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## **GARAGE FIRES-PART 1**

### **Tactics and Strategies to Prevent Firefighter Entrapment At Residential Garage Fires**

Fire companies operating at a garage fire must make many operational decisions: The mode and location from which to attack the fire, needed fire flow and correct hoseline size just to name a few. During Size up you should gather all the basic information needed, and based on the size-up formulate a plan that addresses tactics and strategies to prevent a firefighter entrapment in the garage?

The response to a residential garage fire is a multi-hazard incident. The arriving companies' first hazard is the fire. But not to be over-looked are the hazards associated with the exposures: the residence, autos and adjacent buildings. Also the potential for a hazmat and hazardous run off must be addressed. Given all these factors, firefighter safety can not be over looked.



A line of duty death of a San Francisco firefighter is attributed to the failure of a garage door mechanism. The fire was in a building that sat on a cliff side. The company entered through the street level garage door, making their way down to the fire. Many factors contributed to the events that lead to the death and injury. But it was the failure of the door mechanism that trapped the fire company in the garage. In addition the closed door kinked the hoseline pinching off the water.

If you should chose to access the fire building through the garage door then you should have a basic knowledge of garage door types and their construction. In addition we need to understand the mechanism by which the doors open and close.

## RESIDENTIAL GARAGE DOORS:

There are three basic over-head door types: The sectional or folding door, the rolling steel door and the slab type of door. Residential garage doors are typically either the sectional or slab type and the rolling steel door is typically used in the commercial applications.

### Sectional Garage Door

Despite the construction or application, all types of over-head doors pose similar hazards; they can open or close unexpectedly and with great force causing injury to personnel operating in or near the garage door opening. These doors are large and hard to control and if trapped inside because of sudden door failure it can expose firefighters to the heat of the fire and hazardous chemicals that are often stored in the typical residential garage. The large opening can give the fire a large influx of air intensifying the fire and potentially extending the fire beyond the original fire area.

There are two basic types of mechanisms for opening and closing garage doors. They are manual and electric. In the residential application the manual method uses springs to aid in opening the door. **(Photo- 2)**

Most homes today have one or two motorized garage doors **(Photo-3)**. The problem with the motorized opener is two fold. First the motor and mechanism tend to fail in the heat of a fire. Second we disable the power to the home, effectively disabling the opener.



*Photo-2: Spring used to aid the opening of the door.*



*Photo-3: Typical electric garage door opener.*

All electric openers should have a manual release. **(Photo-4)** But again these devices are at the ceiling level, in the heat and smoke, and tend to fail in a fire.

When gaining access to the garage through the over-head door it must be secured to prevent the accidental closing and possible entrapment behind the door. Many operations advocate blocking the door open. A common technique that is used is to prop open the garage door by using a pike pole. But how long will it take for the hook to be “needed” elsewhere. The door is no longer supported, and may close. Others advocate deforming the track to prevent the door from closing by striking or twisting the track which will keep the door from rolling back closed. This technique works well, but prevents closing the door should it need to be closed at a latter time.



*Photo-4: Typical emergency release*

One of the better methods to secure door is to clamp the track with a pair of vise grip pliers. **(Photo-5)** This effectively blocks the door open, yet still allows the door to be closed as needed.

If the door should fail and close, trapping crews behind the door we must have a plan to gain access to the trapped members. It seems that just prying the door open would be the best action. But remember the door weighs a great deal. The track may be damaged by the fire, or the electric motor and mechanism may prevent the door from operating in the normal fashion.



*Photo-5: Using Vice-Grips to secure the door in place.*

## Slab Garage Door

This type of door is often found in older residential construction and unless the homeowner has upgraded the door with an automatic opener, these doors use the spring style opener to assist in the lifting and closing of the door. **(Photo-6)** It is important to remember that the spring being is used is simply adding some mechanical advantage to assist the weight of the door and provides little or no support when the door is in the open position. These slab doors are almost always made of wood, and is heavier in comparison to their sectional counterpart.

These doors present many problems to the fire companies, because they are difficult to open, and usually require a saw to perform the operation. Additionally, these doors have a higher rate of closing during fire operations because of spring mechanism failing.



*Photo-6: Typical Slab Door.*

## CUTTING GARAGE DOORS:

Techniques used to open commercial roll-up and over head doors may be useful to open a residential garage door. Cutting the door open may be time consuming and requires that you have some knowledge in the construction of the doors. The operation of a power saw may be complicated the inability to run in the smoke conditions, as was the case in the San Francisco Line of Duty Death. Rapid actions that will disable the door, allowing quick access and egress are the best option.

Cutting sectional doors requires the use of a power saw. The saw operator should make a horizontal cut at about shoulder height in the middle of one of the sections. **(Photo-7)** An easy technique to assist the saw operator is to rest the body of the saw on their shoulder and simply walk from side to side. This will assist the keeping the saw operator from becoming fatigued during the cutting operation.



*Photo-7: Cutting a sectional door. Notice the saw operator supporting the saw on his shoulder.*

Once the cut is completed, you simply pull back the cut panel and remove the remaining panels. **(Photo-8)**

There are two schools of thoughts on cutting a slab door. One technique is to simply use the same technique that is used on a sectional door. The second technique is making a “dice” (vertical) cut down the middle of the door. Either technique will work well on wood doors. Should you encounter a metal slab door, the horizontal cut is preferred, and make sure you cut deep enough to cut through the support bracing on the inside of the door.

Attacking the door at the attachment point will easily disable the door, allowing the access to the garage.

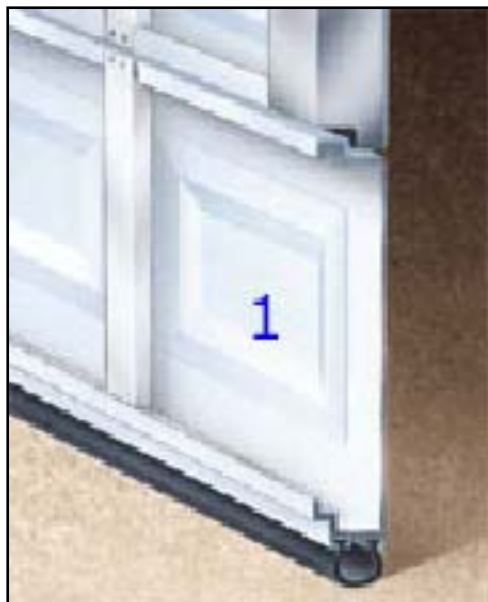
The door may be disabled with power saws, or manually with striking tools. The method that best allows for rapid access through the garage door will enable the timely rescue of trapped firefighters and civilians.



*Photo-8: Pulling back the panels of a sectional door.*

## **CONSTRUCTION FEATURES:**

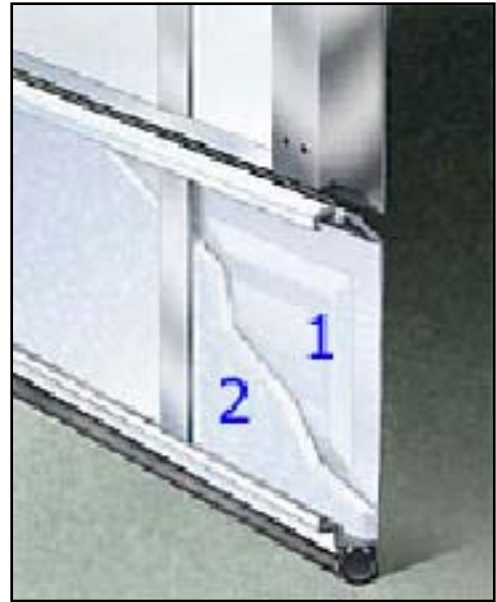
Typical residential garage doors are of three basic designs: A single layer, two layers or three layer door construction.



*Photo-9: Single layer construction.*

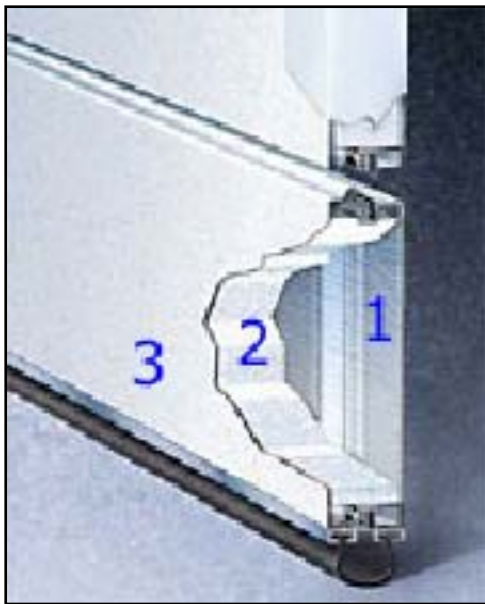
**Single layer construction:** (1) one layer of galvanized steel in 24 or 25 gauge depending on the model. **(Photo-9)**

**Two layer construction:** (1) an outer skin of 25-gauge galvanized steel and (2) a 7/8" layer of polystyrene insulation board that is backed with a plastic film for added protection. (Photo-10)



*Photo-10: Two layer construction*

**Three-layer construction:** (1) an outer skin of 24-gauge or 27-gauge galvanized steel, (2) a layer of polystyrene insulation that is pressure bonded between the two steel layers and ranges in thickness from 1 3/8" to 2" (3) a steel backing plate that protects the insulation and enhances the appearance of the door. (Photo-11)



*Photo-11: Three layer construction.*

In conclusion, we must recognize the hazards associated with accessing the fire building through a garage door, and we must practice tactics and utilize strategies that will limit the potential for firefighter entrapment.