30-04 Turning Offsets

Tool nose radius offset on CNC lathes works on the same principles as cutter radius offset on machining centers. The major exception is that the cutting tool is set to its edge, *not* its center. In this project, the instructions below relate to a typical CNC lathe and reflect common causes for changing existing offsets. The CNC lathe used for the project is a common slant bed rear lathe (turret located above the centerline).

The illustration shows two similar control offset screens - the *geometry* offset screen and the tool *wear* offset screen. On this page, the illustration shows the *current* settings for four tools, T01 through T04. At this point, there are no offset data on the next page (see illustration). The objective of this project is to fill-in all data with current *or* modified offset values, based on the conditions specified in the ten instructions below *(follow the order)*.

OFFSET - GEOMETRY				
No.	X-OFFSET	Z-OFFSET	RADIUS	TIP
01	-308.490	-249.610	1.200	3
02	-293.885	-191.730	0.000	0
03	-306.920	-251.580	0.800	8
04	-310.500	-186.800	0.000	7

OFFSET - WEAR				
No.	X-OFFSET	Z-OFFSET	RADIUS	TIP
01	0.013	0.000	1.200	3
02	0.000	0.000	0.000	0
03	0.000	0.000	0.800	8
04	0.000	0.000	0.000	7

1. Tool T04 is a drill that has not been set correctly and does not cut deep enough.
   Change the existing geometry offset, so the drill makes the hole 1.5 mm deeper (no change in the program).
2. Tool T02 is a boring bar that uses CNMG 12 04 08 insert. The offset entry for this tool is not complete - fill-in the missing data into the proper screen.
3. An external diameter is 0.08 mm oversize, machined with tool T01. Change the proper offset, so the diameter is machined to the correct size.
4. Adjust the geometry offset of tool T03, so it cuts 0.1 mm larger diameter.
5. The bored diameter is 0.057 mm smaller than required. Change the appropriate offset data for tool T02.
6. If the tip number 2 is entered for a tool in the ***Geometry Offset***, what will the setting in the ***Wear Offset*** be?
7. When is the offset tool tip orientation number T equal to zero? Name some typical operations with T set to zero.
8. What minimum clearance is required in tool nose radius offset mode? Provide a typical example.
9. If the insert for T02 were changed from CNMG 12 04 08 to CNMG 12 04 12, what offset changes would be required? Name ALL changes required.
10. Tool T03 is an external finishing tool - describe its general shape and orientation (or a catalogue number)

➲ Fill-in all data for the FIRST FIVE instructions, even if they have not changed from the previous screen illustration:

OFFSET - GEOMETRY				
No.	X-OFFSET	Z-OFFSET	RADIUS	TIP
01				
02				
03				
04				

OFFSET - WEAR				
No.	X-OFFSET	Z-OFFSET	RADIUS	TIP
01				
02				
03				
04				

➲ Answer questions 6 to 10 below:

6. _____

7. _____

8. _____

9. _____

10. _____