Firetown Truck Academy

Elevator Operations

Although the concept of elevators transporting people is relatively simple, extrication of trapped occupants can often be difficult. Consider the following possible conditions:

- An elevator may have stopped between floors.
- Loss of electrical power has resulted in a dark elevator with no ventilation.
- Passengers may be hysterical, panicked, or in need of medical care.

These conditions are further complicated by the fact that elevator technology constantly changes. There are numerous (over 60) elevator manufacturers, each having produced a variety of elevators. It is not uncommon for a single elevator to have features and special equipment offered by several manufacturers, resulting in a wide variety of elevators with unique characteristics.

For information concerning recall phase, override phase, and operational guidelines for the use of elevators in high rise buildings during firefighting.

TYPE OF ELEVATORS

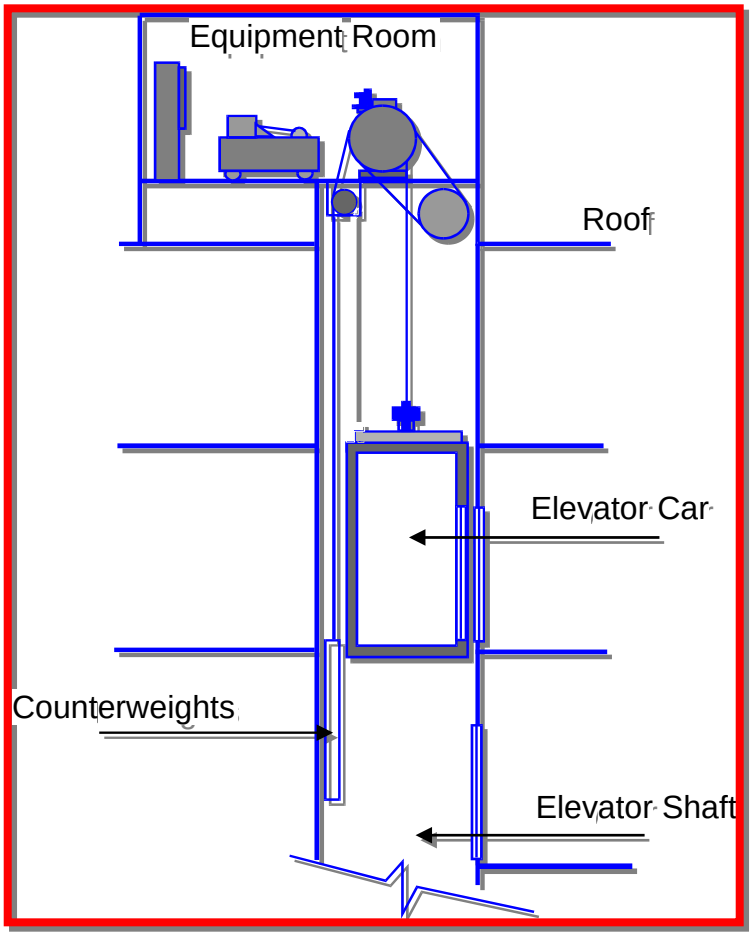
Currently, there are two types of elevators:

- Cable operated elevators (sometimes referred to as an electric elevator)
- Hydraulic operated elevators

CABLE ELEVATORS

A typical cable elevator consists of an elevator shaft for the car to travel within, an elevator car, cables attached to the car, counterweights, vertical tracks, emergency safety

brakes, and an equipment room for the electrical equipment (electric motor and winding drum) to raise or lower the elevator. Cable elevators are drum type or traction type.



Drum Type

A winding drum type elevator consists of a car attached to one or more cables that pass around a winding drum and to a moving counterweight. Counterweight cables are on one side of the drum and car cables are on the other side of the drum. The drum is grooved for cable movement. Both sets of cables run in the same grooves (counterweight cables unwind when car cables wind and vice-versa). The equipment room for drum type may be located in a basement or on the roof of a building. Limitations in the length and diameter of the winding drum restricts this type of elevator to 150-foot lifts and slow speeds. Equipment for this application requires more space than other types of elevators. For this reason, it is no longer manufactured.

Traction Type

Traction type elevators are used for higher lifts and greater speeds than drum type elevators and use a traction sheave instead of a winding drum. In traction type elevators, cables are attached to the car and pass over a traction sheave to counterweights. In this configuration, cables passing over the traction sheave unwind as fast as they wind and car speed is dependent on the size of the traction sheave and the electric motor speed. There are two types of traction equipment:

- High speed direct traction or gearless type traction consists of a slow speed DC motor directly coupled to a traction sheave with a brake wheel mounted on the motor shaft.

- Geared traction type uses a high speed motor. The motor is geared to a traction sheave through worm gears with a brake wheel between the worm gears and motor.

Since there is less weight and equipment with traction type elevators, the equipment room is usually located on the roof or above an elevator shaft in high-rise buildings.

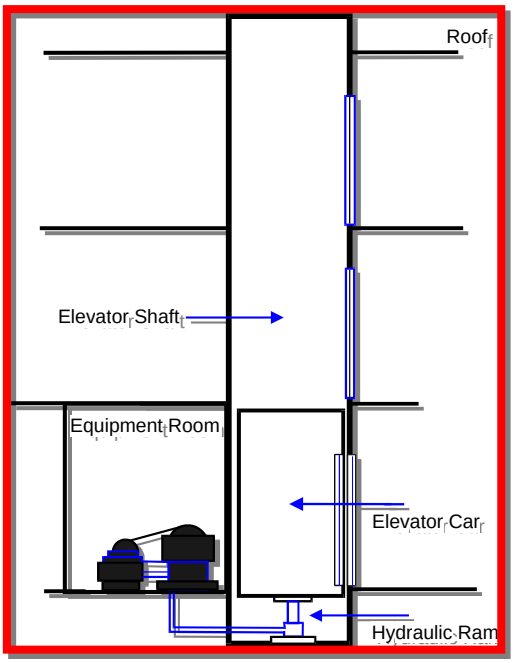
HYDRAULIC ELEVATORS

Similar in general design to the cable elevator, hydraulic elevators use hydraulic power instead of cables and traction sheaves and are generally limited to six story buildings. In very old installations, a car is raised or lowered by a ram powered by water pressure. Newer installations use oil pressure to power a ram. Some less modern hydraulic elevators and hydraulic elevators that travel over six stories may use cables and counterweights.

The equipment rooms for hydraulic elevators are normally located at the lower level of a building, but can be at any floor level or 50 to 100 feet away from the elevator shaft. The equipment room contains the following main components:

- Controller or relay panel (electronics necessary to run the elevator).

- Hydraulic power unit. The hydraulic power unit consists of a reservoir for the oil supply, hydraulic pump, and valves to raise or lower the elevator car.



PASSENGER ELEVATORS

Passenger elevators (cable and hydraulic) are designed to quickly move passengers to different levels within a multi-story building. Modern passenger elevators are completely automated and are under the control of an electronic computer which constantly evaluates the needs and demands of the system. Computers constantly make adjustment, move cars, and work to meet current demands. Cars are sent to the area of greatest need and when cars are not needed, they are allowed to rest or sleep. Passenger elevators are normally faster then freight elevators and often use express elevators that can not stop at all floors.

FREIGHT ELEVATORS

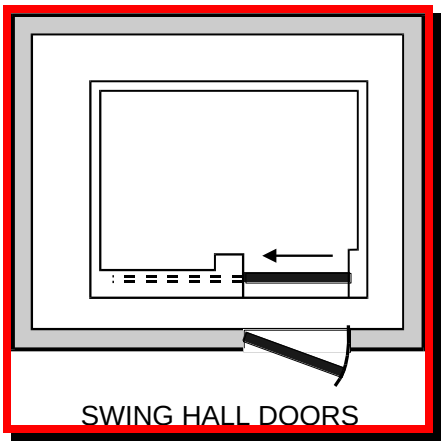
Freight elevators (cable and hydraulic) are generally less complicated and serve a different purpose than passenger elevators. Larger than passenger elevators, freight elevators can be as large as 12 feet by 14 feet and have a carrying capacity of up to three tons. Generally, freight elevators are separate from the main lobby of a building and can have a street, alley, or loading dock access. Not being under computer control, freight elevators are more simple to operate and control than passenger elevators and normally service an entire building from the lowest to highest level. Freight elevators are normally slower than passenger elevators and can stop at all floors unless a special override control is activated.

CONSTRUCTION

ELEVATOR DOORS

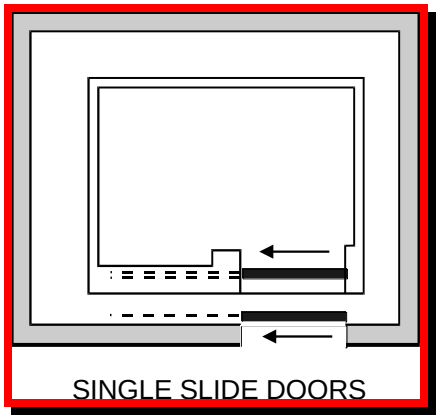
Modern elevators utilize two sets of doors for operation and passenger ingress-egress. The door on the elevator car is referred to as the inner or car door and travels with the elevator car. The door that is seen from each floor of a building is referred to as the outer or hoistway door. This hoistway door is a part of the building (each landing). It is important to realize that the car door does all the work; the hoistway door is a dependent. These doors can be opened or closed by electric motors, or manually for emergency incidents. Safety devices are located at each landing to prevent inadvertent hoistway door openings and to prevent an elevator car from moving unless a door is in a locked position. All types of doors are designed with a safety feature that will cause the car to stop whenever a car door is opened. There are four basic types of doors used on elevators:

- Swing hall doors consists of a hoistway door that is manually opened and a single slide car door that is power operated or a collapsible gate.



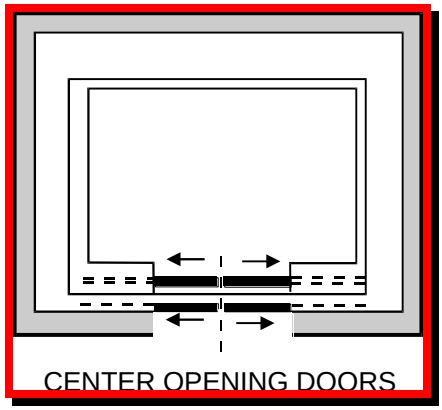
SWING HALL DOORS

- Single slide doors are power operated single panel doors.



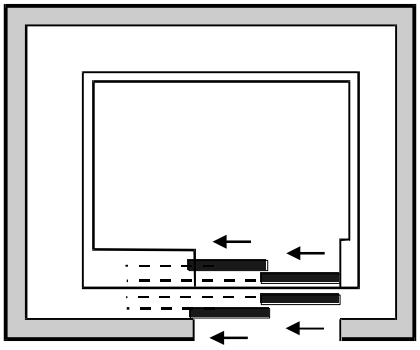
SINGLE SLIDE DOORS

- Center opening doors consist of two power operated panels that part simultaneously with a brisk, noiseless motion.



CENTER OPENING DOORS

- Two speed doors consist of two power operated panels that are geared together. One door moves twice as fast as the other door so that both doors will meet concurrently in the open position.



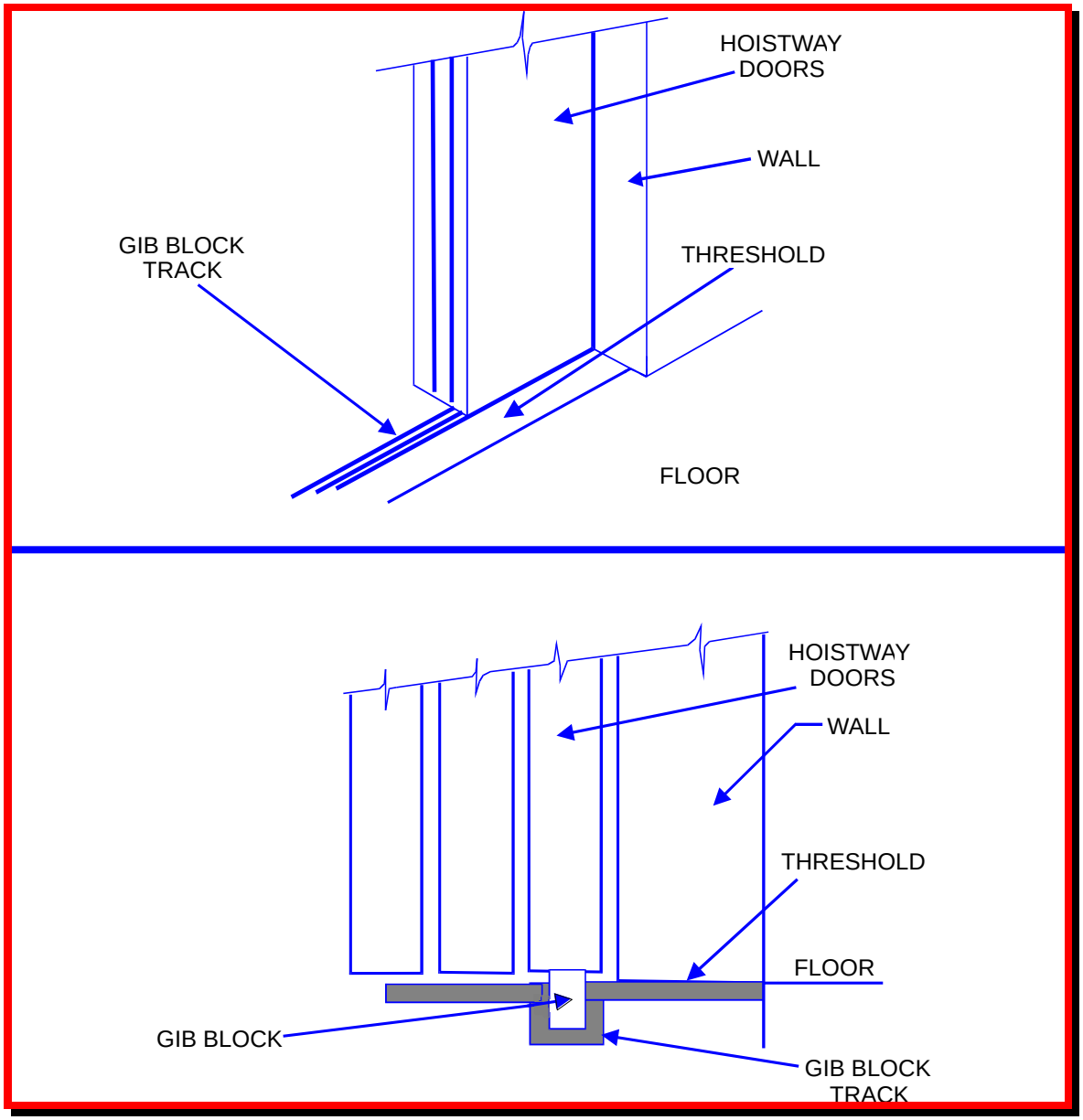
TWO SPEED DOORS

Elevator doors are normally opened by a power unit that is located on top of the elevator

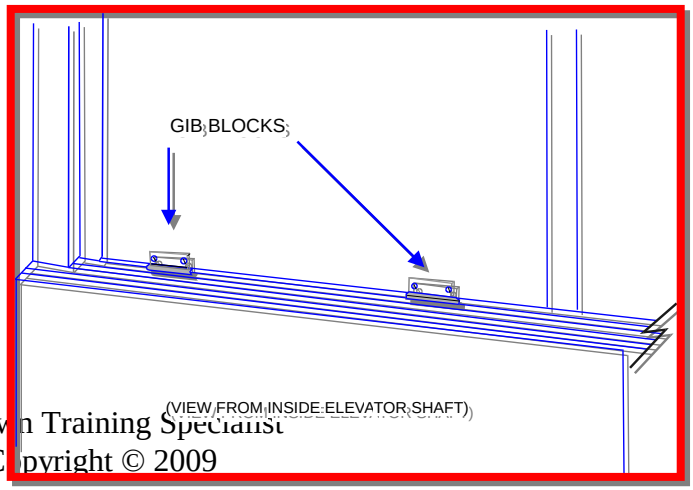
car. When an elevator car is level with a floor landing, the power unit moves the car door open or closed. A pick-up arm (clutch, vane, bayonet, or cam) contacts rollers on the hoistway door which releases the door latch on the hoistway door. The power unit opens the car door which in turn opens the hoistway door. The door rollers and pick-up arm may be different on various elevators but they all work on the same principle.

GIB BLOCKS

The bottom of hoistway doors are equipped with gib blocks. They are made of various plastic or phenolic materials. Gib blocks are approximately 3" wide, 1" high, ½" thick and are installed every 18-inches across the underside of the door panel. They ride in tracks that are in the floor landing.



Gib blocks provide stability to the hoistway door as it opens and closes. Normal hoistway doors can be expected to utilize two gib blocks.



BRAKES

Elevators are provided with brakes for normal operation and are similar to automotive brakes. A centrifugal force governor is provided on most elevators to guard against overspeeding (when a car travels in excess of 20% of top speed, the governor will activate a safety stop device). Safeties are installed at the bottom of an elevator car and occasionally on counterweights to provide positive emergency stopping when activated by the governor. If necessary, abrupt stops are possible with this equipment. On elevators capable of high speeds, wedges are forced between two jaws and the vertical rail is gripped with increasing force to slow a runaway elevator car to a gradual stop.

RESCUE PROCEDURES

Prior to initiating elevator rescue procedures, dispatch and on scene information should be carefully evaluated. When an alarm is received, knowledge of the type and height of occupancies in the geographical area of dispatch will indicate the probable type of elevator (hydraulic or cable), applications (industrial-commercial, apartments, multi-story office buildings, high rise, etc.), and the time of day (indicator of the potential of trapped victims). On scene information should consist of the following minimum considerations:

- Is there an inoperative elevator?
- Does the inoperative elevator contain trapped occupant(s) and what is the occupant(s) condition?
- Has an elevator repair person been notified, and if so, what is their estimated time of arrival?
- What is the location of the inoperative elevator. (Between floors or at a landing?)
- What is the type of elevator? (hydraulic or cable)
- Where is the elevator equipment room? (normally, above for a cable elevator and below for a hydraulic elevator)

Once on scene there are general guidelines for rescue to be considered. Various operations can be utilized to remove trapped passengers from an inoperative elevator. Use of a particular operation should be based on the needs and conditions of each incident and the expertise of personnel. Rescue procedures include the following:

- Moving an Elevator
- Adjacent Car Rescues
- Forcing Doors

- Breaching Elevator Shafts

GENERAL GUIDELINES FOR RESCUES

When it has been determined there is an inoperative elevator with trapped occupants, the following considerations should be initially implemented:

Position personnel equipped with portable radios at the following locations:

- Elevator equipment room (access to main power switches and elevator equipment).

- Floor where elevator is inoperable (elevator rescue procedures will be coordinated from this location).

Establish voice contact with the trapped elevator passengers and:

- Determine if trapped passengers are in need of medical assistance, or if conditions are stable. Do not rescue passengers using forcible entry methods unless they are in need of immediate medical attention. Forcible entry methods can be dangerous to passengers and fire service personnel, and will cause damage to an elevator.

- If conditions are stable, inform the passengers they are safe and will be removed from the inoperative elevator in a short period of time. It is also advantageous to keep trapped passengers informed of operations that are being utilized to remove them.

- Have the trapped passengers verify the status of the Emergency Stop Button. Remember that if an elevator is stalled due to a malfunction, (one that can be quickly corrected, i.e. overheated relay, loss of power from an activated main switch, etc.), it is necessary for the Emergency Stop Button to be activated before power will be returned to an inoperative elevator, (placed in the normal/run position.)

- Instruct the passengers to push the Door Open Button (if so equipped).

- If the elevator car is within a few inches of the landing floor, and the power is off in the equipment room, instruct the passengers to try to manually open the car door. This may require some effort as the car door operates the hoistway door through a clutch mechanism. Moving the car door will release the latch on the hoistway door and allow the door to be opened.

Personnel in the equipment room should:

Check the electrical circuits (main switch, fuses, etc.) to verify if power is on or off to the elevator. Occasionally, circuits are tripped due to overheating and can be safely reset.

- If there is power to the elevator, turn the power off for at least 30 seconds and then back on again. This can reactivate the elevator by allowing relays to reset (at least 30 seconds is necessary to clear any previous programming in the elevator computer). If the elevator car is within a few inches of the landing, the door may be opened.

- If there is a Door Open Button in the elevator, instruct the passengers to again push this button and the doors may open.

- If an elevator is equipped with a recall system, a key can be used to recall the elevator to the ground floor and open its doors. If the elevator returns to the ground floor but does not open its doors, instruct the passengers to push the Door Open Button (if so equipped).

NOTE: Do not attempt to rescue trapped passengers from an inoperative elevator unless the power to the elevator has been disconnected. This requires that a person be assigned to the main power switch until the rescue is completed.

MOVING AN ELEVATOR

As a moving elevator approaches a landing, a pick-up arm on the elevator car will engage rollers on the hoistway doors and allow the hoistway doors to be opened as follows:

- On hydraulic elevators and some cable elevators, the hoistway doors will open if the elevator is either six (6) inches above or below the floor level.

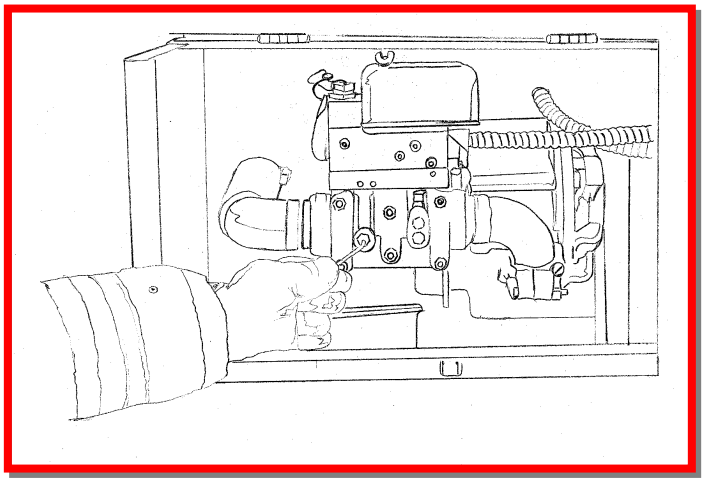
- On cable some elevators, the hoistway doors will open if the elevator is either 18 inches above or below the floor level.

The major difference in rescuing trapped passengers from hydraulic or cable elevators is the method used to lower the elevator to floor level. Moving hydraulic or cable elevators to allow the pick-up arm to engage rollers on hoistway doors, and allow the doors to be opened can be accomplished as follows:

Hydraulic Elevators

- De-energize all electrical power to the inoperative elevator. Direct the passengers to move to the rear of the car and keep the car door closed.

- Locate the bleeder (lowering) valve. The bleeder valves are located on the hydraulic power unit in the equipment room. There are generally three valves in this unit, one to raise the car, one to lower the car, and one that will level the car to a floor landing. Most bleeder valves have a manual lowering screw built into the valve and are marked ML, MAN, or MANUAL near the lowering screw. No valve should be fully opened. Open the bleeder valve slowly, just enough to hear the sound of fluid flowing, and the elevator car will slowly lower.



- When the car is level or within six inches of the floor landing, discontinue bleeding the hydraulic fluid by rotating the valve clockwise until the valve is seated. This will stop the car.

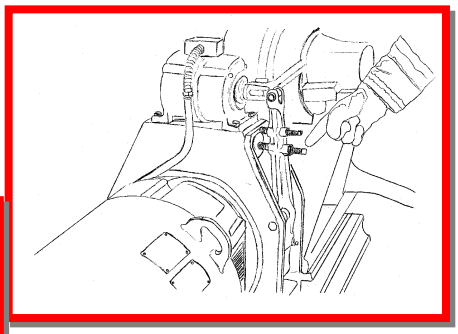
- Direct the passengers to manually open the car door. This will release the hoistway door and allow the hoistway door to be opened. Remember that some elevators require the electric power to be restored for the doors to be opened and that the hoistway door may not automatically open. In this case, it may be necessary to manually open the hoistway door.

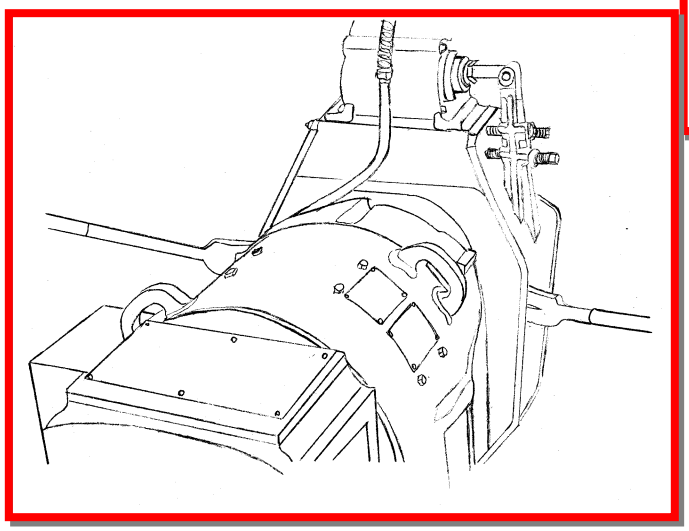
- Quite often the mechanism on the car door that engages the hoistway door to facilitate its opening fails. This leaves the car door open and the hoistway door closed. It should be realized that when this occurs the easiest fix is to direct the passengers to move the latching mechanism (metal rod) upward. The latching mechanism connects the hoistway door rollers to the hoistway door latch.

- Secure the elevator by closing the car and hoistway doors. Shut off all power to the elevator and notify a responsible person that the elevator cannot be placed back in service until repaired by a qualified person.

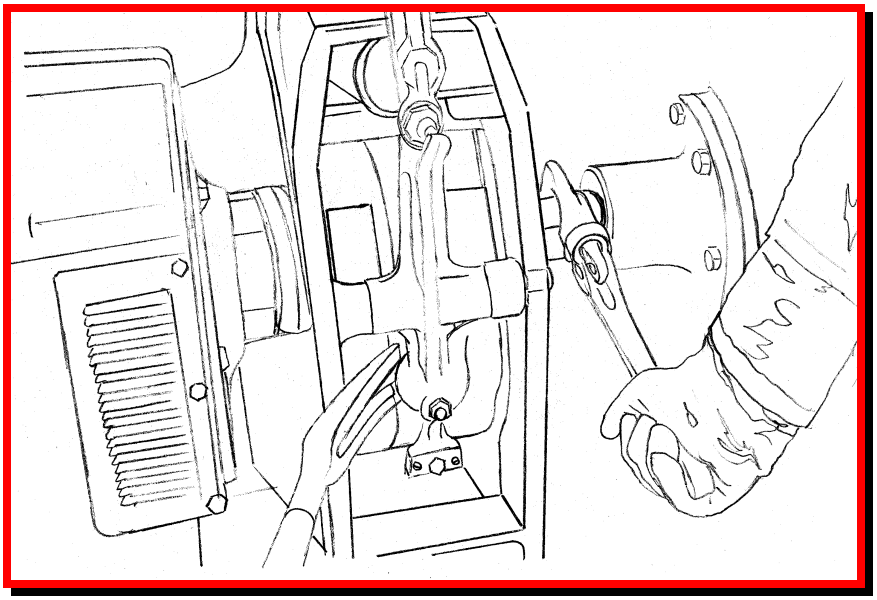
Cable Elevators

- One person on the floor where the passengers will be removed.
- Two members in the equipment room. These members should have two claw tools and a pipe wrench (or large channel locks).
- De-energize the electric power to the inoperative elevator. Direct the passengers to move away from and keep the car door closed.
- Use chalk to mark the hub to show movement of the elevator car.
- Locate the friction brake and determine the direction the brake moves (in or out). The friction brake will be to one side of the shaft.





- Place the claw tools between brake caliper and the spring, one on either side of the brake. Working in unison with personnel on each hayward, release the tension on the brake.
- Once this is accomplished, rotate the shaft with a pipe wrench or channel locks. While rotating the shaft, verify with personnel stationed at the inoperative car that the car is moving in the desired direction (up or down). If not, then rotate the shaft in the opposite direction or change the desired floor that the car is moved to.



Due to counterweights and the number of passengers in the car:

- The car may slowly begin to move upward. This is easily controlled by pressure exerted on the friction brake.

- It is generally easier to move the car upward because of the counterweights.

- When the car is level with or within 18 inches of the floor landing discontinue rotation of the shaft. This will stop the car. Set the friction brake by releasing pressure.

- Direct passengers to manually open the car door. This will release the hoistway door lock and allow the hoistway door to open. Remember that some elevators require the electric power to be restored for the doors to be opened and that the hoistway door may not automatically open. In this case, it may be necessary to manually open the hoistway door.

- Quite often the mechanism on the car door that engages the hoistway door to facilitate its opening fails. This leaves the car door open and the hoistway door closed. It should be realized that when this occurs the easiest fix is to direct the passengers to move the latching mechanism (metal rod) upward. The latching mechanism connects the hoistway door rollers to the hoistway door latch.

- Secure the elevator by closing the car and hoistway doors. Shut off all power to the elevator and notify a responsible person that the elevator cannot be placed back in service until repaired by a qualified person.

ADJACENT CAR RESCUES

When an inoperative elevator shares a common shaft with an operational elevator, it is possible to effect a rescue from an adjacent elevator. Although this is a viable operation, it is very dangerous and should only be used as the very last resort.

Use of Roof Emergency Exit

- Take control of all elevators in the common shaft. De-energize electrical power to the inoperative elevator.

- Position an operational elevator adjacent to the inoperative elevator and deactivate the Emergency Stop Button in both elevators.

- De-energize electrical power to all elevators.

- Open the emergency exit in the roof of the operational elevator. Using a ladder, personnel may climb through the emergency exit to the roof of the operational elevator. The top emergency exit panels are secured by thumb screws and are arranged so the cover can be opened from both the inside and outside of the elevator. The cover will open outward and the space above the cover is unobstructed by elevator equipment. Frequently, a rope or chain ladder is provided in a metal box on top of the elevator. One end of the ladder is fastened to the elevator structure and can be lowered through the exit opening after the cover is removed.

- Confirm electrical power is off to all elevators.

- Fire Department Personnel may now step over to the inoperative elevator and open the emergency exit in the roof of the inoperative elevator.

- Using a ladder, enter the car and assist the trapped passengers from the inoperative elevator.

Use of Side Emergency Exit

- Take control of all elevators in the common shaft. De-energize electrical power to the inoperative elevator.

- Position an operational elevator adjacent to the inoperative elevator and deactivate the Emergency Stop Button in both elevators.

- De-energize electrical power to all elevators.

- Open the emergency side exit in the operational elevator. This will allow personnel to open the emergency side exit in the inoperative elevator. Side emergency exits are usually at least 16 inches wide and 5 feet high, located so there is free access to the side exit of an adjacent car, will open inward, and are either hinged or removable. The removable emergency side exit panel is held in place by at least four fasteners, so arranged that they can be operated by hand from both the inside and outside of an elevator. The hinged emergency exit panel is provided with a lock arrangement so that such lock can be operated from the inside of an elevator by means of a removable key (the key is kept on the premises by the person responsible for the maintenance and operation of the elevator), and from the outside by means of a non-removable handle.

- Confirm electrical power is off to all elevators.

- Once the side emergency exits have been opened in the inoperative and operational elevators, a short plank (ladder, etc.) should be placed through the emergency exits between the elevators.

- Enter the car and assist the trapped passengers from the inoperative elevator.

FORCING DOORS

Rescue of trapped passengers may become time critical if a passenger is in medical distress. It may become necessary to force doors open causing damage to the elevator.

Air Lifting Bags

Air bags can be used to force open center opening doors when a patient is not stable . Insert a hayward, crow bar, or other similar tool at the top portion of the doors and force the two doors apart until a small air bag can be inserted. Instruct the passengers to move to the back of the car and face the rear of the car. Ensure the electrical power to the car has been de-energized. Inflate the air bag until the doors are forced open. This operation will break the interlocks at the top of the doors but causes little or no damage to the car or hoistway doors. The broken interlocks are easily repaired.

Removing Gib Blocks

This rescue method cannot be utilized when the inoperative elevator is located at the top floor of a building.

Personnel can gain entry into an

inoperative elevator by removing the gib blocks as follows:

- Position personnel in the elevator equipment room, floor landing where the elevator is inoperative, and the floor landing above the inoperative elevator.

- Shut off the power to the elevator.

- On the floor above the elevator, cut the gib blocks on one of the hoistway doors. This is easily accomplished by using tools such as a plumbers saw, hacksaw, reciprocating saw, air chisel, etc. If the gap between the bottom of the hoistway door and floor is insufficient, the door can easily be pried upward to provide the necessary clearance.

- Utilizing the top of the hoistway door as a hinge, the bottom of the door may be pushed into the elevator shaft, allowing personnel to look down at the inoperative hoistway door linkage-locking mechanism, allowing personnel to use a pike pole (or other similar tool) to release the locking mechanism. This will release and allow the inoperative hoistway doors to be easily opened. The car doors may then be opened by the passengers or personnel, freeing the trapped passengers.

- When the gib blocks are cut, the hoistway door can dislodge from its upper track if it is pushed too far into the shaft. However, this must be deliberately done to dislodge the door.

- Elevator power shall not be restored until the elevator is restored to proper working condition.

- Ensure that the hoistway door with the cut gib blocks is appropriately secured. To restore the hoistway door, elevator personnel could replace the gib blocks that have been cut and put the door back on its track.

BREACHING ELEVATOR SHAFTS

Occasionally, an express elevator car may be stalled in a blind section of an elevator shaft, and as a final resort it will be necessary to breach an elevator shaft wall. Elevators of more sophisticated design have access panels from blind floors. These panels may be every three floors or 80-feet apart. Panels can be helpful but should not be depended upon as they may be hidden or covered. Shaft panels are on the side of the elevator shaft that the car door is located on. These panels can be removed and used in several ways:

- Locate car by looking into shaft through a panel. If close enough, the car doors can be forced open and passengers removed through the panel.

- Panels can permit entry into the elevator shaft and access to the emergency exit on the roof of a car.

If there are no shaft panels and it is necessary to breach the elevator shaft wall, the breach opening(s) should be made on the elevator car door side of the shaft and as near the car door as possible. The wall opening should be large enough to expose the entire elevator car door opening. Remember, breaching requires personnel, labor, time, property damage, planning and coordination. After elevator shaft entry has been made, car doors or roof emergency exit (if breach was above the car) can be opened. Consider use of the Heavy Rescue for wall breaching. Their jackhammers will go anywhere a 1" hose line will go. If it is necessary to use a ladder from the wall opening to the top of a car, life lines should be considered for use on rescue personnel. Consider use of a USAR task force for any type of rope rescue.

OTHER ELEVATOR EMERGENCIES

ELEVATOR FIRES

Fires occur in elevator cars as a contents fire, which cause smoke problems on multiple floors. Fires also occur in the elevator equipment rooms and elevator shafts.

Equipment Room Fires

When a fire occurs in an elevator equipment room, the probable seat of the fire will be the driving motor. Disconnecting the main and auxiliary power switches will stop car movement and de-energize the driving motor. Whenever possible, the use of water on elevator equipment should be avoided or used sparingly. The removal of passengers from the shut down elevator car should be completed in a routine manner.

Elevator Shaft Fires

Although there is little to burn in an elevator shaft, there is the presence of grease and lint. However, the main source of fuel is debris in the pit. The principal hazard of any fire in an elevator shaft is the smoke created by the fire. Smoke can cause problems by extending to the following areas:

- An elevator car with passengers.
- Equipment room and foul electrical contacts in various control panels. While some electrical equipment is quite sturdy, some equipment is sensitive to smoke and its by-products.
- Extend to other levels in the multi-story building.

If the fire is under the car, the car should be brought to the lowest landing possible to reduce the spread of smoke. If the fire is in the upper portion of the shaft, the car should

be stopped and evacuated and the elevator shaft opened as near to the fire as possible. Remember, the use of water should be avoided or used sparingly. When multiple elevators share a common shaft, all elevators in the elevator shaft involved with fire should be stopped and evacuated.

EARTHQUAKES

As a result of the earthquake in Sylmar, California in 1971 and the Northridge, California earthquake in 1994, over 1000 elevators were put out of service due to the initial shock and aftershocks. The primary causes of stalled elevators were counterweights pulling out of their guide rails, counterweights striking cars, roller guides breaking, damaged cables, damaged equipment in the equipment room, binding doors and power outages.

In the event of an earthquake, all elevators should be stopped with the main power switches and all equipment should be checked for damage prior to attempting to remove passengers. If the building has auxiliary power to the elevators, it should also be shut down.

POWER OUTAGE

During the 1965 East Coast power outage, thousands of elevators were stalled. The greatest problem was panic to trapped passengers in dark inoperative elevator cars. When there is a sudden loss of power, all power switches should be placed in the off position and passengers rescued with appropriate measures. It may be necessary to force doors, or breach walls. Some buildings have auxiliary power which can be used to move elevators until normal power is restored.

ESCALATORS

Escalators are a simple and common means of transportation. They consist of steps, a driving motor, and gearing to form a continuous belt or track running on a set of gears. An escalator traveling between 90 to 120 feet per minute can carry as many as 5000 passengers per hour. Each escalator in a building is an individual installation with separate machinery and controls. A stop button that may be located externally and adjacent to the top and bottom of each unit. Stop buttons stop the escalator slowly and are provided for emergency operation. An escalator cannot be restarted without the use of a key-operated switch located in a covered compartment at the bottom of the escalator.

There are occasional emergencies such as children inserting their fingers and toes between the stop treads and guard plates, shoes that are capable of wedging between the treads, and trapped fingers due to persons attempting to pick up dropped articles. Generally, most injuries are not serious. A moving escalator can be stopped by activating the stop button. By clearing the escalator of all passengers, the treads can be moved

backwards by hand pressure. Some older installations may require the use of a crowbar or other similar tool to push the treads backwards. When pushed backwards, trapped fingers or toes can be easily removed and the victim removed from the escalator. Because of a victims position and/or the extent of injuries, it may be necessary to remove the cover plate that covers the step treads at the demarcation line. When plate removal is necessary, the plate screws should be completely removed from the plate and the plate lifted straight up rather than backwards or away from the victim. Following removal of the victim, place the escalator out of service. In this case, the escalator becomes an ordinary staircase.

GLOSSARY

Alarm Bell:

Used to notify occupants of a building there is an elevator problem. A bell is activated by use of an emergency switch on most elevators.

Blind Section:

The part of an elevator shaft that for 3 or more consecutive floors has no hoistway doors to access the floors.

Buffers:

Buffers smoothly decelerate an elevator car and supports it at rest as it passes the lowest floor landing.

Car, Cab, or Cage:

The moveable part of an elevator used to move passengers. Construction is identical for cable or hydraulic cars except cable cars will have a reinforced top beam due to cable connections. This beam has to be able to carry the load of the car and passengers. Hydraulic elevators have a reinforced bottom joist due to the hydraulic ram connected to the bottom of the car. This beam has to be able to carry the load of the car and passengers.

Car Door:

The door on the elevator car.

Counterbalance Weights:

All cable elevators are counterbalanced. Hydraulic elevators over six stories in height also need to be counterbalanced. Counterbalance weights are normally on the back of the elevator shaft. However, due to construction of a building, oversize cars, and other similar factors, the weights may be on the side of the elevator shaft.

Door Types:

The four basic types of doors are swing hall, single slide, center opening, and two speed.

Door Latch-Lock or Interlock:

Generally located on the beam over the elevator shaft opening. Can also be on the side of an elevator shaft opening. Locks the hoistway doors in a closed position.

Door Roller, or Release Roller:

Generally on the hoistway doors. Activation of this roller will open the door latch, lock, or interlock.

Elevator Shaft:

A shaft that contains an elevator car and appropriate equipment.

Emergency Exit:

Most elevators are equipped with a roof emergency exit in the ceiling of the car. When there is a bank of elevators, a side emergency exit may be in the side of the car.

Emergency Stop Switch:

On the panel inside a car. Must be a manually operated switch that will shut off the electric power to an elevator. The switch is red and may be labeled stop and run, or emergency.

Emergency Switch (PUSH IN CASE OF FIRE):

Override switch on photo electric light beam for closing the car doors. This switch can be used to close the doors when smoke from a fire keeps the doors from closing.

Equipment Room:

The equipment room for cable elevators is normally located on the top floor or roof of a building. In rare occasions, it is in the basement. Equipment rooms for hydraulic elevators are normally located at the lower level of a building, but can be at any floor level or 50 to 100 feet away from the elevator shaft.

Escape Hatch:

See Emergency Exit.

Express Elevators:

An elevator car that has no hoistway doors to access three or more consecutive floors.

Gib Block:

Guides on the bottom of hoistway doors that provide stability for opening and closing.

Governor:
A mechanical device on cable elevators. If a car is traveling downward too fast, it automatically activates a mechanism on the car and causes the safeties to grip the guide rails and stop the car. If a car is traveling upward too fast, it will cause the electric motor to be shut off and slow the movement of the car and set the brakes on the motor, stopping the car.

Hatch, Hatchway, or Hoistway:
See Elevator Shaft.

Hoistway Door:
The door that is seen from each floor of a building.

Inner Door:
See Car Door.

Lowering Valve:
Valve on hydraulic elevator equipment used to lower a car. If there is no manual lowering screw in the valve, there will be a globe valve in the system that can be used to lower an elevator car. This is the valve that is used by Fire Service personnel to lower a car.

Machine Room:
See Equipment Room.

Main Switch:
Main power switch located in the machine room.

Outer Door:
See Hoistway Door.

Pick-Up Arm Clutch, Vane, Cam, or Bayonet:
Located on the hoistway door of an elevator and actuates the door roller that operates the door latch. It is generally, 14 inches long on hydraulic elevators, and 36 inches long on cable elevators.

Pit Area:
Area at the bottom of the elevator shaft.

Power Door Operator:

Located on top of an elevator car or at each floor landing. Comprised of an electric motor that opens and closes the doors.

Power Unit:

Electric motor to operate hydraulic pump or move cables, located in a equipment room.

Push Button Station:

Located at each floor landing and close to the hoistway door opening.

Relays:

Activates the movement of an elevator car and its doors. Located in relay panels or control panels in an equipment room.

Safeties:

Mechanical device on the bottom of cable elevator cars that is activated by the governor if the downward car speed is too fast. Safeties grip the guide rails and stop the car.

Sleeping Elevator, or Parked Car:

When an elevator car is not in use.

Traction Sheave:

Large pulley to provide movement of cables. Is driven by the motor directly or through worm gears.