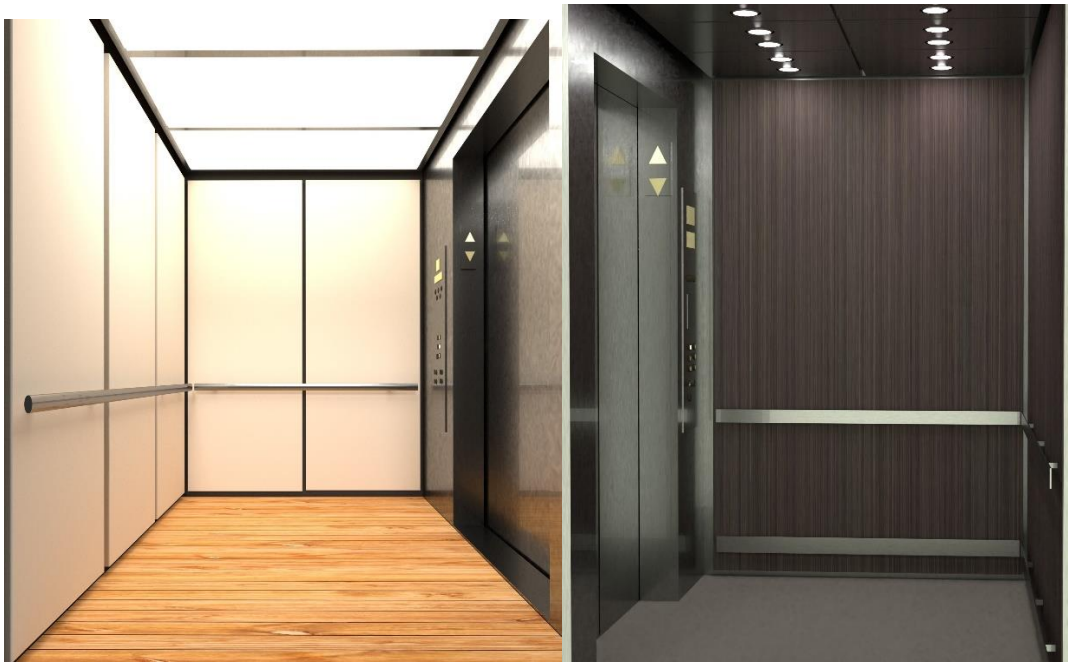
# MCP MAINTENANCE PROCEDURES

## ASME A17.1-2013/CSA B44-13 Code



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# TABLE OF CONTENTS

## GENERAL INFORMATION

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# MAINTENANCE, REPAIR, AND REPLACEMENT INFORMATION

ASME A17.1-2013/CSA B44-13 Code Information

Section 8.6 Maintenance, Repair, and Replacement

Special attention should be paid to the following excerpts taken from section 8.6 of the ASME A17.1-2013/CSA B44-13 Safety Code for Elevators and Escalators. Section 8.6 outlines requirements for Maintenance, Repair, and Replacement. Field employees performing Maintenance, Repair, and Replacement should be familiar with this section of the code.

**Note:** Previous editions of the code do not include all of the following requirements. Check the Edition of the Code in effect in your area for information regarding local requirements.

## 8.6.1: General Requirements

**8.6.1.2.1** This written Maintenance Control Program is in place to maintain the equipment compliance with Section 8.6 of the ASME A17.1 2013 / CSA B44-13 Elevator and Escalator Safety Code. This MCP specifies examinations, tests, cleaning, lubrication, and adjustments to applicable components at regular intervals and it complies with the following:

**8.6.1.2.1 (a)** It is provided for only the unit identified on Page 1 of the MCP and by the Service Contractor identified on Page 1. This MCP is viewable on-site by elevator personnel at all times beginning with acceptance inspection and test and/or from the time of equipment installation or alteration, whichever applies.

**8.6.1.2.1 (b)** This MCP includes Code required maintenance tasks, procedures and examination and tests listed with the associated requirements. If/when Code required maintenance tasks or procedures, or examinations or tests are revised in Section 8.6, the MCP will be updated accordingly.

**8.6.1.2.1 (c)** This MCP references on-site Equipment Documentation needed to fulfill item (b) above, and on-site Maintenance Records that record the completion of all associated maintenance tasks.

**8.6.1.2.1 (d)** If this MCP is maintained remotely from the machine room, machinery space, control room, or control space, instructions for viewing the MCP (hard copy or electronic format) are posted on the controller or at the means necessary for test, and the instructions are permanently legible with characters a minimum of 3mm in height.

**8.6.1.2.1 (e)** Specified maintenance intervals are based on:

(1) Equipment age, condition, and accumulated wear
(2) Design and inherent quality of the equipment
(3) Usage
(4) Environmental conditions
(5) Improved technology
(6) Manufacturers recommendations and original equipment certification for any SIL rated devices or circuits.
(7) Manufacturers recommendations based on ASME A17.7 / CSA B44.7 approved components or functions.

**8.6.1.2.1 (f)** Procedures for tests; periodic inspections; maintenance; replacements; adjustments; and repairs for traction loss detection means, broken-suspension-member detection means, residual-strength detection means, and related circuits are incorporated into and made part of this MCP.

**8.6.1.2.2: On-Site Documentation**

The following documents specify are written and permanently kept on-site in the machine-room, machinery space, control room / control space, or in the means necessary for the test in hard copy for each unit for elevator personnel:

**(a)** Up-to-date wiring diagrams detailing circuits of all electrical protective devices and critical operating circuits.

**(b)** Procedures for inspections and tests not described in ASME 17.2 and procedures or methods required for elevator personnel to perform maintenance, repairs, replacements and adjustments, as follows:

**(1)** All procedures specifically identified in the Code as required to be written.

**(2)** Unique maintenance procedures or methods required for inspection, tests and replacement of SIL rated E/E/PES electrical protective devices and circuits.

**(3)** Unique maintenance procedures or methods required for inspection, tests, and replacement of equipment applied under alternative arrangements are provided by the manufacturer or installer.

**(4)** Unique maintenance procedures or unique methods required for inspection and test of equipment specified in an ASME A17.7 / CSA B44.7, Code Compliance Document (CCD).

**(c)** Written Checkout procedures:

**(1)** To demonstrate E/E/PES function as intended

**(2)** For elevator leveling speed with doors open

**(d)** Written procedures for the following:

**(1)** Evacuation procedures for elevator by authorized persons and emergency personnel are on-site.

**(2)** Procedures for cleaning of car and hoistway transparent enclosures by authorized personnel.

**8.6.1.3: Maintenance Personnel**

Maintenance, repairs, replacements, and tests will only be performed on this elevator equipment by elevator personnel.

**8.6.1.4: Maintenance Records**

Maintenance records for this elevator equipment document compliance with Section 8.6.

Instructions for locating the maintenance records and for viewing records on-site are posted on the controller or at the means necessary for test. Per code requirements, the instructions are permanently legible with characters at least 3mm in height. Records are retained for the most recent 5 years or from the date of installation or adaption of the MCP code requirement, whichever is less or as specified by the authority having jurisdiction. Existing maintenance records up to 5 years are also retained.

**8.6.1.4.1 (a): On-Site Maintenance Records**

Maintenance Control Program Records

**(1)** A record that includes the maintenance tasks listed with the associated requirements in 8.6 and identified in this MCP, and other tests, examinations and adjustments, and the specified scheduled intervals are maintained on-site.

**(2)** The specified scheduled maintenance intervals are applicable as based on the criteria in 8.6.1.2.1(e) above.

**(3)** This MCP is viewable on-site by elevator personnel in electronic or hard copy format.

**8.6.1.4.1 (b): Repair & Replacement Records**

The following repair and replacements are recorded and kept on-site (or remotely) for viewing by elevator personnel in hard copy or electronic format:

**(1) Repairs**

**(2) Replacements**

**8.6.1.4.1 (c): Other records:**
The following records are kept on-site for immediate viewing:

**(1) Oil usage record**
**(2) A record of findings for firefighters' service operation with identification of persons performing the task**
**(3) Periodic Test Records**
**(4) A written record to document compliance with replacement criteria specified in ASME A17.6.**

**8.6.1.4.1 (d) Other records (Continued):**
A permanent record of the results of all acceptance tests is kept with the on-site records. Test tags are permanently attached to or adjacent to the controller.

**CALL BACKS (TROUBLE CALLS)**
A record of call backs that are reported by any means to elevator personnel, is maintained and includes the description of reported trouble, dates, time(s) and corrective actions taken. The records are available to elevator personnel when performing corrective actions. For other elevator personnel, the records are available on request.

Instructions on how to report any need for corrective action (trouble calls) to the responsible party are posted on the controller or at the means necessary for test.

**8.6.1.5.1: Code Data Plate -** The **Code Data Plate** on this elevator complies with Section 8.9

**Per Requirement 8.6.1.4.1 (d)** A permanent record of the results of all acceptance tests as required by 8.10.1.1.4 and 8.10.1.1.5 is kept with the on-site records for this elevator equipment.

**8.6.1.6: General Maintenance Methods and Procedures**

**8.6.1.6.1: Making Safety Devices Inoperative or Ineffective**
No person will at any time make inoperative or ineffective any device on which the safety of users of this elevator is dependent, including any electrical protective devices, except where necessary during tests, inspections, maintenance, repair and replacement, provided that this elevator equipment is first removed from normal operation. Devices made inoperative during tests, inspections, maintenance repair and replacement will be restored to their normal operating condition in conformity with the applicable requirements prior to returning the equipment to service.

**8.6.1.6.2: Lubrication**
All parts of the machinery and equipment requiring lubrication will be lubricated with lubricants equivalent to the type and grade recommended by the manufacturer. Alternate lubricants may be used when the intended lubrication effects are achieved. All excess lubricants will be cleaned from the equipment and containers used to catch lubricant leakage will not be allowed to overflow.

**8.6.1.6.3: Controllers, Wiring, and Wiring Diagrams**

**8.6.1.6.3 (a)** The interior of the controller(s) and their components are cleaned when necessary to minimize the accumulation of foreign matter that can interfere with the operation of the equipment.

**8.6.1.6.3 (b)** Temporary wiring and insulators or blocks in the armatures or poles of magnetically operated switches, contactors, or relays are not installed when this elevator is in service.

**8.6.1.6.3 (c)** When jumpers are used during maintenance, repair or testing all jumpers will

removed prior to returning this elevator to normal operation. Jumpers are not stored in machine rooms, control rooms, hoistways, machinery spaces, control spaces, escalator / moving walk wellways or pits.

**8.6.1.6.3 (d)** Control and operating circuits and devices are maintained in compliance with the applicable code requirements for this elevator equipment.

**8.6.1.6.3 (e)** No substitution will take place for any wire or current-carrying device for the correct fuse or circuit breaker in any circuit on this elevator.

**8.6.1.6.4: Painting**
Care will be used in the painting of this equipment to make certain that it does not interfere with the proper functioning of any component.
Painted components will be tested for proper operation after painting.

**8.6.1.6.5: Fire Extinguishers**
A Class "ABC" fire extinguisher shall be provided in elevator electrical machine rooms, control rooms, and control spaces outside the hoistway intended for full bodily entry, and walk-in machinery and control rooms for escalators and moving walks; and they shall be located convenient to the access door.

**8.6.1.6.6: Workmanship**
When torqueing, drilling, cutting and welding, care will be taken to ensure that no component of the assembly is damaged or weakened. Rotating parts will be properly aligned.

**8.6.1.6.7: Signs and Data Plates**
Signs and data plates on this elevator equipment that are damaged or missing will be repaired or replaced.

**8.6.1.7: Periodic Tests**
The frequency of periodic test will be performed on this elevator equipment as established by the authority having jurisdiction and as required by Requirement 8.11.1.3

**8.6.1.7.1** Periodic tests on this elevator equipment will be witnessed by an inspector and/or as required by the authority having jurisdiction.

**8.6.1.7.2: Periodic Test Tags**
A test record for all periodic tests, containing the applicable Code requirement and dates performed, and the name of the person or company performing the test will be installed and readily visible and adjacent to or securely attached to the controller, in the form of a metal tag, or other format designated by and acceptable to the AHJ. If any alternative test methods are performed the tag will indicate that alternative test was utilized for the applicable requirement.

**8.6.1.7.3** Except where necessary when performing tests, no person will, at any time, make any required safety device or electrical protective device ineffective. Such devices will be restored to their normal operating condition in conformity with the applicable requirements prior to returning this elevator to normal service.

**8.6.1.7.4** All references to "Items" and "Parts" in this document are to Items in ASME A17.2

## 8.6.2: Repairs

**8.6.2.1: Repair Parts**

Repairs to this elevator equipment will be made with parts of at least equivalent material, strength and design.

**8.6.2.2: Welding and Design**

Welding and design of welding will conform to Requirement 8.7.1.4 and Requirement 8.7.1.5.

**8.6.2.3: Repair of Speed Governors**

Where applicable, if a repair is made to the speed governor(s) of this elevator that affects the tripping linkage or speed adjustment mechanism, the governor will be examined and tested according to Requirement 8.6.4.19.2. If a repair is made to the governor jaws or associated parts that affects the pull-through force, the governor pull-through force will be checked in conformance with Requirement 8.6.4.19.2 (b) A test tag will be attached, indicating the date the pull-through test was performed.

**8.6.2.4: Repair of Releasing Carrier**

Where applicable, if a repair is made to the releasing carrier of this elevator, the governor rope pull-out and pull-through forces will be verified.

**8.6.2.5: Repair of Suspension and Compensating Means and Governor Ropes**

Suspension and compensating members governor ropes will not be lengthened or repaired by splicing.

**8.6.2.6: Repairs involving SIL Rated Device(s)**

SIL rated device(s) used to satisfy:

- Electrical Equipment & Wiring
- Release and Application of Driving Machine Brakes
- Software Systems for Protection Against Failures
- E/E/PES to remove power from Driving Machine Motor from AC Sources
- E/E/PES to remove power from Driving Machine Motor from DC Sources

(a) Will not be repaired in the field
(b) May be repaired in accordance with the provisions for repair where included in the listing/certification
(c) Will not be affected by other repairs to the extent that the listing/certification is invalidated

## 8.6.3: Replacements

**8.6.3.1: Replacement Parts**

Replacements to this elevator equipment will be made with parts of at least equivalent material, strength, and design.

**8.6.3.2: Replacement Suspension Means**

Suspension means, compensating means, and governor ropes on this elevator equipment will be replaced when they no longer conform to the requirements of ASME A17.6
Replacement of suspension means, compensating means, and governor ropes will conform to the requirements of ASME A17.6 as stated in 8.6.3.2.1 through 9.6.3.2.3.

**8.6.3.2.1** For steel wire rope, ASME A17.6 Section 1.10 will apply.

**8.6.3.2.2** For aramid fiber ropes, ASME A17.6 Section 2.9 will apply.

**8.6.3.2.3** For noncircular elastomeric-coated steel suspension member, ASME A17.6, section 3.7 will apply.

**8.6.3.3 Replacement of Suspension-Means Fastenings and Hitch Plates**

Replacement of suspension-means fastenings and hitch plates will conform to the requirements of 8.6.3.3.1 through 8.6.3.3.5.

**8.6.3.3.1** If the suspension-means fastenings on this elevator equipment are replaced with an alternate means that conforms to ASME A17.1 2013 Requirement 2.20.9, load-carrying ropes will be in line with the shackle rod.

**8.6.3.3.2** If the existing hitch plates on this elevator equipment do not permit the load-carrying ropes to remain in line with the shackle rods, replacement fastenings will be staggered in the direction of travel of the elevator and counterweight or the hitch plates will be replaced.

**8.6.3.3.3** Replacement hitch plates (if installed) will conform to ASME A17.1 2013 Requirement 2.15.13, and they will provide proper alignment of the load-carrying ropes and shackle rods.

**8.6.3.3.4** Replacement fastenings will only be installed on the car, the counterweight, at either of the dead-end hitches, or at both attachment points.

**8.6.6.3.5** Rope fastenings at the drum connection of winding-drum machines will comply with 8.6.4.10.2 (resocketing and refastening).

**8.6.3.4: Replacement of Governor or Safety Rope**

**8.6.3.4.1** The governor rope(s) on this elevator equipment will be of the same size, material, and construction as the governor rope specified by the governor manufacturer.
If a rope of the same size but of a different manufacturer or construction is used, it will be installed in conformance with Requirements 8.7.2.19 (alterations).

**8.6.3.4.2** Replacement governor ropes on this elevator equipment will conform to the requirements of Requirement 2.18.5

**8.6.3.4.3** If a governor rope on this elevator equipment is replaced the governor pull-through force will be checked as specified in Requirement 8.11.2.3.2(b), (examination and testing)

**8.6.3.4.4** A test tag indicating the date that the pull-through test was performed will be attached.

**8.6.3.4.5** The safety rope on this elevator equipment will comply with ASME A17.1 2013 Requirements 2.17.12.4 and 2.17.12.5.

**8.6.3.4.6** A new rope data tag conforming to 2.18.5.3 will be installed with each rope replacement, and the date of the rope replacement will be recorded in the Maintenance Task Log.

**8.6.3.5: Belts and Chains**

If one belt or chain of a set on this elevator equipment is worn or stretched beyond that specified in the manufacturer's recommendations, or is damaged so as to require replacement, the entire set will be replaced. Sprockets and toothed sheaves will also be replaced if worn beyond that specified in the manufacturer's recommendations.

**8.6.3.6: Replacement of Speed Governor**

If the speed governor on this elevator equipment is replaced it will conform to Requirement 2.18 (Speed Governors). The releasing carrier will conform to Requirement 2.17.15 (Governor Rope Releasing Carriers) and, the governor rope will be of the type & size specified by the governor mfg.

If a speed governor on this elevator equipment is replaced, the governor will be checked in conformance Requirement 8.11.2.3.2.
Drum operated safeties that require continuous tension in the governor rope to achieve full safety application, will be checked as specified in Requirements 8.11.2.3.1 and 8.7.2.19.

**8.6.3.7: Listed/Certified Devices**

**8.6.3.7.1: Listed/Certified Devices**
If a listed/certified device on this elevator equipment is replaced, the replacement will be subject to the applicable engineering or type test as specified in Section 8.3 or the requirements of CSA B44.1/ASME A17.5.
Hoistway door interlocks, hoistway door combination mechanical lock and electric contact, and door or gate electrical contacts will conform to the type tests specified in Requirement 2.14.2.1. The device will be labeled by the certifying organization.
In jurisdictions no enforcing NBCC, door panels, frames, and entrance hardware will be provided with the instructions required by Requirement 2.11.18.

**8.6.3.7.2** If a component in a listed/certified device on this elevator equipment is replaced, the replacement component will be subject to the requirements of the applicable edition of CSA B44.1/ASME A 17.5 and/or the engineering or type test in Requirement 8.3.
Hoistway door interlocks, hoistway door combination mechanical lock and electric contacts, and door or gate electric contacts, will conform to the type tests specified in ASME A17.1 2013 Requirement 2.12.4.1 and the component will be included in the original manufacturers listed/certified device documentation or as listed/certified replacement component. Each replacement component shall be plainly marked for identification in accordance with the certifying organizations procedures.
In jurisdictions not enforcing NBCC, door panels, frames, and entrances hardware on this elevator equipment will be provided with the instructions required by ASME A17.1 Requirement 2.11.18

**8.6.3.8: Replacement of Door Reopening Device**
If a reopening device for the power-operated car door(s) or gate(s) on this elevator equipment is replaced, the following will apply:

(a) The door closing force will comply with the code in effect at the time of installation or alteration.
(b) The kinetic energy will comply with the Code in effect at the time of installation or alteration.
(c) Door reopening devices and door closing on Phase I and Phase II will comply with the requirements applicable at the time of installation of the firefighter's emergency operation (where applicable)

**8.6.3.9: Replacement of Releasing Carrier**
Where applicable, if a replacement is made to the releasing carrier on this elevator equipment, the governor rope pull-out and pull-through forces will be verified.

**8.6.3.10: Replacement of Hydraulic Jack, Plunger, Cylinder, Tank(s) and Anti-Creep Leveling Devices**

**8.6.3.10.1** If a hydraulic jack is replaced on this elevator equipment it shall be classified as an alteration and comply with Requirement 8.7.3.23.1.

**8.6.3.10.2** If a hydraulic plunger is replaced on this elevator equipment it will be classified as an alteration and comply with Requirement 8.7.3.23.2.

**8.6.3.10.3** If a cylinder is replaced on this elevator equipment it will be classified as an alteration and will comply with Requirement 8.7.3.23.3.

**8.6.3.10.4** If a tank(s) is replaced on this elevator equipment it will be classified as an alteration and will comply with Requirement 8.7.3.29.

**8.6.3.10.5** If an anti-creep leveling device is replaced on this elevator equipment it will be classified as an alteration and will comply with Requirement 8.7.3.31.3

**8.6.3.11: Replacement of Valves and Piping**

If any valves, piping, or fitting on this elevator equipment are replaced, replacements will conform to Section 3.19 with the exception of Requirement 3.19.4.6 (Replacement control valves must conform to the Code under which it/they were installed).

**8.6.3.12: Run-by and Clearances After Re-roping or Shortening**

The minimum car and counterweight clearances will be maintained when/if new suspension means are installed or when the existing suspension means are shortened. The minimum clearances will be maintained.

**8.6.3.12.1** The length that the suspension means are shortened will be limited.

**8.6.3.12.2** Blocking at the car or counterweight, if provided (and the blocking means) will be of sufficient strength and secured in place to withstand the reactions of buffer engagement.
If wood blocks are used to directly engage the buffer, a steel plate will be fastened to the engaging surface or will be located between that block and the next block to distribute the load upon buffer engagement.

**8.6.3.12.3** Blocking will be provided under the car or counterweight buffer or both of sufficient strength and secured in place to withstand the reactions of buffer engagement as described in Requirement 8.2.3

**8.6.3.12.4** The month and year (appropriate data) that the suspension means is first shortened will be recorded on the data tag.

**8.6.3.14: Replacements Involving SIL Rated Device(s)**

**8.6.3.14 (a)** A SIL rated device used to satisfy:

- Electrical Equipment & Wiring
- Release and Application of Driving Machine Brakes
- Software Systems for Protection Against Failures
- E/E/PES to remove power from Driving Machine Motor from AC Sources
- E/E/PES to remove power from Driving Machine Motor from DC Sources

Will not be affected by other replacement(s) to the extent that the listing/certification is invalidated.

**8.6.3.14 (b)** Where a SIL rated device is replaced that is used to satisfy

- Electrical Equipment & Wiring
- Release and Application of Driving Machine Brakes
- Software Systems for Protection Against Failures
- E/E/PES to remove power from Driving Machine Motor from AC Sources
- E/E/PES to remove power from Driving Machine Motor from DC Sources

It shall be considered a replacement only when the replacement device is the original manufacturers listed/certified SIL rated device or the original manufacturers listed/certified SIL rated replacement device, otherwise it will be considered an alteration.

**8.6.3.14 (c)** Where a non-SIL rated device is replaced that is used to satisfy:

- Electrical Equipment & Wiring
- Release and Application of Driving Machine Brakes
- Software Systems for Protection Against Failures
- E/E/PES to remove power from Driving Machine Motor from AC Sources
- E/E/PES to remove power from Driving Machine Motor from DC Sources

It will be considered as an alteration.

## 8.6.11: Special Provisions

**8.6.11.1: Firefighters Emergency Operation**

This elevator equipment is subjected to a monthly Phase I recall by use of the key switch and a minimum of one-floor operation on Phase II.

Deficiencies discovered during testing of Firefighters Emergency Operation testing will be corrected.

A record of the testing is available to elevator personnel and the authority having jurisdiction.

**8.6.11.2: Two-Way Communication**

The two-way communication means on this elevator equipment will be checked annually by authorized personnel in accordance with the following:

(a) It will be checked to verify that two-way communication is established, or

(b) It will be checked by pressing the "HELP" button to verify that the visual indicator is functional and that the answering authorized personnel can receive the building location and elevator number.
Item (c) is not applicable if the elevator was installed prior to ASME A17.1a – 2002/CSA B44-00 update 1.

(c) Communication from the building ☐is ☐is not provided.
Two-way communication from the building to each car is provided.

**8.6.11.3: Access Keys**

The keys required for access, operation, inspection, maintenance, repair, and emergency access are made available only to personnel in the assigned security level.

**8.6.11.4: Cleaning Procedures**

**8.6.11.4.1** Cleaning of the exterior of transparent car or transparent hoistway enclosure(s) from inside the hoistway will be performed only by authorized and trained personnel.

**8.6.11.4.2** A written cleaning procedure is kept on the premises where this elevator is located and is available to the authority having jurisdiction.

**8.6.11.4.3** The procedure for cleaning identifies the hazards and details the safety precautions to be utilized.

**8.6.11.4.4** All the personnel assigned to cleaning will be given a copy of these procedures and all necessary training to assure that they understand and comply with the same.

**8.6.11.4.5** A record of the authorized personnel trained as specified in Requirement 8.6.11.4.4 will be kept on the premises where this elevator equipment is located and will be available to the authority having jurisdiction.

**8.6.11.5: Evacuation**

**8.6.11.5.1** The evacuation of passengers from stalled elevators will be performed only by authorized elevator and emergency personnel in compliance with the procedures specified in Requirements 8.6.11.5.2 through 8.6.11.5.6.

**8.6.11.5.2** A written emergency evacuation procedure is kept on the premises where this elevator equipment is located.

**8.6.11.5.3** The procedure identifies the hazards and details the safety precautions utilized in evacuating passengers from a stalled elevator.

**8.6.11.5.4** All authorized personnel who are assigned to assist in evacuation passengers from a stalled elevator, and all persons who use special purpose personnel elevators, and wind turbine tower elevators, will be given a copy of these procedures and all necessary training to assure that they understand and comply with the procedures.

**8.6.11.5.5** The procedures are available to authorized elevator and emergency personnel.

**8.6.11.5.6** A record of authorized personnel training, and all persons who use special purpose personnel elevators, will be kept on the premises where the elevator is located and will be available to the AHJ.

**8.6.11.10 Category 5 Tests Without Load Via Alternative Test Methodologies**

**8.6.11.10.1** Alternative test methods without load are permitted for Cat. 5 testing subject to approval of the AHJ of the following:

(a) Car and counterweight safeties per 8.6.4.20.1
(b) Oil Buffers
(c) Driving Machine Brakes per 8.6.4.20.4
(d) Braking System, Traction, and traction limits per 8.6.4.20.10

**8.6.11.10.2: Alternative Test Method and Tools**

(a) An alternative test method shall be
    (1) Based on sound engineering principals
    (2) Validated and documented via engineering tests
(b) The method, measuring devices, and tools will be capable of producing reliable and consistent measurements suitable for the intended measurement. The monitoring and calibration of the measuring devices or tools will be in accordance with the providers guidelines.

**8.6.11.10.3: Alternative Test Method Procedure**

Where applicable: The alternative test procedures will:

(a) Include requirements to obtain and verify car and counterweight masses (if necessary) for the test
(b) Have a procedure document that:
    (1) Defines the permissible equipment range and limitations regarding use.
    (2) Establishes monitoring and calibration criteria for tools or measuring devices as appropriate.
    (3) Defines test set up procedures.
    (4) Provides instructions on how to interpret results and correlate the results to pass-fail criteria.
(c) Describe how to correlate no load results
(d) Be included in the MCP
(e) Include the information required by 8.6.1.2.1(f) where applicable, and;
(f) Require a report conforming to 8.6.11.10.4

**8.6.11.10.4 Alternative Test Method Report**

Where applicable, the alternative test method report will:

(a) Identify the alternative test tool use to perform the test
(b) Identify the company performing the tests, names of personnel conducting and witnessing the tests, and testing dates
(c) Contain all required printouts or records of the tests required to demonstrate compliance to the testing requirement that were gathered during an acceptance test
(d) Identify which results from the baseline test are to be used for future compliance evaluation

(e) Record the car and counterweight masses that were obtained per 8.6.11.10.3(a) during the acceptance test and during any subsequent Category 5 test if required by the test method
(f) Contain all subsequent Category 5 results with pass-fail conclusions regarding Code compliance
(g) Remain on site or will be available to elevator personnel and the AHJ

**8.6.11.11: Examination After Shutdown Due to Traction Loss**

If a traction loss detection means has been actuated the elevator will not be returned to normal service until a physical examination of the drive sheave and suspension means has been conducted. The elevator will not be moved until all passengers are out of the elevator and the elevator is posted "out-of-service". In addition to the suspension means evaluation criteria, any suspension means or drive-sheave condition that would adversely affect the traction capability of the system will be corrected before returning the elevator to service.

**8.6.11.12: Examination After Safety Application**

After any safety application on a traction elevator has occurred, whether due to testing or during normal service the driving machine sheave, all other sheaves where furnished, and retainers and suspension members will be examined throughout their complete length to ensure that all suspension members are properly seated in their respective sheaves, and that no damage has occurred to the sheaves, suspension members, or retainers. The elevator will not be returned to normal service until this physical examination has been conducted and any repairs made.

**8.6.11.13: Occupant Evacuation Operation**

The elevator will be subjected by authorized personnel to a check of the operation in conjunction with the fire alarm system testing in accordance with the requirements of NFPA 72. Deficiencies, if any, will be corrected. A record of the findings will be available to elevator personnel and the AJH.

**8.6.11.14: Examination After Shutdown Due to Broken-Suspension-Member Detection Means**

After any application of the broken-suspension-member detection means, whether due to testing or during normal operation, the driving-machine sheave, all other sheaves, and retainers and suspension members will be examined throughout their complete length to ensure that all suspension members are properly seated in their respective sheave, and that no damage has occurred to the sheaves, suspension members, or retainers. The elevator will not be returned to normal service until this physical examination has been conducted and any repairs made.
Where a single suspension member has been damaged or broken, the entire suspension means will be replaced.

# MAINTENACE PROCEDURES

| 8.6.1 GENERAL REQUIREMENT TASKS | |
|---|---|
| **TASK** | **PROCEDURE** |
| **8.6.1.2.2(a):**<br>**Wiring Diagrams** | Check to ensure legible, up-to-date wiring diagrams are available on-site. Notify your supervisor if they are not. |
| **8.6.1.2.2(b):**<br>**SIL rated devices** | If SIL rated E/E/PES electrical protective devices are installed:<br>• Ensure writing diagrams document the SIL rated devices.<br>• Ensure the SIL rated devices are marked accordingly.<br>• Ensure maintenance, repair, and testing documentation for the device(s) is available on-site.<br>• If any software is integral to the SIL rated device, check to ensure the software version is as noted in the manufacturer's technical documentation. Upgrade the software if necessary. |
| **8.6.1.5 (See 8.9):**<br>**Code Data Plate** | • Check to ensure a data plate has been provided and is maintained for each unit. The data plate shall indicate the Code to be used for inspections and tests, as well as the Code and edition in effect at time of installation. The data plate shall also indicate the Code in effect at the time of alteration and indicate the applicable requirements of 8.7.<br>• The data plate shall be in plain view, securely attached to each main line disconnect or controller. |
| **8.6.1.6.3(a)(b)(c):**<br>**Controllers and Wiring** | • Clean the interior of the control panel as necessary. Remove all spare parts and other foreign matter that could possible interfere with operation of the equipment.<br>• Check for temporary wiring and insulators or blocks in the armatures or poles of any magnetically operated switches, contractors, or relays. Remove, if present.<br>• Check to ensure that any temporary jumpers have been removed. Jumpers must not be left in machine rooms or control spaces. Notify your supervisor if temporary jumpers are present. |
| **8.6.1.6.3(d):**<br>**Check Relays in Controllers and Drive Units**<br><br>**Clean, Lubricate, Adjust, or Replace Components as Required.** | • Check contact surfaces for excessive burning and wear.<br>• Check contacts for proper wipe and alignment.<br>• Check relay armatures and Christmas tree stems for free movement and proper seating.<br>• Check operation of reverse phase; relay must drop with loss of power.<br>• Check coils for signs of overheating.<br>• Check to ensure contact arc shield blowouts are in place and are in good condition.<br>• Check wire connections for tightness.<br>• Check relay shunts for wear.<br>• Check to ensure proper relay mounting. |

| 8.6.1 GENERAL REQUIREMENT TASKS | |
|---|---|
| **TASK** | **PROCEDURE** |
| **8.6.1.6.3(d):**<br>**Check Contactors in Controllers and Drive Units**<br>**Clean, Lubricate, Adjust, or Replace Components as Required** | Check for:<br>• Binding<br>• Obstructions<br>• Carbon Buildup<br>• Proper air gaps<br>• Contact pressure<br>• Contact wipe<br>• Excessive burning and wear<br>• Proper mounting |
| **8.6.1.6.3(e):**<br>**Fuses and Fuse Holders** | Check to ensure control fuses are securely mounted, are making good electrical contact, and are sized properly. Never replace fuses with wire or current-carrying devices. |
| **8.6.1.6.5:**<br>**Fire Extinguisher** | Check the expiration date on the fire extinguisher, if present. Notify a supervisor if it is out of date. |

| 8.6.4 TRACTION ELEVATOR TASKS | |
|---|---|
| **TASK** | **PROCEDURE** |
| **8.6.4.1.1:**<br>**Suspension & Compensating Ropes Cleaning** | The suspension (and compensating means) on this elevator equipment will be kept sufficiently clean so that they can visually inspected.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Clean the hoist and compensating ropes annually in preparation for an examination of the ropes.<br><br>• Manual cleaning – Wear leather gloves to prevent injury from broken wires. Use a bristle brush (not a wire brush) soaked in gear oil to remove any buildup of dirt from the cables. Remove excess oil with a heavy cloth rag.<br>• Auto-lubricator: Follow the manufacturer's recommendations.<br><br>**Note: Do not use a cleaning solution as it will damage the internal lubrication of the rope.** |
| **8.6.4.1.2:**<br>**Hoist Rope Lubrication** | The steel wire ropes on this elevator equipment will be lightly lubricated and precautions will be taken in lubricating the suspension steel wire ropes to prevent the loss of traction. Lubrication will be in accordance with the instructions on the rope data tag (if provided).<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Examine the hoist ropes and look for the following conditions:<br>• Ropes are dry or the lubricant is stiff<br>• Red dust on the ropes or on the floor<br>• Metal dust under the drive sheave or pulleys<br>• Sheave grooves are dry (no oil on fingertip when wiping) |
| **8.6.4.1.3:**<br>**Hoist Rope Tension** | Equal tension will be maintained between individual suspension members in each set of hoist ropes on this elevator equipment. Tension will be maintained at not more than a 10% difference between the smallest measured tension and the highest measured tension.<br>When suspension-member tension is checked or adjusted, an anti-rotation device will be installed.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Check the tension of the hoist ropes with the top of the cab approximately halfway between the top landing and the counterweight. Use one of the following two methods.<br>1. Measure each rope with a hoist rope tension measuring tool. All hoist ropes must have equal tension.<br>2. Check the tension by pulling each hoist rope in succession with an index finger. Measure the distance each rope deflects using a fixed reference point.<br><br>**Note: Suspension members are considered to be equally tensioned when the smallest tension measured is within 10% of the highest tension measured.** |

| 8.6.4 TRACTION ELEVATOR TASKS | |
|---|---|
| **TASK** | **PROCEDURE** |
| **8.6.4.2.1:**<br>**Governor Rope** | The Governor Wire Ropes will be kept clean.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Clean the governor rope annually.<br><br>Wear leather gloves to prevent injury from broken wires. Remove any lint or dirt from the governor rope with a heavy cloth rag.<br><br>**Note: Do not use cleaning solution, as it will damage the internal lubrication of the rope** |
| **8.6.4.2.2:**<br>**Governor Rope** | Where applicable, the Governor Wire Ropes will not be lubricated after installation. If lubricants are applied to the governor ropes, they will be replaced, or the lubricant removed, and the governor and safety will be tested. |
| **8.6.4.3.1:**<br>**Guide Rail Lubrication** | The lubrication of guide rails on this elevator will be in accordance with the requirements on the crosshead data plate.<br>MAINTENANCE FREQUENCY:<br><br>Lubricate the guide rails as noted on the crosshead data plate, if present. |
| **8.6.4.3.2:**<br>**Guide Rail Lubrication** | If no crosshead data plate exists, lubrication of the guide rails will conform to the following:<br>**8.6.4.3.2(a)** Guide rails, except those of elevators equipped with roller or other types of guiding members not requiring lubrication, will be lubricated.<br>**8.6.4.3.2(b)** Where sliding-type safeties are installed, the guide-rail lubricants, or pre-lubricated or impregnated guide shoe gibs, (when installed), will be of a type recommended by the manufacturer of the safety.<br><br>If a data plate is not present, ensure the guide rails are properly lubricated when slide guides are installed. Do not lubricate guide rails on elevators with roller guides installed.<br>• Check the oil level in the guide rail lubricators, if provided. Add oil, if necessary. |
| **8.6.4.3.3:**<br>**Guide Rail Lubrication** | If lubricants, other than those recommended by the manufacturer are used a safety test conforming to Requirement 8.6.4.20.1 will be made to demonstrate that the safety will function as required. |
| **8.6.4.3.4:**<br>**Guide Rail Cleaning** | The guide rails will be kept clean and free of lint, dirt, and accumulation of excessive lubricant. Where applicable, a means is provided at the base of the rails to collect excess lubricant.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Clean the guide rails. Remove any lint, dirt, and accumulation of lubricant.<br><br>Ensure there is a means to collect excess lubricant at the base of the rails. Empty/clean the container. |

| 8.6.4 TRACTION ELEVATOR TASKS | |
|---|---|
| **TASK** | **PROCEDURE** |
| **8.6.4.3.5:**<br>**Guide Rail Lubrication** | Rust-preventive compounds, such as paint, mixtures of graphite and oil, and similar coatings will not be applied to the guide rail guiding surfaces, unless recommended by the manufacturer of the safety. If such compounds are applied, the safety will be checked as specified in Requirement 8.6.4.20.1. |
| **8.6.4.4.1:**<br>**Buffer Oil Level** | The oil level in the oil buffer(s) will be maintained at the level indicated by the manufacturer and the grade of oil used will be as indicated on the buffer marking plate, where required.<br>MAINTENANCE FREQUENCY:<br><br>Check the oil level in car and counterweight buffers. If low, add oil as noted on the buffer marking plate, or as recommended by the manufacturer. |
| **8.6.4.4.2:**<br>**Oil Buffer Cleaning/Painting** | The buffer plungers will be kept clean and not coated or painted with a substance that will interfere with their operation.<br>MAINTENANCE FREQUENCY:<br><br>Clean the buffer plungers – Remove any paint or other substance that could possibly interfere with its proper operation.<br>• Check alignment of the buffers to the strike plates. Correct any misalignment.<br>• Check security of all buffer fastenings. Tighten as required. |
| **8.6.4.4.3:**<br>**Buffers** | Buffer oil will not be stored in the pit or hoistway or on top of the car. |
| **8.6.4.5.1:**<br>**Safety Mechanisms Cleaning/Lubrication** | Safety mechanisms on this elevator equipment will be kept lubricated and free of rust, corrosion, and dirt that can interfere with the operation of the safety.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Clean the governor rope releasing carrier, the safety linkage, and the safety dogs and wedges. Remove any paint, rust, corrosion or other foreign material that could possibly interfere with the correct operation of the safety mechanisms. |

| 8.6.4 TRACTION ELEVATOR TASKS | |
|---|---|
| **TASK** | **PROCEDURE** |
| **8.6.4.5.2:**<br>**Safety Mechanisms Clearances** | The required clearances between the safety jaws and the rail will be maintained.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>• Examine the releasing carrier and ensure the spring tension of the releasing carrier is sufficient to prevent the governor rope from pulling out of the carrier during the normal starting and stopping of the elevator. Also check to ensure the governor rope will pull out of the releasing carrier when the governor sets.<br>• Examine the safety dogs or wedges (safety clamps) to ensure they do not touch or ride on the guide rails during normal elevator operation. Clearance on both sides of the rails during normal elevator operation. Clearance on both sides of the rails should be approximately the same and should meet the following requirements:<br>- On elevators built after the 1955 ANSI Code the clearance between the safety's rail-gripping faces must not be less than the thickness of the guide rail plus 9/64 inch there must be a minimum of 1/16 inch between either side of the rail and the rail-gripping face.<br>- On elevators built before the 1955 ANSI Code the clearance between the safety's rail-gripping faces must be less than the thickness of the guide rail plus 3/32 in.<br>- On elevators with wood guide rails the distance between the safety's rail-gripping faces must not be less than the thickness of the rail plus ¼ inch.<br>• Manually move the safety dogs or wedges to ensure they operate freely and smoothly. Remove any dirt or corrosion to ensure smooth operation.<br>• Examine the safety linkage and lift rods to ensure they move freely with the proper clearance. If necessary, lightly lubricate the lift rods and pivot points with bearing oil. |
| **8.6.4.6.1:**<br>**Drive Machine Brake** | The driving machine brake will be maintained to ensure proper operations, including, but not limited to the following:<br>Residual pads (antimagnetic pads)<br>Lining and running clearances<br>Pins and levers<br>Springs<br>Sleeves and guide bushings<br>Discs and drums<br>Brake coil and plunger<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Examine the brake fastenings to ensure the brake is securely mounted. |

| 8.6.4 TRACTION ELEVATOR TASKS | |
|---|---|
| **TASK** | **PROCEDURE** |
| **8.6.4.6.1 (b)(c)(d)(e)(f)(g): Drum Brake** | Annually, disassemble, examine, and maintain the brake.<br>1. Ride the elevator in both directions, stopping at the main landing and several other landings. Observe the accuracy of floor stops and listen for abnormal sounds.<br>2. Set the elevator above the top floor and land the counterweights. Turn the power OFF.<br>3. Measure the compressed length of the brake spring(s) and make a note of the length(s).<br>4. Disassemble the brake.<br>5. Examine the brake drum and look for signs of scoring or other damage.<br>6. Examine brake linings and look for signs of wear, scoring, oil contamination or glazing. If any conditions exist that can affect stopping or holding capability of brake, replace linings.<br>7. Check for freedom of movement of the plungers in the sleeves. Check both for excessive wear and scoring. Lubricate the plungers and sleeves with non-hardening grease. If possible, rotate the sleeves slightly to equalize wear.<br>8. Examine brake coil and look for signs of overheating or other damage. Replace brake coil if damage exists.<br>9. Manually activate brake contact to ensure free movement. Check to ensure contact opens only when brake is fully picked. If contact is out of adjustment, readjust when brake is picked.<br>10. Remove any paint from pivot pins and lubricate with motor bearing oil.<br>11. Reassemble brake. Ensure springs are placed back in original positions (measure length) and linings fully contact drum.<br>12. Ride elevator in both directions, stopping at main landing and several other landings. Observe accuracy of floor stops and listen for abnormal sounds.<br>13. Check functionality and holding capacity of brake. Repeat procedure items if brake is not operating properly. |
| **8.6.4.6.1(b)(d)(f)(g): Disc Brake** | Examine and maintain the brake.<br>1. Ride elevator in both directions, stopping at main landing and several other landings. Observe accuracy of floor stops.<br>2. With elevator operating observe brake operations and:<br>• Listen for abnormal sounds or vibrations.<br>• Check for excessive heat.<br>3. Set elevator above top floor and land counterweights. Turn power OFF.<br>4. Measure thickness of friction disc and check for any contamination or damage. Notify your supervisor is disc needs to be replaced.<br>5. Measure the armature air gap. Adjust, if required.<br>6. Examine all electrical connections and tighten, if required.<br>7. Ride elevator in both directions, stopping at main landing and several other landings. Observe accuracy of floor stops. |

| 8.6.4 TRACTION ELEVATOR TASKS | |
|---|---|
| **TASK** | **PROCEDURE** |
| **8.6.4.6.2** | If any part of the driving machine brake is changed or adjusted that can affect the holding capacity or decelerating capacity of the brake when required it will be adjusted and checked by means that will verify its proper function and holding capacity. A test complying with 8.6.4.20.4 will be performed. |
| **8.6.4.6.3:**<br>**Emergency Brake** | If any part of the emergency brake is changed or adjusted that can affect the holding capacity or decelerating capacity of the emergency brake when required, it will be adjusted and checked by means that will verify its proper function and holding capacity. A test complying with 8.6.4.20.4 will be performed.<br>MAINTENANCE FREQUENCY: **Periodically** |
| **8.6.4.7.1:**<br>**Hoistway and Pit** | Hoistways and pits of this elevator equipment will be kept free of dirt and rubbish and will not be used for storage purposes.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>**Hoistway:** Ensure the hoistway is clean. Dirt, lint, and excess oil in the hoistway, particularly on the rails and brackets, should be removed. The counterweight, sills, and headers should be free of an accumulation of dirt. The bottom and sides of the car should be free of lint and oil. Notify a supervisor if a full hoistway clean down must be performed.<br><br>**Pit:** Remove all debris from the pit. The pit should be broom clean and should not be used for storage purposes. |
| **8.6.4.7.2:**<br>**Cleaning of Hoistways and Pits** | Landing blocks and pipe stands may be stored in the pit; however, they will not interfere with the operation of this elevator equipment and will not present a hazard for persons working in the pit. |
| **8.6.4.7.3:**<br>**Pit Access Door** | Where applicable, pit access doors will be kept closed and locked. |
| **8.6.4.7.4:**<br>**Pit Condition** | Water and oil will not be allowed to accumulate on the pit floor of this elevator equipment.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Check the pit floor for an accumulation of water and oil. Notify a supervisor if either is present. |
| **8.6.4.8.1:**<br>**Condition of Floors** | The floor(s) of machinery and control spaces of this elevator equipment will be kept free of water, dirt, rubbish, oil, and grease.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Sweep the machine room floor. Clean up any oil or grease. Notify a supervisor if water is present. |

| 8.6.4 TRACTION ELEVATOR TASKS | |
|---|---|
| **TASK** | **PROCEDURE** |
| **8.6.4.8.2:**<br>**Machinery and Control Rooms and Spaces** | Articles or materials not necessary for the maintenance or operation of this elevator equipment will not be stored in the machinery spaces, machine rooms, control spaces, and control rooms.<br><br>Parts should be neatly organized and stored in a cabinet. Used parts should be discarded. |
| **8.6.4.8.3:**<br>**Machinery and Control Rooms and Spaces** | Flammable liquids having a flashpoint of less than 44° C (110° F) will not be in the machinery spaces, machine rooms, control spaces, and control rooms of this elevator equipment.<br><br>Remove any flammable liquids which have a flashpoint of less than 44° C (110° F). Oily rags should be discarded according to hazardous material guidelines. |
| **8.6.4.8.4:**<br>**Machine Room, Machinery Space Access Door(s)** | Access door to the machinery spaces, machine rooms, control spaces, and control rooms of this elevator equipment will be kept closed and locked.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Check to ensure the machine room door is closed and locked. |
| **8.6.4.8.5:**<br>**Machinery Space/Control Space in Hoistway** | Machinery spaces and control spaces located in the hoistway of this elevator equipment will not be used for storage purposes.<br>MAINTENANCE FREQUENCY: **Periodically** |
| **8.6.4.9:**<br>**Cleaning of Car Tops** | The top of this elevator equipment will be kept free of oil, water, dirt, and rubbish and will not be used for storing lubricants, spare parts, tools, or other items.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Wipe down the car top. Remove debris. Do not use the car top for storage of lubricants, parts, tools, or other items. |

| 8.6.4 TRACTION ELEVATOR TASKS | |
|---|---|
| **TASK** | **PROCEDURE** |
| **8.6.4.10.1:**<br>**Hoist Ropes on Winding Drum Machines** | Examine the condition of the hoist ropes and fastenings with respect to the requirements noted below:<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>**General:** The hoisting ropes of elevators having winding-drum driving-machines with 1:1 roping, if of the babbitted rope socket type, shall be re-socketed, or for other types of fastenings, replaced or moved on the rope to a point above the existing fastening at the car ends at intervals no longer than:<br>• 1 year, for machines located over the hoistway.<br>• 2 years, for machines located below or at the side of the hoistway.<br>• Where auxiliary rope-fastening devices conforming to 2.20.10 are installed, refastening at periods specified is not required, provided that, where such devices are installed, all hoisting ropes shall be refastened on failure or indication of failure of any rope fastening.<br>• Where the elevator is equipped with a drum counterweight, the fastenings shall be examined for fatigue or damage at the socket. Where fatigue or damage is detected, the ropes shall be refastened in conformance with 8.6.4.10.2. |
| **8.6.4.10.2:**<br>**Hoist Ropes on Winding Drum Machines** | **Procedure:**<br>**8.6.4.10.2(a):** Where applicable, when re-socketing babbitted rope sockets or replacing other types of fastenings, a sufficient length shall be cut from the end of the rope to remove damaged or fatigued portions. The fastenings shall conform to 2.20.9. Where the drum ends of the ropes extend beyond their clamps or sockets, means shall be provided to prevent the rope ends from coming out of the inside of the drum and to prevent interference with other parts of the machine.<br>**8.6.4.10.2(b):** The suspension wire ropes shall conform to 2.20.7. |
| **8.6.4.10.3:**<br>**Tags** | A legible metal tag will be securely attached to one of the wire rope fastenings after each re-socketing or changing to another type of fastening and it will bear the following information:<br>(a) The name of the person or firm that performed the re-socketing or changing of other types of fastenings.<br>(b) The date on which the rope was re-socketed or other types of fastenings changed.<br>The material and marking of the tags will conform to 2.16.3.3, except that the height of the letters and figures will not be less than 1.5mm (0.0625in) |
| **8.6.4.11.1:**<br>**Car or Counterweight Run-By and Clearances** | The car and counterweight run-by may be reduced, however, the car or counterweight will not strike the buffer(s). The car and counterweight run-by may be reduced, however the top of car clearances will not be reduced below that required at the time of installation or alteration.<br>The car and counterweight run-by may be reduced, however, the final terminal stopping devices will remain operational.<br>MAINTENANCE FREQUENCY: **Periodically** |

| 8.6.4 TRACTION ELEVATOR TASKS | |
|---|---|
| **TASK** | **PROCEDURE** |
| **8.6.4.11.2:**<br>**Car or Counterweight Run-By** | Where spring-return oil buffers are provided, and compression was permitted with the car at the terminals the buffer compression shall not exceed 25% of the buffer stroke. |
| **8.6.4.12.1:**<br>**Governor Examination** | The governor(s) on this elevator equipment will be examined to ensure that all seals are intact, and the governor(s) will be manually operated to determine that all moving parts, including rope-grip jaws and switches operate freely.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Examine the governor to ensure the governor seal is present and intact.<br><br>Observe the governor during normal operation. Look for abnormal operation and listen for any abnormal noises or vibrations.<br>1. Remove elevator from service. Turn power OFF.<br>2. Ensure all fastening bolts are secure. Tighten bolts, if necessary.<br>3. Ensure the governor rope runs clear of, and is centered within, the governor grip jaws. Adjust if necessary.<br>4. Lubricate the governor shaft bearing:<br>• Grease fittings<br>• Oil cups<br>5. Lubricate pivot points<br>6. Ensure moving parts are not inhibited by paint or any other foreign substance. Check all moving parts for excessive wear or damage.<br>7. Examine the overspeed switch and check for proper operation.<br>8. Lift the governor weights by hand to make certain the overspeed components move freely. If they do not, repair or replace the faulty components and test the governor.<br>9. Manually trip the governor and ensure proper mechanical functionality of the rope grip jaws.<br>10. Check the condition of the electrical contacts and wiring. Check continuity of the contacts.<br>11. Turn power ON.<br>12. Disable door operation and run the elevator. Observe operation of the governor and ensure it is functioning properly.<br>13. Place elevator back in service. |
| **8.6.4.12.2:**<br>**Governor Maintenance** | The governors, governor ropes and all sheaves will be kept free from contaminants or obstructions, or both that will interfere with the operation or function, including the accumulation of rope lubricant or materials, or both, in the grooves of the governors or sheaves.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Clean the governor cable during performance of the Shaft Module. |

| 8.6.4 TRACTION ELEVATOR TASKS | |
|---|---|
| **TASK** | **PROCEDURE** |
| **8.6.4.13.1:**<br>**Door Components** | All landing and car-door or gate mechanical and electrical components will be maintained to ensure safe and proper operation including but not limited to the following:<br>(a) Hoistway door interlocks or mechanical locks and electric contacts<br>(b) Car door electric contacts or car door interlocks<br>(c) Door reopening devices<br>(d) Vision panels and grills<br>(e) Hoistway door unlocking devices and escutcheons<br>(f) Hangers, tracks, door rollers, up-thrusts, and door safety retainers<br>(g) Astragals and resilient members, door space guars, and sight guards<br>(h) Sills and bottom guides, fastenings, condition, and engagement<br>(i) Clutches, engaging vanes, retiring cams, and engaging rollers<br>(j) Interconnecting means<br>(k) Door closers<br>(l) Means to restrict hoistway or car door opening and expiration date for alternate power source, where applicable<br>MAINTENANCE FREQUENCY: **Periodically** |
| **8.6.4.13.1(a):**<br>**Hoistway Door Interlocks or Mechanical Locks and Electric Contacts** | **Check interlock circuit integrity**<br>• Open a landing door and attempt to move the elevator downward (block the door open, if necessary). The elevator should not move.<br><br>**Clean the interlock contacts**<br>• Clean the interlock contacts. Check for pitting, burning or excessive wear. Replace the contacts, as required.<br>• Check for proper contact separation when the hook lifts.<br>• Check for proper contact wipe. The contacts should compress slightly when the hook engages the lock.<br>• Clean the shorting bar contact surface.<br><br>**Check mechanical function of the interlock**<br>• Check to ensure the latching hook moves freely. Lubricate the pin with light machine oil, as required.<br>• Check the latching/locking mechanism for proper alignment and function. Ensure the locked door and door contacts do not open when the door is pushed or pulled by hand.<br>• Check for any misalignment of, or damage to, any landing door components. Replace, as required. |
| **8.6.4.13.1(b):**<br>**Car Door Gate Switch** | Disassemble car door/gate switch and clean contacts. Check contact wipe. Adjust or replace contacts as required. |

| 8.6.4 TRACTION ELEVATOR TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.13.1(c):**<br>**Door Reopening Devices** | **Electronic Detector**<br>1. Check operation of the detector by placing an object in front of the device at several different heights while the door is in closing mode. The door should immediately stop and reverse direction.<br>2. Check to ensure the detector is securely fastened and properly aligned.<br>3. Check condition of external cables.<br>4. Remove covers from detector units (if applicable) and clean with a damp cloth or fine dry brush.<br>5. Check supply voltages.<br>6. Check all wiring connections and tighten as necessary.<br>7. Visually check internal components for signs of overheating or other damage.<br>8. Check sensitivity settings and adjust if the doors do not reopen promptly when an object is placed in front of the sensor.<br>9. Reinstall any covers previously removed and test the unit again for proper operation.<br><br>**Photo-Electric Device**<br>1. Check operation of the photocells by placing an object in front of each cell while the door is in closing mode. The door should immediately stop and reverse direction.<br>2. Check to ensure the sending and receiving units are securely fastened and properly aligned.<br>3. Check condition of external cables.<br>4. Clean the sending and receiving units with a fine dry brush.<br>5. Clean the lenses with a damp cloth, if necessary.<br><br>**Mechanical Edge**<br>1. Activate the device by retracting the leading edge while the door is in closing mode. The door should immediately stop and reverse direction.<br>2. Check security of all fastenings.<br>3. Check retracting mechanism and lubricate pivot points with 30w oil, if necessary.<br>4. Check condition of external cables.<br>5. Clean and adjust unit, as required.<br><br>**Door Open Button**<br>Press the door open button during the closing cycle. The door should open and then close after reopening time has elapsed. |
| **8.6.4.13.1(d):**<br>**Vision Panels and Grills** | • Check to ensure clear, wired glass is installed and securely fastened and intact.<br>• If unit was installed under A17.1-1990 or later code, ensure a vision panel grill is in place. |

| 8.6.4 TRACTION ELEVATOR TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.13.1(e):**<br>**Hoistway Door Unlocking Devices and Escutcheons** | Check operation of the emergency door unlocking device. Adjust as required. Adjust the pick mechanism, if required. |
| **8.6.4.13.1(f):**<br>**Hangers, Tracks, Door Rollers, Up-Thrusts, Safety Retainers** | **Examine and maintain the hanger tracks**<br>• Clean tracks of dirt and lubrication build-up, especially at the point the door rollers stop when the door lock is latched.<br>• Check the condition of the tracks. Look for worn rolling surfaces, especially at the point the interlock hook engages the interlock box. Replace tracks, if required.<br>• Lubricate tracks on freight elevators with 30w motor oil, as necessary.<br>• Check alignment of the tracks relative to the sills. Adjust the tracks if they are not parallel to the sills. |
| **8.6.13.1(g):**<br>**Astragals, Resilient Members, Space & Sight Guards** | Check to ensure that the strike jamb bumpers and astragals are in place and are pliable. Repair or replace, as required. |
| **8.6.13.1(h):**<br>**Sills, Bottom Guides, Fastenings, Condition, Engagement** | **Check hoistway door gibs, brackets, fire tabs, and sills.**<br>• Check door gibs and fire tabs for excessive wear and proper sill penetration. Adjust or replace as required.<br>• Check fastenings. Tighten as required.<br><br>**Check Sills**<br>• Check for excessive wear.<br>• Remove debris from sill.<br>• Check fastenings. Tighten as required. |
| **8.6.13.1(i):**<br>**Clutches, Engaging Vanes, Retiring Cams, Engaging Rollers** | • Clean components as required.<br>• Check alignment of the clutch. It should be plumb.<br>• Check the engaging (pick-up) rollers for proper engagement in the clutch and for proper running clearance. These dimensions should be the same at every floor.<br>**Note: If the relationship of the pick-up rollers to the clutch vanes is changing frequently check to ensure the cab stabilizers have not loosened up.**<br>• Check the tension of the retiring came drive belt or chain. Adjust or replace, as required. Lubricate the chain lightly with chain oil. |
| **8.6.4.13.1(j):**<br>**Interconnecting Means** | • Check the condition and alignment of relating cables and sheaves.<br>• Clean, adjust, or replace as required. |
| **8.6.4.13.1(k):**<br>**Door Closers, Where Required** | • Disengage landing door from car door and ensure landing door is self-closing. The door should close automatically after being stopped at any point in its travel. |

| 8.6.4 TRACTION ELEVATOR TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.13.1(l):**<br>**Maintain the Door Opening Restriction Device**<br><br>**(Passenger Elevators)** | • **On elevators installed under A17.1b-1980 through A17.1-2010/CSA-B44-10**, check to ensure the elevator doors cannot be fully opened manually when the elevator is more than 18 inches above or below the landing.<br><br>If the result of the above test is satisfactory, stop the elevator beyond 18 inches above or below the landing and attempt to manually open the doors. The doors should open no more than 4 inches.<br>• **On elevators installed under A17.1-2013/CSA-B44-13 and later editions**, check to ensure the elevator doors cannot be fully opened manually when the elevator is more than 7 inches above or below a landing. Adjust the device as necessary to maintain code required dimensions.<br><br>If the result of the above test is satisfactory, stop the elevator within 3 inches above or below the landing and attempt to manually open the doors. The doors should open.<br>• Ensure the restrictor is securely fastened and properly aligned. Adjust as necessary to maintain proper operation.<br>• Lubricate pivot points annually with bearing oil. |
| **8.6.4.13.2:**<br>**Kinetic Energy and Force Limitations for Automatic Closing, Horizontal Sliding Car, and Doors and Gates** | Power-operated horizontally sliding door(s), closed by momentary pressure or by automatic means will have the kinetic energy and closing force maintained.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>**To test the Kinetic Energy:**<br>• Check the time the leading edge of the door takes to travel the code zone during closing.<br>• Verify that the average door closing time for the doors is greater or equal to the minimum door closing time shown on the door operator data tag.<br><br>**To test the Closing Force:**<br>• Park the car at floor level and start the doors in the closing direction. Allow the doors to start moving in the closing direction to about the midway point of their normal travel and stop them there.<br>• Push a force measuring device designed for that purpose against the leading edge of the stopped door, removing the stop so the door is held stationary by the gauge.<br>• Ack the gauge off until the door is barely held stationary by the gauge and read the value. The closing force may not exceed 30 lbf (135N). |

| 8.6.4 TRACTION ELEVATOR TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.14:**<br>**Hoistway Access Switches** | Hoistway access switches on this elevator equipment will be maintained.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>• Check hoistway access switches for proper operation. Ensure they cannot be operated outside the code defined zones noted below:<br>- **Lowest Landing:** Car travel in the up direction is limited to the point where the bottom of the platform guard is even with the hoistway entrance header.<br>- **Landing other than the lowest landing:** Car travel in the down direction is limited to the height of the crosshead above the car platform. Car travel in the up direction must be limited to the distance platform guard extends below car platform. |
| **8.6.4.15:**<br>**Car Emergency System** | Emergency operation of signaling devices on this elevator equipment, lighting equipment, communications equipment, and ventilation equipment will be maintained.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Check the condition of all buttons, switches, and visual indicators. Replace any faulty components, as required.<br><br>**Two-way communication:** Place a call on the two-way communication device and ensure the call is responded to correctly, i.e.<br>• Call goes to a location staffed by personnel authorized to take appropriate action in an emergency situation.<br>**Note: If the call is not acknowledged within 45 seconds the call must be forwarded to an alternate location.**<br><br>**Remote/local alarm system:** Press the voice connection button in the car. Wait for a connection, and then perform a test connection to the call center.<br>• Verify disconnection of the device following deactivation of the call by the call center.<br>• Verify that the connection automatically disconnects 20 seconds after initial voice notification if the caller does not extend call.<br><br>**Emergency stop switch:** Check to ensure the elevator stops promptly when the stop button/switch is activated. Check the condition and functionality of the device and replace if it is damaged or the markings are illegible.<br><br>**Audible Alarm:** Where the alarm button is localized inside the car, on top of the car, or under the car, check operation of the audible alarm and ensure it can be heard outside the hoistway.<br><br>**Ventilation System:** Examine and maintain the car ventilation system. Ensure the fan is properly guarded and securely fastened. Clean the fan annually and lubricate the motor bearings with 30w motor oil (not applicable with sealed bearings). |

| 8.6.4 TRACTION ELEVATOR TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.15:**<br>**Car Emergency System (Cont'd)** | **Emergency Power:** Disconnect normal power and check to ensure the emergency light, audible alarm, and two-way communication means operate properly on battery power. Use a voltmeter to verify output of the battery. |
| **8.6.4.16:**<br>**Stopping Accuracy** | This elevator will be maintained to provide a stopping accuracy during normal operation as appropriate for the type of control and in accordance with the applicable Code Requirements.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Check stopping accuracy at each floor in both directions. Floor stops should be maintained at ½" or less, above or below floor level. |
| **8.6.4.17:**<br>**Ascending Overspeed and Unintended Movement Device** | The devices for ascending car over-speed and unintended car movement protection for this elevator equipment will be maintained.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>• Manually operate all components to ensure proper operation.<br>• Lubricate all pivot points, gears, bushings and bearings, as required.<br>• For units equipped with the Hollister-Whitney Rope Gripper refer to Document ID OM-01.03.090.<br>• For manufacturer specific instructions refer to the OEM document included in the Maintenance Control Program documentation. |
| **8.6.4.18.1:**<br>**Examine Compensating Sheave and Switch** | The suspension and compensating means will be maintained to prevent the compensating sheave from reaching the upper or lower limit of travel and to prevent the unintended actuation of compensating sheave switches during normal operation.<br>MAINTENANCE FREQUENCY:<br><br>• Examine and clean compensating sheave and ensure it has not reached its upper or lower limits of travel. Adjust, if required.<br>• Lubricate sheave bearings.<br>• Check to ensure the sheave moves freely. Lubricate the sheave frame with bearing grease, if required.<br>• Check operation of the compensating sheave switch to ensure it is mounted securely, operates freely and removes power to the driving machine when actuated. |

| 8.6.4 TRACTION ELEVATOR TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.21:**<br>**Drive Sheaves with Nonmetallic Groove Surfaces and Steel Wire Ropes** | Examine the drive sheave and look for conditions where the steel wire ropes have worn through the nonmetallic groove surface.<br><br>1. If the wire ropes have worn through the non-metallic drive groove surface but have not damaged the supporting surface of the sheave, replace the nonmetallic groove surfaces and inspect the steel wire ropes to ensure the conform to the criteria of ASME A17.6, Section 1.10. Replace the steel wire ropes, if necessary.<br>2. If the supporting surface of the drive sheave has also been damaged, the drive sheave must be replaced in addition to the steps taken in item 1 above. |
| **8.6.4.22:**<br>**Maintenance of Seismic Devices (if applicable)** | **8.6.4.22.1** Examine the seismic switch to ensure it is clean, securely mounted, properly aligned, and activates as designed in accordance with the manufacturer's recommendations.<br><br>**8.6.4.22.2** Examine the counterweight displacement switch to ensure it is clean, securely mounted, properly aligned, and activates as designed in accordance with the manufacturer's recommendations. |

| 8.6.5 HYDRAULIC ELEVATOR TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.5.1:**<br>**Pressure Tanks** | **8.6.5.1.1:** Maintain a record of pressure tank cleaning. The pressure tank(s) on this elevator will be thoroughly cleaned internally at least every 3 years and prior to the inspection and test required by 8.6.5.15.<br><br>**8.6.5.1.2:** Check the fluid level in the pressure tank. The level should be maintained at approximately two-thirds of the capacity of the tank.<br>MAINTENANCE FREQUENCY: **As Needed** |
| **8.6.5.2:**<br>**Piston Rods** | Maintain a record of cleaning the piston rods on roped-hydraulic elevators. Piston rods of roped-hydraulic elevators must be cleaned prior to the test required by 8.6.5.15. |
| **8.6.5.3:**<br>**Examine the Water-Hydraulic Piston (if applicable)** | Check the piston of a water-hydraulic elevator for build-up of rust and scale. Clean as necessary.<br>**Note:** Pistons of water-hydraulic elevators must be cleaned prior to the test required by 8.6.5.15. |
| **8.6.5.4:**<br>**Tank Levels** | The level of oil in the oil tank of this elevator equipment will be checked and, if necessary, adjusted to comply with the prescribed minimum and maximum level.<br>MAINTENANCE FREQUENCY: **As Needed**<br><br>• Check the level of hydraulic oil in the machine reservoir. Maintain the oil level between the maximum and minimum marks.<br>• Park the elevator on the lowest landing and make a reference mark inside the tank at the current level of the oil. Use the relationship of this mark to the oil level in the future to determine possible oil loss. |
| **8.6.5.5.1:**<br>**Gland Packings and Seals** | Packing glands and seals used on valves and cylinders on this elevator equipment will be maintained to prevent excessive loss of fluid.<br>When/if a cylinder packing or seal (or a pressure-piping seal) is replaced, the integrity of the entire hydraulic system will be verified by operating it at relief-valve pressure for not less than 15 seconds.<br>MAINTENANCE FREQUENCY: **As Needed**<br><br>**Examine the hydraulic cylinder**<br>• Check for excessive leakage around the cylinder head.<br>• Clean the cylinder head and oil drainage channels.<br>• Check for signs of excessive rust.<br>• Check fastenings of above ground cylinders.<br>**Note:** When the cylinder packing/seal is replaced the entire hydraulic system must be tested at relief valve pressure prior to placing the unit back in service.<br><br>**Examine the hydraulic piston**<br>• Check for nicks, scratches, or pitting. |

| 8.6.5 HYDRAULIC ELEVATOR TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.5.5.1:**<br>**Gland Packings and Seals (Cont'd)** | • Check for oil leakage from piston packing. Remove any oil from pit. Report leaking of oil between service visits in excess of the capacity of the collection can to a supervisor.<br>• Check all piston joints for tightness and lack of ridges. Report any gaps or misalignment observed to a supervisor.<br>• Check tightness or piston and platen plate fastenings.<br>• Check stabilizer rollers or slides, cable, and sheaves. Lubricate as required.<br>**Note:** When the cylinder packing/seal is replaced the entire hydraulic system must be tested at relief valve pressure prior to placing the unit back in service.<br><br>**Examine the hydraulic piping and gate valve**<br>• Check for leakage around fittings and where pipes emerge from the pit wall or floor.<br>• Check for leakage from glands or seals.<br>• Check for excessive rust.<br>• Check security of pipe supports.<br>**Note:** When a pressure piping seal is replaced, the entire hydraulic system must be tested at relief valve pressure for not less than 15 seconds prior to placing the unit back in service. |
| **8.6.5.5.2:**<br>**Collection of Oil Leakage** | MAINTENANCE FREQUENCY: **As Needed**<br><br>• Check pit container. Empty, if necessary.<br>• **Note:** The pit container must be no larger than 5 gallons. Check to ensure the contents of the pit can are protected from infiltration of dirt from outside the container. Do not return contaminated oil to the oil reservoir of the hydraulic machine. If the oil is contaminated, return it to the office for proper disposal.<br>• Check operation of oil return pump, if installed. |
| **8.6.5.6:**<br>**Flexible Hoses and Fittings** | Flexible hose(s) and fitting(s) assemblies that are installed between the check valve or control valve and the cylinder on this elevator equipment which are not equipped with an over-speed valve conforming to Requirement 3.19.4.7, will be replaced not more than 6 years beyond the installation date. If no installation or replacement records are available for confirmation, the hoses and fittings should be replaced.<br>Hose assemblies on this elevator equipment that do not indicate an installation or replacement date will be replaced and the replacements will conform to Requirements 3.19.3.3.1(a) through (e) and Requirement 3.19.3.3.2.<br>MAINTENANCE FREQUENCY: **As Needed**<br><br>Examine the machine (pump unit, hydraulic valves, hydraulic pipe, flexible hoses, and muffler). Look for collapsed, weeping or leaking hoses and leaking fittings. Clean the machine and remove any excess oil from the machine pan. Notify a supervisor if any hoses or fittings need to be replaced. When replacing a flexible hose, attach a tag containing the date of the replacement and the names of the company and person performing the work. |

| 8.6.5 HYDRAULIC ELEVATOR TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.5.7:**<br>**Record Oil Usage** | If this elevator equipment has cylinder and/or piping that is NOT exposed for visible inspection, a written record is kept of the quantity of hydraulic fluid added to the system and emptied from leakage collection containers and pans and the written record is kept in the Machine Room.<br>When /if the quantity of hydraulic fluid loss cannot be accounted for, a test specified in Requirements 8.6.5.14.1 and 8.6.5.14.2 will be made.<br>MAINTENANCE FREQUENCY: **As Needed**<br><br>Record fluid added (in gallons) in the Oil Usage Log. Include in this amount oil emptied from oil leakage containers. Report new fluid added to a supervisor.<br><br>**Note:** If any unexplained loss of oil is encountered the elevator must be taken out of service and a full load leak-down test performed to identify the source of the leak. |
| **8.6.5.8:** | If the hydraulic cylinder on this elevator is installed below ground and does NOT conform to 3.18.3.4, the following conditions apply:<br>(a) Car safeties conforming to Requirement 3.17.1 and guide rails, guide-rail supports and fastenings conforming to Requirement 3.23.1 are installed.<br>(b) The elevator is provided with a plunger gripper conforming to requirements 3.17.3. The plunger gripper grips the plunger when the applicable maximum governor tripping speed in Table 2.18.2.1 is achieved. |
| **8.6.5.9:**<br>**Relief Valve Setting** | The relief-valve adjustment on this elevator equipment will be examined to ensure that the seal is intact. If the relief-valve seal is not intact, tests will be conducted in accordance with Requirement 8.11.3.2.1.<br>MAINTENANCE FREQUENCY: **As Needed**<br><br>Check to ensure the relief valve adjustment seal is intact. If the seal is broken or is missing the relief valve must be retested and sealed. |
| **8.6.5.10:**<br>**Roped Hydro:**<br>**Run-By and Clearances after Re-Roping** | Check to ensure all run-by and other clearances are maintained to original specifications following replacement or shortening of the ropes. |

| 8.6.5 HYDRAULIC ELEVATOR TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.5.11: Examine the Cylinder Corrosion Protection Devices and Monitoring Equipment (if applicable)** | Monitored cylinder corrosion protection is installed on this elevator equipment and the monitoring means is examine and maintained.<br><br>**8.6.5.11.1:** Check the condition and functionality of the cylinder protection monitor.<br>**Viewing port in cylinder protection casing:**<br>• Ensure the monitoring port is accessible, e.g. the viewing plug is not frozen or missing or obscured by other installed equipment.<br>• Check the casing for signs of damage.<br>**Electronic monitoring system:**<br>• Check system voltage.<br>• Check wiring for signs of damage. Repair or replace, as required.<br>• Check indicator lights. Replace are required.<br>• Follow additional check-out procedures recommended by the manufacturer.<br><br>**8.6.5.11.2:** If it is determined that the cylinder protection system has failed, it must be repaired or replaced. Notify a supervisor of any such failure. |
| **8.6.5.12:**<br>**Anti-Creep and Low-Oil Protection** | The anti-creep and/or low oil protection on this elevator equipment will be maintained to be in compliance with the applicable code.<br>MAINTENANCE FREQUENCY: **As Needed**<br><br>• Ensure no passengers are in the elevator.<br>• Disable door operation and hall calls with the elevator at a floor above the lowest landing.<br>**Check anti-creep protection**<br>• Open the manual lowering valve slightly until the down valve opens and the car begins to descend.<br>• The pump motor should start when the car reaches a point 1” below the landing and the car should level back up to the floor.<br>• Close the manual relief valve and ensure the car remains level with the floor.<br>**Check low-oil protection**<br>• Disconnect the supply voltage to the motor starter.<br>• Enter an up-car call. The low-oil timer should activate at its preset timing, then the elevator should return to the lowest landing and shut down.<br>• Enable door operation and hall calls.<br>• Ride the elevator and check valve operation. If the anti-creep and low-oil systems operate properly, place the elevator back in service. Notify your supervisor if the anti-creep and low oil systems do not operate properly. |

| 8.6.5 HYDRAULIC ELEVATOR TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.5.13:**<br>**Overspeed Valve Setting** | The over-speed valve will be calibrated and maintained in accordance with the manufacturer's recommendations including replacement of the valves seals or entire valves at intervals specified. All elevators provided with field adjustable over-speed valves will have the adjustment means examined to ensure that the seal is intact.<br>If the over-speed adjustment seal is not intact, compliance with 8.6.5.16.5 will be verified and a new seal will be installed.<br>MAINTENANCE FREQUENCY: **As Needed** |
| **8.6.5.17:**<br>**Plunger Gripper** | • Clean assembly and remove any dirt or debris that could possibly contaminate the unit and prevent it from operating properly.<br>• Manually operate the movable components of the gripper to ensure they move freely and that the jaws grip the plunger securely. |

| DUMBWAITER TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.1.1:**<br>**Suspension & Compensating Ropes Cleaning** | The suspension (and compensating means) on this DW/Mat Lift equipment will be kept sufficiently clean so that they can visually inspected.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Clean the hoist and compensating ropes annually in preparation for an examination of the ropes.<br><br>• Manual cleaning – Wear leather gloves to prevent injury from broken wires. Use a bristle brush (not a wire brush) soaked in gear oil to remove any buildup of dirt from the cables. Remove excess oil with a heavy cloth rag.<br>• Auto-lubricator: Follow the manufacturer's recommendations.<br><br>**Note: Do not use a cleaning solution as it will damage the internal lubrication of the rope.** |
| **8.6.4.1.2:**<br>**Hoist Rope Lubrication** | The steel wire ropes on this DW/Mat Lift equipment will be lightly lubricated and precautions will be taken in lubricating the suspension steel wire ropes to prevent the loss of traction. Lubrication will be in accordance with the instructions on the rope data tag (if provided).<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Examine the hoist ropes and look for the following conditions:<br>• Ropes are dry or the lubricant is stiff<br>• Red dust on the ropes or on the floor<br>• Metal dust under the drive sheave or pulleys<br>• Sheave grooves are dry (no oil on fingertip when wiping) |
| **8.6.4.1.3:**<br>**Hoist Rope Tension** | Equal tension will be maintained between individual suspension members in each set of hoist ropes on this DW/Mat Lift equipment. Tension will be maintained at not more than a 10% difference between the smallest measured tension and the highest measured tension.<br>When suspension-member tension is checked or adjusted, an anti-rotation device will be installed.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Check the tension of the hoist ropes with the top of the cab approximately halfway between the top landing and the counterweight. Use one of the following two methods.<br>3. Measure each rope with a hoist rope tension measuring tool. All hoist ropes must have equal tension.<br>4. Check the tension by pulling each hoist rope in succession with an index finger. Measure the distance each rope deflects using a fixed reference point.<br><br>**Note: Suspension members are considered to be equally tensioned when the smallest tension measured is within 10% of the highest tension measured.** |

| DUMBWAITER TASKS | |
|---|---|
| **TASK** | **PROCEDURE** |
| **8.6.4.2.1:**<br>**Governor Rope** | The Governor Wire Ropes will be kept clean.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Clean the governor rope annually.<br><br>Wear leather gloves to prevent injury from broken wires. Remove any lint or dirt from the governor rope with a heavy cloth rag.<br><br>**Note: Do not use cleaning solution, as it will damage the internal lubrication of the rope** |
| **8.6.4.2.2:**<br>**Governor Rope** | Where applicable, the Governor Wire Ropes will not be lubricated after installation. If lubricants are applied to the governor ropes, they will be replaced or the lubricant removed and the governor and safety will be tested. |
| **8.6.4.3.1:**<br>**Guide Rail Lubrication** | The lubrication of guide rails on this DW/Mat Lift will be in accordance with the requirements on the crosshead data plate.<br>MAINTENANCE FREQUENCY:<br><br>Lubricate the guide rails as noted on the crosshead data plate, if present. |
| **8.6.4.3.2:**<br>**Guide Rail Lubrication** | If no crosshead data plate exists, lubrication of the guide rails will conform to the following:<br>**8.6.4.3.2(a)** Guide rails, except those of elevators equipped with roller or other types of guiding members not requiring lubrication, will be lubricated.<br>**8.6.4.3.2(b)** Where sliding-type safeties are installed, the guide-rail lubricants, or pre-lubricated or impregnated guide shoe gibs, (when installed), will be of a type recommended by the manufacturer of the safety.<br><br>If a data plate is not present, ensure the guide rails are properly lubricated when slide guides are installed. Do not lubricate guide rails on elevators with roller guides installed.<br>• Check the oil level in the guide rail lubricators, if provided. Add oil, if necessary. |
| **8.6.4.3.3:**<br>**Guide Rail Lubrication** | If lubricants, other than those recommended by the manufacturer are used a safety test conforming to Requirement 8.6.4.20.1 will be made to demonstrate that the safety will function as required. |
| **8.6.4.3.4:**<br>**Guide Rail Cleaning** | The guide rails will be kept clean and free of lint, dirt, and accumulation of excessive lubricant. Where applicable, a means is provided at the base of the rails to collect excess lubricant.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Clean the guide rails. Remove any lint, dirt, and accumulation of lubricant.<br><br>Ensure there is a means to collect excess lubricant at the base of the rails. Empty/clean the container. |

| DUMBWAITER TASKS | |
|---|---|
| **TASK** | **PROCEDURE** |
| **8.6.4.3.5:**<br>**Guide Rail Lubrication** | Rust-preventive compounds, such as paint, mixtures of graphite and oil, and similar coatings will not be applied to the guide rail guiding surfaces, unless recommended by the manufacturer of the safety. If such compounds are applied, the safety will be checked as specified in Requirement 8.6.4.20.1. |
| **8.6.4.4.1:**<br>**Buffer Oil Level** | The oil level in the oil buffer(s) will be maintained at the level indicated by the manufacturer and the grade of oil used will be as indicated on the buffer marking plate, where required.<br>MAINTENANCE FREQUENCY:<br><br>Check the oil level in car and counterweight buffers. If low, add oil as noted on the buffer marking plate, or as recommended by the manufacturer. |
| **8.6.4.4.2:**<br>**Oil Buffer Cleaning/Painting** | The buffer plungers will be kept clean and not coated or painted with a substance that will interfere with their operation.<br>MAINTENANCE FREQUENCY:<br><br>Clean the buffer plungers – Remove any paint or other substance that could possibly interfere with its proper operation.<br>• Check alignment of the buffers to the strike plates. Correct any misalignment.<br>• Check security of all buffer fastenings. Tighten as required. |
| **8.6.4.4.3:**<br>**Buffers** | Buffer oil will not be stored in the pit or hoistway or on top of the car. |
| **8.6.4.5.1:**<br>**Safety Mechanisms Cleaning/Lubrication** | Safety mechanisms on this DW/Mat Lift equipment will be kept lubricated and free of rust, corrosion, and dirt that can interfere with the operation of the safety.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Clean the governor rope releasing carrier, the safety linkage, and the safety dogs and wedges. Remove any paint, rust, corrosion or other foreign material that could possibly interfere with the correct operation of the safety mechanisms. |

| DUMBWAITER TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.5.2:**<br>**Safety Mechanisms Clearances** | The required clearances between the safety jaws and the rail will be maintained.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>• Examine the releasing carrier and ensure the spring tension of the releasing carrier is sufficient to prevent the governor rope from pulling out of the carrier during the normal starting and stopping of the DW/Mat Lift. Also check to ensure the governor rope will pull out of the releasing carrier when the governor sets.<br>• Examine the safety dogs or wedges (safety clamps) to ensure they do not touch or ride on the guide rails during normal DW/Mat Lift operation. Clearance on both sides of the rails during normal DW/Mat Lift operation. Clearance on both sides of the rails should be approximately the same and should meet the following requirements:<br>- On elevators built after the 1955 ANSI Code the clearance between the safety's rail-gripping faces must not be less than the thickness of the guide rail plus 9/64 inch there must be a minimum of 1/16 inch between either side of the rail and the rail-gripping face.<br>- On elevators built before the 1955 ANSI Code the clearance between the safety's rail-gripping faces must be less than the thickness of the guide rail plus 3/32 in.<br>- On elevators with wood guide rails the distance between the safety's rail-gripping faces must not be less than the thickness of the rail plus ¼ inch.<br>• Manually move the safety dogs or wedges to ensure they operate freely and smoothly. Remove any dirt or corrosion to ensure smooth operation.<br>• Examine the safety linkage and lift rods to ensure they move freely with the proper clearance. If necessary, lightly lubricate the lift rods and pivot points with bearing oil. |
| **8.6.4.6.1:**<br>**Drive Machine Brake** | The driving machine brake will be maintained to ensure proper operations, including, but not limited to the following:<br>Residual pads (antimagnetic pads)<br>Lining and running clearances<br>Pins and levers<br>Springs<br>Sleeves and guide bushings<br>Discs and drums<br>Brake coil and plunger<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Examine the brake fastenings to ensure the brake is securely mounted. |

| DUMBWAITER TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.6.1 (b)(c)(d)(e)(f)(g): Drum Brake** | Annually, disassemble, examine, and maintain the brake.<br><br>1. Run the DW/Mat Lift in both directions, stopping at the main landing and several other landings. Observe the accuracy of floor stops and listen for abnormal sounds.<br>2. Set the DW/Mat Lift above the top floor and land the counterweights. Turn the power OFF.<br>3. Measure the compressed length of the brake spring(s) and make a note of the length(s).<br>4. Disassemble the brake.<br>5. Examine the brake drum and look for signs of scoring or other damage.<br>6. Examine brake linings and look for signs of wear, scoring, oil contamination or glazing. If any conditions exist that can affect stopping or holding capability of brake, replace linings.<br>7. Check for freedom of movement of the plungers in the sleeves. Check both for excessive wear and/or scoring. Lubricate the plungers and sleeves with non-hardening grease. If possible, rotate the sleeves slightly to equalize wear.<br>8. Examine brake coil and look for signs of overheating or other damage. Replace brake coil if damage exists.<br>9. Manually activate brake contact to ensure free movement. Check to ensure contact opens only when brake is fully picked. If contact is out of adjustment, readjust when brake is picked.<br>10. Remove any paint from pivot pins and lubricate with motor bearing oil.<br>11. Reassemble brake. Ensure springs are placed back in original positions (measure length) and linings fully contact drum.<br>12. Run DW/Mat Lift in both directions, stopping at main landing and several other landings. Observe accuracy of floor stops and listen for abnormal sounds.<br>13. Check functionality and holding capacity of brake. Repeat procedure items if brake is not operating properly. |
| **8.6.4.6.1(b)(d)(f)(g): Disc Brake** | Examine and maintain the brake.<br>1. Run DW/Mat Lift r in both directions, stopping at main landing and several other landings. Observe accuracy of floor stops.<br>2. With DW/Mat Lift operating observe brake operations and:<br>• Listen for abnormal sounds or vibrations.<br>• Check for excessive heat.<br>3. Set elevator above top floor and land counterweights. Turn power OFF.<br>4. Measure thickness of friction disc and check for any contamination or damage. Notify your supervisor is disc needs to be replaced.<br>5. Measure the armature air gap. Adjust, if required.<br>6. Examine all electrical connections and tighten, if required.<br>7. Run DW/Mat Lift in both directions, stopping at main landing and several other landings. Observe accuracy of floor stops. |

| DUMBWAITER TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.6.2** | If any part of the driving machine brake is changed or adjusted that can affect the holding capacity or decelerating capacity of the brake when required it will be adjusted and checked by means that will verify its proper function and holding capacity. A test complying with 8.6.4.20.4 will be performed. |
| **8.6.4.6.3:**<br>**Emergency Brake** | If any part of the emergency brake is changed or adjusted that can affect the holding capacity or decelerating capacity of the emergency brake when required, it will be adjusted and checked by means that will verify its proper function and holding capacity. A test complying with 8.6.4.20.4 will be performed.<br>MAINTENANCE FREQUENCY: **Periodically** |
| **8.6.4.7.1:**<br>**Hoistway and Pit** | Hoistways and pits of this DW/Mat Lift equipment will be kept free of dirt and rubbish and will not be used for storage purposes.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>**Hoistway:** Ensure the hoistway is clean. Dirt, lint, and excess oil in the hoistway, particularly on the rails and brackets, should be removed. The counterweight, sills, and headers should be free of an accumulation of dirt. The bottom and sides of the car should be free of lint and oil. Notify a supervisor if a full hoistway clean down must be performed.<br><br>**Pit:** Remove all debris from the pit. The pit should be broom clean and should not be used for storage purposes. |
| **8.6.4.7.2:**<br>**Cleaning of Hoistways and Pits** | Landing blocks and pipe stands may be stored in the pit; however, they will not interfere with the operation of this elevator equipment and will not present a hazard for persons working in the pit. |
| **8.6.4.7.3:**<br>**Pit Access Door** | Where applicable, pit access doors will be kept closed and locked. |
| **8.6.4.7.4:**<br>**Pit Condition** | Water and oil will not be allowed to accumulate on the pit floor of this DW/Mat Lift equipment.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Check the pit floor for an accumulation of water and oil. Notify a supervisor if either is present. |
| **8.6.4.8.1:**<br>**Condition of Floors** | The floor(s) of machinery and control spaces of this elevator equipment will be kept free of water, dirt, rubbish, oil, and grease.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Sweep the machine room floor. Clean up any oil or grease. Notify a supervisor if water is present. |

| DUMBWAITER TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.8.2:**<br>**Machinery and Control Rooms and Spaces** | Articles or materials not necessary for the maintenance or operation of this elevator equipment will not be stored in the machinery spaces, machine rooms, control spaces, and control rooms.<br><br>Parts should be neatly organized and stored in a cabinet. Used parts should be discarded. |
| **8.6.4.8.3:**<br>**Machinery and Control Rooms and Spaces** | Flammable liquids having a flashpoint of less than 44° C (110° F) will not be in the machinery spaces, machine rooms, control spaces, and control rooms of this DW/Mat Lift equipment.<br><br>Remove any flammable liquids which have a flashpoint of less than 44° C (110° F). Oily rags should be discarded according to hazardous material guidelines. |
| **8.6.4.8.4:**<br>**Machine Room, Machinery Space Access Door(s)** | Access door to the machinery spaces, machine rooms, control spaces, and control rooms of this DW/Mat Lift equipment will be kept closed and locked.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Check to ensure the machine room door is closed and locked. |
| **8.6.4.8.5:**<br>**Machinery Space/Control Space in Hoistway** | Machinery spaces and control spaces located in the hoistway of this DW/Mat Lift equipment will not be used for storage purposes.<br>MAINTENANCE FREQUENCY: **Periodically** |
| **8.6.4.9:**<br>**Cleaning of Car Tops** | The top of this DW/Mat Lift equipment will be kept free of oil, water, dirt, and rubbish and will not be used for storing lubricants, spare parts, tools, or other items.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Wipe down the car top. Remove debris. Do not use the car top for storage of lubricants, parts, tools, or other items. |

| DUMBWAITER TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.10.1:**<br>**Hoist Ropes on Winding Drum Machines** | Examine the condition of the hoist ropes and fastenings with respect to the requirements noted below:<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>**General:** The hoisting ropes of DW/Mat Lift having winding-drum driving-machines with 1:1 roping, if of the babbitted rope socket type, shall be re-socketed, or for other types of fastenings, replaced or moved on the rope to a point above the existing fastening at the car ends at intervals no longer than:<br>• 1 year, for machines located over the hoistway.<br>• 2 years, for machines located below or at the side of the hoistway.<br>• Where auxiliary rope-fastening devices conforming to 2.20.10 are installed, refastening at periods specified is not required, provided that, where such devices are installed, all hoisting ropes shall be refastened on failure or indication of failure of any rope fastening.<br>• Where the elevator is equipped with a drum counterweight, the fastenings shall be examined for fatigue or damage at the socket. Where fatigue or damage is detected, the ropes shall be refastened in conformance with 8.6.4.10.2. |
| **8.6.4.10.2:**<br>**Hoist Ropes on Winding Drum Machines** | **Procedure:**<br>**8.6.4.10.2(a):** Where applicable, when re-socketing babbitted rope sockets or replacing other types of fastenings, a sufficient length shall be cut from the end of the rope to remove damaged or fatigued portions. The fastenings shall conform to 2.20.9. Where the drum ends of the ropes extend beyond their clamps or sockets, means shall be provided to prevent the rope ends from coming out of the inside of the drum and to prevent interference with other parts of the machine.<br>**8.6.4.10.2(b):** The suspension wire ropes shall conform to 2.20.7. |
| **8.6.4.10.3:**<br>**Tags** | A legible metal tag will be securely attached to one of the wire rope fastenings after each re-socketing or changing to another type of fastening and it will bear the following information:<br>(c) The name of the person or firm that performed the re-socketing or changing of other types of fastenings.<br>(d) The date on which the rope was re-socketed or other types of fastenings changed.<br>The material and marking of the tags will conform to 2.16.3.3, except that the height of the letters and figures will not be less than 1.5mm (0.0625in) |
| **8.6.4.11.1:**<br>**Car or Counterweight Run-By and Clearances** | The car and counterweight run-by may be reduced, however, the car or counterweight will not strike the buffer(s). The car and counterweight run-by may be reduced, however the top of car clearances will not be reduced below that required at the time of installation or alteration.<br>The car and counterweight run-by may be reduced, however, the final terminal stopping devices will remain operational.<br>MAINTENANCE FREQUENCY: **Periodically** |

| DUMBWAITER TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.11.2:**<br>**Car or Counterweight Run-By** | Where spring-return oil buffers are provided, and compression was permitted with the car at the terminals the buffer compression shall not exceed 25% of the buffer stroke. |
| **8.6.4.12.1:**<br>**Governor Examination** | The governor(s) on this DW/Mat Lift equipment will be examined to ensure that all seals are intact, and the governor(s) will be manually operated to determine that all moving parts, including rope-grip jaws and switches operate freely.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Examine the governor to ensure the governor seal is present and intact.<br><br>Observe the governor during normal operation. Look for abnormal operation and listen for any abnormal noises or vibrations.<br>14. Remove DW/Mat Lift from service. Turn power OFF.<br>15. Ensure all fastening bolts are secure. Tighten bolts, if necessary.<br>16. Ensure the governor rope runs clear of, and is centered within, the governor grip jaws. Adjust if necessary.<br>17. Lubricate the governor shaft bearing:<br>• Grease fittings<br>• Oil cups<br>18. Lubricate pivot points<br>19. Ensure moving parts are not inhibited by paint or any other foreign substance. Check all moving parts for excessive wear or damage.<br>20. Examine the overspeed switch and check for proper operation.<br>21. Lift the governor weights by hand to make certain the overspeed components move freely. If they do not, repair or replace the faulty components and test the governor.<br>22. Manually trip the governor and ensure proper mechanical functionality of the rope grip jaws.<br>23. Check the condition of the electrical contacts and wiring. Check continuity of the contacts.<br>24. Turn power ON.<br>25. Disable door operation and run the elevator. Observe operation of the governor and ensure it is functioning properly.<br>26. Place elevator back in service. |
| **8.6.4.12.2:**<br>**Governor Maintenance** | The governors, governor ropes and all sheaves will be kept free from contaminants or obstructions, or both that will interfere with the operation or function, including the accumulation of rope lubricant or materials, or both, in the grooves of the governors or sheaves.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>Clean the governor cable during performance of the Shaft Module. |

| DUMBWAITER TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.13.1:**<br>**Door Components** | All landing and car-door or gate mechanical and electrical components will be maintained to ensure safe and proper operation including but not limited to the following:<br>(m) Hoistway door interlocks or mechanical locks and electric contacts<br>(n) Car door electric contacts or car door interlocks<br>(o) Door reopening devices<br>(p) Vision panels and grills<br>(q) Hoistway door unlocking devices and escutcheons<br>(r) Hangers, tracks, door rollers, up-thrusts, and door safety retainers<br>(s) Astragals and resilient members, door space guars, and sight guards<br>(t) Sills and bottom guides, fastenings, condition, and engagement<br>(u) Clutches, engaging vanes, retiring cams, and engaging rollers<br>(v) Interconnecting means<br>(w) Door closers<br>(x) Means to restrict hoistway or car door opening and expiration date for alternate power source, where applicable<br>MAINTENANCE FREQUENCY: **Periodically** |
| **8.6.4.13.1(a):**<br>**Hoistway Door Interlocks or Mechanical Locks and Electric Contacts** | **Check interlock circuit integrity**<br>• Open a landing door and attempt to move the elevator downward (block the door open, if necessary). The elevator should not move.<br><br>**Clean the interlock contacts**<br>• Clean the interlock contacts. Check for pitting, burning or excessive wear. Replace the contacts, as required.<br>• Check for proper contact separation when the hook lifts.<br>• Check for proper contact wipe. The contacts should compress slightly when the hook engages the lock.<br>• Clean the shorting bar contact surface.<br><br>**Check mechanical function of the interlock**<br>• Check to ensure the latching hook moves freely. Lubricate the pin with light machine oil, as required.<br>• Check the latching/locking mechanism for proper alignment and function. Ensure the locked door and door contacts do not open when the door is pushed or pulled by hand.<br>• Check for any misalignment of, or damage to, any landing door components. Replace, as required. |
| **8.6.4.13.1(b):**<br>**Car Door Gate Switch** | Disassemble car door/gate switch and clean contacts. Check contact wipe. Adjust or replace contacts as required. |

| DUMBWAITER TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.13.1(c):**<br>**Door Reopening Devices** | **Electronic Detector**<br>10. Check operation of the detector by placing an object in front of the device at several different heights while the door is in closing mode. The door should immediately stop and reverse direction.<br>11. Check to ensure the detector is securely fastened and properly aligned.<br>12. Check condition of external cables.<br>13. Remove covers from detector units (if applicable) and clean with a damp cloth or fine dry brush.<br>14. Check supply voltages.<br>15. Check all wiring connections and tighten as necessary.<br>16. Visually check internal components for signs of overheating or other damage.<br>17. Check sensitivity settings and adjust if the doors do not reopen promptly when an object is placed in front of the sensor.<br>18. Reinstall any covers previously removed and test the unit again for proper operation.<br><br>**Photo-Electric Device**<br>6. Check operation of the photocells by placing an object in front of each cell while the door is in closing mode. The door should immediately stop and reverse direction.<br>7. Check to ensure the sending and receiving units are securely fastened and properly aligned.<br>8. Check condition of external cables.<br>9. Clean the sending and receiving units with a fine dry brush.<br>10. Clean the lenses with a damp cloth, if necessary.<br><br>**Mechanical Edge**<br>6. Activate the device by retracting the leading edge while the door is in closing mode. The door should immediately stop and reverse direction.<br>7. Check security of all fastenings.<br>8. Check retracting mechanism and lubricate pivot points with 30w oil, if necessary.<br>9. Check condition of external cables.<br>10. Clean and adjust unit, as required.<br><br>**Door Open Button**<br>Press the door open button during the closing cycle. The door should open and then close after reopening time has elapsed. |
| **8.6.4.13.1(d):**<br>**Vision Panels and Grills** | • Check to ensure clear, wired glass is installed and securely fastened and intact.<br>• If unit was installed under A17.1-1990 or later code, ensure a vision panel grill is in place. |

| DUMBWAITER TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.13.1(e):**<br>**Hoistway Door Unlocking Devices and Escutcheons** | Check operation of the emergency door unlocking device. Adjust as required. Adjust the pick mechanism, if required. |
| **8.6.4.13.1(f):**<br>**Hangers, Tracks, Door Rollers, Up-Thrusts, Safety Retainers** | **Examine and maintain the hanger tracks**<br>• Clean tracks of dirt and lubrication build-up, especially at the point the door rollers stop when the door lock is latched.<br>• Check the condition of the tracks. Look for worn rolling surfaces, especially at the point the interlock hook engages the interlock box. Replace tracks, if required.<br>• Lubricate tracks on freight elevators with 30w motor oil, as necessary.<br>• Check alignment of the tracks relative to the sills. Adjust the tracks if they are not parallel to the sills. |
| **8.6.13.1(g):**<br>**Astragals, Resilient Members, Space & Sight Guards** | Check to ensure that the strike jamb bumpers and astragals are in place and are pliable. Repair or replace, as required. |
| **8.6.13.1(h):**<br>**Sills, Bottom Guides, Fastenings, Condition, Engagement** | **Check hoistway door gibs, brackets, fire tabs, and sills.**<br>• Check door gibs and fire tabs for excessive wear and proper sill penetration. Adjust or replace as required.<br>• Check fastenings. Tighten as required.<br><br>**Check Sills**<br>• Check for excessive wear.<br>• Remove debris from sill.<br>• Check fastenings. Tighten as required. |
| **8.6.13.1(i):**<br>**Clutches, Engaging Vanes, Retiring Cams, Engaging Rollers** | • Clean components as required.<br>• Check alignment of the clutch. It should be plumb.<br>• Check the engaging (pick-up) rollers for proper engagement in the clutch and for proper running clearance. These dimensions should be the same at every floor.<br>**Note: If the relationship of the pick-up rollers to the clutch vanes is changing frequently check to ensure the cab stabilizers have not loosened up.**<br>• Check the tension of the retiring came drive belt or chain. Adjust or replace, as required. Lubricate the chain lightly with chain oil. |
| **8.6.4.13.1(j):**<br>**Interconnecting Means** | • Check the condition and alignment of relating cables and sheaves.<br>• Clean, adjust, or replace as required. |
| **8.6.4.13.1(k):**<br>**Door Closers, Where Required** | • Disengage landing door from car door and ensure landing door is self-closing. The door should close automatically after being stopped at any point in its travel. |

| DUMBWAITER TASKS | |
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| **TASK** | **PROCEDURE** |
| **8.6.4.13.1(l):**<br>**Maintain the Door Opening Restriction Device** | • **On elevators installed under A17.1b-1980 through A17.1-2010/CSA-B44-10**, check to ensure the DW/Mat Lift doors cannot be fully opened manually when the elevator is more than 18 inches above or below the landing.<br><br>If the result of the above test is satisfactory, stop the elevator beyond 18 inches above or below the landing and attempt to manually open the doors. The doors should open no more than 4 inches.<br>• **On elevators installed under A17.1-2013/CSA-B44-13 and later editions**, check to ensure the elevator doors cannot be fully opened manually when the elevator is more than 7 inches above or below a landing. Adjust the device as necessary to maintain code required dimensions.<br><br>If the result of the above test is satisfactory, stop the elevator within 3 inches above or below the landing and attempt to manually open the doors. The doors should open.<br>• Ensure the restrictor is securely fastened and properly aligned. Adjust as necessary to maintain proper operation.<br>• Lubricate pivot points annually with bearing oil. |
| **8.6.4.14:**<br>**Hoistway Access Switches** | Hoistway access switches on this DW/Mat Lift equipment will be maintained.<br>MAINTENANCE FREQUENCY: **Periodically**<br><br>• Check hoistway access switches for proper operation. Ensure they cannot be operated outside the code defined zones noted below:<br>- **Lowest Landing:** Car travel in the up direction is limited to the point where the bottom of the platform guard is even with the hoistway entrance header.<br>- **Landing other than the lowest landing:** Car travel in the down direction is limited to the height of the crosshead above the car platform. Car travel in the up direction must be limited to the distance platform guard extends below car platform. |
| **8.6.4.18.1:**<br>**Examine Compensating Sheave and Switch** | The suspension and compensating means will be maintained to prevent the compensating sheave from reaching the upper or lower limit of travel and to prevent the unintended actuation of compensating sheave switches during normal operation.<br>MAINTENANCE FREQUENCY:<br><br>• Examine and clean compensating sheave and ensure it has not reached its upper or lower limits of travel. Adjust, if required.<br>• Lubricate sheave bearings.<br>• Check to ensure the sheave moves freely. Lubricate the sheave frame with bearing grease, if required.<br>• Check operation of the compensating sheave switch to ensure it is mounted securely, operates freely and removes power to the driving machine when actuated. |

# TEST PROCEDURES

This section contains the testing requirements from the A17.1-2013 edition of the Safety code for Elevators and Escalators. It includes the procedures to be performed to complete the tests on most equipment.

However, some units may require that a specific process be followed which is not fully documented here. Before performing any test, always review these procedures relative to the specific equipment being tested to ensure the tests are performed properly and safely.

## CATEGORY 1 TRACTION ELEVATOR TEST PROCEDURE

**NOTE: Category 1 tests are performed with the elevator operation in slow speed, without a load and with the safeties hand tripped.**

The Annual Inspection and Test of traction elevator equipment is performed in two parts – first the Annual Inspections are conducted, and then the Annual Tests. The safety systems do not need to be actuated during the inspection phase – but will be actuated during the test phase.

### 8.6.4.19.1: Oil Buffers

The car and counterweight oil buffers will be tested to determine conformance with the applicable plunger return requirements.

**Category 1 inspection of oil buffers**

- Check to ensure that the hardware holding buffers is in place and is tight.
- Check oil level in buffer to ensure it is within the minimum and maximum limits
  **If the oil is too high or too low, correct to the proper level.**

Check to ensure that the plunger is clean, rust-free, and does NOT have excessive side play.

**Category 1 testing of oil buffers**

Test spring return and gravity return type oil buffers by fully compressing the plunger. Release the plunger and make sure it returns to a fully extended position within 90 seconds.

> **To compress a buffer, place a suitable piece of 4x4 wood block beneath the car or counterweight and the buffer, then run the car or counterweight down at inspection speed.**

Test Type C safety buffers with same procedure.

On spring return buffers, depress the plunger two inches with a 50-pound weight resting on the plunger. Then release the plunger so it can be observed returning to a fully extended position within 30 seconds.

> **The two-inch buffer depression can be accomplished by using a small hydraulic jack between the car and buffer.**

Check the operation of the buffer switch if the buffer is equipped with a switch. For gas spring buffers, make sure the switch removes power from the motor and brake after the plunger has been compressed ½ inch from its fully extended position. With the car running away from the buffer at inspection speed, activate the buffer switch. The elevator must stop.

On Type C buffers, compress buffer 10% and check the switch with an ohmmeter to ensure the switch opens. With buffers fully extended, remove on lead from the switch and make sure the car will not run.

Record the completion of the annual oil buffer rest an annual test tag. This tag must be attached to the buffer with wire. Also record all work completed on a Safety Test Form.

### 8.6.4.19.2: Safeties

All working parts of the car and counterweight safeties will be examined to determine they are in satisfactory operating condition and that they conform to the applicable requirements.

The oil level and operation of the oil buffer compression switch on the Type C safeties will also be checked.

**Category 1 inspection of safeties**

Check the car and counterweight guide shoes and their fasteners to make certain they are properly secured, aligned, and adjusted. Check slide guides or rollers for excessive wear.

Check the clearance between the guide rail and each safety-gripping face.

- On elevators built after the 1955 ANSI code the clearance between the safety's rail-gripping faces must not be less than the thickness of the guide rail plus 9/64 inch and there must be a minimum of 1/16 inch between either side of the rail and the rail-gripping face.
- On elevators built before the 1955 ANSI code the clearance between the safety's rail-gripping faces must be less than the thickness of the guide rail plus 3/32 in.
- On elevators with wood guide rails the distance between the safety's rail-gripping faces must not be less than the thickness of the rail plus ¼ inch.

Look for wear and corrosion on the safety rope on drum-operated Type B safeties. Make sure the rope sheaves are securely fastened and operating.

Before a test is made on drum safeties, the safety drum rope is pulled out until the safety jaws contact and exert pressure on the guide rail. There should be a sufficient number of turns of rope still on the safety drum to allow for additional pull-out of the safety drum rope. These turns are required to make certain the safety will operate properly if the governor actuates in an overspeed condition.

**Reset the safety after this inspection. Keep tension on the safety drum rope to prevent kinking and to wind the rope evenly on the drum without slack.**

Check the crosshead pivot points and linkage for lost motion, loose or missing set screws, and excessive friction. Also check the adjustment of the finger rods and rollers.

**If there is any lost motion in the actuation lever, adjust to eliminate that lost motion. Lost motion and inertia of the governor-rope system may cause the safety to apply unnecessarily under normal starting conditions.**

With the elevator car platform located at a convenient height, check the safety mechanism from the pit. The following conditions must be present.

- Rollers must be in place.
- Finger rods must be in a position to pick up the rollers.
- When the governor rope is pulled to move the finger rods, the roller must move upward freely into the highest wedged positions in the safety block.

**Warning: A safety can fail if there is a jam between the roller and safety block. Check the roller operation several times to make sure that the rollers fall toward the guide rail. When the finger engages the roller, there should not be any tendency for the roller to fall away from the guide.**

- Finger rods are adjusted so the rollers engage at the same time when wedged between the roller pocket and guide rail.

Check the safeties on elevators installed after 1955 to make certain the safety operated switch (SOS) contacts will open before the safety jaws or rollers contact the guide rails. Open the switch manually and attempt to run the elevator to verify it will not run with the SOS contacts open.

Check to see if the self-releasing mechanism, on self-releasing Type A and Type B safeties, is clean, lubricated, and corrosion-free.

**Category 1 testing of safeties**

After the safety has been inspected, position the car or counterweight in the lower portion of the hoistway so that the car will be in a convenient location after the test. Place jumpers to disconnect the switches on the governor and safety (or that part of the safety circuit that would prevent a full setting on the safety).

Start the car or counterweight (whichever is being tested) down at the slowest operating speed and trip the governor by hand. On centrifugal governors that do not have a dropping jaw, engage the flyweight into the starting device before starting the car down. Run the car down until the machine stalls or drives through the hoisting ropes.

Note the governor rope travel distance. The governor rope travel distance must be less than shown when the safety jaws begin to exert pressure against the guide rails. The maximum for governor rope travel distance depends on the car rated speed. This applies only to Type B safeties.

| **MAXIMUM GOVERNOR ROPE TRAVEL** | |
|---|---|
| **Car Safeties** | |
| Car Speed, fpm | Governor Rope Travel, in. |
| 200 | 42 |
| 201-375 | 36 |
| Over 375 | 30 |
| **Counterweight Safeties** | |
| All speeds | 42 |
| 1 fpm = 5.08 E-03 m/s<br>1 in. = 25.4 mm | |

**OPEN** the mainline disconnect switch. **REMOVE** any jumpers and proceed to the safety being tested.

**WARNING: Serious personal injury or death could result from intense arcing if a short should occur during this test. Do not stand directly in front of the mainline disconnect.**

During testing of the safeties, the following conditions must be present.

- All ropes are properly seated on their sheave or drum.
- On Type A safeties, the travel of all safety rollers or dogs should be approximately the same, but not excessive. There should be additional travel, in case the safety is required for an overspeed situation.
- On self-releasing Type B safeties, all four gibs contact the guide rails. On drum-operated Type B safeties, all four rail-gripping faces are in contact with the guide rails.

- On drum-operated safeties that require continual unwinding of the drum to fully apply the safety, more than three turns of rope remain on the drum. This is necessary to meet the requirement of three turns remaining on the drum after a rated-load, rated-speed test.

**Note: Flexible guide clamp safeties that are drum-operated do not require any turns of rope to remain on the drum after a test.**

- Platform is level. Elevators install after 1955 should not be out of level more than 3/8 inch per foot in any direction. Elevators installed before 1955 should not be out of level more than ½ inch per foot in any direction.

Set the counterweight safeties close to the pit or just above the car. In either case, make sure the final location of the car will make the safeties accessible after the test.

Reset the governors and safeties, keeping the following information in mind.

- The Type A safety, or self-releasing Type B safety, is released by moving the car or counterweight up with one short move. After one move, be sure that the governor has released the governor rope. If not, move the governor sheave or the jaw to release the rope.
- The drum-operated Type B safety is released with a safety wrench from inside the car, or at the counterweight. This is a two-person operation. Station the first person on top of the car or in the pit to hold the governor rope so it does not overhaul, while a second person releases and resets the governor. The second person then proceeds to the car or counterweight and releases the safety, while the first person holds back on the rope until the mini-ball moves down to the releasing carrier. Finally, the first person inserts the mini-ball into the releasing carrier, as the second person completes the rope take-up.
- After resetting the governors and safeties, make certain all components of the safeties have returned to normal running positions. There must be no slack in the safety rope. Inspect guide rails for scoring and loose hardware. Dress any scored surfaces with a file. When finished, REMOVE all jumpers
- After completing the test, fill out an annual test tag and attach it to the safety with wire. Fill out a Safety Test Form and return it to your Service Supervisor.

**Category 1 inspection of wood guide rail safeties**

The effectiveness of safeties of this type depends on the initial engagement of the toothed safety jaw to the wood guide rail. Therefore, the condition of the guide rails is a prime consideration in inspecting the equipment. The guide rails must be of first quality hard maple with the width sized to fill the car guide shoe minus the normal running clearance. Replace guide rails that are more than 1/8-inch under-size in width or show evidence of combing (grooving) by the safety jaws.

An inspection of the following items should be made in addition to the governor-rope system and guide rails.

- From the top of the car, inspect all safety-operating parts, including levers and linkage. Make sure that all keys and set screws are in place and tight. Also, make sure there is not an excessive amount of play in the finger rods activating safety jaws.
- From the pit, with the elevator car platform at a convenient height, inspect and apply the safety jaws against the guide rails by pulling the governor rope. The safety jaws should contact both guide rails so that any downward motion of the car would cause the jaw teeth to dig into the rails.

When a safety-operating switch is provided the motion of bringing the safety jaws in contact with the rails should be sufficient to actuate the switch. Open the switch manually and attempt to run the elevator to verify it will not run with the SOS contacts open.

**Category 1 testing of wood guide rail safeties**

With the governor-operated safeties, apply the governor and run the car down from the controller to determine if the governor will operate the safety. Running the car down from the controller consists of actuating contactors in the controller by using nonconductive materials such as wooden sticks.

Continue to run the car down until the hoist ropes slip on traction machines or slacken on drum machines.

For Type A safeties without governors, set blocking in the pit securely, and run the car down slowly. Make sure the jaws come into proper position when a slack rope is obtained.

### 8.6.4.19.3: Governors

The governor on this elevator equipment will be operated manually to determine that all parts, including those which impart the governor pull-through tension to the governor rope, operate freely.

**Category 1 inspection of the governor**

**OPEN** the mainline switch.

Make a general inspection of the governor-rope system, including the condition of the governor, governor rope, governor-rope tension sheave assembly, and the releasing carrier. Make sure all mountings are secure.

Check the rope type to see if it is the type of rope identified on the governor marking plate.

**Note: Governor ropes must not be lubricated.**

With the governor weights extended (spread apart by hand) check to see if all governor components, including the rope-gripping jaws, operate freely. There must NOT be any restriction of motion.

Check all bearings, pins, governor-rope jaws, and rubbing surfaces to see if they are properly lubricated, free of paint, and are not worn excessively.

**Category 1 testing of governor**

**CLOSE** the mainline switch.

Open the governor overspeed (stopping) switch and make sure the elevator cannot be operated. Reset the governor overspeed switch and operate the car at normal speed in each direction. Check to determine if the following possible PROBLEMS exist.

- Governor rope slides on the sheave groove when the car is started or stopped.
- Governor sheave has eccentric or lateral motion.
- Governor rope does NOT run free of the governor jaw at all times.

After testing the governor, the following tasks must be completed.

- Restore the governor release carrier.
- Reset and inspect the governor.
- Fill out a metal test tag and attach it to the governor with a wire.
- Record all work completed on a Safety Test Form.

### 8.6.4.19.4: Slack Rope Device and Stop Motion Switches on Winding Drum Machines

Where applicable the slack-rope device(s) on winding drum machines will be operated manually and tested to determine conformance with the applicable requirements. The final terminal stopping device and the machine final (stop motion switch) will be examined and tested by disabling the normal stopping device, normal terminal stopping device, and final terminal stopping device located in the hoistway and operating the unit to verify proper operation.

**Category 1 inspection of slack-rope device and machine final (stop motion switch) on winding drum machines**

**OPEN** the mainline disconnect switch.

- Manually operate the slack-rope device and machine final (motion stop switch) to ensure all moving parts operate freely.
- Check the slack-rope device to see if it is set as close as possible to the machine drum, so the switch will open with a minimum of slack-rope.
- Manually operate the final terminal stopping device and the machine final (motion stop switch) to ensure all moving parts operate freely.

**Category 1 testing of slack-rope device (winding drum machines)**

- **CLOSE** the mainline switch
- Test the slack-rope device by tripping it with a piece of wood and attempting to move the elevator car. The car must not move.
- If there is any question about the device operating, land the car onto suitable blocking in the pit, and make sure the resulting slack rope will trip the device and stop the car.
- On double-belt winding drum machines, operate the slack-rope device by hand and see that it causes the driving belt to shift to the idler pulley.

**Category 1 testing of machine final (winding drum machines)**

- Disable the normal stopping device, normal terminal stopping device and final terminal stopping device located in the hoistway.
- **CLOSE** the mainline switch.
- Activate the machine final (motion stop switch), then attempt to move the elevator car. The car must not move.

### 8.6.4.19.5: Normal and Final Terminal Stopping Devices

The normal and final terminal stopping devices on this elevator equipment will be examined and tested to determine conformance with the applicable requirements.

**Category 1 testing of normal & final terminal stopping devices**

The normal terminal stopping devices are required to slow down and stop the car at terminal floors independently of operating devices. The usually consist of one or more terminal slow down switches, plus a terminal stop (direction of limit switch).

Before making the annual test of the normal terminal stopping devices, makes rue the terminal stop switches (direction limits) operate. Run the car on INSPECT beyond the terminal floors. The car must stop and only be able to move away from that terminal floor.

Check the electrical functioning of both top and bottom final terminal stop switches before continuing with the following annual normal terminal stop test.

1) Disable the normal stopping means and the emergency terminal stopping device (when used). Do not disable the emergency terminal speed limiting device (if used).
2) Run the (empty) car into both top and bottom terminals at contract speed. Car must slow down and stop near each terminal landing and should not trip the final limit.
3) Restore the normal stopping means and (if used) the emergency terminal stopping device.

**Note: Before testing the final terminal stopping device, see if the potential (safety) switch on the controller is manually or electrically restored. If it is the manual restored type, DO NOT TEST the final terminal stopping device from the car UNLESS someone is in the machine room to reset the controller switch when instructed to do so by the inspector.**

**Warning: If the car move, stop the test until the cause of the movement is corrected. Severe personal injury or death could result if the final terminal stopping device is not working properly.**

Test the terminal stopping device (final limit) with the following procedure.

1) Disable the normal terminal stopping (direction limit) device. (It is not necessary to disable the terminal slow down switches.)
2) Run the car on INSPECT past each terminal floor until the car stops on the final terminal switch. Make sure the car will not move in either direction.
3) Measure and confirm that the actuating cam and final terminal limit switch are properly positioned to be activated for additional travel where the car or counterweight would rest on a fully compressed buffer.
4) Restore the normal terminal stopping device (direction limit portion).

### 8.6.4.19.6: Firefighter's Emergency Operation

Firefighters Service Operations will be tested to determine conformance with the applicable requirements.

Phase I recall will be tested by individually activating fire alarm initiating device inputs to the elevator control, the three-position key switch at the designated landing and, where provided, the two-position switch at the building fire control station.

**Category 1 testing of Firefighter's Service**

***Phase I while elevator is moving***

Place several floor calls in the car. While the elevator is moving up, have the person at the designated level place the Phase I switch in the "ON" position. The following conditions must be true:

- The car stops and reverses without opening the doors, returns to the designated level and parks with power-operated doors open. If there is more than one entrance at the designated landing, only the doors serving the lobby with the fire recall switch open.
- The in-car stop switch or emergency stop switch is inoperative.
- Call-registered lights and directional lanterns are inoperative.
- Position indicators in the car, designated level and central control station are inoperative. All other position indicators function.
- The in-car door open button is rendered inoperative when the elevator moves away from the landing.
- Car call and hall buttons are inoperative.
- The visual and audible signals operate and stay on until car is at designated level.

***Phase I operation with doors open***

Place the Phase I switch to the "**OFF**" position and move the elevator to another floor. With the doors in the open position turn the Phase I switch to the "**ON**" position. The following conditions must be true

- Door reopening devices sensitive to smoke or flame become inoperative immediately. In these situations, the door closing speed is reduced so that the kinetic energy is reduced to 2 ½ ft-lb.
- The emergency stop switch, or in-car stop switch is rendered inoperative as soon as the car moves away from the landing.
- The in-car door open button is rendered inoperative as soon as the car moves away from the landing.

***Phase I operation (Top of car operating device and hoistway access switch)***

While operating from top of car, have the phase I key switch placed in the "ON" position. The following conditions must be true:

- An audible signal sounds.
- The emergency stop switch remains functional.
- The top-of-car operating device maintains control of the elevator.
- The hoistway access switch maintains control of the elevator.

***Phase II operation***

With Phase I activated and the car at the designated or alternate landing, place the Phase II key switch in the "ON" position. Operate the car and ensure the following conditions are true:

- The elevator responds only to the car buttons, and not to hall calls.
- All corridor call buttons, door open and close buttons, and directional lanterns are inoperative. All landing position lanterns are inoperative. All landing position indicators, except at the designated landing and central alarm and control facility, are inoperative. Car position indicators are operative.
- The in-car stop switch or emergency stop switch is inoperative while the car is in motion.
- Doors do not open automatically at any floor except the main floor or alternate level.
- Power-operated doors can only be opened by continuous pressure on the door open button, and if released before the doors are in the normal "OPEN" position, the doors will close automatically without delay.
- Fully open power-operated doors can only be closed by the use of an in-car close button.
- If two entrances can be opened and closed at the same landing, separate door open and close buttons are provided for each entrance.
- All door reopening devices are inoperative (except the door open button). Full speed closing is permitted.
- "CALL CANCEL" button is labeled and when activated, will cancel all calls and cause the car to stop at or before the next available landing.
- Floor selection buttons are provided and functional for all landings without restrictions.
- Moving car will stop at the next landing with a car call registered and remaining car calls will be cancelled.

Make sure the Phase II operation cannot be deactivated after it has been activated. Turn the main floor key to the ON position, and the in-car switch to ON. Take the car to any floor. Turn the main floor key to the OFF position, or if a smoke detector is activated to the BYPASS position and make sure the Phase II operation is maintained until the car is returned to the main floor.

Please a car call above the main floor and while in motion press the "Call Cancel" button and verify that all calls are cancelled, and the car stops at or before the next available landing.

Turn the main floor switch to the OFF position, or BYPASS if a smoke detector is activated. Take the car to a floor above the main floor and turn the in-car switch to the ON position. Make sure the Phase II operation does not operate even if the main floor switch is in the ON position or a smoke detector is activated.

To test the alternate level, turn the main floor key operator switch to the OFF position, and activate the smoke detector. If the smoke detector at a designated level is activated, the elevator should return to an alternate level

designated by an enforcing authority unless the phase 1 switch is activated. Make sure the car returns to the alternate level.

To test the HOLD feature, place the car on Phase II with the key switch in the HOLD position and remove the key. Verify the car remains at the landing and the door close button is inoperative.

### 8.6.4.19.7: Stand-By Emergency Power

Standby or emergency power will be tested to determine conformance with the applicable requirements. Test will be performed with no load in the car.

**Category 1 testing of stand-by (emergency power)**

**NOTE Testing of stand-by (emergency) power is performed with NO LOAD in the car.**

If a stand-by (emergency) power switch is installed, run the elevator to the floor where that switch is installed. Remove elevator(s) from normal service and transfer the system to stand-by power to operate the car(s) with no load. Test the switch which overrides sequence operation, if one is provided. To do this, make several trips and stops, and use a tachometer in the machine room to check the speed of the car(s). Make sure the elevator is running at normal speed (particularly in the up direction). The speed must not exceed 125% of the rated speed.

If a separate power absorption means is used to absorb regenerative power, such as a resister bank, it must be connected on the load side of the elevator. If more than one elevator is designed to operate from the same power source simultaneously, test their simultaneous operation.

### 8.6.4.19.8: Power Operation of Door System

The closing forces and speed of the power-operated hoistway door systems will be tested to determine conformance with the applicable requirements.

The time in the door code zone distance will be measured and compared with the time on the data plate.

**Category 1 testing of door closing force**

1) Park the car at floor level and start the doors closing.
2) Allow the doors to close between one-third and two-thirds of their normal travel, and then stop them.
3) Place a test scale on the leading edge of the hoistway door. Gradually reduce force on the door until it just starts to close, then read the force indicated on the scale. The force must not exceed 30 lbs.

**NOTE: Do not allow the door to strike the scale with an impact. A false reading could result.**

If the elevator was installed under the A17.1-2000/B44 or later code or has a door operator data plate containing this information, verify that the closing time in the code zone is not less than the minimum time shown on the data plate.

### 8.6.4.19.9: Broken Rope, Tape or Chain Switch

The rope, tape, or chain used to connect the motion of the car to the machine room normal limit, the switch that senses failure of this connection shall be tested.

**Category 1 testing of broken rope, tape, or chain switch**

While in the inspection mode on the car top, operate the broken rope, tape or chain switch and attempt to move the car using the top-of-car operating device.

### 8.6.4.19.10: E/E/PES Electrical Protective Devices

Check the functionality of all E/E/PES electrical protective devices to ensure they operate as designed.

SIL rated devices used to satisfy:

- Electrical Equipment & Wiring
- Release and Application of Driving Machine Brakes
- Software Systems for Protection Against Failures
- E/E/PES to remove power from Driving Machine Motor from AC Sources
- E/E/PES to remove power from Driving Machine Motor from DC Sources

Will be identified on wiring diagrams with part identification, SIL, and certification identification information.

A written checkout procedure will be provided that will demonstrate that the SIL rated devices, safety functions, and related circuits operate as intended.

### 8.6.4.19.11: Ascending Car Over-Speed Protection and Unintended Car Movement Devices

#### 8.6.4.19.11(a): Examinations

All working parts of ascending car over-speed protection and unintended car movement devices will be examined to determine that they are in satisfactory condition and that they conform to applicable requirements.

**Category 1 examination of ascending car overspeed and unintended car movement devices.**

Examine all working parts of the ascending car overspeed and unintended car motion devices and ensure both devices operate properly.

#### 8.6.4.19.11(b): Tests

Ascending car overspeed protection will be subjected to tests with no load in the car at the slowest operating speed in the up direction.

**Category 1 testing of ascending car overspeed device.**

1) Operate the elevator in the up direction with no load in the car at the slowest operating speed.
2) Actuate the ascending car overspeed device and ensure the emergency brake applies and prevents the elevator from moving.
3) Once actuated, the switch must be manually reset before the elevator can operate.

**Category 1 testing of unintended car movement device.**

1) Operate the elevator in the up direction with no load in the car at the slowest operating speed.
2) Actuate the unintended car movement device and ensure the emergency brake applies and prevents the elevator from moving.
3) Once actuated, the switch must be manually reset before the elevator can operate.

### 8.6.4.19.12: Traction Loss Detection Means

Traction loss detection means will be demonstrated by:

(a) Causing relative motion between the drive sheave and the suspension means by bottoming the car or Counterweight.
(b) An alternate test. Procedures are provided below:

Where traction loss detection means are installed, land the car or counterweights on the buffers and operate the drive machine. One of the following should occur:

- The hoist ropes should slip in the drive sheave as it rotates, or
- The drive machine should stall **without raising the car or counterweights.**

### 8.6.4.19.13: Broken-Suspension-Member and Residual Strength Detection Means

Testing of the broken-suspension and residual-strength detection means will comply with the following:

The broken-suspension-member detection means will be tested by simulating a slack suspension member or a loss of a suspension member as appropriate (see Requirement 2.20.8.2). Suspension-member residual-strength detection means will be tested to simulate a reduction of residual strength.

### 8.6.4.19.14: Occupant Evacuation Operation

Occupant Evacuation Operation will be tested to determine conformance with applicable requirements.

Deficiencies, if any, will be corrected. A record of test findings will be available to the building owner and AHJ.

### 8.6.4.19.15: Emergency Communications

Emergency communications will be tested to determine conformance with applicable requirements.

Check the condition of all buttons, switches, and visual indicators. Replace any faulty components, as required.

- **Two-way communication:** Place a call on the two-way communication device and ensure the call is responded to correctly, i.e.
  - Call goes to a location staffed by personnel authorized to take appropriate action in an emergency situation.
  - If the call is not acknowledged within 45 seconds the call must be forwarded to an alternate location.
- **Remove/local alarm system (e.g. KRMS, if applicable):**
  Press the voice connection button in the car. Wait for a connection, then perform a test connection to the call center. Verify disconnection of the device following deactivation of the call by the call center. For elevators installed under A17.1-2013 and later editions, verify that the connection automatically disconnects 20 seconds after initial voice notification if the caller does not extend the call.

### 8.6.4.19.16: Means to Restrict Hoistway or Car Door Opening

Means to restrict hoistway or car door opening will be tested to determine conformation with applicable requirements.

- On elevators installed under A17.1b-1980 through A17.1-2010/CSA-B44-10, check to ensure the elevator doors cannot be fully opened manually when the elevator is more than 18 inches above or below a landing.

- If the result of the above test is satisfactory, stop the elevator beyond 18 inches above or below the landing and attempt to manually open the doors. The doors should open no more than 4 inches.
- On elevators installed under A17.1-2103/CSA-B44-13 and later editions, check to ensure the elevator doors cannot be fully opened manually when the elevator is more than 7 inches above or below the landing. Adjust device as necessary to maintain code dimensions.
- If the result of the above test is satisfactory, stop the elevator within 3 inches above or below the landing and attempt to manually open the doors. The doors should open.

**After testing each elevator, record the date of completed test activities on the One Year Test Tags. Attach these test tags to the Safety or Crosshead, Governor, and Oil Buffer.**

**Additionally, complete an Annual Traction Safety Test form, and return to your Service Supervisor.**

## CATEGORY 5 TRACTION ELEVATOR TEST PROCEDURE

### 8.6.4.20.1: Car and Counterweight Safeties

(a) Rated Load, Rated Speed. Car safeties and governors will be tested with rated load in the car. Counterweigh safety tests will be made with no load in the car. The governor will be tripped by hand at rated speed. The following operation conditions will be checked:
   (1) Type B safeties will stop the car with rated load within the required range of stopping distances for which the governor is tripped. The level of the platform will be check for conformance with applicable requirements.
   (2) For Type A safeties and Type A safety parts of Type C safeties, there will be sufficient travel of the safety rollers or dogs remaining after the test to bring the car and its rated load to rest on safety application at governor tripping speed. The level of the platform will be checked for conformance with applicable requirements.

(b) If an alternate test method applies, it will conform with 8.6.11.10 and the following:
   (1) The testing of safeties with any load in the car, centered on each quarter of the platform symmetrically with relation to the centerlines of the platform no load up to rated load, and at not less than rated speed.
      (a) If the alternate test method is performed, the test will stop the car and verify the safeties will be capable of stopping an over-speed car in accordance with Section 2.17 of the ASME A17.1-2016 Safety Code, and as applicable to the specific classification of this elevator.
      (b) If the alternate test method is performed, the method will verify that the safeties perform or are capable of performing in compliance with 8.6.4.20.1(a) and the platform will not be out of level more than 30mm in any direction.
   (2) A test tag will be provided.

**Category 5 testing of car and counterweight safeties**

Test Types A, B and C car safeties (except those on wood guide rails), and their governors, with a rated load in the car. The load should be centered in each quarter of the car, symmetrically as measured from the centerline. Test the counterweight safety without a load in the car. Jump out any governor switches or any part of the safety circuit that will prevent a full setting of the safety, but do NOT jump out the final limit switch.

For Type B safeties, the safety mechanism switch (plank switch) must NOT be jumped out. For the duration of the test, this switch must be temporarily adjusted to open as close as possible to where the car safety mechanism is fully applied. The opening of this switch has an effect on the safety slide, which must be taken into consideration.

To ensure that the safety will retard the car with the minimum assistance from the elevator driving machine and minimize the development of slack rope and fallback of the counterweight, the switch on the car operated by the car safety mechanism should, for the duration of the test, be temporarily adjusted to open as close as possible to the position at which the car safety mechanism is in the fully applied position.

Before setting the car safety, tie down the counterweight safety lift lever with four wraps of 16-gauge copper wire to prevent the counterweight safety from setting accidentally. Do not block the counterweight safety as it must remain operational. Revers the procedure for testing counterweight safeties.

Shut down any adjacent cars. If you are testing a drum type safety, shut down any car adjacent to the releasing carrier, and keep in shut down until all slack in the safety rope is under control. If a safety wrench is to be used, put it in the car and remove the release hole cover on the car floor. Do not insert the wrench into the release hole until after the safety is applied.

Perform the test by moving the car (or counterweight, if testing the counterweight) in the down direction and trip the governor by hand at the rated speed. Let the elevator run until the machine stops or the ropes slip. Type B

safeties must stop the car with the rated load within the required range of stopping distances noted in the table below.

Type A safeties and Type A safety parts of Type C safeties must have sufficient travel of the safety rollers or dogs remaining after the test to bring the car and its rated load to rest should the safeties be applied at governor tripping speed.

**See Table 5Y1**

Following completion of the test:

- Remove any electrical jumpers installed for the test.
- Remove safety tie down wires.
- Reset the governor and inspect for any damage.
- Release the safety, and for all units installed under A17.1-1955 and later editions, check to ensure the platform is within 3/8" of level.
- Check the rails for damage and dress any scored surfaces.
- Check the counterweight safety from the car top. Move the car to a convenient height above the pit floor and check the safety for damage. Check to ensure the safety has returned to the normal running position.
- Examine the driving-machine sheave and all other installed sheaves, retainers and suspension members throughout their entire length to ensure all suspension members are properly seated in their respective sheaves, and that no damage has occurred to sheaves, suspension members, or retainers. The elevator shall not be returned to service until this physical examination has been conducted and any necessary repairs completed.
- Permanently attach a metal test tag to the safety with a wire. Record the date of the test on this tag.
  **Applications record must be affixed to the controller, on which all full load safety applications that occur at rated speed or governor tripping speed must be entered.**
  All safety components must be inspected after each application to monitor wear.

### 8.6.4.20.2: Governors

(a) The tripping speed of the governor and the speed at which the governor over-speed switch operates will be tested to determine conformance with the applicable requirements. The adjustable means will be sealed.
(b) The governor rope pull-through and pull-out forces will be tested to determine conformance with the applicable requirements. The adjustable means will be sealed
(c) In jurisdictions enforcing NBCC:

A metal tag indicating the date of the governor tests will be attached to the governor in a permanent manner.

**Category 5 testing of governor**

Test the tripping speed of the governor overspeed switch (when provided) to make sure the governor trips at a speed which meets ANSI requirements. Perform this test by picking the governor rope sheave and spin the sheave manually or with a variable speed drill motor until the governor trips. Measure governor-tripping speed with a tachometer to determine it meets ANSI requirements (see Table below).

If the governor-tripping speed needs to be adjusted, reset the tension on the spring tension device by carefully adjusting the locknut. After resetting the tension, re-test the governor tripping speed and governor overspeed switch.

After the spring-tension device tension is reset to meet ANSI requirements, seal the locking nut. To complete this task, drill a #36 hole through the locking nut. Then insert a wire seal through the hole and crimp it in place. This

seal helps to hold the tension setting and prevents readjustment of the governor-tripping speed without breaking the seal.

Where speed governors are provided for counterweight safeties, test governors for overspeed. They must trip at a speed greater than the car speed governor is set to trip, but not more than 10% higher.

**See Table 5Y2**

Test the pull-through of governor jaws by the following procedure.

1) Remove the spring tension from the releasing carrier.
2) Trip the governor and prop up the governor tension sheave to allow approximately one foot of movement of the governor rope with lifting the tension sheave.
3) Attach the come-along and dynamometer to the governor rope. Pull at least six inches of the governor rope through the governor by operating the come-along.
4) Note the reading of the dynamometer and compare it with the pull-through force information provided on the Governor Data Tag.

**Note: If a release carrier is used, it must release at no more than 60% of the governor pull-through force. Check by connecting the dynamometer and come-along between the governor rope at the releasing carrier and the existing connection on the governor rope.**

### 8.6.4.20.3: Oil Buffers

**Category 5 testing of oil buffers**

Test the counterweight buffers by running the counterweight onto its buffer at rated speed with no load in the car.

Test car buffers by striking the buffer at the rated speed. Where a reduced strike is used, test by striking the buffer at the speed it was designed for (usually shown on the buffer marking plate).

**Note: Before striking oil buffers, jump out the terminal slowdown and direction switches. Leave the final terminal stopping devices operative. Final terminal stopping devices may need to be temporarily relocated, so the buffer can fully compress during the tests. If the switch is moved, it must be tested after it is relocated.**

1) Where an emergency terminal speed-limiting device is provided, test for proper operation. With normal stopping means and (if separate) the normal terminal stopping devices deactivated, run the car into each terminal with rated load and at rated speed. The stop should be no more severe than a stop produced by running the car into the buffers at the buffer's design speed. The car should stop at each terminal with power removed from the brake and driving machine motor.
2) After the car or counterweight has been removed from the buffer, check for any excessive oil leakage. Also ensure the buffer returns to the fully extended position within 90 seconds.
3) After completing this test, remove any jumpers installed for the test. Then record the test completion on a metal Category 5 Test Tag attached to the oil buffer.

### 8.6.4.20.4: Driving-Machine Brake (Passenger Elevators and Freight Elevators)

The driving-machine brake will be tested for compliance with applicable requirements, in accordance with 8.6.4.20.4(a) or subject to the AHJ with 8.6.4.20.4(b).

Elevators installed under ASME A17.1-2000 and later editions will have the brake setting verified in accordance with the data on the brake marking plate.

Upon completion of the test, the means of adjusting the holding capacity will be sealed to prevent changing the adjustment without breaking the seal. The seal will bear or otherwise attach the identification of the person or firm that installed it.

**8.6.4.20.4(a)** Test the brake with load per Table 8.6.4.20.4 of A17.1-2013. Place the load as shown in Table 8.6.4.20.4 in the car. The driving machine brake, on its own, will hold the car with this load. With no load in the car, the driving machine brake will hold the empty car at rest and will decelerate an empty car traveling in the up direction from governor tripping speed. The driving machine brake on Class 2 Freight Elevators, loaded to their maximum design load, will hold the car at rest.

**8.6.4.20.4(b) Alternate test method for driving-machine brake:**

The alternate test method will comply with 8.6.11.10 and the following:

(1) Any method of verifying conformity of the driving-machine brake with the applicable code requirements and Table 8.6.4.20.4 is permitted, including the testing method of the brakes with or without any load in the car, provided that when applied the method verifies that the brake performs or is capable of performing in compliance.
(2) A test tag as required by 8.6.1.7.2 will be provided.

## 8.6.4.20.5: Reserved for Future Use

## 8.5.4.20.6: Emergency Terminal Stopping and Speed-Limiting Devices

**Category 5 testing of terminal stopping devices**

Note: See the procedure for testing the oil buffers.

**Category 5 testing of speed-limiting device**

Where an emergency terminal speed-limiting device is provided, test for proper operation using the following procedure:

1) With the normal stopping means and (if separate) the normal terminal stopping device deactivated, run the car into each terminal with rated load and at rated speed. The stop should be no more severe than a stop produced by running the car into the buffers at the buffer's design speed.
2) The car should stop at each terminal with power removed from the brake and driving machine motor.

## 8.6.4.20.7: Power Opening of Doors

Examine the power opening of the doors. Make sure power opening can occur only when the car is within 18" of the landing.

**In the case of static control, installed under A17.1 - 1988 and later editions, the person or firm performing the test must demonstrate that power is not applied to open the door when the car is more than 12" from the landing.**

Also, make sure the car is stopped or substantially level with the landing before the hoistway door is fully open.

### 8.6.4.20.8: Landing Zone and Leveling Speed

The leveling speed on this elevator equipment will be checked to determine it does not exceed 0.75 m/s (150 ft/min). For static control elevators, a written checkout procedure demonstrating that the leveling speed with the doors open does not exceed 0.75 m/s (150 ft/min) and the speed-limiting (or speed monitoring) means is independent of the normal means of controlling the speed is provided.

### 8.6.4.20.9: Inner Landing Zone

For static control elevators, verify that the zone in which the car can move, **with the doors open**, is no more than 3 inches above or below the landing.

### 8.6.4.20.10: Braking System, Traction and Traction Limits

Traction and traction limits on traction elevators will be verified for compliance with 2.24.2.3 in accordance with 8.6.4.20.10(a) or subject to the approval of the AHJ.

**Category 5 testing of emergency stopping device**

Note: For elevators installed under A17.1-2000 and alter editions. On counterweighted traction elevators, test the emergency stopping distance and traction drive limits as follows:

1) Move the elevator to an upper landing from where the car can accelerate and reach rated speed.
2) Place 125% of rated load in the car and run the car in the down direction at rated speed.
3) After the car reaches rated speed, open the safety circuit. Ensure the elevator stops and safely holds the load.
4) Land the car or counterweights on the buffers and operate the drive machine in the down direction. One of the following should occur:
   - The hoist ropes should slip in the drive sheave as it rotates, or
   - The drive machine should stall without raising the car or counterweights.

**Alternate test method for braking system, traction and traction limits**

Alternate test methods will comply with 8.6.11.10 and the following:

(1) Other methods for verifying traction for compliance with 2.24.2.3, and traction limits in compliance with 2.24.2.3.4, will be permitted, provided the test method complies with the following:
   (a) When the alternate test method is applied, the method will verify that the elevator traction system performs or is capable of performing with the performance requirements of 8.6.4.20.10(a).
   (b) The braking system and traction relation will be tested to show the system can safely stop and hold the car, and, where required by 2.16.2.2.4(c), will re-level the car without load in the car.

(2) A test tag as required by 8.6.1.7.2 will be provided.

### 8.6.4.20.11: Emergency Brake

**Category 5 testing of emergency brake**

Place 125% of rated load in the car and open the primary brake. The emergency brake should safely hold the load.

**TABLE 5Y 1**

| **MAXIMUM AND MINIMUM STOPPING DISTANCES**<br>TYPE B CAR SAFETIES WITH RATED LOAD & TYPE B COUNTERWEIGHT SAFETIES WITH NO LOAD | | |
|---|---|---|
| **Rated car speed, fpm** | **Stopping distances** | |
| | **Minimum, ft/in** | **Maximum, ft/in** |
| 0-125 | 0-1 | 1-0 |
| 150 | 0-1 | 1-1 |
| 175 | 0-2 | 1-3 |
| 200 | 0-2 | 1-4 |
| 225 | 0-3 | 1-6 |
| 250 | 0-3 | 1-7 |
| 300 | 0-5 | 1-11 |
| 350 | 0-7 | 2-4 |
| 400 | 0-9 | 2-10 |
| 450 | 0-11 | 3-4 |
| 500 | 1-1 | 3-11 |
| 600 | 1-7 | 5-3 |
| 700 | 2-2 | 6-10 |
| 800 | 2-9 | 8-9 |
| 900 | 3-6 | 10-10 |
| 1000 | 4-4 | 13-2 |
| 1100 | 5-2 | 15-9 |
| 1200 | 6-2 | 18-7 |
| 1300 | 7-3 | 21-8 |
| 1400 | 8-5 | 25-0 |
| 1500 | 9-8 | 28-7 |
| 1600 | 11-0 | 32-5 |
| 1700 | 12-5 | 36-5 |
| 1800 | 13-11 | 40-9 |
| This table is for rated load, rated speed test only<br>1 fpm = 5.08 E-03 m/s 1 in = 25.4 mm | | |

**TABLE 5Y 2**

| MAXIMUM CAR SPEEDS AT WHICH GOVERNOR TRIPS & GOVERNOR OVERSPEED SWITCH OPERATES | | |
|---|---|---|
| **FPM** | **Max Car Governor Trip Speed (ft/min)** | **Max speed at which Gov Overspeed Switch Operates, Down (ft/min)** |
| 0-125 | 175 | 175* |
| 150 | 210 | 210* |
| 175 | 250 | 225 |
| 200 | 280 | 252 |
| 225 | 308 | 277 |
| 250 | 337 | 303 |
| 300 | 395 | 355 |
| 350 | 452 | 407 |
| 400 | 510 | 459 |
| 450 | 568 | 512 |
| 500 | 625 | 563 |
| 600 | 740 | 703 |
| 700 | 855 | 812 |
| 800 | 970 | 921 |
| 900 | 1085 | 1031 |
| 1000 | 1200 | 1140 |
| 1100 | 1320 | 1254 |
| 1200 | 1440 | 1368 |
| 1300 | 1560 | 1482 |
| 1400 | 1680 | 1596 |
| 1500 | 1800 | 1710 |
| 1600 | 1920 | 1824 |
| 1700 | 2040 | 1938 |
| 1800 | 2160 | 2052 |
| *Gov overspeed switch not required on car speed governor<br>1 fpm = 5.08 E-03 m/s<br>1 in = 25.4 mm | | |

## CATEGORY 1 HYDRAULIC ELEVATOR TEST PROCEDURE

### 8.6.5.14.1: Relief Valve Verification of Setting and System Pressure Test

The relief valve setting will be tested to determine that it will bypass the full output of the pump before the pressure exceeds 150% of the working pressure. Once this is established, the entire system pressure will be tested to ensure that it will withstand this pressure. The valve will be resealed if the relief pressure is altered or the seal is broken.

**Category 1 testing of relief valve**

1) Disable hall calls and door operation.
2) Land the car in the pit.
3) Turn OFF power to the elevator.
4) Install a pressure gauge in the relief valve port.
5) Close the manual shut off valve to the jack.
6) Turn ON power to the elevator.
7) Use a run button to run the elevator up at rated speed. Watch the pressure gauge.
   **Note: Be ready to shut the pump down immediately if the system pressure exceeds 150% of the system working pressure.** The relief valve must bypass the full output of the pump at a pressure between 125% and 150% of the working pressure and be able to withstand this pressure for 15 seconds.
   - **Pass:** If the test of the relief valve is successful, go to step 8.
   - **Fail:** If the relief valve requires readjustment, make the necessary adjustment and perform step 7 again. When the relief valve is adjusted to bypass the full output of the pump at a pressure between 125% and 150% of the working pressure, go to step 8.
8) Check all oil lines and fitting between the hydraulic control valve and the manual shut off valve to the jack to ensure there are no leaks. If any leaks are discovered, lockout and tagout the elevator and notify a supervisor. If no leaks are discovered, go to step 9.
9) Open the manual shut off valve to the jack and perform the **Category 1 test of system pressure** which follows.

**Category 1 testing of system pressure**

1) Move the elevator to the uppermost landing.
2) Slowly inch the elevator up against the stop ring.
3) Use a run button to run the elevator up at rated speed. Watch the pressure gauge.
   **Note: Be ready to shut the pump down immediately if the system pressure exceeds 150% of the system working pressure.** The relief valve must bypass the full output of the pump at a pressure between 125% and 150% of the working pressure and be able to withstand this pressure for 15 seconds.
4) Following the test:
   - Visually check the system for signs of oil leakage.
   - Run the elevator and ensure it is operating properly.
   - If adjustments have been made to the relief valve, or if the seal is broken or missing, place a new seal on the relief valve.
   - Test flexible hoses and fittings, if installed. See 8.6.5.14.4 below.
   - Enable the hall calls and door operation.
   - Record all work completed on a Safety Test Form and return it to your supervisor.

### 8.6.5.14.2: Hydraulic Cylinders and Pressure Piping

The following test will be performed after the relief valve setting and system pressure test in Requirement 8.6.5.14.1.

(a) Exposed cylinder and pressure piping will be visually examined.
(b) Unexposed cylinder and pressure piping will be tested for leakage not accounted for by visual examination and the duration of the test will be a minimum of 15 minutes.

**Category 1 testing of hydraulic cylinders and pressure piping** Perform this test immediately following the system pressure test.

1) Move the car, with no load, to a convenient location in the hoistway.
2) Measure the location of the platform relative to a fixed reference point.
3) Measure the oil level in the oil reservoir relative to a fixed reference point.
4) Open the main disconnect switch. Wait 15 minutes.
5) Check to ensure that any change in position of the car can be fully explained, e.g. increased oil level in the reservoir or visible leakage. If a change in car position cannot be explained, lockout and tagout the elevator until the source of the leakage is discovered and corrected.

## 8.6.5.14.3(a): Normal and Final Terminal Stopping Devices

The normal and final terminal stopping devices on this elevator equipment will be examined and tested to determine conformance with the applicable requirements.

**Category 1 testing of normal terminal stopping devices**

The normal terminal stopping devices are required to slow down and stop the car at terminal floor independently of operating devices. The usually consist of one or more terminal slowdown switches, plus a terminal stop (direction limit) switch.

Before making the annual test of the normal terminal stopping devices, make sure the terminal stop switches (direction limits) operate. Run the car on INSPECT beyond the terminal floors. The car must stop and only be able to move away from that terminal floor.

Check the electrical function of both top and bottom final terminal stop switches before continuing with the following annual normal terminal stop test.

1) Disable the normal stopping means and the emergency terminal stopping device (when used).
2) Do not disable the emergency terminal speed limiting device (if used).
3) Run the (empty) car into both the top and bottom terminals at rated speed. The car must slow down and stop near each terminal landing and should not trip the final limit.
4) Restore the normal stopping means and check for proper operation.

## 8.6.5.14.3(b): Governors

**Category 1 inspection of governor**

**OPEN** the mainline switch.

Make a general inspection of the governor-rope system, including the condition of the governor, governor rope tension sheave assembly, and the releasing carrier. Make sure all mountings are secure.

Check the rope type to see if it is the type of rope identified on the governor marking plate.

**NOTE: Governor ropes must not be lubricated.**

With the governor weights extended (spread apart by hand), check to see if all governor components, including the rope-gripping jaws, operate freely. There must NOT be any restriction of motion.

Check all bearings, pins, governor-rope jaws, and rubbing surfaces to see if they are lubricated, free of paint, and are not worn excessively.

**Category 1 testing of governor**

**Close** the mainline switch.

Open the governor overspeed (stopping) switch and make sure the elevator cannot be operated.

Reset the governor overspeed switch and operate the car at normal speed in each direction.

Check to determine if the following possible PROBLEMS exist:

- Governor rope slides on the sheave groove when the car is started or stopped.
- Governor sheave has eccentric or lateral motion.
- Governor rope does NOT run free of the governor jaw at all times.

After testing the governor, the following tasks must be completed:

- Inspect the governor rope at the point of connection for any damage.
- Restore the governor release carrier.
- Reset and inspect the governor.
- Fill out a metal test tag and attach it to the governor with wire.
- Record work completed on a Safety Test Form.

## 8.6.5.14.3(c): Safeties

**Category 1 inspection of safeties**

Check the car and counterweight guide shoes and their fasteners to make certain they are properly secured, aligned, and adjusted. Check slide guides or rollers for excessive wear.

Check the clearance between the guide rail and each safety- gripping face, on elevators built after the 1955 ANSI Code. the clearance between the safety's rail-gripping faces on elevators built after 1955 must not be less than the thickness of the guide rail plus 9/64 inch. There must be a minimum of 1/16 inch between either side of the rail and the rail-gripping face.

Check the clearance between guide rail and each safety-gripping face, on elevators built before the 1955 ANSI Code. Clearance between the rail-gripping faces must not be less than the thickness of the guide rail plus 3/32 inch.

Check the distance between the rail-gripping faces on elevators with wood guide rails. The distance must not be less than the thickness of the rail plus 1/4 inch.

Look for wear and corrosion on the safety rope on drum-operated Type B safeties. Make sure the rope sheaves are securely fastened and operating.

Before a test is made on drum safeties, the safety drum rope is pulled out until the safety jaws contact and exert pressure on the guide rail. There should be a sufficient number of turns of rope still on the safety drum, to allow for additional pull-out of the safety drum rope. These turns are required to make certain the safety will operate properly if the governor actuates in an overspeed condition.

> **Reset the safety after this inspection. Keep tension on the safety drum rope to prevent kinking and to wind the rope evenly on the drum without slack**

Check the crosshead pivot points and linkage for lost motion, loose or missing set screws, and excessive friction. The adjustments of the finger rods and rollers are also checked. Remove any lost motion in the actuation lever.

> **If there is any lost motion in the actuation lever, adjust to eliminate that lost motion. Lost motion and inertia of the governor-rope system may cause the safety to apply unnecessarily under normal starting conditions.**

With the elevator car located at a convenient height, check the safety mechanism from the pit. The following conditions must be true.

- Rollers must be in place.
- Finger rods must be in a position to pick up the rollers.
- When the governor rope is pulled to move the finger rods, the roller must move upward freely into the highest wedged positions in the safety block.

**Warning: A safety can fail if there is a jam between the roller and safety block. Check the roller operation several times to make sure that the rollers fall toward the guide rail. When the finger engages the roller, there should not be any tendency for the roller to fall away from the guide rail.**

- Finger rods are adjusted so the rollers engage at the same time when wedged between the roller pocket and guide rail.

Check the safeties on elevators installed after 1955 to make certain the safety switch contacts will open before the safety jaws or rollers contact the guide rails. Then, when the safety switch is operated by hand, the car will not run when the safety switch is open.

**Category 1 testing of safeties**

For counterweight safeties actuated by slack or broken suspension ropes:

1) Place and extended jack and blocking under the counterweight.
2) Slowly move the car in the up direction until the counterweight contacts the block on the jack.
3) Jump the slack rope device.
4) Lower the jack to create a slack rope condition, then verify that the safety operated, and that it will safely stop and hold the counterweight. Following this procedure, the elevator should not be able to operate until the slack rope device and safety operated switch are reset.
5) Reset the slack rope and safety operated switches.
6) Check operation of the elevator.

For car safeties actuated by slack or broken suspension means, follow the procedures above, but place the jack under the car instead of the counterweight.

## 8.6.5.14.3(d): Oil Buffers

The car and counterweight oil buffers will be tested to determine the conformance with the applicable plunger return requirements.

**Category 1 inspection of oil buffers**

Check to see if the hardware holding buffers is in place and is tight.

Check oil level in buffer to ensure it is within the minimum and maximum limits.

**If the oil is too high or too low, correct to the proper level.**

Check to see if the plunger is clean, rust-free, and does NOT have excessive side play.

**Category 1 testing of oil buffers**

Test spring return and gravity return type oil buffers by fully compressing the plunger. Release the plunger and make sure it returns to a fully extended position within 90 seconds.

**To compress a buffer, place a suitable piece of 4x4 wood block beneath the car or counterweight and the buffer, then run the car or counterweight down at inspection speed.**

Test Type C safety buffers with same procedure.

On spring return buffers, depress the plunger two inches with a 50-pound weight resting on the plunger. Then release the plunger, so it can be observed returning to a fully extended position within 30 seconds.

**The two-inch buffer depression can be accomplished by using a small hydraulic jack between the car and buffer.**

Check the operation of the buffer switch if the buffer is equipped with a switch. For gas spring buffers, make sure the switch removes power from the motor and brake after the plunger has been compressed ½ inch from its fully extended position. With the car running away from the buffer at inspection speed, activate the buffer switch. The elevator must stop.

On Type C buffers, compress buffer 10% and check the switch with an ohmmeter to ensure the switch opens. With buffers fully extended, remove one lead from the switch and make sure the car will not run.

Record the completion of the annual oil buffer test on an annual test tag. This tag must be attached to the buffer with wire. Also record all work completed on a Safety Test Form.

## 8.6.5.14.3(e): Firefighters' Emergency Operation

Firefighters Service Operation will be tested to determine conformance with the applicable requirements.

**Category 1 testing of Firefighters' Service**

***Phase I while elevator is moving***

Place several floor calls in the car. While the elevator is moving up, have the person at the designated level place the Phase I switch in the "ON" position. The following conditions must be true.

- The car stops and reverses without opening the doors, returns to the designated level and parks with power-operated doors open. If there is more than one entrance at the designated landing, only the doors serving the lobby with the fire recall switch open.
- The in-car stop switch or emergency stop switch is inoperative.
- Call-registered lights and directional lanterns are inoperative.
- Position indicators in the car, designated level and central control station are inoperative. All other position indicators function.
- The in-car door open button is rendered inoperative when the elevator moves away from the landing.
- Car call and hall buttons are inoperative.
- The visual and audible signals operate and stay on until car is at the designated level.

***Phase I operation with doors open***

Place the Phase I switch to the "**OFF**" position and move the elevator to another floor. With the doors in the open position turn the Phase I switch to the "**ON**" position. The following conditions must be true.

- Door reopening devices sensitive to smoke or flame become inoperative immediately. In these situations the door closing speed is reduced so that the kinetic energy is reduced to 21/.2 ft-lb.
- The emergency stop switch, or in-car stop switch is rendered inoperative as soon as the car moves away from the landing.
- The in-car door open button is rendered inoperative as soon as the car moves away from the landing.

***Phase I operation (Top of car operating device and hoistway access switch)***

While operating from top of car, have the Phase I key switch placed in the "ON" position. The following conditions must be true.

- An audible signal sounds.
- The emergency stop switch remains functional.
- The top-of-car operating device maintains control of the elevator.
- The hoistway access switch maintains control of the elevator.

***Phase II operation***

With Phase I activated and the car at the designated or alternate landing, place the Phase II key switch in the "ON" position. Operate the car and to ensure the following conditions are true.

- The elevator responds only to the car buttons, and not to hall calls.
- All corridor call buttons, door open and close buttons, and directional lanterns are inoperative. All landing position lanterns are inoperative. All landing position indicators, except at the designated landing and central alarm and control facility, are inoperative. Car position indicators are operative.
- The in-car stop switch or emergency stop switch is inoperative while the car is in motion.
- Doors do not open automatically at any floor except the main floor or alternate level.
- Power-operated doors can only be opened by continuous pressure on the door open button, and if released before the doors are in the normal "OPEN" position, the doors will close automatically without delay.
- Fully open power-operated doors can only be closed by the use of an in-car close button.
- If two entrances can be opened and closed at the same landing, separate door open and close buttons are provided for each entrance.
- All door reopening devices are inoperative (except the door open button). Full speed closing is permitted.
- "CALL CANCEL" button is labeled and when activated, will cancel all calls and cause the car to stop at or before the next available landing.
- Floor selection buttons are provided and functional for all landings without restrictions.
- Moving car will stop at the next landing with a car call registered and remaining car calls will be canceled.

Make sure the Phase II operation cannot be deactivated after it has been activated. Turn the main floor key to the ON position, and the in-car switch to ON. Take the car to any floor. Turn the main floor key to the OFF position, or if a smoke detector is activated to the BYPASS position and make sure the Phase II operation is maintained until the car is returned to the main floor.

Place a car call above the main floor and while in motion press the "Call Cancel" button and verify that all calls are cancelled, and the car stops at or before the next available landing.

Turn the main floor switch to the OFF position, or BYPASS if a smoke detector is activated. Take the car to a floor above the main floor and turn the in-car switch to the ON position. Make sure the Phase II operation does not operate even if the main floor switch is in the ON position or a smoke detector is activated.

To test the alternate level, turn the main floor key operated switch to the OFF position, and activate the smoke detector. If the smoke detector at a designated level is activated, the elevator should return to an alternate level designated by an enforcing authority unless the Phase I switch is activated. Make sure the car returns to the alternate level.

To test the HOLD feature, place the car on Phase II with the key switch in the HOLD position and remove the key. Verify the car remains at the landing and the door close button is inoperative.

## 8.6.5.14.3(f): Stand-By or Emergency Power Operation

Standby or emergency power will be tested to determine conformance with the applicable requirements. Tests will be performed with no load in the car.

**Category 1 testing of stand-by (emergency) power**

**Note: Testing of stand-by (emergency) power is performed with NO LOAD in the CAR.**

If a stand-by (emergency) power switch is installed, run the elevator to the floor where that switch is installed. Remove elevator(s) from normal service and transfer the system to stand-by power to operate the car(s) with no load. Test the switch which overrides sequence operation, if one is provided. To do this, make several trips and stops, and use a tachometer to check the speed (particularly in the up direction). The speed must not exceed 125% of the rated speed.

If a separate power absorption means is used to absorb regenerative power, such as a resister bank, it must be connected on the load side of the elevator. If more than one elevator is operated from the same power source simultaneously, test their simultaneous operation.

### 8.6.5.14.3(g): Power Operations of Door System

The closing forces and speed of the power-operated hoistway door systems will be tested to determine conformance with the applicable requirements. The time in the door code zone distance with be measured and compared with the time specified on the data plate.

Examine the power opening of the doors. Make sure power opening can occur only when the car is within 18" of the landing.

**In the case of status control, installed under A17.1-1988 and later editions, the person or firm performing the test must demonstrate that power is not applied to open the doors when the car is more than 12" from the landing.**

Also, make sure the car is stopped or substantially level with the landing before the hoistway door is fully opened.

### 8.6.5.14.3(h): Emergency Terminal Stopping and Speed-Limiting Devices

The emergency terminal and devices on this elevator equipment will be tested for conformance with the applicable requirements.

**Category 1 testing of emergency terminal speed limiting device:**

1) Actuate the device and move the elevator in the down direction.
2) Attempt to move the car at rated speed in the up direction. The speed should be limited to 100 fpm or less.

**Category 1 testing of emergency terminal stopping device:**

Actuate the device and ensure that power is removed from the drive motor.

### 8.6.5.14.3(i): Low Oil Protection Operation

The anti-creep and low oil protection shall be tested for conformance with the applicable codes.

**Category 1 testing of low oil protection device**

1) Place the elevator at any floor above the lowest landing with the doors closed.
2) Disconnect the hall calls.
3) Actuate the low oil protection device.
4) The elevator should return to the bottom floor and the doors should remain closed, with the hall call inoperative.

### 8.6.5.14.4: Flexible Hose and Fitting Assemblies

**Category 1 testing of flexible hose and fitting assemblies**

1) Slowly inch the elevator up against the stop ring.
2) Use a run button to run the elevator up at rated speed with the relief valve in bypass mode for a period of 30 seconds.
3) Observe the hoses and fittings and look for any bulging, distortion or leaking. If any of the aforementioned are observed, the affected component(s) must be replaced.
4) Following the test secure a test tag to the hose.

### 8.6.5.14.5: Pressure Switch

The pressure switch and its related circuits on this elevator equipment will be tested for conformance with applicable requirements.

**Category 1 testing of pressure switch**

1) Place the elevator at any floor above the lowest landing.
2) Open the circuit to the pressure switch.
3) Attempt to run the car in the down direction. The car should not move.
4) Place an ohmmeter across the pressure switch leads. Open the main line disconnect switch and lower the car by opening the manual lowering valve. When the car lands on the buffer the ohmmeter should indicate an open circuit.

### 8.6.5.14.6: Power Operation of Door System

The closing forces and speed of the power-operated hoistway door systems will be tested to determine conformance with the applicable requirements. (Ref. item1.8.2). The time in the door code zone distance will be measured and compared to the time specified on the data plate.

**Category 1 testing of door closing force**

1) Park the car at floor level and start the doors closing.
2) Allow the doors to close between one-third and two-thirds of their normal travel, and then stop them.
3) Place a test scale on the leading edge of the hoistway door. Gradually reduce force on the door until it just starts to close, then read the force indicated on the scale. The force must not exceed 30 lb.

**Note: Do not allow door to strike the scale with an impact. A false reading could result.**

If the elevator was installed under the A17.1-2000/B44 or later code or has a door operator data plate containing this information, verify that the closing time in the code zone is not less than the minimum time shown on the data plate.

### 8.6.5.14.7: Slack-Rope Device

**Category 1 testing of slack rope device**

Activate the slack rope device and ensure that it removes power from the pump motor and lower valve.

# CATEGORY 3 HYDRAULIC ELEVATOR TEST PROCEDURE

### 8.6.5.15.1: Unexposed Portions of Pistons

**Category 3 inspection of unexposed portions of pistons**

On roped water-hydraulic elevators, clean the piston and examine it for signs of any damage which may cause excessive leakage.

Check all piston fastenings to ensure the piston is securely fastened to the frame of the car.

Check to ensure a proper oil recovery container is present. Empty the container, if necessary.

### 8.6.5.15.2: Pressure Vessels

The pressure vessel will be checked to determine conformance with the applicable requirements, thoroughly cleaned, internally examined, and then subjected to a hydrostatic test at 150% of the working pressure for 1 minute.

**Category 3 testing of pressure vessels**

Thoroughly clean the tank and inspect for any damage.

1) Install a pressure gauge with a maximum reading at least twice that of working pressure of the tank.
2) Fill the tank with water, taking care to ensure all air is removed from the tank.
3) Using a hand pump, apply pressure of 150% or the working pressure to the tank.
4) Hold the pressure at that level for one minute and check for leaks or damage.
5) If a rapid loss of pressure is observed, lockout and tagout the unit until necessary repairs are completed.

## CATEGORY 5 HYDRAULIC ELEVATOR TEST PROCEDURE

### 8.6.5.16.1: Governors, Safeties, and Oil Buffers

See items 8.6.4.20.1, 8.6.4.20.2, and 8.6.4.20.3

**SAFETIES**

**8.6.4.20.1: Car and Counterweight Safeties**

(a) Rated Load, Rated Speed. Car safeties and governors will be tested with rated load in the car. Counterweigh safety tests will be made with no load in the car. The governor will be tripped by hand at rated speed. The following operation conditions will be checked:
   (1) Type B safeties will stop the car with rated load within the required range of stopping distances for which the governor is tripped. The level of the platform will be check for conformance with applicable requirements.
   (2) For Type A safeties and Type A safety parts of Type C safeties, there will be sufficient travel of the safety rollers or dogs remaining after the test to bring the car and its rated load to rest on safety application at governor tripping speed. The level of the platform will be checked for conformance with applicable requirements.

(b) If an alternate test method applies, it will conform with 8.6.11.10 and the following:
   (1) The testing of safeties with any load in the car, centered on each quarter of the platform symmetrically with relation to the centerlines of the platform no load up to rated load, and at not less than rated speed.
      (a) If the alternate test method is performed, the test will stop the car and verify the safeties will be capable of stopping an over-speed car in accordance with Section 2.17 of the ASME A17.1-2016 Safety Code, and as applicable to the specific classification of this elevator.
      (b) If the alternate test method is performed, the method will verify that the safeties perform or are capable of performing in compliance with 8.6.4.20.1(a) and the platform will not be out of level more than 30mm in any direction.
   (2) A test tag will be provided.

**Category 5 testing of car and counterweight safeties**

Test Types A, B and C car safeties (except those on wood guide rails), and their governors, with a rated load in the car. The load should be centered in each quarter of the car, symmetrically as measured from the centerline. Test the counterweight safety without a load in the car. Jump out any governor switches or any part of the safety circuit that will prevent a full setting of the safety, but do NOT jump out the final limit switch.

For Type B safeties, the safety mechanism switch (plank switch) must NOT be jumped out. For the duration of the test, this switch must be temporarily adjusted to open as close as possible to where the car safety mechanism is fully applied. The opening of this switch has an effect on the safety slide, which must be taken into consideration.

To ensure that the safety will retard the car with the minimum assistance from the elevator driving machine and minimize the development of slack rope and fallback of the counterweight, the switch on the car operated by the car safety mechanism should, for the duration of the test, be temporarily adjusted to open as close as possible to the position at which the car safety mechanism is in the fully applied position.

Before setting the car safety, tie down the counterweight safety lift lever with four wraps of 16-gauge copper wire to prevent the counterweight safety from setting accidentally. Do not block the counterweight safety as it must remain operational. Revers the procedure for testing counterweight safeties.

Shut down any adjacent cars. If you are testing a drum type safety, shut down any car adjacent to the releasing carrier, and keep in shut down until all slack in the safety rope is under control. If a safety wrench is to be used, put it in the car and remove the release hole cover on the car floor. Do not insert the wrench into the release hole until after the safety is applied.

Perform the test by moving the car (or counterweight, if testing the counterweight) in the down direction and trip the governor by hand at the rated speed. Let the elevator run until the machine stops or the ropes slip. Type B safeties must stop the car with the rated load within the required range of stopping distances noted in the table below.

Type A safeties and Type A safety parts of Type C safeties must have sufficient travel of the safety rollers or dogs remaining after the test to bring the car and its rated load to rest should the safeties be applied at governor tripping speed.

**See Table 5Y1**

Following completion of the test:

- Remove any electrical jumpers installed for the test.
- Remove safety tie down wires.
- Reset the governor and inspect for any damage.
- Release the safety, and for all units installed under A17.1-1955 and later editions, check to ensure the platform is within 3/8" of level.
- Check the rails for damage and dress any scored surfaces.
- Check the counterweight safety from the car top. Move the car to a convenient height above the pit floor and check the safety for damage. Check to ensure the safety has returned to the normal running position.
- Examine the driving-machine sheave and all other installed sheaves, retainers and suspension members throughout their entire length to ensure all suspension members are properly seated in their respective sheaves, and that no damage has occurred to sheaves, suspension members, or retainers. The elevator shall not be returned to service until this physical examination has been conducted and any necessary repairs completed.
- Permanently attach a metal test tag to the safety with a wire. Record the date of the test on this tag. **Applications record must be affixed to the controller, on which all full load safety applications that occur at rated speed or governor tripping speed must be entered.**
  All safety components must be inspected after each application to monitor wear.

**GOVERNORS**

**8.6.4.20.2: Governors**

(a) tripping speed of the governor and the speed at which the governor over-speed switch operates will be tested to determine conformance with the applicable requirements. The adjustable means will be sealed.
(b) The governor rope pull-through and pull-out forces will be tested to determine conformance with the applicable requirements. The adjustable means will be sealed
(c) In jurisdictions enforcing NBCC:

A metal tag indicating the date of the governor tests will be attached to the governor in a permanent manner.

**Category 5 testing of governor**

Test the tripping speed of the governor overspeed switch (when provided) to make sure the governor trips at a speed which meets ANSI requirements. Perform this test by picking the governor rope sheave and spin the sheave manually or with a variable speed drill motor until the governor trips. Measure governor-tripping speed with a tachometer to determine it meets ANSI requirements (see Table below).

If the governor-tripping speed needs to be adjusted, reset the tension on the spring tension device by carefully adjusting the locknut. After resetting the tension, re-test the governor tripping speed and governor overspeed switch.

After the spring-tension device tension is reset to meet ANSI requirements, seal the locking nut. To complete this task, drill a #36 hole through the locking nut. Then insert a wire seal through the hole and crimp it in place. This seal helps to hold the tension setting and prevents readjustment of the governor-tripping speed without breaking the seal.

Where speed governors are provided for counterweight safeties, test governors for overspeed. They must trip at a speed greater than the car speed governor is set to trip, but not more than 10% higher.

**See Table 5Y2**

Test the pull-through of governor jaws by the following procedure.

1) Remove the spring tension from the releasing carrier.
2) Trip the governor and prop up the governor tension sheave to allow approximately one foot of movement of the governor rope with lifting the tension sheave.
3) Attach the come along and dynamometer to the governor rope. Pull at least six inches of the governor rope through the governor by operating the come along.
4) Note the reading of the dynamometer and compare it with the pull-through force information provided on the Governor Data Tag.

**Note: If a release carrier is used, it must release at no more than 60% of the governor pull-through force. Check by connecting the dynamometer and come along between the governor rope at the releasing carrier and the existing connection on the governor rope.**

**OIL BUFFERS**

**8.6.4.20.3: Oil Buffers**

**Category 5 testing of oil buffers**

Test the counterweight buffers by running the counterweight onto its buffer at rated speed with no load in the car.

Test car buffers by striking the buffer at the rated speed. Where a reduced strike is used, test by striking the buffer at the speed it was designed for (usually shown on the buffer marking plate).

**Note: Before striking oil buffers, jump out the terminal slowdown and direction switches. Leave the final terminal stopping devices operative. Final terminal stopping devices may need to be temporarily relocated, so the buffer can fully compress during the tests. If the switch is moved, it must be tested after it is relocated.**

1) Where an emergency terminal speed-limiting device is provided, test for proper operation. With normal stopping means and (if separate) the normal terminal stopping devices deactivated, run the car into each terminal with rated load and at rated speed. The stop should be no more severe than a stop produced by running the car into the buffers at the buffer's design speed. The car should stop at each terminal with power removed from the brake and driving machine motor.
2) After the car or counterweight has been removed from the buffer, check for any excessive oil leakage. Also ensure the buffer returns to the fully extended position within 90 seconds.
3) After completing this test, remove any jumpers installed for the test. Then record the test completion on a metal Category 5 Test Tag attached to the oil buffer.

### 8.6.4.20.7: Power Opening of Doors

Test will be performed to determine that the power opening of car and hoistway doors only occurs as permitted by the applicable requirements.

Examine the power opening of the doors. Make sure power opening can occur only when the car is within 18" of the landing.

> **In the case of static control, installed under A17.1 - 1988 and later editions, the person or firm performing the test must demonstrate that power is not applied to open the door when the car is more than 12" from the landing.**

Also, make sure the car is stopped or substantially level with the landing before the hoistway door is fully open.

### 8.6.4.20.8: Landing Zone and Leveling Speed

The leveling speed on this elevator equipment will be checked to determine it does not exceed 0.75 m/s (150 ft/min). For static control elevators, a written checkout procedure demonstrating that the leveling speed with the doors open does not exceed 0.75 m/s (150 ft/min) and the speed-limiting (or speed monitoring) means is independent of the normal means of controlling the speed is provided.

### 8.6.4.20.9: Inner Landing Zone

For static control elevators, verify that the zone in which the car can move, **with the doors open**, is no more than 3 inches above or below the landing.

### 8.6.4.22: Maintenance of Seismic Devices (if applicable)

**8.6.4.22.1** Examine the seismic switch to ensure it is clean, securely mounted, properly aligned, and activates as designed in accordance with the manufacturer's recommendations.

**8.6.4.22.2** Examine the counterweight displacement switch to ensure it is clean, securely mounted, properly aligned, and activates as designed in accordance with the manufacturer's recommendations.

### 8.6.5.16.2: Coated Ropes

**Category 5 testing of coated ropes**

Coated ropes shall be required to have a magnetic flux test capable of testing broken wires, in addition to a visual examination.

### 8.6.5.16.3: Suspension Ropes

**Category 5 inspection of suspension ropes**

Examine hoist rope fastenings at both ends of the ropes to ensure that they have been made up properly.

### 8.6.5.16.4: Plunger Gripper

The plunger gripper will be examined and tested per code requirements.

**Category 5 testing of plunger gripper**

1) Run the car with rated load at operating speed in the down direction.
2) Verify that the means for actuating the gripper functions properly and stops the elevator.
3) Permanently mark the date of the test on the marking plate.

### 8.6.5.16.5: Overspeed Valves

Overspeed valves on this elevator equipment will be inspected and tested to verify that they will stop and hold the car, traveling down with rated load, within the specified limits of Requirement 3.19.4.7.5(a) using a written procedure supplied by the valve manufacturer or the person or firm maintaining the equipment.

For freight elevators of Class C2 Freight Elevators, the overspeed valve will sustain and level the car with the maximum load shown on the freight elevator loading sign.

**Category 5 testing of overspeed valves**

Run the car with rated load in the down direction and verify that the valve stops the car in an overspeed condition. Following a successful test, a new valve adjustment seal shall be installed.

### 8.6.5.16.6: Freight Elevators with Class 2 Loading

The freight elevator will sustain and level the car with the maximum load shown on the loading sign.

Place a load equal to the maximum load shown on the freight elevator loading sign. The elevator must be able to safely hold and level this load.

## CATEGORY 1 DUMBWAITER TEST PROCEDURE

### 8.6.4.19.1: Oil Buffers

The car and counterweight buffers will be tested to determine the conformance with the applicable plunger return requirements.

**Category 1 inspection of oil buffers**

- Check to ensure that the hardware holding buffers is in place and is tight.
- Check oil level in buffer to ensure it is within the minimum and maximum limits
  **If the oil is too high or too low, correct to the proper level.**

Check to ensure that the plunger is clean, rust-free, and does NOT have excessive side play.

**Category 1 testing of oil buffers**

Test spring return and gravity return type oil buffers by fully compressing the plunger. Release the plunger and make sure it returns to a fully extended position within 90 seconds.

> **To compress a buffer, place a suitable piece of 4x4 wood block beneath car or counterweight and the buffer, then run the car or counterweight down at inspection speed.**

Test Type C safety buffers with same procedure.

On spring return buffers, depress the plunger two inches with a 50-pound weight resting on the plunger. Then release the plunger so it can be observed returning to a fully extended position within 30 seconds.

> **The two-inch buffer depression can be accomplished by using a small hydraulic jack between the car and buffer.**

Check the operation of the buffer switch if the buffer is equipped with a switch. For gas spring buffers, make sure the switch removes power from the motor and brake after the plunger has been compressed ½ inch from its fully extended position. With the car running away from the buffer at inspection speed, activate the buffer switch. The dumbwaiter/material lift must stop.

On Type C buffers, compress buffer 10% and check the switch with an ohmmeter to ensure the switch opens. With buffers fully extended, remove on lead from the switch and make sure the car will not run.

Record the completion of the annual oil buffer rest an annual test tag. This tag must be attached to the buffer with wire. Also record all work completed on a Safety Test Form.

### 8.6.4.19.2: Safeties

**8.6.4.19.2(a)** All working parts of the car and counterweight safeties will be examined to determine compliance with Requirements 8.7.2.14 through 8.7.2.28 and ASME A17.1, Part 7.

**Category 1 inspection of safeties**

Check the car and counterweight guide shoes and their fasteners to make certain they are properly secured, aligned, and adjusted. Check slide guides or rollers for excessive wear.

Check the clearance between the guide rail and each safety-gripping face.

- On dumbwaiters/material lifts built after the 1955 ANSI code the clearance between the safety's rail-gripping faces must not be less than the thickness of the guide rail plus 9/64 inch and there must be a minimum of 1/16 inch between either side of the rail and the rail-gripping face.
- On dumbwaiters/material s built before the 1955 ANSI code the clearance between the safety's rail-gripping faces must be less than the thickness of the guide rail plus 3/32 in.
- On dumbwaiters/material with wood guide rails the distance between the safety's rail-gripping faces must not be less than the thickness of the rail plus ¼ inch.

Look for wear and corrosion on the safety rope on drum-operated Type B safeties. Make sure the rope sheaves are securely fastened and operating.

Before a test is made on drum safeties, the safety drum rope is pulled out until the safety jaws contact and exert pressure on the guide rail. There should be a sufficient number of turns of rope still on the safety drum to allow for additional pull-out of the safety drum rope. These turns are required to make certain the safety will operate properly if the governor actuates in an overspeed condition.

**Reset the safety after this inspection. Keep tension on the safety drum rope to prevent kinking and to wind the rope evenly on the drum without slack.**

Check the crosshead pivot points and linkage for lost motion, loose or missing set screws, and excessive friction. Also check the adjustment of the finger rods and rollers.

**If there is any lost motion in the actuation lever, adjust to eliminate that lost motion. Lost motion and inertia of the governor-rope system may cause the safety to apply unnecessarily under normal starting conditions.**

With the dumbwaiters/material car platform located at a convenient height, check the safety mechanism from the pit. The following conditions must be present.

- Rollers must be in place.
- Finger rods must be in a position to pick up the rollers.
- When the governor rope is pulled to move the finger rods, the roller must move upward freely into the highest wedged positions in the safety block.

**Warning: A safety can fail if there is a jam between the roller and safety block. Check the roller operation several times to make sure that the rollers fall toward the guide rail. When the finger engages the roller, there should not be any tendency for the roller to fall away from the guide.**

- Finger rods are adjusted so the rollers engage at the same time when wedged between the roller pocket and guide rail.

Check the safeties on dumbwaiters/material lifts installed after 1955 to make certain the safety operated switch (SOS) contacts will open before the safety jaws or rollers contact the guide rails. Open the switch manually and attempt to run the elevator to verify it will not run with the SOS contacts open.

Check to see if the self-releasing mechanism, on self-releasing Type A and Type B safeties, is clean, lubricated, and corrosion-free.

**Category 1 inspection of wood guide rail safeties**

The effectiveness of safeties of this type depends on the initial engagement of the toothed safety jaw to the wood guide rail. Therefore, the condition of the guide rails is a prime consideration in inspecting the equipment. The guide rails must be of first quality hard maple with the width sized to fill the car guide shoe

minus the normal running clearance. Replace guide rails that are more than 1/8-inch under-size in width or show evidence of combing (grooving) by the safety jaws.

An inspection of the following items should be made in addition to the governor-rope system and guide rails.

- From the top of the car, inspect all safety-operating parts, including levers and linkage. Make sure that all keys and set screws are in place and tight. Also, make sure there is not an excessive amount of play in the finger rods activating safety jaws.
- From the pit, with the elevator car platform at a convenient height, inspect and apply the safety jaws against the guide rails by pulling the governor rope. The safety jaws should contact both guide rails so that any downward motion of the car would cause the jaw teeth to dig into the rails.

When a safety-operating switch is provided the motion of bringing the safety jaws in contact with the rails should be sufficient to actuate the switch. Open the switch manually and attempt to run the elevator to verify it will not run with the SOS contacts open.

**8.6.4.19.2(b) Safeties/Category 1 (No Load Tests)**

The safeties will be subjected to the following tests with no load in the car:
Governor operated safeties will be operated by manually tripping the governor with the car operating at the slowest operating speed in the down direction. Safeties will bring the car to rest promptly.
Type B safeties stopping distance is not required to conform to ASME A17.1, Part 7.

Governor operated wood guide-rail safeties will be tested by manually tripping the governor with the car at rest and moving the car in the down direction until it is brought to rest by the safety and hoisting ropes slip on traction sheaves or become slack on winding drum sheaves.

Type A and wood guide-rail safeties without governors which are operated as a result of the breaking or slackening of the hoisting ropes will be tested by obtaining the necessary slack rope to cause it to function.

**Category 1 testing of safeties**

After the safety has been inspected, position the car or counterweight in the lower portion of the hoistway so that the car will be in a convenient location after the test. Place jumpers to disconnect the switches on the governor and safety (or that part of the safety circuit that would prevent a full setting on the safety).

Start the car or counterweight (whichever is being tested) down at the slowest operating speed and trip the governor by hand. On centrifugal governors that do not have a dropping jaw, engage the flyweight into the starting device before starting the car down. Run the car down until the machine stalls or drives through the hoisting ropes.

Note the governor rope travel distance. The governor rope travel distance must be less than shown when the safety jaws begin to exert pressure against the guide rails. The maximum for governor rope travel distance depends on the car rated speed. This applies only to Type B safeties.

| MAXIMUM GOVERNOR ROPE TRAVEL | |
|---|---|
| **Car Safeties** | |
| Car Speed, fpm | Governor Rope Travel, in. |
| 200 | 42 |
| 201-375 | 36 |
| Over 375 | 30 |
| **Counterweight Safeties** | |
| All speeds | 42 |
| 1 fpm = 5.08 E-03 m/s<br>1 in. = 25.4 mm | |

**OPEN** the mainline disconnect switch. **REMOVE** any jumpers and proceed to the safety being tested.

**WARNING: Serious personal injury or death could result from intense arcing if a short should occur during this test. Do not stand directly in front of the mainline disconnect.**

During testing of the safeties, the following conditions must be present.

- All ropes are properly seated on their sheave or drum.
- On Type A safeties, the travel of all safety rollers or dogs should be approximately the same, but not excessive. There should be additional travel, in case the safety is required for an overspeed situation.
- On self-releasing Type B safeties, all four gibs contact the guide rails. On drum-operated Type B safeties, all four rail-gripping faces are in contact with the guide rails.
- On drum-operated safeties that require continual unwinding of the drum to fully apply the safety, more than three turns of rope remain on the drum. This is necessary to meet the requirement of three turns remaining on the drum after a rated-load, rated-speed test.

**Note: Flexible guide clamp safeties that are drum-operated do not require any turns of rope to remain on the drum after a test.**

- Platform is level. Dumbwaiters/material lifts installed after 1955 should not be out of level more than 3/8 inch per foot in any direction. Dumbwaiters/material lifts installed before 1955 should not be out of level more than ½ inch per foot in any direction.

  Set the counterweight safeties close to the pit or just above the car. In either case, make sure the final location of the car will make the safeties accessible after the test.

  Reset the governors and safeties, keeping the following information in mind.

- The Type A safety, or self-releasing Type B safety, is released by moving the car or counterweight up with one short move. After one move, be sure that the governor has released the governor rope. If not, move the governor sheave or the jaw to release the rope.
- The drum-operated Type B safety is released with a safety wrench from inside the car, or at the counterweight. This is a two-person operation. Station the first person on top of the car or in the pit to hold the governor rope so it does not overhaul, while a second person releases and resets the governor. The second person then proceeds to the car or counterweight and releases the safety, while the first person holds back on the rope until the mini-ball moves down to the releasing carrier. Finally, the first person inserts the mini-ball into the releasing carrier, as the second person completes the rope take-up.
- After resetting the governors and safeties, make certain all components of the safeties have returned to normal running positions. There must be no slack in the safety rope. Inspect guide rails for scoring and loose hardware. Dress any scored surfaces with a file. When finished, REMOVE all jumpers

- After completing the test, fill out an annual test tag and attach it to the safety with wire. Fill out a Safety Test Form and return it to your Service Supervisor.

**Category 1 testing of wood guide rail safeties**

With the governor-operated safeties, apply the governor and run the car down from the controller to determine if the governor will operate the safety. Running the car down from the controller consists of actuating contactors in the controller by using nonconductive materials such as wooden sticks.

Continue to run the car down until the hoist ropes slip on traction machines or slacken on drum machines.

For Type A safeties without governors, set blocking in the pit securely, and run the car down slowly. Make sure the jaws come into proper position when a slack rope is obtained.

### 8.6.4.19.3: Governors

The governor on this dumbwaiter/material lift will be operated manually to determine that all parts, including those which impart the governor pull-through tension to the governor rope, operate freely.

**Category 1 inspection of the governor**

**OPEN** the mainline switch.

Make a general inspection of the governor-rope system, including the condition of the governor, governor rope, governor-rope tension sheave assembly, and the releasing carrier. Make sure all mountings are secure.

Check the rope type to see if it is the type of rope identified on the governor marking plate.

**Note: Governor ropes must not be lubricated.**

With the governor weights extended (spread apart by hand) check to see if all governor components, including the rope-gripping jaws, operate freely. There must NOT be any restriction of motion.

Check all bearings, pins, governor-rope jaws, and rubbing surfaces to see if they are properly lubricated, free of paint, and are not worn excessively.

**Category 1 testing of governor**

**CLOSE** the mainline switch.

Open the governor overspeed (stopping) switch and make sure the elevator cannot be operated. Reset the governor overspeed switch and operate the car at normal speed in each direction. Check to determine if the following possible PROBLEMS exist.

- Governor rope slides on the sheave groove when the car is started or stopped.
- Governor sheave has eccentric or lateral motion.
- Governor rope does NOT run free of the governor jaw at all times.

After testing the governor, the following tasks must be completed.

- Restore the governor release carrier.
- Reset and inspect the governor.
- Fill out a metal test tag and attach it to the governor with a wire.
- Record all work completed on a Safety Test Form.

### 8.6.4.19.4: Slack Rope Devices on Winding Drum Machines

The slack-rope device(s) on winding drum machines will be operated manually and tested to determine conformance with the applicable requirements.

**Category 1 inspection of slack-rope device and machine final (stop motion switch) on winding drum machines**

**OPEN** the mainline disconnect switch.

- Manually operate the slack-rope device and machine final (motion stop switch) to ensure all moving parts operate freely.
- Check the slack-rope device to see if it is set as close as possible to the machine drum, so the switch will open with a minimum of slack-rope.
- Manually operate the final terminal stopping device and the machine final (motion stop switch) to ensure all moving parts operate freely.

**Category 1 testing of slack-rope device (winding drum machines)**

- **CLOSE** the mainline switch
- Test the slack-rope device by tripping it with a piece of wood and attempting to move the elevator car. The car must not move.
- If there is any question about the device operating, land the car onto suitable blocking in the pit, and make sure the resulting slack rope will trip the device and stop the car.
- On double-belt winding drum machines, operate the slack-rope device by hand and see that it causes the driving belt to shift to the idler pulley.

**Category 1 testing of machine final (winding drum machines)**

- Disable the normal stopping device, normal terminal stopping device and final terminal stopping device located in the hoistway.
- **CLOSE** the mainline switch.
- Activate the machine final (motion stop switch), then attempt to move the car. The car must not move.

### 8.6.4.19.5: Normal and Final Terminal Stopping Devices

The normal and final terminal stopping devices on this dumbwaiter/material lift will be examined and tested to determine conformance with the applicable requirements.

**Category 1 testing of normal & final terminal stopping devices**

The normal terminal stopping devices are required to slow down and stop the car at terminal floors independently of operating devices. The usually consist of one or more terminal slow down switches, plus a terminal stop (direction of limit switch).

Before making the annual test of the normal terminal stopping devices, makes rue the terminal stop switches (direction limits) operate. Run the car on INSPECT beyond the terminal floors. The car must stop and only be able to move away from that terminal floor.

Check the electrical functioning of both top and bottom final terminal stop switches before continuing with the following annual normal terminal stop test.

1) Disable the normal stopping means and the emergency terminal stopping device (when used). Do not disable the emergency terminal speed limiting device (if used).
2) Run the (empty) car into both top and bottom terminals at contract speed. Car must slow down and stop near each terminal landing and should not trip the final limit.
3) Restore the normal stopping means and (if used) the emergency terminal stopping device.

**Note: Before testing the final terminal stopping device, see if the potential (safety) switch on the controller is manually or electrically restored. If it is the manual restored type, DO NOT TEST the final terminal stopping device from the car UNLESS someone is in the machine room to reset the controller switch when instructed to do so by the inspector.**

**Warning: If the car move, stop the test until the cause of the movement is corrected. Severe personal injury or death could result if the final terminal stopping device is not working properly.**

Test the terminal stopping device (final limit) with the following procedure.

1) Disable the normal terminal stopping (direction limit) device. (It is not necessary to disable the terminal slow down switches.)
2) Run the car on INSPECT past each terminal floor until the car stops on the final terminal switch. Make sure the car will not move in either direction.
3) Measure and confirm that the actuating cam and final terminal limit switch are properly positioned to be activated for additional travel where the car or counterweight would rest on a fully compressed buffer.
4) Restore the normal terminal stopping device (direction limit portion).

### 8.6.4.19.7: Stand-By or Emergency Power Operation

Stand-by or emergency power will be tested to determine conformance with the applicable requirements. Tests will be performed with no load in the car.

**Category 1 testing of stand-by (emergency power)**

**NOTE Testing of stand-by (emergency) power is performed with NO LOAD in the car.**

If a stand-by (emergency) power switch is installed, run the elevator to the floor where that switch is installed. Remove dumbwaiter(s) from normal service and transfer the system to stand-by power to operate the car(s) with no load. Test the switch which overrides sequence operation, if one is provided. To do this, make several trips and stops, and use a tachometer in the machine room to check the speed of the car(s). Make sure the dumbwaiter is running at normal speed (particularly in the up direction). The speed must not exceed 125% of the rated speed.

### 8.6.4.19.8: Power Operation of Door System

Power-operated hoistway door systems will be tested to determine conformance with the applicable requirements.

**Category 1 testing of door closing force**

1) Park the car at floor level and start the doors closing.
2) Allow the doors to close between one-third and two-thirds of their normal travel, and then stop them.
3) Place a test scale on the leading edge of the hoistway door. Gradually reduce force on the door until it just starts to close, then read the force indicated on the scale. The force must not exceed 30 lbs.

**NOTE: Do not allow the door to strike the scale with an impact. A false reading could result.**

If the elevator was installed under the A17.1-2000/B44 or later code or has a door operator data plate containing this information, verify that the closing time in the code zone is not less than the minimum time shown on the data plate.

### 8.6.4.19.9: Broken Rope, or Chain Switch

The rope, tape, or chain used to connect the motion of the car to the machine room normal limit, the switch tat senses failure of this connection shall be tested for compliance with ASME A17.1, Part 7.

**Category 1 testing of broken rope, tape, or chain switch**

While in the inspection mode on the car top, operate the broken rope, tape or chain switch and attempt to move the car using the top-of-car operating device.

### 8.6.4.19.10: E/E/PES Electrical Protective Devices

Check the functionality of all E/E/PES electrical protective devices to ensure they operate as designed.

SIL rated devices used to satisfy:

- Electrical Equipment & Wiring
- Release and Application of Driving Machine Brakes
- Software Systems for Protection Against Failures
- E/E/PES to remove power from Driving Machine Motor from AC Sources
- E/E/PES to remove power from Driving Machine Motor from DC Sources

Will be identified on wiring diagrams with part identification, SIL, and certification identification information.

A written checkout procedure will be provided that will demonstrate that the SIL rated devices, safety functions, and related circuits operate as intended.