

NHTI-CONCORD'S COMMUNITY COLLEGE MANUFACTURING PROCESS SHEET		PART NAME: HAMMER HEAD			DRAWING NO. MP101 - MF111- RB110 HEAD	
LAB SECTION: MP101 RB110 MF111	START DATE: TBD	COMPLETION DATE: TBD	QUANTITY: 1	MATERIAL: 1020 CD STEEL	SHEET 1 of 3	
OPERATION NUMBER	OPERATION DESCRIPTION	EQUIPMENT	MACHINE SETTINGS		TOOL(S)	
			FEED	SPEED		
1	Cut a <b>3 9/16"</b> length of <b>1.00"</b> square stock and deburr both ends	Cutoff Saw	Auto	Fixed	12" Rule Hand File	
2	Mill to height and width dimensions by removing approximately equal amounts from each surface. Rough mill to approximately .010 oversize and check for flatness and squareness on surface plate. Finish mill - see below. (maximum depth of cut 0.020")  Allow +0.005" <u>per side</u> on surfaces for finish grinding	Vertical Milling Machine	Manual 20-30 ipm	1200 rpm	2" dia. Carbide-index face mill  1" micrometer	
3	Mill ends to length dimension by removing approximately equal amounts from each end.Check for squareness on surface plate. (maximum depth of cut 0.010") Note: conventional mill all rough cuts and climb mill finish cuts (climb mill final pass .005 max)	Vertical Milling Machine	Manual approx. 2.0 ipm	750 rpm	5/8" dia. HSS end mill  6" caliper or 3-4"micrometer	
4	Layout on surface plate 10° tapers using height gage, sine bar, gage blocks, and Blue Dykem  Using the 10° fixture block, mill the 10° tapers	Vertical Milling Machine	Manual 20-30 ipm	1200 rpm	Sine-bar Height gage Blue Dykem  Carbide-index face mill 10° fixture	

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OPERATION NUMBER	OPERATION DESCRIPTION	EQUIPMENT	MACHINE SETTINGS		TOOL(S)
			FEED	SPEED	
<b>5</b>	Using the 45° fixture, mill all the 45° chamfers	Vertical Milling Machine	Manual 20-30 ipm	1200 rpm	Carbide-index face mill  45° fixture
<b>6*</b>	MF111 & MP101 Only Mill the pocket, one side of head	Vertical Milling Machine	Manual approx. 2.0 ipm	1000 rpm	5/16" HSS end mill  depth micrometer
<b>7</b>	a) Center drill (#4 Center Drill) b) Drill through the part using "tap drill" c) Counter-sink 90° both sides of hole  Tap drill = Ø5/16"(.312)	Vertical Milling Machine	Manual	750 rpm Drilling  350 rpm C'sinking	#4 Center Drill Ø.312" Drill 90° end mill
<b>8</b>	Tap Threads Ø.375-16 UNC-2B	Manual Tapping Fixture	n/a	Manual	Tapping Fixture 3/8-16 UNC-2B Plug Tap Cutting oil

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OPERATION NUMBER	OPERATION DESCRIPTION	EQUIPMENT	MACHINE SETTINGS		TOOL(S)
			FEED	SPEED	
<b>9</b>	Stamp initials one side in pocket area	Anvil	n/a	n/a	Stamp set Brass hammer Anvil on back bench
<b>10*</b>	MF111 & MP101 Finish grind two sides to final dimension (Maximum depth of pass = 0.001")	Surface grinder	Manual	n/a	1" micrometer
<b>11</b>	Inspect part  Produce Inspection Report	Optical Comparator	n/a	n/a	Micrometers, Calipers, Optical comparator,
<b>12</b>	Submit inspection report and physical part to lab instructor for grading	n/a	n/a	n/a	

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