



The stock is 2.26"W X 1.00"D X 1.5"H

Clamp the part in centering vise by extra stock thickness.

Rough the boss using 3 passes to depth leaving $.025\phi$ for finishing

Rough the outer contour to full depth leaving $.025\phi$ for finishing

Spot Drill the $7/32\phi$ holes with a 90° spot drill

Cut the part off of the stock with a slitting saw

Calculate the minimum size cutter

(the distance from the boss OD to the corner of the stock)

Tolerances of $\pm .001$ except where noted.

Tool List

T4: 90° Spot Drill

T5: $\phi 7/32$ Drill

T6: $\phi 1"$ 2 Flute End Mill

T7: Long 90° Spot Drill

T8: $\phi 1/8$ Drill

T11: 5.0 Slitting Saw 40 Teeth

Adam Hathaway

TITLE:

Rotor

SIZE

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Tuesday, April 20, 2021 5:24:57 PM

Material: 6061-T6 (SS)

SCALE: 2:1

SHEET 1 OF 1

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 O00304 (AL03 ELI ROTOR PARTOFF OP)
 N10 G01 Y4. F0.05 (MOVE SAW TO CUT)
 N20 G00 Z.15 (MOVE Z UP .150)
 N30 G00 X-4.5 (RETRACT SAW OUT)
 N40 G00 Y-4. (MOVE SAW TO START POSITION)
 N50 G91 C90.
 N60 G90
 N70 M99

 O00003 (AL03 ELI GONZALEZ, .89 DIA BOSS ROTOR,
 3/30/21)
 (T5: 1/4 DRILL)
 (T6: 1 INCH 2 FLUTE END MILL)
 (T7: 90 DEG LONG SPOT DRILL)
 (T8: 1/8 DRILL)
 (T4: 90 DEG SPOT DRILL)
 (T11: 40T 5 INCH SLITTING SAW)
 N10 G00 G90 G80 G95 G17 G40 D0 G53 Z3.0 (ROUGH AND
 FINISH MILL THE ROTOR)
 N20 T06 M06 (1 INCH 2 FLUTE END MILL)
 N30 G154 P1 X0 Y-1.445 A0. C0. S2000 M03
 (Y = .89/2 + 1.0 = 1.445)
 (S = 4 X 500 / 1 = 2,000)
 N40 G43 Z.150 H06 M08
 N50 G01 Z0 F.0025
 (F = .0025 X 2 = 0.005/2 = 0.0025)
 N60 D26 F.005
 (F = .0025 X 2 = 0.005)
 /N70 M97 P850 L3 (ROUGH BOSS IN 3 PASSES TO DEPTH
 / = BLOCK DELETE)
 N75 G01 Z-.750 F.0025
 N80 D06 F.005
 N90 M97 P900 (FINISH BOSS)

N91 M01 (MEASURE BOSS DIA = .89)
 N100 G01 Z-1.0700 (.070 DEEPER FOR THE CUT OFF WITH
 THE ROTARY SAW)
 N110 D26
 /N120 M97 P960 (ROUGH FLANGE CONTOUR)
 N130 D06
 N140 M97 P960 (FINISH FLANGE CONTOUR)
 N150 M09
 N160 G00 G53 G49 Z0 D0 M05
 N180 M01
 N190 G00 G90 G80 G95 G17 G40 D0 G53 Z3.0 (SPOT DRILL
 2 HOLES 7/32 DIA)
 N200 T04 M06 (90 DEG SPOT DRILL)
 N220 G154 P1 X-.750 Y0 A0. C0. S7314 M03
 (S = 4 X 400 / .21875 = 7,314.285)
 N230 G43 Z.150 H04 M08
 N240 G82 G98 X-.75 Y0 Z-.8694 R+.150 F.002 P.03
 (SPOT DRILL DEPTH = .23875 X .5 = 0.119375)
 (Z = .75 - 0.119375 = 0.869375)
 (F = 2 X .001 = .002)
 (P = 3 X 60 / 5926 = .03037)
 N250 X.750
 N260 G80 M09
 N270 G00 G53 G49 Z0 D0 M05
 N290 M01
 N300 G00 G90 G80 G95 G17 G40 D0 G53 Z3.0 (DRILL 2
 HOLES .21875 DIA)
 N310 T05 M06 (7/32 DRILL)
 N330 G154 P1 X0.750 Y0 A0. C0. S7500 M03
 (S = 4 X 500 / .21875 = 9,142.857)
 N340 G43 Z.150 H05 M08
 N350 G81 G98 X-0.75 Y0 Z-1.0656 R-.6 F.003
 (R = 1 - .25 + .15 = .6)
 (Z = 1 + [.3 X .21875] = 1.065625)

(F = .0025 X 2 = 0.005/ = 0.0025)
 N360 X0.75
 N370 G80 M09
 N380 G00 G53 G49 Z0 D0 M05
 N400 M01
 N410 G00 G90 G80 G95 G17 G40 D0 G53 Z3.0 (SPOT DRILL
 6 FLANGE HOLES .135 DIA)
 N420 T07 M06 (LONG 90 DEG SPOT DRILL)
 N440 G154 P2 X-0.4891 Y.875 A0. C12.8824 S7500 M03
 (HOLE 1)
 (S = 4 X 500 / .135 = 14,814.814)
 (Y = 1.0 - .25 + .125 = .875)
 N450 G43 Z2.500 H07 M08
 N460 G82 G99 X-0.4891 Y.875 Z.3775 R+.600 F.002 P.024
 (Z = .445 - [.135 X .5] = .3775)
 (F = 2 X .001 = .002)
 (P = 3 X 60 / 7500 = .024)
 N470 G98 X0.4891 C-12.8824 (HOLE 2)
 N480 X0 C-90.0 Z+.97 R+1.5 (HOLE 3)
 (Z = 1.0375 - [.135 X .5] = .97)
 N490 G98 X-0.4891 C-167.1176 Z+.3775 R+.600 (HOLE 4)
 N500 G98 X0.4891 C-192.8824 (HOLE 5)
 N510 X0 C-270.0 Z+.97 R+1.5 (HOLE 6)
 N520 G80 M09
 N530 G00 G49 G53 Z0 D0 M05
 N540 G53 C0.0
 N550 M01
 N560 G00 G90 G80 G95 G17 G40 D0 G53 Z3.0 (DRILL 6
 FLANGE HOLES .125 DIA)
 N570 T08 M06 (1/8 DIA DRILL)
 N590 G154 P2 X-0.4891 Y.875 A0. C12.8824 S7500 M03
 (HOLE 1)
 (S = 4 X 500 / .125 = 16,000)
 N600 G43 Z2.500 H08 M08

N610 G81 G98 X-0.4891 Y.875 Z.2669 R+.600 F.003
 (Z = .445 - [.0375 + .1406] = .2669)
 (F = .0015 X 2 = .003)
 N620 G98 X0.4891 C-12.8824 (HOLE 2)
 N630 X0 C-90.0 Z+.8594 R+1.5 (HOLE 3)
 (Z = 1.0375 - [.0375 + .1406] = .8594)
 N640 G98 X-0.4891 C-167.1176 Z+.2269 R+.600 (HOLE 4)
 N650 G98 X0.4891 C-192.8824 (HOLE 5)
 N660 X0 C-270.0 Z.8594 R+1.5 (HOLE 6)
 N670 G80 M09
 N680 G00 G53 G49 Z0 D0 M05
 N690 G53 C0.
 N700 M01
 N710 G00 G90 G80 G95 G17 G40 D0 G53 Z0. (START
 PARTOFF)
 N720 T11 M06 (REMOVE TOOL)
 N725 M00 (LOAD 5.0 INCH SLITTING SAW IN SPINDLE)
 N730 G154 P1 X-4.5 Y-4. A0. C0. S400 M03
 N735 G43 Z.150 H11 M08
 N740 G01 G95 Z-1.0625 F0.05
 (Z = 1.00 + 1/16 = 1.0625)
 N750 G154 P1 X-2.55 Y-4.
 (S = 4 X 500 / 5 = 400)
 N760 M98 P304
 N770 G154 P1 X-2.55 Y-4.
 N780 M98 P304
 N790 G154 P1 X-2.55 Y-4.
 N800 M98 P304
 N805 G154 P1 X-2.55 Y-4.
 N806 M98 P304
 N810 M05
 N820 G00 G49 G53 Z0 M00 (REMOVE SLITTING SAW)
 N830 G53 A0 C0 (RESET BACK TO HOME)
 N840 M30 (OPERATION COMPLETED)

N850 G91 Z-.25 (G91= INCREMENTAL DEPTH FOR BOSS
ROUGHING)
($Z = .75/3 = 0.25$)
N860 G90 (SWITCH BACK TO ABSOLUTE POSITIONING)
N870 M97 P900 (RUN NEXT SUB ROUTINE ON LINE N900)
N880 M99 (LOOP UNTIL RUN 3 TIMES THEN RETURN TO
MAIN PROGRAM ON LINE N75)
N900 G41 G01 X1.00 (BOSS SUBROUTINE) (X = RADIUS
OF ARC ON)
N910 G03 X0 Y-.445 I-1.0 J0
N920 G02 X0 Y-.445 I0 J.445
N930 G03 X-1.00 Y-1.445 I0 J-1.0
N940 G01 G40 X0
N950 M99 (IF ROUGHING RETURN TO PREVIOUS
SUBROUTINE AT LINE N880, IF FINISHING RETURN TO
MAIN PROGRAM AT LINE N100)
N960 G01 X0 Y-1.445 (FLANGE CONTOUR SUBROUTINE)
N970 G01 G41 X1.0 (START OF CONTOUR GEOMETRY)
N990 G03 X0 Y-.445 R1.0 (TRANSITION POINT 0)
N991 G02 X-.0992 Y-0.4338 R.445 (TRANSITION POINT 1)
N1000 G01 X-.8238 Y-.2681 (TRANSITION POINT 2)
N1010 G02 X-.8238 Y.2681 R.275 (TRANSITION POINT 3)
N1020 G01 X-.0992 Y.4338 (TRANSITION POINT 4)
N1030 G02 X.0992 Y.4338 R.445 (TRANSITION POINT 5)
N1040 G01 X.8238 Y.2681 (TRANSITION POINT 6)
N1050 G02 X.8238 Y-.2681 R.275 (TRANSITION POINT 7)
N1060 G01 X.0992 Y-.4338 (TRANSITION POINT 8)
N1070 G02 X0 Y-.445 R.445
N1080 G03 X-1.0 Y-1.4445 I0 J-1.0
N1090 G01 G40 X0
N1100 M99 (IF ROUGHING RETURN TO MAIN PROGRAM
AT LINE N130, IF FINISHING RETURN TO LINE N150)
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