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The Art of Shimming a Door

FOUR IMPORTANT TRICKS OF THE TRADE TO HANG IT RIGHT THE FIRST TIME.

Gone are the days when skilled carpenters installed every door in a building. Not to say that skilled carpenters are not still out there, but at least on non-union projects, they are not likely the ones installing the doors.



Oftentimes this task is relegated to a painter or drywall professional who may not understand the complexity of door installation. After all, don't you just fasten the hinges to the door and frame and move on to the next opening? If you do, you probably shouldn't.

Lost with the skilled labor force is the art of shimming a door. As door security and safety professionals, we know that hanging the door correctly is one of the most important steps in the installation process. If the door is not hung properly, the facility personnel will be unhappily living with the repercussions of that misstep for the life of the installation.

As a Certified Fire Door and Egress Assembly Inspector (CFDAI), I know that the majority of door opening failures found during an

inspection occur due to improper clearances. What many people don't realize is that, in many cases, these clearances can be corrected just by shimming the door.

According to NFPA 80 (2013), the clearances between the top and vertical edges of the door and the frame, and the meeting edges of doors swinging in pairs, are mandated to be 1/8-inch plus or minus 1/16-inch for steel doors and must not exceed 1/8-inch for wood doors. These clearances are measured from the pull side face of the door(s).

Later versions of NFPA 80 make some additional allowances for high pressure decorative laminate and 20-minute wood doors installed in steel frames; this change will be referenced in the 2018 model codes and would not be applicable until referenced or adopted.

Positive latching of a fire rated door is a critical component of maintaining the fire rating of the opening and ensuring safety of building occupants. If clearances are too great, actual fire conditions will likely cause the latchbolt to



ILLUSTRATION A

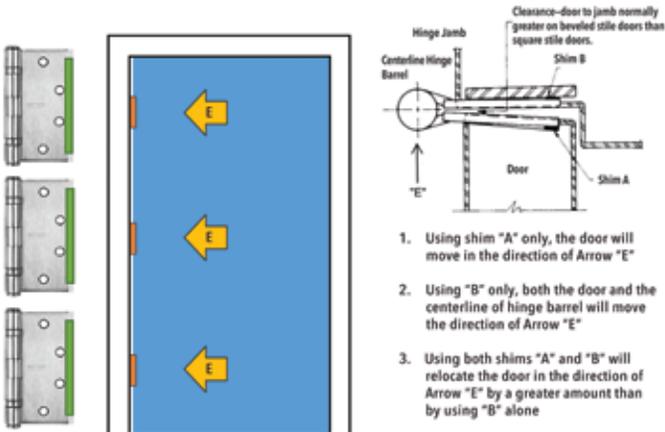
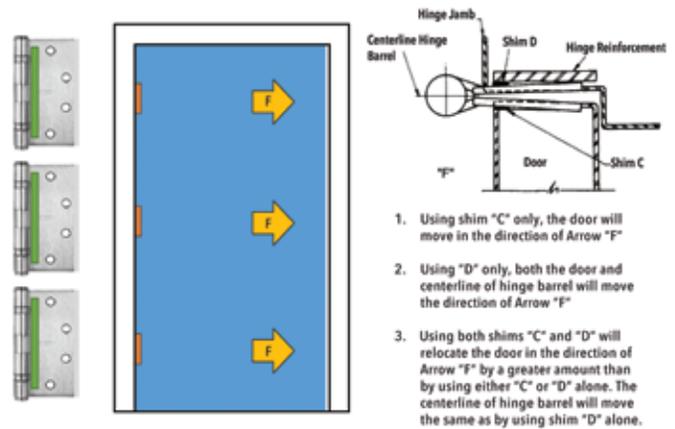


ILLUSTRATION B



disengage spreading fire and smoke throughout a building. Shimming the hinges is the most reliable way to adjust the door in the frame to achieve these required clearances. NFPA 80 does allow for the shimming of hinges as long as the shim material used is steel.

If you have ever noticed, most butt hinge manufacturers provide hinge shims in the box with their hinges. This in and of itself should imply that many, if not the majority of, doors require shimming. Always remember that these cardboard shims can only be used to adjust non-fire rated doors, and keep in mind that cardboard or paper shims will deteriorate over time, so you might have a better shim option.

Shims are available from many manufacturers in many shapes and sizes from full hinge configuration to thin strips of varying thicknesses in materials including paper, wood, plastic and steel. Half the adventure is choosing the right shim for your application.

I have found that the thin strips of steel available in varying thicknesses are often just what is needed to solve many clearance issues and are usually

available with an adhesive backing to keep the shim in place while you are refastening the hinge, making the job of shimming a little easier. Full-size shims made to fit the profile of the hinge can be incredibly helpful when attempting to make up larger gaps the full height of the door.

Now that you have your shims, four recommended steps will push or pull your door in reach of the perfect clearances.

To shim doors when clearances are too great on the hinge side of the door, see Illustration A. Shims must be located opposite the barrel of the hinge. Depending on how the door needs to move, shims can be located on the door side, frame side or both. Using shims on both the door and frame will move the door closer to the hinge side than by using just a shim on the frame.

To shim doors when clearances are too great on the lock/latch side of the door, see Illustration B. Shims should be located on the side of the hinge closest to the barrel. Just like in Illustration A, depending on how the door needs to move, shims can be located on the door side, frame side or both.

Whenever you remove the hinge to place the shim, fasten the screws opposite the shim first to get the greatest results from the shim.

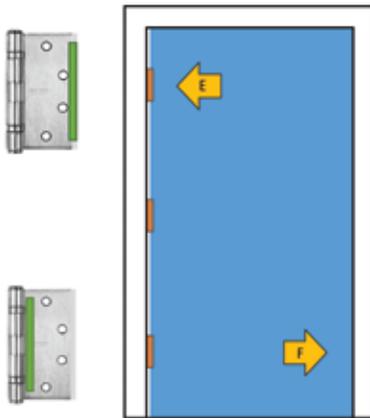
Many doors present in the field with uneven clearances; for instance, a door may have a gap at the head but be rubbing or tight at the bottom or it may be tight at the head with a gap at the bottom. If your frame is plumb, level, square and true and your hinge reinforcements are still firmly in place, shimming can be your rescue here as well. Unfortunately, shimming cannot correct a hinge reinforcement breaking loose or a frame that is twisted in the opening, at least not for long.

If your door is tight or rubbing at the top and there is a gap at the bottom on the latch side, you can insert shims as shown in Illustration C.

Conversely, if your door is tight or rubbing at the bottom and there is a gap at the top on the latch side, you can insert shims as shown in Illustration D.

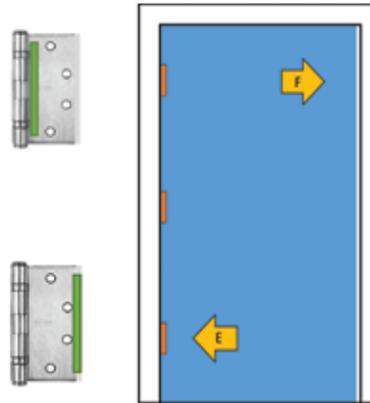
It may take a little bit of practice and trial and error to become proficient at shimming, but with a little patience, you will find it is well worth the effort.

ILLUSTRATION C



1. Using shim "A" only (see Illustration A) door will move in the direction of Arrow "E"
2. Using shim "C" only (see Illustration B), both the door and centerline of hinge barrel will move the direction of Arrow "F"

ILLUSTRATION D



1. Using shim "C" only (see Illustration B) door will move in the direction of Arrow "F".
2. Using shim "A" only (see Illustration A), both the door and centerline of hinge barrel will move the direction of Arrow "E"

For more information on the topic, there are several industry publications that contain information on shimming. These documents are all useful when installing or maintaining doors, and a specifier can reference them to ensure doors are adjusted properly for required clearances.

The Steel Door Institute (SDI) publishes *SDI 122 -15, Installation Guide for Standard Steel Doors and Frames*. The Hollow Metal Manufacturers Association Division (HMMA) of the National Association of Architectural Metal Manufacturers (NAAMM) publishes *NAAMM HMMA 840-07, Installation and Storage of Hollow Metal Doors and Frames* and the Door and Hardware Institute (DHI) publishes *TDH-007-20 Installation Guide for Doors and Hardware*. +



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