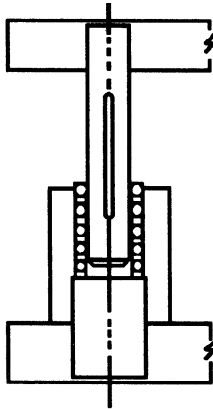
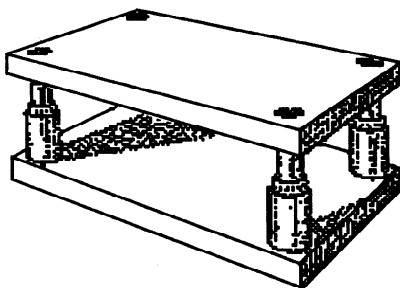


**Lamina****OPERATING DATA & DESIGN SELECTION**

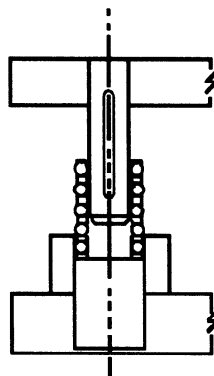
In component selection varied characteristics must be taken into consideration when selecting length of guide post, bushing and ball bearing retainer, such as stroke, shut height and type of operation. To help in your selection we have supplied engineering data and instructions that should be used as a guide when making your component selection. The following conditions should be considered for the most effective performance in a specific application.

**FULL CONTACT PRE-LOAD**

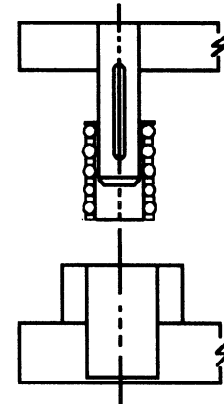
In this condition the guide post, bushing and ball bearing retainer remain in full contact throughout the stroke cycle. This selection is beneficial and recommended for high speed, high production, short stroke dies.



When in a pre-loaded (rolling press fit) condition, the ball retainer will travel half the distance of movement. In a die set application it would be half the distance of the press stroke.

**PRE-LOAD RELIEVED AT TOP OF STROKE**

This may be accomplished by selecting the guide post bushing length that allows the guide post to disengage the bushing at the beginning of the stroke or cycle. This will result in the loss of pre-load while the ball retainer is still within the bushing. This condition may be utilized with long stroke dies. It also provides safe operation by eliminating pinch points and prevents foreign materials from entering the bushing. A further benefit is it allows for re-registration of the ball retainer on each stroke. Removal of the punch holder or die holder from press is possible without total removal of dies.

**FULL DISENGAGEMENT**

This condition is permissible when the ball retainer must totally disengage the bushing on applications requiring long strokes. Safety precautions (as outlined on page 5) should always be taken when employing this method.

It should also be noted the the above illustration depicts the proper way to assemble (insert) the guide post and ball bearing retainer into the bushing.

**BALL BEARING ASSEMBLY
LUBRICATION RECOMMENDATION**
In operation of ball assembly, add lubricant once each 8-hour shift by spray or brush application. Use a lightweight spindle oil like Lamina Ball Lube.
NEVER USE GREASE