

# ELEVATOR DOOR LOCK MONITORING & ENERGY CODE COMPLIANCE

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PRESENTED BY

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# PRESENTATION DESCRIPTION

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This presentation provides an overview of Elevator Door Lock monitoring and Energy Code compliance. During this course participants will learn about door lock monitoring requirements and the Departments' enforcement strategy for non-compliance with this retroactive requirement. Additionally, the Energy Code requirements for escalators and moving walks to reduce speed when not conveying passengers is provided.

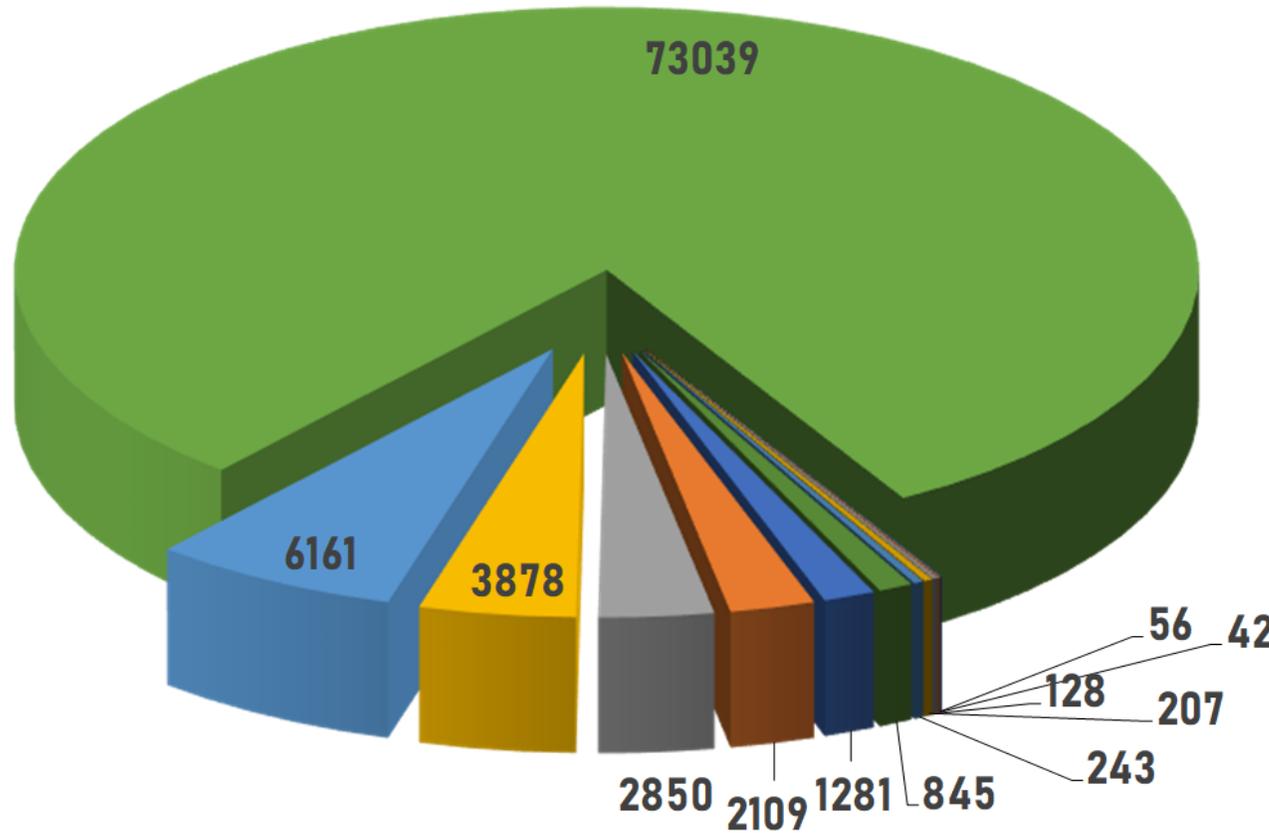
# OVERVIEW: ELEVATORS IN NEW YORK CITY

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- 150.....Years of Elevator History (since 1857)
- ~90K.....Devices Under the DOB Jurisdiction
- 500.....Average Daily Elevator Trips
- ~45 Million.....Daily Citywide Trips
- 12%.....Percentage of all Elevators in NYC

# TYPES OF DEVICES

## Elevator Devices



- Public Elev
- Manlift
- Amusement
- Handicap Lift
- Private Elev
- Sidewalks
- Dumbwaiters
- Conveyers
- Escalators
- Freight
- Wheelchairs
- Passenger

# FUNCTIONS OF THE ELEVATOR UNIT



# ELEVATOR REFERENCE CODES

Code	Description
<i>IBC 2009 as modified by NYC Building Code 2014 - Elevators and Conveying Systems Chapter 30</i>	
ICC/ANSI A117.1 - 2009	Accessible and usable buildings and facilities
ASME A17.1/2000 with supplements A17.1a - 02 and A17.1b - 03	Safety code for Elevators and Escalators as modified by NYC Building Code Appendix K; Chapter K1
ASME A17.1s - 2005	Supplement to Safety Code for Elevator and Escalator for Machine Room Less (MRL) elevators as modified by Appendix K; Chapter K4
ASME A17.2 - 2002	Guide for Inspection of Elevators, Escalators and Moving Walk
ASME A17.3 - 2002	Safety Code For Existing Elevators and Escalators as modified by Appendix K; Chapter K3
ASME A17.5 - 2004	Elevator and escalator electrical equipment
ASME A17.6 - 2010	Standard for Elevator Suspension, Compensation, and Governor Systems as modified by Appendix K; Chapter K4
ANSI A10.4 - 1981	Personnel Hoists and Employee Elevators on Construction and Demolition Sites
ANSI A10.4 - 2007*	*Device Operator requirements only
ASME A18.1 - 2005	Safety Standard for Platform Lifts and Stairway Chairlifts
B20.1—2006	Safety Standard for Conveyors and Related Equipment

# CODE COMMITTEES

AFFILIATION/REPRESENTATION
NEII - National Elevator Industry, Inc.
NYCHA - New York City Housing Authority
REBNY - Real Estate Board of New York
ECNY - Elevator Conference of NY
Port Authority of NY & NJ
EMANY - Elevator Manufacturers Association of NY
FDNY - New York City Fire Department
ASME - Code Committee Member
BOMA - Buildings Owners and Managers Association of NY
Local Union - 1, 3
NYC - DOB - New York City Department of Buildings
NAEC - National Association of Elevator Contractors
DCAS - Department of Citywide Administrative Services

- NYC Elevator Code Committee consist of elevator stakeholder groups, organizations, associations and government agencies.
- Committee reviews each section of the Code and standards and makes decisions to enhance the safe and reliable service for our riders.
- Committee uses consensus-based process.

# ELEVATOR SAFETY

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The Public

Elevator  
Personnel

Authorized  
Personnel

Emergency  
Responders

# DOOR LOCK MONITORING

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3.10.12 System to monitor and prevent automatic operation of passenger and freight elevators with faulty door contact circuits

# DOOR LOCK MONITORING

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- All automatic passenger and freight elevators must comply.
- Compliance date: January 1, 2020.
- A permit is always required.

# DOOR LOCK MONITORING

- RCNY §§ 101-02 and 101-07:
  - Applicant - Elevator Director
- Must file as a self certifiable EBN/PPN work type.
- Third party witnessing required.



JULY 2018

## SERVICE UPDATE

### Updated Filing Requirements: Changes to Elevator Door Monitoring System

Effective May 20, 2018, elevator door monitoring work performed per Section 3.10.12 of Chapter K3 of Appendix K of the New York City Building Code:

- The application must be filed by an Elevator Agency Director or Co-Director approved by the Department, rather than a design professional.
- Design drawings, including approval letter(s) from the controller manufacturer or registered design professional, are not required to be submitted to the Department, but must be kept in the premises' machine rooms and made available to the Department upon request.
- Tests and inspections must be performed by an approved elevator inspection agency (applicant) and witnessed by an approved elevator inspection agency not affiliated with the agency performing the test.

#### Permit Applications

Applications must still be filed with the Department in [DOB NOW: Build](#) (using the PPN process).

#### Test Notification

Elevator agency directors must notify the Department at least 48 hours prior to inspection and test by sending an email to [notification@buildings.nyc.gov](mailto:notification@buildings.nyc.gov).

#### **NEW:** Inspection/Test Report and Sign-off

Both the Elevator Agency performing the inspection and the Elevator Agency witnessing the inspection, as well as the Owner must use [DOB NOW: Build](#) to submit the inspection/test results and obtain final sign-off. (ELV3 forms will no longer be accepted in person or by email.)

Please refer to [1RCNY Section 101-02](#) and [1RCNY Section 101-07](#) for more information.

# DOOR LOCK MONITORING

To further assist the property owners and the industry expedite the permitting process for Door Lock Monitoring jobs:

An approved Elevator agency director can pull a permit directly using DOB NOW.



June 2020

## SERVICE NOTICE

### DOB NOW: *Build* Updates – Elevator

Effective June 29, 2020, DOB NOW: *Build* will be updated with a number of changes specific to the Elevator (VT) work type.

In response to feedback from industry members, the following changes are being implemented. All changes are applicable to new VT job filings (formerly the ELV1) that are created on or after June 29 or were still in Pre-Filing status on June 26. Changes will also apply to PAAs that are in Pre-filing or Objections statuses if the specific fields are editable on the PAA.

CATEGORY	DESCRIPTION
<b>General Information – New Questions</b> <ul style="list-style-type: none"><li>– Door Lock Monitoring</li><li>– EBN/PPN</li></ul>	<p>When a filing includes Alteration/Replacement, two new questions have been added:</p> <ul style="list-style-type: none"><li>• Is this application to install Door Lock Monitoring only? (this will also be printed on the permit)</li><li>• Are you filing this application as EBN/PPN?</li></ul> <p>If 'Yes' is selected for Door Lock Monitoring:</p> <ul style="list-style-type: none"><li>– EBN/PPN question will automatically be set to Yes;</li><li>– Witnessing Agency on the Sign Off request will be required;</li><li>– Application will be auto permitted (except for fee exempt applications);</li><li>– PAAs cannot be done.</li></ul> <p>If 'No' is selected for Door Lock Monitoring:</p> <ul style="list-style-type: none"><li>– the EBN/PPN question can be answered either way;</li><li>– the EBN/PPN question can be changed during Objections or PAA (only from EBN/PPN to EBN).</li></ul>

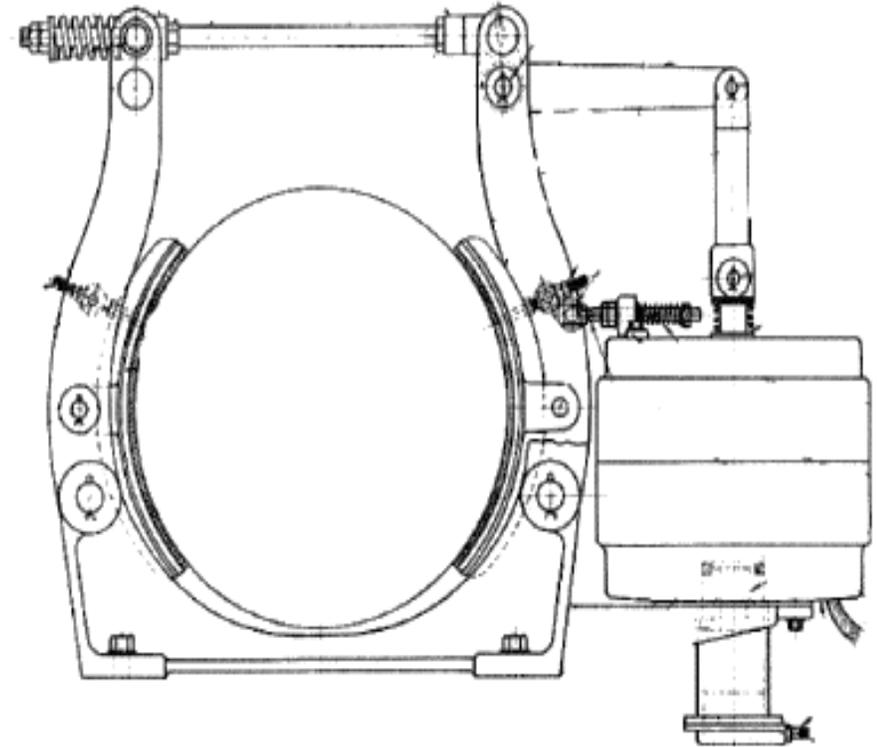


# SINGLE PLUNGER BRAKES

## 3.8.4.1 Single plunger brakes.

All existing traction elevators with single plunger brakes must comply with either of the following by January 1, 2027:

- (1) Alteration of single plunger assemblies to dual-plunger type, or
- (2) Compliance with Unintended Car Movement Protection as specified by Section 2.19.2 of ASME A17.1.



# CAPACITY & LOADING

## RCNY 3610-05: Effective Date 09/28/18

### 2.16.10 Detection of Overload on Passenger Elevators and Freight Elevators Permitted by 2.16.4 to Carry Passengers.

Passenger elevators and freight elevators permitted by 2.16.4 to carry passengers must be designed with the means to detect if the load exceeds the rated capacity of the elevator. If an overload is detected, the elevator doors must reopen and remain open and a voice notification and visual signal must indicate that the car is overloaded



# CAPACITY & LOADING

- Applicable to new and altered elevators.
- Capacity plate requirements.

Maximum Capacity  
2500 lbs.  
15 Passengers

# ELEVATORS AND THE ENERGY CODE

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- Local law 048 of 2020
- A local law to bring the New York City Energy Conservation Code up to date with the [2020 Energy Conservation Construction Code of New York State](#) (2020 ECCCNYS),
- Effective date of May 12, 2020.

# ELEVATORS AND THE ENERGY CODE

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## Elevator Cabs (C405.8.1, 10.4.3)

Drawings must specify that:

- **Lighting Efficacy:** For each elevator cab's interior lighting, total lumens divided by total watts must be  $\geq 35$  lumens/watt.
- **Ventilation Fan Power:** Ventilation fans in elevator cabs without their own air-conditioning system must not consume power  $> 0.33$  watts/cfm.
- **Controls to De-energize:** When stopped and unoccupied with doors closed for over 15 minutes, cab interior lighting and ventilation systems must be automatically controlled to be de-energized.

# ELEVATORS AND THE ENERGY CODE

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## Traction Elevator Power Conversion System (C405.8.1.1, 10.4.3.5)

New traction elevators with a rise  $\geq 75'$  in new buildings must have a power conversion system with the following:

- Induction Motors with a Class IE2 efficiency rating, or approved alternative technologies
- Transmissions shall not reduce the efficiency of the combined motor/transmission for the Class IE2 motor for elevators with capacities below 4,000 lbs. Gearless machines shall be assumed to have a 100 percent transmission efficiency.
- Regenerative Drive recovering potential energy released during motion and supplying it to the building electrical system

# ELEVATORS AND THE ENERGY CODE

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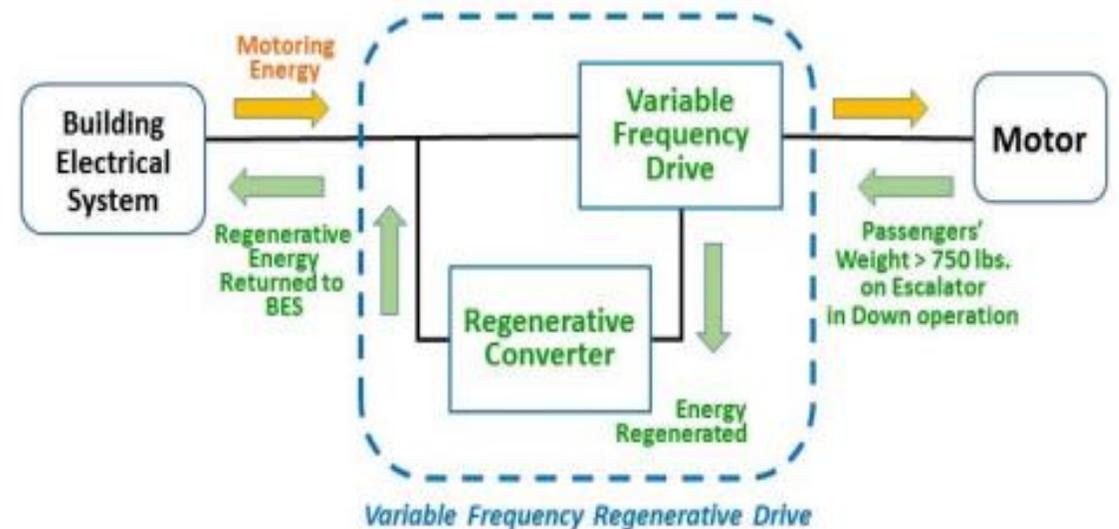
## Escalators & Moving Walks (C405.8.2, 10.4.4)

- **Automatic Speed Reduction:** Drawings must specify that escalators and moving walks have controls to automatically reduce speed when not conveying passengers.

# ELEVATORS AND THE ENERGY CODE

## Escalators and Moving Walks (C405.8.2, 10.4.4)

- **Regenerative Drive:** An escalator designed either for one-way down operation only or for reversible operation must have a variable frequency regenerative drive that supplies electrical energy to the building electrical system when the escalator is loaded with passengers whose combined weight > 750 lbs.



# FSAE & OEE

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**403.6 Elevators.** Elevator operation and installation shall be in accordance with Chapter 30.

- **403.6.1 Fire service access elevator.** In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, a minimum of one fire service access elevator shall be provided in accordance with Section 3007.
- **403.6.2 Occupant evacuation elevators.** Where installed in accordance with Section 3008, passenger elevators for general public use shall be permitted to be used for occupant self-evacuation.

# FIRE SERVICE ACCESS ELEVATORS

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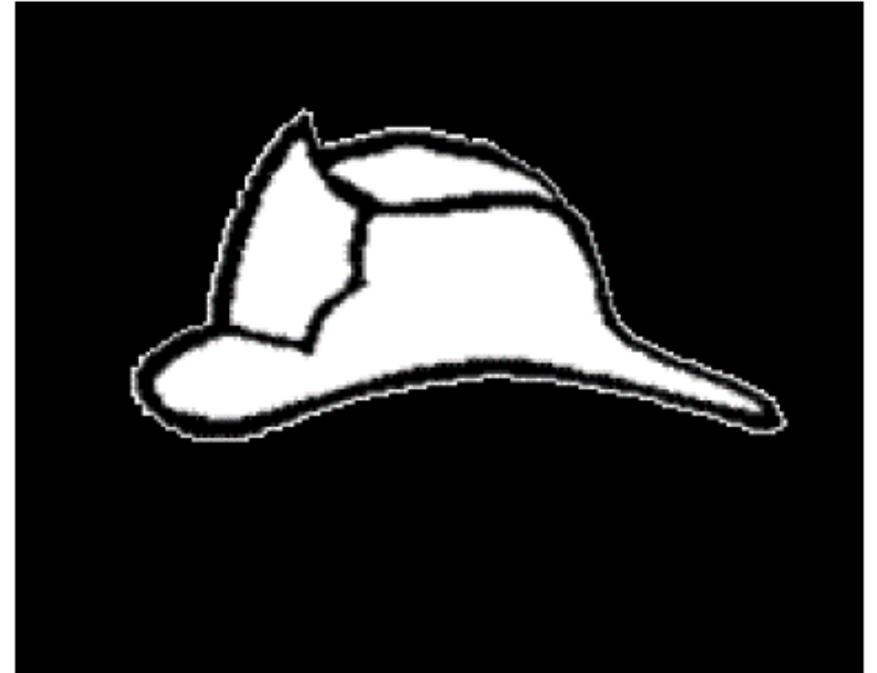
- In buildings with an occupied floor more than 120 feet above the lowest level of Fire Department vehicle access, a minimum of one fire service access elevator shall be required, which shall serve every floor of the building.
- Fire service access elevators have to comply with **BC 403.6.1** and **BC 3007**.

# FIRE SERVICE ACCESS ELEVATORS

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## Comply with sections 3007

- Serve every floor
- Automatic sprinkler systems
- Water protection
- Protection of wiring or cables
- Hoistway lighting
- Lobby requirements (120 square feet)
- Signage
- Power requirements



# ELEVATORS OCCUPANT EVACUATION

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- In buildings higher than 420 feet, designated elevators permitted to be used in case of fire.
- These special occupant self-evacuation elevators must comply with **BC 403.5.2** and **BC 3008**



# ELEVATORS OCCUPANT EVACUATION

## SECTION 3008.1 – 3008.11

Additional exit stairways: not required	Approved fire-safety and emergency-action plans	Emergency voice/ alarm communication system	Structural integrity of the hoistway
Operation	Sprinklers	Water Protection	Lobby requirements
Vision Panel	Signage	Two-way Communication	Power Requirements
Protection of wiring and cables	Elevator system monitoring		

# PERSONNEL HOISTS CAPACITY

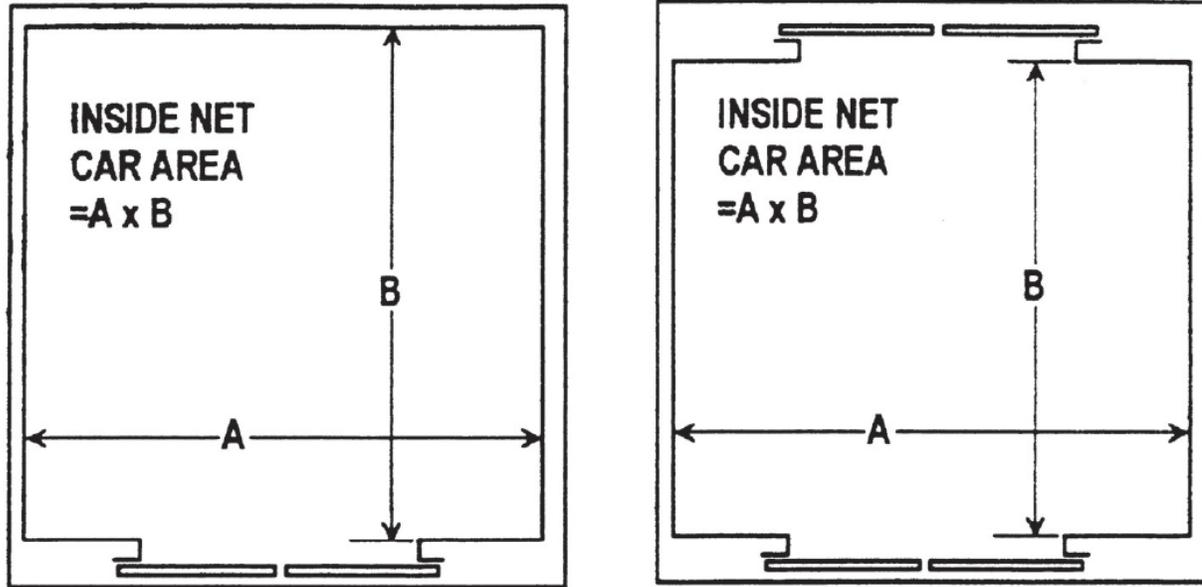


Figure 21.1 - Inside Net Platform Areas for Personnel Hoist Cars

RATED LOAD (pounds)	INSIDE NET PLATFORM AREA (square feet)
2,000	24.2
2,500	29.1
3,000	33.7
3,500	38.0
4,000	42.2
4,500	46.2
5,000	50.0
6,000	57.7
7,000	65.3
8,000	72.9
9,000	80.5
10,000	88.0

# PERSONNEL HOISTS CAPACITY

- Extensions must be in accordance with the manufacturer's specification
- Designed and approved by a NYS Registered Professional Engineer
- Conform with provisions of ANSI A10.4-2016 code

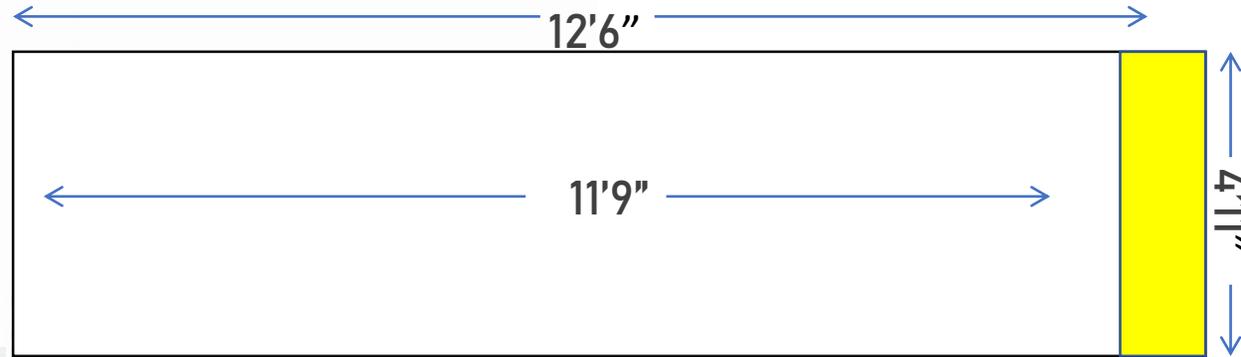


# PERSONNEL HOISTS CAPACITY

- Overload detection device to prevent overloading of the cars.
- Rated load ratio to inside net platform area shall not be less than 82 psf
- Safeties must be capable of supporting the  $DL + RC + OL$ , where
  - **DL** = dead load of the car
  - **RC** = Rated Capacity of the car
  - **OL** margin weight allowed by overload detection device
- No passengers except operator and handlers allowed when hoisting material
- Material properly secured
- Platform size limited by clear visible markings/sensors
- Proper capacity signage

# PERSONNEL HOIST CAPACITY

## EXAMPLE



- Car Capacity: 6,000 lbs.
- Car inside dimensions: 12'6"x4'11" (w/markings 11'9"x4'11")
- Car inside area: **61.4 sq. ft.** (ANSI A10.4 = 57.7 sq. ft.)
- Rated load/Net Platform: 97.7 lbs./sq. ft.
- Rated Safety Capacity: 13,488 lbs.
- Cab weight + Rated Capacity + Overload < Rated Safety Capacity  
6,670 lbs. + 6,000 lbs. + 300 lbs. = **12,970 lbs.** < **13,488 lbs.**

# BUILDINGS FIVE STORIES OR MORE: STRETCHERS

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- Must have at least one elevator accessible to all floors.
- Must have an elevator that can accommodate a stretcher
  - 24-inch x 84-inch with not less than 5-inch radius corners.
  - Standby power required.
  - Exceptions:
    - Private-residence elevators
    - LULA



# BUILDINGS FIVE STORIES OR MORE – STRETCHERS

Buildings Bulletin 2017-008 (Issued July 17, 2017)

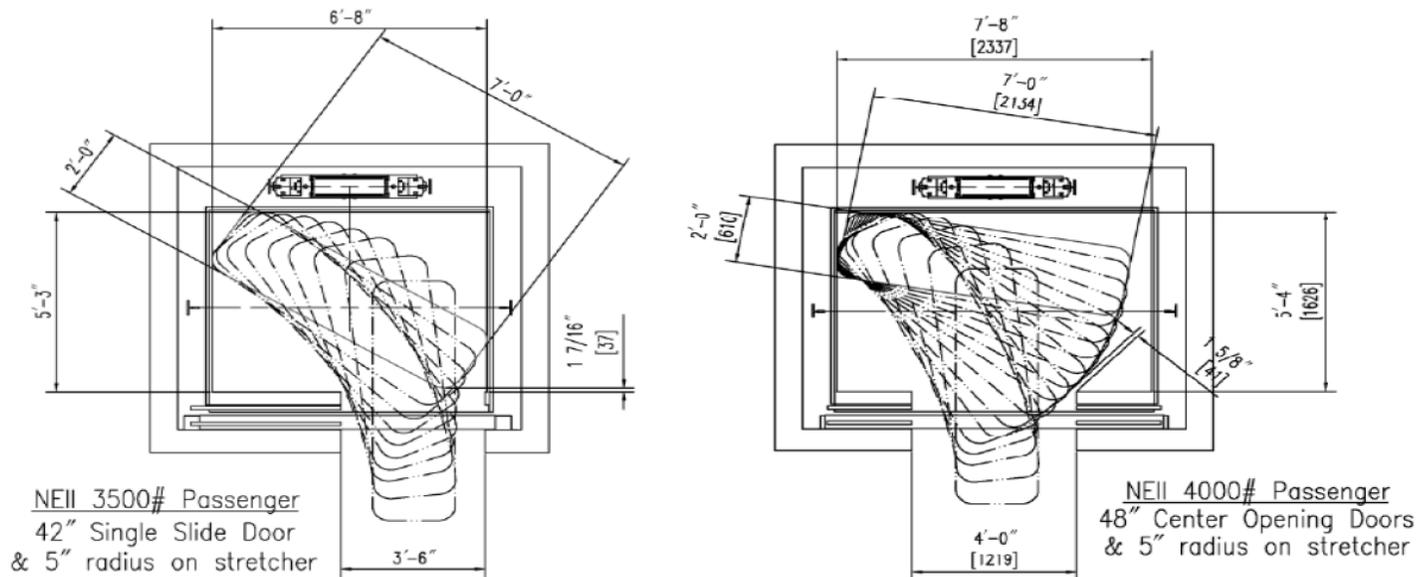


FIGURE 1

Excerpt of FIGURES 3002.4(a) and 3002.4(b) of 2009 IBC Commentary  
Stretcher-sized elevator cars

# PASSENGER ELEVATORS

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## Private Residences

- Must fully comply with either part 2 or part 3 of ASME A17.1.
- Must comply with the ANSI A117.1 for platform size requirements of a passenger elevator.
- Must comply with emergency operation and signaling devices: provide Firefighter's Emergency Operation Phase 1 & Phase 2.

# ELEVATOR CONSTRUCTION CODE DETERMINATIONS (CCD1)



JULY 2017

## SERVICE UPDATE

### Elevator Construction Code Determinations

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Effective August 1 2017, Elevator Determinations will follow the same process as regular borough determinations. As such, the Department has updated the CCD1 form and created a dedicated email address for elevator Construction Code determinations and variances.

Applicants **must** send all elevator Code determination and variation requests using the revised CCD1 form to [elevdeterminations@buildings.nyc.gov](mailto:elevdeterminations@buildings.nyc.gov).

The revised CCD1 form and instructions can be accessed at:

- Form - <http://www1.nyc.gov/assets/buildings/pdf/ccd1.pdf>
- Instructions - [http://www1.nyc.gov/assets/buildings/pdf/zrd1ccd1\\_instr.pdf](http://www1.nyc.gov/assets/buildings/pdf/zrd1ccd1_instr.pdf)

# ELEVATOR CONSTRUCTION CODE DETERMINATIONS (CCD1)



JANUARY 2018

## SERVICE UPDATE

### Review Fees for Construction Codes Determinations and Zoning Resolution Determinations

Effective January 28, 2018, Construction Codes Determination (CCD1) requests and Zoning Resolution Determination (ZRD1) requests submitted to the Department for review are subject to the following fees per §28-112.2 of the NYC Administrative Code, and the Rules of the Department [1RCNY 101-03](#).

#### FEES

- CCD1 or ZRD1 request for Determination ..... \$1,000
  - Pre-Determination (pre-filed job) Request
  - Request for variation of a Code requirement or MDL section 277.16
  - Appeal of an affirmation of an objection after a second plan examination review
- Appeal of CCD1 or ZRD1 Determination ..... \$2,500

A request for review of plan examination objections **must** go through a second plan examination review (requires an AI-1 form) first, which is included in the filing fee and is not subject to additional review fees. All submissions **must** include a copy of the invoice from the Borough Office where the fee was paid, except properties that are exempt from fees per §28-112.1 and this rule.

#### CONSTRUCTION CODES DETERMINATION FORM (CCD1)

This form will be used to request a determination for all non-zoning related issues for a filed job or a pre-filed job from the Department, including requests for variation of applicable Code or Multiple Dwelling Law provision and for appeals of such determinations. [CCD1 Form - Rev. 1/18](#)

#### ZONING RESOLUTION DETERMINATION FORM (ZRD1)

This form will be used to request a zoning determination for a filed job or a pre-filed job from the Department and for appeals of such zoning determinations. [ZRD1 Form – Rev.1/18](#)

#### SUBMISSIONS

Only one determination or appeal request may be submitted on each form



# COVID-19 SIGNAGE

- Signage Required indicating maximum elevator/hoists limited to 50% capacity.
- Signage must be posted within the cab and at each landing where you enter/exit the car.





# ELEVATOR UNIT

# DOOR LOCK MONITOR 2009 - 2014

- 2008 Building Code Appendix K 2000
- 2.26.5 System to Monitor and Prevent Automatic Operation' of the Elevator with Faulty Door Contact Circuits Means shall be provided to monitor the position of power-operated car doors that are mechanically coupled with the landing doors while the car is in the landing zone, in order
  - (a) to prevent the operation of the car if the car door is not closed (see 2.14.4.11), regardless whether the portion of the circuits incorporating the car-door contact, or the interlock contact of the landing door coupled with car door, or both, are closed or open, except as permitted in 2.12.7, 2.26.1.5, and 2.26.1.6; and
  - (b) to prevent, except as permitted in 2.26.1.5, the power closing of the doors if the car door is fully open and any of the following conditions exist:
    - (1) the car-door contact is closed or the portion of the circuit, incorporating this contact is bypassed;
    - (2) the interlock contact of the landing door that is coupled to the opened car door is closed or the portion of the circuit, incorporating this contact is bypassed; and
    - (3) the car-door contact and the interlock contact of the door that is coupled to the opened car door are closed, or the portions of the circuits incorporating these contacts are bypassed.

# DOOR LOCK MONITOR 2015

## Current (K1 New Devices)

- 2014 New York Building Code
- 2.26.5 System to Monitor and Prevent Automatic Operation of the Elevator With Faulty Door Contact Circuits Means shall be provided to monitor the position of power-operated car doors that are mechanically coupled with the landing doors while the car is in the landing zone, in order
  - (a) to prevent the operation of the car if the car door is not closed (see 2.14.4.11), regardless whether the portion of the circuits incorporating the car-door contact or the interlock contact of the landing door coupled with car door, or both, are closed or open, except as permitted in 2.12.7, 2.26.1.5, and 2.26.1.6; and
  - (b) to prevent, except as permitted in 2.26.1.5, the power closing of the doors if the car door is fully open and any of the following conditions exist:
    - (1) the car-door contact is closed or the portion of the circuit, incorporating this contact is bypassed;
    - (2) the interlock contact of the landing door that is coupled to the opened car door is closed or the portion of the circuit, incorporating this contact is bypassed; and
    - (3) the car-door contact and the interlock contact of the door that is coupled to the opened car door are closed, or the portions of the circuits incorporating these contacts are bypassed.

### EXCEPTION

- When operating on Firefighters' Service Phase II, item (b) (2) shall not be permitted.

# DOOR LOCK MONITOR 2015

## Current K3 Existing Devices

- 2014 New York Building Code K3
- 3.10.12 System to monitor and prevent automatic operation of passenger and freight elevators with faulty door contact circuits.
- All automatic passenger and freight elevators shall comply with this section by January 1, 2020. Means shall be provided to monitor the position of power-operated car doors that are mechanically coupled with the landing doors or power-operated car doors with manually operated swing-type hall doors, while the car is in the landing zone, in order
  - (a) to prevent the operation of the car if the car door is not closed (see Section 3.4.2(c) of ASME A17.3), regardless whether the portion of the circuits incorporating the car-door contact or the interlock contact of the landing door coupled with car door, or both, are closed or open, except as permitted

# DOOR LOCK MONITOR 2015

## Current K3 Existing Devices *(continued)*

under any of the following conditions:

- (1) by a car-leveling or truck-leveling device
- (2) when a hoistway access switch is operated
- (3) when the top-of-car inspection operation utilizing a car door by-pass or hoistway-door bypass switch is activated
- (4) when on any mode of inspection operation; and

(b) to prevent, except as permitted by inspection operation, the power closing of the doors if the car door is fully open and any of the following conditions exist:

- (1) the car-door contact is closed or the portion of the circuit, incorporating this contact is bypassed;
- (2) the interlock contact of the landing door that is coupled to the opened car door is closed or the portion of the circuit, incorporating this contact

# DOOR LOCK MONITOR 2015

## Current K3 Existing Devices *(continued)*

is bypassed, except when operating during Firefighters' Service Phase II; Exception: For swing-type door operation, the locking (secondary) contacts shall be monitored.

- (3) the car-door contact and the interlock contact of the door that is coupled to the opened car door are closed, or the portions of the circuits incorporating these contacts are bypassed; Exception: For swing-type door operation, the locking (secondary) contacts shall be monitored.

■ Design and/or controller modifications shall be approved by the controller manufacturer or a registered design professional. Notwithstanding any inconsistent provision of chapter 1 of title 28 of the Administrative Code, the work required to comply with this section may not be performed without a permit from the department.

# DOOR LOCK MONITORING



- For elevators installed 2015 DLM is a system that connects to the elevator controller that meets the 2014 code requirement. For elevator installed from 2009 – 2014 is a system that connects to the controller and to meet the 2014 code requirement requires a software upgrade. Devices installed prior to 2009 were required to have DLM installed by 12/31/2019 with the system connected to the elevator controller and software upgrade if required
- Monitors the system which will prevent the automatic operation of passenger and freight elevators with faulty door contact circuits or jumpers. The new code addition requires all automatic and freight elevators to monitor the door position and hall door lock and gate switch operation to ensure no ground, short or jumper will allow unsafe condition to exist.

# DOOR LOCK MONITOR SERVICE NOTICE

## SERVICE NOTICE

### Elevator Door Monitoring System Compliance Deadline

Effective January 1, 2020 all automatic passenger and freight elevators must be in compliance with the retroactive requirements found in Appendix K Chapter K3 Section 3.10.12 of the New York City Building Code.

To assist property owners and the industry in expediting these jobs, the Department has modified rules allowing testing and inspections of Door Lock Monitoring (DLM) work to be performed by approved elevator agencies in the presence of a witnessing agency.

For additional information, please refer to [1 RCNY 101-02](#) and [1 RCNY 101-07](#).

#### Category 1 Inspections & Tests

An Applicant/Approved Elevator Agency submitting required annual inspection/test results in DOB NOW: *Safety* must report a defect if the DLM is not working or installed and notify the Department by email to [elevatorDLM@buildings.nyc.gov](mailto:elevatorDLM@buildings.nyc.gov).

#### Report a Defect in DOB NOW: *Safety*

1. Navigate to **Device Details** for the respective elevator device and click on **+ Add Defect**.
2. Select **All Types** for **Elevator Part** and **Entire Device** for **Elevator Sub-Part**.
3. Select either **DLM Not Working** or **DLM Not Installed** as the **Violating Condition**.
4. Select **Install** or **Repair** accordingly for **Suggested Remedy**.

#### Enforcement

The Department will issue OATH summonses to building owners for elevator devices that are not in compliance with DLM requirements after the January 1, 2020 deadline. These devices will be subject to follow-up inspections and additional violations if they remain non-compliant.

The Department will take enforcement actions against non-compliant owners based on different types of inspections, including but not limited to:

- Category 1 inspection and tests
- Periodic inspections (PVT)
- Complaint inspections
- Acceptance inspection and tests

# ENFORCEMENT

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- ECB Violations
- PVT/DOB Violations
- Aggravated I and II
- Criminal Court summons (under major offenders program)
- Work-Without Permit Violation

# ELEVATOR MAINTENANCE + REPAIR

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- Maintenance Control Program
- Maintenance Log
- Repair

# MAINTENANCE & REPAIR: CONTRACT

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## NYC Administrative Code 28-304.7 – Required Contract

- Owner of New and existing passenger elevators shall have contract with an approved agency to perform elevator repair work and maintenance as defined by ASME A 17.1 – Section 8.6.
- The name, address and telephone number of approved agency under contract shall be maintained at each premises, on the elevator mainline disconnect switch and in a location readily accessible to employees of the department, building maintenance and custodian staff at the premises.

# MAINTENANCE, REPAIRS + REPLACEMENT

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Shall confirm following Code requirements

- Code at the time of the installation
- Code requirements at the time of any alteration/modernization
- ASME A 17.3-2002 as modified by NYC Building Code Appendix K
- ASME A 17.1b-2003, Section 8.6

# MAINTENANCE CONTROL PROGRAM

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**MCP shall be in compliance with ASME A 17.1b-2003 Section 8.6.1.2**

- Examination, maintenance and tests at schedule interval
- Equipment age, condition, and accumulated wear
- Design and inherent quality of the equipment
- Usage, Environmental condition
- Improved technology
- Cleaning, lubricating and adjusting applicable components at regular intervals

# MAINTENANCE CONTROL PROGRAM

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*(continued)*

- Repair or replace all worn or defective component where necessary to maintain installation as per codes and manufacturer requirements
- Available at site to elevator personnel
- As required by manufacturer manual

# MAINTENANCE RECORDS

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Maintenance records shall be in compliance with ASME A 17.1b-2003 Section 8.6.1.4

- Description of maintenance task performed and dates
- Description and dates of examinations, tests, adjustments, repairs and replacements
- Description and dates of call backs (trouble calls), including corrective action taken
- Written record of the findings on the firefighter service
- Available at the site for elevator personal

# ADVANTAGES OF MAINTENANCE PER MCP

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- Enhance safety
- Improve service reliability
- Increase life span of equipment
- Enhance efficiency of vertical system transportation
- Avoid costly repairs
- Avoid violations and penalties

# ELEVATOR SAFETY

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- **Worker Safety** – OSHA safety regulation
- **Fall Protection** – Personal fall-arrest system, guardrail system, barricades
- **Electrical Safety** – Personal protective equipment, safety checklist
- **Proper Use of Jumpers** – Use extreme caution; only use on inspection and ensure jumpers removed before placing equipment back in service
- **Lockout and Tag out**
- **Use of Caution Tape When Elevators are Serviced** – NYC Building Code Section BC-3009

# ELEVATOR SAFETY – GENERAL PUBLIC

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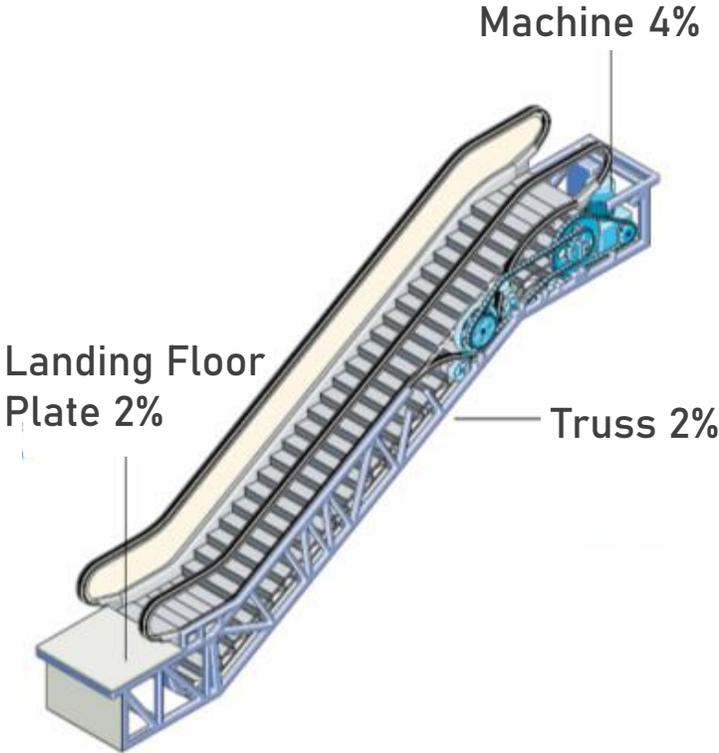
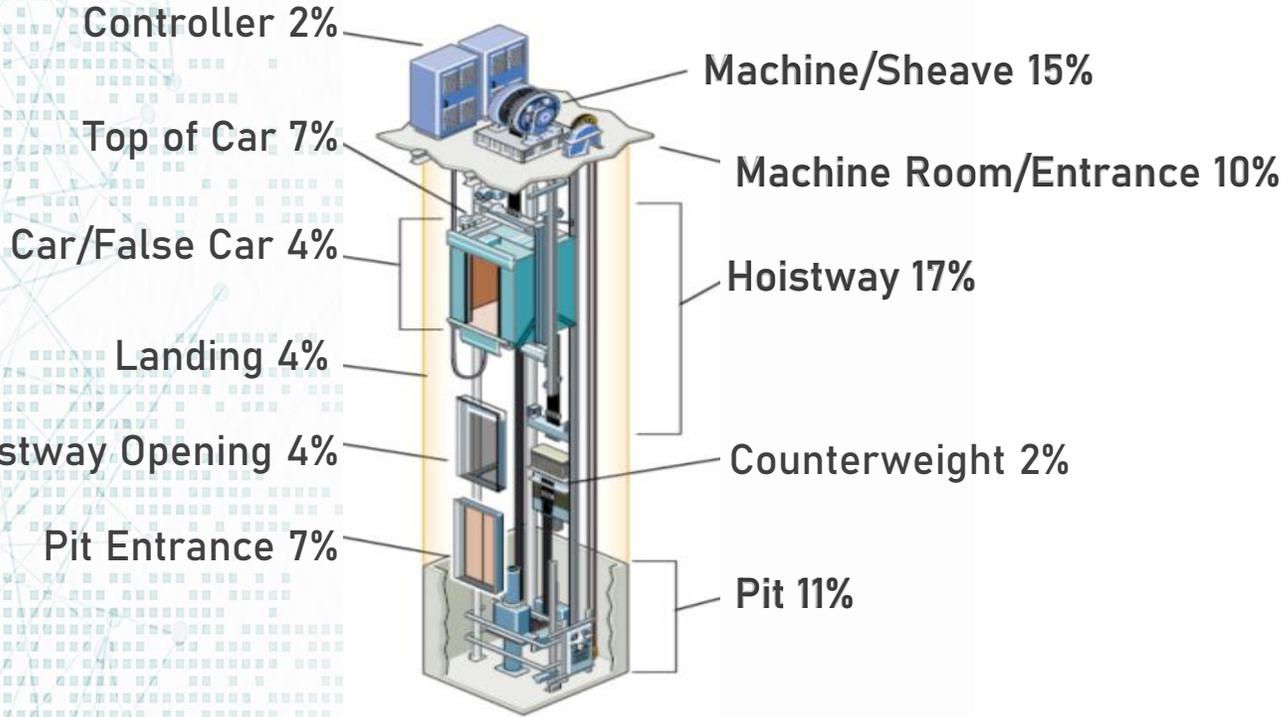
## Caution Tape

- 3" yellow caution safety tape installed at 18" and 54" on the inside car door threshold when working on the elevator
- Use tape when elevator is removed from normal service and a mechanic is not working in front of the entrance of the device
- Prevents unintended public entrance
- Lights out/doors open communicates that the car is out of service

**CAUTION CAUTION CAUTION**

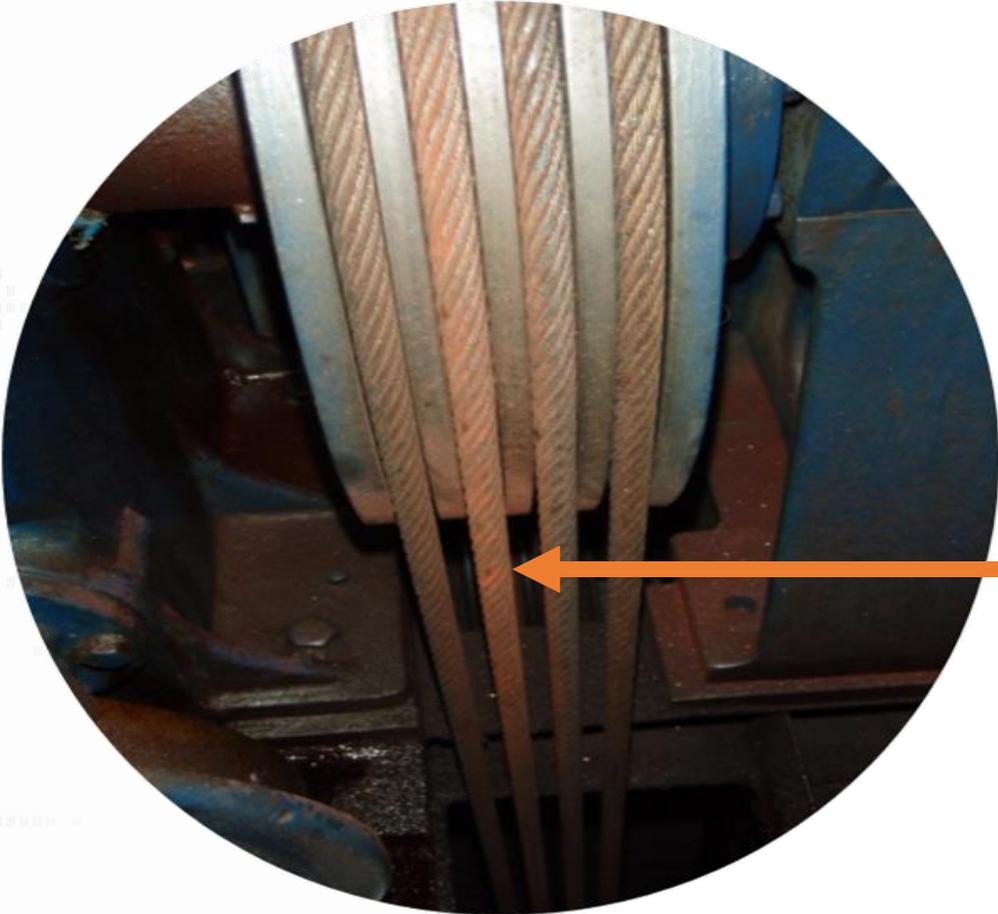
# ELEVATOR SAFETY

## Elevator Mechanic Serious Injury Risk Areas



# MAINTENANCE ISSUES

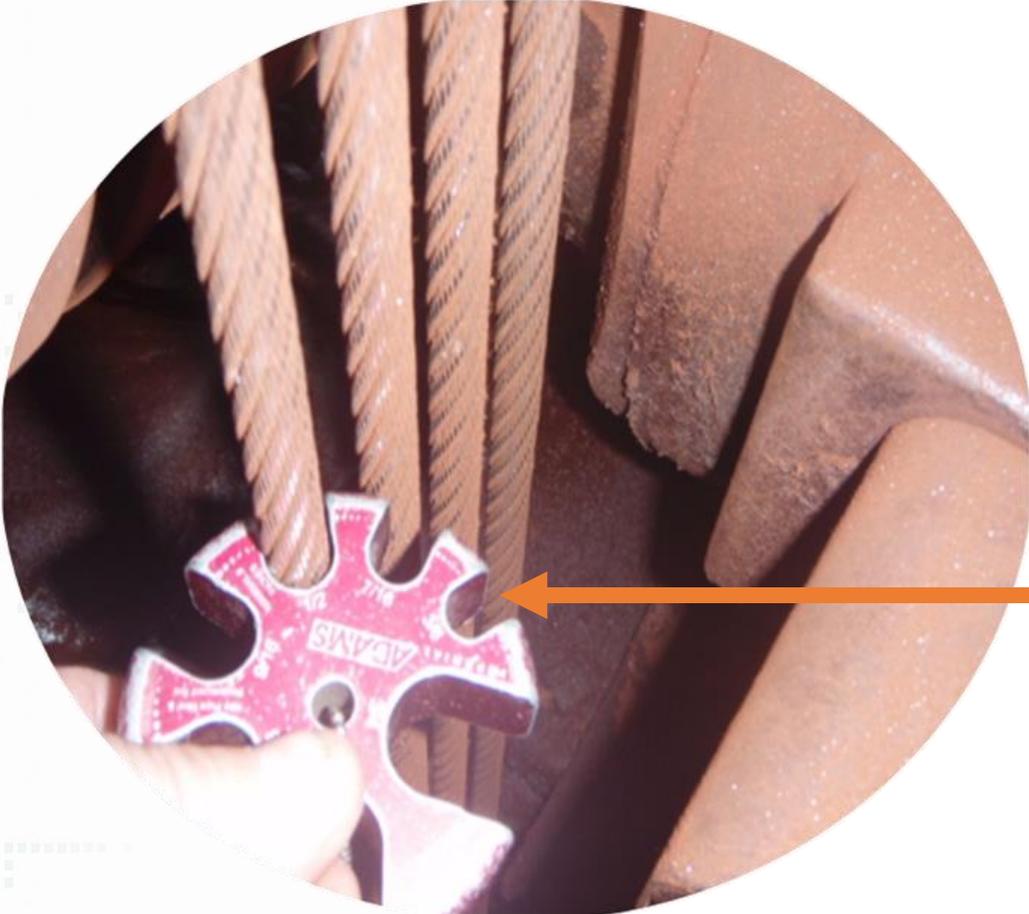
## Hoist Cables



Rouge on Ropes:  
Lack of  
Maintenance

# MAINTENANCE ISSUES

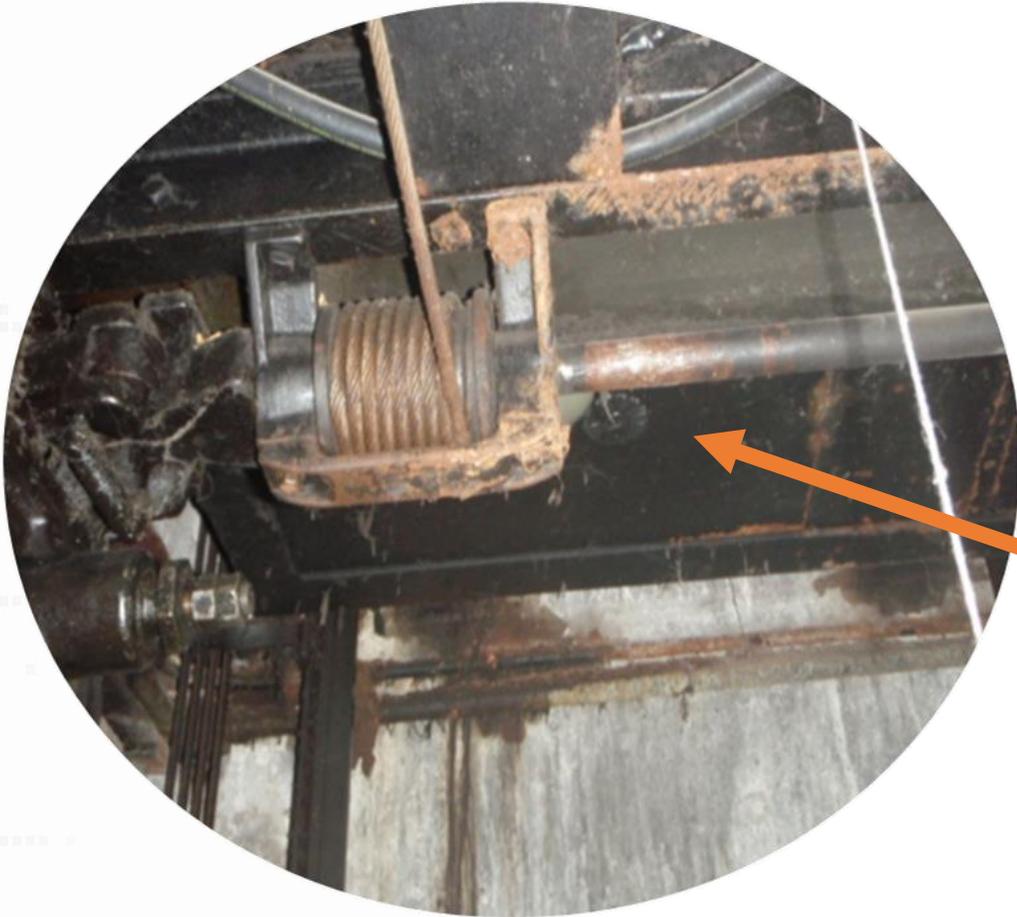
## Hoist Cables



Undersized  
Ropes

# MAINTENANCE ISSUES

## Safety Rope



Severe Rust  
on Safety  
Cable Drum

# MAINTENANCE ISSUES

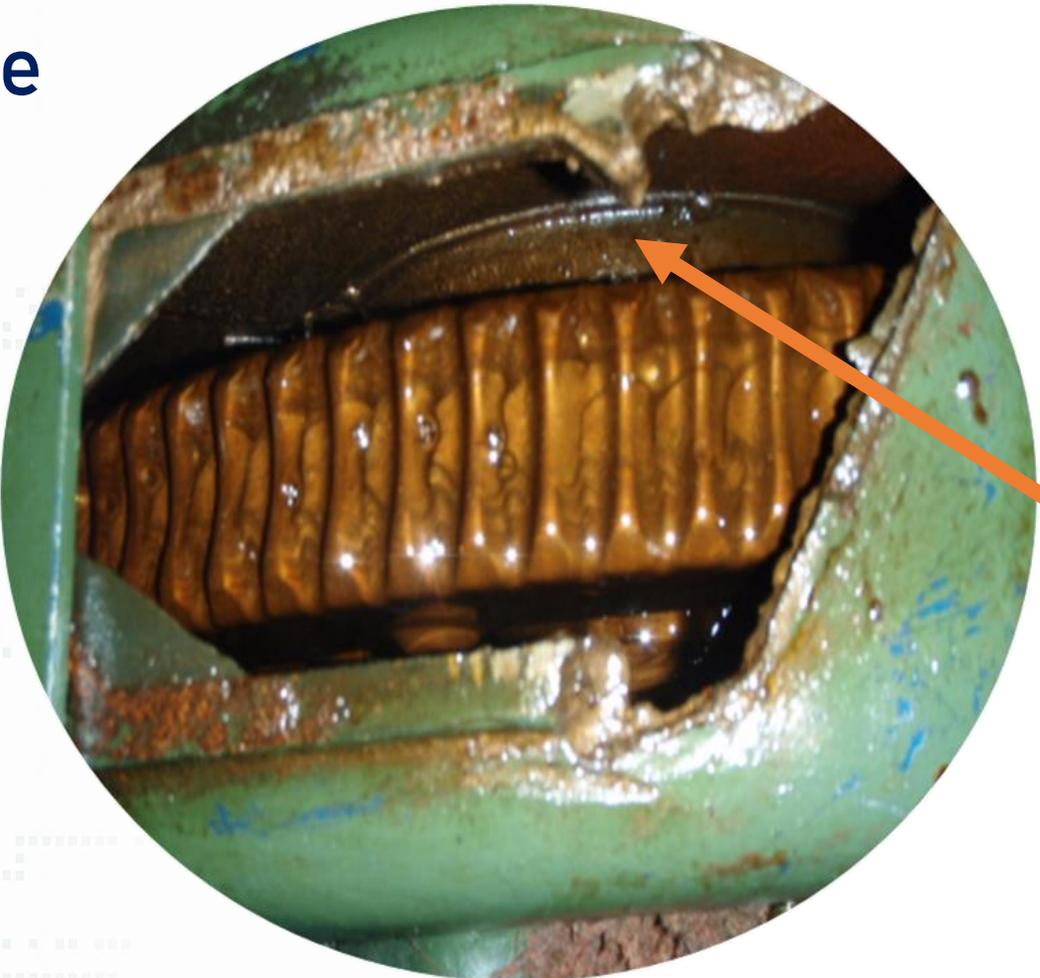
## Hoist Cables



Damaged Ropes

# MAINTENANCE ISSUES

## Hoist Machine



Lack of Oil  
Change

# MAINTENANCE ISSUES

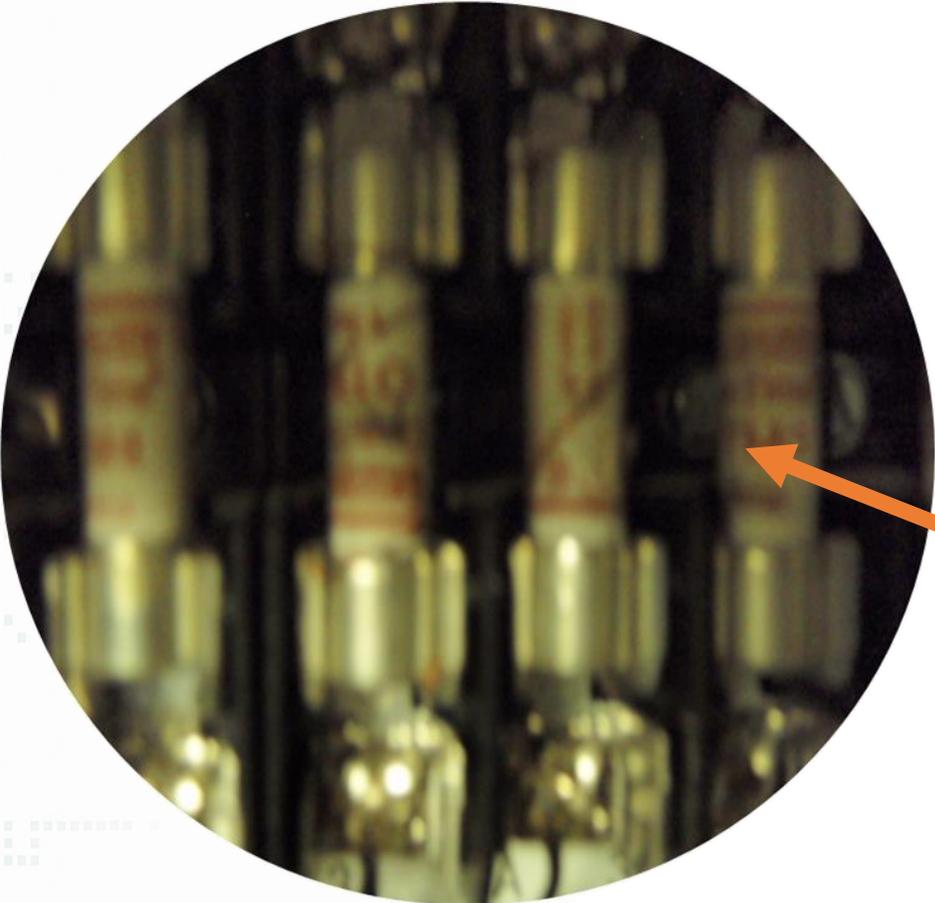
## Hoist Machine



Oil Leak on  
Machine

# MAINTENANCE ISSUES

## Electrical



Jumped Fuses

# MAINTENANCE ISSUES

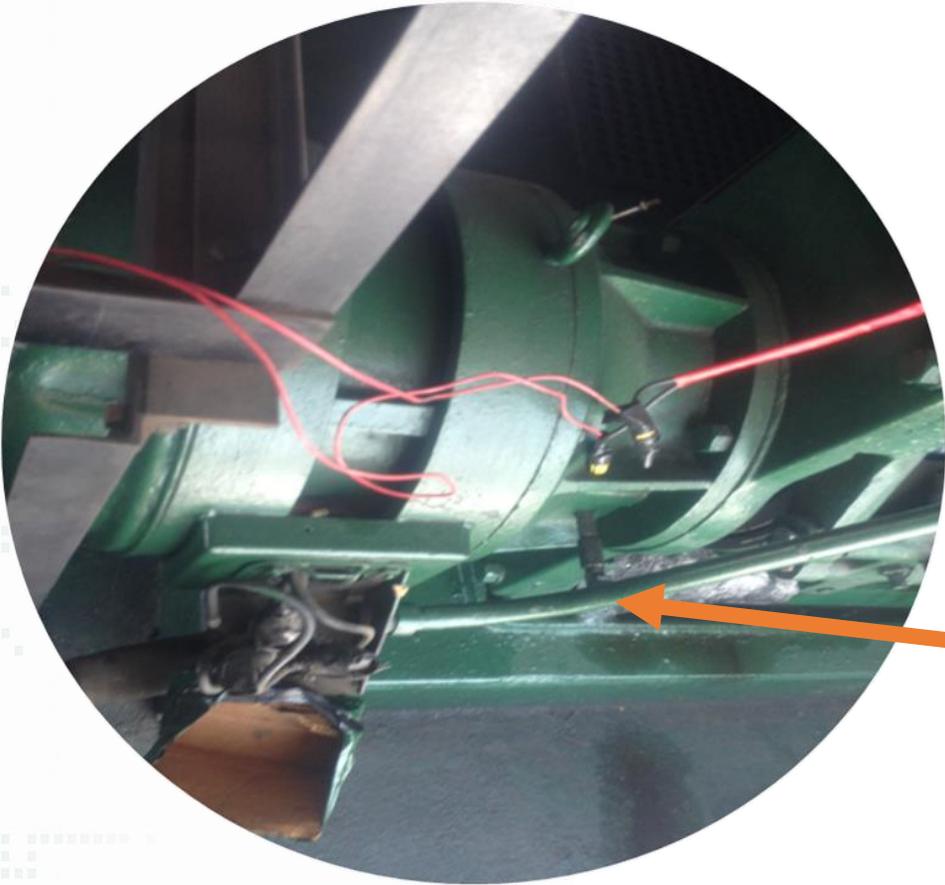
## Electrical



Exposed Wiring

# MAINTENANCE ISSUES

## Electrical



Exposed Wiring

# MAINTENANCE ISSUES

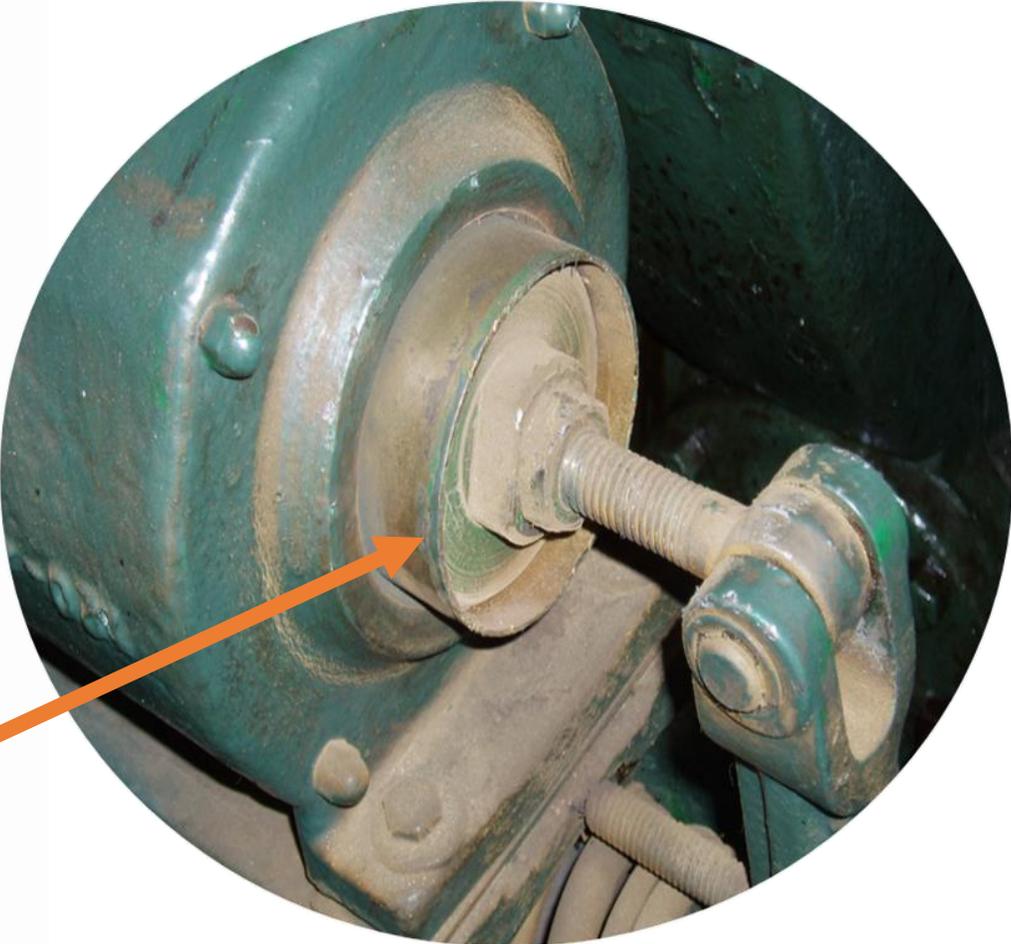
## Housekeeping

Dirty Pit:  
Fire Hazard



# MAINTENANCE ISSUES

## Safety



Brake Sleeve  
Defective

# HOIST APPLICATIONS

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## New Installations

- Electrical permit must be filed for electrical work
- As per the 2008 NYC Building Code (section 3318.4), upon completion of the installation of the personnel hoist and/or its runback structure, an inspection report verifying that the hoist has been installed in accordance with the design drawings, construction documents and specifications shall be prepared by the designer, installer or third party designated by both the designer and installer and acceptable to the commissioner. This inspection report must be submitted by professional engineer to the department of buildings.

# HOIST INSPECTION REQUIREMENTS

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## Acceptance Inspection and Test – Department

- Cathead/Tower Raise – approved agency inspectors (requires 3-day notification)
- 90 Day Inspection – approved agency inspectors (requires full load test)
- Inspections required as per manufacturer's manual
- Audit inspection – Department
- Hoist removal – Department

# SAFETY CULTURE DEVELOPMENT

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- Minimum Operational Requirements:
  - Comply with Federal, State and City regulations
- Develop a Culture of Safety
  - Develop a Safety Management System
  - Proactively manage safety through
    - Employee training & communication
    - Proper safety equipment & tools
    - Create an environment where mechanics champion safety
    - Empower mechanics to own safety
    - Support the safest work, not the fastest
    - Vehicle Management/Driver Accountability
    - Invest in the safety program

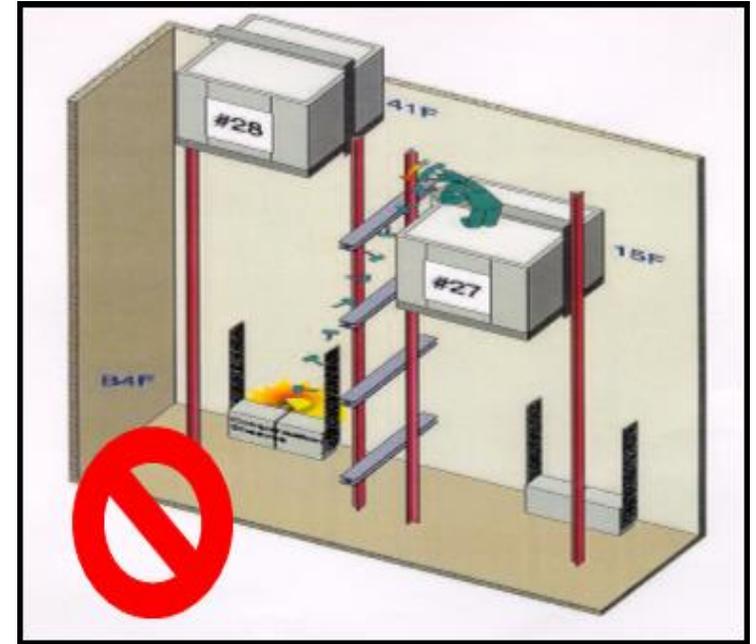
# ESTABLISH THE RULES



**NEVER** ride escalator when steps are removed.



**NEVER** ride the car top with the elevator in normal operation.

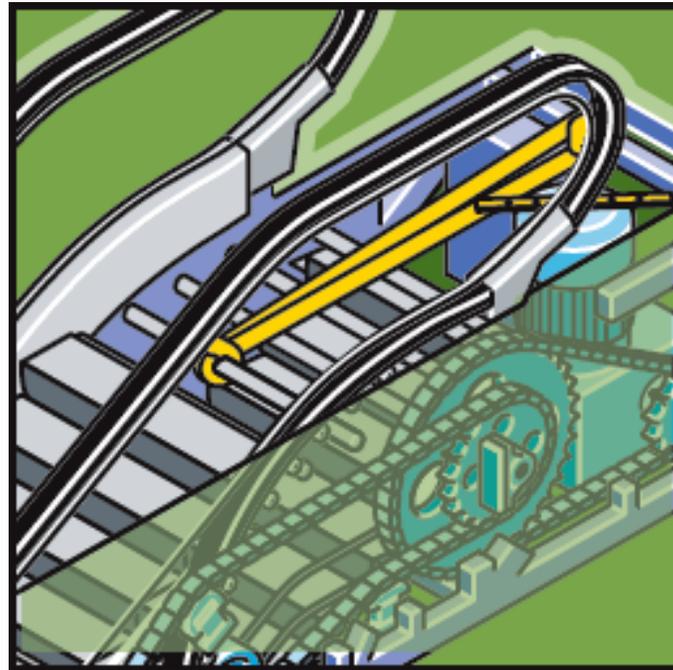


**NEVER** work above or below others when working in the hoistway.

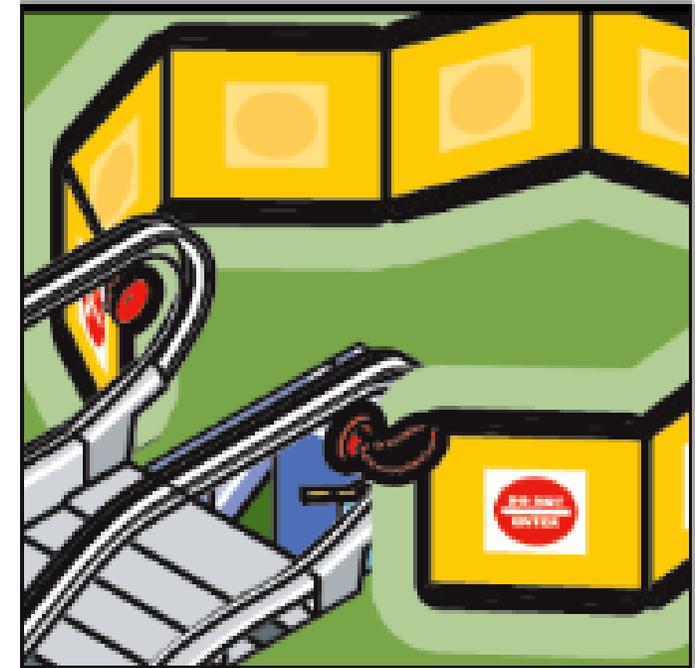
# ESTABLISH THE RULES



**ALWAYS** control live electricity and rotating equipment when working within close proximity.

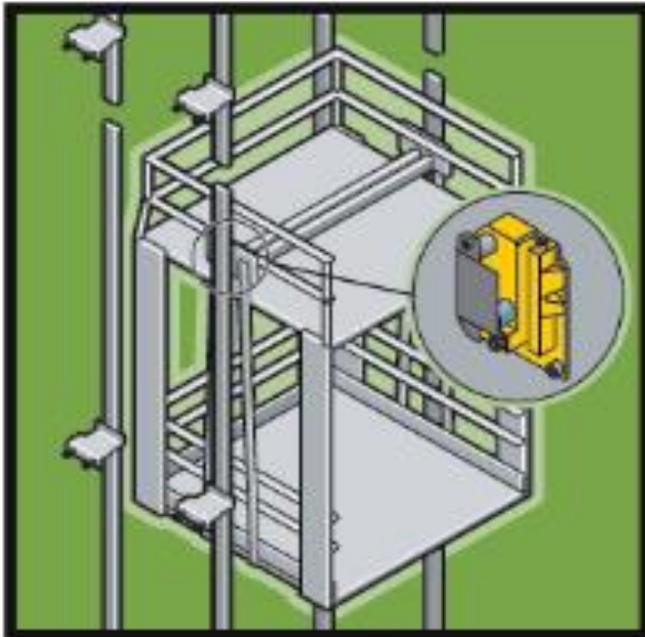


**ALWAYS** secure the step chain from movement.

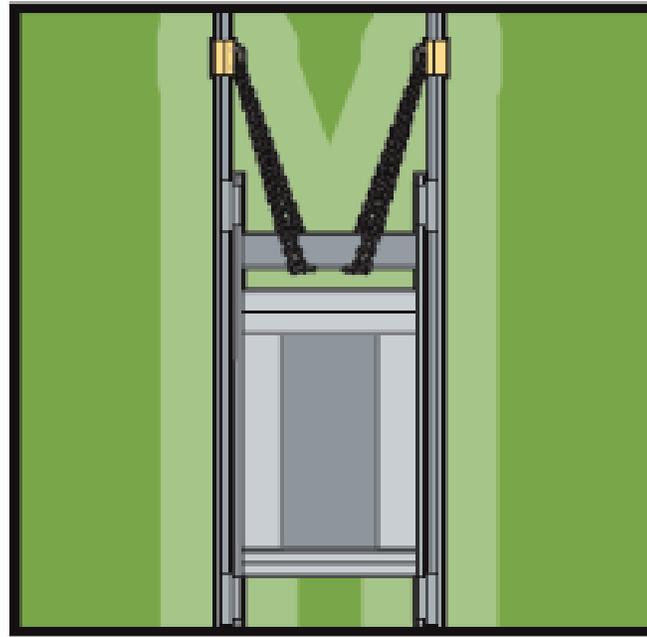


**ALWAYS** use barriers and redundant controls (LOTO) when unattended

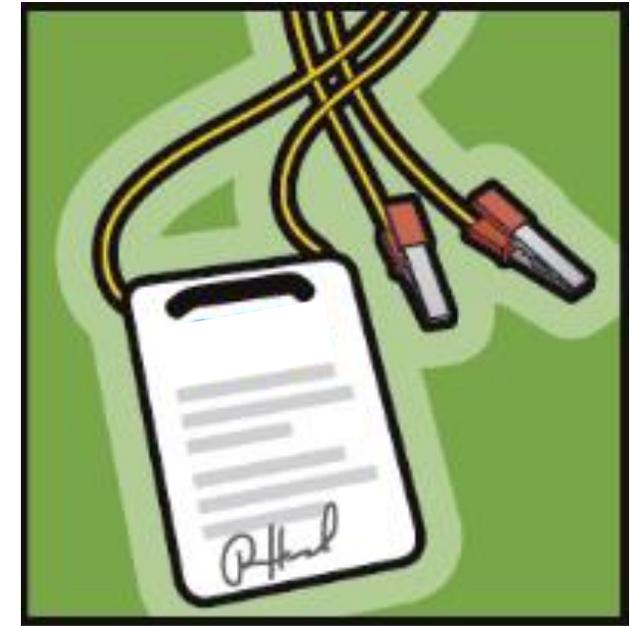
# ESTABLISH THE RULES



**ALWAYS** follow the operation authorized procedures for false cars/running platforms.

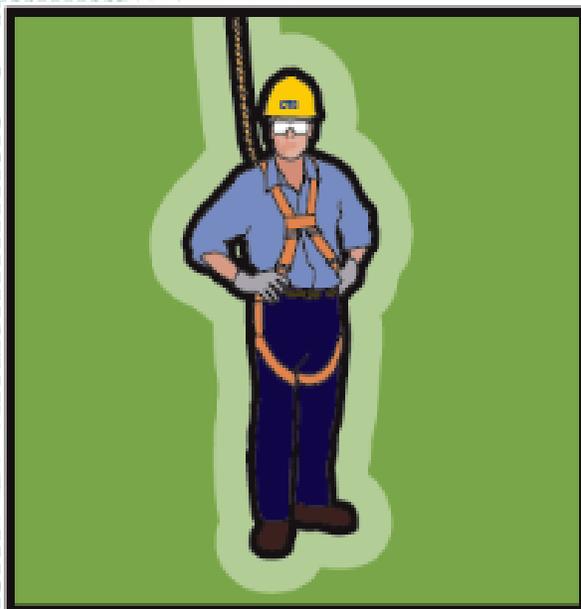


**ALWAYS** use certified & inspected hoisting & rigging equipment.

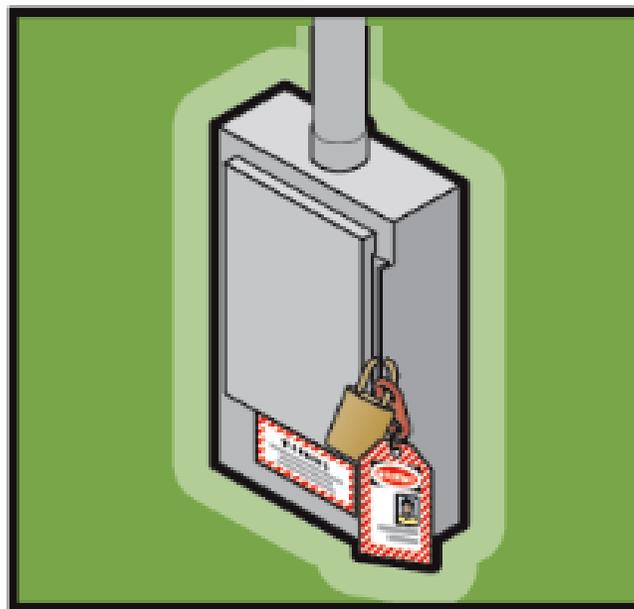


**ALWAYS** follow proper jumper procedures.

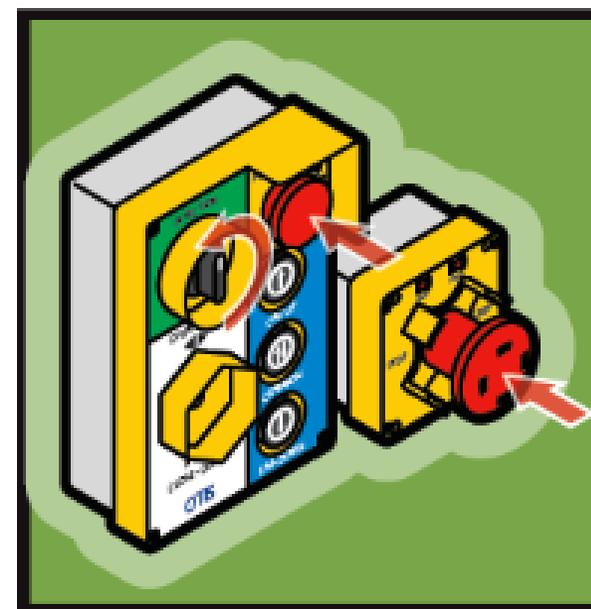
# ESTABLISH THE RULES



**ALWAYS** use fall protection when a fall hazard exists.



**ALWAYS** lock and tag out equipment when power is not required.

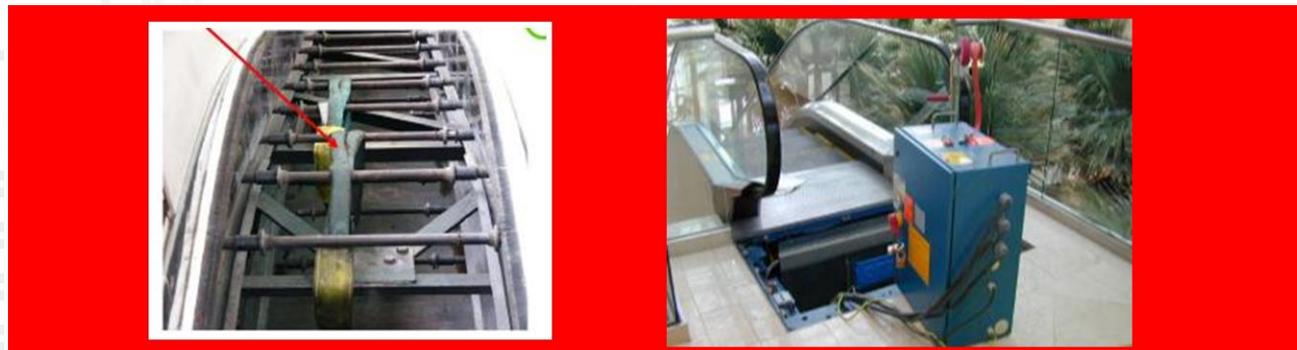


**ALWAYS** establish and maintain control of the unit prior to accessing.

# ESCALATOR SAFETY: GENERAL PUBLIC

## Barricades

- Separates public from the hazards of fall and electricity



# ELEVATOR SAFETY: ELEVATOR MECHANIC

## Fall Protection

- Elevator mechanics can be exposed to great falls
- Guardrails eliminate the hazard



# ELEVATOR SAFETY: ELEVATOR MECHANIC

## Hoistway Access

- Serious injuries occur when control of the car is lost
- Specialized tooling and processes to validate the safety circuits is a best practice

Specialized Tool



Improvised Control



# ELEVATOR SAFETY: ELEVATOR MECHANIC

## Mechanical Hazards

- Elevator companies maintain equipment that is owned by another party
- Retrofitting of permanent guards is an owner decision
- Use of temporary guarding is a best practice

Guarded



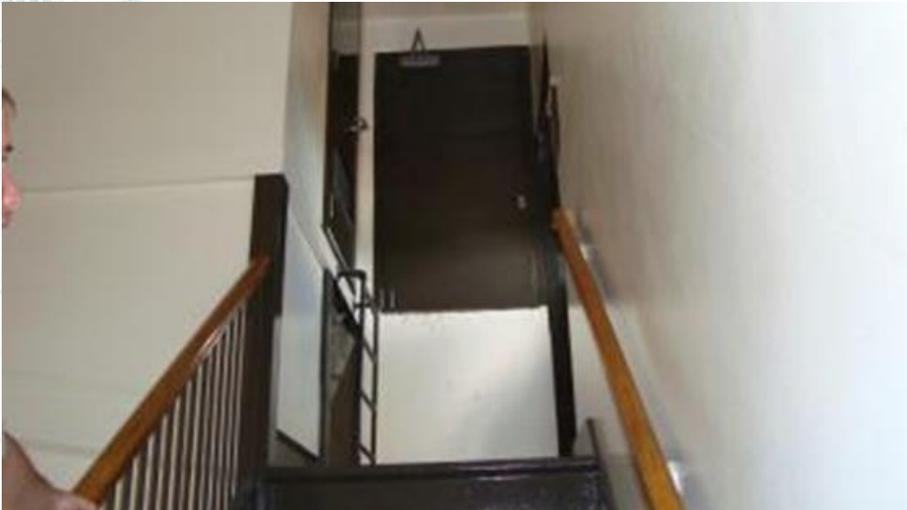
Not  
Guarded



# ELEVATOR SAFETY: ELEVATOR MECHANIC

## Access/Egress Machine Room

- Presents hazard to the mechanic
- Must commonly access rooftops, staircases and mechanical spaces not designed for public access



# ELEVATOR SAFETY: GENERAL PUBLIC

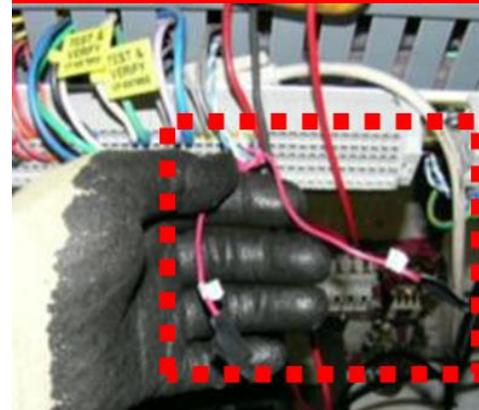
## Jumper Management

- The controller is programmed to prevent unwanted movement of the car, jumpers defeat these circuits
- Robust management practices must be applied
- Personal accountability for jumpers must start with the Mechanic

Controlled Jumper



Uncontrolled Jumper



# ELEVATOR SAFETY: GENERAL PUBLIC

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## Jumper Best Practices

- Jumpers must not be used as a diagnostic tool.
- Temporary bridging devices must never be used to short out hall door contacts.
- Exceptions must have a written JHA approved by supervision.
- Never jump-out door and gate contacts at the same time.
- Ensure that elevator is on inspection prior to placing jumpers on door, gate, or safety circuits.
- When passenger(s) are trapped inside a stalled car, mechanic must never jump car gate and move the car from the machine room unless they have communication either directly with the passenger(s) or with a second mechanic. In these types of situations it is preferable to move the elevator using TOCl.



# THANK YOU

2020 DIGITAL: SAFETY, INNOVATION & SUSTAINABILITY CONFERENCE

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Buildings