TECH Talk

PIVOTS

What is a pivot? *A pivot is a shaft or pin on which something turns; to provide with a mount or attach by a pivot.*

The definition long has been fuzzy, but the product is not.

For decades most of the heavy, large and lead-lined doors have been hung on pivot sets. Pivots take the weight of the door off the jamb (frame) and put it on the floor. Pivots originated because of door closers concealed in the floor which, because of their very nature, may have to be removed. This cannot be accomplished with a door hung on butt hinges.

The two types of pivot arrangements are offset hung and center hung. A set consists of a bottom portion and a top portion. Figures 1 and 2 illustrate typical center hung pivot sets.

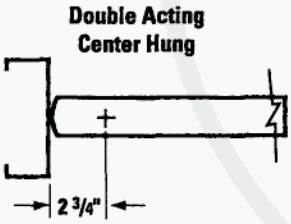


Figure 1.

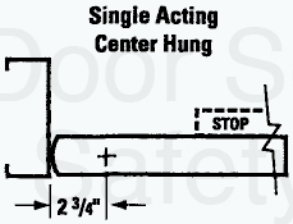


Figure 2.

Common to all center hung pivot sets is the fact the doors can swing in either direction. In other words, they are double acting unless a stop is provided on the door frame to limit the swing to single acting. The door hanging hardware is not visible, creating a pleasing architectural appearance. Caution must be exercised to avoid the possibility of interference with the jamb if the door is allowed to swing past 110°.

The bottom portion is mounted directly on the floor. Some models also use the jamb for extra support. A door of 1000 lbs. or more would require the bottom pivot to be set directly into the concrete floor.

The top pivot (also commonly called a walking beam pivot) is located in the frame head. It has a pin which is projected into the door or retracted from the door by means of a screw.

The hanging of the door is done by placing the bottom of the door in the bottom pivot and tipping the door into the opening.

At this point, the top pivot pin is projected into the top of the door. Longer pins can be furnished if the pin has to go through a suspended celling.

A center hung door, single or double acting, is attractive, shows less hardware and can be used anywhere in a building.

The other type of pivot set is the offset type (Figures 3 and 4 are typical).

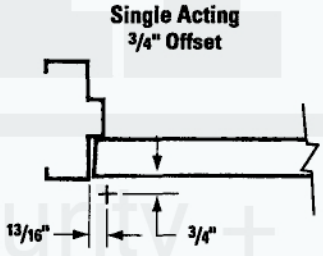


Figure 3.

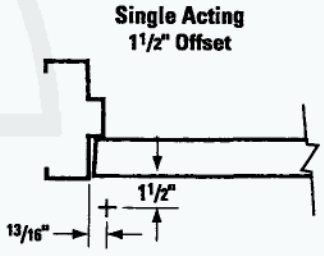


Figure 4.

The ¾" offset is most commonly used in this country. A 1 ½" offset is available and used for one of two reasons: to clear trim or to allow a decorative panel, etc. to be applied to the face of the door.

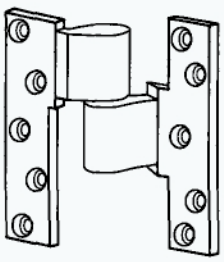


Figure 5.

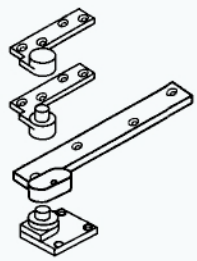


Figure 6.

A top and bottom portion constitutes a complete set. However, an intermediate pivot (Figure 5) can and should be used for door alignment and/or to help carry the weight of the door One Intermediate pivot is

recommended for a door up to 7'6" of door height and one additional intermediate pivot for each additional 30" of door height or fraction thereof.

Figure 6 shows a typical offset pivot set. This particular set is listed in ANSI/BHMA Standard A156.4 as number C07121.

A pivot set similar to the one in Figure 6 can handle doors up to 4'0" wide by 8'0" high by 2'A thick, and weighing up to 250 lbs. The advantage of the floor mounted pivot set is that the majority of the weight of the door is on the floor. Also, the screws in the top of the door are in shear in lieu of tension.

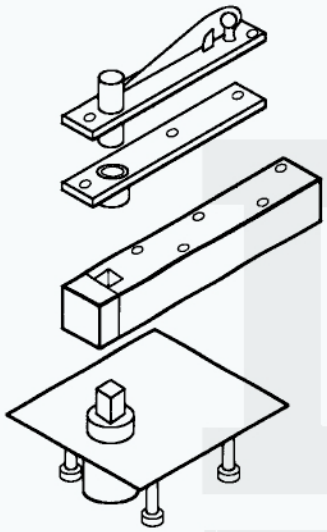


Figure 7.

For heavy, 1500 lbs. doors the bottom portion of the pivot set must be put into concrete as pictured in the center hung pivot set (Figure 7).

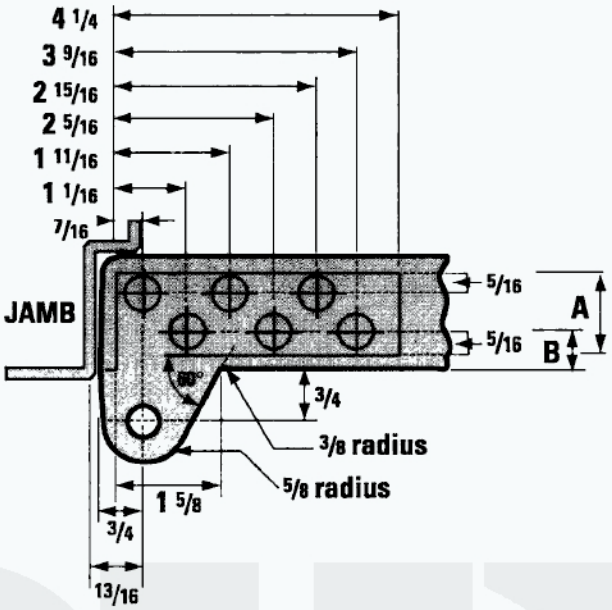
Lead-lined doors often are confused with heavy doors. Although all lead-lined doors are heavy doors, not all heavy doors are lined with lead.

In the case of doors that contain lead for protection from radiation, the lead may be located in the middle of the door or may be laminated just under the surface of the door. It is important that the pivot manufacturer knows the location of the lead in the door so the proper mounting arm can be furnished. These special arms prevent the lead from being pierced by the mounting screws. This must be avoided because 1) the integrity of the lead shield can be violated, and 2) the screws will not hold in the lead.

Pivot sets are made for lead-lined doors from 1^{3}A" thick through 3" thick as standard. Hole punching for lead-lined top, bottom and intermediate pivots is shown in Figures 8 and 9.

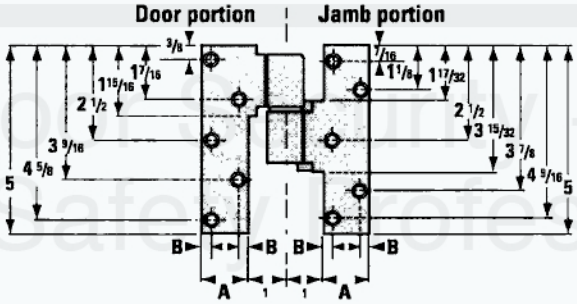
You should be made aware that pivots are available to complement electronic and security needs. Check with the manufacturer for information on power transfer, monitoring and other special purpose items.

Certainly pivots are more costly than plain bearing hinges and should not be used on every door, but when specified properly should be used on certain openings where the vertical adjustment and other advantages of the pivot sets can best be utilized.



Door size	A	B	Max. lead thickness
1 3/4"	1 1/4"	1/4"	9/32"
2"	1 3/8"	5/16"	3/8"
2 1/4"	1 3/4"	3/8"	15/32"
2 1/2"	1 5/8"	7/16"	9/16"
3"	2"	1/2"	3/4"

Figure 8.



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3"	2 7/16"	5/16"	3/4"

Figure 9.