

Machining with Tailstock

Solution to this project requires understanding its initial requirements. For an accurate part setup, the Z geometry offsets for T03 and T08 must be set for actual machining, which means the Z0 must be 200 mm from the chuck/collet face. For the stopper, 34 mm have to be shifted on diameter (17 mm per side) and 16 mm shift is necessary along the Z axis. The part can be finished to length in a subsequent operation, not important for this project.

(44-01 - MACHINING WITH TAILSTOCK)

(25 MM DIA ALUMINUM BAR PRECUT TO 250 MM LENGTH)

(INITIAL BAR EXTENSION MUST BE LESS THAN 50 MM FROM JAWS FACE)

(T08 USED AS A STOPPER - MACHINE SETUP SHIFTED BY XZ AMOUNTS)

N1 G21 T0800	(METRIC UNITS - TOOL 8 SELECTED)
N2 G00 Z-165.7 T0808	(0.3 MM FOR FACING - STOPPER SHIFTED BY 16-0.3 MM)
N3 X55.0	(FRONT FACE OF STOPPER AT 21.0 DIA - 21+2*17=55)
N4 M00	(EXTEND THE BAR AGAINST STOPPER FOR CENTER DRILL)
N5 G28 U0	(RETURN TO MACHINE ZERO IN X-AXIS)
N6 G00 Z-100.0 T0800	(TOOL TO SAFE INDEXING POSITION FOR T03)
N7 M01	(OPTIONAL STOP)

(T03 - FACE CUT - 35 DEG INSERT)

N8 T0300	(TOOL 3 SELECTED)
N9 G97 S1800 M03	(1800 R/MIN FOR FACE CUT)
N10 G00 X28.0 Z-150.0 T0303 M08	(START POSITION FRO FACE CUT)
N11 G01 X-1.8 F0.1	(FACE CUT BELOW CENTER LINE FOR FLATNESS)
N12 G00 X28.0 Z-145.0	(SAFE POSITION OFF THE FACE)
N13 G28 U0	(RETURN TO MACHINE ZERO IN X-AXIS)
N14 G00 Z-100.0 T0300 M09	(TOOL TO SAFE INDEXING POSITION FOR T08)
N15 M01	(OPTIONAL STOP)

(T08 USED AS A CENTER DRILL - MACHINE SETUP USED)

N16 T0800	(TOOL 8 SELECTED)
N17 G97 S1400 M03	(1400 R/MIN FRO CENTER DRILLING)
N18 G00 X0 Z-145.0 T0808 M08	(5 MM CLEARANCE OFF FACE)
N19 G01 W-11.0 F0.075	(6 MM DEPTH OF CENTER DRILL)
N20 G04 U0.5	(0.5 SEC DWELL FOR BETTER FINISH)
N21 G00 W11.0 M09	(RETURN TO THE START POSITION)
N22 G28 U0	(RETURN TO MACHINE ZERO IN X-AXIS)
N23 Z-11.0	(ADJUSTED STOPPER POSITION 5 MM OFF FACE - 16-5=11)
N24 X55.0 Z-16.0	(FRONT FACE OF STOPPER AT 21.0 DIA - 21+2*17=55)
N25 M00	(EXTEND THE BAR AGAINST STOPPER FOR TURNING)
N26 G28 U0	(RETURN TO MACHINE ZERO IN X-AXIS)
N27 Z-11.25	(TOOL TO SAVE INDEXING POSITION FOR T03)
N28 M00	(APPLY TAILSTOCK)

(T03 - FACE CUT - 35 DEG INSERT)

N29 G50 S3000 T0300	(TOOL 3 SELECTED WITH 3000 R/MIN MAXIMUM)
N30 G96 S125 M03	(SURFACE SPEED SETTING OF 125 M/MIN)
N31 G00 Z2.5 T0303 M08	(START OF THE 1 MM CHAMFER IN Z-AXIS)
N32 G42 X17.0	(START OF THE 1 MM CHAMFER IN X-AXIS)
N33 G01 X24.0 Z-1.0 F0.25	(FRONT CHAMFER CUTTING)
N34 Z-15.0	(FRONT DIAMETER OF 24 MM)
N35 G02 Z-165.0 R2000.0	(CUTTING THE 2000 MM RADIUS)
N36 G01 Z-185.0	(BACK DIAMETER OF 24 MM)
N37 U3.0	(CLEAR ABOVE PART)
N38 G40 G28 U0	(RETURN TO MACHINE ZERO IN X AXIS)
N39 G28 W0 T0300 M09	(RETURN TO MACHINE ZERO IN Z AXIS)
N40 M30	(END OF PROGRAM)
%	