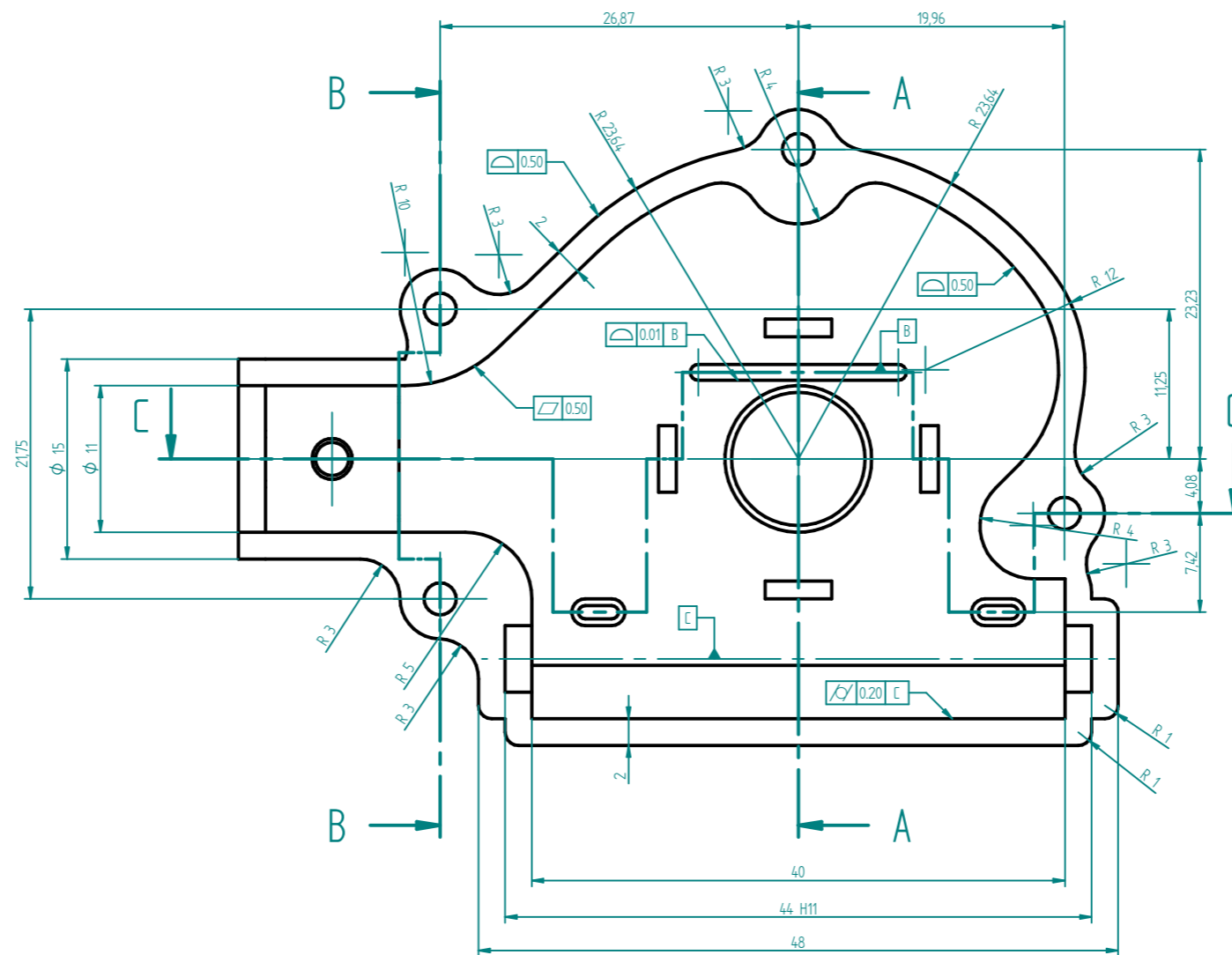


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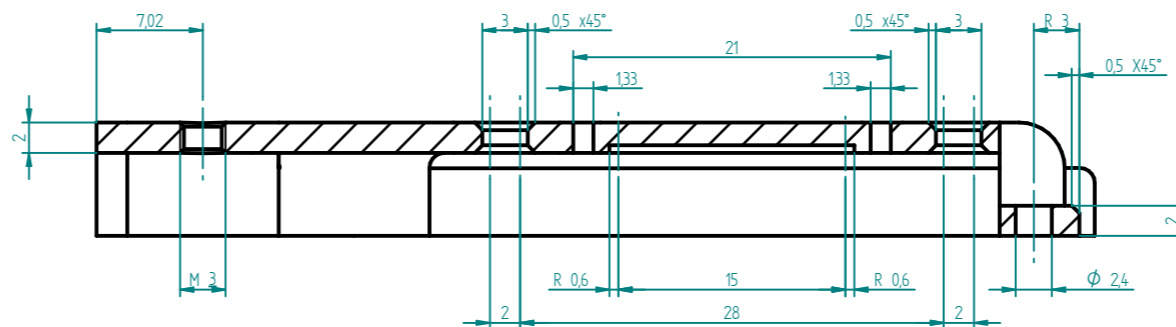
	DATE	SURNAME, NAME	Signature	 Escola Politècnica Superior d'Enginyeria de Vilanova i la Geltrú UNIVERSITAT POLITÈCNICA DE CATALUNYA EPSEVG
Drawn by	27-05-2023	Zambrano Bravo, Roney Emanuel		
Professor				
Id. Se. Nor				
Projection	Indicator rod			Speciality: Mechanics Year: 2022-23
ESCALE 4 : 1				Subject: Final Degree Project
			Project: Ratchet Shifting Clutch	Plan nº: 02-04
			Material: AISI 51B60H Steel	



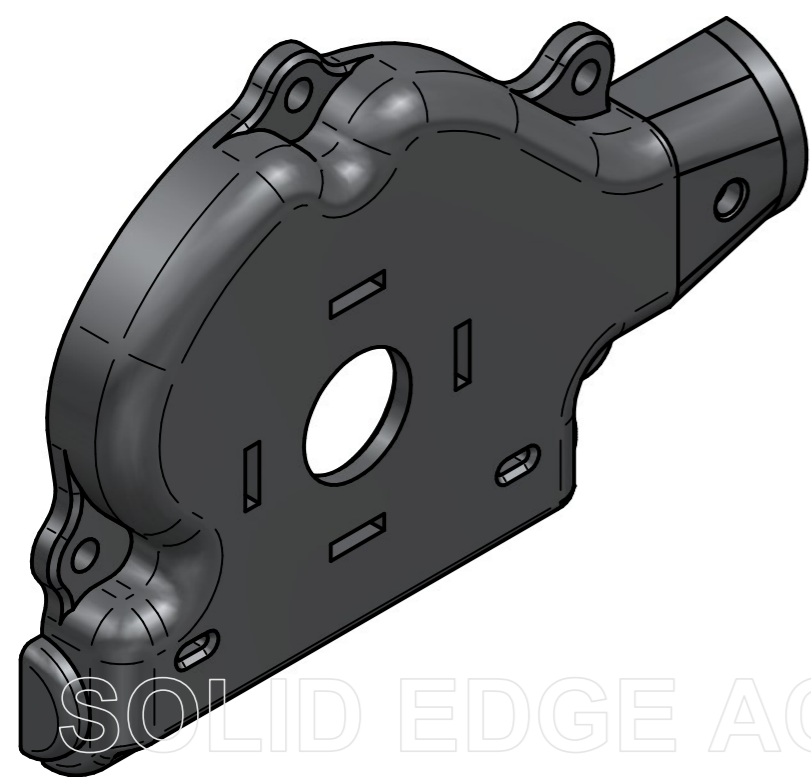
SECTION A-A





SECTION B-B

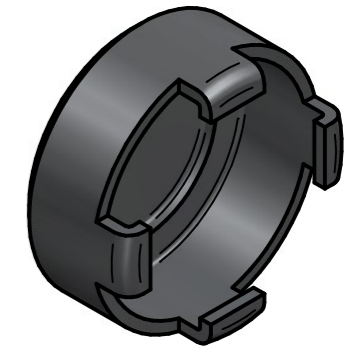
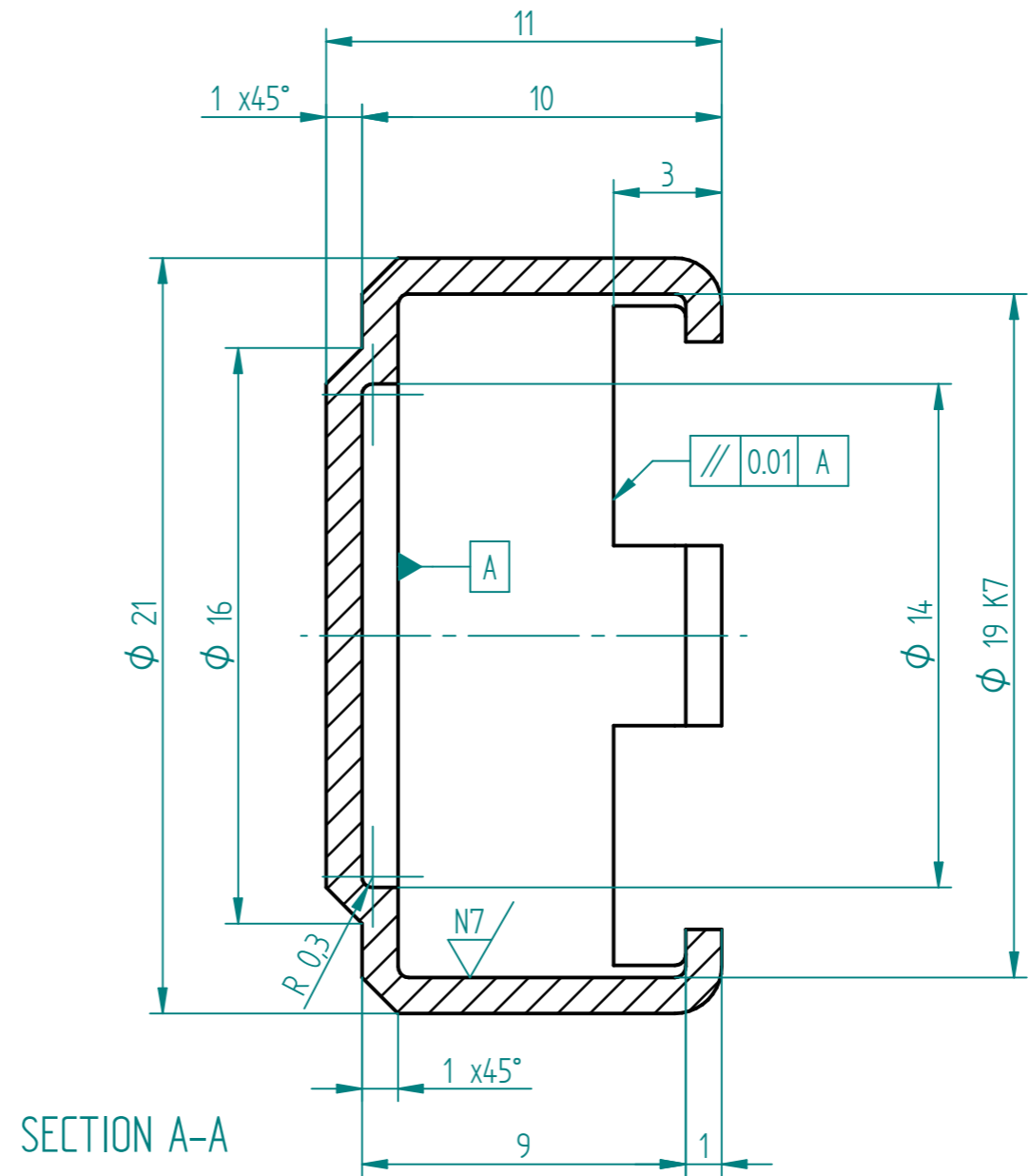
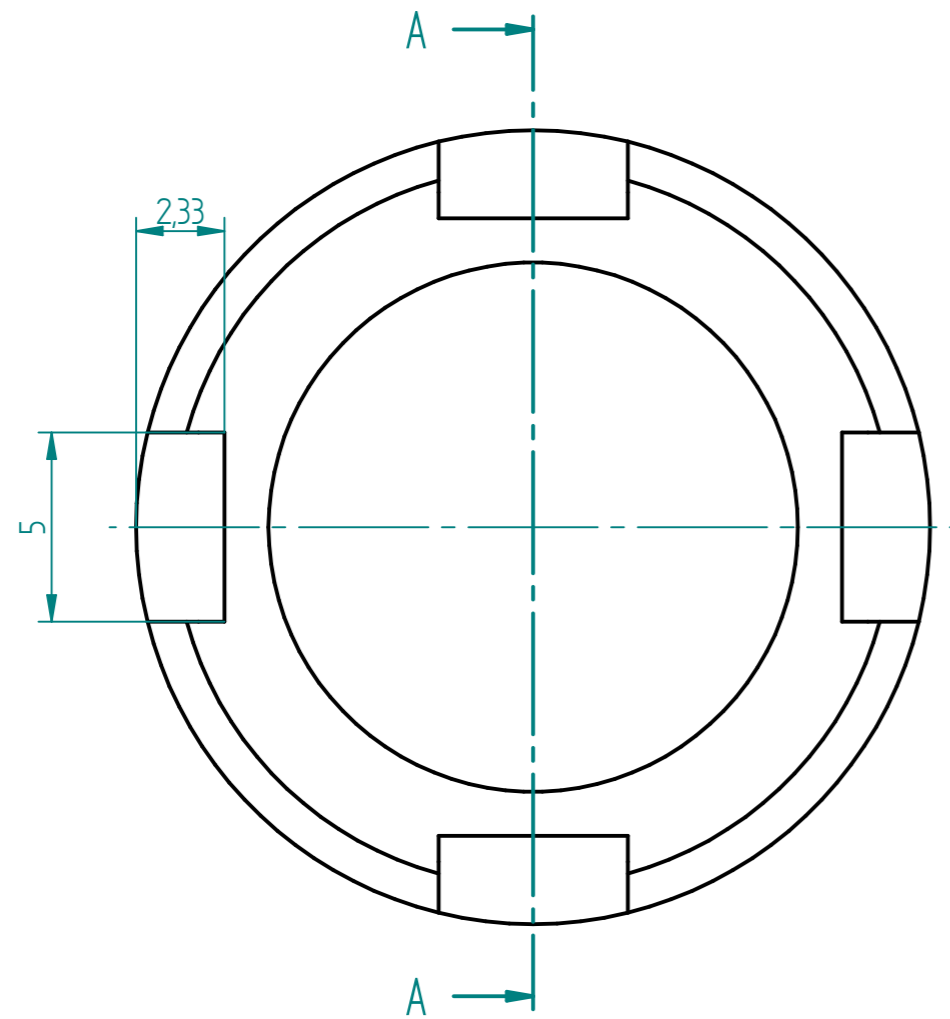


SECTION C-C




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	DATE	SURNAME, NAME	Signature	  Escola Politècnica Superior d'Enginyeria de Vilanova i la Geltrú UNIVERSITAT POLITÈCNICA DE CATALUNYA EPSEVG
Drawn by	27-05-2023	Zambrano Bravo, Roney Emanuel		
Professor				
Id. Se. Nor				
Projection	Main case			Speciality: Mechanics Year: 2022-23
				Subject: Final Degree Project
ESCALE	2 : 1			Project: Ratchet Shifting Clutch
				Plan nº: 03-01
				Material: AISI Type S14800 Stainless Steel condition SRH1050



N9 / ( N7 / )

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Drawn by	04-06-2023	Zambrano Bravo, Roney Emanuel		
Professor				
Id. Se. Nor				
Projection	<h1>Bearing case</h1>			Speciality: Mechanics Year: 2022-23
ESCALE				5 : 1
			Project: Ratchet Shifting Clutch	
			Plan nº: 03-02	
			Material: AISI Type S14800 Stainless Steel condition SRH1050	