Hyattsville Volunteer Fire Department Training

Elevator Rescue Module

Elevator Types

- Cable Elevators
- Hydraulic Elevators
- Drum Type
- Traction Type

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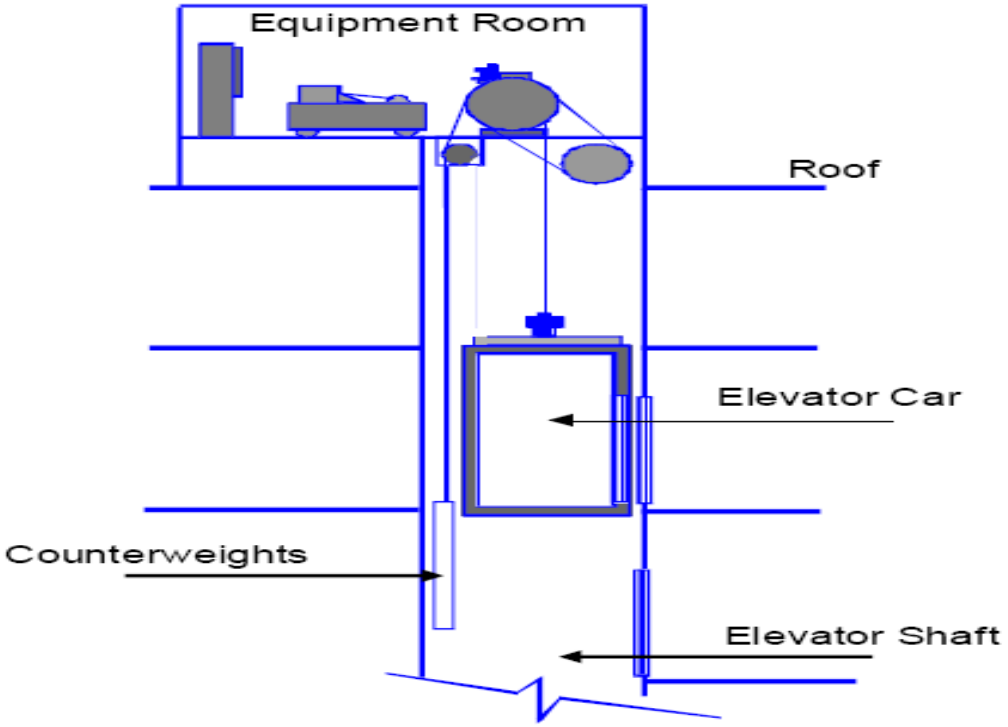
Cable Elevator

- 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.

Cable Elevator (contd.)



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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. 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
  - 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)

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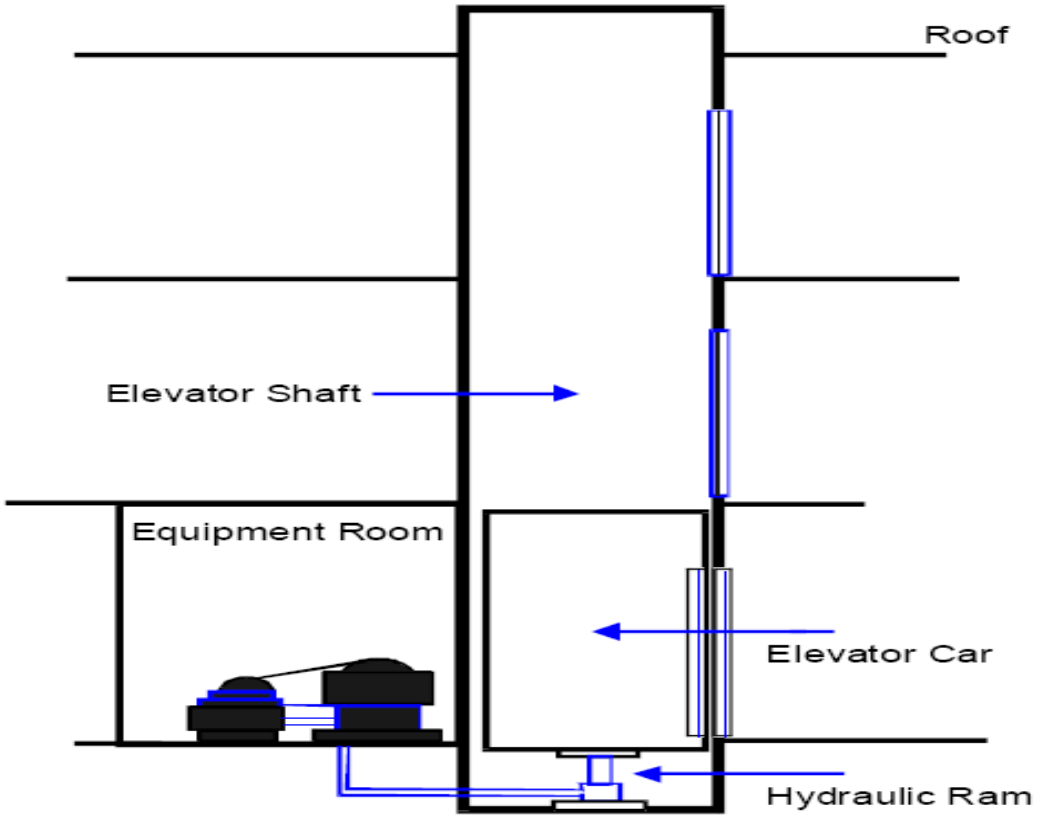
Hydraulic Elevators (contd.)



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Drum Elevator

- 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 Elevator

- 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.

Elevator Rescue

- 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).

Elevator Rescue (contd.)

- On scene information should consist of the following minimum considerations:
  - Is there an inoperative elevator
  - Does the inoperative elevator contain trapped occupants and what is the condition of the occupant?
  - 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?
  - Where is the elevator equipment room? (normally, above for a cable elevator and below for a hydraulic elevator)

Elevator Rescue (contd.)

- Observe the position of the indicator light at the lobby floor. If phones are usable, have the passenger provide the information from the car panel.

- In a multi-car hoist way (shaft), ride up in the adjacent car, stopping and looking across the shaft as necessary. Fire personnel are never to ride on the top of the car to perform this step.

- Go to the elevator mechanical room and determine the location of the car by checking the selector equipment, if visible and available.

- Open the lowest floor door and look up the hoist way.

Elevator Rescue (contd.)

- Once it has been determined that there is an inoperative elevator, personnel with portable radios should be placed:
  - One person in the elevator equipment room to access the main power switches, and or bleed off valve (only for hydraulic).
  - The rest of the crew crew should be on the floor or above the floor of the inoperable elevator where rescue procedures will be taking place.
- Once communication has been established with trapped occupants determine the condition of patients, which will help the crew establish a priority for removal of these occupants.

Elevator Rescue (contd.)

- 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. If the elevator car is within a few inches of the landing, the door may be opened
  - 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, 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.

Elevator Rescue (contd.)

- If the trapped occupants are able to assist have them push the Emergency Stop Button. This in return can restart the elevator due to a malfunction or overheating of elevator car. (Keep in mind the person at the elevator equipment room can kill the power and turn the power back on to also return the elevator to full function).

- Next instruct the occupants to push the Door open button.

Elevator Rescue (contd.)

- 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 hoist way door through a clutch mechanism. Moving the car door will release the latch on the hoist way door and allow the door to be opened allowing the occupants to be removed

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Elevator Rescue Equipment

- All firefighters should be wearing or have bunker pants, helmet, gloves, light box, and portable radio.

- Suggested tools for elevator rescue:
- Set of Irons
- Elevator Keys
- Elevator Poles
- Attic Ladder