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**Firefighter Tools & Equipment**  
**Fire Station Duties**



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**Fire Fighter I Objectives**

- Describe the general purposes of tools and equipment.
- Describe the safety considerations for the use of tools and equipment.
- Describe why it is important to use tools and equipment effectively.
- Describe why it is important to know where tools are stored.




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**Fire Fighter I Objectives**

- List and describe tools and equipment that are used for rotating.
- List and describe tools and equipment that are used for pushing or pulling.
- List and describe tools and equipment that are used for prying or spreading.
- List and describe tools and equipment that are used for striking.
- List and describe tools and equipment that are used for cutting.
- Describe the tools used in response and scene size-up activities.




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**Fire Fighter I Objectives**

- Describe the tools used in a forcible entry.
- Describe the tools used during an interior attack.
- Describe ventilation tools.
- Describe the hand tools needed during an overhaul assignment.
- Explain how tools and equipment are staged for rapid access.
- Describe the importance of properly maintaining tools and equipment.
- Describe how to clean and inspect hand tools.




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**Fire Fighter II Objectives** FFII


- Describe the tools used in search and rescue operations.
- Explain how tools and equipment are staged for rapid access.
- Describe how to maintain power equipment and power tools.

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**Introduction**


- Tools are used for a wide range of activities.
- Fire fighters must know how to use tools and equipment
  - Effectively
  - Efficiently
  - Safely
  - In dark, limited visibility environments

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**General Considerations**

- Hand tools
  - Extend or multiply body actions
  - Increase task effectiveness
  - Use simple machine principles
- Power tools
  - Powered by electric motors or internal combustion engines
  - Faster and more efficient

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**General Considerations**

Hand tools and power tools are used in almost all fire suppression and rescue operations.

Hand tools are used to extend or multiply body actions and increase the effectiveness in performing specific functions.

Hand tool operation uses simple machine principles.

Pike pole extends reach and allows ceiling penetration and pull down.


Axe multiplies the cutting force exerted on a given area.

Power tools and equipment use an external power source, such as electric motors or an internal combustion engine, and are faster and more efficient than hand tools.

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**Safety**

- Safety is the prime consideration for use of tools and equipment.
- Safe equipment avoids unintentional injury.

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**Safety**

Safety is a prime consideration when using tools and equipment.

Safe equipment operation avoids unintentional injury to fire fighter, other responders, victims, and bystanders.



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**Safe Operation Requires Approved PPE**

- Helmet
- Firefighting hood
- Eye protection
- Face shield
- Gloves
- Turnout coats
- Bunker pants
- Boots
- Self-contained breathing apparatus (SCBA)
- Personal alert safety system (PASS)

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**Safe Operation Requires Approved PPE**

Safe operation requires use of proper approved personal protective equipment (PPE)

- Helmet
- Firefighting hood
- Eye protection
- Face shield
- Firefighting gloves
- Turnout coats
- Bunker pants
- Boots
- Self-contained breathing apparatus (SCBA)
- Personal alert safety system

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**Conditions of Use / Operating Conditions**

- As proficiency increases, practice under more realistic conditions.
- Be able to use tools with no visibility.
- Requires ability to work safely while wearing PPE.

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**Conditions of Use/ Operating Conditions**

Conditions of Use/Operating Conditions The best way to learn how to use tools and equipment properly is under optimal conditions of visibility and safety.

In the beginning, you must be able to see what you are doing and practice without endangering yourself and others.

As proficiency increases, practice using tools and equipment under more realistic working conditions. Eventually, you must be able to use tools and equipment safely and effectively when darkness or smoke decreases visibility.

You must be able to work safely in hazardous areas, from a ladder, or pitched roof, where you are surrounded by noise and other activities, while wearing all of your protective clothing and using your SCBA.


Many departments require fire fighters to practice certain skills and evolutions in total darkness or with their face masks covered to simulate



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**Effective and Efficient Use**

- Use the least amount of energy to accomplish the task.
- Complete task safely and quickly.
- Many are surprised by the strength and energy required for tasks.
- You will learn which tools are used during various fire-ground operations.



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**Effective and Efficient Use**

Effective Use Effective and efficient use of tools and equipment means using the least amount of energy to accomplish the task. Being effective means you achieve the desired goal and that you produce the desired effect without wasting time or energy.

When assigned a task on the fire ground, your objective is to complete that task safely and quickly.

If you waste energy by working inefficiently, you will not be able to perform additional tasks.

However, if you know which tools and equipment are needed for each phase of firefighting, you will be able to achieve the desired objective quickly and have the energy needed to complete the remaining tasks.

New fire fighters are often surprised by the strength and energy required to perform many tasks.

An aggressive, continuous program of physical fitness will enable you to maintain your body in the optimal state of readiness.

As your training continues, you will learn which tools and equipment are used during different phases of fire-ground operations.


For example, the tools needed for forcible entry are different from the tools usually needed for overhaul.

Knowing which tools are needed for the work that must be done will help you prepare for the different tasks that unfold on the scene of a fire.

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**Effective and Efficient Use**

- Fire department may have standard operating guidelines specify tools and equipment needed for specific situations
- Some carry a selection of tools and equipment in the pockets of bunker pants.



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**Effective and Efficient Use**

Most fire departments have standard operating procedures (SOPs) or guidelines that specify the tools and equipment needed in various situations. As a fire fighter, you must know where every tool and piece of equipment is carried on your apparatus.

Knowing how to use a piece of equipment does you no good if you cannot find it quickly.

Your company officer is responsible for telling you which tools to bring along for different situations.

Some fire fighters carry a selection of small tools and equipment in the pockets of their turnout coats or bunker pants.

Check to see whether your department requires you to carry certain tools and equipment at all times.




Ask senior fire fighters for recommendations about what tools and equipment you should carry.



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**Functions**

- Rotating
- Pushing or pulling
- Prying or spreading
- Striking
- Cutting
- Multiple use

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**Functions**



An engine or truck company carries a number of tools and different types of equipment. Often, the easiest way to learn and remember these tools is to group them by the function each performs. Most of the tools used by fire departments fit into the following functional categories:

- Rotating (assembly or disassembly)
- Pushing or pulling
- Prying or spreading
- Striking
- Cutting
- Multiple use

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**Rotating Tools**

- Apply rotational force to turn
- Most common are screwdrivers, wrenches, and pliers
- Apparatus carry tool kits with a wide selection

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**Rotating Tools**

Rotating Tools Rotating tools apply a rotational force to make something turn.

The most common rotating tools are:



- Screwdrivers
- Wrenches
- Pliers

Used to assemble (fit together) or disassemble (take apart) parts that are connected with threaded fasteners. Assembling and disassembling are basic mechanical skills that are routinely used by fire fighters to solve problems.

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**Rotating Tools**

- Various sizes and types of screw heads
- Spanner wrenches are used for couplings.
- Hydrant wrenches are used for hydrants.

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**Rotating Tools**

Most fire apparatus carry a tool kit with a selection of screwdrivers with different heads, open-end wrenches, box wrenches, socket wrenches, pliers, adjustable wrenches, and pipe wrenches. There are various sizes and types of screw heads, including slotted head, Phillips head, Roberts head, and others. A spanner wrench is used to tighten or loosen fire hose couplings (one set or pair of connection devices that allow a fire hose to be interconnected with additional lengths of hose).

A hydrant wrench is used to open or close a hydrant by rotating the valve stem or to remove the caps from the hydrant outlets



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**Common Rotating Tools**

- Box-end wrenches
- Gripping pliers
- Hydrant wrenches
- Open-end wrenches
- Pipe wrenches
- Screwdrivers
- Socket wrenches
- Spanner wrenches

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**Common Rotating Tools**

Common rotating tools  
 Box-end wrenches  
 Gripping pliers  
 Hydrant wrenches  
 Open-end wrenches  
 Pipe wrenches  
 Screwdrivers  
 Socket wrenches  
 Spanner wrenches

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**Pushing/Pulling Tools**

- Extend fire fighter's reach
- Increase the power exerted on an object
- Many different uses in fire department operations



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**Pushing/Pulling Tools**

Pushing/Pulling Tools  
 Pushing/pulling tools can extend the reach of the fire fighter and increase the power that can be exerted on an object. These tools have many different uses in fire department operations.

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**Pike Pole**

- Wood or fiberglass pole with sharpened point metal head attached to one end
- Primarily used to pull down ceilings
- Available in different sizes, handles, and head configurations
- Most common size: 4 to 6 ft for use on 10-ft ceilings
- Head designs vary for different ceiling types.



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**Pike Pole**

An example of a tool that extends reach is a pike pole. A pike pole consists of a wood or fiberglass pole with a metal head attached to one end. A pike pole is used primarily to pull down a ceiling to get to the seat of a fire burning above. The metal head has a sharpened point that can be punched through the ceiling and a hook that can grab and pull it down. Pike poles come in several different sizes and with a variety of heads.


The most common length of 4 to 6 ft enables a fire fighter to stand on a floor and pull down a 10-ft high ceiling. Closet hooks, intended for use in tight spaces, are commonly 2 to 4 ft long. Some pike poles are equipped with handles as long as 12 or 14 ft for use in rooms with very high ceilings; others may have a *D*-type handle for better pulling power. Bring the right size pike pole to a fire. The different head designs are intended for different types of ceilings and come in a variety of configurations. Many fire departments use one type of pike pole for plaster ceilings and another for drywall ceilings.



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**Prying/Spreading Tools**

- May be as simple as a pry bar or complex as a hydraulic spreader
- There are many variations.



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**Prying/Spreading Tools**

**Prying/Spreading Tools** These tools may be as simple as a pry bar or as mechanically complex as a hydraulic spreader.

They also come in several variations for different applications.

A simple pry bar consists of a hardened steel rod with a tapered end that can be inserted into a small area.

The bar acts as a lever to multiply the force that a person can exert to bend or pry objects apart.

A properly positioned pry bar can apply an enormous amount of force.

Fire departments use a wide range of prying tools in different sizes and with different features.

One of the most popular is a Halligan tool, which was designed by a New York City fire fighter.

This tool incorporates a sharp pick, a flat prying surface, and a forked claw.

It can be used for forcible entry applications

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**Common Prying/Spreading Tools**

- Claw bar
- Crowbar
- Flat bar
- Halligan tool
- Hux bar
- Kelly tool
- Pry bar
- K-Tool





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**Common Prying/Spreading Tools**

Common prying tools Claw bar

Crowbar

Flat bar

Halligan tool

Hux bar

Kelly tool

Pry bar

A K tool is another type of pushing or pulling tool.

This tool is used to pull the lock cylinder out of a door, exposing the locking mechanism so it can be unlocked easily.

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**Common Prying/Spreading Tools**




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**Common Prying/Spreading Tools**

Hydraulic spreaders are an example of machine-powered rescue tools. The use of hydraulic power enables you to apply several tons of force on a very small area.

You need to have special training to operate these machines safely.

Fire and rescue departments most commonly use them for extrication from vehicles and machinery.

Hand-powered hydraulic tools are also used for prying and spreading.


One of these, called a rabbit tool, is designed for quickly opening doors.



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**Striking Tools**

- Used to apply impact force
- Used to gain entry or make openings




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**Striking Tools**

Striking Tools Striking tools are used to apply an impact force to an object. They are often used to gain entrance to a building or a vehicle or to make an opening in a wall or roof. They can also be used to force the end of a prying tool into a small opening.

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**Common Striking Tools**

- Hammer
- Mallet
- Sledgehammer
- Pick-head axe
- Flat-head axe
- Maul
- Battering ram
- Chisel
- Spring-loaded center punch

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**Common Striking Tools**

- Common striking tools Hammer
- Mallet
- Sledgehammer
- Maul
- Chisel
- Flat-head axe
- Pick-head axe

One of the most frequently used tools in the fire service is the axe. Both flat-head axes and pick-head axes are used.

Both types of axes have a wide cutting blade that can be used to chop into a wall, roof, or door.

A flat-head axe also can be used as a striking tool for forcible entry, usually in combination with a prying tool, such as a Halligan tool.

Together, the flat-head axe and the Halligan tool are sometimes referred to as “the irons” and are very effective for most forcible entry situations.

A pick-head axe has a point or pick that can be used for puncturing, pulling, and prying.

**Spring-loaded center punch**

The spring-loaded center punch is a striking tool used primarily on cars.

This tool can exert a large amount of force on a pinpoint-size portion of tempered automobile glass.

This disrupts the integrity of the glass and causes the window to shatter into small, uniform-sized pieces.

A spring-loaded center punch is often used in vehicular crashes to gain access to a patient who needs care.






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**Cutting Tools**

- Sharp edge to sever an object
- Range from knives to saws and torches
- Each is designed for certain materials.
- Fire fighters can be injured and tools ruined if used incorrectly.



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**Cutting Tools**

Cutting Tools Cutting tools have a sharp edge that severs an object.

They come in several forms and are used to cut a wide variety of substances.

Cutting tools used by fire fighters range from knives or wire cutters carried in the pockets of turnout coats to seatbelt cutters, bolt cutters (a scissors-like tool used to cut through items such as chains or padlocks), saws, cutting torches (a torch that produces a high temperature flame capable of melting through metal), and hydraulic shears.


Each is designed to work on certain types of materials.

Fire fighters can be injured and cutting tools can be ruined if tools are used incorrectly.

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**Common Cutting Tools**

• Axes	• Reciprocating saws
• Bolt cutters	• Rotary saws
• Chain saws	• Seatbelt cutter
• Cutting torches	
• Hacksaws	
• Handsaws	
• Hydraulic shears	




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**Common Cutting Tools**

- Axes
- Bolt cutters
- Chain saws
- Cutting torches
- Hacksaws
- Handsaws
- Hydraulic shears
- Reciprocating saws
- Rotary saws
- Seatbelt cutter

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**Common Cutting Tools**




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**Common Cutting Tools**

Cutting tools.



- Combination tool.
- Seat belt cutter.
- Bolt cutters
- Handsaws.



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**Saws**

- Two main categories
  - Manual
  - Mechanical
- Handsaws include
  - Hacksaws
  - Carpenter's handsaw
  - Keyhole saw
  - Coping saw

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**Saws**

Fire departments often carry several different types of saws. Saws can be divided into two main categories based on the power source.

Handsaws are manually powered, and mechanical saws are usually powered by electric motors or gasoline-powered engines.

Handsaws include hacksaws, carpenter's handsaws, keyhole saws, and coping saws.

Hacksaws are designed to cut metal.

Different blades can be used, depending on the type of metal being cut.

Hacksaws are useful when metal needs to be cut under closely controlled conditions.

Carpenter's handsaws are designed for cutting wood.

Saws with large teeth are effective in cutting large timbers or tree branches.

These saws are useful at automobile crashes where tree limbs may hamper the rescue effort.

Saws with finer teeth are designed for cutting finished lumber.


A coping saw is used to cut curves in wood and has a narrow blade set between the ends of a U-shaped frame.

A keyhole saw, a specialty saw, is narrow and slender and can be used to cut keyholes in wood.

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**Mechanical Saws**

- Three main types
  - Chain, rotary, reciprocating
- Faster than handsaws
- Conserve fire fighter energy
- Requires proper training



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**Mechanical Saws**

There are three primary types of mechanical saws: chain saws, rotary saws, and reciprocating saws.

Although handsaws have a valuable role, power saws have the advantage of accomplishing more work in a shorter period.

They also enable fire fighters to conserve energy, resulting in less fatigue.

Because mechanical saws are powerful, they must only be used by trained operators.

There are some disadvantages to using power saws. They are heavy to carry and sometimes can be difficult to start.


They may also require an electrical connection, although cordless models are becoming more available.



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**Chain Saws**

- Gasoline powered or powered by electricity
- Special chains are good for cutting ventilation openings.



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**Chain Saws**



Most people are familiar with gasoline-powered or electric chain saws commonly used to cut wood, particularly trees.

Fire fighters often use saws with special chains to cut ventilation openings in roofs constructed of wood, metal, tar, gravel, or insulating materials.

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**Rotary Saws**

- Gasoline powered or electric
- Round metal blade with teeth or flat
- Choice of blade depends on type of material to be cut.



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**Rotary Saws**

Rotary saws are powered by electric motors or gasoline engines. In some rotary saws, the cutting part of the saw is a round metal blade with teeth. Different blades are used, depending on the type of material being cut.

Other rotary saws use a flat, abrasive disk for cutting.

The disks are made of composite materials and are designed to wear down as they are used.

It is important to match the appropriate saw blade or saw disk to the material being cut.

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**Reciprocating Saws**

- Powered by electricity or battery
- Different blades for different materials
- Most commonly used to cut metal during vehicle extrication



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**Reciprocating Saws**

Reciprocating saws are powered by an electric or battery motor that rapidly pulls a saw blade back and forth. As with rotary saws, reciprocating saws use different blades to cut different materials.

Reciprocating saws are most commonly used to cut metal during a vehicle extrication.



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**Cutting Torches**

- Heats heavy steel objects until they melt and can be cut through (5700°F)
- Specialized training required
- Cannot be used around flammable fuels



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**Cutting Torches**

Cutting torches produce an extremely high temperature flame and are capable of heating steel until it melts, thereby cutting through the object. Because these torches produce such high temperatures (5700°F), operators must be specially trained before using this tool. Cutting torches are sometimes used for rescue situations and for cutting through heavy steel objects. Cannot be used where flammable fuels are present.

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**Multiple Function/Special-Use Tools**

- Multiple-function tools reduce the tools needed to achieve a goal
- Special-use tools perform other functions:
  - Rakes
  - Brooms
  - Shovels

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**Multiple Function/Special-Use Tools**

**Multiple Function Tools** Certain tools are designed to perform multiple functions, thus reducing the total number of tools needed to achieve a goal. One example is a flat-head axe because it can be used as either a cutting or a striking tool. There are combination tools that can be used to cut, pry, strike, and turn off utilities.

**Special-Use Tools**

Some fire situations require the special-use tools that perform other functions.

For example, fire departments located in areas where brush and ground fires occur frequently may need to carry rakes, brooms, shovels, and combination tools that can be used for raking, chopping, cutting, and leaf blowing.

Fire department rescue squads also use specialized equipment, such as jacks and air bags for lifting heavy objects, come-alongs or lever blocks for dragging heavy objects, and tripods.

You can learn more about the proper use of this special equipment by taking special rescue courses or during in-service training.



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#### Phases of Use

- Basic phase of fire suppression
  - Response/size-up
  - Forcible entry
  - Interior attack
  - Search and rescue
  - Rapid intervention
  - Ventilation
  - Overhaul



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#### Phases of Use

The process of extinguishing a fire usually involves a sequence of steps or stages. Each phase of a fire-ground operation may require the use of certain types of tools and equipment.

#### The basic steps of fire suppression include:

##### Response/size-up:

This phase begins when the emergency call is received and continues as the units travel to the incident scene. The last part of this phase involves the initial observation and evaluation of factors used to determine the strategy and tactics that will be used.

##### Forcible entry:

This phase applies when entry to buildings, vehicles, aircraft, or other confined areas are locked or blocked, requiring fire fighters to use special techniques to gain access.

##### Interior attack:

During this phase, a team of fire fighters is assigned to enter a structure and attempt fire suppression.

##### Search and rescue:

As its name suggests, this phase involves a search for any victims trapped by the fire and their rescue from the building.

##### Rapid intervention:

A rapid intervention company/crew (RIC) is a team of fully equipped personnel that is designated to provide immediate assistance to injured or trapped fire fighters.

##### Ventilation:

This step involves changing air within a compartment by natural or mechanical means.

##### Overhaul:

The final phase is to ensure that all hidden fires are extinguished after the main fire has been suppressed.



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### **Response/Size-Up**

- Consider information from dispatch.
  - May indicate the nature and gravity of the situation and problems that might arise
- Begin considering tools needed.
- On arrival, company officer will size-up and develop action plans following standard operating procedures (SOPs).



### **Response/Size-Up**

**Response and Size-Up** The response and size-up phase enables you to anticipate emergency situations. At this time, you should consider the information from the dispatcher along with preincident plan information about the location.

This information can provide you with an idea of the nature and possible gravity of the situation and the types of problems that might arise.

For example, an automobile fire on the highway may present different problems and require different tools than a call for smoke coming from a single-family house.

A different thinking process occurs when you are dispatched at midnight to a house fire that may have trapped a family inside than when you respond to a report of a kitchen stove fire at suppertime.

Even though information is limited, this is the time to start thinking about the types of tools and equipment that you might need.

Most fire departments have SOPs or guidelines that specify the tools and equipment required for different types of fires.

On arrival at the scene, the company officers will size-up the situation and develop the action plans for each company, following SOPs and guidelines.



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### **Forcible Entry**

- Locked or blocked entries and security systems
- Typical tools for forced entry
  - Axe
  - Prying tool
  - K tool
  - Other prying tools



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### **Forcible Entry**

Forcible Entry Gaining entrance to a locked building or structure can present a challenge to even the most seasoned fire fighter.

Buildings are often equipped with security devices designed to keep unwanted people out.

But these same devices can make it very difficult for fire fighters to gain access to the building.

Forcible entry is the process of entering a building by overcoming these barriers.

Several types of tools can be used in forced entry, including an axe, a prying tool, or a K tool.

A flat-head axe and a Halligan tool are often used in combination to quickly pry open a door, although they may permanently damage both the door and the frame.

Prying tools used for gaining access include pry bars, crowbars, Halligan tools, Hux bars, and the hydraulic-powered rabbit tool.

A K tool can be used to pull out a cylinder lock mounted in a wood or heavy metal door, so that the lock can be released.

This is a comparatively nondestructive process that leaves the door and most of the locking mechanism undamaged.

The building owner can have the lock cylinder replaced at a relatively low cost.

Various striking tools can be used for forcible entry when brute force is needed to break into a building.

These include flat-head axes, hammers, sledgehammers, and battering rams.

Sometimes the easiest or only way to gain access is to use cutting tools.

An axe can be used to cut out a door panel.

A power saw can be used to cut through a wood wall.

Bolt cutters can be used to remove a padlock.

Cutting torches or power saws can be used to cut through metal security bars.

Many techniques can be used to gain entry into secured structures.

The exact tool needed will depend on the method of entry and the type of obstacle.


Because experience usually determines the best way to gain entry in each situation, rely on the orders and advice of your captain and coworkers.



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**Interior Attack**

- Involves multiple tasks performed simultaneously or in rapid succession
- Specialized tools should be carried for particular assignments.
- A basic set of tools includes a prying, striking, cutting, and pushing tool, and a hand light.
- Interior attack team is responsible for advancing hose lines and locating and extinguishing the fire.

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### Interior Attack

Interior Firefighting Tools and Equipment The process of fighting a fire inside a building involves several tasks that are usually performed simultaneously or in rapid succession by teams of fire fighters.

Some basic tools and equipment should be carried by every crew working inside a burning building. Crews may also carry specialized tools and equipment needed for their particular assignment. The basic tools enable them to solve problems they may encounter while performing interior operations.

For example, the crew may encounter obstacles, such as locked doors, or they may need to open an emergency escape route. They may need to establish horizontal ventilation by forcing, opening, or breaking a window.

They may have to gain access to the space above the ceiling by using a pike pole or to make a hole in a wall or floor with an axe.

A powerful light is important because smoke can quickly reduce interior visibility to just a few inches. The basic set of tools for interior firefighting includes:

- A prying tool, such as a Halligan tool
- A striking tool, such as a flat-head axe or sledgehammer
- A cutting tool, such as an axe
- A pushing tool, such as a pike pole
- A hand light or portable light


The specific tools that must be carried by each crew are usually defined in a fire department's training manuals and SOPs.

The interior attack team is responsible for advancing a hose line, finding the fire, and applying water to extinguish the flames. They need the basic tools that will allow them to reach the seat of the fire.

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**Search and Rescue** FFII

- Search team carries:
  - Pushing tool (short pike pole)
  - Prying tool (Halligan tool)
  - Striking tool (sledgehammer or flat-head axe)
  - Cutting tool (axe)
  - Hand light

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### Search and Rescue

Search and Rescue Tools and Equipment

Search and rescue needs to be performed quickly, shortly after arrival on the fire ground.

A search team should carry the same basic hand tools as the interior attack team:

- Pushing tool (short pike pole)
- Prying tool (Halligan tool)
- Striking tool (sledgehammer or flat-head axe)
- Cutting tool (axe)
- Hand light





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**Search and Rescue** FFII

- May also need:
  - Thermal imaging device
  - Portable lighting
  - Lifelines
  - Prying, striking, and cutting tools
  - SCBA and spare air cylinders
  - Litter or patient packing device



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### Search and Rescue

In addition to being equipped for forcible entry and emergency exit, a search-and-rescue team may also use tools to probe under beds for unconscious victims.


A short pike pole or closet hook is relatively light and reduces the time needed to search an area by extending the fire fighter's reach. An axe handle can also be used for this purpose.

Other types of tools used for search and rescue include thermal imaging cameras, portable lights, and lifelines.

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**Rapid Intervention Crew (RIC)**

- Ready for immediate assistance to lost, trapped, or injured fire fighters.
- All equipment should be staged.
- Special equipment includes thermal imaging camera, portable lighting, lifelines, prying tools, striking tools, cutting tools, SCBA, and spare air cylinders.

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### Rapid Intervention Crew (RIC)

**Rapid Intervention Tools and Equipment** An RIC is designated to stand by to provide immediate assistance to any fire fighters who become lost, trapped, or injured during an incident or training exercise.

The RIC team should have the standard set of tools for interior firefighting and extra tools and equipment particularly important for search and rescue tasks. The extra tools and equipment should help them find and gain access to a fire fighter who is in trouble, extricate a fire fighter who is trapped under debris, provide breathing air for a fire fighter who has experienced an SCBA failure or run out of air, and remove an injured or unconscious fire fighter from the building.

All of this equipment should be gathered and staged with the RIC, where it will be immediately available if it is needed.

The special equipment that an RIC should carry includes:


- Thermal imaging device
- Additional portable lighting
- Lifelines
- Prying tools
- Striking tools
- Cutting tools, including a power saw
- SCBA and spare air cylinders with RIC and universal air connection
- Litter or patient packaging device



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**Ventilation**

- Similar to forcible entry
- Power saws and axes are common
- Fans are used to remove smoke or introduce fresh air.
- Horizontal ventilation requires opening doors and windows.
- Interior openings may be created.



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**Ventilation**

Ventilation Tools and Equipment Many of the same tools used for forcible entry are also used to provide ventilation.

Power saws and axes are commonly used to cut through roofs and vent combustion by-products. Fans are often used either to remove smoke from a building or to introduce fresh air into a structure. With positive-pressure ventilation, fresh air is blown into a building through selected openings to force contaminated air out through other openings. Negative-pressure ventilation uses fans placed at selected openings to draw contaminated air out of a building.

Ventilation fans can be powered by either electric or gasoline motors or water pressure.

Horizontal ventilation usually involves opening outer doors and windows to allow fresh air to enter and to remove contaminated air.

Unlocked or easily released windows and doors should be opened normally.



Locked or jammed windows and doors may have to be broken or forced open using basic interior firefighting tools.

It may also be necessary to make interior openings within the building so that contaminated air can reach the exterior openings.

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**Ventilation**

- Vertical ventilation requires openings in the roof.
- Special tools needed include positive pressure fans, exhaust fans, cutting tools, and long pike poles.



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**Ventilation**

Vertical ventilation requires openings in the roof or the highest part of a building to allow smoke and hot gases to escape. Whenever possible, existing openings, such as doors, windows, roof hatches, and skylights, should be used for vertical ventilation.

It may be necessary to force them open or to break them using forcible entry tools.

In some circumstances it may be necessary to cut through a roof to make an effective vertical ventilation opening.

Cutting tools, such as axes and power saws, are used to make these openings.

Pike poles will also be needed to pull down ceilings after the roof covering is opened.

The special equipment needed for ventilation includes:


- Positive-pressure fans
- Negative-pressure (exhaust) fans
- Cutting tools (power saws and axes)
- Pulling and pushing tools (long pike poles)



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**Overhaul**

- Examines fire scene to extinguish hidden fires
- Burned debris must be removed.
- Accomplished using hand tools
- Tools that can shut off activated sprinkler heads
- Shovels, brooms, and rakes used to clear debris
- Water vacuums for water removal



**Overhaul**

**Overhaul Tools and Equipment** The purpose of overhaul is to examine the fire scene carefully and ensure that all hidden fires are extinguished. Burned debris must be removed, and potential hot spots in enclosed spaces behind walls, above ceilings, and under floors must be exposed. Both tasks can be accomplished using simple hand tools. Tools that can shut off activated sprinkler heads are needed.

Shutting off activated sprinkler heads reduces water damage and restores fire protection system in the building.

If possible, restore sprinkler system to service. Sprinkler heads can be shut off by:

Using a wooden wedge: leaves inoperable sprinkler head when turned on

Tool with fusible link: allows activated sprinkler heads to be placed back in service until replacement can be installed



Shovels, brooms, and rakes are used to clear away debris.

Water vacuums remove water from buildings.

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**Overhaul**

- Pike poles used to pull ceilings and open walls
- Axes and saws used to open walls
- Prying and striking tools used to open closed spaces
- Thermal imaging used to “see” hot spots



**Overhaul**

Pike poles used to pull ceilings and open walls

Axes and saws used to open walls

Prying and striking tools used to open closed spaces

Pike poles are commonly used for pulling down ceilings and opening holes in walls.

Axes and sometimes power saws are used to open walls and floors.


Prying and striking tools are also used to open closed spaces

The widespread introduction of infrared thermal imaging devices has made it possible to “see” hot spots behind walls without physically cutting into them.

Slide 45

**Tool Staging** FFII

- Many departments have SOPs for staging tools at scenes.
  - Salvage covers at designated location for layout of commonly used tools
- SOPs specify staged tools and equipment.
- Additional personnel may transport tools to and from staging area.



**Tool Staging**

Many fire departments have SOPs for staging necessary equipment nearby during a fire or rescue operation.

This often involves placing a salvage cover on the ground at a designated location and laying out commonly used tools and equipment where they can be accessed readily.

A similar procedure may be used for rescue operations, where tools that are likely to be needed can be laid out ready for use.

This saves valuable time because fire fighters do not have to return to their own apparatus or search several different vehicles to find a particular tool.

A department’s SOPs usually specify the types of tools and equipment to be staged.

The tool-staging area could be outside the building or, in the case of a high rise or large building, at a convenient location inside.

Additional personnel may be directed to bring particular items to the tool staging location at working fires.



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**Maintenance**

- Tools and equipment must be maintained to ensure readiness.
  - Tools and equipment must be ready for use before you respond to an emergency incident.
- Follow manufacturer's instructions for cleaning and maintenance
- Use equipment only for its intended purpose.

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**Maintenance**

Tools and equipment must be properly maintained so that they will be ready for use when they are needed. Keep equipment clean and free from rust.

Keep cutting blades sharpened and fuel tanks filled.

Every tool and piece of equipment must be ready for use before you respond to an emergency incident.

**Follow manufacturer's instructions for cleaning and maintaining each piece of equipment.**

**Use equipment only for its intended purposes.**

For example, a pike pole is made for pushing and pulling; it is not a lever and will break if used inappropriately.

Use the right tool for the job.

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**Hand Tool Maintenance**

- Remove all dirt and debris.
- If appropriate, use soap and water.
- Dry tools completely.
- Sharpen cutting tools.
- Avoid painting tools.
- Learn how to use cleaning solutions.

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**Hand Tool Maintenance**

Cleaning and Inspecting Hand Tools All hand tools should be completely cleaned and inspected after use. Remove all dirt and debris.

If appropriate, use water streams to remove the debris and soap to clean the equipment thoroughly.

Learn how to use cleaning solutions.

To prevent rust, metal tools must be dried completely, by either hand or air, before being returned to the apparatus.

Coat unpainted metal surfaces with a light film of oil to prevent rust.

Cutting tools should be sharpened after each use.

Before any tool is placed back into service, it should be inspected for damage.

Avoid painting tools because this will hide any possible defects or visible damage.

Keep the number of markings on a tool to a minimum.

**Cleaning and Inspecting Power Equipment and Tools**

Used for lighting, ventilation, salvage and overhaul

Use only after training.

Read and heed instructions.

Test frequently and have items serviced regularly by a qualified shop.

Retain all records.

Ensures proper operation when item is needed

Report defective equipment to your officer.

Fill each tool with proper fuel.

Some operate on gasoline, gas-oil mixture, or diesel fuel.

Fuel has a limited storage life.

Check manufacturer's recommendations before fueling.

After returning from a fire, clean, inspect, and record maintenance data.

Ensures tools are in a "ready state"

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Cleaning and Inspecting Power Equipment and Tools

FFII

- Used for lighting, ventilation, salvage, and overhaul
- Test frequently.
- Fill with proper fuel.
- After returning from a fire, clean, inspect, and record maintenance data.


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**Steps for Cleaning and Inspecting Power Tools**

- All tools should be left in "ready state."
- Read and follow manufacturer-provided manuals.
- Learn proper procedure for reporting a problem with power tools and taking it out of service.

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**Steps for Cleaning and Inspecting Power Tools**

Steps for Cleaning and Inspecting Power Tools All power tools should be left in a "ready state."

Remove all debris and clean and dry tool.

Fill fuel tanks with fresh fuel.

Replace dull or damaged blades.

Inspect belts, ensuring they are tight and undamaged.

Guards should be securely in place.

Clean and inspect hydraulic hoses.

Inspect power cords for damage.

Clean, inspect, and test hose fittings.

Start tools to ensure correct operation.

Empty, wash, clean, and dry tanks on water vacuums.

Clean and dry hoses and nozzles on water vacuums.

Read and follow all manufacturer-provided manuals.

Retain manuals in a safe and easily accessible location.

Refer to manuals when cleaning and inspecting.


Learn proper procedure for reporting a problem with power tools and taking it out of service.

Your safety depends on quality of tools and equipment.



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## Fire Station Duties

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### Fire Station Duties


- Review the duties and responsibilities of the firefighters in the station.
  - Shift change procedures
  - House duties
  - Assigned duties
  - Apparatus and tool familiarization

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### Fire Station Duties


- Typical FD Daily Activity Schedule
  - 07:00 – 07:30 / Shift change
    - Be at Assigned Station
    - Relieve opposite firefighter
    - Receive Pass-On Information from off going Shift
    - Inspected and Place your PPE on Apparatus
    - Receive additional Daily Assignments
    - Review email and calendar for Weekly Schedule and Memos

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### Fire Station Duties

- Typical FD Daily Activity Schedule
  - 07:30 – 11:30
    - Check Apparatus and Equipment
    - Begin Assigned Tasks
      - Fire Station Housework
      - Weekly Assigned Tasks
    - Training \*
    - PT \*
      - Goal is complete one of Training and Physical Training each Shift


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**Fire Station Duties**

- Typical FD Daily Activity Schedule
  - 11:30 – 13:00
    - Lunch
      - Is not guaranteed, plan on interruptions
      - Come prepared to miss it




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**Fire Station Duties**

- Typical FD Daily Activity Schedule
  - 13:00 – 17:00
    - Continue / Complete Assigned Tasks
    - Training \*
    - PT \*
      - Goal is complete one of Training and Physical Training each Shift




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**Fire Station Duties**

- Typical FD Daily Activity Schedule
  - 17:00 – 18:00
    - Continue / Complete Assigned Tasks
    - Training \*
    - PT \*
      - Goal is complete one of Training and Physical Training each Shift




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**Fire Station Duties**

- **Shift change**
  - Relieve opposite firefighter
    - Find out what happened the previous shift
      - Changes in equipment on the rig
      - Were there any calls, department notices, G.O.G's / S.O.G.'s, Union Activities etc.




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**Fire Station Duties**

- **Shift change** (continued)
  - PPE goes on the rig (Before your first cup of coffee)
    - Find out if you're "allowed" to remove the relieved FF's PPE from apparatus before you do it
    - PPE checked to make sure it's **all** there
      - Your no good without all your gear
    - PPE inspected to make sure it's in working order
      - Note any problems with torn, damaged or otherwise inoperable PPE
      - Report problems to officer




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**Fire Station Duties**

- **Shift change** (continued)
  - SCBA inspection
    - Done at start of shift (when get in)
      - Do not rely on others
      - It's your SCBA make sure it works.
    - Done per department SOG's
    - Fill out proper paper work
      - Inspection check list
      - Out of service tag if needed




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**Fire Station Duties**

- **Shift change** (continued)
  - Apparatus and tool familiarization
    - You are the **new guy** take the time to learn your truck
      - Ladder compliment
      - Hose compliment
      - Location of all the tools and equipment
    - Shows motivation
    - Shows you eager to learn




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**Fire Station Duties**

- House duties (Welcome to the fire service)
  - Includes normal upkeep and maintenance of the fire house and grounds
    - Cleaning of kitchen, bathrooms, bedrooms, etc.
    - Emptying garbage
    - Landscape maintenance
  - Duties usually assigned by:
    - Seniority (sorry new guy)
    - Riding position (ask Officer)



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**FIRE STATION DUTIES**

- House duties
  - Duties assigned to particular day of the week
    - OP check on Monday
    - Brass and grass on Tuesday
  - House duties usually done on the day shift
    - Designated starting time
    - Be the first one to start your work




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**FIRE STATION DUTIES**

- Cleaning 101
  - If you have cleaned your own home, apartment or condo this should be a review.

**Otherwise, pay attention!**




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**FIRE STATION DUTIES**

- Bedrooms
  - Dust first
    - All surfaces
    - Yes you will have to pick up a few things to get under them
  - Vacuum




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**FIRE STATION DUTIES**

- Bathrooms (Don't be afraid)
  - Rubber gloves, sponge, mop, bucket & broom
    - Cleaning solutions
      - Bleach/ water
      - Windex
      - General purpose cleaner (spray bottle)
  - Sweep floors **FIRST!**
  - Clean mirrors and sinks
  - Clean showers
    - Scrub floors (preferably with bleach & water)
    - Get rid of any mildew




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**FIRE STATION DUTIES**

- Toilets/Urinals
  - Last thing you do before mopping the floor
    - It won't bite you
    - Hit ALL the parts
      - Entire surface
      - Seat (especially under it)
      - Under the rim
    - Change out urinal mint if needed
  - **Be sure the toilet paper and paper towels are full !!**
  - Mop floor




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**FIRE STATION DUTIES**

- Kitchens
  - Same tools as the bathroom
  - Be sure to change your gloves, sponge and water in bucket before you start!
  - Counter tops
    - Knock the big chunks off
    - Get under toaster, microwave and coffee maker
  - Sweep floors
    - Get under everything especially the table




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**FIRE STATION DUTIES**

- Kitchens
  - Stove, Table top and Counter top
    - Wipe down with general purpose cleaner
    - Get under all appliances
    - Get inside of the microwave
    - Stove
      - Be sure to clean off any cooking residue
  - Mop floors
  - Refrigerator
    - Is food being saved for left overs (find out before you through it out)




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**FIRE STATION DUTIES**

- Apparatus floors
  - Sweep first
  - Treat oil or transmission fluid spots with degreaser
  - Wash down floor
  - Finally squeegee




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**FIRE STATION DUTIES**

- More house duties
  - Answering the phone
    - Identify yourself
      - Town, station, rank and name
  - Taking alarms
    - Nature of alarm
    - Location
    - Person's name, address and phone #




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**FIRE STATION DUTIES**

- Walk-ins
  - Taking alarms
    - Nature of alarm
    - Location
    - Person's name, address and phone #
  - Information/directions
    - If you don't know refer them to the officer
  - Look at the trucks
    - Another new guy job
    - Have another firefighter with you
    - Ask the Driver/Operator




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**FIRE STATION DUTIES**

- Assigned duties
  - Duties assigned to address specific purpose
    - Daily/weekly tool checks
    - Spare apparatus OP and tool checks
    - Equipment specific testing and maintenance
  - Duties may be assigned to specific day or time during the month.




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**FIRE STATION DUTIES**

- Tool checks
  - Done per department SOG's
  - Involves accountability, inspection and maintenance of all equipment on apparatus and in fire house
  - May also involve operation of power equipment




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**FIRE STATION DUTIES**

- Accountability
  - Tool inventory checked and compared to master list
  - All discrepancies are noted and reported to officer




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**FIRE STATION DUTIES**

- Inspection
  - Check for condition and operability of tools
  - Condition
    - Hand Tools
      - Burrs or chips in blades or heads of tools
      - Loose handles or heads
      - Cracked or broken handles
      - Rusty/dirty




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**FIRE STATION DUTIES**

- Condition
  - Power tools
    - Missing or broken teeth on power saws
    - Broken or bent tips on Jaws
    - Bulges in hydraulic hoses
    - Damaged cords on electrical equipment
- Operability
  - Hand tools
    - Can they be used in the condition they are in?
    - Can they be used safely?




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**FIRE STATION DUTIES**

- Operability
  - Power tools (gas powered)
    - Does it start?
    - Does it run?
  - Saws
    - Chain or blade on correctly?
  - Hydraulic rescue tools
    - Hydraulic fluid level OK?
    - Hose couplings operable
  - Electrical power tools
    - Plug them in. Do they run?




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**FIRE STATION DUTIES**

- Maintenance
  - Involves general upkeep, cleaning and repairing of the tools and equipment.
  - Addresses proper procedure for reporting equipment issues.




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**FIRE STATION DUTIES**

- Reporting procedure
  - SOG and department dependant
    - Who do we report to?
      - » Officer
      - » Mechanic
    - What do we report?
      - » Out of service equipment
      - » Equipment in need of repair
      - » Equipment changes on apparatus




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**FIRE STATION DUTIES**

- Repairs
  - Major repairs
    - Qualified technician
    - Department mechanic
  - Minor repairs
    - Hand Tools
      - » File burrs or nicks on cutting and striking tools
    - Power tools
      - » Change spark plugs
      - » Change blades or chains on saws



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