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O0001 (FANUC ANGLE HEAD MACRO)
(AUTHOR: Tim Markoski)
G00 G17 G20 G40 G49 G80 G90 G94
G00 G91 G28 Z0.0 M09
T01 M06
G00 G90 G54 X0.0 Y0.0 S2500 M04 (REVERSE SPINDLE FOR CW ON HEAD)
G00 G43 H01 Z12.0 M08
G65 P9180 X-3.5 Y0.0 Z1.0 D5.0 H0.2 Q0.19 R0.1 W500 U5.9055 V2.1345
F10.0 A2 B10.0 C45.0
G00 Z12.0 M05
G00 G91 G28 Z0.0 M09
G00 G91 G28 Y0.0
M30


O9180 (UNIVERSAL ANGLE HEAD MACRO)
(-------------------------)
(GENERATE LINEARIZED POINT-TO-POINT NC CODE)
(FOR MULTI-AXIS DRILLING OPERATIONS)
(PARAMETERS)
(#24 = HOLE LOCATION - X {0})
(#25 = HOLE LOCATION - Y {0})
(#26 = HOLE LOCATION - Z {0})
(#7 = HOLE DEPTH - D {2.0})
(#11 = SWARF CLEARANCE(G73/G83 ONLY) - H {0.2})
(#17 = PECK AMOUNT(G73/G83 ONLY) - Q {0.1})
(#18 = INCREMENTAL CLEARANCE - R {0.1})
(#23 = DWELL IN MILLISECONDS(G82 ONLY) - W {500})
(#21 = PIVOT DISTANCE - U {5.9055})
(#22 = TOOL GAUGE LENGTH - V {5.5})
(#9 = FEED RATE - F {10.0})
(#2 = B-AXIS ANGLE (ROTATE ABOUT Y) {10.0})
(#3 = C-AXIS ANGLE (ROTATE ABOUT Z) {45.0})
(#1 = TYPE G81=0/G82=1/G73=2/G83=3/G84=4/G85=5 {3})
(FORCE ABSOLUTE VALUES)
#1 = [ABS[#1]]
IF[#1GT5] GOTO 9991 (INVALID CYCLE TYPE!)
#7 = [ABS[#7]]
IF[#7EQ0.0] GOTO 9992 (INVALID HOLE DEPTH!)
#9 = [ABS[#9]]
IF[#9EQ0.0] GOTO 9993 (INVALID FEEDRATE!)
#17 = [ABS[#17]]
IF[#1EQ2] GOTO 17
IF[#1EQ3] GOTO 17
GOTO 18
N17
IF[#9EQ0.0] GOTO 9994 (INVALID PECK VALUE!)
N18
#18 = [ABS[#18]]
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IF[#18EQ0.0] GOTO 9995 (INVALID R CLEARANCE!)
#21 = [ABS[#21]]
IF[#21EQ0.0] GOTO 9996 (INVALID PIVOT LENGTH!)
#22 = [ABS[#22]]
IF[#22EQ0.0] GOTO 9997 (INVALID TOOL GAGE LENGTH!)
#11 = [ABS[#11]]
IF[#11EQ0.0] GOTO 9998 (INVALID CHIP CLEARANCE!)
#23 = [ABS[#23]]
(CALCULATE THE UNIT VECTORS)
#4 = [COS[#3] * SIN[#2]]
#5 = [COS[#3] * [TAN[#3] * SIN[#2]]]
#6 = [COS[#2]]
(CALCULATE THE TOTAL GAUGE LENGTH)
#8=[#21+#22]
(CALCULATE X,Y,Z SHIFTS FOR TOTAL GAUGE LENGTH)
#101=[#8*#4]
#102=[#8*#5]
#103=[#8*#6]
(CALCULATE X,Y,Z SHIFTS FOR R-PLANE CLEARANCE)
#111=[#18*#4]
#112=[#18*#5]
#113=[#18*#6]
(START POINT W/CLEARANCE)
#124=[#101+#111+#24]
#125=[#102+#112+#25]
#126=[#103+#113+#26]
#134=[#101+#111+#24]
#135=[#102+#112+#25]
#136=[#103+#113+#26]
(FINAL END POINT)
#144=[#24-[#7*#4]+#101]
#145=[#25-[#7*#5]+#102]
#146=[#26-[#7*#6]+#103]
IF[#1EQ0.0]GOTO 10
IF[#1EQ1.0]GOTO 20
IF[#1EQ2.0]GOTO 30
IF[#1EQ3.0]GOTO 40
IF[#1EQ4.0]GOTO 50
IF[#1EQ5.0]GOTO 60
GOTO 9991 (INVALID CYCLE SELECTION!)
N10 (G81 - STANDARD DRILL CYCLE)
(**********************)
(HOLE LOCATION - 'X' = #24)
(HOLE LOCATION - 'Y' = #25)
(HOLE LOCATION - 'Z' = #26)
(ANGLE 'B' = #2)
(ANGLE 'C' = #3)
(**********************)
(UNIT VECTOR - 'I' = #4)
(UNIT VECTOR - 'J' = #5)
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(UNIT VECTOR - 'K' = #6)
(**********)
(PIVOT DISTANCE = #21)
(TOOL GAUGE LENGTH = #22)
(TOTAL SET LENGTH = #8)
(**********)
(HOLE DEPTH - 'D' = #7)
(INCREMENTAL CLEARANCE - 'R' = #18)
(FEED RATE - 'F' = #9)
(**********)
G00 X[#124] Y[#125] Z[#126]
G01 X[#144] Y[#145] Z[#146] F[#9]
G01 X[#134] Y[#135] Z[#136] F[#9*50]
GOTO 99
(**********)
N20 (G82 - STANDARD DRILL CYCLE W/DWELL)
(**********)
(HOLE LOCATION - 'X' = #24)
(HOLE LOCATION - 'Y' = #25)
(HOLE LOCATION - 'Z' = #26)
(ANGLE 'B' = #2)
(ANGLE 'C' = #3)
(**********)
(UNIT VECTOR - 'I' = #4)
(UNIT VECTOR - 'J' = #5)
(UNIT VECTOR - 'K' = #6)
(**********)
(PIVOT DISTANCE = #21)
(TOOL GAUGE LENGTH = #22)
(TOTAL SET LENGTH = #8)
(**********)
(HOLE DEPTH - 'D' = #7)
(INCREMENTAL CLEARANCE - 'R' = #18)
(DWELL IN MILLISECONDS - 'P' = #23)
(FEED RATE - 'F' = #9)
(**********)
G00 X[#124] Y[#125] Z[#126]
G01 X[#144] Y[#145] Z[#146] F[#9]
G04 P#23
G01 X[#134] Y[#135] Z[#136] F[#9*50]
GOTO 99
(**********)
N30 (G73 - CHIP BREAK CYCLE)
(**********)
(HOLE LOCATION - 'X' = #24)
(HOLE LOCATION - 'Y' = #25)
(HOLE LOCATION - 'Z' = #26)
(ANGLE 'B' = #2)
(ANGLE 'C' = #3)
(**********)
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```
(UNIT VECTOR - 'I' = #4)
(UNIT VECTOR - 'J' = #5)
(UNIT VECTOR - 'K' = #6)
(**********)
(PIVOT DISTANCE = #21)
(TOOL GAUGE LENGTH = #22)
(TOTAL SET LENGTH = #8)
(**********)
(HOLE DEPTH - 'D' = #7)
(PECK AMOUNT - 'Q' = #17)
(SWARF CLEARANCE - 'H' = #11)
(INCREMENTAL CLEARANCE - 'R' = #18)
(FEED RATE - 'F' = #9)
(**********)
G00 X[#124] Y[#125] Z[#126]
WHILE[#126GT#146]DO 1
#124=[#124-[#17*#4]]
#125=[#125-[#17*#5]]
#126=[#126-[#17*#6]]
IF[#126LT#146] GOTO 73
G01 X[#124] Y[#125] Z[#126] F[#9]
G01 X[#124+[#11*#4]] Y[#125+[#11*#5]] Z[#126+[#11*#6]] F[#9*50]
END 1
N73
G01 X[#144] Y[#145] Z[#146] F[#9]
G01 X[#134] Y[#135] Z[#136] F[#9*50]
GOTO 99
(**********)
N40 (G83 - DEEP HOLE CYCLE)
(**********)
(HOLE LOCATION - 'X' = #24)
(HOLE LOCATION - 'Y' = #25)
(HOLE LOCATION - 'Z' = #26)
(ANGLE 'B' = #2)
(ANGLE 'C' = #3)
(**********)
(UNIT VECTOR - 'I' = #4)
(UNIT VECTOR - 'J' = #5)
(UNIT VECTOR - 'K' = #6)
(**********)
(PIVOT DISTANCE = #21)
(TOOL GAUGE LENGTH = #22)
(TOTAL SET LENGTH = #8)
(**********)
(HOLE DEPTH - 'D' = #7)
(PECK AMOUNT - 'Q' = #17)
(SWARF CLEARANCE - 'H' = #11)
(INCREMENTAL CLEARANCE - 'R' = #18)
(FEED RATE - 'F' = #9)
(**********)
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G00 X[#124] Y[#125] Z[#126]
WHILE[#126GT#146]DO 2
#124=[#124-[#17*#4]]
#125=[#125-[#17*#5]]
#126=[#126-[#17*#6]]
IF[#126LT#146] GOTO 83
G01 X[#124] Y[#125] Z[#126] F[#9]
G01 X[#134] Y[#135] Z[#136] F[#9*50]
G01 X[#124+[#11*#4]] Y[#125+[#11*#5]] Z[#126+[#11*#6]] F[#9*50]
END 2
N83
G01 X[#144] Y[#145] Z[#146] F[#9]
G01 X[#134] Y[#135] Z[#136] F[#9*50]
GOTO 99
(**********************)
N50 (G84 - TAPPING CYCLE)
(**********************)
(HOLE LOCATION - 'X' = #24)
(HOLE LOCATION - 'Y' = #25)
(HOLE LOCATION - 'Z' = #26)
(ANGLE 'B' = #2)
(ANGLE 'C' = #3)
(**********************)
(UNIT VECTOR - 'I' = #4)
(UNIT VECTOR - 'J' = #5)
(UNIT VECTOR - 'K' = #6)
(**********************)
(PIVOT DISTANCE = #21)
(TOOL GAUGE LENGTH = #22)
(TOTAL SET LENGTH = #8)
(**********************)
(HOLE DEPTH - 'D' = #7)
(INCREMENTAL CLEARANCE - 'R' = #18)
(FEED RATE - 'F' = #9)
(**********************)
G00 X[#124] Y[#125] Z[#126]
G01 X[#144] Y[#145] Z[#146] F[#9]
M03
G01 X[#134] Y[#135] Z[#136] F[#9]
M04
GOTO 99
(**********************)
N60 (G85 - BORING CYCLE)
(**********************)
(HOLE LOCATION - 'X' = #24)
(HOLE LOCATION - 'Y' = #25)
(HOLE LOCATION - 'Z' = #26)
(ANGLE 'B' = #2)
(ANGLE 'C' = #3)
(**********************)
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(UNIT VECTOR - 'I' = #4)
(UNIT VECTOR - 'J' = #5)
(UNIT VECTOR - 'K' = #6)
(**********)
(PIVOT DISTANCE = #21)
(TOOL GAUGE LENGTH = #22)
(TOTAL SET LENGTH = #8)
(**********)
(HOLE DEPTH - 'D' = #7)
(INCREMENTAL CLEARANCE - 'R' = #18)
(FEED RATE - 'F' = #9)
(**********)
G00 X[#124] Y[#125] Z[#126]
G01 X[#144] Y[#145] Z[#146] F[#9]
G01 X[#134] Y[#135] Z[#136] F[#9]
GOTO 99
(**********)
N99 G00 (END MACRO - SUCCESS)
M99
N9991
#3000=1(INVALID CYCLE TYPE!)
GOTO 9999
N9992
#3000=2(INVALID HOLE DEPTH!)
GOTO 9999
N9993
#3000=3(INVALID FEEDRATE!)
GOTO 9999
N9994
#3000=4(INVALID PECK VALUE!)
GOTO 9999
N9995
#3000=5(INVALID R CLEARANCE!)
GOTO 9999
N9996
#3000=6(INVALID PIVOT LENGTH!)
GOTO 9999
N9997
#3000=7(INVALID TOOL GAGE LENGTH!)
GOTO 9999
N9998
#3000=8(INVALID CHIP CLEARANCE!)
GOTO 9999
N9999 (END MACRO - FAIL)
M30
%
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(SOURCE: https://protect-us.mimecast.com/s/P7WZC1wMxVsNkX2sLUxzA?domain=linkedin.com)