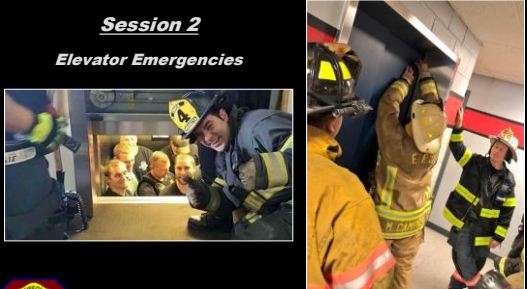



Heavy Rescue II

Session 2
Elevator Emergencies


Suffolk County Fire Academy

1

Course Overview

5 Sessions

- **Session 1** – Meters and Chemical / Physical Properties
- **Session 2** – Elevator Emergencies
- **Session 3** – Basic Rigging
- **Session 4** – Cutting Torches
- **Session 5** – Industrial Rescue / Man-in-machine.



2

Session Overview

- General Elevator Hazards
- Elevator Types (Traction/Hydraulic)
- Elevator Failures
- Machine Rooms
- Elevator Power and Components
- Elevator Cars
- Elevator Doors.



3

Session Overview (Cont'd)

- Elevator Emergency Tools
- Initial Company Operations
- Removal Methods
- Other Elevator Emergencies
- Elevator Firefighter Service
- Elevator Emergency Hands-on.



4

Session Objectives

- Describe elevator components within the car and hoist way
- Define the two types of elevators, traction and hydraulic, and the types of buildings where they might be found
- Identify the safety mechanisms located within an elevator as well as the elevator hoist way
- List the dangers surrounding operations in the elevator hoist way, on top of the elevator car, and in the elevator machinery room.

5

Session Objectives (Cont'd)

- List tools which may be needed during elevator emergencies
- Describe the procedures (mechanical and power removal) to secure an elevator for safe emergency operation
- Describe the procedure to access and remove victims within a stalled elevator
- Discuss the operation of an elevator during a fire/emergency using firefighter service
- Demonstrate the use of elevator drop keys to open hoist way and car doors.

6

Elevator Mechanic Presentation



7

TAKE A BREAK



8

Elevator Emergency Tools



9

Portable Radios

Invaluable Tool To Coordinate Power Removal

10

Forcible Entry Tools

Irons
Rabbit Tool
Hydra-ram
Air Bags

11

Interlock Release Key "Elevator Keys"

POWER MUST BE REMOVED BEFORE THESE ARE USED!

Drop Key (Most Common)

12

Interlock Release Key "Elevator Keys"

Where Are The Drop Key
Accesses Located?



13

Elevator Poling Tool



**POWER MUST BE REMOVED
BEFORE THIS IS USED!**



14

Elevator Poling Tool



15



16



17



18

Class III Harness & Life Saving Rope

This is A Last Resort Operation Performed By Technical Rescue Trained Personnel.



19

Other Tools



20


Initial Company Operations



21

What Is The Problem?

- Elevator malfunction, stalled, dropped?
- Are people still in the elevator (condition - EMS required)?
- Elevator mechanic - on site or responding?
- Which elevator is stuck and where is it located in the hoist way (approximate floor)?



22

Where Is The Elevator Stalled?

Elevator Floor Indicator






23

People Trapped In The Elevator

- Contact passengers:
 - Elevator car telephone
 - Elevator car intercom
 - Call or yell up
 - Speak through hoist way/car doors
- Ask:
 - Deactivate emergency bell (if activated)
 - If they know their approximate location (floor)
 - Number of people in elevator and their condition

Reassure them that the problem is being addressed.

24


People Trapped In The Elevator

- **Communication with passengers is key for the first removal method (Primary Removal).**




25

Removal Methods




26

Three Removal Methods

- **Primary – Power remains on**
- **Secondary – Power must be removed**
- **Emergency – Power must be removed**

These removal methods should be attempted in order


Elevator Mechanic Should Be Requested; Must Be Requested If Primary Removal Methods Are Unsuccessful.



27

Primary Removal

- Power remains on
- Have passengers:
 - Ensure emergency stop switch is not activated (usually accompanied by bell)
 - Press "Door Open" button
 - Press the floor buttons
 - Push elevator car door towards closed position.



28


Primary Removal




29

Primary Removal

- In the lobby:
 - Press the elevator call button
 - Activate Phase I recall using Firefighter Service (if equipped)
- Check the hoist way doors on each floor to ensure they are closed.



30

Primary Removal

Where might we find the keys for Firefighter Service?

31

Primary Removal Elevator Power Reset

- Prior to transition to Secondary Removal Methods
- Member sent to elevator machine room
- Attempt to reset the elevator by removing power and then turning it back on
 - Elevator can take up to 2 minutes to reset
 - Similar to resetting a computer.

32

Primary Removal → Secondary Removal

If not already done, an Elevator Mechanic must be requested


Secondary removal involves members opening the hoist way and elevator car doors to remove passengers

Power To The Elevator Must Be Removed Before Proceeding.

33

Power Removal
Elevator Machine Room

- **Location:**
 - **Top of the shaft (traction)**
 - **Bottom of the shaft (hydraulic)**
 - **Could be anywhere in the building**
- **If possible have building personnel escort**
 - **At very least, get a key (Knox Box)**
 - **If necessary, force entry.**



34

Power Removal
Elevator Machine Room



Large and Elaborate to ...



35

Power Removal
Elevator Machine Room



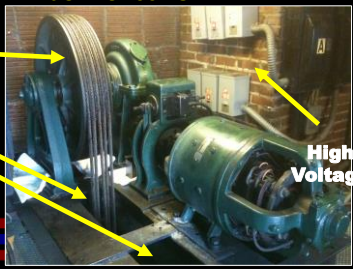
... Small and Simple



36

Power Removal Elevator Machine Room


Extreme caution must be used in elevator machine rooms:



Moving Parts

Holes


High Voltage



37

Power Removal Procedure

- Confirm elevator to be isolated
- Communicate with officer when in position to remove power
- Remove power
 - Confirm power is removed with officer
 - Member is to stay in this position throughout the incident
 - **We do not restore power (even after passengers are removed and operation is complete) - Elevator mechanic.**



38


Power Removal Procedure



39

Secondary Removal

- Confirm location of the stalled car
- Utilize drop key access as close to stalled car as possible
 - If located on every floor (drop key at that floor or above and below if car is stalled between floors)
 - If located on first and top floors only (pole up or down to the stalled car).



40

Secondary Removal

Interlock Release Keys

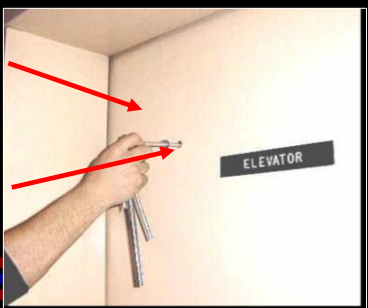
- Interlock Release Keys = Elevator Keys
- “Drop key” is most common used
- Releases interlock allowing hoist way door to be opened
- May be located in elevator machine room.




41

Secondary Removal

Opening The Hoist Way Door (Drop Key)

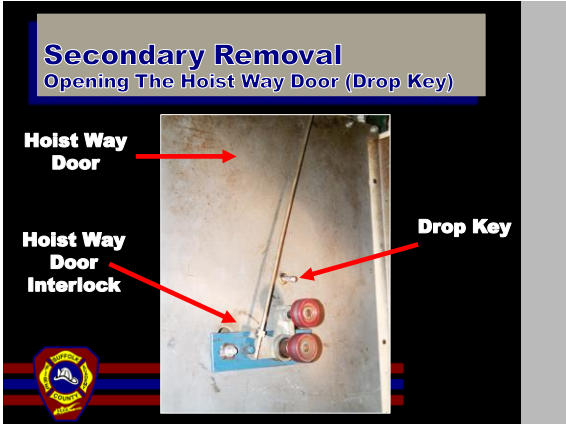


Hoist Way Door

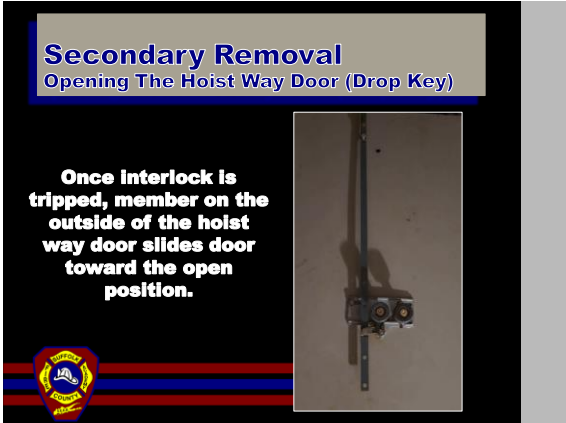
Elevator Key Access



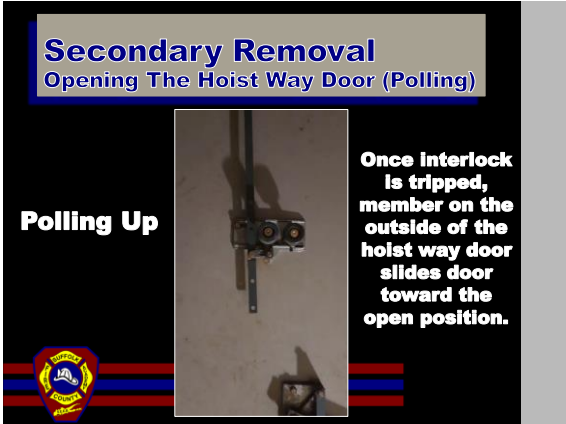
42



43



44



45

Secondary Removal
Opening The Hoist Way Door (Polling)

Polling Down




46

Secondary Removal
Forcible Entry

Remove a lock




47

Secondary Removal
Opening The Hoist Way Door

Hoist Way Door

Elevator Car Door

Chock



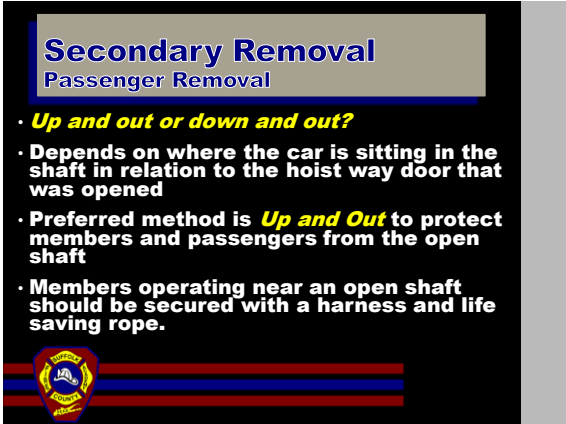

48



49



50



51

Secondary Removal
 Passenger Removal - Down and Out

52

Secondary Removal
 Passenger Removal - Up and Out

53

Secondary Removal
 Upon Completion

- Elevator power must be locked-out and tagged-out (unless turned over to elevator mechanic).
- Advise building personnel elevator is OOS pending the arrival and evaluation of the elevator mechanic
- Close elevator car door and hoist way door(s) before taking up.

54

**Secondary Removal →
Emergency Removal**

*Power Should Have Already Been
Removed To The Effected Car*

**Emergency removal involves exposing
members and passengers to the elevator
shaft**

**In most cases, it is safer and more
efficient to await the arrival of an elevator
mechanic rather than perform this
removal.**



55

Emergency Removal
Calming Passengers


**Communicating with passengers and
keeping them informed will help to keep
them calm while waiting for the
elevator mechanic.**




56

Emergency Removal

- Conducted after **Secondary Removal** is unsuccessful and there is a true emergency inside the car (**medical**)
 - Opened hoist way door cannot access elevator car door
 - Elevator car door will not open
- A hoist way door above elevator car must be opened
 - Top of elevator car must be in reach of a portable ladder.



57

Emergency Removal
Portable Ladder

Ladder Placed in Shaft To Top of Elevator Car

58

Emergency Removal
Portable Ladder

- Choose a portable ladder that will reach the top of the car and out of the shaft
 - Depending on location of the top of the car to the open hoist way door, a ladder may or may not be needed
 - Members entering the shaft **must** be secured with a harness and life saving rope.

59

Emergency Removal

Harness and Life Saving Rope (Member)

60

Emergency Removal
Roof Escape Hatch

- Access hatch



61

Emergency Removal
Scissor Ladder


- Scissor (attic) ladder used to access the inside of the elevator car.



62

Emergency Removal
Member Positioning

- Member positioned inside elevator car to assist passengers onto the roof of the elevator car
- Member positioned on the roof of the elevator car to assist passenger onto the ladder leading out of the shaft
- Members positioned at the floor landing to receive passengers from shaft
- Passenger must be secured with harness and life saving rope before moving to the roof of the car and into the shaft.



63



64




65



66

Other Removal Methods
 Technical Rescue

- Elevators in blind shafts or not within reach of portable ladders
- **Technical Rescue – Confined Space**
- **Requires the response of Technical Rescue Trained Members**
- **Wait for Elevator Mechanic!**



67


Other Removal Methods
 Technical Rescue




68

Other Removal Methods
 Wall Breach

- Elevators in blind shafts or not within reach of portable ladders
- Can be difficult to estimate what floor the car is stalled on and what wall, when breached, will provide the best access
- Labor intensive – must open a large enough hole to access elevator car door or roof of the car
- **Wait for Elevator Mechanic!**



69

Other Removal Methods


Wall Breach



70

Elevator Threshold

“Danger Zone”



In all removal methods described, never straddle the threshold between the floor and elevator car. This is considered the **Danger Zone**. Although power has been removed, the car can still move without warning under certain circumstances.

71


Other Elevator Emergencies



72

Entering Elevator Pit

- Only enter for life saving purposes (person in pit)
- **Power must be removed**
- Open hoist way door at lowest level
- Use portable ladder to enter pit
- Trip lower limit switch to ensure elevator will not move.



73

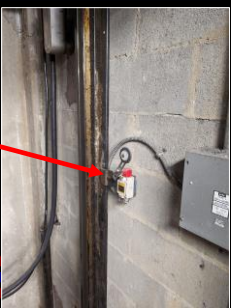

Entering Elevator Pit




74

Entering Elevator Pit


Lower Limit Switch

75

Elevator Pit Fire

- **Power must be removed**
- **Use caution when fire involves hydraulic components**
 - Contents under pressure
 - Release of pressure may cause elevator to drop
- **Fire typically involves rubbish in the pit**
- **Operate line from landing away from open shaft (away from threshold).**



76


Elevator Pit Fire




77

Residential Elevators

- **Becoming more common in larger homes and retirement communities**
- **Hoist way doors open out**
- **Use caution when searching in a smoke condition**
 - **Outward opening door may lead to open elevator shaft.**



78



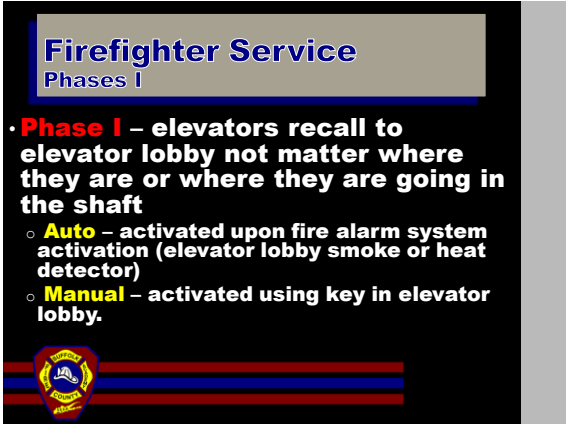
Residential Elevators

79



Firefighter Service

80



Firefighter Service

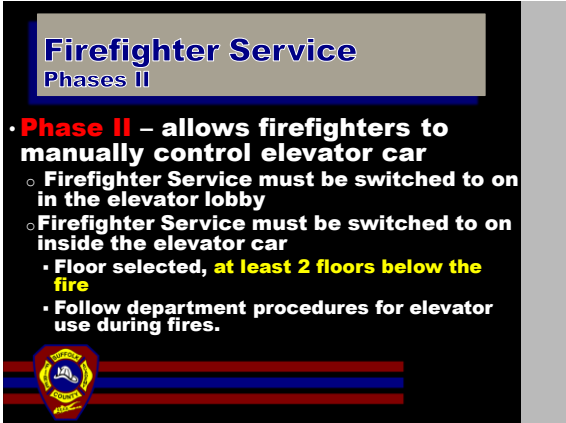
Phases I

- **Phase I** – elevators recall to elevator lobby not matter where they are or where they are going in the shaft
 - **Auto** – activated upon fire alarm system activation (elevator lobby smoke or heat detector)
 - **Manual** – activated using key in elevator lobby.

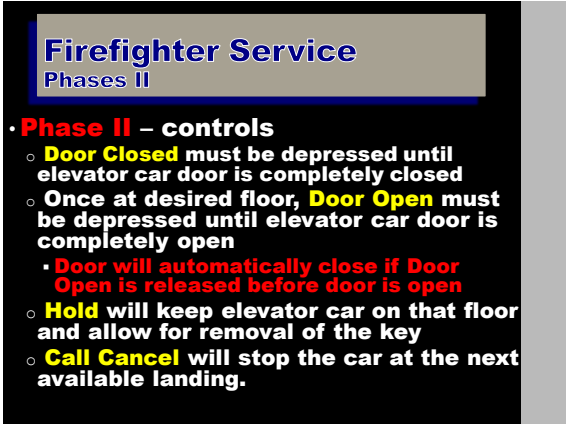
81



82



83



84

Firefighter Service
Phases II

Firefighter Service should be tested on lower floors before proceeding 2 floors below the fire.



85

Questions?



86
