

Project #110 Hammer Handle

(7/28/14 wrr)

Project Description:

The Hammer Handle project is the third of three components of the hammer. The hammer handle will require the student to calculate and offset a lathe tailstock to accurately machine the tapered surface of the handle.

Project Objectives:

After you have completed this project, you should be able to:

1. Offset the lathe's tailstock to produce a taper using the offset method.
2. Inspect a cylindrical taper using a sine bar and gage blocks.
3. Turn a cylindrical taper to a specification of .0015".
4. Drill a hole on a manual lathe
5. Tap a hole on a manual lathe

References/ Study Material:

Precision Machining Technology textbook:

Section 3, Unit 6, pg. 298-307, (threading and tapping)
Section 5, Unit 3, pg. 419, (thread cutting with taps and dies)

Machine Tool Study Guide:

Online Tasks: **MS-34**, Tapping Threads on the Lathe, 23 minutes

Materials Needed: Stock size 1.000" or larger x 6.125 "

Note: 1.264" extra length is for work holding

Additional Tooling: sine bar, gage blocks and a .0001" reading indicator.

Blank Page

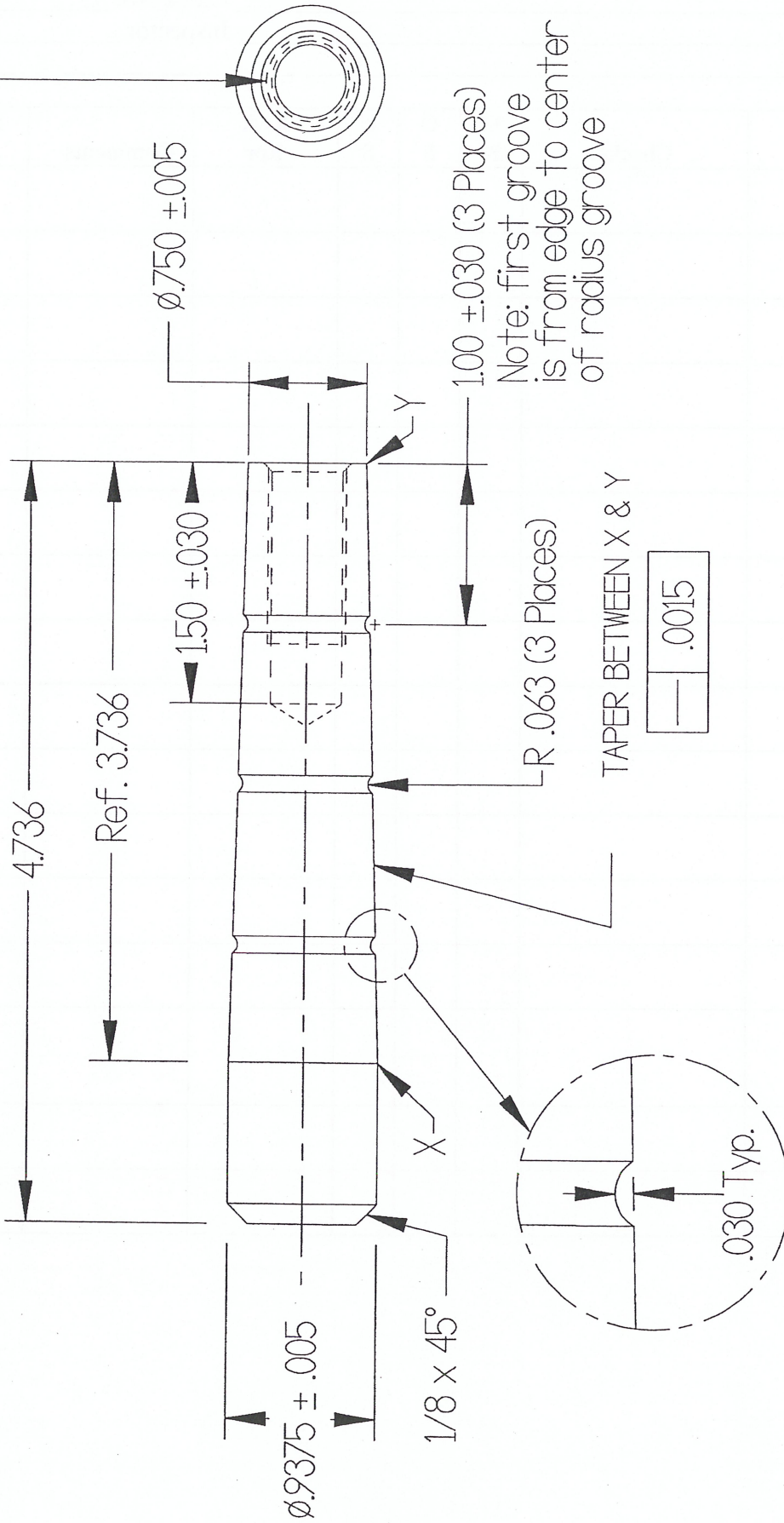
Process Sheet #110

Hammer Handle

Operation No.	Machine	Description	Tools	Speeds/ Feeds
10	Horizontal Bandsaw	Stock size 1.000 diameter or larger x 6.125" long	Multi pitch blade	180 SFPM
20	Lathe	Align centers using straight bar and universal indicator, must be aligned within .002".	universal indicator	
30	Lathe	Face ends to size (6.000") and center drill each end of both parts (extra stock will be removed later). Note: use a Radius center drill	3-jaw chuck Drill chuck Radius center drill	Face @ 418 rpm & Drill @ 940
40	Lathe	Place part between centers and cut the .9375 dia Note: make sure you turn enough length, 2.500" from right end (both parts).	Dead center	You Calculate
50	Lathe	Remove part from setup and offset tailstock the calculated amount from Project #109 . Note: move the tailstock toward you.	universal indicator	
60	Lathe	Place lathe dog on the end you just machined, then place part between centers and prepare to cut	Dead center	You Calculate
70	Instructor	Contact instructor for setup inspection, and have the proper rough turning rpm calculated and set.	Initials and Date: _____	
80	Lathe	Cut at least 3.00" of taper length to measure the taper. Note: you will need a smooth finish on last cut, this will help with the inspection of the taper.	Dead center	
90	Granite Plate	Set up the sine bar and Inspect the taper Note: for rough turning, the taper needs to be within .003 (final taper to be .0015 or less)	.0001 graduated indicator	
100	Instructor	Contact instructor to double check your part/taper inspection.	Initials and Date: _____	
110	Lathe	Finish turn taper diameter (both parts)	0-1" micrometer .0001 graduated indicator	
120	Instructor	Contact instructor to re-check your final taper inspection when the diameters are to size (final taper to be .0015 or less)	Initials and Date: _____	
130	Lathe	Align centers using straight bar and universal indicator, must be aligned within .002".	universal indicator	

140	Lathe	Cut the three radius grooves on the tapered portion of the handle. Note: 1.000 dimension is to center of groove.	Cutoff tool and 0-1" travel indicator	90 RPM.
150	Lathe	Place left end of part in 5C Collet, right end toward tailstock. Pilot drill (.250 dia), drill, chamfer and tap right end. Make sure you have the right size tap drill!!!!!!	5C Collet, Drill chuck Drills, 90 degree counter sink and tap	You Calculate
160	Saw	Place part in solid socket fixture and cut off extra material on vertical band saw	Solid socket fixture	
170	Lathe	Place left end of part in 5C collet. Face left end of part to length and chamfer	5C Collet	You Calculate
180		Deburr part		
190	Bench	Inspect part and record measurements on inspection sheet Note: tolerances that are +/- .005 or less need to be recorded to the 4th decimal place	Inspection Tools	
200	Bench	Engrave your name/initials and number on your part	Electric engrave	

1/2-20 UNF - 2B Depth 1.15
Ø.062 X 45° Chamfer



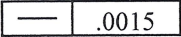
NOTES: Unless otherwise specified
TOLERANCES: Fractional: +/- 1/64
Decimal: .XX +/- .015
Decimal: .XXX +/- .010
Decimal: .XXXX +/- .005
Angular +/- 30'
FAO 125

Title: Hammer Handle	
MAT'L MILD STEEL	SCALE: FULL
DWG.NO:	REV: 5/15/12

CVTC

Hammer Handle

Operator _____ Clock No. _____
 Date handed in: _____ Inspector _____
 Grade _____

Dimension	Checks	O K	O S	U S	Rwk Rpr	Comments	Function Y/N
4.736 +/- .010							
1.50 +/- .030							
1/2-20 UNF-2B 1.15 deep							
.9375 dia +/- .005							
.750 dia +/- .005							
.062 X 45 degrees							
1/8 x 45 degrees							
1.000 +/- .010							
1.000 +/- .010							
1.000 +/- .010							
R.063 x .03 +/- .010							
R.063 x .03 +.010							
R.063 x .03 +/- .010 Taper between X&Y  .0015							
FAO 125							
Deburr							