

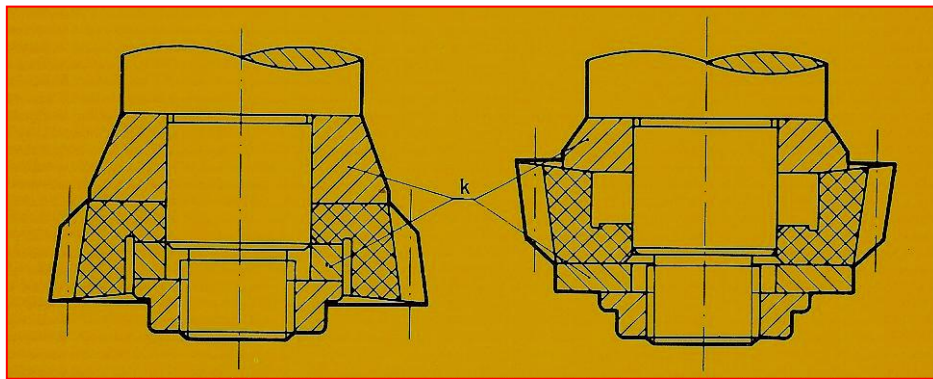
## Suggestions for mounting shaper cutters

A wrong installation of shaper cutters in the shaper machine causes errors and reduces the performance of the cutters.

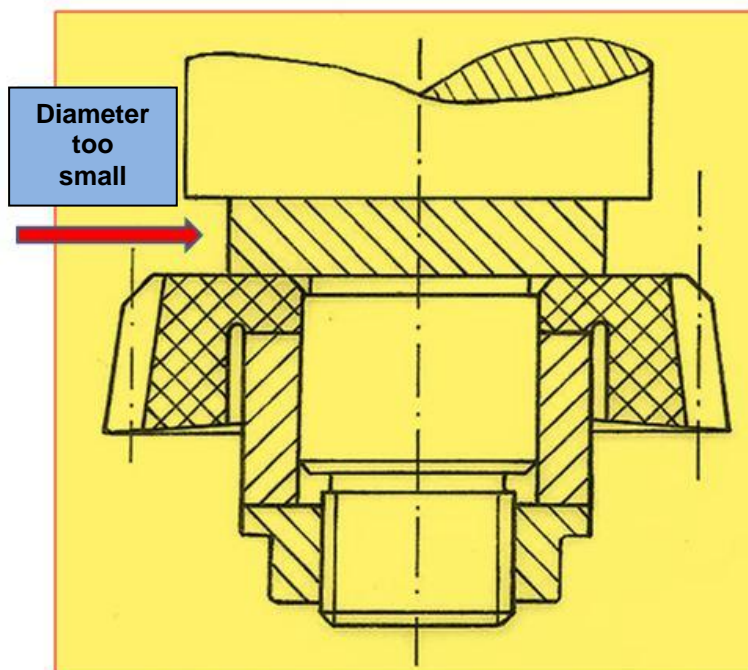
It is suggested to observe the following precautions:

- 1) Before mounting the cutter in the shaper machine you should check that the spindle rotates without errors of eccentricity and that the flatness errors of the support surface of the cutter are not excessive.
- 2) The surface of the cutter mounted must have a flatness of less than 0.015 mm and the error of eccentricity must not exceed 0.01 mm. If the flatness is too high you can reduce it by changing the angular position of the spacers (K).
- 3) To ensure greater rigidity, the spacer must be sized so that the cutter is locked to the largest diameter possible. If possible only one spacer must be used.

In the figure N°1 are two examples of correct clamping of the cutters, and figure N°2 shows an incorrect mounting, because the upper spacer has a diameter too small.

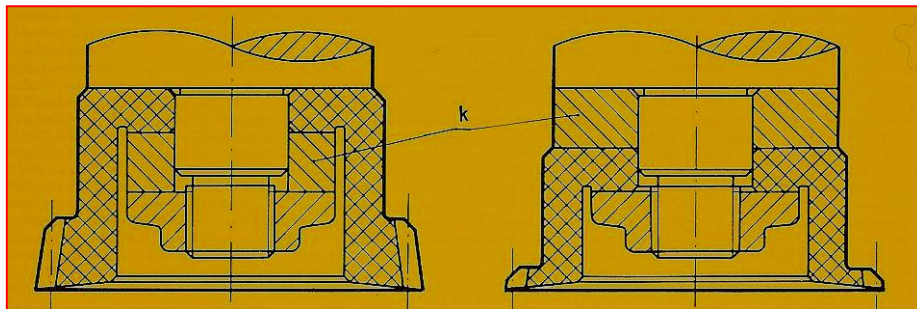


**Figure N°1** – Correct mounting of shaper cutters disk type



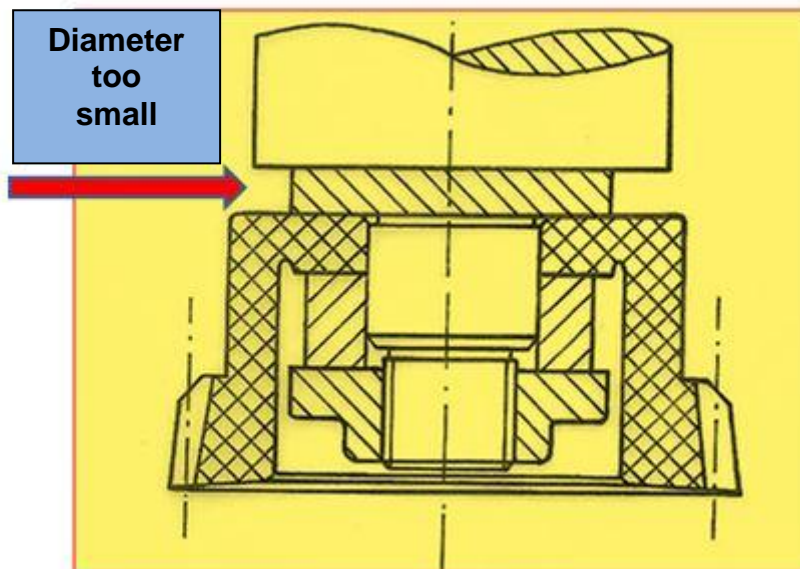
**Figure N°2-** Incorrect mounting, because the upper spacer has a diameter too small

Figure N°3 shows two counterbore shaper cutters at the beginning of life and end of life. At the end of life is necessary to remove the upper spacer to prevent the nut protrudes beyond the plane of the cutting edges.

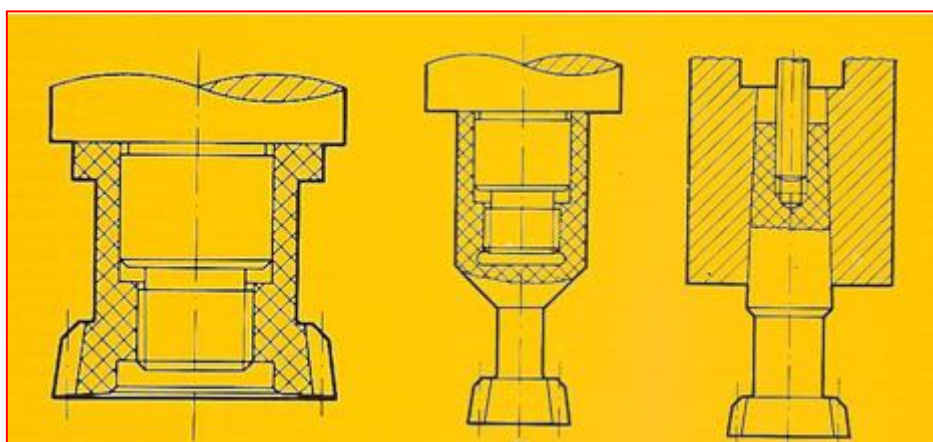


**Figure N°3** – Deep counterbore shaper cutters at the beginning of life and end of life, mounted properly

Also in this case you should avoid using spacers with diameters too small, as shown in figure N°4.



**Figure N°4** -Incorrect mounting, because the upper spacer has a diameter too small



**Figure N°5**- Other types of shaper cutter mounted properly