

Forcible Entry

by Dan Sheridan

This chapter provides required knowledge items for the following NFPA Standard 1001 Job Performance Requirements:

FFI: 5.3.4

FFII: 6.3.2 (Specialized forcible entry tools)

This chapter contains Skill Drills. When you see this icon, refer to your Skill Drill book for step-by-step instructions.



OBJECTIVES

Upon completion of this chapter, you should be able to do the following:

- Identify and demonstrate in a safe manner the use of tools needed for forcible entry
- Identify the proper tool for each situation requiring forcible entry
- Identify different types of locks
- Identify different types of doors
- Describe forcible entry on different types of doors
- Describe the “through the lock” method of forcible entry
- Identify different types of windows
- Describe forcible entry on different types of windows
- Describe methods for breaching floors and walls

INTRODUCTION

On Broadway the show doesn’t start until the curtain opens. It is the same in the fire service—nothing can happen on the fireground until **forcible entry** is effected. Whether it is a fire in a dwelling or just a simple emergency call, we need to gain entry to perform our duties. We need to be proficient in forcible entry, choosing the right tool for the job in every situation and operating safely.

More lives are saved by stretching a hand line to the proper location and extinguishing the fire than by any other tool we have in our arsenal. Often, it is necessary to force entry to be able to place this critical first hoseline. Forcible entry includes being able to size up the situation, and picking the right tool for the situation at hand will help facilitate the placement of that very important first line.

It is human nature to always want to improve our surroundings. We are always trying to build a better mousetrap. Technology is constantly changing on both sides of the fire service. When crime emerged as a significant issue in the early 1960s, people started putting better security systems in homes and places of business. This forced the fire service to adapt and find better ways to gain entry to fires and emergencies. The fire service has at times lagged behind the security measures and our ability to

make rapid entry. Years later, as forcible-entry technologies and training improved, the fire service began gaining entry much more quickly than the hoselines were being stretched. Firefighters were able to, in some cases, outpace the stretching of hand lines.

New challenges continue to present themselves even today. One of the more recent changes, sparked by the need for energy efficiency, is the installation of **thermal pane windows**. These windows have proved to be much more difficult than single-pane windows to force entry into and ventilate. People are now installing more complicated gates on windows, particularly in high-crime areas. It is not uncommon to find whole houses in “cages.” Modern office buildings often utilize **magnetic locking devices** that are very difficult to force. Forcible entry is a constantly evolving function within the fire service.

FORCING ENTRY

FFI: 5.3.4 Firefighters should be aware of the hazards involved with forcing entry. The acts of forcing through doors, windows, or walls can all have adverse effects on firefighting operations and personal safety.

The entry point for a fire attack will usually be the front door. When commencing fire operation, keep in mind that any opening we make will also affect fire behavior.

Depending on their locations, forcing doors or windows can disrupt or redirect ventilation, which can increase fire growth. In very tight buildings, the simple act of opening the front door may cause a backdraft. This makes it of utmost importance to control the door after forcible entry. Firefighters should be prepared for those changes when selecting a forcible entry target.

In multiple dwellings, for example, where the door to the apartment leads into an open interior stairwell, it is critical to control the door so that occupants who may be above the fire can safely get past the fire apartment. Some wooden doors have panels that can be easily removed, and it may seem like a good idea to just remove one of the panels and reach in and unlock the door. If you do this, though, you will not be able to **control the door**. That door is just like a lid. It is the only thing that keeps the fire in the area of origin. The only time it may be acceptable to remove a panel would be in a minor emergency or a very small fire, like a pot burning on the stove. Even then, many locks on exterior doors today are **double keyed**, that is, a key is needed to turn the lock on either

side of the lock cylinder. Removing a panel will not allow the door to open, and heat and smoke may begin to enter the hall. In addition, the occupant is faced with replacing an entire door instead of just a lock, and we have no way to secure the premises if no one is home.

As we move through this chapter, keep in mind how it will affect the fire when forcible entry is performed before a hoseline is stretched. Sometimes the easy way is not the best way, as we will see.

Forcible entry doesn't end after we force the front door. The old thinking was that after the front door was forced, an axe or another type of chock should be placed under the door so it wouldn't close behind the **forcible-entry team**. With buildings being tighter and outfitted with thermal pane windows, we are more concerned about the air supply to the fire. Today, it is recommended that we control the door by leaving a firefighter there, or making sure we throw the slide bolt so that the door can't relock and closing the door.

Once in the fire area, we may still have to perform forcible entry. It is not uncommon anymore to find a window gate with a padlock or a locked bedroom door. Many dwellings appear to be one- or two-family homes from the outside, but may in fact contain many single-room occupancies, each with their own locking devices. Some may even be padlocked from the outside with the occupant inside. In some businesses, where employers are concerned with employee theft, employers will lock some employees in the workplace overnight. It is also not uncommon to find emergency exits locked, or locks that can't be opened by hand. The **fox lock** is a lock that is sometimes found in commercial buildings. Employers have been known to remove the knobs that enable the door to be opened.

Firefighters entering any situation should always be thinking, “What is my second means of egress?” A firefighter was killed in New York City in the 1990s when a room he entered to search exploded with fire, and his only way out was a fire escape that contained a padlock. The first thing we should do when entering any room is check to see if the second way out is accessible.

SPECIALIZED FORCIBLE-ENTRY TOOLS

FFII: 6.3.2 Some forcible-entry tools, including the Halligan tool and the power saw, are used for other purposes on the fireground and are covered in chapter

11. Other tools, however, are used almost exclusively for forcible entry, including the following:

Officer's tool/A-tool

The **officer's tool** is also known as the A-tool. There are a few versions of this tool. In the New York City Fire Department (FDNY), a new generation of the A-tool has been introduced called the rex tool. It is not a front-line forcible-entry tool, but rather a tool that firefighters could carry in the event that they need to self-extricate in an emergency situation. This tool also doubles as a component of the through-the-lock kit.

Made of high-strength steel, the versatile **A-tool** pairs a pry bar at one end with an a-type lock puller and adz at the opposite end. The head is welded to the shaft and covered with a non-slip surface. The complete A-tool set includes a through-the-lock kit, a double-ended key tool, and a shove knife, all stored inside the shaft of this tool (fig. 12-1).



Fig. 12-1. A-tool

Rex tool

The **Rex tool** has been called “the A-tool on steroids.” This well-designed forcible-entry instrument has a double-headed feature that includes tapered blades that can pull a variety of lock cylinders. A chisel on the opposite end drives out rim locks once the cylinder is removed (fig. 12-2).



Fig. 12-2. Rex tool

K-tool

The **K-tool** is very limited and has only one function, to go through the lock. It is made up of a lock-pulling device that needs to be used in conjunction with a Halligan

tool. It is usually carried in a leather pouch, with a set of keys including a 5/32 square-head key, a key tool, and a shove knife (fig. 12-3).



Fig. 12-3. K-tool

Duck bill

Simple, but effective, the **duck bill** incorporates basic physics to break locks. With a long, tapered end and a flat back strike zone, it fits almost any lock shackle, and an 18-in. (460-mm) handle ensures that hands are away from the strike area. The duck bill's striking surface combines well with a maul or back of an axe (fig. 12-4).



Fig. 12-4. Duck bill

Hydraulic spreading tool

There are two types of **hydraulic spreading tools**. The first is the “rabbit” tool which has spreading jaws attached to the end of a hose that, depending upon the model, can spread 4 in. (100 mm) or 9 in. (230 mm) with 8,000 lb (3,629 kg) of force. The other “integrated” tool has the spreading jaws as part of the hydraulic pump, and is commonly known by its trade name of Hydra-Ram™. It has a spreading distance of 4 in. (100 mm), or 6 in. (150 mm) (depending upon the model) and applies 10,000 lb (4,536 kg) of force. These tools are

typically employed to force inward-swinging metal doors, but they have many other applications as well.

When practicing with the tool, become familiar with the number of pumps needed to fully open them and how much the jaws spread with each pump. Check these tools frequently by placing them under a load to verify proper operation (figs. 12-5 and 12-6).



Fig. 12-5. Integrated hydraulic forcible entry tool



Fig. 12-6. The rabbit tool

Bolt cutters

Heavy duty **bolt cutters** are useful and effective tools for numerous cutting situations. Padlocks, bolts, chain links, rivets, and reinforcing rods are typical cutting tasks for bolt cutters. These tools come in 18, 24, 30, and 36 in. (46, 61, 76, and 91 cm) sizes. Bolt cutters will not cut **case-hardened steel** (fig. 12-7).

Battering ram

Sometimes the oldest and simplest tools are still the most effective. Case in point is the **battering ram**, a 35-in. (89-cm) 35-lb (15.9-kg) one- or two-person tool. Invaluable for reaching trapped firefighters, battering rams can breach solid doors or concrete and brick walls (fig. 12-8).



Fig. 12-7. Heavy-duty bolt cutters



Fig. 12-8. Battering ram

Keyless garage door entry tool

Firefighters needing access to garage doors can have a difficult time forcing an opening. The **keyless garage door entry tool** will unlock nearly any overhead garage door that uses an automatic opener. The firefighter slips the tool between the garage door panels to pull the emergency release rope attached to the automatic opener and manually lift the garage door (fig. 12-9).



Fig. 12–9. Keyless garage door entry tool

Choosing the right tool

It is important to choose the right tool for the job. If the situation allows, we will always try to choose the method that will do the least amount of damage. If we were responding to an emergency where there was no life hazard, such as a water leak, it would be bad public relations to destroy an expensive door, and also security would become an issue. In this situation it may be more appropriate to find a window, or if that is not an option, we may want to go through the lock using the K-tool or A-tool. On the other hand, if we are responding to a confirmed structure fire, we probably will want to use the tool that will give us the quickest access, such as hydraulic spreading tools.

In the fire service it is important not to pigeonhole our thinking into having to do certain things the same way every time. It is very easy when it comes to forcible entry to get tunnel vision. The best firefighters are the ones that can think outside the box. Although it is true that certain situations will always call for the same tools, for

example, when we are forcing residential doors, we will usually use the axe and Halligan tool, or if we are dealing with roll-down gates, we will probably need a power saw with a metal cutting blade (aluminum oxide blade).

Choosing the correct tool also means having the right blade on the saw; for example, we wouldn't want to attempt to cut a padlock with a wood-cutting blade (carbide tip). We wouldn't bring a rabbit tool to force the gates, either.

The obvious. One thing to keep in mind when approaching forcible entry is not to overlook the obvious. The old saying “try the door first” still is valid today. Many times we will find that the door is unlocked. Another scenario is when we encounter very expensive, strong locks held on by just a cheap hasp with some small wood screws or a cheap chain.

A few years back, a ladder company was working for quite some time on a very stubborn commercial door. A few minutes into the operation two firefighters came over to help, and decided that they would look for another way. Ten feet down the wall from the door, they found another door, a cheap one with a cheap rim lock. The firefighters put the Halligan tool into the door and popped it open in a few seconds.

Confidence. Forcible entry is an art, a skill to be honed by practice. It is not something that can be learned by just reading about it. It is a very hands-on skill. One of the tasks that probationary firefighters need to perform on every tour or whenever they are required to be at the station (if they are in a volunteer company) is to clean the tools, not because fire departments really like shiny tools, but because by cleaning the tools, new firefighters will actually have to handle and touch them. They will become familiar with the weight and specific characteristics of each tool. In chapter 11, tool maintenance was covered. This is the same time that we should practice swinging the axe, holding the Halligan tool the proper way, and giving the rabbit tool a few pumps. This is the start of building confidence with ourselves and our tools. One thing that is passed down to the new firefighter by senior firefighters is to have confidence in yourself and your tools. Attack every situation with vigor—like there is no door that you can't get through, no gate you can't open. This is the secret to forcible entry: self-confidence.

How else do we start building self-confidence? Of course, we have to train. We train by doing drills in the station, or we read about forcible entry. Most importantly, we start by putting theory into practice. Minor incidents are a great time to train. Emergencies and minor fires are

a great time to sharpen our forcible-entry skills. Good golfers are not good because they are extremely talented and can go out once a week and break 100. They are good because they go to the driving range and practice, or they set up putting greens in their basements and practice. It is all about muscle memory and, again, self-confidence. It is the same with forcible entry; you can't expect to sit in the station and never look at the tools and still be proficient at forcible entry. The time to learn is not at 03:00 hours when you pull up to a house with smoke and fire showing and reports of people trapped inside. The golfer who doesn't break 100 may get hurt feelings, but he or she can come back another day. If we don't get the door open, and we can't get the line onto the fire, firefighters and civilians may die!

LOCKS

FFI 5.3.4 Locks are the primary reason why firefighters need to have forcible-entry skills. Locks come in a variety of types; some locks are easier to force than others. The key to getting past a lock is to understand its vulnerabilities and attack the lock at these points.

Padlocks

**SKILL
DRILL**

Padlocks can be used for either heavy-duty or regular service. They are portable devices that are made up of a **shackle** and a body that secure a door or a gate to a **hasp** or a chain (fig. 12–10).



Fig. 12–10. Locked padlock attached to a staple and hasp

When sizing up padlocks, remember to look at the whole picture, because, as always, we need to be able to keep our options open. Often we may find a very expensive lock being held on by a cheap **staple and hasp** or chain. It may

be easier to break the hasp or cut the cheap chain and save the lock for reuse.

In heavy-duty padlocks that have shackles larger than $\frac{1}{4}$ in. (6 mm) in diameter, the toe and heel both lock. They are made of hardened steel, the result of a process in which the steel is heated to give it more strength (fig. 12–11).



Fig. 12–11. Heavy-duty padlocks

Regular padlocks have a shackle of less than $\frac{1}{4}$ in. in diameter and are not case-hardened (fig. 12–12).



Fig. 12–12. Regular padlock

Heavy-duty padlocks: forcing entry. The preferred method is to use a power saw, if one is available, with a metal-cutting blade. When cutting these types of locks, it is necessary to cut both sides of the lock. (*Note:* Attach a pair of Vise-Grips to the power saw with a short chain, to hold the lock in place while cutting. This is a much safer way to operate.)

- If a saw is not available or desirable (e.g., near gasoline spills or natural gas leaks), the duck bill

will work well. Insert the bill into the opening of the lock and drive it in with a maul or heavy axe. The bill will force the lock open. Be sure to put the duck bill into the lock bow so the wedge will pull the lock open, not make it wider. If put in sideways, the duck bill may get jammed and may not open the lock (fig. 12–13).



Fig. 12–13. Duck bill breaking heavy-duty padlock

- Bolt cutters are ineffective on case-hardened locks.
- A pipe wrench is quite effective, especially on American Lock™ Series 2000 locks (see later in this chapter) but also on strong conventional padlocks, as long as there is room to twist. The teeth should be kept sharp, and two people can help in setting up the tool onto the lock, as the tool can be heavy and often won't hold until torque is applied. The best grab is accomplished if the tool is adjusted so the back of the jaw just touches the lock or chain to be broken.

Regular padlocks: forcing entry. These types of locks should not present much of a problem. If there are a few locks to force, it may be faster and easier to cut them with a power saw. If one is not available, a Halligan tool and heavy flat-head axe will work fine. Insert the pike end of the Halligan in the opening and drive it through with the heavy axe (fig. 12–14). Use the fork end of the Halligan tool around the staple and twist. Another option, if available, is to use bolt cutters.



Fig. 12–14. Halligan tool breaking padlock

American Lock Series 2000 locks

**SKILL
DRILL**

American Lock Series 2000 locks, also known as “hockey puck locks,” are made of case-hardened steel and have the locking pin inside (fig. 12–15).



Fig. 12–15. American Lock Series 2000 lock

Forcing entry. Using a power saw, if available, with a metal-cutting blade is the preferred method. Make a notch two-thirds of the way from the keyway with the blade. After the blade has a small channel, bring the saw up to full RPM, and cut the lock into two pieces, resulting in cutting the pin inside. If a saw is not available, use an 18-in. (460 mm) pipe wrench with a 36-in. (915 mm) extension. Place the pipe wrench firmly around the lock and twist off the lock. If the lock has a guard around it, this won't work, and you will need to use the saw (figs. 12–16 and 12–17).



Fig. 12–16. Firefighter cutting American Lock Series 2000 lock with power saw



Fig. 12–17. Firefighter removing American Lock Series 2000 lock with pipe wrench

Door locks

The following three general types of locks—mortise, rim, and cylindrical—are described next. Forcible-entry techniques for each lock type are described in the succeeding sections concerning different types of doors.

Mortise locks. A commonly used lock before bored cylindrical locks became prevalent, **mortise locks** have seen resurgence in recent commercial and residential construction.

Typically, a mortise lock installation includes a **lock body** (installed within the “mortise cut-out” in the door) and the **lock trim**, and includes a variety of designs, a **strike plate**, and the **keyed mortise cylinder**. This final piece operates the locking and unlocking function of the mortise lock (figs. 12–18 and 12–19).

Rim locks. **Rim locks** are locks in which the body of the lock is surface-mounted on the inside of the door. A cylinder extends through the door to the outside, where the lock is opened by a key. A vertical bolt lock is secured to its mating plate in the same fashion a door hinge is secured by its pin. To remove the lock, you must destroy it (figs. 12–20 and 12–21).



Fig. 12–18. Demonstrating the use of a key tool on a mortise lock

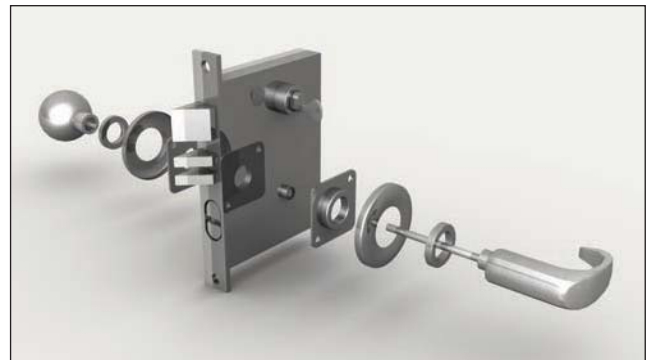


Fig. 12–19. Exploded view of mortise lock



Fig. 12–20. Rim lock



Fig. 12–21. An exploded view of a key-operated rim lock

Cylindrical locks. Cylindrical locks have locking mechanisms that are round in shape, hence their name. The locking mechanism itself is contained in the door's lever or knob, not in the door (unlike the mortise lock). Compared with the mortise lock, it is simpler and less formidable. **Key-in-the-knob locks** (fig. 12–22) and **deadbolt locks** are examples of a cylindrical locks.

The bolt itself on a deadbolt has a flat “squared” end, as opposed to a spring latch which is beveled. A cylinder is set into the face of the door; the bolt is moved in and out by either a key or a thumbblatch by the occupants inside the building.



Fig. 12–22. Key-in-the-knob lock

Extraordinary security devices

In certain areas of the United States, people have different security needs as well as different forces of nature. In urban areas as well as the suburbs, crime is now a major concern. People are generally more concerned with crime than they are with the threat of fire. Given the choice, people are more inclined to fortify areas, regardless of the fire hazard. People are literally locking up their dwellings like fortresses. Commercial occupancies are

also as well fortified as some banks. Some examples are fox locks, magnetic door locks, and electric strikes.

Fox locks. Fox locks are devices with two bars that hold the door closed from the inside. The bars are attached on a rotating plate on the door. The plate is rotated in order to move the bars. Looking from the outside, you will be presented with two sets of bolts. The lower set of bolts indicate the direction that you would turn the key to remove the bars from the keeper. From the inside, the process is reversed; the plate has a knob that needs to be pulled out before you can turn it. If you fail to pull out the knob, it will only spin and not engage the bars (figs. 12–23 and 12–24).



Fig. 12–23. Fox lock outside view



Fig. 12–24. Fox lock inside view

Forcing entry. You will normally find a plate surrounding the lock with four bolts. To force entry, shear three of the four bolts, thus exposing the cylinder. Next remove cylinder with the point of the Halligan tool. Use the 5/32 square tool to open the locking mechanism. Turn the key toward the bottom two bolts while pushing in (fig. 12–25).



Fig. 12–25. Opening a fox lock with 5/32 square tool

Magnetic and electric strike locks. These types of locks are typically found on outward-opening entrance doors, gates, and inward-opening doors to large multiple dwellings and commercial buildings.

All **magnetic locks** will work only with DC current. You may come across a magnetic lock that comes with an AC power supply, but here the AC voltage is being converted to DC in the lock. All magnetic locks are fail safe. This means that they need a constant source of current to remain locked. If power is removed the lock will open (fig. 12–26).

Electric strikes are often used for “buzz in” type of systems. Electric strikes come in many varieties. They may be fail-safe or fail-secure (fig. 12–27).

- A fail-safe electric strike needs power to keep it locked.
- A fail-secure electric strike stays locked even without power.

The most common by far is a fail-secure. When using a fail-secure electric strike even without power, it stays locked from the outside coming in. For **egress** or getting out, a door knob or lever on the lock allows for safe exit.

Forcing entry. Outward-swinging doors should be forced with conventional forcible entry using a Halligan tool and flat head axe, including doors with two magnets (top and bottom) or three magnets (top, middle, bottom) running down the side of the door frame. Start at the top and work downward. When the top magnet releases, it may be necessary to put the axe or chock into the space and let the Halligan slide down the gap to force the next magnet. When you reach the bottom magnet, you can pivot the axe so its wider width is able to hold the gap further open and assist in releasing this magnet. Some doors may only have a top magnet located about

6–8 in. (150–200 mm) away from the door frame on the handle side. These doors can be forced with the Halligan tool by prying down on the adz or popping it with a hydraulic tool if it's an inward-opening door.



Fig. 12–26. Magnetic door lock



Fig. 12–27. Electric strike door lock

In some cases, firefighters can use the blunt end of the tool and strike the door near the magnet while also pulling on the door handle. The force from striking the door near the magnet and the pull on the handle will allow the magnet to be freed from its receiver. This will not always work, but offers the possibility of quickly opening the door in some cases.

Hydraulic spreading devices are the tools of choice to force inward-swinging doors with electric strike doors

and magnetic door locks. When forcing an electric strike door, treat it like a normal inward-opening door. Use the Halligan tool and axe (or maul) to create a small gap between the door and the door frame, at the electric strike. Place the jaws in the gap, with the fixed jaw against the door frame. Pump the tool and push the door away from the electric strike. Magnetic locks are formidable foes. They can exert a force of 3,000 lb (1,361 kg). If accessible, you can de-energize the lock by disconnecting the DC current to the device. Alternatively, you can use your hydraulic spreading tool. As with the electric strike, create a gap next to the magnetic lock between the door and the door frame using the Halligan and a striking tool. Place the jaws in the gap and pump the tool until the magnetic hold is broken (note that you must control the door with a hose strap or the like as it may swing quickly away from you). Place a ten penny nail on the magnet to prevent it from closing once you have forced the door.

Forcing magnetic locks on ornamental entry gates. Many gates are also equipped with magnetic lock assemblies. Often these will have a large flat plate handle on them protecting the lock mechanism and magnet. To force these gates, a simple tactic can be performed by the firefighter. First they will pull on the handle and take any slack out of the gate; this usually creates a gap above and below the handle. Then the adz end of the Halligan can be inserted into this space and either pushed upward or pried downward to pop the magnet's hold onto its receiver. Normally, this is a quick and easy tactic to perform to force entry when faced with these gates.

DOORS

Types of doors

Inward-opening doors. **FFI 5.3.4** The majority of the doors that we encounter are the types that swing inward, which is away from the forcible-entry team. These doors will usually be found with more than one type of locking device. Single-family homes—the most common location of fires in the United States—typically use wood inward-opening doors with wooden frames. In some newer residential buildings, as well as commercial buildings, we will find metal doors. Metal doors (usually steel) can have a hollow core, be filled with a honeycomb cardboard, or have a wooden core (also known as **Kalamein doors**). These doors are usually set in metal frames, and together they create a very formidable door.

Looking at a door from the outside, if the hinges are not visible, we are dealing with an inward-opening door (figs. 12–28 and 12–29).



Fig. 12–28. The use of a Halligan tool on an ornamental entry gate

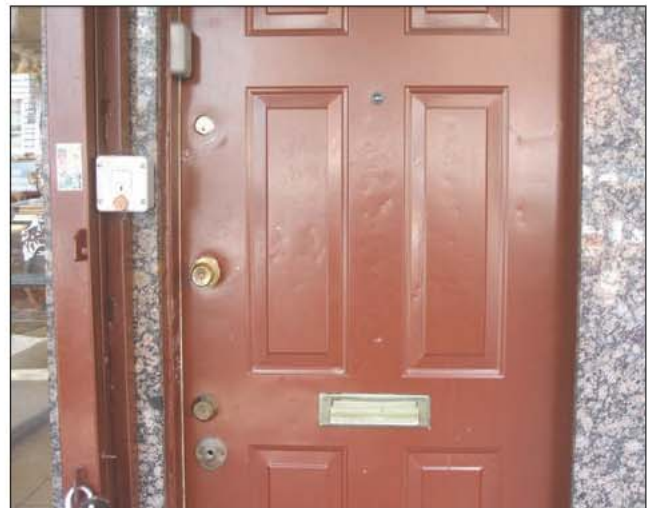


Fig. 12–29. Inward-opening steel door

Note: Kalamein doors are set in metal frames, as are metal doors. Sometimes you may not pick up the difference immediately. When we begin forcing entry into both these types of doors, you will notice the difference immediately. The Kalamein door is more pliable; that is, there is more “give” in the door. Because metal doors are stronger, they will not bend as much when attempting to force. The energy from the tool is more easily transferred to the lock. Think of it as the same concept as the crumple zone, which is built into cars today. Older cars were made of steel, where the force would be transferred throughout the vehicle.

Outward-opening doors. When the hinges are visible from the outside, the door will swing toward the forcible-entry team. These types of doors are usually found in commercial occupancies, including places of public assembly, which are required to have doors that swing in the direction of egress for life safety purposes (fig. 12–30). Strip mall storefronts, for example, should have outward-opening tempered glass doors with aluminum frames, known as **aluminum stile doors**. The glass is heat treated to add strength (fig. 12–31). We often find outward-opening metal doors in factories as well.



Fig. 12–30. Outward-opening door

Tempered glass doors. This type of door is usually distinguishable by its lack of frame and little or no trim. The lock is usually found in the bottom stile. Its tempered glass is four times stronger than plate glass. If smashed, it will explode into little pieces (fig. 12–32).



Fig. 12–31. Aluminum stile door



Fig. 12–32. Tempered glass door

Sliding doors. Sliding or patio doors are really door-sized windows that glide in tracks. They first appeared in the Southwest in the United States in the 1950s. Sliding doors provide wide, easy access between indoors and outdoors (fig. 12–33).



Fig. 12–33. Sliding patio door

Residential overhead garage doors. Overhead doors are normally found in garages. Garage door panels are made of fiberglass, fiberboard, steel, aluminum, or wood. Windows are optional.

There are three types of garage doors:

1. Roll-up: Doors with hinged sections that roll on a track (fig. 12–34)
2. Swing-up: One piece that arcs up (fig. 12–35)
3. Hinged: Pair of doors that open outward (fig. 12–36)



Fig. 12–34. Roll-up garage door



Fig. 12–35. Swing-up garage door



Fig. 12–36. Hinged garage door

Hurricane-resistant garage doors. In some parts of the country where hurricanes and tornados are a common occurrence, homeowners have either upgraded their garage doors or replaced them altogether with stronger reinforced garage doors (fig. 12–37). When homeowners do these types of renovations, they inadvertently make our job of forcible entry a lot tougher.

Hurricane-resistant garage doors are embedded with heavier vertical stiles and horizontal reinforcement,

as well as impact-resistant steel skin and heavy-gauge sheathing. They also use heavy-gauge steel tracks supported with a high number of anchoring brackets to help maintain the door's integrity in high-wind situations.

To sum it up, tougher doors mean added delays if we are not aware of them.



Fig. 12–37. Hurricane-resistant garage doors

Security gates or roll-down gates. Security gates are more commonly known to firefighters as **roll-down gates**. Roll-down gates are normally found in strip malls and commercial occupancies known as taxpayers. They come in a variety of thicknesses and types. Roll-down gates operate in three ways:

1. Manually operated: Often recognizable by their smaller size and wide slats with handles on the bottom. The gate is lifted up by hand with the assistance of springs (fig. 12–38).
2. Electrically powered: An electric motor raises and lowers the gate, activated by a switch on the wall (fig. 12–39).
3. Chain operated: A chain hoist mechanism lifts the gate (fig. 12–40).



Fig. 12–38. Manually operated roll down gate



Fig. 12–39. Electric powered roll-down gate



Fig. 12–40. Chain-operated roll-down gate

Forcing doors



FFI: 5.3.4 Before we commence operations, we need to assess what the call is for: fire, medical, or other nonemergency. We should always strive to gain entry in the least damaging way. Sometimes we may not even wind up forcing the door if there is another means of entry. If the

call is for a fire, then there should be no delays, and we need to force entry immediately, in the most efficient way. We need to attack the normal point of entry. This is the route that most people take in a fire or an emergency. Lives are depending on it. It is important for firefighters to use the tools correctly.

- A Halligan tool is held like a baseball bat, except that the hands should be spread apart. The hand at the hook end is palm up, and the hand at the fork end is held palm down. Your hands should never be anywhere but on the shaft of the Halligan tool (fig. 12–41).
- The axe is held with the upper hand 6 in. (152 mm) from the head of the axe, with the other hand near the bottom of the handle (fig. 12–42).

After forcing, doors may have to be propped open to keep from closing on hoselines, or to remain visible as exits.



Fig. 12–41. Firefighter holding Halligan tool correctly



Fig. 12–42. Firefighter holding axe correctly

Inward-opening doors. One of the more common types of doors encountered when forcing entry is the inward-opening door. To achieve entry, firefighters should work in teams of two while using a flat-head axe or maul and a Halligan tool. First and foremost, size-up the door to determine the best means possible of entry. Once this is done, the team of firefighters will insert the Halligan tool in between the door and frame near the lock. The flat-head axe or maul is then used to drive the tool in further to allow the door to be pried open. In order to increase safety, a rope or hose strap should be used to hold the door so that when it is opened it does not swing into the room prematurely and expose the firefighters to danger. This method can also be accomplished by a single firefighter if necessary.

Forcing inward-opening door with hydraulic spreading tool. While manual tools are more commonplace on the fireground and will typically be used for forcing entry, there are a number of power tools that can be used to also accomplish the job. One of these is the hydraulic spreading tool. As with any attempt at forcing entry, it is important to size-up the situation before proceeding. This method is best accomplished with a minimum of two firefighters working as a team. To open the door with a hydraulic spreading tool, it is a good idea to have hand tools like the Halligan available. First, “shock and gap” the door or loosen it on the lock side with the Halligan tool. Then place the spreaders of the tool in the opening and operate the tool with short pumping strokes to force the door open. In order to increase safety, a rope or hose strap should be used to hold the door so that when it is opened it doesn’t swing into the room prematurely and expose the firefighters to danger.

Note: Some hydraulic forcible-entry tools utilize a small spring to keep the tool in *work* mode. This spring can easily get dislodged. If the tool falls to work, firefighters should know without looking at the tool which direction the lever needs to be pushed to put the tool into work mode. It’s a good idea to put hydraulic tools under a load to test them, because often failures will only be apparent if the tool is under a load—so give them an operational test.

This tool will actually work best on stronger doors, given that some wooden doors that have strong locks will actually blow the door jamb. The tool is best used with the jaws placed directly on the lock. Some residential occupants add a piece of angle iron around their door locks to prevent people from forcing them open. You will

need to position the jaws of the tool as close as possible to the locks in order to force the door (fig. 12-43).



Fig. 12-43. Angle iron on inward-opening door

Through-the-lock technique. When using the **through-the-lock** method, we are normally going to be dealing with two types of locks, the mortise lock and the rim lock. We are going to be using the K-tool to remove the trim ring and the face of the lock cylinder. After getting a bite into the cylinder, the tool's blades will lock onto the cylinder and then be leveraged out. In the case of aluminum stile doors with mortise pivoting dead bolts, a pair of vise grips may be used to turn the entire cylinder housing 1/4 turn clockwise to bend the two set screws that hold it in place. The cylinder can then be spun completely out of the door by turning it counter-clockwise, allowing it to be manipulated with the key tool as described below. The cylinder can be reinstalled at the conclusion of the incident.

Mortise locks. The key turns a cam that slides the bolt out of the strike. To open the lock after the cylinder has been removed, use the key tool. Before pulling the cylinder, note the position of the keyway. The keyway would normally be found at the 6 o'clock position. Use the bent end of the key tool and slide the bolt from the 5 o'clock position to the 7 o'clock position. If the slide is

found at the 7 o'clock position, then move it over to the 5 o'clock position.

Note: If the lock has a dead bolt mechanism that prevents the bolt from moving, you must depress the dead bolt mechanism with the end of the key tool while sliding the bolt. If after doing this, you still find that the latch is in the locked position, continue rotating the key until you make contact with the spring-loaded latch lever, found at the 3 or 9 o'clock position. Depress this latch to release the spring latch.

Rim locks. The key turns stem on the end of the cylinder, which fits into the back plate of the lock. We are going to insert the straight end of the key tool into the slot and turn left or right. If you cannot insert the key tool into the slot because a shutter is present, or turn it because the **night latch** is thrown, take the point of the Halligan, insert it into the opening, and drive the lock off the door.

Note: The lock may have a shutter that closes when the cylinder is withdrawn. Some firefighters carry a dental pick or a ground-down screwdriver to get at the shutter.

Forcing inward-opening doors using a Halligan tool and flat-head axe. The method we use to force these types of doors depends on the position of the door in the frame. They may be **flush fitting** or **recessed**.

Flush fitting. These doors may be forced using the adz or the fork end of the Halligan tool. When using the fork end of the tool, place the concave end of the tool facing toward the door. Slightly canted for ease of penetration, as the tool is being driven in between the door and the jamb, bring it to perpendicular to avoid being driven into the jamb. After the tool has spread the door as far as possible, push the tool away from the door. Place the adz end of the Halligan tool 6 in. (152 mm) above or below the lock. Drive it into the area between the door jamb and the door. Avoid penetrating the door stop. Pry the tool downward and out.

Recessed doors. The fork end of the Halligan tool cannot be used for these types of doors. We will only use the adz end of the Halligan tool, in the same manner as in the flush fitting doors.

Note: Realize that to force an outward-opening door, sometimes the adz needs to get behind the door. This will require the entire head of the Halligan to get in between the door and the jamb. This will take some time and effort (a

minute longer than an inward-opening door operation), so persevere.

Forcing an aluminum stile glass door using a power saw. Some doors are designed so that traditional means of forcing them with hand tools will cause substantial damage to the door which flies in the face of the third incident priority, **property conservation**. To effectively perform this task, a power saw is an effective tool. This method requires at least two firefighters and the use of a Halligan tool, flat-head axe, or maul and a power saw. As with other methods, first size-up the situation before going ahead with the operation. For this method the firefighter makes a gap in the door using the hand tools, then uses the power saw to cut the slide bolt and open the door. Because they are using power tools, safety is a primary concern for this operation.

Note: Often the frame of a glass and metal store door is part of a showcase window. These frames can have quite a bit of play. You may be able to get the door somewhat easily using conventional forcible entry, even though the keeper of the lock has considerable throw. Check to see if the door is outward-opening, so that when the keeper of the lock pops out, it won't wind up on the inside of the frame. This will prevent the door from opening, even though the dead bolt is out of the strike box.

If it's a double door, this will not work because the keeper of the lock will have a hook on it to prevent the spreading of the door from unlocking the door.

Forcing sliding doors. If the occupants don't have any homemade security devices in the track, such as a cut-down broomstick or 2 × 4 or pipe, forcing the door should not present much of a problem. Place the fork of the Halligan tool with the bevel side against the door jamb and snap the lock striker out of the frame (fig. 12-44).



Fig. 12-44. Locking device on a sliding glass door

As a last resort, if there is a homemade device, you will have to break the glass. Remember that if you break glass, you will be adding oxygen to the fire and may increase the fire.

Forcing residential overhead garage doors. Normally these types of doors are found with glass windows or wooden panels. The best method with these types doors would be to break one of the panels and reach in and unlock the door. Break a panel near the lock, but also near where you think the cross bar may be, so if double-keyed, you can put the fork of the Halligan on the bar and beat it in by hitting the head of the Halligan tool with the maul. This should pull the bar out of its keeper in the door track, enabling the door to be opened. If the garage has an electric opener, you should break one of the panels and reach in and pull the release cord. The through-the-lock method can also work here. Use the K-tool or A-tool and pull the cylinder. If the above methods don't work, you can use the power saw and make an inverted V cut or a box cut (figs. 12-45 and 12-46).



Fig. 12-45. Inverted V cut



Fig. 12-46. Box cut

Note:

- After forcing the door you need to secure it, to make sure it doesn't come down behind you. A portable ladder or a 6-ft (2-m) hook propped under the door works; if these are not available, use vise grips on the track.
- Keep in mind that this may not be the best point of attack if there is a fire in the garage. If there is a front door, you must also make entry there and make sure that fire is not extending into the house through an opening between garage and house. You don't want to save the garage and lose the house.
- When overhauling garage fires with overhead doors, make sure to inspect where the door track supports pierce the ceiling. It is often not spackled, so an opening in the Sheetrock® may be present that would allow extension. This is sometimes missed because the open door hides this likely avenue of vertical extension.

Forcing entry. The primary point of attack will be the padlocks. Cutting the padlocks is usually the fastest way to gain entry. When cutting padlocks you also must remember to pull the pin that holds the lock to the hasp on the gate (fig. 12-47). After the pin is pulled, you must manually lift up the gate.



Fig. 12-47. Pin in roll-down gate

If it is not feasible to remove the locks, you should then attack the gate itself. Sometimes the gate is little used and so may resist raising even with the locks removed. Sometimes the fire may have warped the door. The idea is to cut the gates and remove the slats. Removing the slats will free up the slats and release the tension on the gate. There are two methods to do this:

1. Make an inverted V cut. When doing this, leave a small piece at the apex uncut as this will allow the gate to stay in place while finishing the cut.

2. The second style is a **slash cut**. Make two parallel cuts from top to bottom and pull out the middle slat above the highest lock. Then pull out the remaining two slats on either side. This will release the gate (fig. 12-48).



Fig. 12-48. Slash cut

Note: It is generally a good idea to open all the gates at the same time at a serious working fire. Cutting gates will also chew up a blade very quickly; so if you have a lot of cutting to do, make sure you set your priorities and get the main gate first.

Forcing hurricane-resistant garage doors. One of the more interesting doors that firefighters come up against are hurricane-resistant doors. By their nature they are designed to withstand severe forces of nature. Forcing this type of door requires a team of firefighters using hand tools, a power saw, and bolt cutters. As with previous methods of forcing doors, size-up is critical before committing firefighters to the task. Access to this door usually requires the removal of a pad lock and the cutting of the door near the lock mechanism to make it accessible.

Forcing entry to security gates or roll-down gates.

In many urban areas it common to find roll down gates protecting the entrances to commercial establishments. Access to these buildings can prove to be a challenge. Forcing this type of gate requires a team of firefighters using hand tools, a power saw, and bolt cutters. As with previous methods of forcing doors, size-up is critical before committing firefighters to the task. Since this involves any incident with heavy fire, the main purpose is to allow for access to quickly attack the fire.

A cone cut allows for stream application at ceiling level prior to entry for a quick knockdown.

Forcing entry to electric powered roll-down gates.

The motor on the wall could be mounted outside or inside the building. If inside, you may have to cut an inverted V or box cut to gain entry. Be aware that often these larger gates do not have slats that are removable.

Another method is to gain entry and use the manual override cable and chain to raise the gate. In a smoke condition this can be difficult. The firefighters must coordinate their efforts. One firefighter pulls on the cable or chain that engages the gear for manual raising of the door. This may take several tries, as the gears may not be lined up and may be stiff from lack of use. The second firefighter needs to pull the chain that raises the door. This firefighter will not know if he or she is pulling the right way, as the gear ratio is usually very low to accommodate the motor. The solution is for the second firefighter to pull in both directions as the first firefighter continues to tug on the cable, and at the same time a third firefighter uses his or her hand or light to detect when the door is rising. Once the door is found to be rising, the third firefighter instructs the other two to continue doing what they are doing to raise the door. Getting a large door fully open this way will often have dramatic improvement on the fire operation.

If the motor is outside, the manual override may be up in the housing of the motor or locked in a vertical track alongside the gate. Accessing this may allow you to use the manual override. If there is a keyed switch outside, you may have two options: pulling the lock cylinder and turning the switch with a screwdriver, or you may shear the housing cover and jump the switch.

WINDOWS

FFI 5.3.4 Our normal point of entrance in a fire operation rarely involves entering through a window. There are exceptions, but for the most part we use the door. This is not to say that we don't need to know how to force entry. The reality is that in a working fire, we will not be forcing windows, but breaking them. Extreme care must be used, as there have been cases where firefighters have been killed or injured behind windows for various reasons.

Flying glass from forcing windows can be dangerous to both firefighters and interior victims, as well as the shards remaining in a window where firefighters or victims must exit.

Most of our responses today are for calls other than fires. We get calls for all sorts of emergencies. In this chapter we have discussed using less damaging methods when forcing doors, such as going through the lock. There are sometimes even better options when we are confronted with non-life-threatening emergencies. Many homeowners go through great lengths to fortify their front doors but a second-floor window may have a cheap window lock. If there is a window within reach of the street, a portable ladder or fire escape will usually provide us with the least damaging way to gain entry. For safety, always send at least two firefighters when using a window for entry.

Windows usually were single pane up until the mid-1980s. This was bad for the homeowner but good for the firefighter. Windows would fail very early in a fire and prevented firefighters from entering a potentially explosive situation.

This section will show you how to identify the various window types.

Window types



Glazing: Low-E glass. In these types of windows, a low-emissivity (low-E) coating is applied to each layer of glass in the unit. Each unit can be either double glazed or triple glazed, meaning that it has two or three vertical panels. Each panel is separated by an air gap that is normally filled with some type of inert gas such as argon or krypton.

In areas of the country where there are ultraviolet (UV) issues, most window manufacturers offer some form of “superglass” technology. The most common superglass is called low-E glass, which has a metallic film vacuum-deposited on one side. In a double-pane unit, the film is on the outside of the inner pane.

What this means to the firefighter is that we will have a very difficult time venting these windows.

Plate glass. The dictionary defines **plate glass** as “glass produced in thin sheets, used for windows and mirrors” (fig. 12-49). This is the type of glass that we see every day used as windows in storefronts. It is heavy and will shatter when you break it. Firefighters who have underestimated the weight of these windows have been injured when breaking these, and pieces of glass have landed on them.

Note: Keep in mind that when we are training to be professional firefighters, anybody can break a window. What is going to set us apart from

the rest of society is our professionalism. We should treat every home or business we respond to as if a close relative owned it. This means when we have opportunities in non-life-threatening emergencies to create less damage by opening a window rather than breaking it, we should do so.



Fig. 12–49. Plate glass window

Tempered glass. Tempered glass has been treated either chemically or in a thermal process to add strength (fig. 12–50). In addition to the increased strength, tempered glass shatters into soft-edged tiny fragments instead of the sharp-edged shards of typical pane glass. Side and rear windows of automobiles are made of tempered glass.



Fig. 12–50. Tempered glass

Wired glass. A wire mesh fed into molten glass during manufacturing adds strength to wired glass. Usually installed for doors and roof applications, **wired glass** keeps objects from breaking through, and when the glass is broken, the wire holds pieces together. Ideal for deterring burglaries, wired glass can also inhibit the spread of a fire (fig. 12–51).



Fig. 12–51. Wired glass

Lexan®. Lexan® is a polycarbonate resin thermoplastic glazing that has an impact resistance 250 times greater than safety glass (fig. 12–52). It will not shatter and is half the weight of glass. It is self-extinguishing and has one-third the conductivity of glass.

It is usually found in high-crime areas or areas that are prone to vandalism. Fires where Lexan® is involved are very difficult to ventilate since Lexan® cannot be broken with conventional forcible-entry tools.

Forcing entry. The best tools to use are either a power saw with a carbide-tipped blade or a reciprocating saw (e.g., Sawzall®) with a coarse wood-tooth blade. The reciprocating saw is slower than the power saw. If neither of these tools are available, the Halligan tool and axe can be used to force the framing or mullions, thus making it possible to remove the whole pane of Lexan®. If the window is at ground level, a portable ladder can be used to push in the whole assembly.

Casement windows. Casement windows open sideways at the turn of a crank. The advantage is that the whole window can be cracked slightly and still (with the handle removed) prevent entry by intruders. These windows are a disadvantage for the fire service given that vent and access are limited by the way they open and their small size. They close tightly because the lock draws the sash against the frame. The handle can be removed to add additional security (fig. 12–53).

Double-hung windows. In **double-hung windows**, both sashes move up and down vertically. (A single-hung window has only the bottom sash that moves.) Some have key locks that attach to the top rail of the lower sash. They can be used to keep the window shut or partially open. The lock pins into the jamb (fig. 12–54).



Fig. 12–52. Lexan® window



Fig. 12–53. Casement window

Forcing entry. From the exterior, place the fork of the Halligan tool with the bevel side against the windowsill and pry inward and downward. This should break the weak window latch. Should the glass break, clear it completely.

From the interior, most modern double-hung windows have clips that can be moved to allow easy removal of the entire window with the glass intact. If in a heavy smoke condition, these windows can be readily forced by placing the adz of the Halligan tool between the upper and lower sash against the window jamb and prying upward. This is faster and provides a better opening than breaking a double-paned glass window.

Note: Anytime you make entry into a window at a fire, you should remove both the bottom and the top sashes, for safety reasons. The old expression is to “make a door.”



Fig. 12–54. Double-hung window

Sliding windows. Sliding windows are like patio doors, only smaller. The primary advantage is that the sash doesn't protrude outward when open. A problem for the fire service is that they are often too small for effective vent and entry (fig. 12–55).



Fig. 12–55. Sliding window

Forcing entry. Here is the same type of locking mechanism as on a double-hung window. The best way to force this window is to use the Halligan tool with the bevel end against the wall, placing the fork end of the tool between the edge of the window and the window jamb and pushing the tool toward the wall.

Awning windows. Awning windows are like casement windows, but open upward instead of sideways. They are normally used for basement windows. Like casement windows, the crank handle can be removed for added security, and like casement windows, their small size limits our vent and access capabilities (fig. 12–56).



Fig. 12–56. Awning window

Jalousie windows. Overlapping glass panes opened with a crank or turn-screw form the sections of a **jalousie window** (fig. 12–57). When opened, the sections allow air flow through a residence, but this type of window does not form a tight seal when closed. Even closed tightly, the glass louvers still allow air to pass through, and the side hinges also are difficult to seal without completely covering the window. The disadvantage for a

homeowner with this type of window actually helps in a fire situation: the air leakage allows a fire to breathe and greatly diminishes the chance of a flashover.



Fig. 12–57. Jalousie window

Window security devices



Window bars. In some high-crime areas, people try to make their homes impregnable. Firefighters are finding more windows that are accessible from the ground or a ladder covered with outside bars, also called **burglar bars**.

Just as there are numerous types of windows, there are equal types of bars that can be installed (figs. 12–58, 12–59, and 12–60). From ornamental wrought iron to simple iron bars, there are many examples, as well as a variety of anchoring systems. Often these iron bars are mounted with lag screws in the exterior of the building. Firefighters also will encounter burglar bars that were set directly into the building's masonry or frame (fig. 12–61).

Note: Structure fires in buildings with strong security devices should be approached differently than fires in unsecured buildings. While security devices covering windows and doors keep unwanted people out during normal situations, these same devices can make a building unsafe for firefighters (and building occupants) who need a quick exit from an unsafe situation. Security bars on windows and doors should be addressed by the incident commander, and communicated to all personnel on the scene. Removing window bars and all barriers needs to be handled quickly, and in some instances with assistance from the rapid intervention team (RIT).



Fig. 12-58. Window bars on a house



Fig. 12-61. Burglar bars on a wooden frame



Fig. 12-59. Close-up of window bars



Fig. 12-60. Decorative window bars

Tools for window bar removal. The tools of first choice for removing burglar bars usually are common power tools such as the air chisel or rotary saw with the metal-cutting blade. However, sometimes power tools don't work or aren't available. Because removing burglar bars is such a crucial operation, always have basic hand

tools such as a sledgehammer and irons (flathead ax and Halligan) as a backup.

Rotary gas-powered saw. The rotary saw can be used in a number of ways to defeat security bars. One approach is to remove the moving sections of the hinges by cutting vertically through the edge of the hinge assembly to remove it from the doorframe. Another method is to cut through the deadbolt as if you were cutting the deadbolt on metal doors. Position the blade in the gap between the gate edge and the jamb, and cut downward through the bolt. This can be more difficult if the bolt is protected by a metal cover; in this case you must cut through the cover as well as the deadbolt. If a metal cover is present, it is often better to use the saw to cut through the bar segments that support and connect the lock mechanism to the gate. Cutting these bars that support the lock will enable you to displace the lock assembly from the gate. When using the saw to remove burglar bars on windows, cut at the points where the bars are flattened into tabs and attached to the building with connectors, at the weakest link or attachment point.

Cutting through the main bars with a rotary saw should be a last resort. Working horizontally with the rotary saw can be very awkward and fatiguing. It's better to make vertical cuts through horizontal members, whenever possible—i.e., move the saw blade up and down while cutting through horizontal bar members and let the weight of the saw assist with the cutting. Older-model rotary saws can also be awkward and fatiguing to use above eye level, so if you must make higher-level cuts, work from a stable ladder or an elevated platform. Another point to remember, especially when using the rotary saw to cut metal, is to keep the revolutions per minute (rpm) high for greatest cutting efficiency.

Flathead axe and Halligan. In the hands of firefighters who know how to use them, the irons are the “master keys” for all-purpose forcible entry on the fireground. Use the adz end of the Halligan driven by the flathead ax as a muscle-powered version of the air chisel to shear off burglar bar hinges or connections. Use the point end of the Halligan to attack burglar bar gate hinges. Position the point on the top of the hinge, and use the ax (or maul) to pound the claw point down and split open the hinge assembly. Once again, if the lower and center connections can be broken at two or three points, very often you can bend back the bars from the loosened points and use leverage to either break the remaining connections or move the bars completely out of the way.¹

Window gates. Instead of fixed burglar bars, some buildings actually have a gate that can be opened. The gates themselves may be operable by pushing a button to release them (or by the operation of a smoke detector tied directly to them), or a key may need to be turned inside. Sometimes the gates have padlocks on the inside. Note that fixed bars as well as gates that need keys to open are typically prohibited by building and fire codes; however, many people in high-crime areas install them illegally.

Note: Recently building owners have begun installing metal window enclosures on top of the window gates and window bars, while a building is undergoing renovations or foreclosures. These will have to be forced prior to attacking the window gates or window bars (fig. 12–62).



Fig. 12–62. Metal window enclosures

In multiple dwellings that have fire escapes, you will find window gates attached to the inside of the window. The upper and lower hinges are screwed into the jamb (fig. 12–63).

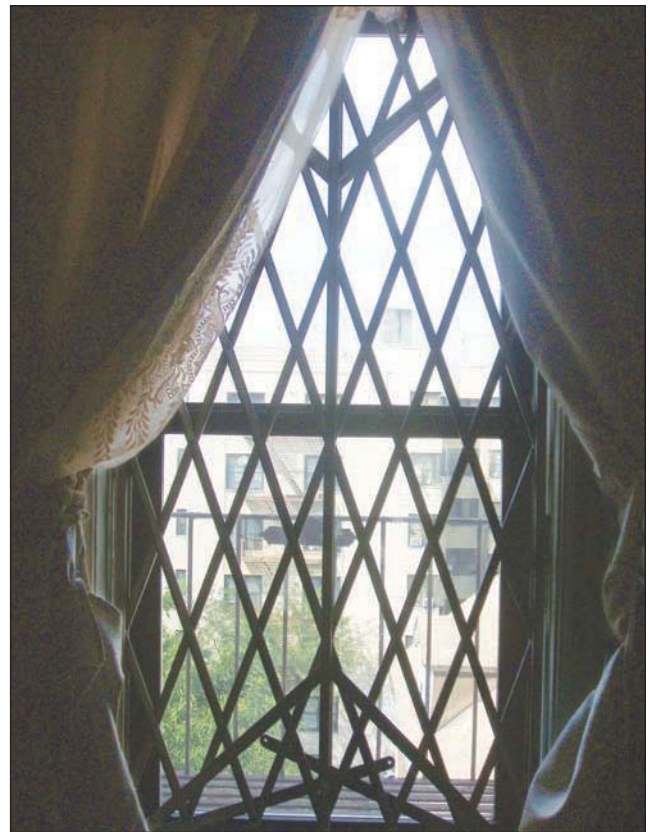


Fig. 12–63. Window gate

Forcing entry. You will need to open the window and attack the hinges. Attack the top hinge first with the Halligan tool, and afterward attack the bottom hinge. When both hinges have been removed, slide the gate toward the lock, and this will open the window two-thirds of the way.

Note:

- Do not kick the gate, as this could result in the gate jamming and your wasting time. Also keep in mind that you may find padlocks on the inside. When entering a room, size up the situation first, and if there is a lock, remove it.
- It's a good idea when searching a large fire area (big apartment) to establish a second means of egress. You wouldn't want to get cut off from the way you came in and only then find out that the windows had gates or bars on them. Determine early on if there are accessible windows, and make one into a second means of egress remote from where you came in, just in case.

Window guards. Window guards, also known as “child guards,” are usually three to four horizontal bars that interlock and slide into a prescribed opening (fig. 12–64). The device is installed on the lower

sash to prevent children from falling out. They are normally screwed to the outside of the lower sash of the window frame.

Forcing these window guards is normally not a problem. Striking the vertical frame of the window guard (there are two) away from the mounting frame will get the job done.

Note: Sometimes if the gate is larger than the window, the vertical frames will be too close to the side of the window frame to insert the fork of the Halligan tool. If that is the case, you will need to work on the mounting screws.



Fig. 12–64. Window guard

Hurricane-resistant windows. Security is not our only issue. In the areas of the country where hurricanes are prevalent, people are now using windows that can withstand hurricane-force winds. As a result, people who don't even live in hurricane-prone areas are now using **hurricane-resistant windows** because of the added security value. Chances are now that you may find these windows in any part of the country.

The frames are built right into homes that are constructed with concrete block walls. They are set into the openings with tap cons, which are 3 in. (76 mm) long and $\frac{3}{8}$ in. (10 mm) in diameter. They are tapped in 8 to 12 in. (200 to 305 mm) apart (fig. 12–65). The glass rests against the frame (resistance is to the inside). Hurricane-resistant windows feature three panes of glass—two of which sandwich a protective interlayer—solar control plus low-E (metallic film), argon gas, and heavy-duty double locks (fig. 12–66).

Note: The film gives the glass the ability to stay together.



Fig. 12–65. Tap cons



Fig. 12–66. Hurricane-resistant windows

Forcing entry. As mentioned earlier, hurricane-resistant doors provide challenges to firefighters. Hurricane resistant windows are no different. Forcing this type of door requires a team of firefighters using hand tools, chain or reciprocating saw, and pruning shears. As with previous methods of forcing doors, size-up is critical before committing firefighters to the task. Because these windows are designed to resist high winds and debris, the use of a saw is needed to cut through the window panes.

Note:

- If a saw is not available, use pruning shears. If pruning shears are used, you will have to shatter the glass to loosen it up, because the shears don't have the power to go through glass like a saw.
- Full personal protective equipment (PPE) must be used, because the cutting operation will create a dust cloud, and there will be small shards of glass thrown about while you are cutting.

Breaching walls and floors

**SKILL
DRILL**

FFI 5.3.4 FFI 5.3.9 Breaching walls and floors should usually be a last resort. To breach a wall or floor takes a great deal of time and energy and also damages the structure, which can be costly and dangerous.

Breaching a wall is especially dangerous, as firefighters must be very aware of the fire-related structural weaknesses and load-bearing factors, as well as any electrical, gas, or plumbing lines hidden in the walls that could be struck or cut when breaching. In some cases, cutting into a load-bearing wall could precipitate a collapse. The collapse potential must be carefully weighed against expected gains.

There are times, however, when it is the best course of action, and firefighters should be able to breach walls or floors when the need arrives.

There are a great many special tools coming into the fire service from the demolition, construction, and mining industries. Generally these tools are expensive and therefore in short supply in the fire service. They usually need to be special-called to a fire or emergency scene and require specific training on the use of the tool. The methods discussed next involve the use of tools commonly found on today's fire trucks and as so should be available for rapid use.

Breaching interior walls. Breaching interior walls is generally considered as an emergency method to exit a fire area if cut off from a normal route of egress by an unexpected fire growth. If you are put to work as part of a rapid intervention team (RIT) to breach an interior wall to help find or free a lost or downed firefighter, a good tool to bring may be a reciprocating saw. Many of these saws are now light, have quick-change blades and batteries, and will operate in heavy smoke. In some cases, interior walls are breached to create openings to attack a fire in an adjacent room that cannot be attacked from a public hallway door.

For a wood stud wall, firefighters can dismantle tough wood studs by splitting them with either the point or the adz swung or placed and hit with an axe or maul (fig. 12–67).

Some large and tough studs found in older construction or pieces installed by “wood butchers” can be rapidly removed with this method.

There are occasions when an interior wall may be breached to facilitate line placement or search, usually if an alteration to the building has sealed off the expected

access (hallway), and the new access cannot readily be found. If faced with duplex, triplex, or “sandwich” apartments, and the line has to advance down into the fire area, it may be advantageous to breach an interior wall from the level of the fire area to avoid the punishment of pushing in from above. Any breaching is a judgment call, and the firefighter or officer should try to determine if the wall is a bearing wall.



Fig. 12–67. Firefighter removing wood stud

Note: Often a valence of greater depth over a doorway or window might be a beam or double header, indicating that the wall is a bearing wall. Removing more than one stud on a bearing wall could cause a collapse.

Breaching a lath and plaster or gypsum board wall. The preferred method of access to a victim or for firefighter escape is through a door. If a door is not readily accessible or it is too difficult and time consuming to force, breaching a wall may be a necessary alternative. While this method of entry can be accomplished by a single firefighter, a team effort should be used. The tools consist of a Halligan tool, pike pole, and an axe or maul. Just as with forcing doors, size-up is a primary concern for the firefighter. It is important for the firefighter(s) to make sure that any hazards are removed or not in the area where the opening will be made. Once this is done, the firefighter will make an opening that will be large enough to move a victim or themselves through.

Breaching exterior walls. Breaching exterior walls for access or line placement is not a sound firefighting tactic. The fire probably has made good headway by the time this option is considered, and the wall is probably load bearing if the construction is common (unframed).

In some cases, cutting into a load-bearing wall could precipitate a collapse; the risks must be thoroughly understood. Some modern buildings can be supported by steel columns and beams, with the walls of glass, masonry, or metal providing covering and rigidity rather than support. This is known as framed construction, but most buildings are supported by their exterior walls. Although breaching is possible, the collapse potential must be carefully weighed against expected gains.

Breaching exterior walls for rescue, especially of firefighters, may be needed. Collapse potential and the hazards of gas or electric utilities within the wall all need to be considered. Fuel-powered saws, reciprocating saws, mauls, axes, and Halligan tools may be used to breach wood-framed walls. Power saws are versatile and powerful (*measured in horsepower*). They can do the work of several firefighters working to their full capacity, and do it continuously until out of fuel or blade. However, saws can bog down in heavy smoke and are limited to a 4-in. (100-mm) cut if using the common 12-in. (305-mm) blade on circular saws. Chain saws cut deeper but can be quite dangerous as they can kick or pull as they go through different materials.

Breaching masonry walls with a power saw usually requires a blade change, as most units run with carbide-tipped blades for general purpose and metal-cutting blades (aluminum oxide) for locks and gates. A blade change may not be desirable in a rapid intervention situation due to the time needed to change blades. A maul and a Halligan tool can be used to readily breach hollow-core concrete block. If the wall is three wythes thick (a wythe is a single vertical stack of brick), brick-faced concrete block, or solid filled concrete block, it can be breached with a battering ram. To do this, two firefighters would pick up the tool and swing repeatedly using the forked end of the tool to chip the masonry. Some firefighters like to start high to get the tough work done before their arms tire out. Other firefighters may choose to start low to help their arms work while making the tough initial hole, and hope gravity will assist them with making the upper blocks fail once the blocks below have been compromised. You will need to rotate members as you create a hole and then enlarge the hole into an upside down V-shaped opening. (The upside down V shape may aid in keeping wall stability.) The knob end of the tool may be used to knock out bricks or blocks once the masonry yields. The knob end might also allow rapid takedown of plastered-over plywood coverings used to seal vacant buildings. Any use of the battering ram will rapidly exhaust a crew.

Breaching floors. Floors have been breached in the fire service to do the following:

- Vent cellar fires
- Allow water application to cellar fires from the floor above
- Put water on fires in voids between flooring layers
- Rescue
- Allow for drainage and runoff

If the area is carpeted, clear it using a sharp knife. Generally power saws are used to cut the flooring, but if unable to use saw due to smoke, the old reliable axe and Halligan tool are used to dismantle wood floors. Strike close to the beam (determined by sounding or seeing nail heads), with the axe blade hitting at an angle to allow penetration into the hard wood that often makes up flooring. Cut where it will facilitate the prying tools (across the grain) (fig. 12–68). Work in teams, starting where the floorboards or plywood end if possible.



Fig. 12–68. Axe opening a floor

If you need to cut a masonry floor, you already have a very serious situation. If the fire is below the masonry floor, it is weakening the much-needed supports to the heavy floor. Serious consideration needs to be made as to the risk versus reward of this operation. Special tools such as power saws with concrete cutting blades, concrete cutting chain saws, and power hammers (jackhammers) may be needed to breach masonry floors.

NOTES

1. Crow, J. “Burglar Bar Removal: Strategies and Tactics,” *Fire Engineering* magazine online, www.fireengineering.com.



LESSON FROM THE FIREGROUND

I train my firefighters in every aspect of firefighting. In the fire service you never can predict what you will be doing at an operation. I think it is important that firefighters know every part of the job even if they are not assigned to it. In my station, we send firefighters to the company “across the floor” to cross train in truck work, and the ladder company sends firefighters across the floor to do engine work.

The training detail is normally 90 days. One of my firefighters, Dan, had just come back from a 90-day detail in the ladder. It was a busy detail—he went to a few good fires and worked in all the positions. Dan is a great young firefighter, and this detail just made him that much more experienced.

We also just received two new probies, Brian and John, out of the training academy. It is always a good thing to get new guys in the house because it gives the officers a chance to train them the way we want, and at the same time it refreshes the memories of some of the senior guys. You know that they are just chomping at the bit to use all that great knowledge they just learned at the training academy, and put it into action.

I was the acting battalion chief on the night tour, and it was an uneventful night. I was waiting for my relief to come in so I could get back to my engine company. Around 0800 hours, I heard on our department radio a call for a fire in a store. Usually when we get a call at that hour for a store, it means that the workers came to the store and opened the gates and discovered the fire. I knew the area, and there are lots of stores in a row, called taxpayers. The first unit came upon the scene and gave the signal: 10-75, working fire. I knew that this was going to be a big fire, and after a few minutes, they transmitted a second alarm. At that moment, as the fire was gaining headway, my relief man came in. I didn't waste much time with him; I gave him a quick rundown of the previous night, then I bolted out of there. I knew that if the fire progressed, we were going to be assigned on third alarm. I raced back to firehouse and parked the car. As I walked in the front door, the alarm went off; we were going to the fire.

Brian, my brand new probie, was working one of his first tours, and Dan was working as well. En route, the chief was asking companies to report in to the front of the fire building with their multiversals. I informed the members of my company that we were going to probably “surround and drown” this fire, now an outside, defensive operation. When we arrived, there was heavy fire in about 13 stores, and it was through the roof. Next to the fire building, there was a huge multiple dwelling, which the fire was now threatening. We reported in to the front of the building with our multiversal, expecting that we would pick a store and operate the large-caliber stream into that store. We began setting up the device, and we were ready for water. Just then the chief grabbed me and ordered me to drop what we were doing, because he needed a line in the multiple dwelling. We left the device and started out our search for a pumper from where we could stretch a hose. I found a pumper on the other street that was on a hydrant, which was close to the entrance to the multiple dwelling. We were now on our own, and we needed to stretch eight lengths of 2½-in. (65 mm) hose to the most severely exposed apartment.

I figured out which was going to be the best building entrance to stretch to: the building had five wings. I told the men to start stretching to the front of the building, and I would let them know where to go when I found the right apartment. I found the right apartment, and I was hoping someone was home, so I banged on the door, but got no answer. I now had a little problem, as this was the apartment I needed to get into. It was the perfect spot; it was right where the fire was hitting the building, and I knew that if we didn't get water on this apartment soon, we would have a fire in the entire multiple dwelling. The apartment also had a very difficult door with five locks and an angle iron. Not only did it have angle iron, but this angle iron was held together with a J channel. The men brought the line up to the fire floor, and we were ready for water.

I radioed to Dan to get the forcible-entry tools. He brought them up, and I showed him what we had. Due to the severity of the situation, I was tempted to grab

the tools myself, as I knew what was needed and how to force this door. In my department it is a big “no-no” for officers to work with tools—we supervise. I trusted my men and their training, and I also had two other more senior firefighters working, but instead I grabbed the probie Brian to assist him, and we went to work on the door. I thought this would be a great opportunity for Brian to work under a pressure situation and build his confidence. Neither of them was phased by the formidability of the door (at least they didn’t show it). We were on our own, all the ladder companies were heavily engaged, and there was no time to call for one. I instructed them on where to place the tool, and we began dismantling the door one lock at a time. I helped

them with my officer’s tool when it was needed to chock an opening. We took it a lock at a time, and we were through the door in no time. Our troubles were not over, however, as the window we needed to get to was covered by a window gate. We now needed to force the gate to get to the fire. Again we took our tools and forced the gate. We brought the line out on to the fire escape, and were able to keep the fire out of the multiple dwelling. We were in a perfect spot.

After the fire, the occupant of the apartment showed up. I asked him if he was storing gold and diamonds in his apartment, because it was like Fort Knox. He told me that he didn’t have anything that valuable, but he mentioned that he was a locksmith!

QUESTIONS

1. How has technology changed forcible entry?
2. Why is it important to “control the door” when forcing entry for fire attack?
3. List the four typical door locks.
4. Explain the role of size-up in forcible entry.
5. Describe how a key tool is used to operate a locking mechanism after the cylinder has been removed.
6. What is the difference between a single hung and a double hung window?
7. Describe techniques to remove burglar bars or window grates.
8. When would firefighters breach an interior wall?
9. Describe the differences between plate and tempered glass in terms of forcible entry.
10. What are two cuts used for roll down gates?
11. What is a keyless garage door entry tool, and how is it used on residential garages?
12. List security features which complicate forcible entry present in high crime areas.