

Changing offsets at the CNC machine is a typical job for a qualified CNC operator. The part programmer should also understand how offsets work and how to change them properly. In this project, the questions relate to a CNC machining center, and reflect common causes for changing existing offsets.

The illustration shows a control offset screen, where the length and radius offsets use separate registers. All tools in the project follow the format **Txx = Hxx = Dxx**, for example, T03 uses H03 and D03 as offsets, and so on.

The top illustration shows current settings for four tools, T01 through T04. At the moment, the bottom illustration is empty. The objective of this project is to fill-in the bottom illustration with current or modified offset values, many of them based on the conditions specified in the ten questions.

No.	H-OFFSET		D-OFFSET	
	GEOMETRY	WEAR	GEOMETRY	WEAR
01	-154.370	0.000	6.000	0.055
02	-178.830	-0.028	4.500	0.000
03	-166.725	0.036	0.000	0.000
04	-147.510	0.000	7.500	-0.117

No.	H-OFFSET		D-OFFSET	
	GEOMETRY	WEAR	GEOMETRY	WEAR
01				
02				
03				
04				

- Tool T04 has cut a pocket diameter that is 0.064 mm oversize. Change the existing offset, so the diameter is cut within tolerances.
- Tool T02 has cut a depth that is 0.1 mm too shallow. Change the existing offset, so the depth is cut within tolerances.
- A rectangular pocket width is 0.12 mm undersize, machined with tool T01. Change the existing offset, so the width is cut within tolerances.
- Change the offsets for tool T03 in such a way, that the wear offset becomes zero, and its current amount is transferred to the geometry offset.
- The pocket depth machined with tool T01 is 0.14 mm too deep. Change the existing offset, so the depth is cut within tolerances.
- The cutter radius offset for tool T03 has been accidentally omitted in the settings. Correct the error for tool T03, which is a new Ø25 mm end mill.
- What is the current diameter of tool T02?
- If the tool diameter of tool T02 were changed to 10 mm, what offset changes would be affected?
- If the pocket depth machined with tool T04 had to be increased by 3 mm, how would the offset settings change?
- The above examples show a separate entry for the length offset (**H**) and the radius offset (**D**). Some controls have a single (shared) offset registry, where both **H** and **D** offsets are stored. How would the current settings for tool T01 be affected? Specify program entry as well as the stored offset values.