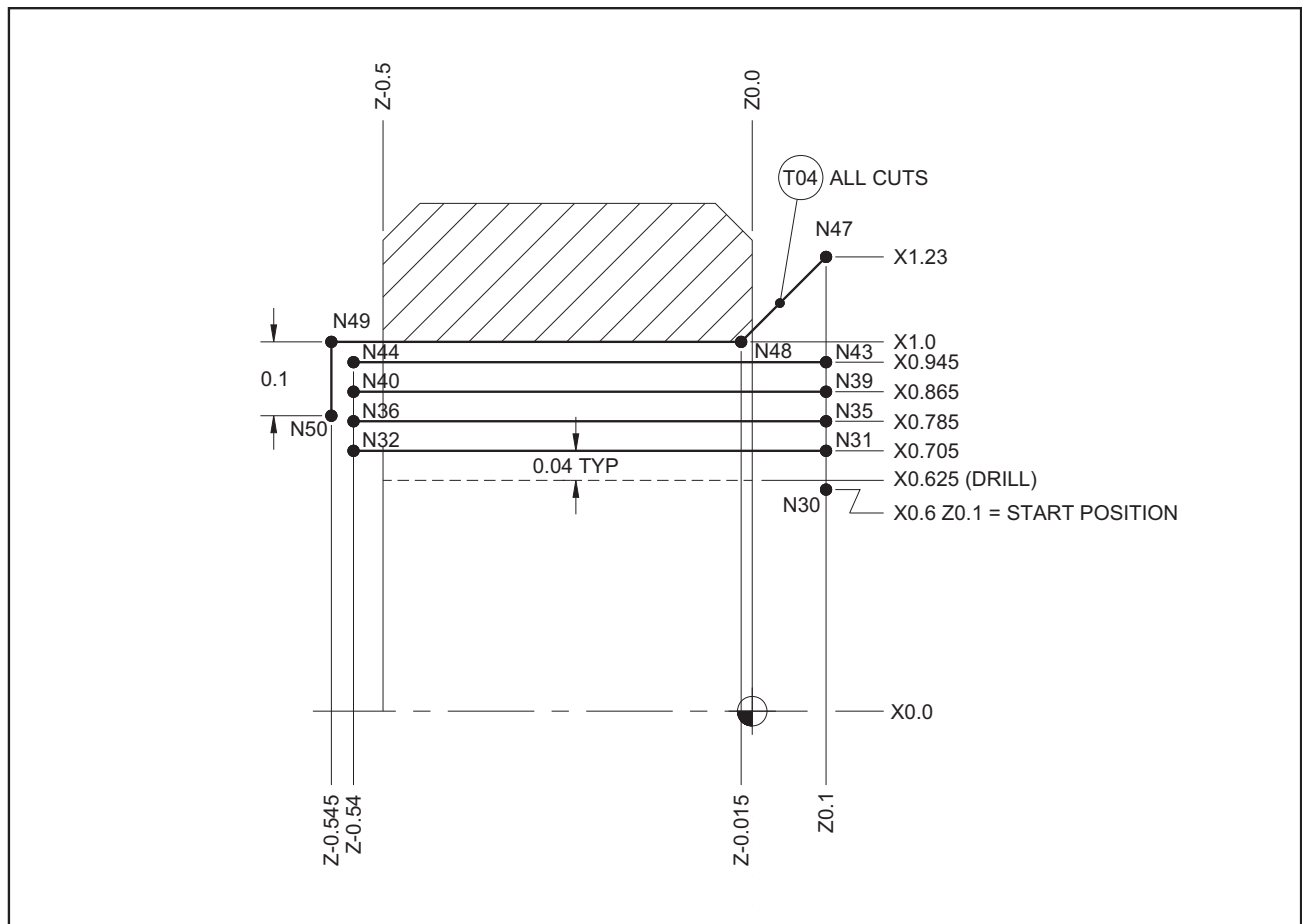


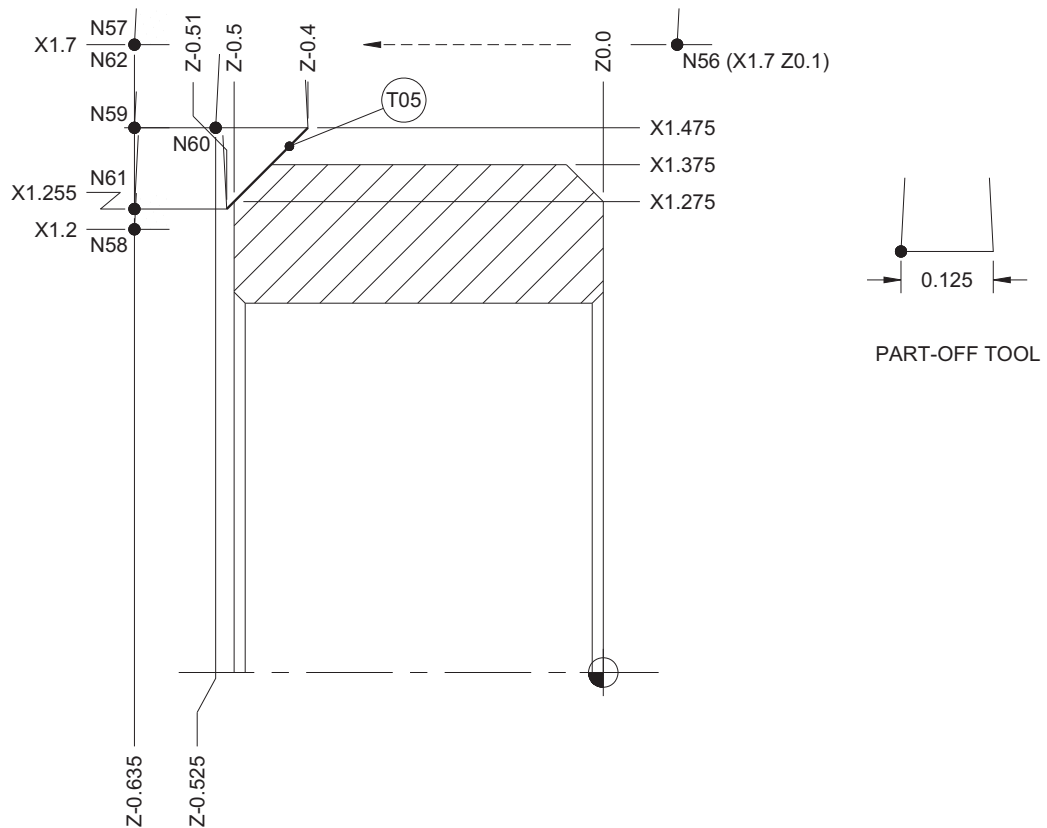
## Simple Lathe Project - 3 of 4

The illustration shows the block numbers corresponding to those in the program. In the *Part 3* of the *Simple Lathe Project*, the operations include:

- ➡ BORING ... identified by blocks N30-N51
- ➡ BACK CHAMFER ... identified by blocks N56-N62

The center drill depth is programmed at Z-0.269 (in block N15), which is referenced on *page 196*, in the *CNC Programming Handbook*. Keep in mind that any Z-depth close to this value would most likely be correct as well.





(SIMPLE LATHE PROJECT - PART 3 OF 4)  
 (TO BE USED IN ORDER OF PART 1 TO PART 4)  
 (PROJECT ILLUSTRATES THE CONCEPT OF CNC LATHE PROGRAMMING)

(34-07 - PART 3 OF 4)  
 (1.5 DIA ALUMINUM BAR - EXTEND BAR 1.0 OFF FRONT JAWS FACE)

(T03 - FACE & TURN - OD)

N1 G20 G50 S2500 T0300  
 N2 G96 S450 M03  
 N3 G00 X1.7 Z0 T0303 M08  
 N4 G01 X-0.07 F0.004  
 N5 G00 Z0.1  
 N6 G42 X1.075  
 N7 G01 X1.375 Z-0.05 F0.003  
 N8 Z-0.635 F0.005  
 N9 G00 U0.2  
 N10 G40 X4.0 Z5.0 T0300  
 N11 M01

(INCHES - 2500 RPM MAX - T03)  
 (450 SFPM - SPINDLE CW)  
 (START FOR FACING-OFFSET 03-COOLANT)  
 (FACE OFF TO BELOW CENTER LINE)  
 (CLEAR AWAY 0.1)  
 (COMPENSATION RIGHT-START OF CHAMFER)  
 (CUT CHAMFER 0.05 X 45 DEG)  
 (CUT DIA 1.375)  
 (CLEAR 0.1 ABOVE DIA)  
 (COMP OFF-CLEAR TOOL CHG POS)  
 (OPTIONAL STOP)  
 (BLANK LINE FOR CLARITY)

(T08 - NO.4 CENTER DRILL)

N12 T0800  
 N13 G97 S1200 M03  
 N14 G00 X0 Z0.1 T0808 M08  
 N15 G01 Z-0.269 F0.003  
 N16 G00 Z0.1  
 N17 X4.0  
 N18 Z5.0 T0800  
 N19 M01

(TOOL CHANGE - T08)  
 (1200 RPM - SPINDLE CW)  
 (START FOR CDRILL-OFFSET 08-COOLANT)  
 (FEED-IN TO CHFR DIA 0.25)  
 (RAPID OUT TO CLEAR)  
 (TOOL CHG X POSITION)  
 (TOOL CHG Z POSITION - OFFSET OFF)  
 (OPTIONAL STOP)  
 (BLANK LINE FOR CLARITY)

(T07 - 5/8 DIA DRILL)	(TOOL CHANGE - T07)
N20 T0700	(917 RPM CW - 150X3.82/0.625 IS 917)
N21 G97 S917 M03	(START FOR DRILL-OFFSET 07-COOLANT)
N22 G00 X0 Z0.1 T0707 M08	(FEED TO DEPTH - 0.5+0.03+0.3X0.625)
N23 G01 Z-0.7175 F0.01	(RAPID OUT TO CLEAR)
N24 G00 Z0.5	(TOOL CHG X POS)
N25 X4.0	(TOOL CHG Z POS-OFFSET OFF-STOP SPDL)
N26 Z3.0 T0700 M05	(OPTIONAL STOP)
N27 M01	(BLANK LINE FOR CLARITY)
 (T04 - BORING BAR)	 (TOOL CHANGE - T04)
N28 T0400	(350 SFPM - SPINDLE CW)
N29 G96 S350 M03	(COMPENSATION LEFT AT START POINT)
N30 G00 G41 X0.6 Z0.1 T0404 M08	(START OF ROUGH BORE 1 OF 4)
N31 X0.705	(ROUGH BORE 1 OF 4)
N32 G01 Z-0.54 F0.007	(RETRACT MOTION)
N33 U-0.2	(RETURN MOTION)
N34 G00 Z0.1	(START OF ROUGH BORE 2 OF 4)
N35 X0.785	(ROUGH BORE 2 OF 4)
N36 G01 Z-0.54	(RETRACT MOTION)
N37 U-0.2	(RETURN MOTION)
N38 G00 Z0.1	(START OF ROUGH BORE 3 OF 4)
N39 X0.865	(ROUGH BORE 3 OF 4)
N40 G01 Z-0.54	(RETRACT MOTION)
N41 U-0.2	(RETURN MOTION)
N42 G00 Z0.1	(START OF ROUGH BORE 4 OF 4)
N43 X0.945	(ROUGH BORE 4 OF 4)
N44 G01 Z-0.54	(RETRACT MOTION)
N45 U-0.2	(RETURN MOTION)
N46 G00 Z0.1	(START FOR CHAMFERING)
N47 X1.23	(0.015X45 DEG CHAMFER)
N48 G01 X1.0 Z-0.015 F0.001	(BORE THRU AT 1.0 DIA)
N49 Z-0.545 F0.003	(RETRACT X MOTION - CLEAR OUT BY 0.1)
N50 U-0.2	(RETRACT IN FRONT OF PART)
N51 G00 Z0.1	(COMP OFF - TOOL CHG POS - STOP SPINDLE)
N52 G40 X4.0 Z3.0 T0400 M05	(OPTIONAL STOP)
N53 M01	(BLANK LINE FOR CLARITY)
 (T05 - 0.125 WIDE PART-OFF TOOL)	 (TOOL CHANGE - T05)
N54 T0500	(1750 RPM - SPINDLE CW)
N55 G97 S1750 M03	(CLEAR POSITION AT FRONT)
N56 G00 X1.7 Z0.1 T0505 M08	(START POSITION AT END OF PART)
N57 Z-0.635	(OPEN UP TO 1.2 DIA)
N58 G01 X1.2 F0.002	(RAPID TO START POSITION IN X)
N59 G00 X1.475	(RAPID TO START POSITION IN Z+0.125)
N60 Z-0.525	(CUT BACK CHFR 0.01 FURTHER)
N61 G01 X1.255 Z-0.635	(RAPID TO CLEAR X)
N62 G00 X1.7	(RAPID TO TOOL CHG POS)
N63 X4.0 Z5.0 T0500	(OPTIONAL STOP)
N64 M01	(BLANK LINE FOR CLARITY)
 (T05 - 0.125 WIDE PART-OFF TOOL)	 (TOOL CHANGE - T05)
N65 T0500	(1750 RPM - SPINDLE CW)
N66 G97 S1750 M03	(CLEAR POSITION AT FRONT)
N67 G00 X1.7 Z0.1 T0505	(START POS AT END OF PART)
N68 Z-0.625	(PART-OFF TO 0.02 BELOW CENTERLINE)
N69 G01 X-0.02 F0.0015	(RAPID TO CLEAR ABOVE PART)
N70 G00 X1.7	(RAPID TO TOOL CHG POSITION)
N71 X4.0 Z5.0 T0500	(END OF PROGRAM)
N72 M30	(END OF FILE TRANSFER)
%	

*Note:* The part-off tool called in block N54 is the same as the part-off tool called in N65. They are separated only for convenience of the training and easy understanding of their operations. In a production environment, there would be only one call for the part-off tool, beginning in N54, and combining the BACK CHAMFER and the PART-OFF together, with a shorter result.

The block reference numbers in the illustrations refer to the program numbers above.

(T05 - 0.125 WIDE PART-OFF TOOL)

```
N54 T0500
N55 G97 S1750 M03
N56 G00 X1.7 Z0.1 T0505 M08
N57 Z-0.635
N58 G01 X1.2 F0.002
N59 G00 X1.475
N60 Z-0.525
N61 G01 X1.275 Z-0.625
N62 X-0.02 F0.0015
N63 G00 X1.7
N64 X4.0 Z5.0 T0500
N65 M30
%
```

```
(TOOL CHANGE - T05)
(1750 RPM - SPINDLE CW)
(CLEAR POSITION AT FRONT)
(START POSITION AT END OF PART)
(OPEN UP TO 1.2 DIA)
(RAPID TO START POSITION IN X)
(RAPID TO START POSITION IN Z+0.125)
(CUT BACK CHAMFER)
(PART-OFF TO 0.02 BELOW CENTERLINE)
(RAPID TO CLEAR ABOVE PART)
(RAPID TO TOOL CHG POSITION)
(END OF PROGRAM)
(END OF FILE TRANSFER)
```