Mount Intermediate – Manufacturing Procedure

WATCH THE VIDEO!

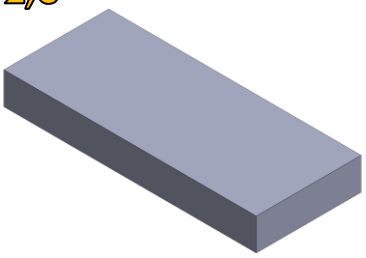
https://youtu.be/FjtUpLt6jsw

1) **Cut a piece of .38” X 1.25” 6061-T6 aluminum alloy rectangular bar to a length of 3.13” on bandsaw.** *(9:48)*
   Tools used: Combination square

Milling Machine Operations:

Install mill vise on table and ensure it is properly aligned to the table travel. Clamp part in vise on parallels with 1.25” stock dimension between jaws and about .5” stick-out on left side of jaws.

#2,3



2) **Side mill one end to clean.** *(11:27)*
   Tools used: 6” rule, 1/2” HSS end mill, digital readout

Remove part, rotate 180° and reclamp as before.

3) **Side mill other end to 3.01” overall length. Use *conventional*, rather than climb, milling technique for roughing cuts.** *(12:27)*
   Tools used: 1/2” HSS end mill, dial caliper, digital readout

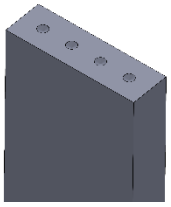
Remove part from vise.

Layout Operations:

4) **Scribe lines for outer contour. *Granite surface plate is for layout and measurement only! It is not for storage or benchwork and must be kept clean!*** *(14:08)*
   - **Apply Dykem layout fluid to 1.25” X 3.01” top surface of part on workbench. Use height gauge with scriber and angle plate on top of surface plate to scribe lines for outer contour 1.50” from left side of part and .438” from both sides of 1.25” dimension. Also, scribe crosshair for location of 1/4-20 UNC 2B threaded hole at 2.81” from left side of part and on center of 1.25” dimension. Lightly punch location of 1/4-20 UNC 2B threaded hole using 60° prick punch on workbench. Set dividers to 3/16”. Set one point in the small punch mark and the other on the part surface. Swivel the dividers to scribe a 3/8” circle.**

   Tools used: Dykem layout fluid, height gauge with scriber, angle plate, 60° prick punch, 6” ruler, dividers, surface plate

#6



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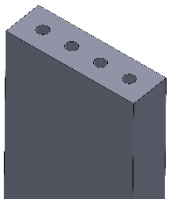
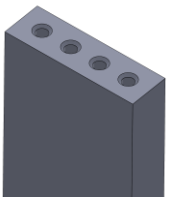


Milling Machine Operations:

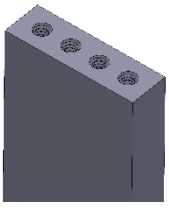
Reclamp part in mill vise so that .38” X 1.25” surface is facing up, .38” dimension is between jaws, part is oriented so scribed lines are against moveable jaw and part is in center of vise. Select shortest parallels available.

#8



5) **Find center of part in X and Y axes.** *(22:06)*
   Tools used: Edgefinder, drill chuck, digital readout
6) **Spot four holes for #6-32 UNC 2B threads.** *(24:25)*
   Tools used: #3 HSS center drill, drill chuck, WD-40 lubricant, digital readout
7) **Drill four ⌀.107” holes .40” deep for #6-32 UNC 2B threads.** *(25:05)*
   Tools used: #36 HSS drill, drill chuck, WD-40 lubricant, digital readout

#9



8) **Countersink four holes for #6-32 UNC 2B threads.** *(26:54)*
Tools used: 1/2" X 90° HSS countersink, drill chuck, WD-40 lubricant, digital readout

9) **Tap four holes for #6-32 UNC 2B threads minimum .3" deep.** ***Be very careful not to overtorque the delicate tap and break it!*** *(28:26)*
Tools used: #6-32 HSS plug tap, tap wrench, spring-loaded tap guide, drill chuck, WD-40 lubricant, digital readout

Remove part. Reclamp part in mill vise on parallels so that 1.25" X 3.01" surface (with scribed lines) is facing up, 1.25" dimension is between jaws, part is oriented so scribed lines are on right side and part is in center of vise.

10) **Find left side of part in X axis and center of part in Y axis.** ***Apply vise stop on left side of part as reference for future setups.*** *(30:33)*
Tools used: Edgefinder, drill chuck, digital readout, vise stop

11) **Spot hole at 2.81" from left side of part.** *(33:36)*
Tools used: #3 HSS center drill, drill chuck, WD-40 lubricant, digital readout

12) **Drill ⌀.201" hole for 1/4-20 UNC 2B threads.** *(34:08)*
Tools used: #7 HSS drill, drill chuck, WD-40 lubricant, digital readout

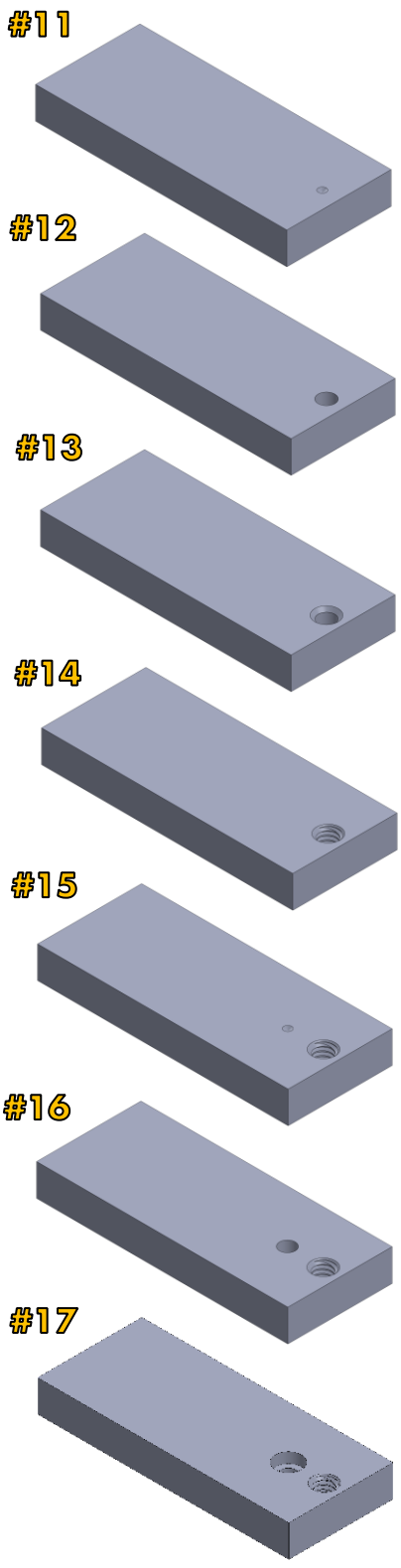
13) **Countersink hole for 1/4-20 UNC 2B threads.** *(34:13)*
Tools used: 1/2" X 90° HSS countersink, drill chuck, WD-40 lubricant, digital readout

14) **Tap for 1/4-20 UNC 2B threads.** *(34:27)*
Tools used: 1/4-20 HSS plug tap, tap wrench, spring-loaded tap guide, drill chuck, WD-40 lubricant, digital readout

15) **Spot hole at 2.38" from left side of part.** *(34:38)*
Tools used: #3 HSS center drill, drill chuck, WD-40 lubricant, digital readout

16) **Drill ⌀.188" hole at 2.38".** *(34:55)*
Tools used: 3/16" HSS drill, drill chuck, WD-40 lubricant, digital readout

17) **Counterbore ⌀.32" X .13" deep.** *(35:01)*
Tools used: 5/16" HSS end mill, R8 collet, WD-40 lubricant, digital readout



18) **Spot hole at .750” from left side of part.** *(35:39)*
Tools used: #3 HSS center drill, drill chuck, WD-40 lubricant, digital readout

19) **Pilot drill hole. *Exact pilot drill size is not critical.*** *(36:29)*
Tools used: 3/16” HSS drill, drill chuck, WD-40 lubricant, digital readout

20) **Pre-drill for ⌀.750” hole.** *(37:42)*
Tools used: 47/64” HSS drill, #2-morse-taper-to-R8-taper adapter, WD-40 lubricant, digital readout

21) **Ream ⌀.750” hole at .750” from left side of part.** *(38:53)*
Tools used: 3/4” HSS reamer, #2-morse-taper-to-R8-taper adapter, WD-40 lubricant, digital readout

Remove part and reclamp in vise so that .38” X 3.01” surface is facing up with about .63” stick-out above top of jaws, .38” dimension is between jaws, part is oriented so scribed lines are against moveable jaw and left side of part is against vise stop.

22) **Find center of part in Y axis.** *(40:06)*
Tools used: Edgefinder, drill chuck, digital readout

23) **Spot hole at 1.270” from left side of part.** *(41:14)*
Tools used: #3 HSS center drill, drill chuck, WD-40 lubricant, digital readout

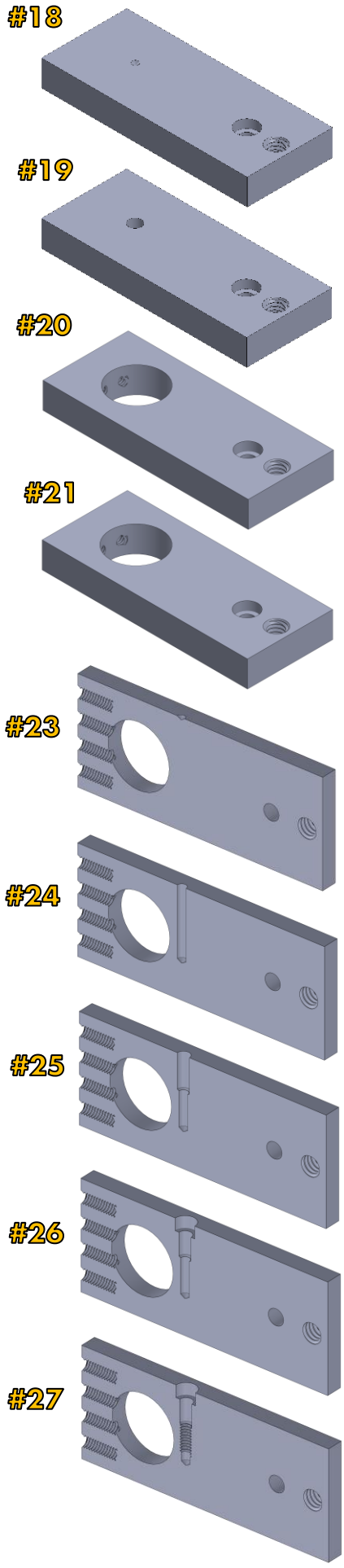
24) **Drill ⌀.107” hole .81” deep.** *(41:17)*
Tools used: #36 HSS drill, drill chuck, WD-40 lubricant, digital readout

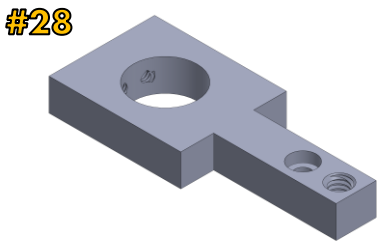
25) **Drill ⌀.150” hole .4” deep.** *(41:51)*
Tools used: #25 HSS drill, drill chuck, WD-40 lubricant, digital readout

26) **Counterbore ⌀.24” X .14” deep.** *(42:31)*
Tools used: HSS counterbore for #6 screw, drill chuck, WD-40 lubricant, digital readout

27) **Tap for #6-32 UNC 2B threads minimum .7” deep.** *(43:53)*
Tools used: #6-32 HSS plug tap, tap wrench, spring-loaded tap guide, drill chuck, WD-40 lubricant, digital readout

Remove part from vise.

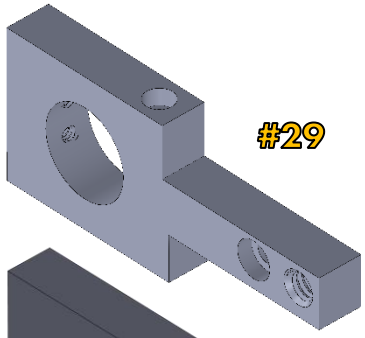




Vertical Bandsaw Operations:

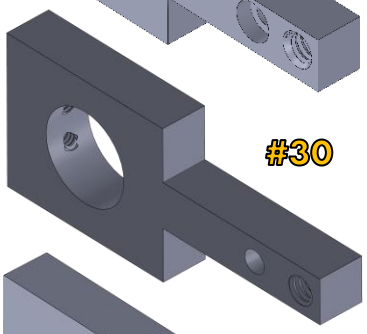
28) Remove excess material on contour of part using scribed lines as a guide. Set rail on bandsaw for straight cuts and use pusher blocks for safety. *(44:33)*

Milling Machine Operations:



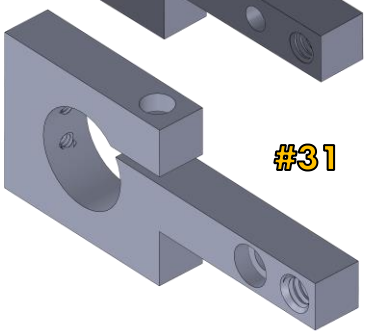
Reclamp part in mill vise against stop as before with scribed lines against ***moveable*** jaw.

29) Mill first step surface .438" from top of part and 1.5" from left side of part. *(48:12)*
Tools used: 1/2" HSS end mill, dial caliper, digital readout



Remove part, flip 180° so part is oriented with scribed lines against ***fixed*** jaw and reclamp in vise against stop.

30) Mill second step surface .438" from top of part and 1.5" from left side of part. *(50:11)*
Tools used: 1/2" HSS end mill, dial caliper, digital readout



Remove part, flip 180° so part is oriented with scribed lines against ***moveable*** jaw once again and reclamp in vise against stop.

31) Cut .063" wide slot to split ⌀.750" hole. *(50:57)*
Tools used: ⌀1.5" X 1/16" wide HSS slitting saw, dial caliper, digital readout

Belt Sander Operations:

32) Sand .19" radius on right side of part using scribed circle as a guide. *(52:37)*