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Major Code changes 2004-2013

MESA Continuing Education

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Color Code

- Blue is revised code language/sections
- Red is code additions

ASME A17.1S–2005-Definitions

control space, elevator, dumbwaiter, material lift:

A space inside or outside the hoistway, intended to be accessed with or without full bodily entry, that contains the motor controller. This space could also contain electrical and/or mechanical equipment used directly in connection with the elevator, dumbwaiter, or material

lift but not the electric driving machine or the hydraulic machine.
(See Appendix Q.)

NOTE: See 2.7.6.3.2 for an exception regarding the location of a motor controller.

ASME A17.1S–2005-Definitions

machine room, elevator, dumbwaiter, material lift:

an enclosed machinery space outside the hoistway, intended for full bodily entry, that contains the electric driving machine or the hydraulic machine. The room could also contain electrical and/or mechanical equipment used directly in connection with the elevator, dumbwaiter, or material lift. (See Nonmandatory Appendix Q.)

ASME A17.1S–2005-Definitions

machine room and control room, remote, elevator, dumbwaiter, material lift:

a machine room or control room that is not attached to the outside perimeter or surface of the walls, ceiling, or floor of the hoistway. (See Appendix Q.)

ASME A17.1S–2005-Definitions

machinery space, elevator, dumbwaiter, material lift:

a space inside or outside the hoistway, intended to be accessed with or without full bodily entry, that contains elevator, dumbwaiter, or material lift mechanical equipment, and could also contain electrical equipment used directly in connection with the elevator, dumbwaiter, or material lift.

This space could also contain the electric driving machine or the hydraulic machine. (See Appendix Q.)

ASME A17.1S–2005-Definitions

machinery space and control space, remote, elevator, dumbwaiter, material lift:

a machinery space or control space that is not within the hoistway, machine room, or control room, and that is not attached to the outside perimeter or surface of the walls, ceiling, or floor of the hoistway.

(See Nonmandatory Appendix Q.)

ASME A17.1b–2009-Definitions

car-direction indicator: a visual signaling device that displays the current direction of travel.

car lantern: an audible and visual signaling device located in a car to indicate the car is answering the call and the car's intended direction of travel

hall lantern: an audible and visual signaling device located at a hoistway entrance to indicate which car is answering the call and the car's intended direction of travel.

ASME A17.1–2010-Definitions

creep: slight incremental, natural movement of the suspension means over their arc of contact with the driving sheave due to tractive force. The tractive force is a result of unequal tensile loads in the suspension means at points of entry and exit from the driving sheave, the tensile elasticity of the suspension member, and the frictional work occurring in the direction of the greater tension. Creep is independent of the motion status or direction of rotation of the driving sheave. NOTE: Creep exists in all traction systems and is not loss of traction, and can occur while the drive sheave is stationary or rotating.

compensation means: wire rope, chain, or other mechanical means used to counterbalance, or partially counterbalance, the weight of the suspension ropes.

ASME A17.1–2010-Definitions

residual strength: the actual breaking strength of a suspension member at any time during its operational life cycle.

NOTE: The residual strength will be reduced as the suspension member is used and is subjected to wear

suspension member, noncircular elastomeric-coated steel (hoisting): a noncircular suspension member, such as an elastomeric-coated steel belt constructed of encapsulated steel cords, used to raise and lower an elevator, dumbwaiter, or material lift car or its counterweight or both.

ASME A17.1–2013-Definitions

unlocking zone: a zone extending from the landing floor level to a point not less than 75 mm (3 in.) nor more than 175mm(7 in.), except not more than 450mm(18 in.) for freight elevators with vertically sliding doors, above and below the landing.

SECTION 2.2 PITS- A17.1-2007

2.2.2.5 In elevators provided with Firefighters' Emergency Operation, a drain or sump pump shall be provided. The sump pump/drain shall have the capacity to remove a minimum of 11.4 m³/h (3,000 gal/h) per elevator.

SECTION 2.2 PITS- A17.1-2007

2.2.4.2 There shall be installed in the pit of each elevator, where the pit extends more than 900mm(35 in.) below the sill of the pit access door (lowest hoistway door or separate pit access door), a fixed vertical ladder of noncombustible material, located within reach of the access door. The ladder is permitted to be retractable or non-retractable. Non-retractable ladders, where provided, shall conform to 2.2.4.2.1 through 2.2.4.2.6. Retractable ladders, where provided, shall conform to 2.2.4.2.1 through 2.2.4.2.3 and 2.2.4.2.5 through 2.2.4.2.8. When in the extended position, retractable ladders shall conform to 2.2.4.2.4

2.4.6 Maximum Upward Movement of the Car- A17.1b-2009

2.4.6 Maximum Upward Movement of the Car

2.4.6.1 Counterweighted Elevators. The maximum upward movement of a counterweighted elevator above the top landing shall be no more than the sum of either of the following:

(a) for elevators without tie-down compensation, dimensions specified in 2.4.6.1.1(a) through (c)

(b) for elevators with tie-down compensation, dimensions specified in 2.4.6.1.1(a), (b), and (d)

2.4.6 Maximum Upward Movement of the Car-

A17.1-2010

2.4.6.1.1 The following shall be used when calculating the maximum upward movement of a counterweighted elevator:

- (a) the designed maximum bottom counterweight runby [see 2.4.4(b)]
- (b) the stroke of the counterweight buffer, determined as follows
 - (1) for full-stroke buffers, the stroke of the buffer used, or the remaining stroke when the buffer is compressed with the car at the top terminal landing (see 2.4.2 and 2.22.4.8); or
 - (2) for reduced-stroke oil buffers (see 2.22.4.1.2), ~~the full stroke required by 2.22.4.1.1.~~
- (c) one-half of the gravity stopping distance, based on
 - (1) 115% of the rated speed where oil buffers are used, or 115% of the reduced striking speed when emergency terminal speed-limiting devices meeting the requirements of 2.25.4 are used and no compensating rope tie-down device in conformance with 2.21.4.2 is provided (see 8.2.4 for gravity stopping distances); or
 - (2) the governor tripping speed where spring buffers are used.
- (d) the distance to which the compensating rope tie down device, if provided (see 2.21.4.2), limits the jump of the car when the counterweight strikes the buffers at speeds specified in 2.4.6.1.1(c) plus the distance to account for the amount of compensation rope stretch.

2.4.7 Top of Car Clearances-A17.1b-2009

2.4.7.1 When the car has reached its maximum upward movement, the clearance above the car top, measured vertically up to the horizontal plane described by the lowest part of the overhead structure or other obstruction and measured within the projection of the car enclosure top exclusive of the area outside the standard railing (2.10.2) where provided, shall be not less than 1100 mm (43 in.). In no case shall the following additional clearances be less than:

- (a) 600 mm (24 in.) above the car crosshead assembly except as permitted in 2.4.7.1(b) when the crosshead is located over the car enclosure top or the distance which any sheave assembly mounted in or on the crosshead projects above the top of the car crosshead, whichever is greater, but in no case shall there be less than 150 mm (6 in.) clearance above the sheave assembly

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2.4.7 Top of Car Clearances-A17.1b-2009

(b) 300 mm (12 in.) above the car crosshead assembly where the crosshead is adjacent to the car enclosure top. The crosshead shall not overlap the car enclosure top by more than 100 mm (4 in.) horizontally.

(c) 600 mm (24 in.) above equipment attached to and projecting above the car enclosure top, exclusive of

- (1) standard railings (see also 2.14.1.7.2)
- (2) areas outside of the standard railing, the vertical clearance shall be not less than 100 mm (4 in.)
- (3) roller and sliding guide assemblies (see also 2.4.9)
- (4) gatepost(s) for vertically sliding gates (see also 2.4.9).

Spreader bars between gateposts with horizontal and vertical clearances not in compliance with 2.14.1.7.2 shall have yellow and black diagonal stripes of not less than 25 mm (1 in.) wide along the length of the spreader bar, mounted at a location visible from the car top

SECTION 2.7 - A17.1S-2005

MACHINERY SPACES, MACHINE ROOMS, CONTROL SPACES, AND CONTROL ROOMS

Section 2.7 has been revised in its entirety to permit the installations of machineromless elevators

See the next several slides a they address the major changes to Section 2.7

2.7.1 Enclosure of Rooms and Spaces-

A17.1S-2005

2.7.1 Enclosure of Rooms and Spaces

Machinery space and control space enclosures located outside the hoistway and machine room and control room enclosures shall conform to the requirements of 2.7.1.1 or 2.7.1.2, and shall also conform to 2.7.1.3, as applicable.

2.7.1.1 Fire-Resistive Construction

2.7.1.2 Non-Fire-Resistive Construction

2.7.1.3 Floors

2.7.3 Access to Machinery Spaces, Machine Rooms, Control Spaces, and Control Rooms [A17.1S-2005](#)

2.7.3.1 General Requirements

2.7.3.1.1 A permanent and unobstructed means of access shall be provided to

- (a) machine rooms and control rooms
- (b) machinery spaces and control spaces outside the hoistway
- (c) machinery spaces and control spaces inside the hoistway that do not have a means of access to the space as specified in 2.7.3.1.2

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2.7.3 Access to Machinery Spaces, Machine Rooms, Control Spaces, and Control Rooms [A17.1S-2005](#)

2.7.3.1.2 Access to machinery spaces and control spaces inside the hoistway

- (a) from the pit shall comply with 2.2.4 and 2.7.5.2.4
- (b) From the car top shall comply with 2.12.6 and 2.12.7
- (c) from a platform shall comply with 2.7.5.3.5
- (d) from inside the car shall comply with 2.7.5.1.4

2.7.3.1.3 Access to other locations within the building or access to machinery and equipment not related to elevators through the machinery space, machine room, control spaces, or control rooms shall not be permitted

2.7.3 Access to Machinery Spaces, Machine Rooms, Control Spaces, and Control Rooms-A17.1b-2009

2.7.3.3 Means of Access. The means of access to the following shall conform to 2.7.3.3.1 through 2.7.3.3.6:

2.7.3.3.6 Where a ladder is provided, a permanent, noncombustible platform or floor shall be provided at the top of the ladder, conforming with the following:

- (a) Railings conforming to 2.10.2 shall be provided on each open side.
- (b) The floor of the platform shall be located below the level of the access-door sill by a vertical distance of not more than 200 mm (8 in.) where full bodily entry is required, and by a vertical distance of not more than 900 mm (35 in.) where full bodily entry is not required.
- (c) The depth of the platform shall be not less than 915 mm (36 in.) and the width not less than the width of the door or a minimum of 915 mm (36 in.), whichever is greater.
- (d) The size of the platform shall be sufficient to permit the full swing of the door plus 600 mm (24in.) from the standard railing to the swing line of the door.
- (e) The ladder or handgrips shall extend a minimum of 1 220 mm (48 in.) above the platform floor level and shall be located on the access door/panel strike jamb side of the platform.
- (f) The railing on the access side shall be provided with a hinged section not less than 600 mm (24 in.) wide with a latch able end adjacent to the ladder.

2.7.4 Headroom in Machinery Spaces, Machine Rooms, Control Spaces, and Control Rooms-A17.1S-2005

2.7.4.5 When working from inside the car, or from the top of the car in accordance with 2.7.5.1, or from the pit in accordance with 2.7.5.2, the headroom when the means required by 2.7.5.1 or 2.7.5.2 are engaged shall

- (a) comply with the height of working space requirements of NFPA 70 or CSA-C22.1, whichever is applicable (see Part 9)

- (b) in no case be less than 1 350 mm (53 in.)

2.7.5 Working Areas Inside the Hoistway and in the Pit-A17.1S-2005

2.7.5.3 Working Platforms.

A platform located in the car, on the car, or in the hoistway shall be permitted for access to and maintenance and inspection of equipment in machinery spaces or control spaces in the hoistway and shall comply with 2.7.5.3.1 through 2.7.5.3.6 (see also 8.6.11.8).

2.7.5.4 Working Platforms in the Line of Movement of the Car or Counterweight-A17.1S-2005

2.7.5.4 Working platforms in the line of movement of the car or counterweight shall be permitted

(a) where retractable stops are provided and the car is

(1) below the platform, the travel of the elevator shall be limited by a retractable stop(s) in such a manner that the car shall be stopped below the platform at least the distance required for car top refuge space

(see 2.4.12.1)

(2) above the platform, the travel of the elevator shall be limited by a retractable stop(s) in such a manner that the car shall be stopped above the platform at least the distance required in 2.7.4.5; or

(b) where the elevator is provided with a device conforming to 2.7.5.1.1 and 2.7.5.1.2

2.7.6 Location of Machinery Spaces, Machine Rooms, Control Spaces, Control Rooms, and Equipment-A17.1S-2005

2.7.6.1 Location of Machine Rooms and Control Rooms.

Elevator machine rooms and control rooms, where provided, shall not be located in the hoistway.

2.7.6.2 Location of Machinery Spaces and Control Spaces.

Machinery spaces and control spaces shall be permitted to be located inside or outside the hoistway.

NOTE: Inside the hoistway includes, but is not limited to, on or in the car, on the counterweight, or in the pit.

2.7.6.3 Location of Equipment. The location of equipment used directly in connection with the elevator shall conform to the requirements of 2.7.6.3.1 through 2.7.6.3.4.

2.7.6 Location of Machinery Spaces, Machine Rooms, Control Spaces, Control Rooms, and Equipment-A17.1S-2005

2.7.6.4 Means Necessary for Tests.

Where an elevator driving-machine brake or an emergency brake, or an elevator motion controller or motor controller is located in the hoistway or pit, means necessary for tests that require movement of the car or release of the driving-machine brake or emergency brake, shall be provided and arranged so that they can be operated from outside the hoistway and shall conform to 2.7.6.4.1 through 2.7.6.4.3. These means are also permitted to be used by elevator personnel for passenger rescue

2.7.6 Location of Machinery Spaces, Machine Rooms, Control Spaces, Control Rooms, and Equipment-A17.1S-2005

2.7.6.5 Inspection and Test Panel

2.7.6.5.1 The inspection and test panel shall be required where any of the following are not accessible from outside the hoistway:

- (a) the devices necessary for the manual reset of the detection means for ascending car overspeed protection [see 2.19.1.2(a)(4)], and protection against unintended car movement [see 2.19.2.2(a)(4)], or
- (b) the circuits of the following devices:
 - (1) the car-safety mechanism switch (see 2.26.2.9)
 - (2) the car buffer switch, where provided (see 2.26.2.22)
 - (3) the top and bottom final terminal stopping devices (see 2.26.2.11)
 - (4) the car and counterweight governor switches, where provided (see 2.26.2.10)

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2.7.6 Location of Machinery Spaces, Machine Rooms, Control Spaces, Control Rooms, and Equipment-A17.1S-2005

2.7.6.5 Inspection and Test Panel

2.7.6.5.2 The inspection and test panel, where provided, shall be accessible from outside the hoistway and shall

- (a) be readily accessible for maintenance and inspection at all times.
- (b) have the required devices located behind a locked door or panel that does not open into the hoistway, that is not self-closing, that is self-locking, and that shall be kept closed and locked. Keys shall be of Group 1 Security (see 8.1).
- (c) be provided with a stop switch, conforming to 2.26.2.24.
- (d) be lit by permanently installed electric lighting with a lighting intensity of at least 200 lx (19 fc) at the floor level. A switch placed inside or close to the enclosure shall control lighting of the enclosure.
- (e) include the display devices as required by 2.7.6.4.1.
- (f) include the “CAR DOOR BYPASS” and “HOISTWAY DOOR BYPASS” switches where required by 2.26.1.5. **(Continued on next slide)**

2.7.6 Location of Machinery Spaces, Machine Rooms, Control Spaces, Control Rooms, and Equipment-A17.1S-2005

(g) include the devices necessary for the manual reset of the detection means for ascending car overspeed protection [see 2.19.1.2(a)(4)], and protection against Unintended Car Movement [see 2.19.2.2(a)(4)] where these devices are not accessible from outside the hoistway.

(h) where the circuits of the devices in 2.7.6.5.1(b)(1) through (4) are not accessible from outside the hoistway, include landing inspection operation in conformance with 2.26.1.4.4, and that shall be permitted to render ineffective the following electrical protective devices, individually or as a group or groups, in conformance with the requirements of 2.26.9.3.1(a), 2.26.9.3.2, and 2.26.9.4:

- (1) the car-safety mechanism switch (see 2.26.2.9)
- (2) the car buffer switch, where provided (see 2.26.2.22)
- (3) the top and bottom final terminal stopping devices (see 2.26.2.11)
- (4) the car and counterweight governor switches, where provided (see 2.26.2.10)

NOTE (2.7.6.5): For electrical clearance requirements, see NFPA 70 or CSA-C22.1, whichever is applicable (see Part 9). See also 2.8.3.3.2.

2.11.6 Opening of Hoistway Doors-A17.1a-2005

2.11.6.3 Egress from the interior of the car to any elevator landing by means of the car and hoistway doors shall be unrestricted once the car and hoistway doors are open. Additional doors or devices, that are not part of nor function with the elevator but are provided in lieu of an enclosed elevator lobby in order to guard against the migration of smoke in or out of the hoistway, shall comply with the following:

- (a) The building code.
- (b) The additional door or device, in any position, shall not interfere with the function and operation of the elevator.
- (c) The additional door or device shall not interfere with the fire-resistance rating and operation of the hoistway entrance. Direct or mechanical attachment (i.e., welding, holes, bolts, or rivets) shall not be made to hoistway doors or frames, unless the additional door or device and the hoistway elevator entrance are listed as a complete assembly by a certifying organization.
- (d) Additional doors or devices when in the closed position shall not prevent firefighters from visually observing the elevator landing (lobby) when the elevator hoistway door is no more than one-quarter open.
- (e) Additional doors or devices shall be permitted to be deployed only at those hoistway openings of elevators where fire alarm initiating devices used to initiate Phase I Emergency Recall Operation associated with that elevator have been activated.

2.12.7 Hoistway Access Switches-A17.1b-2009

2.12.7.1 General

2.12.7.1.1 Hoistway access switches shall be provided when the rated speed is greater than 0.75 m/s (150 ft/min) at

- (a) the lowest landing when a separate pit access door is not provided
- (b) the top landing

2.12.7.1.3 When one or more hoistway access switches are provided but not required, the switch(es) shall be provided at the landing(s) specified in 2.12.7.1.1. Additional hoistway access switches shall be permitted at other landings only when switches specified in 2.12.7.1.1 have been provided.

2.12.7 Hoistway Access Switches-A17.1-2013

2.12.7.2 Location and Design

2.12.7.2.1

The switch shall be installed adjacent to the hoistway entrance at the landing with which it is associated. The switch shall be labeled “ACCESS” and shall be a three-position switch, labeled “UP,” “OFF,” and “DOWN” (in that order), with the “OFF” position as the center position. The switch shall be rotated clockwise to go from the “UP” to “OFF” to “DOWN” positions.

2.12.7.2.3 The switch shall

(a) use contacts that are positively opened mechanically; their openings shall not be solely dependent on springs, or

(b) be SIL rated with an SIL equal to or greater than the SIL indicated for the applicable device shown in Table 2.26.4.3.2

2.12.7 Hoistway Access Switches-A17.1-2013

2.12.7.3.1 Except as permitted in 2.26.1.4.3(d), a separate switch labeled “ACCESS” with two positions labeled “OFF” and “ENABLE” shall be provided in the car and shall be key operated or behind a locked cover.

The key shall be Group 1 Security (see 8.1).

2.12.7.3.2 When in the “ENABLE” position the elevator shall be on hoistway access operation and shall conform to the following:

- (a) operation by car and landing operating devices shall be disabled
- (b) automatic power operation of the hoistway door and/or car door or gate shall be disabled
- (c) automatic operation by a car-leveling device shall be disabled
- (d) stopping the car at the access landing by a car-leveling device while operating a hoistway access switch at the landing shall be permitted
- (e) enable the hoistway access switches at the landing and their operation in accordance with 2.12.7.3.3 except where either top-of-car inspection operation (see 2.26.1.4.2) or in-car inspection operation (see 2.26.1.4.3) is in effect

2.14.1.7 Railing and Equipment on Car Enclosure Top-A17.1-2000 & A17.1-2009

2.14.1.7.1 A standard railing conforming to 2.10.2 shall be provided on the outside perimeter of the car enclosure top on all sides where the perpendicular distance between the edges of the car enclosure top and the adjacent hoistway enclosure exceeds 300 mm (12 in.) horizontal clearance and on sides where there is no hoistway enclosure. If clearances require (see (2.14.1.7.2) the standard railing to be located more than 100 mm (4 in.) from the edge of the outside perimeter of the car enclosure top, the top of the car enclosure outside of the railing shall be clearly marked. The marking shall consist of alternating 100 mm (4 in.) diagonal red and white stripes. The forces specified in 2.10.2.4 shall not deflect the railing beyond the perimeter of the car top.

(Added in 2009)

The top-of-car enclosure, or other surface specified by the elevator installer, shall be the working surface referred to in 2.10.2.

2.14.1.7 Railing and Equipment on Car Enclosure

Top-A17.1b-2009

2.14.1.7.2 When the car has reached its maximum upward movement (2.4.6.1), the following minimum clearances shall be provided from the top rail of the standard railing to building structure or equipment not attached to the car:

- (a) 100 mm (4 in.) vertically
- (b) 100 mm (4 in.) horizontally in the direction towards the hoistway enclosure
- (c) 300 mm (12 in.) horizontally towards the centerline of the car enclosure top

NOTE (2.14.1.7.2): See Nonmandatory Appendix G.

2.14.5.7 Restricted Opening of Car Doors-A17.1-2013

2.14.5.7 Restricted Opening of Car Doors.

Car doors of passenger elevators shall be provided with a car door interlock conforming to 2.14.4.2 or 2.14.5.7.1 through 2.14.5.7.5.

2.14.5.7.1

When a car is outside the unlocking zone, the car doors shall be so arranged that when in the closed position they shall be restricted from opening more than 100 mm (4 in.) from inside the car.

2.14.5.7.2

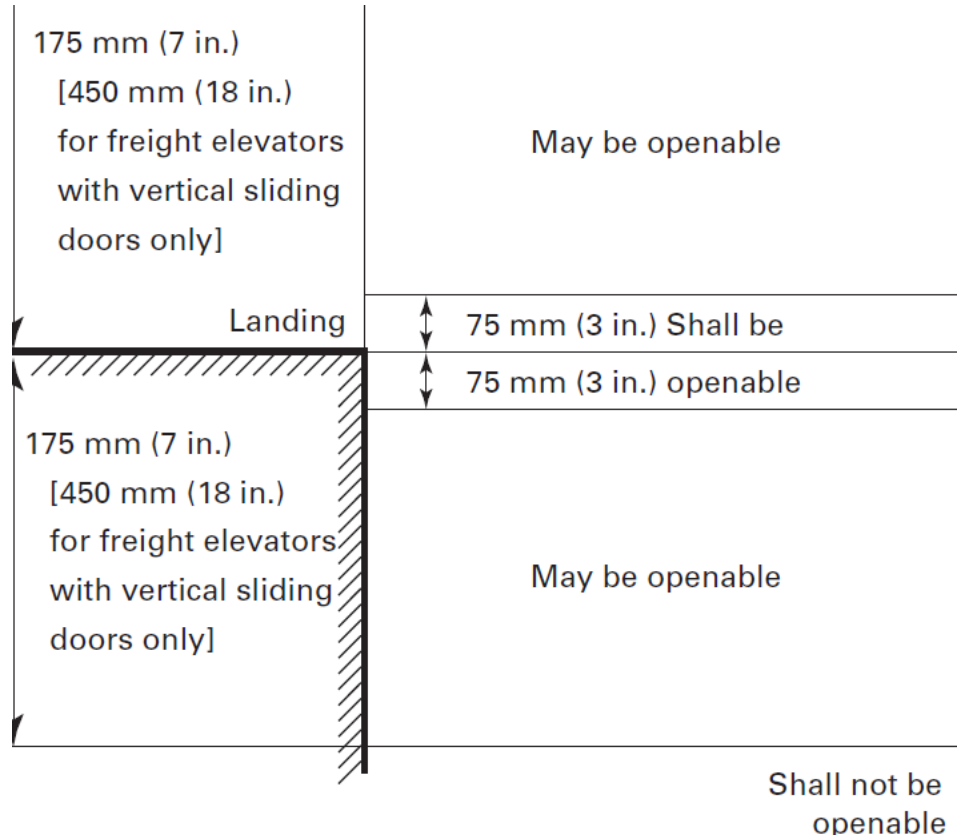
Car doors shall be openable from outside the car without the use of a special tool(s).

2.14.5.7.3

The doors shall be openable from within the car (see 2.14.5.8) when the car is within the unlocking zone, except as specified in 2.14.5.7.4(b)(1).

NOTE (2.14.5.7): See also 2.12.1 and Nonmandatory Appendix B, Unlocking Zone.

Non-mandatory Appendix B, Unlocking Zone



2.14.5.7 Restricted Opening of Car Doors-

A17.1-2013

2.14.5.7.4 If the means used to restrict car door opening requires electrical power for its functioning, it shall comply with 2.14.5.7.4(a) through 2.14.5.7.4(d).

- (a) The means shall not use electrical power to maintain restricted opening of the car door in accordance with 2.14.5.7.1.
- (b) The means shall operate in accordance with 2.14.5.7.1 and 2.14.5.7.3 and the following:
 - (1) an alternate power source shall be provided that shall permit the means to operate for not less than one (1) hr upon loss of normal power
 - (2) the alternate power source shall be
 - (a) monitored and when it is detected that there is sufficient capacity to operate the means for not less than one (1) hr, an audible signal conforming to 2.14.5.7.4(d) shall operate
 - (b) provided with readily visible information that indicates the expiration date of the alternate power source in lettering not less than 5 mm (0.25 in.) high

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2.14.5.7 Restricted Opening of Car Doors - A17.1-2013

2.14.5.7.4 If the means used to restrict car door opening requires electrical power for its functioning, it shall comply with 2.14.5.7.4(a) through 2.14.5.7.4(d).

(c) On automatic operation, the portion of the means dependent on power shall be monitored and when it is detected that it has failed to operate in accordance with 2.14.5.7.1, an audible signal conforming to 2.14.5.7.4(d) shall operate.

(d) The audible signal required by 2.14.5.7.4(b)(2)(a) or 2.14.5.7.4(c) shall be at least 10 dBA above ambient, not exceeding 80 dBA, measured inside the car.

2.14.5 Passenger Car Doors-A17.1-2010

2.14.5.10 Folding Car Doors- was 2.14.5.9 in 2010 when first introduced

2.14.5.10.1 Folding car doors shall conform to 2.14.4 except paras. 2.14.4.4, 2.14.4.7, and 2.14.4.9. They shall also conform to all of 2.14.5 except paras. 2.14.5.3, 2.14.5.6.2, 2.14.5.7, and 2.14.5.9.

2.14.5.10.2 The effort needed to prevent a folding car door from closing shall conform to 2.13.4.2.3.

2.14.5.10.3 Folding car doors shall not be power opened to a distance exceeding one-third of the clear opening, and in no case more than 250 mm (10 in.).

2.14.5.10.4 Handles of manually operated folding car doors nearest the car operating device on elevators operated from the car only shall be so located that the nearest handle is not more than 1 220 mm (48 in.) from the car operating device when the folding door is closed, and between 1 220 mm (48 in.) and 380 mm (15 in.) above the car floor

2.18.4 Speed-Governor Overspeed Switch-A17.1-2013

2.18.4.1 Where Required and Function

2.18.4.1.3 (was 2.18.4.4 in 2010 code)

The switches required in 2.18.4.1.1 shall remain in the open position until manually reset.

NOTE: Manual reset includes means such as a finger, hand or cable-actuated lever, cam, etc., or some form of electromechanical actuation from the location of elevator controllers located outside the hoistway or the enclosure as specified in 2.7.6.5.

2.18.5 Governor Ropes-A17.1-2010

2.18.5 Governor Ropes

Governor ropes shall comply with the requirements of **ASME A17.6**, Part 1, and 2.18.5.1 through 2.18.5.3.

2.18.5.1 Material and Factor of Safety. Governor ropes shall be made of iron, steel, monel metal, phosphor bronze, or stainless steel. They shall be of a regular-lay construction and not less than 6 mm (0.25 in.) in diameter. The factor of safety of governor ropes shall be not less than 5. **Where provided, ropes of a diameter less than 9.5 mm (0.375 in.) shall have a factor of safety of not less than 8 and shall be of a six-, eight-, or nine strand construction.** Tiller-rope construction shall not be used

SECTION 2.20-SUSPENSION MEANS AND THEIR CONNECTIONS-A17.1-2010

2.20.1 Suspension Means

Elevator cars and counterweights shall be suspended by steel wire ropes, [aramid fiber ropes](#), or [noncircular elastomeric-coated steel suspension members](#) attached to the car frame or passing around sheaves attached to the car frame specified in 2.15.1. Suspension means that have previously been installed and used on another installation shall not be reused. All suspension members in a set of suspension means shall be the same material, grade, construction, and dimensions. A suitable means shall be provided to protect the suspension means during the installation process.

Only the following shall be permitted:

- (a) steel wire ropes constructed in accordance with ASME [A17.6, Part 1](#)
- (b) aramid fiber ropes constructed in accordance with ASME [A17.6, Part 2](#)
- (c) noncircular elastomeric-coated steel suspension members constructed in accordance with ASME [A17.6, Part 3](#)

SECTION 2.20-SUSPENSION MEANS AND THEIR CONNECTIONS-A17.1-2010

2.20.2 Suspension-Means Data

2.20.2.1 Crosshead Data Plate. The crosshead data plate required by 2.16.3 shall bear the following suspension-means data:

- (a) type of suspension means
- (b) the number of suspension members
- (c) either the diameter or the width and thickness in millimeters (mm) or inches (in.), as applicable
- (d) the elevator manufacturer's required minimum breaking force per suspension member in kilo Newtons (kN) or pounds-force (lbf), as applicable

SECTION 2.20-SUSPENSION MEANS AND THEIR CONNECTIONS-A17.1-2010

2.20.8 Suspension-Means Monitoring and Protection

2.20.8.1 Protection Against Traction Loss. All electric traction elevators shall be provided with a traction loss detection means to detect loss of traction between suspension members and the drive sheave [see 8.6.1.2.1(g)].

2.20.8.2 Broken Suspension Member. All electric traction elevators, excluding those with steel wire ropes greater than or equal to 8 mm (0.315 in.), shall be provided with a broken-suspension-member detection means

2.20.8.3 Suspension-Member Residual Strength. All electric traction elevators, excluding those with steel wire ropes, shall be provided with residual-strength detection means

2.25.4.1 Emergency Terminal Speed-Limiting Device-A17.1-2013

2.25.4.1.3

The car speed-sensing device used for the emergency terminal speed-limiting device shall be permitted to be either a separate car speed-sensing device from that of the normal speed control system or the same car speed-sensing device, provided that a separate means is used to continuously verify the proper operation of this speed-sensing device. Where the same car speed sensing device is used, the detection of a failure of this car speed-sensing device shall cause the power to be removed from the driving-machine motor and brake. The car speed-sensing device(s) and, where required, the verification means described above, shall conform to the following:

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2.25.4.1 Emergency Terminal Speed-Limiting Device-A17.1-2013

2.25.4.1.3 (a) a common actuating means (e.g., a driving-machine shaft, brake drum, etc.) shall be permitted provided that it is not dependent on the following connection types, unless the connection is continuously monitored:

- (1) traction (excluding the traction between the drive sheave and suspension means and the traction between the governor and governor rope)
- (2) friction (except for interference fits)
- (3) a flexible coupling where positive engagement is not assured between coupling halves

Where monitoring is required, the monitoring shall detect a failure that prevents conformance with this requirement and shall cause the electric power to be removed from the elevator driving-machine motor and brake.

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2.25.4.1 Emergency Terminal Speed-Limiting Device-A17.1-2013

2.25.4.1.3

(b) a common member (e.g., tape, target, wire, etc.) that is sensed by both speed-sensing devices shall be permitted, provided that

(1) the member is monitored such that when its presence is not detected, this shall cause the electric power to be removed from the elevator driving-machine motor and brake

(2) the common member is securely mounted in such a manner that horizontal movement of the car shall not affect the operation of the sensors

(c) a common mounting means shall be permitted

2.26.2 Electrical Protective Devices-A17.1S-2005

2.26.2.34 Unexpected Car Movement Device.

An unexpected car movement device shall be provided where required by 2.7.5.1.2(c). This requirement shall be permitted to be satisfied by another device specified in 2.26.2, provided that the means required by 2.7.5.1.1 actuates the electrical device.

2.26.2.35 Equipment Access Panel Electrical Device.

An electric contact on equipment access panels in the car shall be provided where required by 2.7.5.1.4 or 2.14.2.2(g).

2.26.2 Electrical Protective Devices-A17.1S-2005

2.26.2.36 Working Platform Electrical Device.

An electric contact conforming to 2.14.4.2.3(b), (c), and (e) shall be provided where required by 2.7.5.3.1.

2.26.2.37 Retractable Stop Electrical Device.

An electric contact conforming to 2.14.4.2.3(b), (c), and (e) shall be provided where required by 2.7.5.5(a).

2.26.2 Electrical Protective Devices-A17.1-2007

2.26.2.38 Retractable Ladder Electrical Device.

An electrical contact conforming to the following shall be provided where required by 2.2.4.2.7:

- (a) be positively opened by a device attached to and operated by the ladder
- (b) not utilize mercury tube switches

2.26.2 Electrical Protective Devices-A17.1-2013

2.26.2.39 Sway Control Guide Slack Suspension Detection Means.

An electrical device conforming to the following shall be provided where required by 2.30.2(d):

- (a) It shall operate whenever any of the suspension members of the sway control guide become slack.

- (b) It shall be of the manually reset type.

2.26.4 Electrical Equipment and Wiring- A17.1-2007

2.26.4.3 The devices covered by 2.26.2 shall meet the requirements of either 2.26.4.3.1 or 2.26.4.3.2.

2.26.4.3.2 They shall be listed/certified and labeled/marked to a **SIL rating** in accordance with the applicable requirements of IEC 61508-2 and IEC 61508-3 and IEC 61508-3 with a SIL rating equal to or greater than the SIL indicated for the applicable device shown in Table 2.26.4.3.2. They shall be labeled/marked with part identification. Wiring diagrams (see 8.6.1.6.3) shall include part identification, SIL, and certification information that shall be in accordance with the certifying organization's requirements.

2.26.4 Electrical Equipment and Wiring- A17.1-2007

2.26.4.3 The devices covered by 2.26.2 shall meet the requirements of either 2.26.4.3.1 or 2.26.4.3.2.

2.26.4.3.2 Assemblies containing SIL rated devices shall be labeled or tagged with the statement: “Assembly contains SIL rated devices. Refer to Maintenance Control Program and wiring diagrams prior to performing work.” The detection of a dangerous fault (e.g., with diagnostic tests, proof-tests, or by any other means) in SIL rated devices that can tolerate a single fault shall cause the elevator to revert to a known fail-safe condition. Where necessary, to maintain the integrity of the SIL rated devices and maintain the fail-safe condition prior to a second fault that could lead to a dangerous condition, a manual reset shall be required to remove the SIL rated devices from the fail-safe condition

2.27.1 Car Emergency Signaling Devices- A17.1b-2009

2.27.1.1.6 (a) The two-way communications means within the car shall include a means to verify operability of the telephone line, where

- (1) verification of the telephone line operability shall be automatically performed
- (2) verification may be continuous or periodic
- (3) periodic verification shall be at least on a daily basis
- (4) verification shall not require activation of the two-way communications link(s)

If means other than a telephone line (e.g., VOIP, network, intercom, etc.) is used for the two-way communications, similar verification of this equivalent means shall be performed.

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2.27.1 Car Emergency Signaling Devices- A17.1b-2009

2.27.1.1.6 (b) If the verification means in 2.27.1.1.6(a) determines that the telephone line or equivalent means is not functional, an audible and illuminated visual signal shall be activated. A minimum of one visual and one audible signal shall be provided for each group of elevators controlled by a “FIRE RECALL” switch.

(1) The visual signal shall

(a) be located at the designated landing in the vicinity of the “FIRE RECALL” switch and visible to elevator user(s)

(b) be labeled “ELEVATOR COMMUNICATIONS FAILURE” in red letters a minimum of 5 mm (0.25 in.) high

(c) illuminate intermittently

(d) continue illuminating intermittently until the telephone line or equivalent means is functional

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2.27.1 Car Emergency Signaling Devices- A17.1b-2009

2.27.1.1.6 (b) If the verification means in 2.27.1.1.6(a) determines that the telephone line or equivalent means is not functional, an audible and illuminated visual signal shall be activated. A minimum of one visual and one audible signal shall be provided for each group of elevators controlled by a “FIRE RECALL” switch.

(2) The audible signal shall

(a) be 10 dBA minimum above ambient, but shall not exceed 80 dBA measured at the designated landing “FIRE RECALL” switch

(b) sound at least once every 30 s with a minimum duration of half a second

(c) continue to sound until silenced by authorized personnel or the telephone line or equivalent means is functional

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2.27.1 Car Emergency Signaling Devices- A17.1b-2009

2.27.1.1.6 (b)(3) A means to silence the audible signal shall be provided and shall be accessible only to authorized personnel. The signal when silenced shall remain silent for a period of no less than 12 hr or until activated by the next failed periodic verification [see 2.27.1.1.6(a)(3)].

(4) The verification means in 2.27.1.1.6(a) shall continue to monitor the operability of the telephone line or equivalent means while the telephone line or equivalent means is not functional on a continuous basis or periodically with intervals of not more than 5 min. **(2013)**

When the verification determines that the operability of the telephone line or equivalent means has been restored after being nonfunctional, the audible signal shall be silenced unless the signal has already been silenced in accordance with 2.27.1.1.6(b)(3) and the illuminated visual signal shall be extinguished. **(2013)**

2.27.2 Emergency or Standby Power System- A17.1a-2008

2.27.2.4.6 A visual means, located adjacent to the manual selector switches, shall be provided to indicate which elevator(s) is currently selected.

2.27.3.1 Phase I Emergency Recall Operation- A17.1-2007

2.27.3.1.6 When a “FIRE RECALL” switch is in the “ON” position all cars controlled by the switch shall operate as follows:

(n) If the normal power supply, emergency power supply, and standby power supply are not available and the elevator is equipped with an alternate source of power that is insufficient to move the car to the recall level, the following requirements shall apply:

- (1) The visual signal [2.27.3.1.6(h)] shall extinguish.
- (2) A car that is not at a landing shall move to the closest landing it is capable of reaching.
- (3) A car that has automatic power-operated horizontally sliding doors or power-operated vertically sliding doors provided with automatic closing operation and is stopped at a landing, shall open the doors, and then within 15 s, initiate reclosing.
- (4) A car that is stopped at a landing shall have its door open button operative.
- (5) A car stopped at a landing shall not move until normal power, emergency power, or standby power becomes available.

2.27.3.3 Phase II Emergency In-Car Operation- A17.1-2007

2.27.3.3.1 When the “FIRE OPERATION” switch is in the “ON” position, the elevator shall be on Phase II Emergency In-Car Operation, for use by emergency personnel only, and the elevator shall operate as follows:

(n) If the normal power supply, emergency power supply, and standby power supply are not available and the elevator is equipped with an alternate source of power that can move the car to a floor, but is insufficient to move the car to all landings, the following requirements shall apply:

- (1) The visual signal [2.27.3.1.6(h)] shall illuminate intermittently.
- (2) A car that is not at a landing shall not start until a car call is entered. After a car call is entered, the car shall move to the closest landing it is capable of reaching.
- (3) A car stopped at a landing shall not move until normal power, emergency power, or standby power becomes available.

SECTION 2.30 SWAY CONTROL GUIDES-A17.1-2013

2.30.1 General Requirements

Where provided, sway control guides shall conform to the following:

- (a) Sheaves and drums shall conform to requirements of 2.24.2.1 and 2.24.2.2(b).
- (b) There shall be sufficient traction to lower, stop, and hold the car in the event the sway control guide becomes separated from the elevator system.
- (c) Safeties shall not be provided for the sway control guide.
- (d) All members of the sway control guide shall be designed to meet the strength requirements of 2.15.10.
- (e) A sway control guide position switch shall be provided, conforming to the requirements of 2.25.1.2, located in the hoistway, and be operated by a cam attached to the sway control guide frame. The switch shall be located so that it operates after the car final terminal stop switch is actuated.

SECTION 2.30 SWAY CONTROL GUIDES-A17.1-2013

2.30.2 Suspension Means

Suspension means systems for a sway control guide shall conform to the following:

- (a) It shall consist of not less than two suspension members.
- (b) The factor of safety of suspension members shall conform to the requirements of 2.20.3.
- (c) Means shall be provided to prevent the displacement of the suspension means of the sway control guide during safety or buffer operations.
- (d) It shall be provided with a slack suspension detection means conforming to the requirements of 2.26.2.39.

SECTION 2.30 SWAY CONTROL GUIDES-A17.1-2013

2.30.3 Abrasion Protection

Means shall be provided to minimize the abrasion between the sway control guide and the components being stabilized by this device.

2.30.4 Guiding Members

Sway control frames shall be guided by guiding means attached to the frame. Retention means shall be provided to prevent the frame from being displaced by more than 13 mm (0.5 in.) from its normal running position should any part of the guiding means fail, excluding the guiding member base and its attachment to the frame. The retention means shall be permitted to be integral with the base.

3.17.4 Governors-A17.1-2007

3.17.4 Governors

Governors, when provided, shall comply with 2.18, except 2.18.4. In addition, governors shall conform to 3.17.4.1 and 3.17.4.2

3.17.4.1 The term “operating speed in the down direction with rated load” shall be substituted for the words “rated speed” whenever these words appear.

3.17.4.2 For governors located inside the hoistway, see 2.7.6.3.4

3.18.6 Marking of Hydraulic Jack - A17.1-2007

3.18.6 Marking of Hydraulic Jack

The hydraulic jack shall be permanently and legibly marked. The marking shall be visible after installation. The letters and symbols shall be stamped, etched, cast, or otherwise applied with depressed or raised letters and symbols not less than 3 mm (0.125 in.) in height with the following information:

- (a) the name or trademark by which the organization that manufactured the hydraulic jack can be identified

- (b) the manufacturer's designation of the type or model

- (c) year of manufacture

SECTION 3.19 VALVES, PRESSURE PIPING, AND FITTINGS-A17.1-2013

3.19.2.8 Where the pressure piping is outside the machine room, machinery space, or hoistway, the pressure piping shall be protected from external damage. Where the pressure piping is buried underground or extends beyond the building containing the hydraulic machine or machine room, the elevator shall be fitted with at least one of the following:

- (a) a car safety conforming to 3.17.2
- (b) an overspeed valve(s) conforming to 3.19.4.7
- (c) a plunger gripper(s) conforming to 3.17.3

3.25.2 Terminal Speed Reducing Devices- A17.1-2007

3.25.2.3 Requirements for Mechanical or Hydraulic Means. Where the terminal speed reducing devices are implemented by mechanical or hydraulic means, a means shall be provided to prevent overheating of the drive system (pump and motor). The mechanical or hydraulic means shall not cause permanent deformation to any part upon which the means act.

3.25.2 Terminal Speed Reducing Devices- A17.1-2007

3.25.2.4 Requirements for Electrical Means. Where the terminal speed reducing devices are implemented by electrical means, they shall conform to 3.25.2.4.1 through 3.25.2.4.5.

3.25.2.4.1 They shall be so designed and installed that a single short circuit caused by a combination of grounds or by other conditions shall not render the device ineffective.

3.25.2.4.2 Where magnetically operated, optical, or solid-state devices are used for position sensing, a single short circuit caused by a combination of grounds or by other conditions, or the failure of any single magnetically operated, optical, or solid-state device, shall not

- (a) render the terminal speed reducing device inoperative
- (b) permit the car to restart after a normal stop

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3.25.2 Terminal Speed Reducing Devices- A17.1-2007

3.25.2.4.3 Mechanically operated switches, where located on the car or in the hoistway, shall conform to the following:

- (a) be operated by the movement of the car
- (b) have metal operating cams
- (c) have contacts that are positively opened mechanically
- (d) be of the enclosed type
- (e) be securely mounted in such a manner that horizontal movement of the car shall not affect operation of the device

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3.25.2 Terminal Speed Reducing Devices- A17.1-2007

3.25.2.4.4 Electrohydraulic elevators with two means to control upward movement (e.g., pump motor and valve) shall conform to the following:

(a) One or both means to control upward movement of the elevator shall be controlled by the terminal speed reducing device, either directly or through an intermediate device.

(1) Where an intermediate device is implemented with a solid-state device or software system to satisfy 3.25.2.4.4(a), the failure of any single solid-state device or a software system failure in the intermediate device shall not render the terminal speed reducing device ineffective.

(2) Redundant devices used to satisfy 3.25.2.4.4(a)(1) shall be checked prior to each start of the elevator from a landing, when on automatic operation. When a failure as specified occurs the car shall not be permitted to restart.

(b) The other means or both means to control upward movement of the elevator are to be controlled by the normal terminal stopping device, either directly or through an intermediate device.

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3.25.2 Terminal Speed Reducing Devices- A17.1-2007

3.25.2.4.5 Electrohydraulic elevators with one means to control upward movement (e.g., pump motor only). One or both of the devices required in 3.26.6.4(a) shall be controlled by the terminal speed reducing device and the other device or both devices by the normal terminal stopping device.

3.26.6 Control and Operating Circuits- A17.1-2007

3.26.6.3 For electrohydraulic elevators where there are two means of controlling upward movement of the elevator (e.g., a pump motor and a valve), at least one means shall be directly controlled by an electromechanical contactor or relay unless the terminal speed reducing device (see 3.25.2) directly removes power from one of the control means.

3.26.6 Control and Operating Circuits- A17.1-2007

3.26.6.4 For electrohydraulic elevators where the only means of controlling upward movement of the elevator is the pump motor, the pump motor control shall conform to the following:

- (a) Two devices shall be provided to remove power independently from the pump motor. At least one device shall be an electromechanical contactor.
- (b) The contactor shall be arranged to open each time the car stops.
- (c) The electrical protective devices shall control both devices [see 3.26.6.4(a)] in accordance with 3.26.4.

3.27.1 Phase I Emergency Recall Operation After Device Actuation-A17.1-2010

3.27.1 Phase I Emergency Recall Operation After Device Actuation

If Phase I Emergency Recall Operation is activated while the elevator is responding to any of the following devices, the car shall return to the recall level:

- (a) low oil protection (see 3.26.9)
- (b) plunger-follower guide protection, provided the car is capable of being moved (see 3.18.2.7)
- (c) auxiliary power lowering device (see 3.26.10)
- (d) oil tank temperature shutdown (see 3.26.6.5)

If the elevator is incapable of returning to the recall level, the car shall descend to an available floor. Upon arrival, automatic power-operated doors shall open, and then reclose within 15 s. The door open button(s) shall remain operative. The visual signal [2.27.3.1.6(h)] shall extinguish.

Part 6-Escalators - A17.1-2010

6.1.4 Rated Speed

6.1.4.1 Limits of Speed

6.1.4.1.1 The rated speed shall be not more than 0.5 m/s (100 ft/min), measured along the centerline of the steps in the direction of travel.

The speed attained by an escalator after start-up shall not be intentionally varied, except as permitted by 6.1.4.1.2.

6.1.4.1.2 Variation of the escalator speed after start-up shall be permitted provided the escalator installation conforms to all of the following:

- (a) The acceleration and deceleration rates shall not exceed 0.3 m/s^2 (1.0 ft/sec^2).
- (b) The rated speed is not exceeded.
- (c) The minimum speed shall be not less than 0.05 m/s (10 ft/min).
- (d) The speed shall not automatically vary during inspection operation

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Part 6-Escalators-A17.1-2010

6.1.4.1 Limits of Speed

6.1.4.1.2 (e) Passenger detection means shall be provided at both landings of the escalator such that

(1) detection of any approaching passenger shall cause the escalator to accelerate to or maintain the full escalator speed conforming to 6.1.4.1.2(a) through (d)

(2) detection of any approaching passenger shall occur sufficiently in advance of boarding to cause the escalator to attain full operating speed before a passenger walking at normal speed [1.35 m/s (270 ft/min)] reaches the combplate

(3) passenger detection means shall remain active at the egress landing to detect any passenger approaching against the direction of escalator travel and shall cause the escalator to accelerate to full rated speed and sound the alarm (see 6.1.6.3.1) at the approaching landing before the passenger reaches the combplate

(f) Automatic deceleration shall not occur before a period of time has elapsed since the last passenger detection that is greater than 3 times the amount of time necessary to transfer a passenger between landings.

(g) Means shall be provided to detect failure of the passenger detection means and shall cause the escalator to operate at full rated speed only. **(same req. for Moving Walks)**

8.4.2 Machinery and Sheave Beams, Supports, and Foundations-A17.1-2013

8.4.2.3.4

For areas not utilizing seismic zones, the Nonstructural Component Anchorage, as defined by IBC/ASCE 7, shall be in conformance with the requirements of the governing building code.

SECTION 8.6-MAINTENANCE, REPAIR, REPLACEMENT, AND TESTING-A17.1-2013

8.6.1.2 General Maintenance Requirements

8.6.1.2.1

(a) “A Maintenance Control Program for each unit (see 8.6.1.1.1) shall be provided by the person(s) and/ or firm maintaining the equipment and shall be viewable on-site by elevator personnel at all times from time of acceptance inspection and test or from the time of equipment installation or alteration (see 8.10.1.5).”

(b) The MCP shall include, but not be limited to, the Code required maintenance tasks, maintenance procedures, and examination and tests listed with the associated requirement (see 8.6.4 through 8.6.11). Where maintenance tasks, maintenance procedures, or examinations or tests have been revised in 8.6, the MCP shall be updated.

SECTION 8.6-MAINTENANCE, REPAIR, REPLACEMENT, AND TESTING-A17.1-2013

8.6.1.2 General Maintenance Requirements

8.6.1.2.1

(c) The MCP shall reference On-Site Equipment Documentation (see 8.6.1.2.2) needed to fulfill 8.6.1.2.1(b) and On-Site Maintenance Records (see 8.6.1.4.1) that record the completion of all associated maintenance tasks specified in 8.6.1.4.1(a).

(d) Where the MCP is maintained remotely from the machine room, machinery space, control room, or control space (see 8.11.1.8), instructions for on-site locating or viewing the MCP either in hard copy or in electronic format shall be posted on the controller or at the means necessary for test (see 2.7.6.4). The instructions shall be permanently legible with characters a minimum of 3 mm (0.125 in.) in height

SECTION 8.6-MAINTENANCE, REPAIR, REPLACEMENT, AND TESTING-A17.1-2013

8.6.1.2.1

(e) The specified scheduled maintenance intervals (see 1.3) shall, as applicable, be 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) the manufacturer's recommendations and original equipment certification for any SIL rated devices or circuits (see 8.6.3.12 and 8.7.1.9)
- (7) the manufacturer's recommendations based on any ASME A17.7/CSA B44.7 approved components or functions

(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 shall be incorporated into and made part of the Maintenance Control Program. [See 2.20.8.1, 2.20.8.2, 2.20.8.3, 8.6.11.10, 8.10.2.2.2(cc)(3)(c)(2), 8.10.2.2.2(ss), and 8.6.4.19.12.]

SECTION 8.6-MAINTENANCE, REPAIR, REPLACEMENT, AND TESTING-A17.1-2013

8.6.1.2 General Maintenance Requirements

8.6.1.2.2 On-Site Documentation.

The following documents specified in 8.6.1.2.2(a), (b), and (c) shall be written and permanently kept on-site in the machine room, machinery space, control room, control space, or in the means necessary for test (2.7.6.4) in hard copy for each unit for elevator personnel. The documentation specified in 8.6.1.2.2(d) shall be on-site and available to the specified personnel.

- (a) Up-to-date wiring diagrams detailing circuits of all electrical protective devices (see 2.26.2) and critical operating circuits (see 2.26.3).

SECTION 8.6-MAINTENANCE, REPAIR, REPLACEMENT, AND TESTING-A17.1-2013

8.6.1.2 General Maintenance Requirements

8.6.1.2.2 On-Site Documentation.

(b) Procedures for inspections and tests not described in ASME A17.2 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 (e.g., 8.6.4.20.8, check out procedure for leveling; 8.6.5.16.5, check out procedure for overspeed valve; and 8.6.8.15.7, check out procedure for reversal stop switch, etc.)

(2) unique maintenance procedures or methods required for inspection, tests, and replacement of SIL rated E/E/PES electrical protective devices and circuits. See 2.26.4.3.2, 2.26.9.3.2(b), 2.26.9.5.1(b), and 2.26.9.6.1(b)

(3) unique maintenance procedures or methods required for inspection, tests, and replacement of equipment applied under alternative arrangements (see 1.2.2.1) shall be 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)

SECTION 8.6-MAINTENANCE, REPAIR, REPLACEMENT, AND TESTING-A17.1-2013

8.6.1.2 General Maintenance Requirements

8.6.1.2.2 On-Site Documentation.

(c) Written checkout procedures

- (1) to demonstrate E/E/PES function as intended (see 8.6.4.19.10)
- (2) for elevator leveling speed with open doors (see 8.6.4.20.8)
- (3) for hydraulic elevator overspeed valve (see 8.6.5.16.5)
- (4) for escalator reversal stopping device (see 8.6.8.15.7)
- (5) for escalator handrail retarding force (see 8.6.8.15.13)

(d) Written procedures for the following:

- (1) evacuation procedures for elevators by authorized persons and emergency personnel shall be available on-site (see 8.6.11.5.2 and ASME A17.4)
 - (2) the procedure for cleaning of a car and hoistway transparent enclosures by authorized persons (see 8.6.11.4.2)
-

SECTION 8.6-MAINTENANCE, REPAIR, REPLACEMENT, AND TESTING-A17.1-2013

8.6.1.4 Maintenance Records.

Maintenance records shall document compliance with 8.6. Instructions for locating the maintenance records of each unit, for viewing on-site, shall be posted on the controller or at the means necessary for test (see 2.7.6.4). The provided instructions shall be permanently legible with characters a minimum of 3 mm (0.125 in.) in height. These records shall be retained for the most recent 5 yr or from the date of installation or adoption of this Code edition, whichever is less or as specified by the authority having jurisdiction. Existing maintenance records up to 5 yr shall be retained.

SECTION 8.6-MAINTENANCE, REPAIR, REPLACEMENT, AND TESTING-A17.1-2013

8.6.1.4.1 On-Site Maintenance Records

(a) Maintenance Control Program Records

(1) A record that shall include the maintenance tasks listed with the associated requirements of 8.6 identified in the Maintenance Control Program (8.6.1.2.1), other tests (see 8.6.1.2.2), examinations and adjustments, and the specified scheduled intervals shall be maintained.

(2) The specified scheduled maintenance intervals (see 1.3) shall, as applicable, be based on the criteria given in 8.6.1.2.1(e).

(3) MCP records shall be viewable on-site by elevator personnel in either hard copy or electronic format acceptable to the authority having jurisdiction and shall include but not limited to the following:

- (a) site name and address
 - (b) service provider name
 - (c) conveyance identification (I.D.) and type
 - (d) date of record
 - (e) a description of the maintenance task, interval, and associated requirements of 8.6
 - (f) indication of completion of maintenance task
-

SECTION 8.6-MAINTENANCE, REPAIR, REPLACEMENT, AND TESTING-A17.1-2013

8.6.1.4.1 On-Site Maintenance Records

(b) Repair and Replacement Records. The following repairs and replacements shall be recorded and shall be kept on-site for viewing by elevator personnel in either hard copy or electronic format. Instructions for locating the records of each unit for immediate viewing shall be posted on the controller or at the means necessary for test (see 2.7.6.4). The provided instructions shall be permanently legible with characters a minimum of 3 mm (0.125 in.) in height. The record shall include an explanation of the repair or replacement, date, and name of person(s) and/or firm performing the task. The record of repairs and replacements shall be retained by the owner of the equipment for the most recent 5 yr or from the date of installation or adoption of this Code edition, whichever is less or as specified by the authority having jurisdiction and shall be a permanent record for the installation. These records may be kept remotely from the site.

(1) Repairs (8.6.2.1 through 8.6.2.5) including repairs of components and devices listed in 8.6.4, 8.6.5, 8.6.6, 8.6.7, 8.6.8, 8.6.9, and 8.6.10.

(2) Replacements (8.6.3.1 through 8.6.3.11 except 8.6.3.7 and 8.6.3.10) including replacements of components and devices listed in 8.6.4, 8.6.5, 8.6.6, 8.6.7, 8.6.8, 8.6.9, and 8.6.10.

SECTION 8.6-MAINTENANCE, REPAIR, REPLACEMENT, AND TESTING-A17.1-2013

8.6.1.4.1 On-Site Maintenance Records

(c) Other Records. The following written records shall be kept on-site for each unit. Instructions for locating the records of each unit for immediate viewing shall be posted on the controller or at the means necessary for test (see 2.7.6.4). The provided instructions shall be permanently legible with characters a minimum of 3 mm (0.125 in.) in height. These records shall be retained for the most recent 5 yr from of the date of installation or adoption of this Code edition, whichever is less or as specified by the authority having jurisdiction. The record shall include the date and name of person(s) and/or firm performing the task.

(1) A record of oil usage (8.6.5.7).

(2) A record of findings for firefighters' service operation required by 8.6.11.1 with identification of the person(s) that performed the operation.

(3) Periodic tests (see 8.6.1.7) shall be documented or recorded in accordance with 8.6.1.7.2.

(4) Written record to document compliance with replacement criteria specified in ASME A17.6 requirement 1.10.1.1(c).

SECTION 8.6-MAINTENANCE, REPAIR, REPLACEMENT, AND TESTING-A17.1-2013

8.6.1.4.1 On-Site Maintenance Records

(d) Permanent Record. A permanent record of the results of all acceptance tests as required by 8.10.1.1.4 and 8.10.1.1.5 shall be kept with the on-site records. Test tags, complying with 2.16.3.3 for marking plates (except lettering shall be 1.6 mm [0.0625 in.]), permanently attached to or adjacent to the controller, shall meet this requirement.

NOTE: This requirement does not apply to equipment installed under ASME A17.1-2010 and earlier editions

SECTION 8.6-MAINTENANCE, REPAIR, REPLACEMENT, AND TESTING-A17.1-2013

8.6.1.4.2 Call Backs (Trouble Calls).

A record of call backs shall be maintained and shall include the description of reported trouble, dates, time, and corrective action(s) taken that are reported by any means to elevator personnel. These records shall be made available to elevator personnel when performing corrective action. For elevator personnel other than personnel performing the corrective action, records will be available upon request. Instructions on how to report any need for corrective action (trouble calls) to the responsible party shall be posted on the controller or at the means necessary for test (see 2.7.6.4). The instructions shall be permanently legible with characters a minimum of 3 mm (0.125 in.) in height

8.6.4.19 Periodic Test Requirements — Category 1- A17.1a-2008

Periodic test requirements moved from 8.11.2.2 for
Periodic Inspections and Tests to 8.6.4.19 now under
Maintenance, Repair, Replacement, And Testing

8.6.4.20 Periodic Test Requirements — Category 5- A17.1a-2008

Periodic test requirements moved from 8.11.2.3 for Periodic Inspections and Tests to 8.6.4.20 now under Maintenance, Repair, Replacement, And Testing

8.6.4 Maintenance and Testing of Electric Elevators-A17.1-2010

8.6.4.19.12 Traction-Loss Detection Means.

Where provided, conformance with the traction-loss detection means specified in 2.20.8.1 shall be demonstrated by

- (a) causing relative motion between the drive sheave and the suspension means either by bottoming the car or counterweight [see 8.6.4.20.10(b)], or
- (b) an alternative test provided in the Maintenance Control Program [see 8.6.1.2.1(f)]

8.6.4.19.13 Broken-Suspension-Member and Residual-Strength Detection Means.

Where provided, testing of broken-suspension and residual-strength detection means shall comply with the following:

- (a) The broken-suspension-member detection means shall be tested by simulating a slack suspension member or a loss of a suspension member as appropriate (see 2.20.8.2).
- (b) Suspension-member residual-strength detection means shall be tested to simulate a reduction of residual strength to 2.20.8.3.

8.6.4 Maintenance and Testing of Electric Elevators-A17.1-2013

8.6.4.19.14 Occupant Evacuation Operation.

Occupant Evacuation Operation shall be tested to determine conformance with the applicable requirements. Deficiencies shall be corrected. A record of findings shall be available to the building owner and the authority having jurisdiction.

8.6.4.19.15 Emergency Communications.

Emergency communications shall be tested to determine conformance with the applicable requirements (Item 1.6).

8.6.4.19.16 Means to Restrict Hoistway or Car Door Opening.

Means to restrict hoistway or car door opening shall be tested to determine conformance with the applicable requirements (Item 1.18).

8.6.4.22 Maintenance of Seismic Devices – A17.1-2013

8.6.4.22.1

A seismic switch, where provided, shall be maintained in accordance with the manufacturer's recommendations.

8.6.4.22.2

The counterweight displacement switch components, where provided, shall be

(a) maintained in accordance with the manufacturer's recommendations

(b) properly aligned and tensioned and kept free of dirt, debris, and other contaminants that may interfere with proper operation

8.6.7 Maintenance and Testing of Special Application Elevators-A17.1-2013

8.6.7.11 Wind Turbine Tower Elevator.

The maintenance of wind turbine tower elevators shall conform to the applicable requirements of 8.6.7.11.1 through 8.6.7.11.3.

8.6.7.11.1 Periodic Test Requirements.

Wire rope gripping safeties with slack rope actuation, or wire rope gripping safeties with an internal centrifugal governor, shall be tested with rated load in the car. Tests for governor operated safeties shall be made by manually tripping the governor at the rated speed. The overspeed switch on the governor shall be made ineffective during the test.

8.6.7.11.2 Wind Turbine Tower Elevators.

The maintenance of wind turbine tower elevators shall conform to 8.6.1 through 8.6.3 and the applicable requirements of 8.6.

8.6.7 Maintenance and Testing of Special Application Elevators-A17.1-2013

8.6.7.11 Wind Turbine Tower Elevator.

The maintenance of wind turbine tower elevators shall conform to the applicable requirements of 8.6.7.11.1 through 8.6.7.11.3.

8.6.7.11.3 Car and Counterweight Safeties

Types A, B, and C car safeties except those operating on wood guide rails, and their governors, wire rope gripping safeties with slack rope actuation, or wire rope gripping safeties with an internal centrifugal governor shall be tested with rated load in the car. Counterweight safety tests shall be made with no load in the car. Tests for governor operated safeties shall be made by manually tripping the governor at the rated speed. The overspeed switch on the governor shall be made ineffective during the test. Type A safeties and wire rope gripping safeties without governors that are operated as a result of the breaking or slackening of the hoisting ropes shall be tested by obtaining the necessary slack rope to cause it to function (Item 2.29.2.1) and hold the car with rated load. The following operational conditions shall be checked (Item 2.29.2.1).

8.6.7 Maintenance and Testing of Special Application Elevators-A17.1-2013

8.6.7.12 Outside Emergency Elevators.

The maintenance, repair, and replacement of outside emergency elevators shall conform to 8.6.1 through 8.6.3 and ASME A17.7/CSA B44.7, Requirement 2.12.2.

8.6.7.12.1 Periodic Test Requirements —Category 1.

Outside emergency elevators shall be subject to applicable periodic tests specified in 8.6.4.19.1 through 8.6.4.19.5, 8.6.4.19.7, 8.6.4.19.8, 8.6.4.19.10, and ASME A17.7/CSA B44.7, Requirement 2.12.3. Outside emergency elevators are not required to be powered by electric driving-machine motors.

8.6.7.12.2 Periodic Test Requirements — Category 5.

Outside emergency elevators shall be subject to applicable periodic tests specified in 8.6.4.20.1 through 8.6.4.20.11 and ASME A17.7/CSA B44.7, requirement 2.12.3. Outside emergency elevators are not required to be powered by electric driving-machine motors

8.6.11 Special Provisions-A17.1b-2009

8.6.11.2 Two-Way Communications Means.

The two-way communications means shall be checked annually by authorized personnel in accordance with the following:

- (a) Two-way communications means shall be checked to verify that two-way communications is established; or
- (b) All elevators installed under ASME A17.1a-2002/ CSA B44-00 Update 1 and later editions shall have the two-way communications means checked by pressing the “HELP” button in the car to verify that the visual indicator [2.27.1.1.3(c)] is functional and that the answering authorized personnel can receive the building location and elevator number [2.27.1.1.3(d)]; and
- (c) Where communications from the building into the elevator is provided, check the two-way communications means to each car.

8.6.11 Special Provisions - A17.1-2013

8.6.11.10 Category 5 Tests Without Load Via Alternative Test Methodologies

8.6.11.10.1 Where Permitted

8.6.11.10.2 Alternative Test Method and Tools

8.6.11.10.3 Alternative Test Method Procedure.

8.6.11.10.4 Alternative Test Method Report

8.6.11 Special Provisions-A17.1-2010

8.6.11.11 Examination After Shutdown Due to Traction Loss. Where the traction-loss detection means has been actuated [see 2.20.8.1 and 8.6.1.2.1(g)], the elevator shall not be returned to service until a physical examination of the drive sheave and suspension means has been conducted. The elevator shall 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 in 8.11.2.1.3(cc), any suspension-means or drive-sheave condition that would adversely affect the traction capability of the system (see 2.24.2.3) shall be corrected before returning the elevator to service.

NOTE: See lockout/tagout procedures in Elevator Industry Field Employees' Safety Handbook for procedure for removing the elevator from service

8.6.11 Special Provisions-A17.1-2010

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 shall 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 sheaves, suspension members, or retainers. The elevator shall not be returned to service until this physical examination has been conducted and any repairs made, if necessary

8.6.11 Special Provisions-A17.1-2013

8.6.11.13 Occupant Evacuation Operation. All elevators provided with Occupant Evacuation Operation shall 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 shall be corrected. A record of findings shall be available to elevator personnel and the authority having jurisdiction.

8.6.11 Special Provisions-A17.1-2010

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 service, the driving-machine sheave, all other sheaves, where furnished, and retainers and suspension members shall 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 sheaves, suspension members, or retainers. The elevator shall not be returned to service until this physical examination has been conducted and any repairs made, if necessary. Where a single suspension member has been damaged or broken, the entire suspension means shall be replaced in accordance with 8.6.3.2.

8.7.2.27 Operating Devices and Control Equipment-A17.1-2007

8.7.2.27.8 Electrical Protective Devices.

Where there is an alteration to or addition of an electrical protective device, it shall conform to 2.26.2 for that device.

8.7.2 Alterations to Electric Elevators-A17.1-2013

8.7.2.28 Emergency Operations and Signaling Devices

- (a) Where an alteration is made to car emergency signaling devices, the alteration shall conform to 2.27.1.
 - (b) Where an alteration is made to, or consists of the addition of, an emergency or standby power system, the installation shall conform to the requirements of 2.27.2.
 - (c) Where an alteration is made to, or consists of the addition of, Firefighters' Emergency Operation, the elevator and all elevators in the same group automatic operation shall conform to 2.27.3 through 2.27.8.
 - (d) Where the alteration consists of the addition of an elevator to a group, all elevators in that group shall conform to 2.27.
 - (e) Where any of the alterations (a) through (d) above occur, all new equipment and wiring shall conform to 8.7.2.8 and 2.26.4.2, and all modified equipment and wiring shall conform to 8.7.2.8. Equipment and floors shall be identified as required by 2.29.
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8.7.3 Alterations to Hydraulic Elevators-

A17.1-2013

8.7.3.31.8 Emergency Operation and Signaling Devices

(a) Where an alteration is made to car emergency signaling devices, the installation shall conform to 2.27.1.

(b) Where an alteration is made to, or consists of the addition of, an emergency or standby power system,

the installation shall conform to the requirements of 2.27.2.

(c) Where an alteration is made to, or consists of the addition of, Firefighters' Emergency Operation, the elevator and all elevators in the same group, automatic operation shall conform to 3.27, except 2.27.1 and 2.27.2.

(d) Where the alteration consists of the addition of an elevator to a group, all elevators in that group shall conform to 3.27.

(e) Where any of the alterations of (a) through (c) above occur, all new equipment and wiring shall conform to 8.7.3.8 and 2.26.4.2, and all modified equipment and wiring shall conform to 8.7.3.8. Equipment and floors shall be identified as required by 2.29.

8.7.6 Alterations to Escalators and Moving Walks- A17.1a-2005

8.7.6.1.16 Controller. Where a controller is installed as part of an alteration, it shall conform to 6.1.6.10 through 6.1.6.15, and 6.1.7.4.

8.7.6.2.15 Controller. Where a controller is installed as part of an alteration, it shall conform to 6.2.6.9 through 6.2.6.14, and 6.2.7.4

8.7.6 Alterations to Escalators and Moving Walks- A17.1-2013

8.7.6.1.17 Variable Frequency Drive Motor Control.

Where the alteration consists of the addition of, or alteration to, a variable frequency drive motor control, the installation shall conform to 6.1.6.3.2 and 6.1.6.10.3.

8.7.6.2.16 Variable Frequency Drive Motor Control.

Where the alteration consists of the addition of, or alteration to, a variable frequency drive motor control, the installation shall conform to 6.2.6.3.2 and 6.2.6.9.3.

8.10.1 General Requirements for Acceptance Inspections and Tests-A17.1-2013

8.10.1.1 Persons Authorized to Make Acceptance Inspections and Tests

8.10.1.1.3 The inspector shall meet the qualification requirements of ASME QEI-1. Inspectors and inspection supervisors shall be certified by an independent, accredited, certifying organization as specified in 8.10.1.2 (see 1.3).

8.10.1 General Requirements for Acceptance Inspections and Tests-A17.1-2013

8.10.1.1 Persons Authorized to Make Acceptance Inspections and Tests

8.10.1.1.4 Acceptance Test Tags. A metal tag with the applicable Code requirement(s) and date(s) performed, and the name of the person or firm performing the test and the inspector witnessing the test, including their inspector's ID number and certifying organization, shall be installed to be readily visible and shall be permanently attached to the controller of each unit.

8.10.1 General Requirements for Acceptance Inspections and Tests-A17.1-2013

8.10.1.1 Persons Authorized to Make Acceptance Inspections and Tests

8.10.1.1.5 Acceptance Test Records.

A permanent test record showing the test dates, the requirement number for each test, the name of the person or firm performing the test, the inspector's name that witnessed the tests, their inspector's ID number and certifying organization, shall be made a permanent part of the maintenance records (8.6.1.4.1). The test record shall document all applicable acceptance tests shown in Nonmandatory Appendix X (Tables X-1 through X-4).

8.10.1 General Requirements for Acceptance Inspections and Tests-A17.1-2013

8.10.1.2 Accreditation of Certifying Organizations.

All organizations that certify elevator inspectors and inspection supervisors shall be accredited by an accrediting body (see 1.3) in accordance with ANSI/ISO/IEC 17024, or equivalent, and ASME QEI-1.

8.10.1 General Requirements for Acceptance Inspections and Tests-A17.1-2007

8.10.1.5 Unique or Product-Specific Procedures or Methods. Where unique or product-specific procedures or methods are required to maintain, repair, replace, inspect, or test equipment, such procedures or methods shall be provided by the manufacturer or installer [see 8.6.1.2.2(b)].

8.10.1 General Requirements for Acceptance Inspections and Tests-A17.1-2013

8.10.1.6 Maintenance Control Program.

The Maintenance Control Program complying with 8.6.1.2.1 shall be available at the time of inspection. On-site equipment documentation complying with 8.6.1.2.2 shall be available at the time of inspection

8.10.2 Acceptance Inspection and Tests of Electric Elevators-A17.1-2010

8.10.2.2 Inspection and Test Requirements for New Installations

8.10.2.2.2 Machine Room/Spaces, Control Room/Spaces

(cc) Traction Sheaves (Item 2.25)

(3) traction limits (2.20.8.1, 2.24.2.3, and 2.16.6) shall be verified

(c) Conformance with the traction-loss detection means specified in 2.20.8.1 shall be demonstrated by

(1) causing relative motion between the drive sheave and suspension means either by bottoming the car or counterweight [see 8.10.2.2.2(cc)(3)(b)], or

(2) an alternative test provided in the Maintenance Control Program [see 8.6.1.2.1(f)] or by the installer and acceptable to the authority having jurisdiction

NOTE [8.10.2.2.2(cc)(3)(b) and 8.10.2.2.2(cc)(3)(c)]: Demonstration need not involve an actual loss of traction, for example, where the method of protection used to meet 2.20.8.1 prevents a loss of traction.

8.10.2 Acceptance Inspection and Tests of Electric Elevators-A17.1-2007

8.10.2.2 Inspection and Test Requirements for New Installations

8.10.2.2.2 Machine Room/Spaces, Control Room/Spaces

(ee) Rope Fastenings (2.9.3.3, 2.20.5, and 2.20.9) (Item 2.27)

(ff) Terminal Stopping Devices (Item 2.28). The following tests are performed with an empty car in the up direction and the car loaded with rated load or 125% of rated load in the down direction (see 2.16.8).

(1) Test normal terminal stopping device for conformance with 2.25.2 by making inoperative the normal stopping means. The final terminal stopping device and the emergency terminal speed-limiting device shall remain operative.

(2) Test emergency terminal speed-limiting device for conformance with 2.25.4.1.

(3) For static control elevators, see 2.25.4.2. [See also 8.10.2.2.3(g) and (h).]

(gg) Operating Devices

(1) inspection operation (2.26.1.4.4)

(2) inspection operation with open door circuits (2.26.1.5)

(3) additional operation devices (2.26.1.3)

8.10.2 Acceptance Inspection and Tests of Electric Elevators-A17.1-2007

8.10.2.2 Inspection and Test Requirements for New Installations

8.10.2.2.2 Machine Room/Spaces, Control Room/Spaces

(hh) Governor, Overspeed Switch, and Seal (Item 2.13)

(1) The tripping speed of the governor and the speed at which the governor overspeed switch operates shall be tested to determine conformance with 2.18.2 and 2.18.4.

(2) The governor rope pull-through and pull-out forces shall be tested to determine conformance with 2.17.15 and 2.18.6. If adjustments are made to the governor it shall be sealed immediately following the test.

(3) The adjustable means shall be sealed (2.18.3).

(4) A marking plate conforming to 2.18.9 shall be attached at the governor.

(5) Access and securing of car, if applicable (2.7.6.3.4)

8.10.2 Acceptance Inspection and Tests of Electric Elevators-A17.1-2010

8.10.2.2 Inspection and Test Requirements for New Installations

8.10.2.2.2 Machine Room/Spaces, Control Room/Spaces

(qq) Rope Retainers or Restraints for Seismic Risk Zones (Item 2.42)

(rr) Seismic and Displacement Switches Operation and Door Operation (Item 2.42)

(ss) Testing of Broken-Suspension and Residual- Strength Detection Means

(1) The broken-suspension-member detection means shall be tested by simulating a slack suspension member or a loss of a suspension member as appropriate (2.20.8.2).

(2) Suspension-member residual-strength detection means shall be tested to simulate a reduction of residual strength to 2.20.8.3.

8.10.2 Acceptance Inspection and Tests of Electric Elevators-A17.1-2010

8.10.2.2 Inspection and Test Requirements for New Installations

8.10.2.2.3 Top-of-Car

(jj) For seismic risk zones, horizontal clearance for car and counterweight, snag-point clearance, and rail fastening

(kk) For seismic risk zones, snag guards, location of compensating ropes/chains, and traveling cables

8.10.2.2.5 Pit

(q) Snag guards for governor rope and traveling cables in seismic risk zones (Item 5.16.3)

(r) Verify information shown on layout drawing [Item 5.16.3(d)]

8.10.2 Acceptance Inspection and Tests of Electric Elevators-A17.1-2007

8.10.2.2 Inspection and Test Requirements for New Installations

8.10.2.2.7 Working Platforms

- (a) Working Platforms (2.7.5.3 and 2.7.5.4)
 - (1) operating instructions (8.6.10.8)
- (b) Retractable Stops (2.7.5.5)
 - (1) retractable stop electrical device (2.26.2.37)
- (c) Inspection Operation (2.26.1.4.4)

8.10.2 Acceptance Inspection and Tests of Electric Elevators-A17.1-2007

8.10.2.2 Inspection and Test Requirements for New Installations

8.10.2.2.8 Functional Safety of SIL Rated Device(s). Where an installation or alteration contains SIL rated devices, verify the Code Data Plate is marked (see 8.9) and that SIL rated devices used to satisfy 2.26.4.3.2, 2.26.8.2, 2.26.9.3.2(b), 2.26.9.5.1(b), and 2.26.9.6.1(b) are identifiable on wiring diagrams (see 8.6.1.6.3) with part identification, certification identification information, and an SIL equal to or greater than the values indicated for the devices in Table 2.26.4.3.2, and 2.26.8.2 and 2.26.9, as applicable. The person or firm installing the equipment shall provide a written checkout procedure and demonstrate that SIL rated devices, safety functions (see Table 2.26.4.3.2), and related circuits operate as intended.

8.10.2 Acceptance Inspection and Tests of Electric Elevators-A17.1-2013

8.10.2.2 Inspection and Test Requirements for New Installations

8.10.2.2.9 Occupant Evacuation Operation. Verify conformance with 2.27.10.

8.10.3 Acceptance Inspection and Tests of Hydraulic Elevators—A17.1-2007

8.10.3.2 Inspection and Test Requirements for New Installations

8.10.3.2.7 Working Platforms

(a) Working Platforms (3.7.1, 2.7.5.3, and 2.7.5.4)

(1) operating instructions (8.6.10.8)

(b) Retractable Stops (3.7.1 and 2.7.5.5)

(1) retractable stop electrical device (2.26.2.37)

(c) Inspection Operation (3.26.2)

8.10.4 Acceptance Inspection and Tests of Escalators A17.1-2010

8.10.4.1.2 Internal Inspection and Tests

(a) **Machine Space** (Items 8.1 and 10.1)

(5) Verify that the connection and restraints between the truss and the building structure comply with seismic risk zone requirements (Items 8.16 and 10.17).

(w) Verify that the balustrades are installed as shown on the manufacturer's drawing for seismic requirements [Item 7.20.3(a)].

(x) Verify the installation, location, and function of the seismic switch [Items 7.20.3(a), and 9.20.3 (b) and (c)].

8.10.5.14 Wind Turbine Tower Elevators-A17.1-2013

8.10.5.14 Wind Turbine Tower Elevators

Wind turbine tower elevators shall be subject to the applicable acceptance inspections and tests specified in 8.10.1, 8.10.2, and the applicable requirements of 8.10.5. The inspection and test requirements shall apply to the corresponding requirements of 5.11. Any additional requirements for this equipment shall also be checked during these inspections and tests.

8.10.5.15 Outside Emergency Elevators-A17.1-2013

8.10.5.15 Outside Emergency Elevators

Outside emergency elevators shall be subject to the applicable acceptance inspections and tests specified in 8.10.1 and ASME A17.7/CSA B44.7, Requirement 2.12.3.

8.11.1 General Requirements for Periodic Inspections and Tests-A17.1-2007

8.11.1.7 Unique or Product-Specific Procedures or Methods.

Where unique or product-specific procedures or methods are required to maintain, repair, replace, inspect, or test equipment, such procedures or methods shall be provided by the manufacturer or installer. These procedures and any unique devices required by the procedures for inspection and testing shall be accessible on site to elevator personnel [see also 8.6.1.2.2(b)].

8.11.1.8 Maintenance Control Program.

8.11.2 Periodic Inspection of Electric Elevators-

A17.1-2010

8.11.2.1 Periodic Inspection Requirements.

Inspectors shall include the following when identifying components or systems, or both, that shall be inspected

8.11.2.1.2 Machine Room/Spaces, Control Room/Spaces

(mm) Rope Retainers or Restraints for Seismic Risk Zones (Item 2.42)

(nn) Seismic and Displacement Switches (Item 2.42)

8.11.2 Periodic Inspection of Electric Elevators- A17.1-2010

8.11.2.1.3 Top-of-Car

(jj) Anchoring of beams and supports in seismic risk zone 2 or greater [Item 3.34.1(b)].

(kk) Rope retainers and snag guards in seismic risk zone 2 or greater [Items 3.34.1(c) and (d)].

(ll) Position restraints in seismic risk zone 2 or greater [Item 3.34.1(e) and (g)].

(mm) Car and counterweight guide rails system in seismic risk zone 2 or greater [Item 3.34.1(h)].

8.11.2 Periodic Inspection of Electric Elevators-

A17.1-2010

8.11.2.1.3 Top-of-Car

(nn) For seismic risk zones 2 or greater, horizontal clearance for car and counterweight, snag-point clearance, and rail fastening.

(oo) Seismic risk zone 2 or greater rope retainers/restraints and snag guards (Item 5.16.1).

(pp) Seismic risk zone 2 or greater rope retainer and snag guard for compensating ropes or chains and compensating tension sheave fastening.

(qq) Sheaves with nonmetallic groove surfaces (see 8.6.4.18) (Item 3.34).

8.11.2 Periodic Inspection of Electric Elevators- A17.1-2007

8.11.2.1 Periodic Inspection Requirements.

Inspectors shall include the following when identifying components or systems, or both, that shall be inspected

8.11.2.1.7 Working Platforms

(a) Working Platforms (2.7.5.3 and 2.7.5.4)

(1) operating instructions (8.6.10.8)

(b) Retractable Stops (2.7.5.5)

(1) retractable stop electrical device (2.26.2.37)

(c) Inspection Operation (2.26.1.4.4)

8.11.2 Periodic Inspection of Electric Elevators- A17.1-2013

8.11.2.1 Periodic Inspection Requirements.

Inspectors shall include the following when identifying components or systems, or both, that shall be inspected

8.11.2.1.8 Braking System. For passenger elevators and all freight elevators, verify that seal on the means of adjusting the holding capacity of the driving-machine brake has not been broken and that it bears or otherwise attaches the identification of the person or firm that installed it (see 8.6.4.20.4)

8.11.3 Periodic Inspection of Hydraulic Elevators- A17.1-2010

8.11.3.1 Periodic Inspection Requirements. Inspectors shall include the following when identifying components or systems, or both, that shall be inspected

8.11.3.1.5 Pit

(q) For seismic risk zones, overspeed valve and pipe supports (Item 5.15.2.2)

8.11.3 Periodic Inspection of Hydraulic Elevators- A17.1-2007

8.11.3.1 Periodic Inspection Requirements.

Inspectors shall include the following when identifying components or systems, or both, that shall be inspected.

8.11.3.1.7 Working Platforms

- (a) Working Platforms (3.7.1, 2.7.5.3, and 2.7.5.4)
 - (1) operating instructions (8.6.10.8)
- (b) Retractable Stops (3.7.1 and 2.7.5.5)
 - (1) retractable stop electrical device (2.26.2.37)
- (c) Inspection Operation (3.26.2)

8.11.5.14 Wind Turbine Tower Elevators- A17.1-2013

8.11.5.14 Wind Turbine Tower Elevators

Wind turbine tower elevators shall be subject to the applicable periodic inspections specified in 8.11.1, 8.11.2, and the applicable requirements of 8.11.5. The inspection requirements shall apply to the corresponding requirements of 5.11. Any additional requirements for this equipment shall also be checked during these inspections.

8.11.5.15 Outside Emergency Elevators- A17.1-2013

8.11.5.15 Outside Emergency Elevators.

Outside emergency elevators shall be subject to the applicable periodic inspections specified in 8.11.1 and ASME A17.7/CSA B44.7, Requirement 2.12.3.

SECTION 8.12 FLOOD RESISTANCES-

A17.1a-2005

8.12.1 Flood-Resistant Design and Construction

Where required by the building code, elevators shall comply with SEI/ASCE 24.

Seismic Equivalence Matrix

Table: IBC parameters/existing seismic zones matrix			
IBC (2000 and later) / ASCE7/SEI (2002 and later)			ASME A17.1/B44
Seismic Design Category	I_p^3	$S_{DS}^{1,2,4}$	Seismic Zone ⁵
A or B	-	Not required	0, 1
	1		
C	1.5	$0 < S_{DS} \leq 0.496$	2
		$0.496 < S_{DS} \leq 0.993$	3 or greater
		> 0.993	Special Analysis Required
D or E or F	1	$0 < S_{DS} \leq 0.745$	2
		$0.745 < S_{DS} \leq 1.487$	3 or greater
		> 1.487	Special Analysis Required
	1.5	$0 < S_{DS} \leq 0.496$	2
		$0.496 < S_{DS} \leq 0.993$	3 or greater
		> 0.993	Special Analysis Required

1. Values have been reduced by 0.7 to convert from Strength Design to ASD (Working Stress)

2. Assumed $(z/h) = 1$

3. I_p = Component Importance Factor

4. S_{DS} = Spectral Acceleration at short period

5. For California, the minimum horizontal acceleration shall be 0.5g (minimum Zone 3 or greater)