













Sharing Information

References

- A.S.M.E. A17.1 Safety Code for Elevators & Escalators
- A.S.M.E. A17.4 Emergency Evacuation of Passengers from Elevators
- N.E.I.E.P. Training Modules
 F.D.N.Y. Training Bulletin/Emergencies 1/Elevator Operations/March 15, 1997
- Thyssenkrupp.com/Classroom on Demand
- YouTube.com
- Otis.com
- Elevatorbob.com

A.S.M.E. – American Society of Mechanical Engineers N.E.I.E.P. – National Elevator Industry Educational Program F.D.N.Y. – Fire Department City of New York

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Elevator Intro

Most common form of transportation

- Travel millions of miles
- Reach great heights
- Can be found anywhere

Safest form of transportation

- Occasionally present a problem
- Needs immediate attention
- Not always an emergency

WAIT FOR ELEVATOR MECHANIC IF POSSIBLE!







C.M.A.!

- The main focus for this lecture is to provide the necessary information needed to free a passenger from a stalled elevator safely.
- It is not intended to turn rescuers into elevator mechanics, but only to provide information on how to safely remove the passenger from their unfortunate situation.

Remember This!!!!! (five most important points)

- Safety
- True emergency (Incident vs. Emergency)
- Kill the power! (Lock-out/Tag-out)
- Secure elevator mechanically (Operations level skill)
 - While operating in the shaft-way
 - When the car is overloaded
 - Forced to remove the occupant through a narrow space
 - When any doubt exists
- Do not restore power! (Stalled elevator)

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Why Do Elevators Stall?

- Human error
- Equipment malfunction
- Electrical & mechanical safeties
- Power failure
- Relay's & switches in the control panel
- No preventive maintenance
- Overloading

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Elevator Terms

Hoistway: Emergency stop switch: Position indicator: Door lock: Interlock: Interlock release key:

Elevator Terms

Counterweights: Guide rails: Hoist Cable (Rope): Guide Roller/Guide Shoe: Main line disconnect: Top access hatch:

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The Hydro

The Pit (hazards)

- Inadequate refuge space
- Inadequate lighting
- Improper accessTripping hazards
- Inpping nazards
 Unsafe or lack of pit ladders
- Moisture/water/oil
- Moving equipment

Do Not step on the pipe!





The Hydro

Top of Car (hazards)

- Inadequate lightingOverhead clearances
- Tripping hazards Oily surfaces
- Extreme falling hazardMoving equipment
 - Adjacent car
 - Door motor
- Top escape hatch

































Traction Elevator

Geared

- Reach speeds up to 450 fpm or 5 mph
- Generally found in buildings under 20 stories
- Motor room is generally located directly above the last stop or in a separate structure on the roof





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Traction Elevator

Gearless

- Operating speeds are 451 - 4000 fpm or 5 - 45 mph
- Found in buildings 20 stories or more
- Motor room is generally located directly above the last stop or in a separate structure on the roof

































Traction Elevator

Motor Room (hazards)

- Electricity
- Tripping hazardsLow clearances
- Moving Parts
 Avoid wearing turnout gear
 - aring turnout gear Communication problems
- Falls from secondary levels



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Traction Elevator

The Pit (hazards)

- Inadequate refuge space
- Inadequate lighting
- Improper access
- Tripping hazards
- Unsafe or lack of pit ladders
- Moisture/water/oil
- Moving equipment
 Counterweight
 - Sheaves



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Elevator Safety Devices

The Governor

Monitors the speed of the car in the down direction



<u>Two types:</u> – Centrifugal

(most common)

– Fly-ball





























































Elevator Safety Devices

Electric current safety switch



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Machine Room-less Elevator (MRL)

- MRL- intent is to replace the hydro (EPA concerns)
- Usually found in low to mid-rise buildings (reach travel speed up to 450 fpm)
- Typical motor room is not required
- Hoist machine & governor is located in the shaft
- Controller & main-line disconnect is located in a room usually at the top floor









































Slide 85

CH0 Comfortable adding and removing images using animation? This would decrease slide count.

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Possible Equipment Needed

• Lock-out/tag-out Kit



























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Initial Response Steps (Upon Arrival)

If possible, make contact elevator mechanic & building engineer

Use them for their expertise!



Initial Response Steps (Upon Arrival)

Obtain Knox Box keys if available



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Initial Response Steps (Upon Arrival)

Locating the elevator (recap)

- Position Indicator
- Open lobby door
 - See car
 - Counterweight position
- Adjacent Car
- Motor room
 - Look down shaft-way (traction car)
 - Controller (floor selector)
 - Hydro Oil (fluid level)
- Laser Tape






Initial Response Steps

Have the passenger push the Door Open button and/or push another floor button



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Initial Response Steps Make sure all hoist-

way doors are fully closed (front/rear/side)

Don't forget to check the floors above & below the stalled car!



Initial Response Steps

Activate phase 1 switch in the lobby

Caution Passenger(s) MUST be notified before activating Fire Recall



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Lock/out - Tag/out (LOTO) Procedures

This procedure is designed during elevator rescue operations, to ensure that power has been removed and to prevent the unauthorized restoration of power...



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Lock/out - Tag/out (LOTO) Procedures

Verifying that power has been removed tips:

-Open Controller Cabinet and look for lights and/or Floor Selector

-Listen for fan if equipped





Verifying that power has been removed tips:

 After initiating LOTO, the lighting circuit will still be energized



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Lock/out - Tag/out (LOTO) Procedures

Verifying that power has been removed tips:

 Wait until DC Motor Generator Set stops rotating, before giving the OK that power is off!



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Elevator Doors

The Car Door Components

- Door motor/operator
 Door motor swing arm(s)
- Door track
- Door hangers/rollers
 Door panel(s)
- Gate switch
- Door clutch (vain)
- Safety edge
- Door gibs

























Elevator Doors

Hoistway Door (cont.)

- Generally, hollow lightweight metal construction
- Fire protection rating (2 hour min.)

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Elevator Doors

The Hoist-way Door (components)

- Door lock/Interlock
- Door closure
- Keyhole/Escutcheon
- Door rollers
- Door Track(s)
- Door Gibbs













































Pick Tool Operation

- A pick tool is used when a key hole is not present
- Pick tools prevent damage to the door by eliminating forcible entry
- Train often to become proficient





























































Pick Tool Operation

Important

• Determine the action of the interlock and placement of the pick tool, at a floor with a key hole, before proceeding to the stalled car



- Disconnect power to the stalled elevator before using a pick tool!









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Forcible Entry

• Last Resort

Attack the door high, getting as close to the door lock as possible



























































































































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Lock/out - Tag/out Procedures

WARNING:

When shutting down power to the elevator, make sure <u>ALL</u> power has been turned off, including the main shut off and any other back-up/auxiliary power supplies, before entering the shaft.

Use lock-out/tag-out procedures

KNOW YOUR FIRST DUE DISTRICT!






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Construction

Site safety hazards

- Bad housekeeping
- Falls
- Falling objectsTripping hazards
- Unsecured barricades
 Plank & plywood traps
- Careless workers
- Machinery
- Open shaft-waysThe list is endless



Construction

Bad housekeeping

Open shaft-way (not properly barricaded)



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Outside Hoist

Rails

- Hoist riding surface
- Adds strength to tower
- Square or round tubular



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Outside Hoist

Wall Ties

- Used to stabilize the tower
- Connected to building every 10 30 ft.





































Removing Passengers from Stalled Elevators

Four most important points (review)

- Safety
- True emergency (Incident vs. Emergency)
- Kill the power! (Lock-out/Tag-out)
- Do not restore power! (Stalled elevator)

Removing Passengers from Stalled Elevators

Five most important points (review)

- Safety
- True emergency (Incident vs. Emergency)
- Kill the power! (Lock-out/Tag-out)
- Secure elevator mechanically (Operations level skill)
 - While operating in the shaft-way
 - When the car is overloaded
 - Forced to remove the occupant through a narrow space
 - When any doubt exists
- Do not restore power! (Stalled elevator)

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Removing Passengers from Stalled Elevators

Safe Order of Removal:

- 1. Floor level/normal entranceway (safest)
 - Use initial response steps
- 2. Floor above/normal entranceway
- Minimizes falling hazard
- 3. Floor below/normal entranceway
 - Must barricade opening to shaft-way
- 4. Top access hatch
 - Fall arrest system required (last resort)

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Removing Passengers from Stalled Elevators

4 elevator rescue conditions

- Car at or near the landing (within 18 in.)
- Car within 3ft. of the landing (above or below)
- Car more than 3ft. from the landing (above or below)
- Car more than 3ft. of the landing (Top access hatch removal)









Removing Passengers from Stalled Elevators

Car more than 3ft. of the landing (above)

Securing the open shaft below the car is a MUST!



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Removing Passengers from Stalled Elevators

Safety Concerns:

- When ever possible remove trapped occupant from the floor above (minimizes falling hazard)
- If the opening through the normal entranceway has less than 3 feet of clearance, remove occupant via an access hatch





















Manually Moving a Hydraulic Elevator





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Manually Moving a Hydraulic Elevator

IMPORTANT

- This procedure should only be performed when an emergency exists (FIIP)
 - Fire
 - Injury/Illness
 - Panic
- This procedure should only be performed by personnel trained to the operational level or under the direct supervision of an elevator mechanic...

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Manually Moving a Hydraulic Elevator

Locating the valve & Manual Lower (ML) device

Valve Locations

- Inside tank (most common)
- Below tank
- Outside tank

Types of ML devices

- "T" shaped
- Wheel type
- Spring loaded push type

















Manually Moving a Hydraulic Elevator

Spring loaded push type (inside tank)



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Manually Moving a Hydraulic Elevator

- Establish communication w/ passenger & instruct them to stay away from the doors
- Let them know you are attempting to move the elevator



Manually Moving a Hydraulic Elevator

- Send two rescuers to motor room & locate manual lowering device
- Establish constant/ clear communication between lowering team & spotter
- <u>Do Not</u> open valve until given the OK from spotter



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Manually Moving a Hydraulic Elevator

- Open valve, on command of spotter, until hydro oil can be heard flowing into the tank
- Keep hand on the valve, ready to stop procedure, at a moments notice



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Manually Moving a Hydraulic Elevator

• A member must be at the landing where car is relocated to spot the car & assist passenger off the elevator









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Manually Moving a Hydraulic Elevator

- Lower the elevator to a floor that has a key hole or the lowest landing
- Close manual lowering device
- Do Not restore power to the elevator

Manually Moving a Hydraulic Elevator

Warning!

If the elevator does not move with the ML device in the open position, stop immediately and find another way to remove occupant. A Roped Hydro may be the cause of no movement.

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Removing Passengers from Stalled Elevators

WARNING!

Sometimes killing the power is just not enough!

- Secure elevator mechanically:
 - While operating in the shaft-way
 - When the car is overloaded
 - Forced to remove the occupant through a narrow space
 - When any doubt exists

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Fireman's Service

Quick terms

- Lobby: every landing or floor the elevator stops.
- Main lobby: main elevator lobby.
- Designated level: the landing that the elevator will return to, when phase I is activated.

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Fireman's Service

Quick terms

- <u>Alternate designated level:</u> the alternate landing that the elevators will return to, when phase I is activated.
- <u>Phase I switch :</u> the switch located outside the elevator on the designated level.
- Phase II switch: switch located inside the car.





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Fireman's Service (Phase I Operation)

Phase I is activated automatically by the Fire Alarm Initiating Device (FAID)

FAID Locations:

- Lobby landing's
- Shaft-way
- Motor room









Fireman's Service

- Phase II switch (3 position)
 - Off (normal operation)
 - On (activates system)
 - Hold (keeps car at landing)



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27

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Fireman's Service

Operating Procedure

- Look at fire hat on panel
 If flashing, FAID in motor
 - room or shaft is activated – Recommended not to use
 - elevator
- Insert key & turn to "On" position
- Press desired floor button
 - Two floors below fire floor
- To cancel floor selection, press "Call Cancel"

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Fireman's Service Operating Procedure . . . • Press & hold "Door Close" button 27 • Make several stops before arriving @ ²² @ 7 @ 7 @ at the destination floor, insuring 10 20 2° 20 20 proper operation • To open door press & hold "Door ® ® ® 7 Ø ® Open" button 10 07070 - Check doors for heat and/or smoke before pushing "Door Open" button 0 6 0 .



Fireman's Service

Operating Procedure

- Check shaft for smoke and/or water
- To hold car at floor turn key to "Hold" position
- Make sure doors are fully open
 To return car to Recall Floor, turn key to "Off" position
 - Make sure doors are fully open

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Fireman's Service

Resetting the elevator

- Return elevator to recall floorTurn "Phase II" switch to the
- "Off" position & remove key • Insert key into "Phase I" switch &
- turn key to "Reset"/"Bypass" position, then turn to "Off" position



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Fireman's Service

Fireman Service Changes

- Fireman service controls located behind locked panel
 - Fire key will open the panel (manually)
 - Panel will open automatically when Phase I is activated
 - Firefighter Stop Switch (operated with gloved hand)
- Flashing red (fire hat)
 - FAID activation in shaft/motor room
 - Consider taking another elevator

• Standard Fire Key (FEO-K1) - New installs

















THE END

If you have any questions or encounter an oddball elevator incident, please contact me at anytime.

It would be my pleasure to assist you and I can use the info in future presentations.

STAY SAFE!!

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