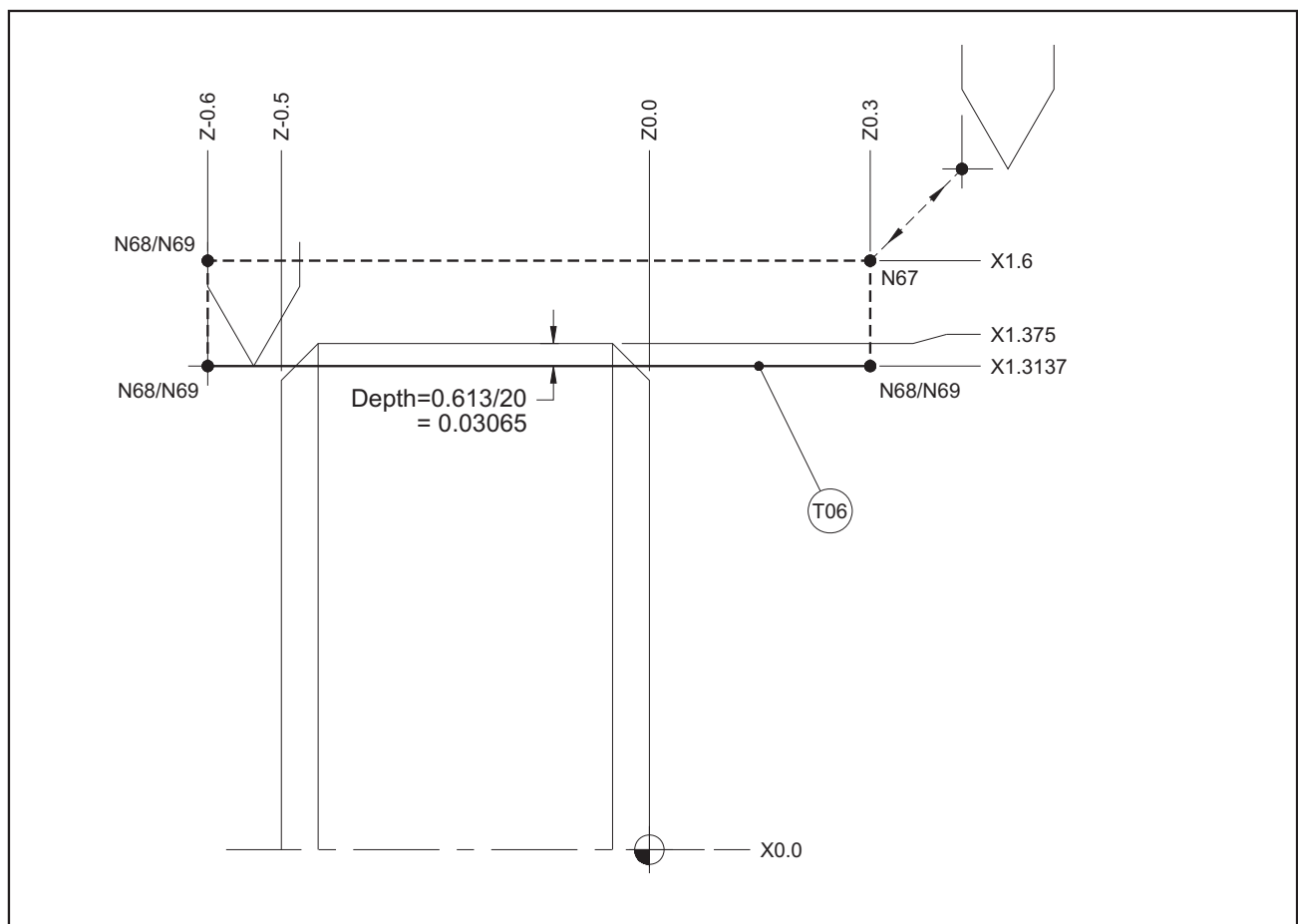


Simple Lathe Project - 4 of 4

The illustration shows the block numbers corresponding to those in the program. In the *Part 4* of the *Simple Lathe Project*, the operations include:

- ➡ SINGLE POINT THREADING ... identified by the start point N67 and the threading cycle N68/N69

The threading tool is programmed as a two-block G76 cycle, starting in block N67. The actual threading cuts are represented by blocks N68/N69 in the illustration.



(SIMPLE LATHE PROJECT - PART 4 OF 4)
 (TO BE USED IN ORDER OF PART 1 TO PART 4)
 (PROJECT ILLUSTRATES THE CONCEPT OF CNC LATHE PROGRAMMING)

(34-08 - PART 4 OF 4)
 (1.5 DIA ALUMINUM BAR - EXTEND BAR 1.0 OFF FRONT JAWS FACE)

(T03 - FACE & TURN - OD)	
N1 G20 G50 S2500 T0300	(INCHES - 2500 RPM MAX - T03)
N2 G96 S450 M03	(450 SFPM - SPINDLE CW)
N3 G00 X1.7 Z0 T0303 M08	(START FOR FACING-OFFSET 03-COOLANT)
N4 G01 X-0.07 F0.004	(FACE OFF TO BELOW CENTER LINE)
N5 G00 Z0.1	(CLEAR AWAY 0.1)
N6 G42 X1.075	(COMPENSATION RIGHT-START OF CHAMFER)
N7 G01 X1.375 Z-0.05 F0.003	(CUT CHAMFER 0.05 X 45 DEG)
N8 Z-0.635 F0.005	(CUT DIA 1.375)
N9 G00 U0.2	(CLEAR 0.1 ABOVE DIA)
N10 G40 X4.0 Z5.0 T0300	(COMP OFF-CLEAR TOOL CHG POS)
N11 M01	(OPTIONAL STOP)
	(BLANK LINE FOR CLARITY)
(T08 - NO.4 CENTER DRILL)	
N12 T0800	(TOOL CHANGE - T08)
N13 G97 S1200 M03	(1200 RPM - SPINDLE CW)
N14 G00 X0 Z0.1 T0808 M08	(START FOR CDRILL-OFFSET 08-COOLANT)
N15 G01 Z-0.269 F0.003	(FEED-IN TO CHFR DIA 0.25)
N16 G00 Z0.1	(RAPID OUT TO CLEAR)
N17 X4.0	(TOOL CHG X POSITION)
N18 Z5.0 T0800	(TOOL CHG Z POSITION - OFFSET OFF)
N19 M01	(OPTIONAL STOP)
	(BLANK LINE FOR CLARITY)
(T07 - 5/8 DIA DRILL)	
N20 T0700	(TOOL CHANGE - T07)
N21 G97 S917 M03	(917 RPM CW - 150X3.82/0.625 IS 917)
N22 G00 X0 Z0.1 T0707 M08	(START FOR DRILL-OFFSET 07-COOLANT)
N23 G01 Z-0.7175 F0.01	(FEED TO DEPTH - 0.5+0.03+0.3X0.625)
N24 G00 Z0.5	(RAPID OUT TO CLEAR)
N25 X4.0	(TOOL CHG X POS)
N26 Z3.0 T0700 M05	(TOOL CHG Z POS-OFFSET OFF-STOP SPDL)
N27 M01	(OPTIONAL STOP)
	(BLANK LINE FOR CLARITY)
(T04 - BORING BAR)	
N28 T0400	(TOOL CHANGE - T04)
N29 G96 S350 M03	(350 SFPM - SPINDLE CW)
N30 G00 G41 X0.6 Z0.1 T0404 M08	(COMPENSATION LEFT AT START POINT)
N31 X0.705	(START OF ROUGH BORE 1 OF 4)
N32 G01 Z-0.54 F0.007	(ROUGH BORE 1 OF 4)
N33 U-0.2	(RETRACT MOTION)
N34 G00 Z0.1	(RETURN MOTION)
N35 X0.785	(START OF ROUGH BORE 2 OF 4)
N36 G01 Z-0.54	(ROUGH BORE 2 OF 4)
N37 U-0.2	(RETRACT MOTION)
N38 G00 Z0.1	(RETURN MOTION)
N39 X0.865	(START OF ROUGH BORE 3 OF 4)
N40 G01 Z-0.54	(ROUGH BORE 3 OF 4)
N41 U-0.2	(RETRACT MOTION)
N42 G00 Z0.1	(RETURN MOTION)
N43 X0.945	(START OF ROUGH BORE 4 OF 4)
N44 G01 Z-0.54	(ROUGH BORE 4 OF 4)
N45 U-0.2	(RETRACT MOTION)
N46 G00 Z0.1	(RETURN MOTION)
N47 X1.23	(START FOR CHAMFERING)
N48 G01 X1.0 Z-0.015 F0.001	(0.015X45 DEG CHAMFER)
N49 Z-0.545 F0.003	(BORE THRU AT 1.0 DIA)
N50 U-0.2	(RETRACT X MOTION - CLEAR OUT BY 0.1)
N51 G00 Z0.1	(RETRACT IN FRONT OF PART)
N52 G40 X4.0 Z3.0 T0400 M05	(COMP OFF - TOOL CHG POS - STOP SPINDLE)
N53 M01	(OPTIONAL STOP)
	(BLANK LINE FOR CLARITY)

(T05 - 0.125 WIDE PART-OFF TOOL)	
N54 T0500	(TOOL CHANGE - T05)
N55 G97 S1750 M03	(1750 RPM - SPINDLE CW)
N56 G00 X1.7 Z0.1 T0505 M08	(CLEAR POSITION AT FRONT)
N57 Z-0.635	(START POSITION AT END OF PART)
N58 G01 X1.2 F0.002	(OPEN UP TO 1.2 DIA)
N59 G00 X1.475	(RAPID TO START POSITION IN X)
N60 Z-0.525	(RAPID TO START POSITION IN Z+0.125)
N61 G01 X1.255 Z-0.635	(CUT BACK CHFR 0.01 FURTHER)
N62 G00 X1.7	(RAPID TO CLEAR X)
N63 X4.0 Z5.0 T0500	(RAPID TO TOOL CHG POS)
N64 M01	(OPTIONAL STOP)
	(BLANK LINE FOR CLARITY)
(T06 - THREADING TOOL - 20 TPI)	
N65 T0600	(TOOL CHANGE - T06)
N66 G97 S1000 M03	(1000 RPM - SPINDLE CW)
N67 G00 X1.6 Z0.3 T0606 M08	(START POS FOR THREADING - NOTE Z0.3)
N68 G76 P011060 Q005 R0.002	(THREADING CYCLE)
N69 G76 X1.3137 Z-0.6 R0 P0307 Q0120 F0.05	(THREADING CYCLE CONTINUED)
N70 G00 X4.0 Z5.0 T0600	(CLEAR POS FOR TOOL CHG - OFFSET OFF)
N71 M01	(OPTIONAL STOP)
	(BLANK LINE FOR CLARITY)
(T05 - 0.125 WIDE PART-OFF TOOL)	
N72 T0500	(TOOL CHANGE - T05)
N73 G97 S1750 M03	(1750 RPM - SPINDLE CW)
N74 G00 X1.7 Z0.1 T0505	(CLEAR POSITION AT FRONT)
N75 Z-0.625	(START POS AT END OF PART)
N76 G01 X-0.02 F0.0015	(PART-OFF TO 0.02 BELOW CENTERLINE)
N77 G00 X1.7	(RAPID TO CLEAR ABOVE PART)
N78 X4.0 Z5.0 T0500	(RAPID TO TOOL CHG POSITION)
N79 M30	(END OF PROGRAM)
%	(END OF FILE TRANSFER)

For the CNC lathes with controls that use a single block multiple repetitive cycle G76, the closest equivalent input for the threading operation will be:

```
G76 X1.3137 Z-0.6 I0 K0.03065 D0120 A60 P2 F0.05      (THREADING CYCLE)
```