

# Machining Science and Metrology (ME-305)

Process Engineering

Component: Brake lever

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210004042 - SARAL SETHI

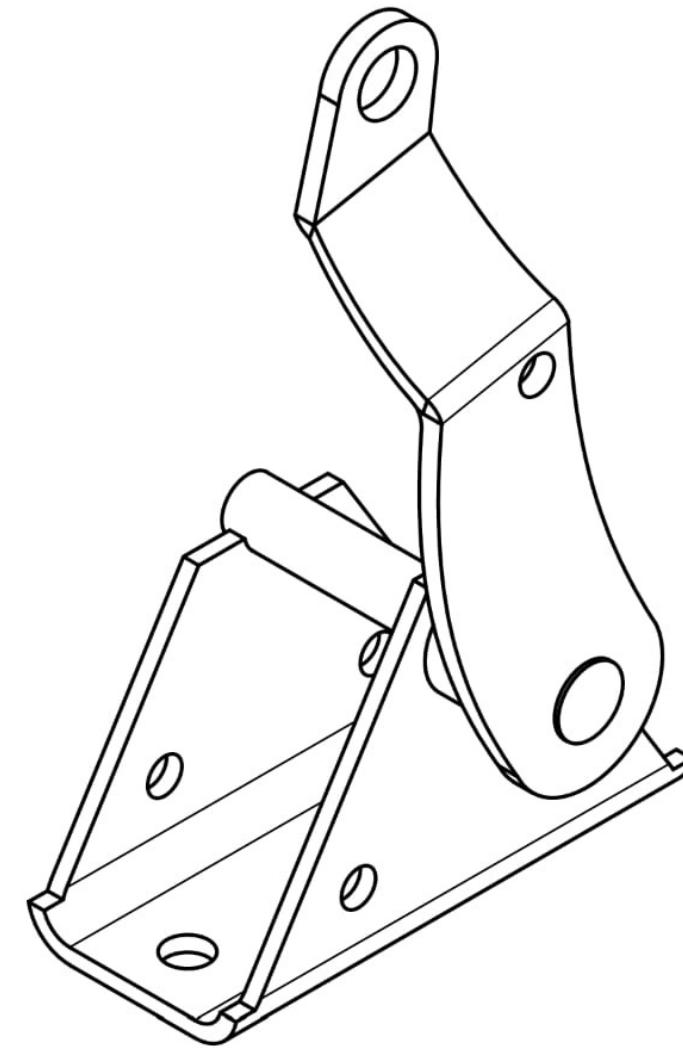
210004046 - SPANDAN  
CHAKRABORTY

210005013 - BANOTH VENNELA



# Brake Lever

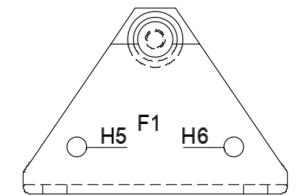
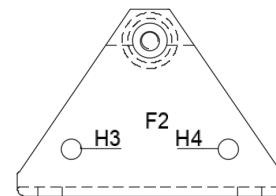
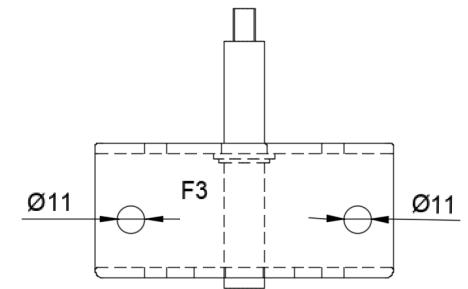
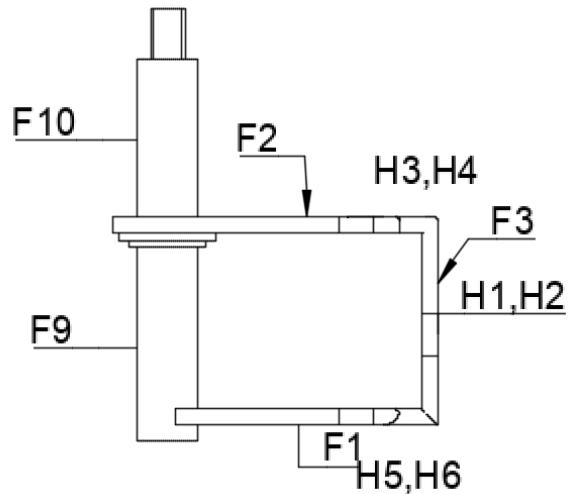




# Component Details

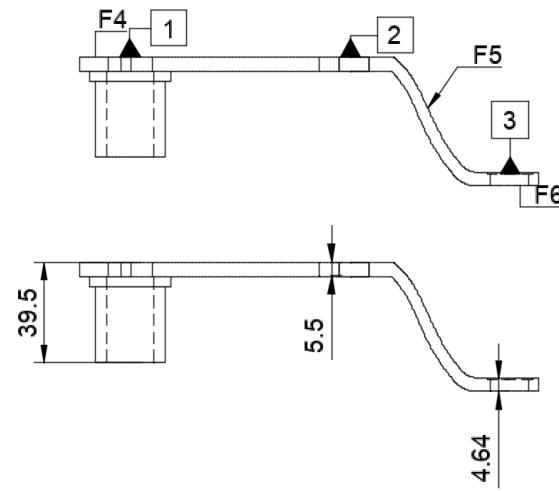
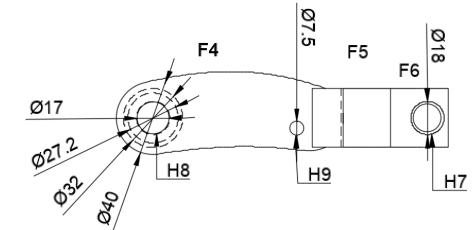
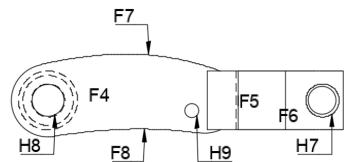
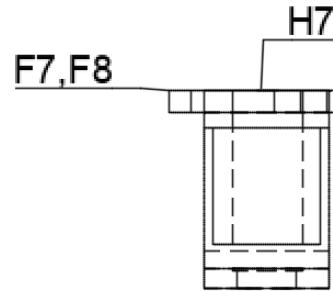
## SURFACES

- F1 –Bottom Face (Brake)
- F2 –Top Face (Brake)
- F3 –Side Face (Brake)
- F4 –Top Face (Lever) (casting)
- F5 –(Lever) (casting)
- F6 –(Lever) (casting)

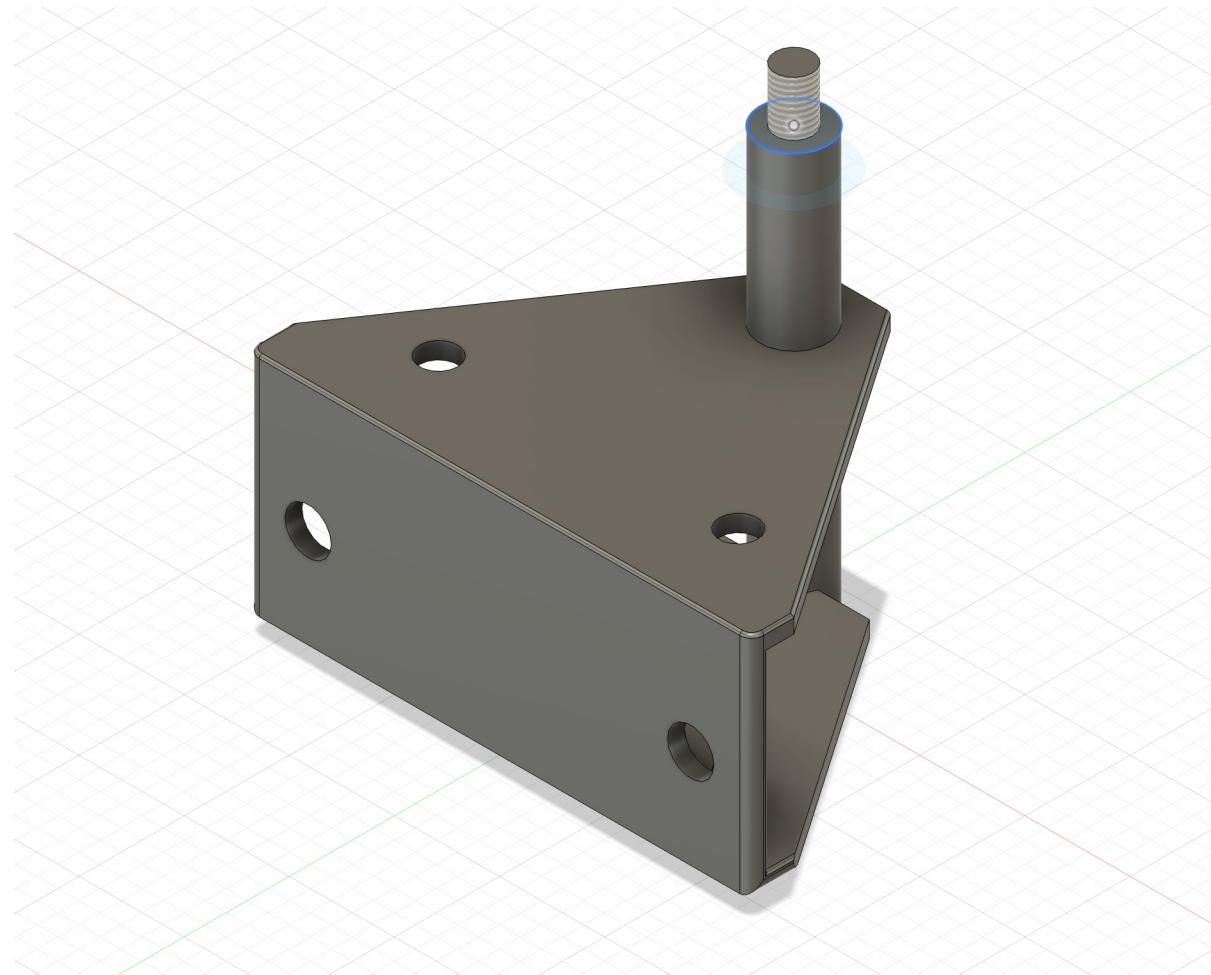


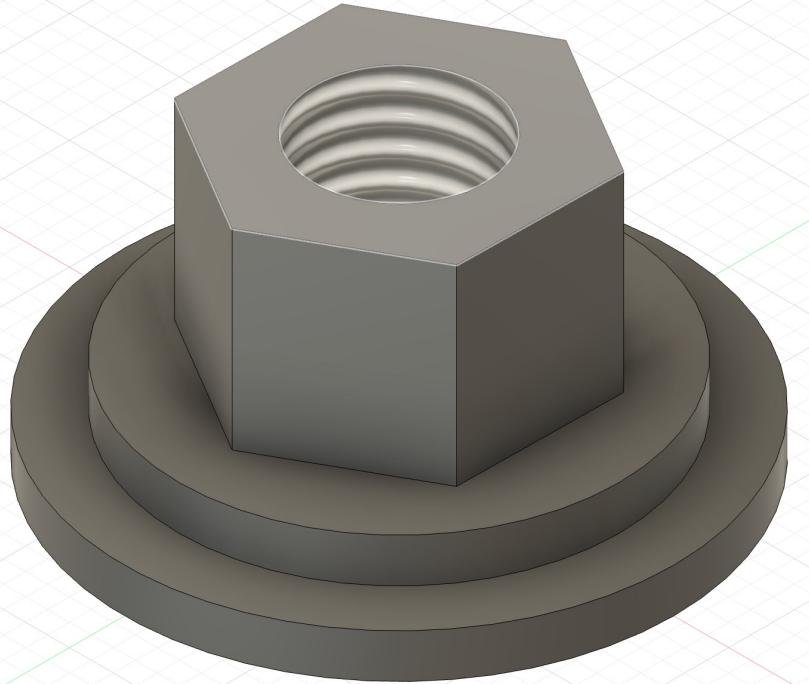
# Component Details

- LEVER Views
- Face containing F4, F5 and F6 will be cast and sanded.

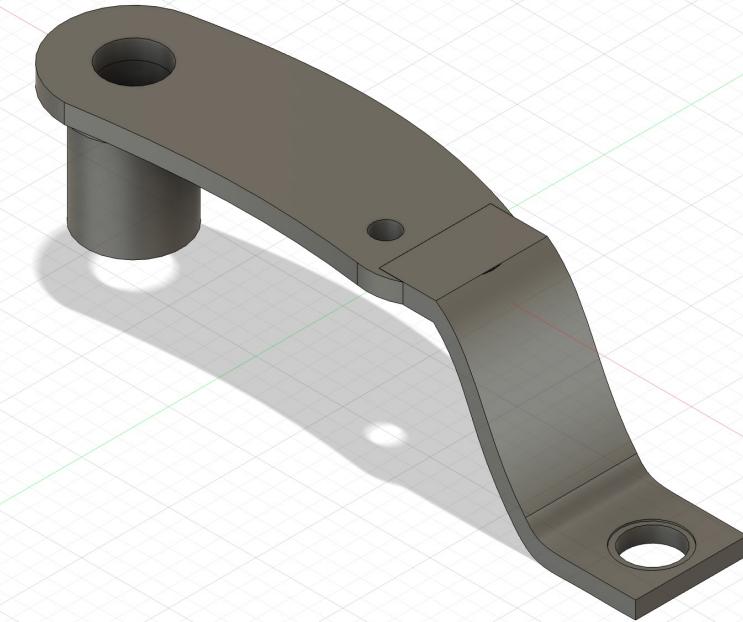


BRAKE PART



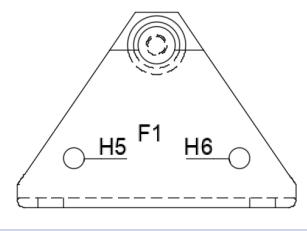
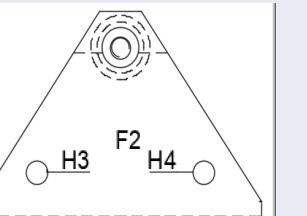
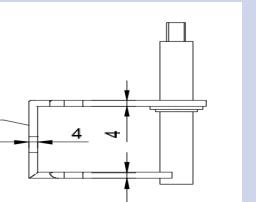
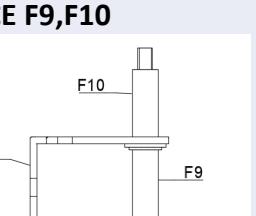


BOLT

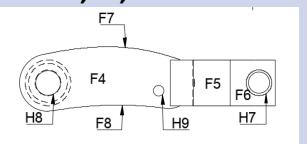
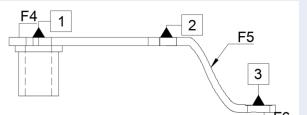


LEVER

# Process Sheet

S.NO.	Operation Description	Machine Used	Tool	Location	Support	Clamp	Speed	Feed	DOC	M/c Time	Remark Tooling
1.	<b>FACE F1</b> 	Horizontal spindle milling m/c	Tungsten Carbide	F1	F2	F3 (Horizontal clamps)	--	--	--	--	Milling Fixture
2.	<b>FACE F2</b> 	Horizontal spindle milling m/c	Tungsten Carbide	F2	F1	F3 (Horizontal clamps)	--	--	--	--	Milling Fixture
3.	<b>FACE F3</b> 	Horizontal spindle milling m/c	Tungsten Carbide	F3	--	F1,F2(2 horizontal clamps)	--	--	--	--	Milling Fixture
4.	<b>FACE F9,F10</b> 	--	Sandpaper	F9,F10	F3	F1,F2(2 Clamps)	--	--	--	--	Sanding

# Process Sheet

S.NO.	Operation Description	Machine Used	Tool	Location	Support	Clamp	Speed	Feed	DOC	M/c Time	Remark Tooling
4.	<b>FACE F4,F5,F6</b> 	--	Sand Paper	F7(1,2,3) F8 (1,2,3)	--	F4(1)	--	--	--	--	Sanding
5.	<b>FACE F7/F8</b> 	--	Sand Paper	F4(both sides); F5(both sides); F6(both sides)	--	F9	--	--	--	--	Sanding
6.	(H7) $\varnothing 18 \times 4.64$	Horizontal Boring m/s	HSS Form Tool	F6	--	F4	--	--	--	--	Boring Fixture
7.	(H3, H4) $\varnothing 9 \times 4, \varnothing 9 \times 4$	Horizontal Boring m/s	HSS Form Tool	F2	F3	F1, F2 (2 Clamps)	--	--	--	--	Boring Fixture

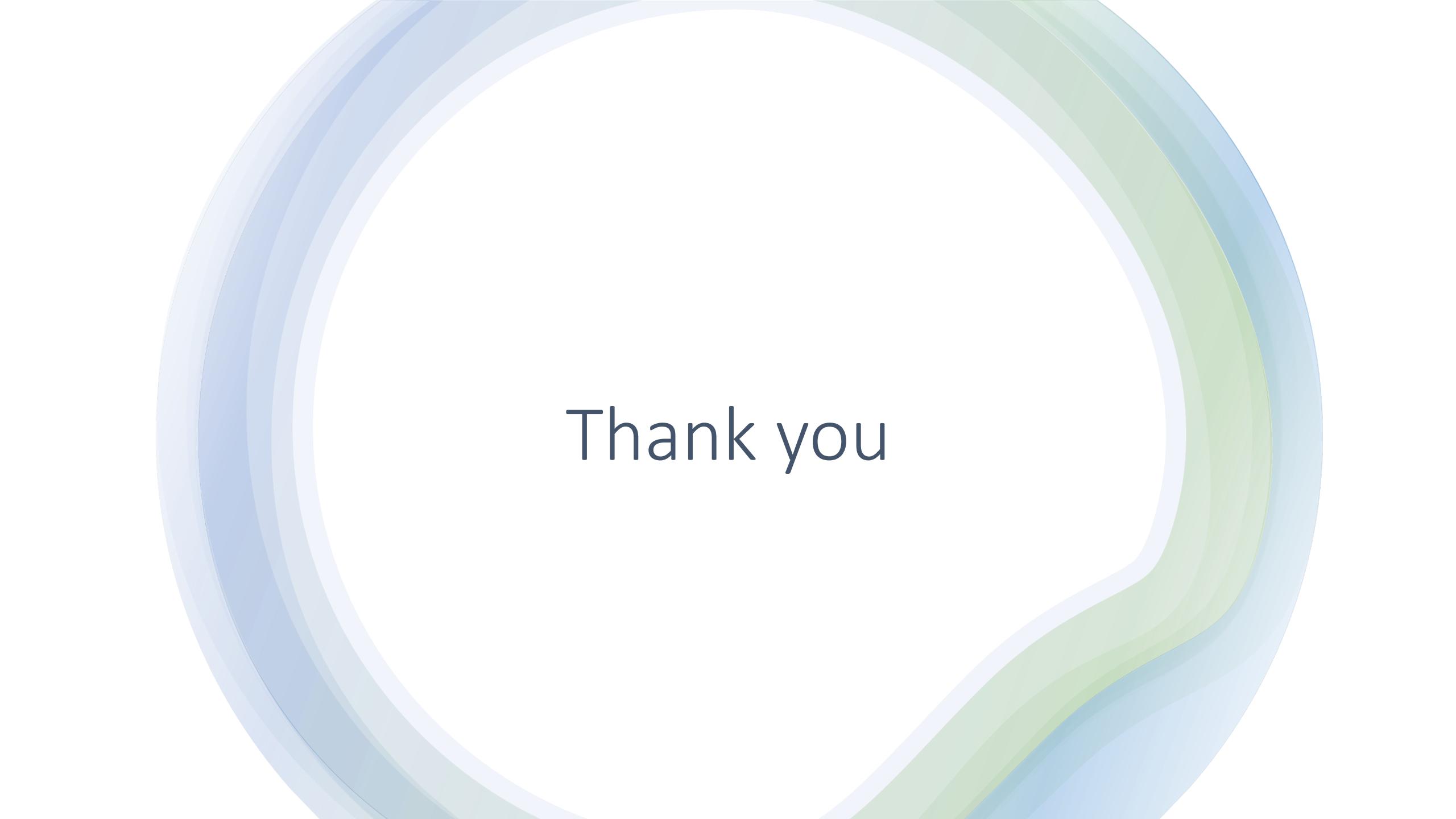
# Process Sheet

S.NO.	Operation Description	Machine Used	Tool	Location	Support	Clamp	Speed	Feed	DOC	M/c Time	Remark Tooling
7.	(H5, H6) Ø9 x 4, Ø9 x 4	Horizontal Boring m/s	HSS Form Tool	F1	F3	F1, F2 (2 Clamps)	--	--	--	--	Boring Fixture
8.	(H1, H2) Ø11 x 4, Ø11 x 4	Horizontal Boring m/s	HSS Form Tool	F3	--	F1, F2 (2 Clamps)	--	--	--	--	Boring Fixture
9.	(H8) Ø17 x 39.5	Horizontal Boring m/s	HSS Form Tool	F4	--	F4	--	--	--	--	Boring Fixture
10.	(H9) Ø7.5 x 5.5	Horizontal Boring m/s	Tungsten Carbide	F4	--	F4	--	--	--	--	Boring Fixture

## 3D Printed Component

Different views of Final Product





Thank you