

# Fire Engineering®

## **Forcible Entry on Exit Hardware**

*By Samuel Hittle*

Forcible entry tactics are limited only by the imagination of the firefighter seeking to gain entry. Conversely, security is generally only limited by the imagination of the one seeking to secure an environment. Certain occupancy types, however, have restrictions set forth by local fire code-limiting measures occupants may take. For this reason, knowing what the local code specifies, especially pertaining to non-residential doors and their hardware, can aid you in identifying an appropriate forcible entry plan for gaining access to particular structures--as long as the occupant adheres to the code and laws, of course.

## **Why Panic or Fire Exit Hardware?**

Chicago experienced the deadliest building fire in United States history in 1903 at the Iroquois Theater; 603 people died. The number of lives lost is largely attributed to the fact that the exits were locked, blocked, or had inward-swinging doors. This unfortunate event resulted in the rewriting of the fire code to mandate that egress doors swing outward and to prohibit them from being locked or blocked when occupied. The fire also led to the development of the exit device by Carl Prinzler. He sought to create a device that would allow a door to be locked from the outside, maintaining a constant state of security, but that could be readily opened from the inside when force was applied in the direction of travel toward the egress side.

Other multiple-fatality fires, like the Lakeview Grammar School in Colinwood, Ohio. (176 fatalities) and the Triangle Shirt Waist Factory in New York City, New York, (146 fatalities) reinforced the need for this hardware to be installed in public occupancies.

## **Which Doors Will Have Exit Hardware?**

*The International Fire Code\** dictates that all means of egress in occupancy types categorized as Assembly or Educational with an occupant load greater than 50 and any Group Hazardous Occupancy as well as other specific high-hazard

areas shall **not** be provided with a latch or lock unless it is panic or fire exit hardware. An exception to this code is the primary entrance/exit of an Assembly Occupancy, which may have an auxiliary locking mechanism (i.e., deadbolt, mortise lock, rim lock). This secondary device, however, is required to be disengaged when the structure is occupied.

It should be noted the *International Fire Code* required Institutional (i.e., hospitals) Occupancies to also be equipped with exit devices prior to the 2006 edition. Although no longer necessary per *International Fire Code*, newly constructed occupancies must still meet this condition if the state has adopted the National Fire Protection Association (NFPA) *101 Life Safety Code*.

According to the written code, these devices shall be installed no lower than 34 inches and no higher than 48 inches from the threshold of the exit opening. The activation bar shall extend at least one-half the width of the door on the latch side and deactivate any and all locks with a single motion when 15 pounds of force is applied. The door shall swing open when 30 pounds of force is applied (anywhere on the activation bar) in the direction of travel.

*Not every door* within the occupancy types listed are mandated to be equipped with panic or fire exit hardware. This is primarily true of alley way doors in the kitchens of restaurants, storage rooms of mercantile, or posterior located offices if the door(s) is not considered a “public” egress by the fire code. Although not dictated by code, it is not uncommon to find many of these doors equipped with an exit device. Performing a solid size-up of the door will establish if it is or is not outfitted with exit hardware.

### **Sizing Up a Door with Exit Hardware**

Like other fire service functions, preplanning your response district is truly the most beneficial size-up. It is the most valuable way to learn what kind of forcible entry challenges you will be called to mitigate.

When approaching an unfamiliar door on an alarm, consider the following: the area's reputation for crime, time of day, where it is located in relation to the building, and if the occupancy type is required to have exit hardware. Next, look at the door. Identify door slab and jamb construction, the type of wall the assembly it is mounted in, visible hardware, and anything out of the ordinary (i.e., added security measures). Don't overlook the obvious; if a door is marked “FIRE EXIT” on the exterior, it will have exit hardware and by law is supposed to open outward.

Levered handles without an auxiliary lock, thumb latches, simple pull handles, pull plates, and door without any hardware at all on the outward swinging side are common indicators that exit hardware is present. Doors entirely devoid of exterior hardware will be the most likely of all to have an exit device installed.

Pay extra attention to these doors if encountered during non-operational hours. The occupant has obviously intended it for exiting only and not as an avenue for entering the occupancy; therefore, he may have illegally installed some type of secondary security on the inward side. This will be more common among privately operated entities and should be factored into the visual assessment size-up.

When sizing up double doors, look at the symmetry of the exterior hardware. If *only* one side has a keyway, handle, or weather strip overlapping the center reveal, the opposite side is likely a leaf door. Leaf doors will either unlock when the primary door is opened or require a top and bottom slide bolt to be manually disengaged. When you encounter nonsymmetrical hardware, focus your attention on the side with the most hardware present. In many cases, this facilitates an easier breach, since leaf doors are intended to open secondary and may be more fortified than the primary. This is especially true when a leaf door is not required to open because it was not calculated into the required egress size for the approved occupancy load.

After visually inspecting the door, begin a more detailed size-up. Always try before you pry. If it is a fire door, the code mandates the installation of fire exit hardware which must latch when closed, without exception. If the lock is engaged, you will be locked out. If the code deems the door to be an egress only, panic hardware is mandated. This hardware has a dog option, which allows the occupant to temporarily disengage the latching device(s) from the inward-swinging side so those seeking to enter from the outward side can do so. Thus, it may not be secured on your arrival.

Next, determine if the door is outfitted with exit hardware or standard locking components. Slide a shove knife, screw driver, or similar tool along the reveal on the latch side. It is an exit device if the tool moves freely, since the latching



mechanisms and receiving strikes for this type of hardware are mounted on the interior door face or configured vertically.

Subsequently, sweep along the top and bottom reveals (**Photo 1, left**). If your tool meets opposition, this means one of two things: The egress is secured with a vertical rod latching assembly, or slide bolts are installed. On a single door,

resistance signifies the installation of a vertical component which secures the door at both the top and bottom. Likewise, if both halves of double doors present equally (i.e., both sides have symmetrical hardware), they too will likely be installed with a vertical-rod latching assembly on each side. In contrast, if one door has more hardware than the other, that side is likely a leaf door and will possibly be set up with slide bolts. In this case, execute an attack on the half with the least hardware. *Note:* Determining the existence of a leaf door this way is secondary to inspecting it for the symmetry of exterior hardware.

When evaluating the top and bottom reveal, keep in mind vertical-rod assemblies or slide bolts associated with leaf doors may be attached on the interior door skin or manufactured inside the door slab. If the latching components are fastened on the interior surface, detection will not be feasible, because of the door stop and your tool will move freely along the reveal. The bottom reveal inspection, however, is more telling. Because of the flat characteristics of the threshold,



nothing should prevent your tool from detecting the presence of hardware, so place more emphasis on this part of the assessment.

Last, shock the door (**Photo 2, left**). Forcefully bump the latch side with a tool in multiple locations. This will loosen any rigid components of the assembly, facilitating an easier breach. Another hit in the center of the door

will help determine if the slab is flimsy or unyielding. An insubstantial door could fail before the locking mechanism, whereas one that is solid will potentially produce little give, making entry difficult.

## Forcing Entry with Conventional Tactics



There are a multitude of options to choose from when forcing entry. The fireground and door specifics will influence which technique is best. This is equally true of egress doors equipped with exit hardware. Conventional (irons) tactics (**Photo 3, left**) should be the go-to method and will be effective on most doors, especially when dealing with older-style hardware

that consists of a single latching point.

On doors with two latching points (seen with vertical-rod systems), conventional means usually work, but keep in mind that the attack must be made at both the top and bottom instead of the traditional strike region. Fortunately, bottom strikes over time tend to fill with debris and will barely receive the latch, making it easy to overcome. For this reason, some crews prefer to go after the top first and use the leverage of the door to prevail over the bottom latch. When adhering to this philosophy, understand that if the bottom does not fail immediately, fire and smoke may be allowed to enter the work area while you finish the force. Regardless of whether you start at the top or the bottom when working these types of doors, never give up progress. Once a latch has been conquered, wedge it open with a tool or chock it to keep it from resealing



Although conventional tactics are effective on most doors, there will be instances when these techniques fall short. Exit hardware has evolved over the years, taking on many forms to provide greater protection while maintaining code compliance. As security is augmented, the difficulty of gaining entry is also increased. Many doors have sensors in the activation bar that relay to strong magnetic locks located at the top portion, traditional strike region, bottom portion, or in multiple locations along the frame.

These magnets require anywhere from 250 pounds to 2,400 pounds of force to overcome the connection. Other devices secure the door with protruding horizontal rods that extend into both jambs simultaneously, similar to a fox lock (**Photo 4, previous page**).

Vertical-rod latching assemblies are naturally problematic because you have to defeat multiple lock locations. This configuration is further aggravated by tall or rigid doors. The amount of attainable leverage becomes an issue on taller doors when forcing the top latch. On rigid doors, the lack of flex in the slab creates a challenge unless both locations can be defeated simultaneously.

Single-point latching hardware can be problematic because of the locations of the latch and strike components. Unlike common slam latches or auxiliary locks, this hardware is fastened to the interior side of the door and door stop. On occasion, you would have to overcome up to two inches of width in this design to spread the lock enough to gain entry. Again, if the door slab is well-constructed,



conventional methods can prove very difficult and time consuming. Further, in an attempt to make the latch mechanism less likely to fail when being forced, manufacturers now incorporate the use of a dead man (**Photo 5, left**). This is a small component that prevents the latching device from moving when the door is in a closed position. The strike plate prohibits the dead man from completely extending, rendering the slam

latch immobile.

Other common solutions for forcing doors will be limited in the occupancy types discussed (i.e., assemblies, schools, hospitals, etc.). Hydraulic spreaders (i.e., rabbit tool or hydra-ram) provide little benefit, since most of the doors encountered when pushing deeper into these structures will be outward swinging. Spreader tools are ideal for inward-swinging doors, not outward. If you arrive at an inward-swinging door, simply take advantage of the exit hardware.

Circular saws are another powerful option. Although their usefulness is indisputable, it can be argued that crews do not carry them when performing a search or opening up the interior for the line. Saws also have inherent limitations when operated in smoky environments. Ultimately, when functioning inside these buildings, crews will likely have to stage an attack with the irons and other

commonly carried tools.

### **Poke-Through Technique**

Focusing efforts on activating the exit hardware push bar instead of conventional forcible entry tactics may be more advantageous on some doors. When performed in the right circumstances, this approach can be less fatiguing to crews, quicker, and can decrease the damage done to the overall door assembly.

The poke-through technique is a forcible entry option in which the irons and other common tools are used to depress the push bar of an exit assembly for quick access on metal doors that are not reinforced (i.e., diamond-plate welded on entire surface). By going after the activation bar, you can alleviate all locking points simultaneously while exerting less effort than conventional tactics. Remember, code dictates that all locks are to disengage with a single motion of this device. This technique also maintains the structural integrity of the slab, frame, and locking mechanisms while controlling the door. Because the door slab, mounting assembly, and hardware elements are preserved, the access can be resecured when the alarm has been brought under control.

First, determine the location of the activation bar on the interior side, then drive the pike completely through the door skin approximately 15 inches over from the



reveal on the latch side, slightly above where the exit hardware is believed to be (**Photo 6, left**). The placement of pull handles, pull plates, thumb latches, levers, and keyways will line up relatively close



to the same height as the activation bar. With the diversity of manufacturers and the occupant's leeway to install the hardware within a 14-inch range, locating the bar is easier said than done. The ability to find these bars is best developed through daily observation and by preplanning your first- and second-due district. If nothing else, once one door is forced, note the exit device style and mounted height. Unless the

occupancy has been remodeled, other hardware throughout likely will be similar and installed to the same specifications.

Doors being popped proactively for investigation or recon may warrant minimal damage. Once the door skin has been breached on both sides, remove the pike to expose the generated hole. Slide the "L"-shaped end of a "J" tool \*\*, square tool, or key tool into the purchase and overlap the activation bar. Pull back toward the exterior to unlock the door (**Photo 7, above**). If the tool is properly located, you should hear and feel the hardware moving. Since only a small hole is created in the skin, this procedure makes repairs very simple for the tenant. A \$20 bondo job and some paint are all that will be needed to fix the door.

If fireground conditions require a more rapid and swift entry, more damage is acceptable. Instead of pulling the pike out, drive it deep into the door, point the



fork toward the ground, and pull up on the halligan bar (**Photo 8, left**). On push-pad or integral-style devices, a correctly located pike will roll over the activation pad, depressing it enough to unlock the door. Although quicker than reaching through with a "J" tool, this method is more destructive. It will bow the door skin and possibly dent the hardware.





On older, crossbar-style exit hardware, the pike will not be long enough roll over the activation bar. To obtain the required distance, remove the pike and insert the pry end of a roof hook, rex tool, or similar instrument to engage it (**Photo 9, above**).



Another alternative is to enlarge the initial purchase made by the pike so the fork end of the halligan can be used to trigger the hardware. Make a second hole next to the first at a distance the width of the forks. Place the forks in the two holes and drive the bar completely through the door. The narrowing of the forks assists in shearing the door skin on both sides (**Photo 10, left**). Because of the reach, these techniques will be more forgiving than rolling the pike over the activation

mechanism if the initial purchase is inadequately positioned.

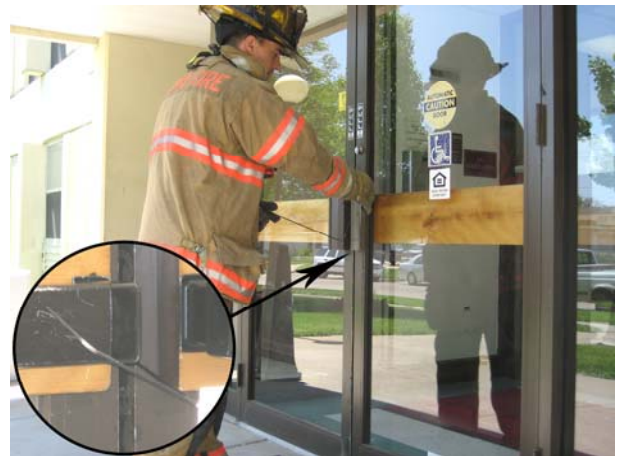
After resecuring forced doors, try to conceal the punctured area to dissuade thieves or vandals from gaining entry in the same fashion. Something as simple as placing duct tape over the hole, fastening an electrical junction plate, or



driving a sprinkler shut-off dowel through the skin should be adequate (**Photo 11, left**).

### **“J” Tool Technique**

You can also use the “J”-shaped end of a “J” tool to reach through the reveal and engage exit hardware by hooking it. On double doors without a mullion (center post), slide the tool through the middle reveal, grab the activation bar, and pull it toward you to open the egress (**Photo 12, right**). You can force single doors and double doors with a mullion with an additional step. First, create a space by working the adze-end of the halligan into the reveal and push downward on the fork end. Then insert the “J” tool into the gap, activating the exit hardware. Do not apply excessive pressure with the halligan on a storefront setting, or you will compromise the glass. This method is ideal for entry when limited damage is preferred. There will also be times when this option is more efficient than forcing with conventional tactics or breaking glass and removing cross bars.



### **Modified Poke-Through Technique**

A modified poke-through technique can be used for solid-core wood doors when viewing glass is present. For security reasons, these windows are typically designed with a layer of chicken wire to make them smash resistant. It is possible to remove the glass, but this takes time and usually leaves sharp edges, making a firefighter who attempts to reach through and manually engage the exit hardware vulnerable to cuts. Instead, drive the end of a tool (i.e., roof hook, rex, or forked end of a halligan) through the glass. Position another tool parallel to the



ground across the opening. This will act as a fulcrum so the inserted tool can be driven upward, allowing it to depress the activation bar and unlock the door (**Photo 13, left**). The success of this technique depends on the window's location and surrounding building features. A ceiling or overhang may prevent you from thrusting a roof hook upward, and a window high on a door may prevent a shorter tool from reaching the hardware.

### Other Considerations

Some doors with exit devices will present with additional hardware typically associated with added security, such as auxiliary locks, burglar bars, or slide bolts. For example, security system keyways appear to be similar to a deadbolt, rim, or mortise lock. Do not presume anything on outward show. Slide your shove knife or a like tool in the reveal past the location of the cylinder. If it's a security keyway, your tool will move freely without being impeded. If it's a secondary lock and your tool moves freely past, it is obviously not activated.



Pan-head bolts may also be deceiving. Some panic devices have exterior mounted bolts consistent with burglar bar installations (**Photo 14, left**). Typically, panic hardware with bolts protruding through the door skin are either after-market installations or high-security devices. Differentiating between the two can be difficult, so take time to perform a good size-up. Does the code mandate that the door must have exit hardware installed? Are the bolts at the height consistent with where the activation bar would be installed? Are they the only bolts visible? If you

answer yes to all three questions, you are probably dealing with an exit device on the inward side rather than a drop bar.

Various doors have pan-head bolts at the top portion on the latch side that present as if a slide bolt has been installed. If these bolts are two smaller vertically aligned pan-head bolts within inches of the reveal, they are likely part of a vertical-rod latching assembly. A single large bolt slightly offset from the reveal

is characteristic of a magnetic-lock installation. Remember, magnetic locks require up to 2,400 pounds of force to disengage when being attacked conventionally. The difficulty of forcing this lock is increased by the fact that it will be overhead. Therefore, activating the exit device can prove to be invaluable in these situations.

Some doors have been installed with touch-sensitive exit hardware. These devices recognize contact from a bare hand and releases the magnetic lock(s), allowing the door to open. Depending on the set sensitivity, a metal “J” tool may be successful as long the tool is held with an ungloved hand. Fortunately, most double doors with this hardware style are glass, allowing you to identify the lack of moving parts during your visual size-up.

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There isn't a single tactic applicable to forcible entry that works every time. Doors are different, and situations are dynamic. For this reason, you must have an arsenal of diverse plans and methods to overcome obstacles. Knowing what the local fire code says about door assemblies and their hardware can be beneficial in choosing an attack method. The poke-through and “J” tool techniques are other toolbox options.

\* **International Fire Code** -- Prior to 1997, a community could adopt three fire codes: the BOCA, Southern, or UBC. In an attempt to simplify and standardize a common code across the nation, the three codes were merged r to form the International Fire Code, which is upheld by the International Code Council. This article references the International Fire Code and NFP's 101 Life Safety Code.



\*\* **“J” Tool** -- A “J” tool is easily created by bending a car antenna into the shape of a “z” with one end shaped like an “L” and the other end shaped like a “J” (**Photo 15**).

A manufactured version of this tool can be purchased, however both sides form a “J” for grabbing the exit hardware. Although the “J” shape is beneficial for hooking the exit device, leaving one side straight adds versatility to the tool when breaching via the poke-thru technique.

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