

CNC Mill Programing Basics

Created and Presented By:

John Hoff



DEC 28 2013



DEC 28 2013



MV-42

MACHINIST

375

CN

DEC 28 2013



MV-42

MACHINIST
375
CNC

DEC 28 2013



DEC 28 2013



TEXAS
170-02E

DEC 28 2013



DEC 28 2013



JAN 15 2014



JAN 15 2014



JAN 15 2014



JAN 15 2014

MV-42

SPEEDS ARE APPROXIMATE

MACHINIST

375



CNC

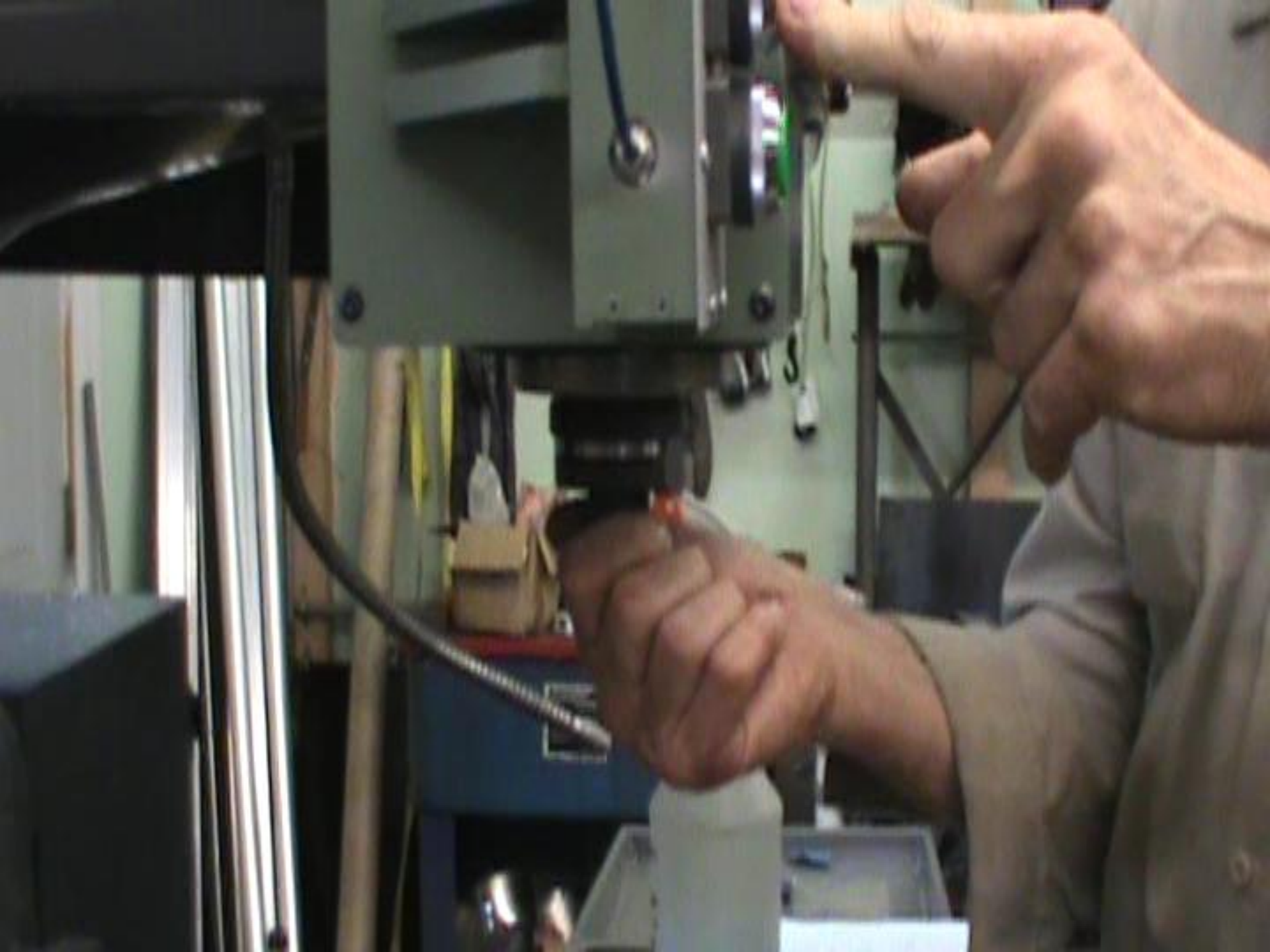
MACHINERY GROUP

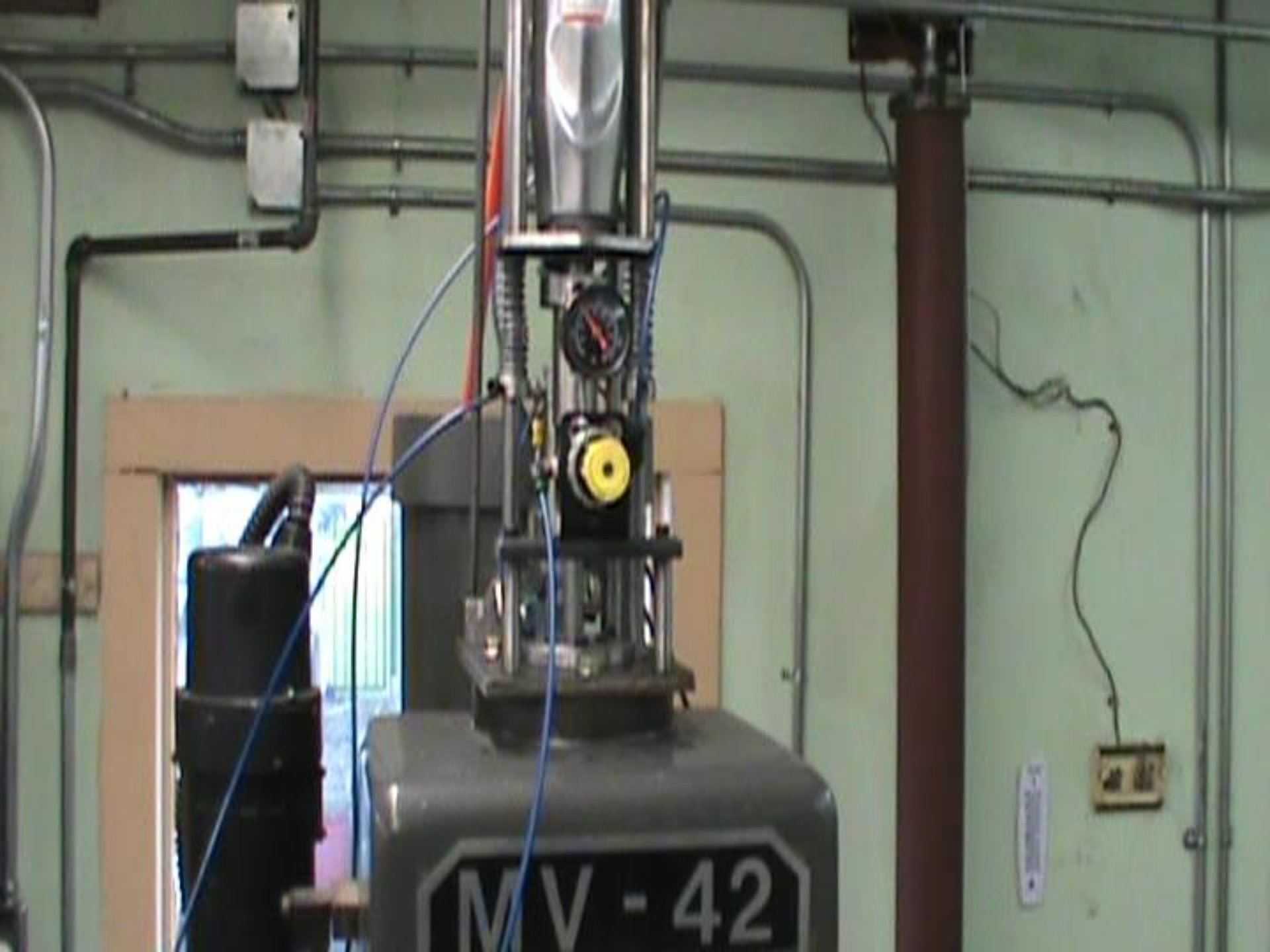
1000 JAMESVILLE LANE / WASHINGTON BEACH, SC 29587



FEB 21 2014









DELTA SERIES CNC



Control panel buttons:

- Next Event
- Faulty Status
- EO Abort
- Reset
- Alphanumeric keypad (A-Z, 0-9)
- Function keys (F1-F12)
- Emergency Stop (Red)

DYNAPATH SYSTEMS INC. (CHINA) LTD.

MIST

COOLANT

SPINDLE OFF ON

MACH. ON

JOG

X + - Y + - Z + -

AUX + -

SPINDLE OVERRIDE

LOW HIGH

FEEORATE OVERRIDE

LOW HIGH STOP

RETRACT

CYCLE START

MOTION STOP

EMERGENCY STOP

PROGRAM ID: PD5217
COPYRIGHT:
AUTOCON TECHNOLOGIES, INC. 1992
NO ERROR DETECTED ON CHECKSUM
NO ERROR DETECTED IN RAM
DIAGNOSTICS PASSED
PUSH MODE SELECT TO SEE MENU
PUSH "F" - ADVANCED FEATURE LIST
PUSH "C" - CUSTOMER SUPPORT
SERVICES

FAULT
AXIS NEED TO BE REFERENCED

| STATUS | PIC | EXIT
| DISPLA | TABLES | DISPLA

FAULT
STATUS

NO
ASSIST

RESET

A
E
I
M
Q
U
X

MIST

COOLANT

SPINDLE
OFF ON

TACH. ON

JOG

SPINDLE OVERRIDE

RETRACT

X Y Z AUX
+ - + - + - +

PROGRAM OVERRIDE

LOW HIGH

JOG MODE

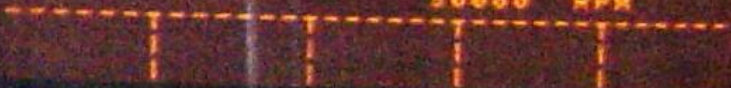
0-SLOW
1-MEDIUM
2-FAST
3-RAPID
4-0.0001 INCH
5-0.0010 INCH
6-0.0100 INCH
7-0.1000 INCH
8-1.0000 INCH
9-ZERO SET
H-HOME
M-MACHINE ZERO

POSITION
X+000.0000
Y+000.0000
Z+000.0000

DISTANCE MOVED
X+000.0000
Y+000.0000
Z+000.0000

SPINDLE SPEED
50000 RPM

0.0000



JOG

X Y Z AUX
- + - + - +

SPINDLE OVERRIDE



FEEDRATE OVERRIDE



RETRACT



IST

LANT

NDLE
ON

H. ON



A
E
I
M
Q
U
X

JOG MODE

0-SLOW
1-MEDIUM
2-FAST
3-RAPID
4-0.0001 INCH
5-0.0010 INCH
6-0.0100 INCH
7-0.1000 INCH
8-1.0000 INCH
H-HOME
M-MACHINE ZERO
R-REF ZERO

POSITION:
X+000.0000
Y+000.0000
Z+000.0000

DISTANCE MOVED:
X+000.0000
Y+000.0000
Z+000.0000

SPINDLE SPEED:
50000 RPM



JOG

X

Y

Z

AUX

- + - + - + - +

SPINDLE OVERRIDE



FEEDRATE OVERRIDE



RETRACT

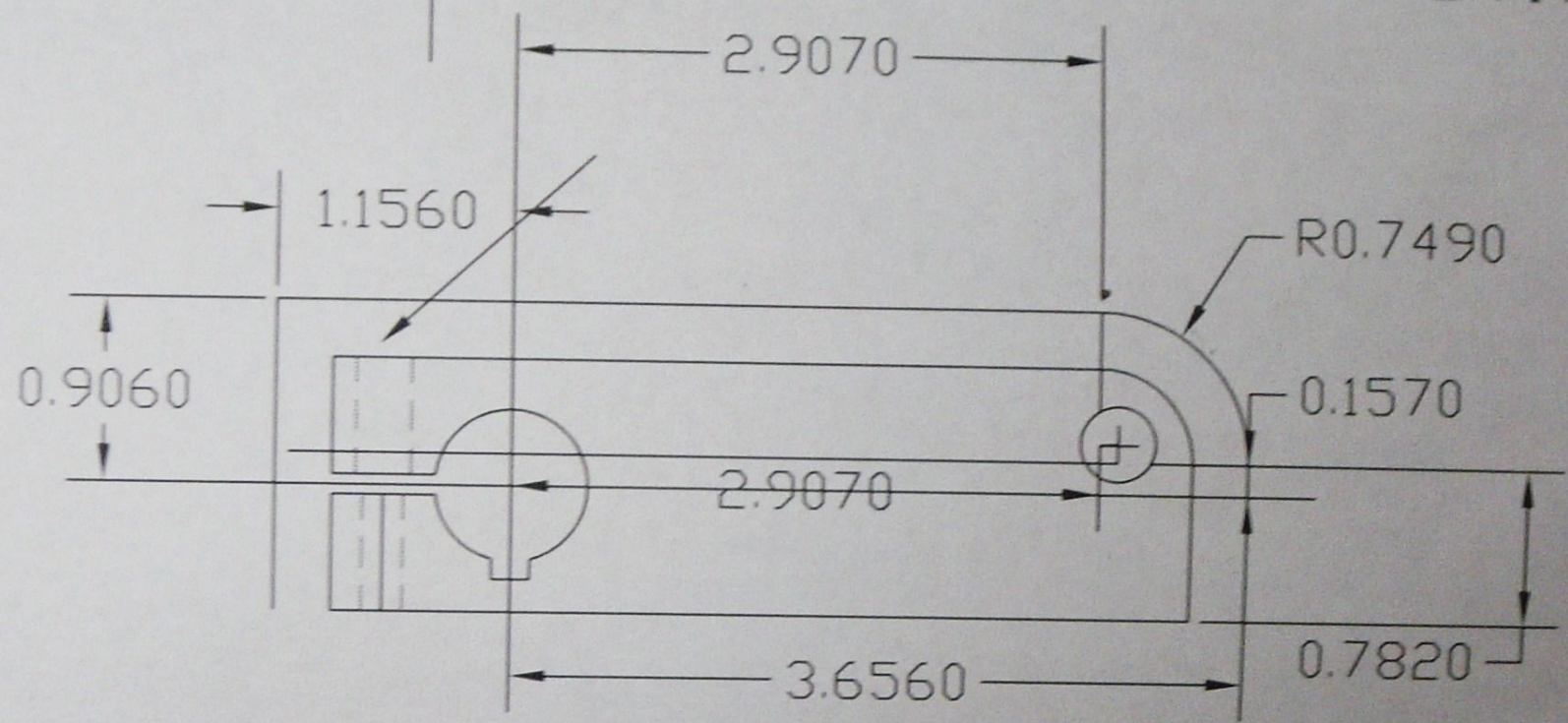


MIST

COOLANT

SPINDLE ON

CH. ON

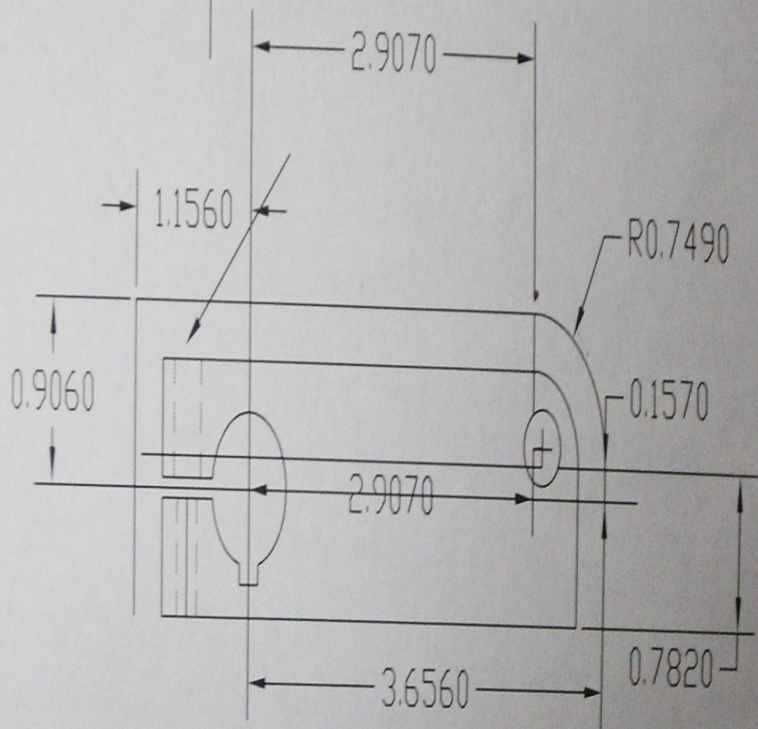


MAT. 3/8" THICK 0-1 TOOL STEEL

THIS PRINT IS FOR ROUGHING IN PART. IT IS +.031"

	REPUBLIC BAG CLAMP

10/27/14



MAT. 3/8"THICK 0-1 TOOL STEEL

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DISPLAY PROGRAM

PART: REPUBCLP

```

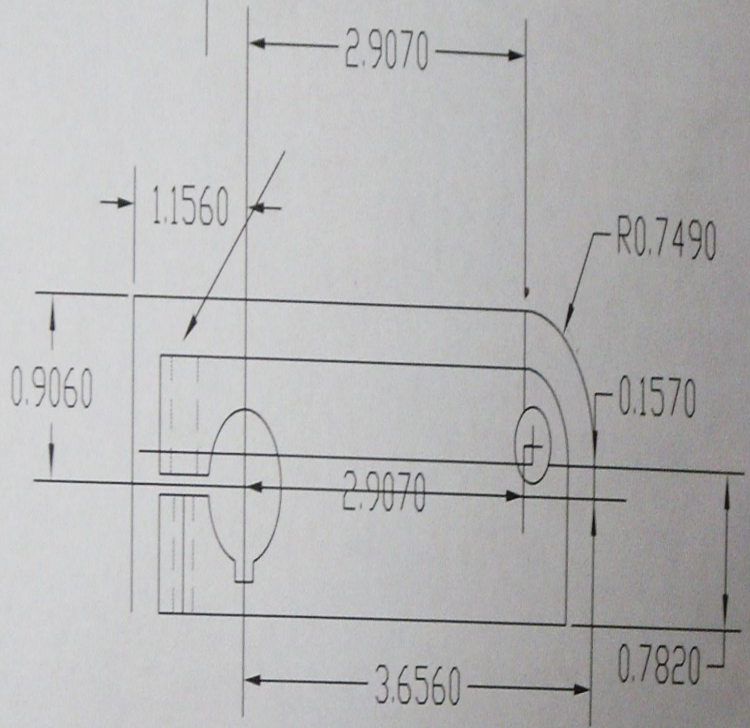
N0001 (0) X-3.656 Y1 Z0$
N0002 (0) X-3.656 Y1 Z-1.5$
N0003 (9) M03$
N0004 (1) X-3.656 Y-.157 Z-1.5
          F.875$
N0005 (2) X-2.907 Y-.906 Z-1.5
          I-2.907 J-.157 R.749 D1$
N0006 (1) X1.156 Y-.906 Z-1.5$
N0007 (1) X1.156 Y.750 Z-1.5$
N0008 (1) X1.125 Y.750 Z-1.5$
N0009 (1) X1.125 Y-.875 Z-1.5$
N0010 (1) X-2.907 Y-.875 Z-1.5$
N0011 (2) X-3.625 Y-.157 I-2.907
          J-.157 R.718 D0$
  
```

PAGE
FWD

PAGE
REV

SHINGLES OVERVIEW

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MAT. 3/8"THICK 0-1 TOOL STEEL

THIS PRINT IS FOR ROUGHING IN PART. IT IS +.031"

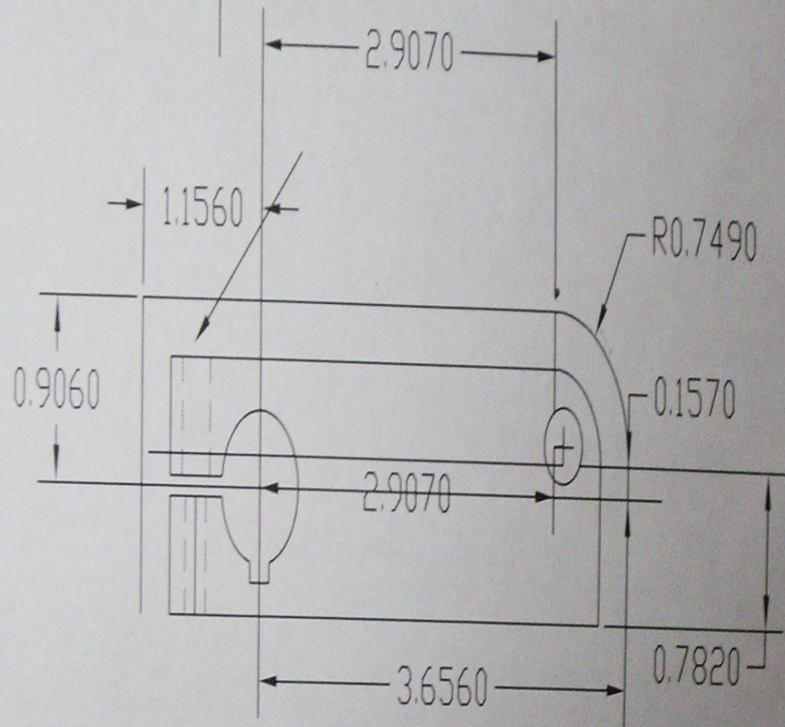
REPUBLIC BAG CLAMP	
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```

PROGRAM          N0001
0-POSITION       POSITION
1-LINEAR MILL   P0 XY      PLANE
2-ARC MILL      X-003.6560  ENDPT
3-FRAME MILL    Y+001.0000  ENDPT
4-CIRCLE MILL   Z+000.0000  ENDPT
5-BOLT CIRCLE
6-REPEAT
7-SUBROUTINE    V          VECANG
8-DWELL         D          VECDIM
9-M FUNCTION    F          FEED
                G          GCYCLE
                W          Z REF
                K          PECK
                Q          CLR
                L          DWELL
  
```

PAGE	POS	DELETE	COPY/	RUN
FWD	DISPLA	EVENT	STORE	

10/27/14



MAT. 3/8" THICK 0-1 TOOL STEEL

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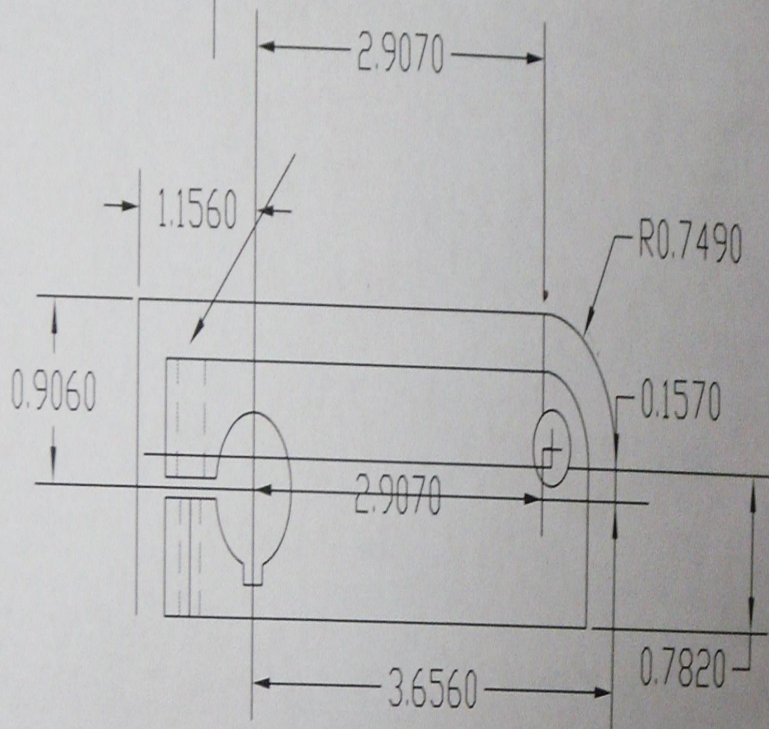
REPUBLIC BAG CLAMP

```

PROGRAM           N0003
0-POSITION        M FUNCTIONS
1-LINEAR MILL
2-ARC MILL        M03
3-FRAME MILL
4-CIRCLE MILL
5-BOLT CIRCLE    E           FIXTUR
6-REPEAT
7-SUBROUTINE
8-DWELL          T           TOOL
9-M FUNCTION
  
```

		S	SPEED	
PAGE	POS	DELETE	COPY/	RUN
FWD	DISPLA	EVENT	STORE	

10/27/14



MAT. 3/8"THICK 0-1 TOOL STEEL

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```

PROGRAM          N0004
0-POSITION      LINEAR MILL
1-LINEAR MILL   P0 XY      PLANE
2-ARC MILL      X-003.6560  ENDPT
3-FRAME MILL    Y-000.1570  ENDPT
4-CIRCLE MILL   Z-001.5000  ENDPT
5-BOLT CIRCLE
6-REPEAT
7-SUBROUTINE    V          VECANG
8-DWELL         D          VECDIM
9-M FUNCTION    R          RADIUS

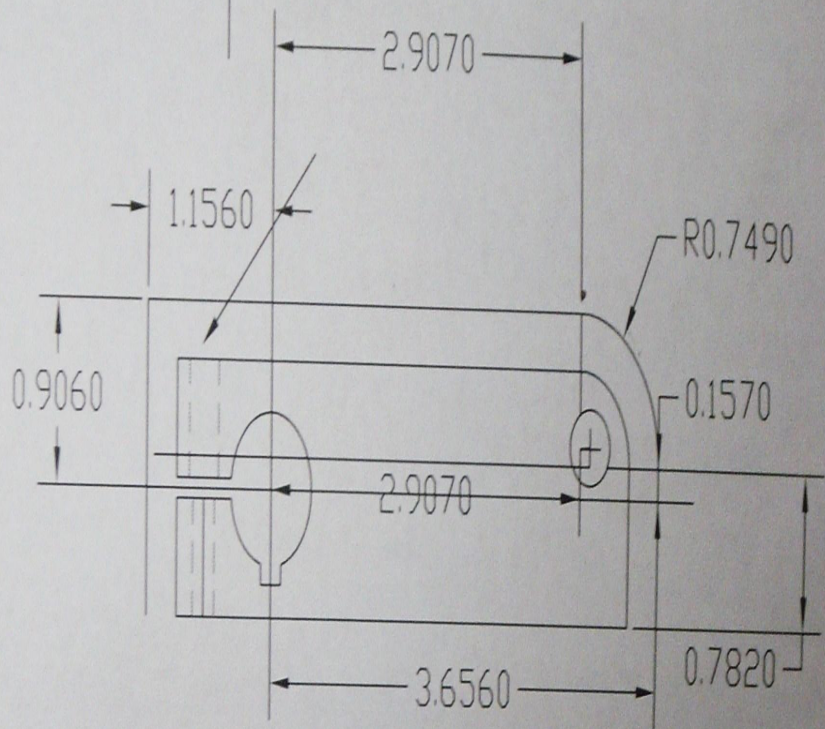
                  F0000.875  FEED
                  T          TIME
                  G
                  C          CCOMP
-----
PAGE | POS | DELETE | COPY/ | RUN
FWD  | DISPL | EVENT  | STORE |

```

JOG

SPINDLE OVER

10/27/14



MAT. 3/8"THICK 0-1 TOOL STEEL

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REPUBLIC BAG CLAMP

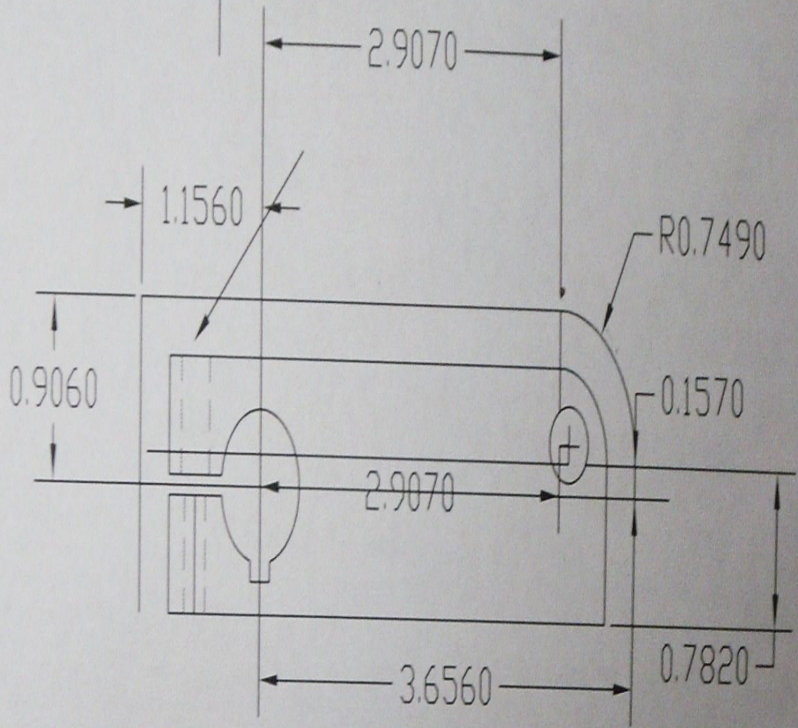
```

PROGRAM          N0004
0-POSITION      LINEAR MILL
1-LINEAR MILL   P0 XY      PLANE
2-ARC MILL      X-003.6560  ENDPT
3-FRAME MILL    Y-000.1570  ENDPT
4-CIRCLE MILL   Z-001.5000  ENDPT
5-BOLT CIRCLE
6-REPEAT
7-SUBROUTINE    V          VECANG
8-DWELL         D          VECDIM
9-M FUNCTION    R          RADIUS

                  F0000.875  FEED
                  T          TIME
                  G
                  C          CCOMP
-----
PAGE | POS | DELETE | COPY | RUN
FWD  | DISPL | EVENT  | STORE |
  
```

STUDY COVER

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MAT. 3/8"THICK 0-1 TOOL STEEL

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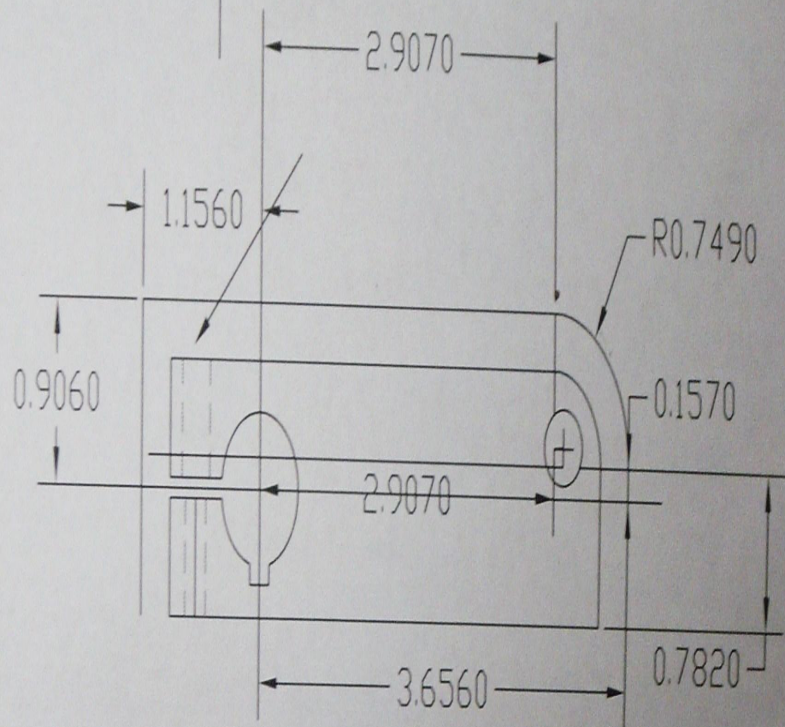
REPUBLIC BAG CLAMP

```

PROGRAM          N0005
0-POSITION      ARC MILL
1-LINEAR MILL   P0 XY      PLANE
2-ARC MILL      X-002.9070  ENDPT
3-FRAME MILL    Y-000.9060  ENDPT
4-CIRCLE MILL   I-002.9070  CNTRX
5-BOLT CIRCLE   J-000.1570  CNTRY
6-REPEAT        Z-001.5000  HELIX
7-SUBROUTINE    A          STRANG
8-DWELL         B          ENDANG
9-M FUNCTION    R000.7490  RADIUS
                E          ENDRAD
                D1         DIRECT
                F          FEED
                G
                C          CCOMP
  
```

PAGE	POS	DELETE	COPY/	RUN
FWD	DISPLA	EVENT	STORE	

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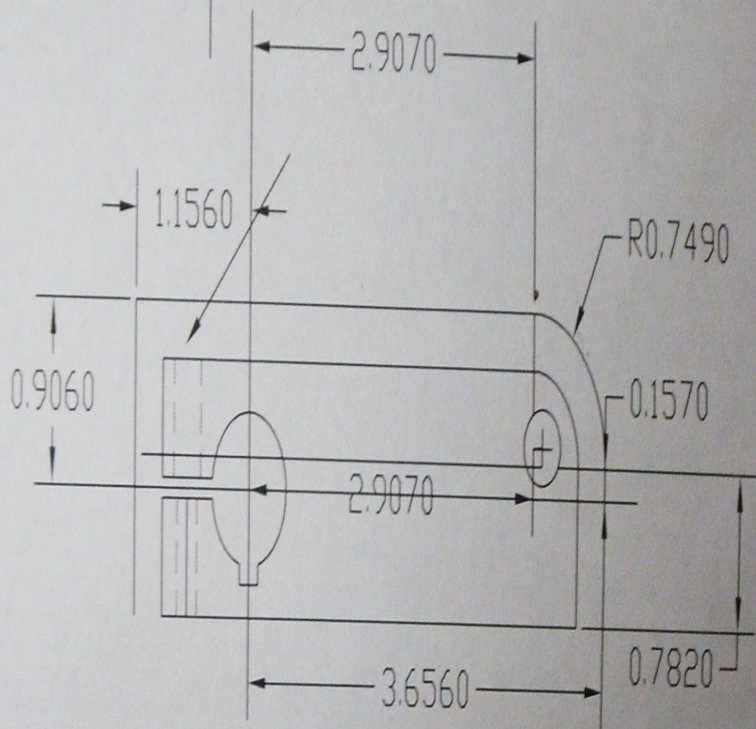
PROGRAM                                N0007
0-POSITION                              LINEAR MILL
1-LINEAR MILL                           P0 XY          PLANE
2-ARC MILL                              X+001.1560     ENDPT
3-FRAME MILL                            Y+000.7500     ENDPT
4-CIRCLE MILL                           Z-001.5000     ENDPT
5-BOLT CIRCLE
6-REPEAT
7-SUBROUTINE                            V              VECANG
8-DWELL                                  D              VECDIM
9-M FUNCTION                             R              RADIUS

                                           F              FEED
                                           T              TIME
                                           G
                                           C              CCOMP

```

PAGE	POS	DELETE	COPY/	RUN
FWD	DISPLA	EVENT	STORE	

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MAT. 3/8" THICK 0-1 TOOL STEEL

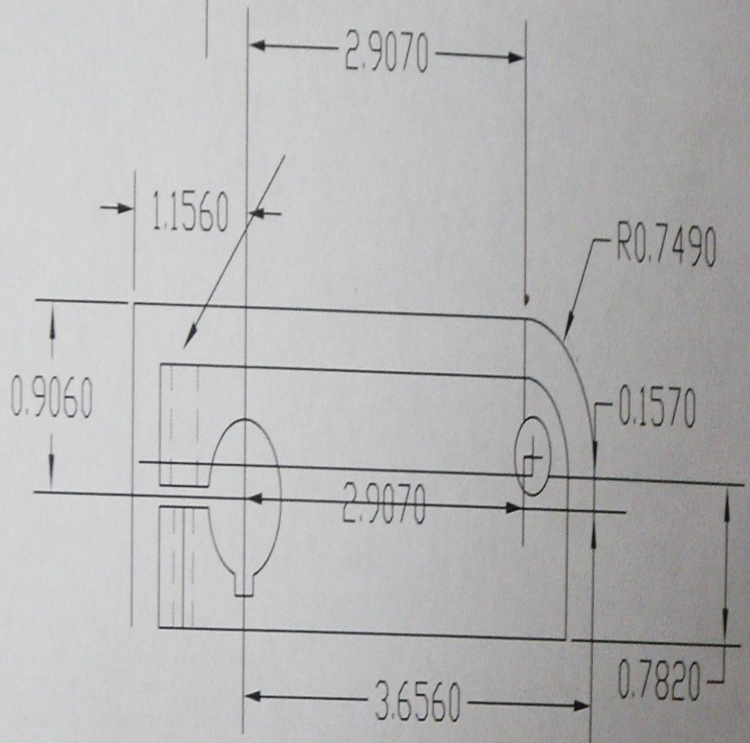
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```

PROGRAM          N0008
0-POSITION      LINEAR MILL
1-LINEAR MILL   P0 XY      PLANE
2-ARC MILL      X+001.1250  ENDPT
3-FRAME MILL    Y+000.7500  ENDPT
4-CIRCLE MILL   Z-001.5000  ENDPT
5-BOLT CIRCLE
6-REPEAT
7-SUBROUTINE    V          VECANG
8-DWELL         D          VECDIM
9-M FUNCTION    R          RADIUS
                  F          FEED
                  T          TIME
                  G
                  C          CCOMP
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PAGE | POS | DELETE | COPY | RUN
FND  | DISPLA | EVENT | STORE |
  
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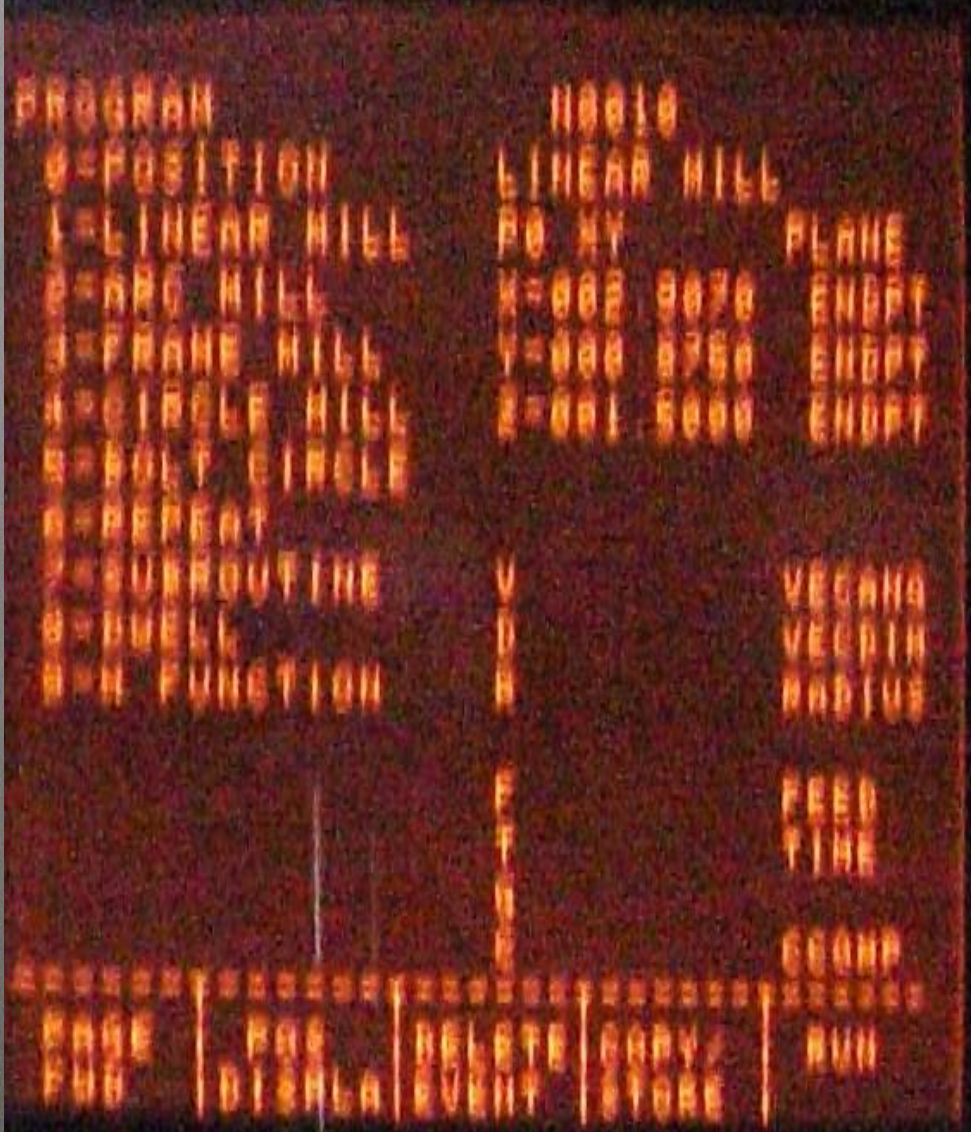

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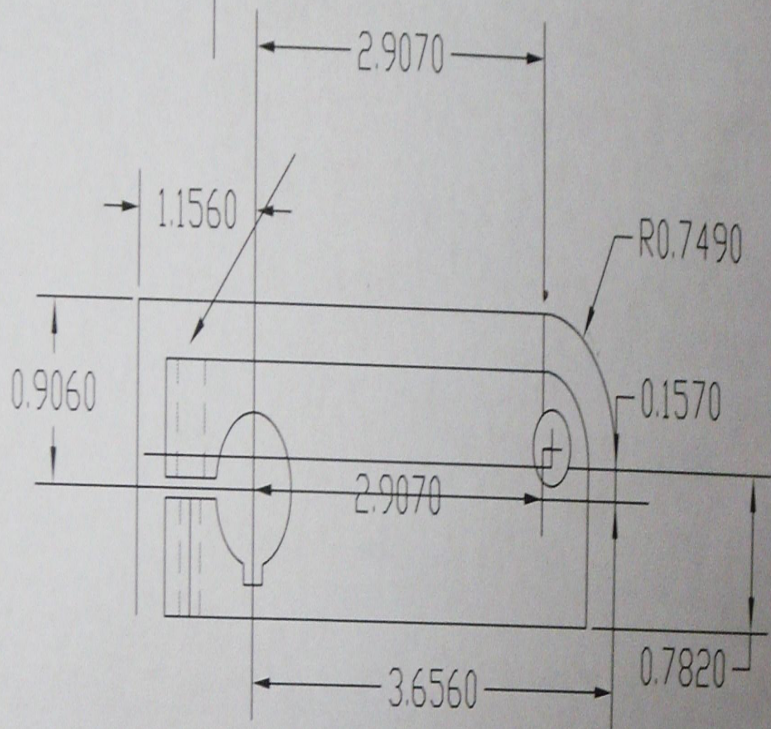
MAT. 3/8"THICK 0-1 TOOL STEEL

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MAT. 3/8"THICK 0-1 TOOL STEEL

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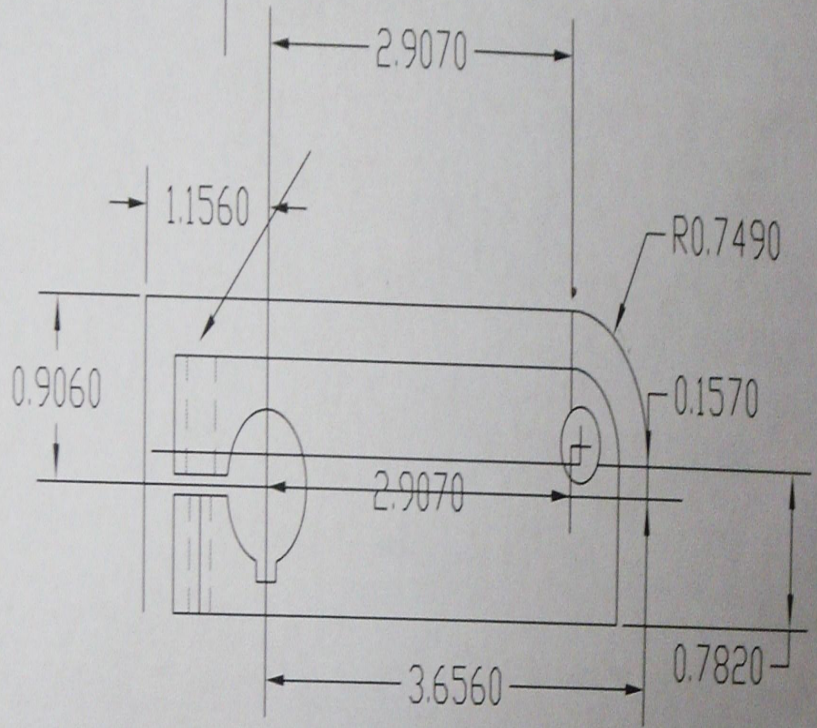
REPUBLIC BAG CLAMP

```

PROGRAM                               N0011
0-POSITION                             ARC MILL
1-LINEAR MILL                          P0 XY          PLANE
2-ARC MILL                             X-003.6250     ENDP
3-FRAME MILL                           Y-000.1570     ENDP
4-CIRCLE MILL                          I-002.9070     CNTRX
5-BOLT CIRCLE                           J-000.1570     CNTRY
6-REPEAT                                Z              HELIX
7-SUBROUTINE                            A              STRANG
8-DWELL                                 B              ENDANG
9-M FUNCTION                             R000.7180      RADIUS
                                           E              ENDRAD
                                           D0             DIRECT
                                           F              FEED
                                           G
                                           C              CCOMP
  
```

PAGE	POS	DELETE	COPY/	RUN
FWD	DISPLA	EVENT	STORE	

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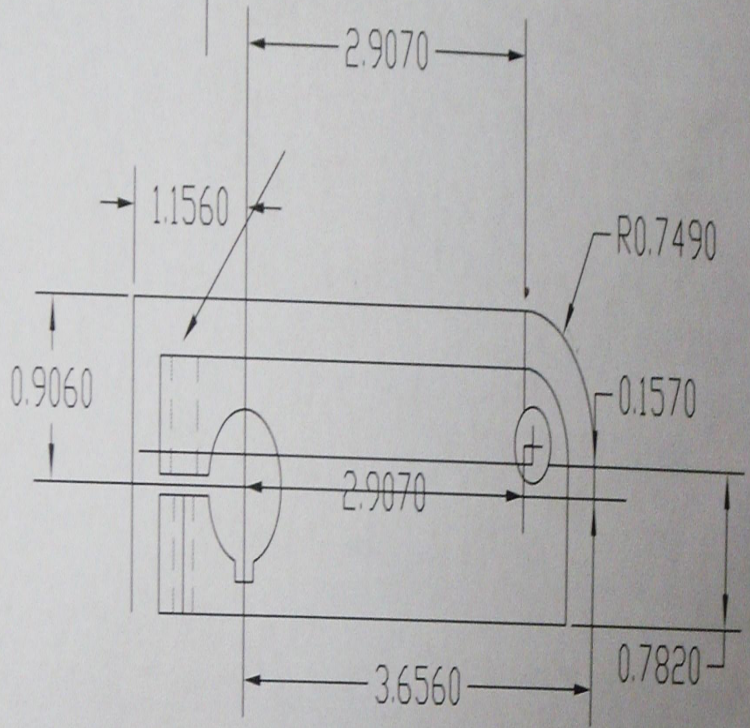
REPUBLIC BAG CLAMP

```

PROGRAM N0012
0-POSITION LINEAR MILL
1-LINEAR MILL P0 XY PLANE
2-ARC MILL X-003.6250 ENDPT
3-FRAME MILL Y+000.7500 ENDPT
4-CIRCLE MILL Z-001.5000 ENDPT
5-BOLT CIRCLE
6-REPEAT
7-SUBROUTINE V VECANG
8-DWELL D VECDIM
9-M FUNCTION R RADIUS
          F FEED
          T TIME
          C CCOMP
-----
PAGE | POS | DELETE | COPY/ | RUN
END  | DISPLA | EVENT  | STORE  |

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MAT. 3/8"THICK 0-1 TOOL STEEL

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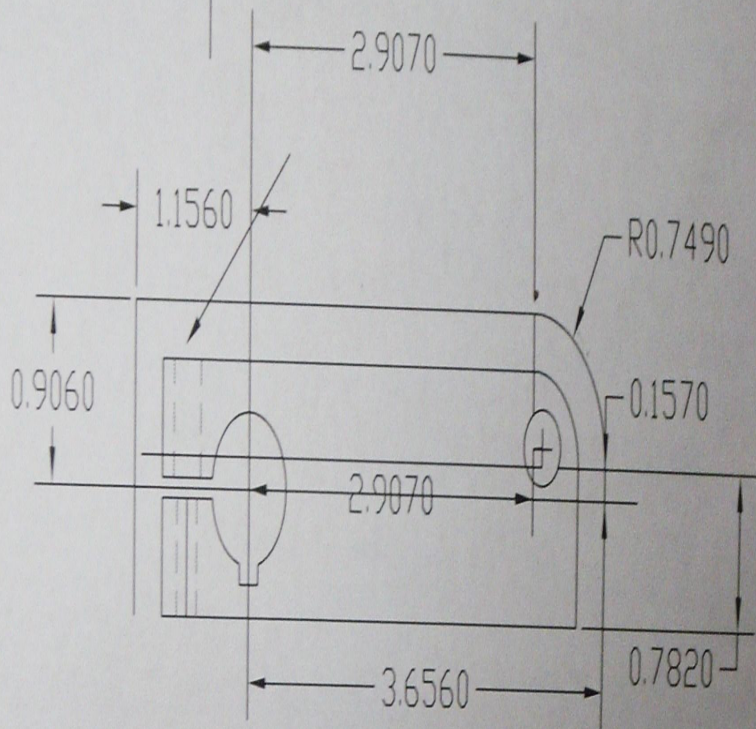
```

PROGRAM                                N0013
0-POSITION                              LINEAR MILL
1-LINEAR MILL                           P0 XY          PLANE
2-ARC MILL                               X-003.6250     ENDPT
3-FRAME MILL                             Y+000.7500     ENDPT
4-CIRCLE MILL                            Z+000.0000     ENDPT
5-BOLT CIRCLE
6-REPEAT
7-SUBROUTINE                             V              VECANG
8-DWELL                                  D              VECDIM
9-M FUNCTION                              R              RADIUS

                                         F              FEED
                                         T              TIME
                                         G
                                         C              CCOMP
-----
PAGE | POS | DELETE | COPY / | RUN
FWD  | DISPLA | EVENT | STORE |

```

10/27/14



MAT. 3/8"THICK 0-1 TOOL STEEL

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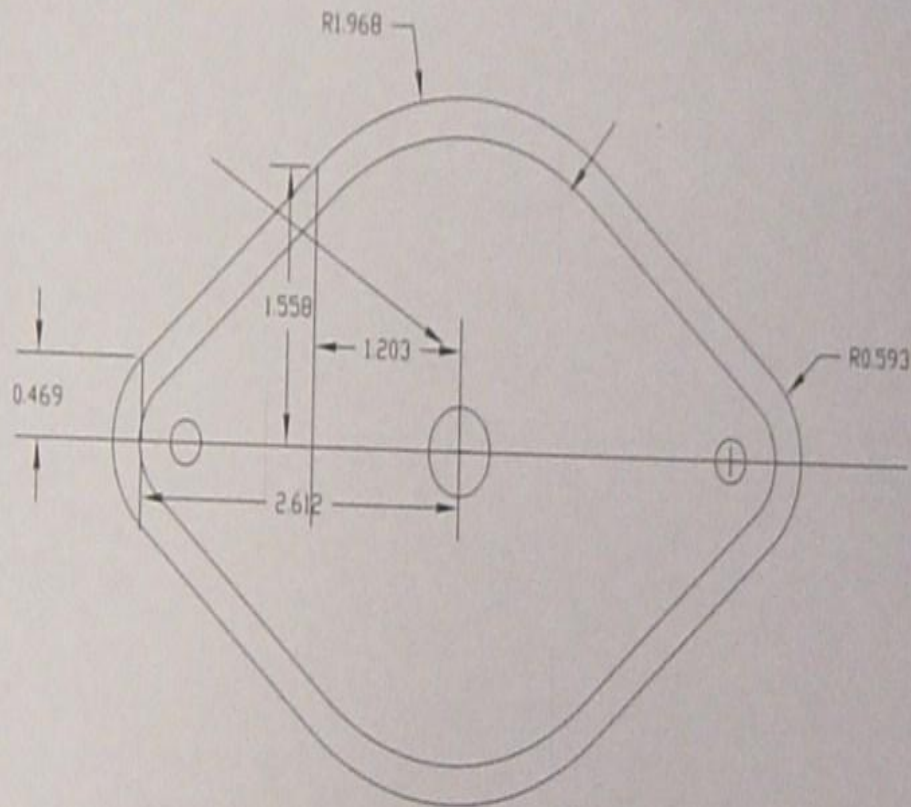
REPUBLIC BAG CLAMP

```

PROGRAM                               N0015
0-POSITION                             M FUNCTIONS
1-LINEAR MILL
2-ARC MILL                             M30
3-FRAME MILL
4-CIRCLE MILL
5-BOLT CIRCLE                           E           FIXTUR
6-REPEAT
7-SUBROUTINE
8-DWELL                                 T           TOOL
9-M FUNCTION

```

				S	SPEED
PAGE	POS	DELETE	COPY	✓	RUN
FWD	DISPLA	EVENT	STORE		



ROUGHING PRINT

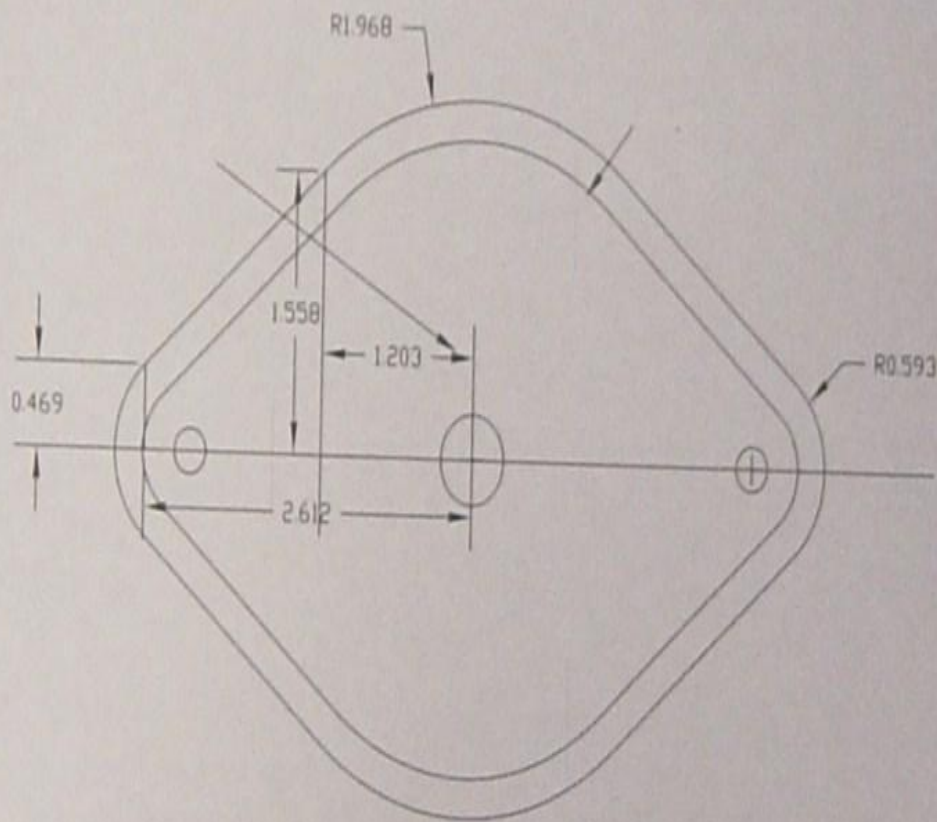
```

DISPLAY PROGRAM
PART: PUMPBACK
N0001 (0) X3.5 Y0 Z-1.5 F1.00$
N0002 (9) M03$
N0003 (1) X2.843 Y0 Z-1.5$
N0004 (2) X2.612 Y.469 Z-1.5 I2.25
          J0 R.593 D1$
N0005 (1) X1.203 Y1.558 Z-1.5$
N0006 (2) X-1.203 Y1.558 I0 J0
          R1.968 D1$
N0007 (1) X-2.612 Y.469 Z-1.5$
N0008 (2) X-2.612 Y-.469 Z-1.5
          I-2.25 J0 R.593 D1$
N0009 (1) X-1.203 Y-1.558 Z-1.5$
N0010 (2) X1.203 Y-1.558 Z-1.5 I0
          J0 R1.968 D1$

```

PAGE
FWD

PAGE
REV



ROUGHING PRINT

DISPLAY PROGRAM

PART: PUMPBACK

N0015 (1) X1.184 Y-1.534 Z-1.58

N0016 (2) X-1.184 Y-1.534 I0 J0

R001.938 D08

N0017 (1) X-2.594 Y-.445 Z-1.58

N0018 (2) X-2.594 Y.445 I-2.25 J00

R.563 D08

N0019 (1) X-1.184 Y1.534 Z-1.58

N0020 (2) X1.184 Y1.534 Z-1.5 I0

J0 R1.938 D08

N0021 (1) X2.594 Y.445 Z-1.58

N0022 (2) X2.812 Y0 Z-1.5 I2.25 J0

R.563 D08

N0023 (0) X2.812 Y0 Z08

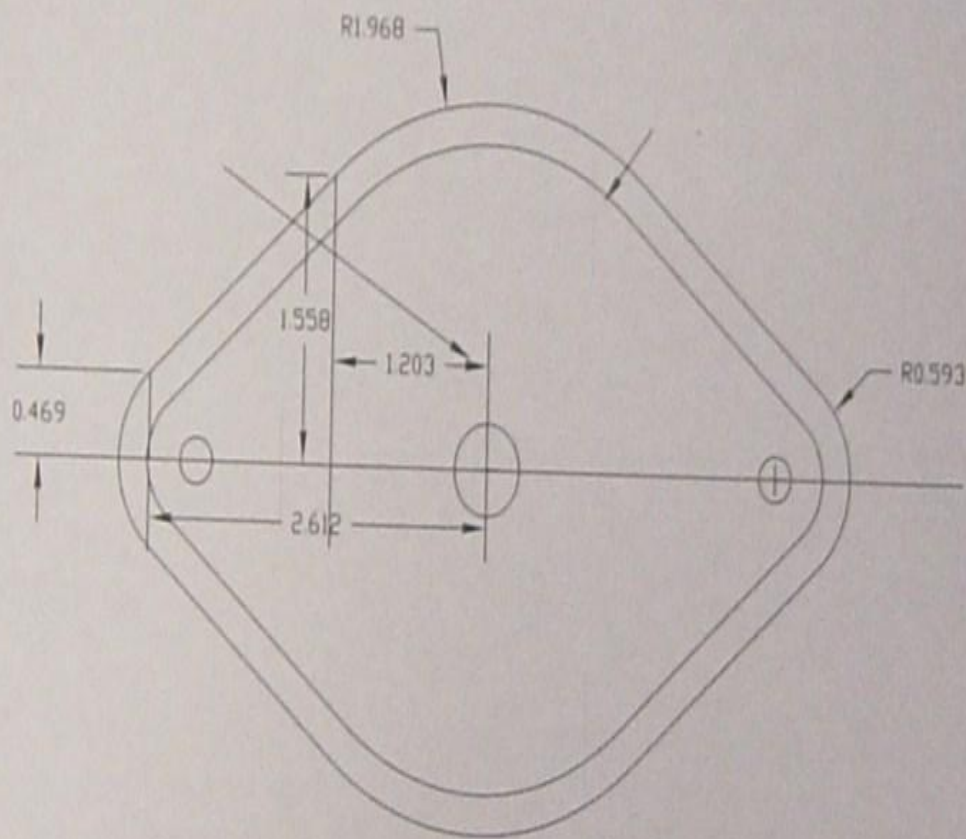
N0024 (9) M308

PAGE

PAGE

FWD

REV



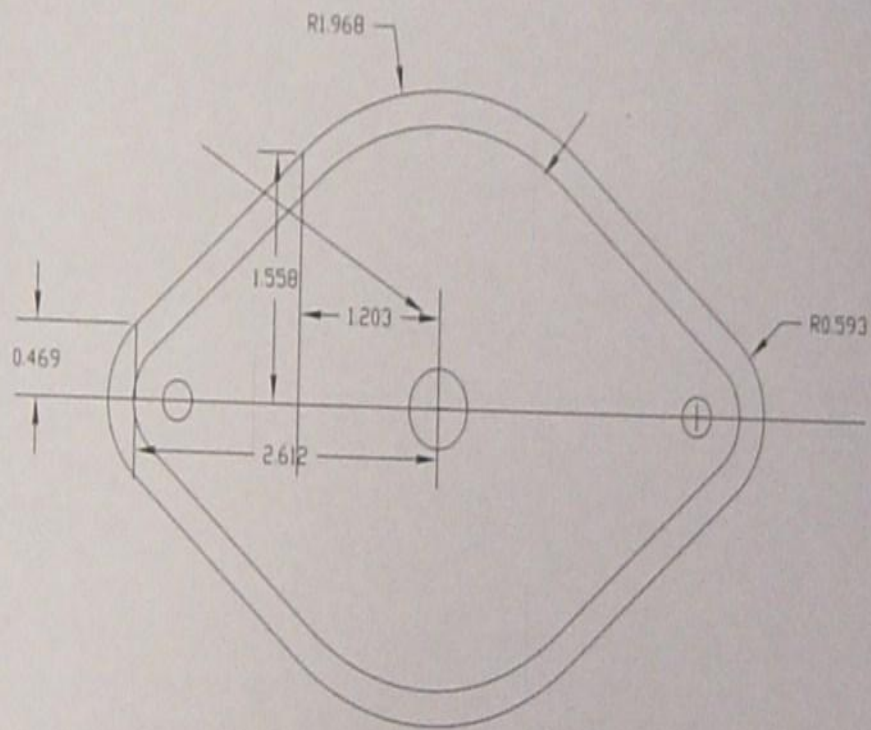
ROUGHING PRINT

```

PROGRAM          N0001
0-POSITION      POSITION
1-LINEAR MILL   P0 XY      PLANE
2-ARC MILL      X+003.5000  ENDPT
3-FRAME MILL    Y+000.0000  ENDPT
4-CIRCLE MILL   Z-001.5000  ENDPT
5-BOLT CIRCLE
6-REPEAT
7-SUBROUTINE    V          VECANG
8-DWELL         D          VECDIM
9-M FUNCTION    F0001.000  FEED
                G          GCYCLE
                W          Z REF
                K          PECK
                Q          CLR
                L          DWELL
  
```

```

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PAGE | POS | DELETE | COPY/ | RUN
FMD  | DISPLA | EVENT | STORE |
  
```

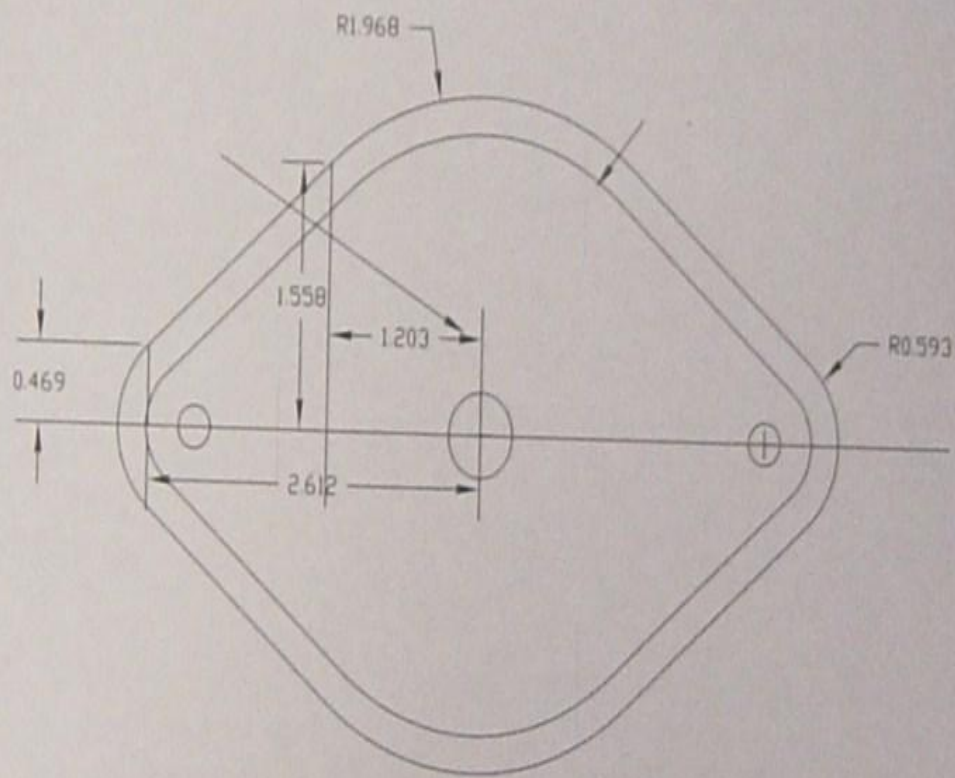



ROUGHING PRINT

```

PROGRAM                                N0002
0-POSITION                              M FUNCTIONS
1-LINEAR MILL
2-ARC MILL                              M03
3-FRAME MILL
4-CIRCLE MILL
5-BOLT CIRCLE                            E          FIXTUR
6-REPEAT
7-SUBROUTINE
8-DWELL                                  T          TOOL
9-M FUNCTION
  
```

				S	SPEED
PAGE	POS	DELETE	COPY/	RUN	
FWD	DISPLA	EVENT	STORE		



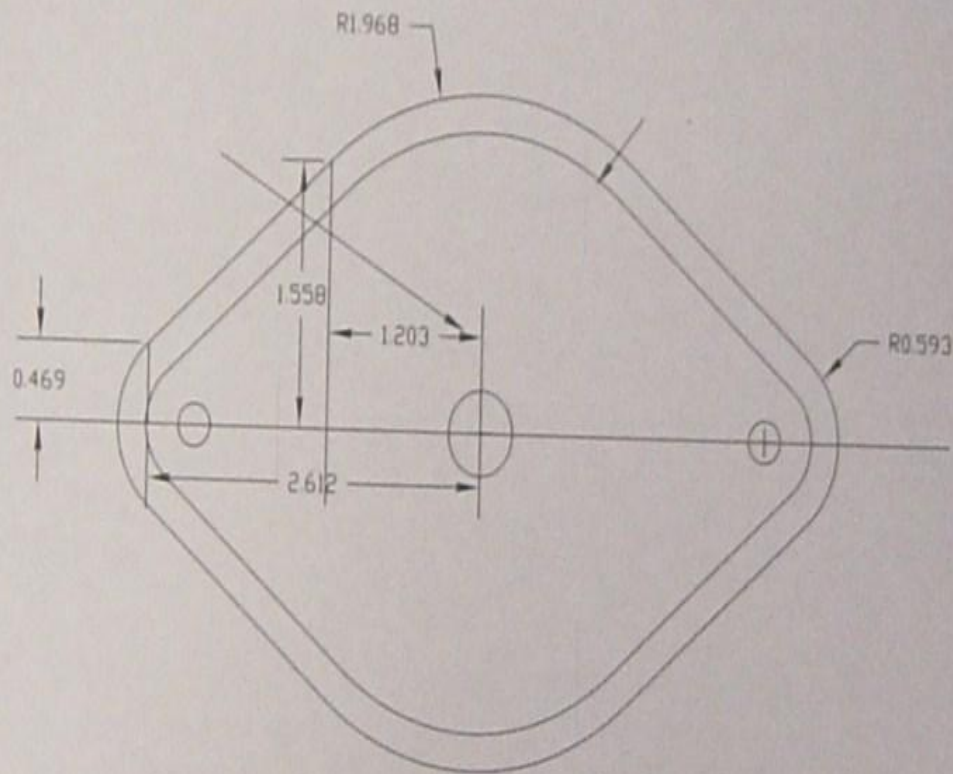
ROUGHING PRINT

```

PROGRAM N0003
0-POSITION LINEAR MILL
1-LINEAR MILL P0 XY PLANE
2-ARC MILL X+002.8430 ENDPT
3-FRAME MILL Y+000.0000 ENDPT
4-CIRCLE MILL Z-001.5000 ENDPT
5-BOLT CIRCLE
6-REPEAT
7-SUBROUTINE V VECANG
8-DWELL D VECDIM
9-M FUNCTION R RADIUS
          F FEED
          T TIME
          G
          C CCOMP
  
```

```

PAGE | POS | DELETE | COPY/ | RUN
FWD  | DISPLA | EVENT  | STORE  |
  
```

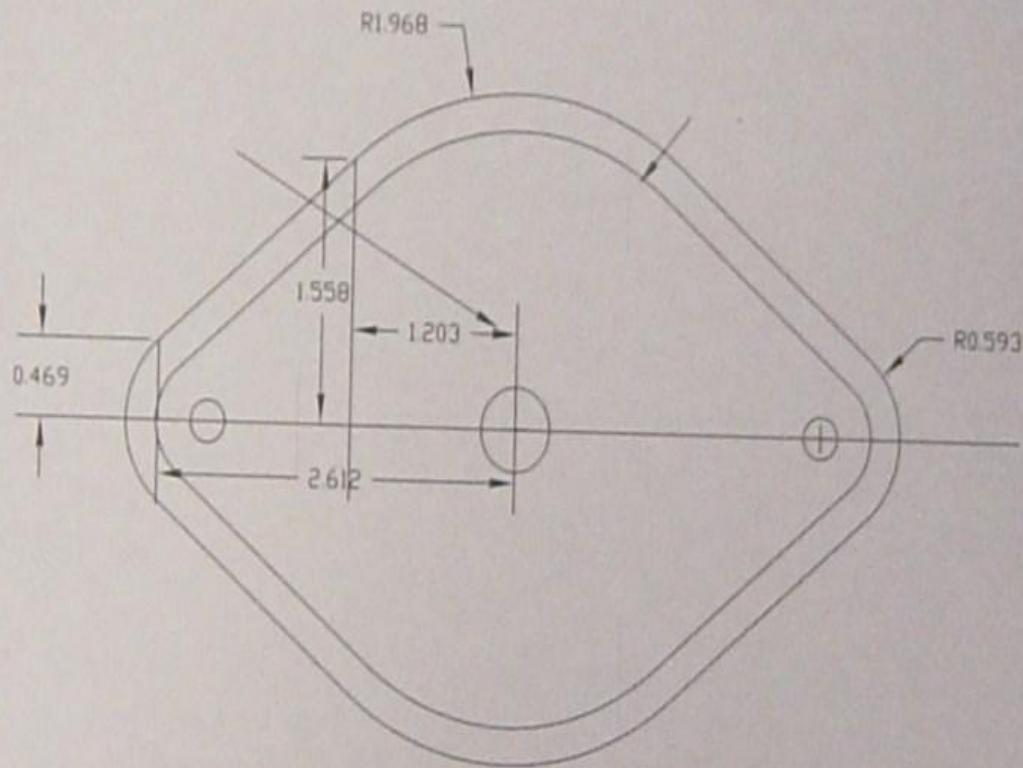


ROUGHING PRINT

```

PROGRAM          N0004
0-POSITION      ARC MILL
1-LINEAR MILL   P0 XY      PLANE
2-ARC MILL      X+002.6120  ENDPT
3-FRAME MILL    Y+000.4690  ENDPT
4-CIRCLE MILL   I+002.2500  CNTRX
5-BOLT CIRCLE   J+000.0000  CNTRY
6-REPEAT        Z-001.5000  HELIX
7-SUBROUTINE    A          STRANG
8-DWELL         B          ENDANG
9-M FUNCTION    R000.5930  RADIUS
                  E          ENDRAD
                  D1         DIRECT
                  F          FEED
                  G
                  C          CCOMP
  
```

PAGE	POS	DELETE	COPY/	RUN
FWD	DISPLA	EVENT	STORE	



ROUGHING PRINT

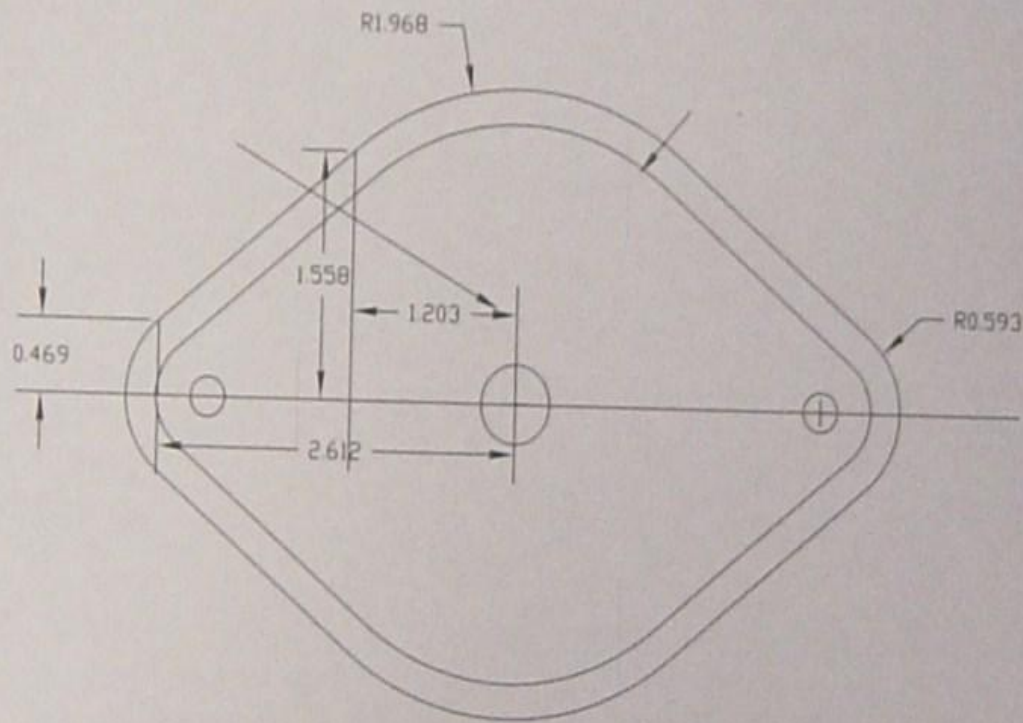
```

PROGRAM          N0005
0-POSITION      LINEAR MILL
1-LINEAR MILL   P0 XY      PLANE
2-ARC MILL      X+001.2030  ENDPT
3-FRAME MILL    Y+001.5580  ENDPT
4-CIRCLE MILL   Z-001.5000  ENDPT
5-BOLT CIRCLE
6-REPEAT
7-SUBROUTINE    V          VECANG
8-DWELL         D          VECDIN
9-M FUNCTION    R          RADIUS

                  F          FEED
                  T          TIME
                  G
                  C          CCOMP
  
```

```

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PAGE | POS | DELETE | COPY/ | RUN
FMD  | DISPLA | EVENT | STORE |
  
```



ROUGHING PRINT

```

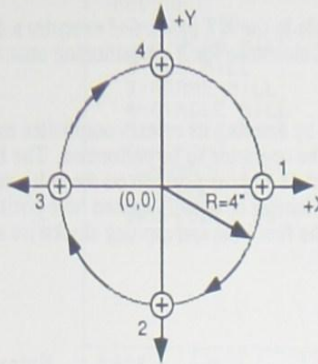
PROGRAM          N0006
0-POSITION      ARC MILL
1-LINEAR MILL   P0 XY      PLANE
2-ARC MILL      X-001.2030  ENDPT
3-FRAME MILL    Y+001.5580  ENDPT
4-CIRCLE MILL   I+000.0000  CNTRX
5-BOLT CIRCLE   J+000.0000  CNTRY
6-REPEAT        Z          HELIX
7-SUBROUTINE    A          STRANG
8-DWELL         B          ENDANG
9-M FUNCTION     R001.9680  RADIUS
                  E          ENDRAD
                  D1         DIRECT
                  F          FEED
                  G
                  C          CCOMP
  
```

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PAGE | POS | DELETE | COPY/ | RUN
FWD  | DISPLA | EVENT | STORE |
  
```

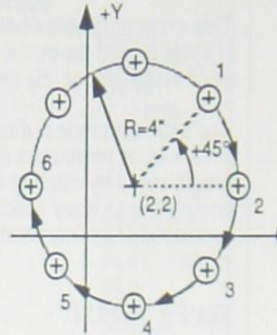
G1 - DRILL

X0
Y0
Z-1
A0
R4
F4
G1
W.5
H04



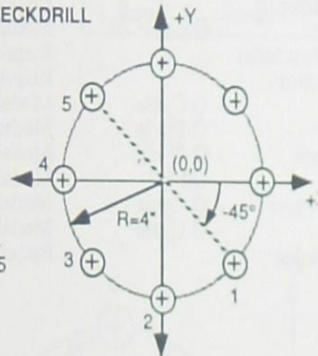
G2 - COUNTERBORE

X2
Y2
Z-1.5
A45
R4
F5
G4
W.5
L1.5
H08.06



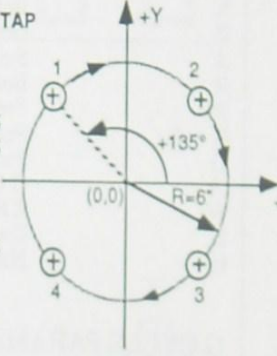
G3 - PECKDRILL

X0
Y0
Z-1.75
A-45
R4
F7.5
G3
W.25
H08.05



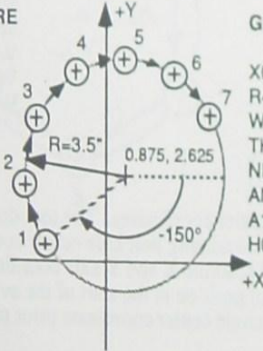
G4 - TAP

X0
Y0
Z-1.5
A135
R6
F6.5
G4
W.35
L2
H04



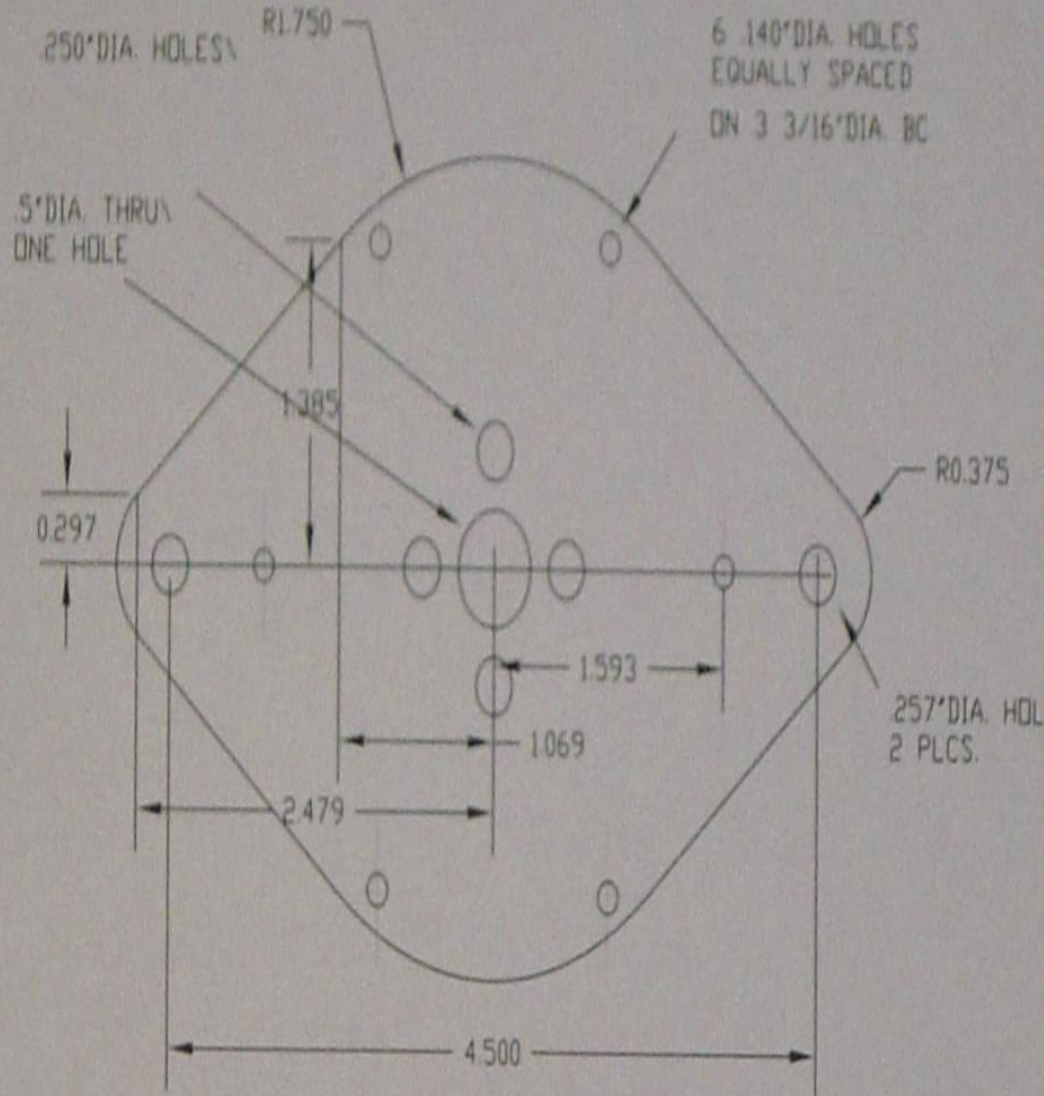
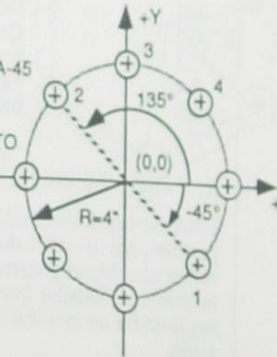
G5 - BORE

X0.875
Y2.625
Z-2.5
A-150
R3.5
F5
G5
W.45
H12.07



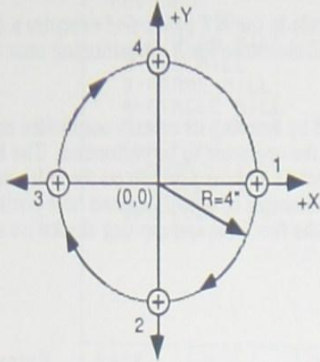
G1 - SKIP

X0,Y0,Z-1.75,A-45
R4,F7.5,G1
W.25,H08.01
THEN COPY TO
NEXT EVENT
AND EDIT...
A135
H08.03



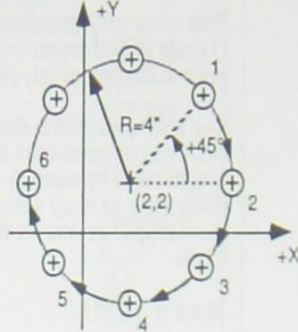
G1 - DRILL

X0
Y0
Z-1
A0
R4
F4
G1
W.5
H04



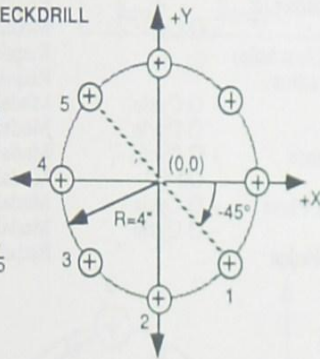
G2 - COUNTERBORE

X2
Y2
Z-1.5
A45
R4
F5
G4
W.5
L1.5
H08.06



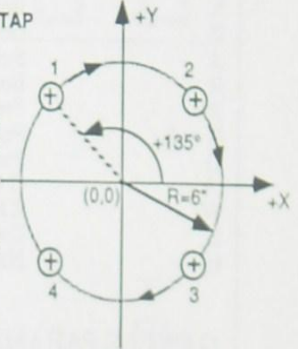
G3 - PECKDRILL

X0
Y0
Z-1.75
A -45
R4
F7.5
G3
W.25
H08.05



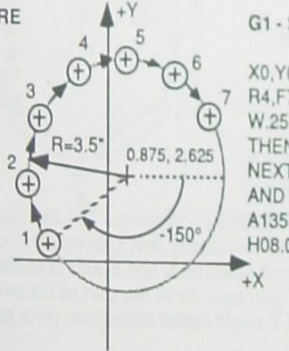
G4 - TAP

X0
Y0
Z-1.5
A135
R6
F6.5
G4
W.35
L2
H04



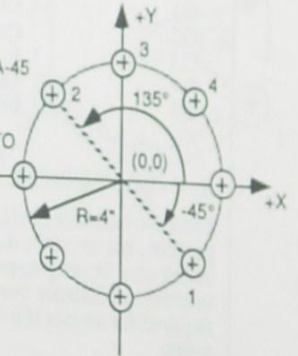
G5 - BORE

X0.875
Y2.625
Z-2.5
A-150
R3.5
F5
G5
W.45
H12.07



G1 - SKIP

X0,Y0,Z-1.75,A-45
R4,F7.5,G1
W.25,H08.01
THEN COPY TO
NEXT EVENT
AND EDIT...
A135
H08.03



DISPLAY PROGRAM

PART: PUMPBKBC

N0001 (9) M03\$

N0002 (5) X0 Y0 Z-1.5 A0 R1.5935

F.875 G1 W-1 H6\$

N0003 (9) M30\$

PAGE
FWD

PAGE
REV

