

■ **Effects of plate machining error and adhesive gaps on stripper guides**

When the punch is inserted during die production, centering deviation may occur due to the effects of factors such as machining error in the punch plate, stripper plate, or die plate, or to guide bushing adhesive gaps. If the punch is inserted under these conditions, center deviation will cause punch deformation, resulting in punch breakage or abnormal wear. The following countermeasures can be enacted to eliminate the causes of the above trouble.

Countermeasure

(I) **Enlarge the punch guide bushing hole.**

When the punch guide hole is enlarged, the stripper plate functions only for stripping of the work piece material. Because it loses its function as a punch guide, this renders it unsuitable for punching of thin sheets with small clearance or for use with high precision dies.

(II) **Change the punch guide to an insert-type and make adjustments.**

This allows adjustments to be made easily, but involves high costs.

(III) **Adjust the die.**

Use items such as liners and shims on the block die to prevent center deviation.

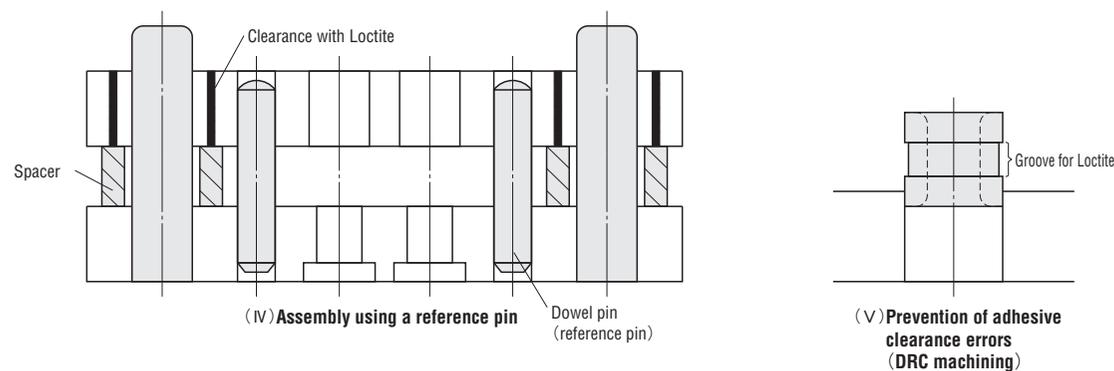
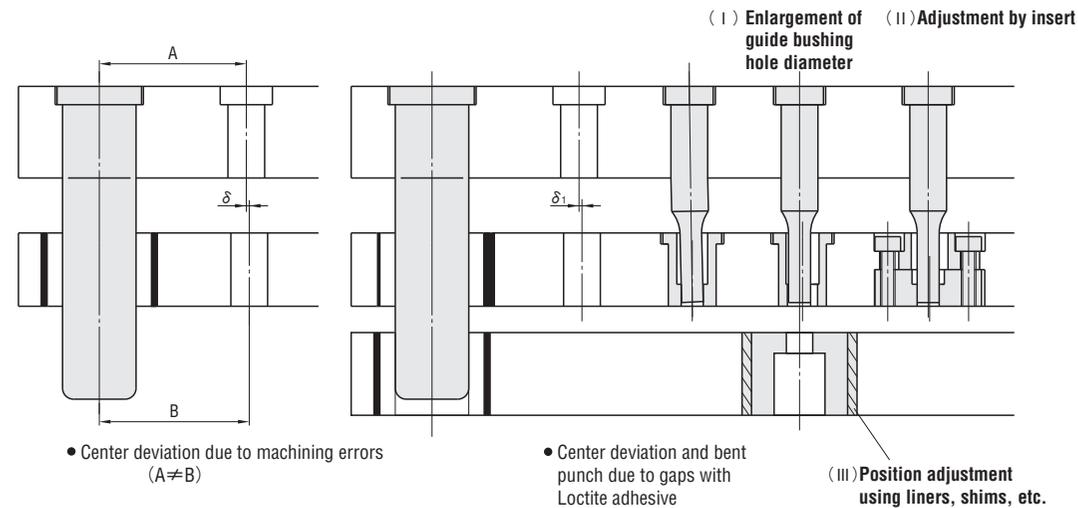
(IV) **Use a reference pin to make adjustments.**

The reference pin can be used to adjust for variations in the Loctite adhesive gap.

(V) **Change to micro clearance for the precision of the stripper guide bushing mounting hole.**

With precision dies that have no machining error, one way to prevent center deviation due to adhesive gaps is to minimize the clearance between the mounting hole and bushing. In this case, the concentricity and circularity of the bushing are critical. Use a precision grade bushing (VG·TG series). Also, the additional DRC alteration process is the optimal way to improve adhesion strength.

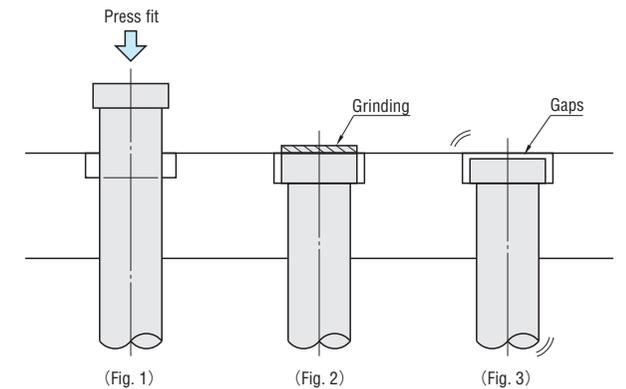
Another way to prevent centering deviation is to change to a press-fit bushing, however because press fitting causes strain due to the shrinkage of the internal diameter, and also has a weak mounting strength, this method is not recommended for high-precision dies.



■ **Assembling the stripper guide pin**

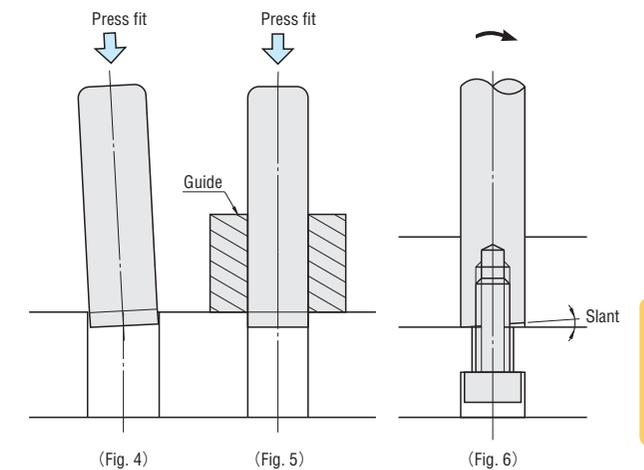
Headed type

- (1) Because the headed type guide pins are press fit with the sliding part as a lead, press-fit errors are minimized and perpendicularity can be easily achieved. (Fig. 1)
- (2) Ideally, the protruding head surface which protrudes above the plate surface after press fitting should be ground away, producing a surface that is level with the plate. (Fig. 2) (Because the head thickness tolerance for the TG and VG series is $5_{-0.05}^0$, it is possible to make adjustments at the counter bore depth. For SGPH·SGOH, the additional TKC alteration process will improve the tolerance of head thickness.)
- (3) If any gaps exist at the head, then even slight looseness during use will adversely affect the perpendicularity. (Fig. 3)



Straight type

- (1) If a straight type guide pin is inclined when press fit during assembly, seizure may occur during sliding as a result of insufficient perpendicularity. (Fig. 4)
- (2) If a guide is used during press fitting, stable perpendicularity can be achieved. (Fig. 5) For bolt-type guide pins, if the guide pin end face is not maintained perpendicular, then bolt tightening will result in a perpendicularity defect. (Fig. 6) (For SGPN and SGON, it is possible to improve perpendicularity by the additional TGC adjustment process. The end surfaces of the TG and VG series have already been ground.)



■ **Guide length for stripper guide pins**

Press fit length of guide pin for punch plate

Thickness of 1.5~2 times the guide pin diameter is most suitable for producing perpendicularity. (Fig. 7)

$$T \geq D, \quad T = (1.5 \sim 2) D$$

Stripper plate guide length

Thickness of 1.5~2 times the guide pin diameter is most suitable when considering stability and seizure of the guide. (Fig. 8)

$$T \geq D, \quad T = (1.5 \sim 2) D$$

