ASME A17.2–2004
(Revision of ASME A17.2–2001)

Guide for Inspection of Elevators, Escalators, and Moving Walks

Includes Inspection Procedures for Electric Traction and Winding Drum Elevators, Hydraulic Elevators, and Escalators and Moving Walks

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FOREWORD (04)

Following the publication of the 1925 edition of the Safety Code for Elevators, Dumbwaiters, and Escalators, requests for a handbook, or manual, covering the inspection of elevators were received by the A17 Committee. This Committee appointed a subcommittee to prepare such a manual. Cities, states, insurance companies, elevator manufacturers and maintenance companies, and the federal government furnished the Committee with material based on their field experiences. A final draft was prepared and was unanimously approved by the A17 Committee, the Code Sponsors, and the American National Association (presently known as the American National Standards Institute, Inc.) and the first edition of the Manual was published in 1937 simultaneously with the fourth edition of the Code.

A second edition of the Manual was prepared by the Committee to bring it in line with the fourth edition of the Code, including the 1942 supplement. A new Part to cover the inspection of escalators, and new Appendices were added to cover descriptions of various types of safeties, methods for determining stopping distances of gradual-type safeties, guide rail data, types of speed governors, and the handling and socketing of wire rope. The second edition of the Manual was approved by the American Standards Association and was published in 1945.

The third edition of the Manual was published in 1960 and included revision to bring it in line with the 1960 edition of the Code.

The fourth edition of the Manual was published in 1973 to bring it in line with the 1971 editions including the 1972 supplement to the Code, and to update the inspection procedures. A new Part was also added to cover the inspection of moving walks.

The Inspectors' Manual Subcommittee was reactivated in 1976 to review the Manual and coordinate it with a proposed new edition of the Code. The Subcommittee, during its review, felt that it was time for the Manual to take on a new format. Thus, the fifth edition of the Manual, published in 1979, was reorganized into four major Parts: Electric Elevators, Hydraulic Elevators, Escalators, and Moving Walks. Each Part was further divided into three major Divisions: Routine Inspection, Periodic Inspection and Test, and Acceptance Inspection and Test. New Appendices were added to this edition, containing sample inspection checklists for electric elevators, hydraulic elevators, escalators and moving walks. A considerable amount of new material was also added to the Manual to bring it in line with the 1978 edition of the Code.

In order to keep the Manual as current as possible, the Committee began the policy of publishing supplements on a regular basis. Supplements were issued in 1980 and 1981 to update the 1979 edition.

The sixth edition of the Manual contained the revisions included in the 1980 and 1981 supplements, as well as many other revisions made to keep the Manual abreast of new Code requirements and to add more comprehensive inspection and testing procedures. The title of this edition was also changed to ANSI/ASME A17.2 Inspectors' Manual for Elevators and Escalators. This change was made to reflect a reorganization of the A17 Committee structure, and to shorten the title for convenience.

The seventh edition of the Manual included the revisions in the 1983 and 1984 supplements as well as other new revisions. One of the major revisions was the Inspection Checklists in Appendix E, which were expanded to include routine and periodic inspections and tests in addition to acceptance inspections and tests.

The eighth edition included revisions in the 1986 and 1987 supplements as well as other revisions listed in the Summary of Changes section.

In 1989, the Inspectors' Manual Committee polled the inspection community to determine what portions of the Manual were most effective and the direction that should be taken to meet the need of the inspector. In response to requests for equipment, specific inspection guidelines, techniques, and cautionary notes as well as field convenience, the concept of individual equipment inspection manuals was developed. The Committee decided to concentrate initially on three major segments. As a result, the Inspectors' Manual is to be published in three volumes: A17.2.1, Electric Elevators; A17.2.2, Hydraulic Elevators; and A17.2.3, Escalators and Moving Walks. Each volume addresses inspection procedures for assuring compliance with the A17.1 Code since 1955 and the A17.3 Code. It is the Committee's plan to publish additional manuals to address inspection of other equipments such as roped-hydraulic elevators, dumbwaiters, sidewalk elevators, private residence elevators, hand elevators, material lifts and dumbwaiters with automatic transfer devices, special purpose personnel elevators, rack and pinion elevators, inclined elevators, screw-column elevators, elevators used for construction, wheelchair and stairway chairlifts, shipboard elevators, and rooftop elevators.

In 1993, the Inspectors' Manual Committee was requested to review equipment installed prior to the 1955 edition of A17.1. ASME A17.2.3 includes inspection

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and testing procedures for assuring compliance with some requirements in pre-1955 editions of A17.1.

In 1999, based on feedback from the user community, the A17 Main Committee approved the Inspectors' Manual Committee's recommendation to consolidate the three existing manuals: A17.2.1–1996, Inspectors' Manual for Electric Elevators (including A17.2.1a–1997 and A17.2.1b–1998 Addenda); A17.2.2–1997, Inspectors' Manual for Hydraulic Elevators (including A17.2.2a–1998 Addenda); and A17.2.3–1998, Inspectors' Manual for Escalators and Moving Walks (including A17.2.3a–2000 Addenda). The resulting A17.2–2001, *Guide for Inspection of Elevators, Escalators, and Moving Walks*, represents an editorial consolidation of the three manuals. The revised standard also includes technical revisions, which have been approved by the A17.1 Committee since the last publications.

The second edition of the Guide includes revisions listed in the Summary of Changes section.

The following is a list of past editions and supplements and the dates on which they received final approval. The dates of issuance are also included for documents published since 1979.

Editions and Supplements		Approved	Issued
First Edition	ASA A17.2–1937	July 1937	…
Second Edition	ASA A17.2–1945	October 22, 1945	…
Third Edition	ASA A17.2–1960	August 10, 1960	…
Addenda	ASA A17.2a–1965	July 29, 1965	…
Supplement	USAS A17.2b–1967	July 7, 1967	…
Fourth Edition	ANSI A17.2–1973	May 29, 1973	…
Fifth Edition	ANSI A17.2–1979	February 18, 1979	May 15, 1979
Supplement	ANSI A17.2a–1980	August 11, 1980	September 15, 1980
Supplement	ANSI A17.2b–1981	November 23, 1981	January 15, 1982
Sixth Edition	ANSI/ASME A17.2–1982	September 22, 1982	November 30, 1982
Supplement	ANSI/ASME A17.2a–1983	September 23, 1983	December 20, 1983
Supplement	ANSI/ASME A17.2b–1984	August 16, 1984	September 16, 1984
Seventh Edition	ANSI/ASME A17.2–1985	July 23, 1985	October 31, 1985
Supplement	ANSI/ASME A17.2a–1986	September 8, 1986	October 31, 1986
Supplement	ANSI/ASME A17.2b–1987	September 11, 1987	October 30, 1987
Eight Edition	ANSI/ASME A17.2–1988	August 25, 1988	October 31, 1988
Addenda	ANSI/ASME A17.2a–1989	November 10, 1989	December 31, 1989
Addenda	ANSI/ASME A17.2b–1990	October 8, 1990	January 21, 1991
First Edition	ASME A17.2.1–1993	January 22, 1993	May 31, 1993
Addenda	ASME A17.2.1a–1994	August 18, 1994	December 31, 1994
Addenda	ASME A17.2.1b–1995	August 10, 1995	January 29, 1996
Second Edition	ASME A17.2.1–1996	September 6, 1996	January 31, 1997
Addenda	ASME A17.2.1a–1997	December 16, 1997	January 30, 1998
Addenda	ASME A17.2.1b–1998	November 13, 1998	February 19, 1999
First Edition	ASME A17.2.2–1994	April 14, 1994	May 31, 1994
Addenda	ASME A17.2.2a–1995	August 10, 1995	January 10, 1996
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PREFACE

FORM AND ARRANGEMENT

This Guide addresses how-to inspection guidelines, techniques, and cautionary notes in a logical sequence. Subsections are arranged to focus on routine inspection requirements, followed by periodic (annual and five year) and acceptance criteria. Appropriate references to the latest edition of the Code, in effect at the time of this Guide's publication, are listed at the end of each subsection. The referenced numbers may not be the same in earlier editions. This Guide is organized as follows: Parts 1 through 6 apply to electric and hydraulic elevators, Parts 7 and 8 apply to escalators, and Parts 9 and 10 apply to moving walks. The Parts are arranged to show the location of the inspection:

Part 1	Elevator — Inside of Car
Part 2	Elevator — Machine Room
Part 3	Elevator — Top of Car
Part 4	Elevator — Outside Hoistway
Part 5	Elevator — Pit
Part 6	Elevator — Firefighters' Service
Part 7	Escalator — External
Part 8	Escalator — Internal
Part 9	Moving Walk — External
Part 10	Moving Walk — Internal

Each inspection location is further subdivided as follows:

X	Location of inspection
X.X	Item to be inspected
X.X.1	Periodic inspections (routine)
X.X.1.1	Electric elevators (as applicable)
X.X.1.2	Hydraulic elevators (as applicable)
X.X.2	Periodic test
X.X.2.1	Electric elevators (as applicable)
X.X.2.2	Hydraulic elevators (as applicable)
X.X.3	Acceptance inspection
X.X.3.1	Electric elevators (as applicable)
X.X.3.2	Hydraulic elevators (as applicable)
X.X.4	Code references
X.X.4.1	Electric elevators (as applicable)
X.X.4.2	Hydraulic elevators (as applicable)

When a requirement within A17.1 or A17.3 cross-references another requirement, the cross-reference is shown with the refering requirement in braces, { }. For the A17.1–2000 and later edition requirements, where no direct cross-reference is found within the A17.1–2000 Cross-Reference Table, the prior code Rule (A17.1d–2000 and earlier editions) is shown in parentheses, ( ), with a preceding "NR" designation.

Subsection numbering of items may not be sequential when there are no inspection or test procedures indicated within this Guide.

NOTE: This Guide addresses the requirements of A17.1–1955 and later editions and latest edition of A17.3. Some requirements in earlier editions of A17.1 are also addressed. The inspector is referred to the particular edition of the A17.1 Code that applies for requirements prior to 1955.

This Guide has included the pertinent requirement from prior editions of A17.1, which differ from the requirements in the latest edition. As the inspector becomes familiar with the prescribed order of inspection procedures, variations may be appropriate. The Foreword, Preface, and Appendix that are included in this document have been approved by the A17 Committee, but are not part of this American National Standard.

NOTE: See also para. 2, Application, under the Introduction of this Guide.

REQUIREMENTS FOR EXISTING INSTALLATIONS

Elevators and escalators in jurisdictions that have adopted the Safety Code for Existing Elevators and Escalators, ASME A17.3, and installations that have been altered in accordance with Part XII of the Safety Code for Elevators and Escalators ANSI/ASME A17.1d–1986 and later editions must, as a minimum, conform to the requirements identified in this Guide as "A17.3." If an existing installation does not meet the requirements of the A17.3 Code, it must be upgraded. If an existing installation was required to meet more stringent requirements, it must continue to meet those requirements.

Alteration, if made, must conform to the requirements of A17.1, Part XII and the entire installation must conform to the requirements of A17.3. The alteration requirements in A17.1, Part XII may be more stringent than the requirements of A17.3. The equipment must conform to the more stringent of the two.

METRIC (SI) UNITS

This edition of the Guide uses both imperial and metric (SI) units. The units used in the Guide are the units found in the referenced code [e.g., imperial (metric) or metric (imperial)]. Information on the usage of SI units and conversion to imperial units is contained in IEEE/ASTM SI 10-1997, *Standard for the Use of the International System of Units (SI): The Modern Metric System*; ASME Guide SI-1, *Orientation and Guide for Use of SI (Metric)*

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Abbreviations Used in This Code

Abbreviation	Unit	Abbreviation	Unit
A	Ampere	lb	pound (mass)
°C	degree Celsius	lbf	pound (force)
deg	degree (angle)	lx	lux
°F	degree Fahrenheit	m	meter
ft/min	foot per minute	m^2	square meter
ft/s	foot per second	m^3	cubic meter
ft	foot	mA	milliampere
fc	footcandle	m/s	meter per second
ft^2	square foot	m/s^2	meter per second per second
ft^3	cubic foot	mm	millimeter
ft/s^2	foot per second per second	mm^2	square millimeter
h	hour	mm^3	cubic millimeter
Hz	hertz	MPa	megapascal
in.	inch	N	Newton
$in.^2$	square inch	psi	pound per square inch
$in.^3$	cubic inch	s	second
kg	kilogram	V	volt
kPa	kilopascal		

Units; or CAN/CSA-Z234-1, *Canadian Metric Practice Guide*.

DEFINITIONS

For definitions, see Section 3 of the ASME A17.1d–2000 and earlier editions (Section 3.1, A17.1–2000 and later editions).

ASME ELEVATOR PUBLICATIONS

This Guide is one of the numerous codes and standards that have been or are being developed and published by the American Society of Mechanical Engineers. The following publications are of special interest to users of this Guide. For prices and availability, contact:

ASME Order Department
22 Law Drive
Box 2300
Fairfield, NJ 07007-2300
Tel: 800-843-2763
Fax: 973-882-1717
E-Mail: infocentral@asme.org
ASME Website: www.asme.org/catalog

ASME A17.1 Safety Code for Elevators and Escalators. This American National Standard Safety Code covers the design, construction, installation, operation, testing, maintenance, alteration, and repair of elevators, dumbwaiters, escalators, moving walks, and material lifts and dumbwaiters with automatic transfer devices.

Inspection Checklists. The checklist forms shown in Nonmandatory Appendix A of this book are posted on the ASME Website: www.asme.org.

ASME A17.3 Safety Code for Existing Elevators and Escalators. This Code covers retroactive requirements for existing elevators and escalators. The purpose of this Code is to establish minimum requirements that will provide a reasonable degree of safety for the general public. While many of these requirements will also increase the degree of safety for the elevator mechanic and inspector, this area has not been addressed at this time.

ASME A17.4 Guide for Emergency Personnel. This Guide for emergency personnel (fire, police, etc.), building owners, lessees, and building operating managers explains the proper procedures to be used for the safe removal of passengers from stalled cars.

CAN/CSA B44.1/ASME A17.5. This Standard covers driving machine controllers, logic controllers, operating devices, and accessories there to, for starting, stopping, regulating, controlling, or protecting electric motors, generators, or other equipment for elevators, escalators, moving walks, dumbwaiters, and elevating devices for wheelchair lifts and stairway chairlifts.

Published Interpretations. Interpretations of the various A17 standards are published periodically.

Interpretations of A17.1 and A17.2 approved by the A17 Committee from June 14, 1972 through June 1979 were published in a separate book in 1980.

Starting with the 1981 edition of the Code, interpretations are published with each new edition and supplement of the applicable standard. A compilation of Interpretations Nos. 2-13 (June 1979 – May 1989) has also been published by ASME.

ASME A17.1/CSA B44 Handbook. This Handbook augments the ASME A17.1 and CSA B44 Codes with commentary diagrams and illustrations that are intended to explain the requirements of these Codes.

The commentary contained in the Handbook is the opinion of the author and has not been approved by the A17 Committee.

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QEI-1 Standard for the Qualification of Elevator Inspectors. This Standard covers requirements for the qualification and duties of inspectors and inspection supervisors engaged in the inspection and testing of equipment within the scope of the A17.1 Code. It also includes requirements for the accreditation of organizations that certify inspectors and inspection supervisors as meeting the QEI criteria.

ASME A18.1 Safety Standard for Platform Lifts and Stairway Chairlifts. This safety Standard covers the design, construction, installation, operation, inspection, testing, maintenance, and repair of inclined stairway chairlifts and inclined and vertical platform lifts intended for transportation of a mobility impaired person only.

CORRESPONDENCE WITH THE A17 COMMITTEE

ASME codes and standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this and other ASME A17 codes and standards may interact with the Committee by requesting interpretations, proposing revisions, and attending committee meetings. Correspondence should be addressed to:

Secretary, A17 Standards Committee
ASME International
Three Park Avenue
New York, NY 10016-5990
E-mail: infocentral@asme.org

Proposing Revisions. Revisions are made periodically to the Guide to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the procedures, and in order to conform to developments in elevator technology. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Guide. Such proposals should be as specific as possible: citing the Item number(s), the proposed wording, and a detailed description of the reasons for the proposal including any pertinent documentation.

Requesting Interpretations. On request, the A17 Committee will render an interpretation of any requirement of the Guide. Interpretations can only be rendered in response to a written request sent to the Secretary of the Standards Committee.

The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submits his request using the following format:

Subject: Cite the applicable Item number(s) and a concise description.

Edition: Cite the applicable edition and supplement of the Guide for which the interpretation is being requested.

Question: Phrase the question as a request for an interpretation of a specific item suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in this format will be written in this format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the congnizant ASME committee or subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Attending Committee Meetings. The A17 Standards Committee and the various Working Committees regularly hold meetings, all of which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the Standards Committee.

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ASME A17.2–2004
SUMMARY OF CHANGES

Following approval by the ASME A17 Elevator and Escalator Committee and ASME, and after public review, ASME A17.2–2004 was approved by the American National Standards Institute on July 22, 2004.

The 2004 edition of ASME A17.2 includes revisions that are identified by a margin note, **(04)**. Changes made to correct errors, as well as other editorial changes, are identified by **(ED)**. The following is a summary of the latest revisions and changes:

Page	*Location*	*Change*
ix–xi	Foreword	Updated
xvi–xviii	Preface	Editorially revised
1–3	Introduction	(1) Paragraphs editorially designated as 1 through 8 (2) Paragraphs 4 and 7 revised
4–14	Part 1	Revised in its entirety
15–40	Part 2	Revised in its entirety
41–61	Part 3	Revised in its entirety
62–67	Part 4	Revised in its entirety
68–78	Part 5	Revised in its entirety
79–91	Part 6	Revised in its entirety
92–109	Part 7	Revised in its entirety
110–116	Part 8	Revised in its entirety
117–127	Part 9	Revised in its entirety
128–134	Part 10	Revised in its entirety
135–158	Nonmandatory Appendix A	Checklists revised in their entirety
159–164	Nonmandatory Appendix B	Added

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GUIDE FOR INSPECTION OF ELEVATORS, ESCALATORS, AND MOVING WALKS

INTRODUCTION

(ED)
(04)

1 SCOPE

This Guide covers recommended inspection and testing procedures for electric and hydraulic elevators, escalators, and moving walks required to conform to the Safety Code for Elevators and Escalators, A17.1–1955 and later editions and The Safety Code for Existing Elevators and Escalators, A17.3. This Guide also addresses some requirements from editions of A17.1 prior to 1955.

NOTE: This Guide may not reflect the latest requirements in the current A17.1 and A17.3 Codes.

2 APPLICATION

This Guide is intended to assist qualified inspectors performing routine inspections and witnessing periodic and acceptance inspections and tests. It is not intended to serve as a basis for government regulations. This Guide does not contain information on handling discrepancies noted during an inspection and test. The authority having jurisdiction in their legislation adopting the Code is responsible for addressing this subject. The acceptance inspection and testing procedures apply only to the extent that they conform to the latest edition of the A17.1 Code. The routine and periodic inspection and testing procedures apply only to the extent that they conform to the applicable Code requirements that were in effect at the time of installation or alteration. The inspection and testing procedures do not take into account local regulations that may differ.

It is recognized that inspectors will not be able to accomplish all the inspection procedures specified in this Guide, during each inspection. Qualified inspectors have the knowledge and experience to recognize potential deficiencies and to focus the inspection in those areas.

This Guide uses the following format to describe the appropriate inspection and test:

(a) For inspections and tests performed in compliance with ASME A17.1d–2000 and earlier editions:

(1) Routine. The examination and operation of equipment at specified intervals by an inspector to check for compliance with the applicable Code requirements.

(2) Periodic Tests. Routine inspection and tests plus additional detailed examination and operation of equipment at specified intervals witnessed by an inspector to check for compliance with the applicable Code requirements.

(3) Acceptance. The initial inspection and tests of new or altered equipment to check for compliance with the applicable Code requirements.

(b) For inspections and tests performed in compliance with ASME A17.1–2000 and later editions:

(1) Periodic Inspection. The examination and operation of equipment at specified intervals by an inspector to check for compliance with the applicable Code requirements.

(2) Periodic Tests. The testing and detailed examination and operation of equipment at specified intervals witnessed by an inspector to check for compliance with the applicable Code requirements.

(3) Acceptance. The initial inspection and test of new or altered equipment to check for compliance with the applicable Code requirements.

The procedures in this Guide are recommendations only and are intended to illustrate a method of complying with the requirements in ASME A17.1d–2000 and earlier editions and A17.1–2000 and later editions, requirements 8.10 and 8.11. The person performing the inspection and test may employ other methods to demonstrate compliance with the applicable code requirement. Qualified inspectors have the knowledge and experience to recognize potential deficiencies and to focus the inspection where necessary.

Where no inspection procedure is specified for routine inspections, it indicates that the Code requirements need no explanation. This does not indicate that no inspection of the specified item is required. The item is to be inspected for compliance with the applicable Code requirements.

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Where, as an example, the periodic inspection has no specified inspections, the inspections specified under routine are to be used for the periodic inspection. If, as an example, the acceptance inspection has a test procedure that differs from the test procedure specified under periodic, the acceptance test procedure should be followed for acceptance inspection and the periodic test procedure should be followed for periodic inspections.

This Guide contains inspection procedures for compliance with the applicable Code only. A17.1d–2000 and earlier editions Rule 1000.2 and A17.1–2000 and later editions requirements 8.10.1.2 and 8.11.1.2, reads in part "the inspection and test required by this Part are to determine that the equipment conforms to the applicable Code requirements at the time of installation and any alteration." This Guide contains no recommendations that exceed the requirements of A17.1d–2000 and earlier editions Rule 1000.2 and A17.1–2000 and later editions requirements 8.10.1.2 and 8.11.1.2, and A17.3.

To facilitate making inspections and tests, sample checklists can be found in Nonmandatory Appendix A of this Guide. The checklist Item numbers correspond to the Item numbers in this Guide. The checklist also contains appropriate A17.1 and A17.3 references for each Item.

NOTE: See also Form and Arrangement under the Preface of this Guide.

3 QUALIFICATIONS OF INSPECTORS

Inspectors and inspection supervisors are required by ASME A17.1d–2000 and earlier editions and A17.1–2000 and later editions, requirements 8.10.1.1(c) and 8.11.1.1 to be certified by an organization accredited by The American Society of Mechanical Engineers Qualifications for Elevator Inspectors Committee in accordance with the requirements set forth in the Standard for the Qualification of Elevator Inspectors, ASME QEI-1 and be recognized by the authority having jurisdiction.

4 PERSONAL SAFETY

Inspectors should have knowledge of the personal safety practices including, but not limited to, the safety practices contained in *The Elevator Industry Field Employees' Safety Handbook* as required by ASME QEI-1.

NOTE: *The Elevator Industry Field Employees' Safety Handbook* is available from Elevator World, Inc., P.O. Box 6507, Mobile, Alabama 36660 (http://www.elevator-world.com).

5 DUTIES OF INSPECTORS

The duties of inspectors are:

(a) when witnessing acceptance inspections and tests of new or altered installations, to determine whether all parts of the installation conform to the requirements of the applicable code or regulations and whether the required safety devices function as required.

(b) when making routine and/or periodic inspections and tests, to determine that the equipment conforms to the applicable Code edition (edition which it was installed, A17.3 and local requirements) and that alterations conform with Code requirements. Determine that periodic tests performed by the owner or his agent are conducted in accordance with Code requirements and results of these tests demonstrate Code compliance.

(c) to report the results of inspections and tests in accordance with applicable local regulations.

It is not the function or duty of inspectors to make any repairs or adjustments to the equipment, nor to recommend methods or procedures for correction of deficiencies.

6 ARRANGEMENT FOR INSPECTION

The inspecting authority or the inspector should request the owner or his agent to make the following arrangements prior to an inspection or test:

(a) Provide qualified personnel for periodic and acceptance inspections and tests to perform the tests specified in the applicable code or regulations.

(b) Have a person familiar with the operation of the elevator available to accompany and assist during the inspections. The inspector should be accompanied by a person familiar with the operation of the equipment to assist him during his inspections.

7 RECOMMENDED EQUIPMENT

(a) It is recommended that the inspector have the following equipment:

(1) flashlight with a nonconductive case

(2) 6 ft (2 m) rule of nonconductive material

(3) set of thick gages

(4) small hammer, preferably a $\frac{1}{2}$ lb (0.2 kg) ball peen

(5) chalk or crayon

(6) small metal mirror

(7) safety hat (nonconductive)

(8) copy of the latest applicable codes and standards (i.e., A17.1, A17.3, ANSI/NFPA 70, etc.)

(9) copy of the applicable local regulations

(10) copy of the latest edition of *The Elevator Industry Field Employees' Safety Handbook*

(11) copy of the checklists as contained in this Guide

(12) padlock, multiple lock device, and "Do Not Start" tags

(13) caliper

(14) telescoping pointer with an alligator clip and business cards or stiff paper

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(15) other items such as an eraser, kitchen spatula, etc. (for escalators and moving walks)

(16) stop watch or timer

(17) 50 ft (15 m) nonconductive tape and 25 ft (7.5 m) tape

(18) tachometer, which reads directly in ft/min (m/s)

(19) multimeter

(20) level, 30 deg/60 deg triangle, and protractor or angle finder

(21) door test scale (gage) to check closing door force

(22) a light meter that can accurately measure light level from 0 fc to 19 fc (0 lx to 200 lx)

(23) marking chalk or crayon

(b) Periodic and Acceptance Inspection and Tests. In addition to the equipment specified above, the following should be provided by the owner or contractor:

(1) suitable test weights

(2) dynamometer

(3) copy of all pertinent drawings, specification, data sheets, and required test procedures

(4) transceiver

(5) come-along and "Chicago" grip or mid-line rope clamps

(6) "Out of Service" signs and/or barricades at hoistway doors

(7) device for testing smoke detectors

(8) no. 16-gage copper wire or equivalent

(9) keys for access and operation of all elevator equipment

(10) hydraulic jack and 4 × 4

(11) plumb line (for escalators)

(12) torque wrench (for escalators)

(13) skirt/step performance index test apparatus and accessory apparatus

NOTE: If iron counterweight sections are used as test weights and scales are not available to accurately determine their weight in pounds, their approximate weight can be determined by multiplying the product of the length, breadth, and thickness in inches by 0.26. If weights are lead, multiply by 0.41. If weights are steel, multiply by 0.28. Deduct for volume of any holes or slots.

Table 1 Procurement Information

Organization	Address and Phone Number
ANSI	American National Standards Institute, Inc. 25 West 43rd Street New York, NY 10036 Telephone: (212) 642-4900 http://www.ansi.org
ASME	The American Society of Mechanical Engineers Three Park Avenue New York, NY 10016-5990 Telephone: (212) 591-8500 http://www.asme.org
	ASME Order Department 22 Law Drive Box 2300 Fairfield, NJ 07007-2300 Telephone: (201) 882-1167 (800) 843-2763
ASTM	American Society for Testing and Materials 100 Barr Harbor Drive W. Conshohocken, PA 19428-2959 Telephone: (610) 832-9500
CSA	Canadian Standards Association 178 Rexdale Boulevard Etobicoke, Ontario M9W1R3 Canada Telephone: (416) 747-4000
IEEE	Institute of Electrical and Electronics Engineers, Inc. 445 Hoes Lane P.O. Box 1331 Piscataway, NJ 08855-1331 Telephone: (800) 678-4333
NFPA	National Fire Protection Association 1 Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101 Telephone: (617) 770-3000

8 REFERENCE DOCUMENTS

Table 1 lists the organizations from which documents referenced in this book can be procured.

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(04)

PART 1
ELEVATOR — INSIDE OF CAR

ITEM 1.1
DOOR REOPENING DEVICE

1.1.1 Periodic Inspections

For elevators installed under A17.1–1955 through A17.1d–1975, power opening of the car door was permitted to take place anywhere in the hoistway. For elevators installed under A17.1e–1975, power opening of the car door was permitted to take place only within the landing zone.

CAUTION: In any of the following tests where the inspector uses an object to test the reopening device, the object must not be inserted when the door is nearing its fully closed position.

(a) Mechanical Reopening Device (Safety Edge). Actuate the device while the doors are being closed and note whether car and hoistway doors stop and reopen. For vertically sliding car doors or gates, a stop and reopen is not required for obstructions within 5 in. (127 mm) of the sides of the opening.

(b) Electronic Reopening Device. Place an object in front of the leading edge of the car door at various positions while it is being closed. The car and hoistway doors should stop and reopen. For vertically sliding car doors or gates, a stop and reopen is not required for obstructions within 5 in. (127 mm) of the sides of the opening.

(c) Photoelectric Reopening Device. To qualify as a reopening device that complies with the Code, the device must sense the presence of the obstruction anywhere within the opening along the leading edge of the car door. Determine the location of the light beam or beams with relation to the car floor. Where an invisible beam is used, the position of the beam can be determined by an examination of the equipment. While the car and hoistway doors are being closed, obstruct the beam which should cause the doors to stop and reopen. This type of device is usually installed in addition to a mechanical or electronic reopening device.

1.1.2 Periodic Test

1.1.3 Acceptance

1.1.4 References

1.1.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 112 and Rule 1001.2(a)(1).

A17.1–2000 and later editions — Requirements 2.13 and 8.11.2.1.1(a).

A17.3 — Section 2.8.

1.1.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 112 {Rule 300.13}; and Rules 1001.2(a)(1), and 1004.2(a)(1).

A17.1–2000 and later editions — Requirements 2.13 {3.13}; and 8.11.2.1.1(a) and 8.11.3.1.1(a).

A17.3 — Section 2.8.

ITEM 1.2
STOP SWITCHES

1.2.1 Periodic Inspections

An emergency stop switch must be provided on freight elevators and existing passenger elevators with perforated enclosures. An emergency stop switch or in-car switch must be provided on passenger elevators.

(a) Emergency Stop Switch. Operate the emergency stop switch and note whether the car stops promptly. On elevators installed under A17.1–1980 and later editions, the stop switch should also activate an audible signaling device. On elevators installed under A17.1a–1982 and later editions, an emergency stop switch is required to be located in or adjacent to each car operating panel. Passenger elevators with non-perforated car enclosures may be equipped with an in-car stop switch in lieu of the emergency stop switch.

(b) In-Car Stop Switch. Passenger elevators installed under A17.1d–1986 and later editions do not require an in-car emergency stop switch but do require an in-car stop switch. The in-car stop switch must be key operated or behind a locked panel. Check the operation of this switch by placing it in the stop position and attempt to operate the car by the normal means.

1.2.2 Periodic Test

1.2.3 Acceptance

1.2.4 References

1.2.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 210.2(e), 210.2(v), and 1001.2(a)(2).

A17.1–2000 and later editions — Requirements 2.26.2.5, 2.26.2.21, and 8.11.2.1.1(b).

A17.3 — Paragraphs 3.10.4(t) and 3.10.4(u).

1.2.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 306.4(b)(1), 306.4(b)(6), and 1004.2(a)(2).

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A17.1–2000 and later editions — Requirements 3.26.4.2(a), 3.26.4.2(f), and 8.11.3.1.1(b).

A17.3 — Paragraphs 3.10.4(t) and 3.10.4(u) {4.7.4}.

ITEM 1.3
OPERATING CONTROL DEVICES

1.3.1 Periodic Inspections

(a) Continuous-Pressure Operation. Operate the car in each direction by means of the operating buttons or other devices in the car to verify that they do not stick or bind, are properly marked, and that the car stops when the operating device is released.

(b) Automatic Operation and Signal Operation. Operate the car, making stops in both the up and down direction. At each stop, open the car door or gate and note the relation of the car platform sill to the landing sill. Note operating push buttons work properly.

(c) Hand Rope, Lever, Wheel, or Crank Operation. This type of operation is prohibited for elevators installed under A17.1–1955 and later editions and by A17.3.

(d) Dual and Attendant Operation. Where the elevator can be operated at times only from the car and at times as an automatic elevator (dual or attendant operation), check the operation under both operating conditions.

(e) Emergency Release Switch in Car. Emergency release switches that permit operation with the car door or gate open and other permanent devices that render door interlocks and door or gate electric contacts inoperative are not permitted under A17.1–1955 and later editions or by A17.3.

1.3.1.1 Electric Elevators

(a) Car Leveling and Truck Zoning Device. When an automatic leveling device is provided, the accuracy of stopping in both directions of travel should be noted at each landing. A leveling tolerance may be required by an accessibility or handicapped code. Where inching buttons are provided, test them to determine that they will operate the car only within the zone allowed by the Code. While the car is leveling, operate the emergency or in-car stop switch as outlined in Item 1.2.1. This should stop the car.

NOTE [Item 1.3.1.1(a)]: Leveling devices cannot be expected to stop the car exactly level with the landing sill.

(b) Car-Switch Operation. Operate the car switch to determine whether the operating handle returns to the stop position and latches in this position when the hand is removed. Note any evidence of excessive friction, or weakened or broken centering springs.

1.3.1.2 Hydraulic Elevators

(a) Car Leveling and Truck Zoning Device. When an automatic leveling device is provided, the accuracy of stopping in both directions of travel should be noted at each landing. A leveling tolerance may be required by an accessibility or handicapped code. Where inching buttons are provided, test them to verify that they will operate the car only within the zone allowed by the Code. While the car is leveling, operate the emergency or in-car stop switch as outlined in Item 1.2.1.

NOTE [Item 1.3.1.2(a)]: Leveling devices cannot be expected to stop the car exactly level with the landing sill.

1.3.2 Periodic Test

1.3.3 Acceptance

1.3.4 References

1.3.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 210.1a, 210.1e, and 1001.2(a)(3).

A17.1–2000 and later editions — Requirements 2.26.1.1, 2.26.1.6, and 8.11.2.1.1(c).

A17.3 — Paragraphs 3.10.1, 3.10.2, and 3.10.7.

1.3.4.2 Hydraulic Elevators. A17.1d–2000 and later editions — Rules 210.1a {306.1}, 306.3, and 1004.2(a)(3).

A17.1–2000 and later editions — Requirements 2.26.1.1 {3.26.1}, 3.26.3, and 8.11.3.1.1(c).

A17.3 — Paragraphs 3.10.1 and 3.10.2 {Section 4.7}, and 3.10.9 {4.7.6}.

ITEM 1.4
SILLS AND CAR FLOOR

1.4.1 Periodic Inspections

(a) Hinged Car Platform Sills

(1) Visually examine the sill plate for cracks, wear, broken welds, or loose rivets. Check the area under the sill for foreign material, which would prevent proper operation at the landing.

(2) Check all bolts on the counterweight housing and stop angles. Inspect the ropes or chains that connect the sill to the counterweight. Check pivot points and sheaves for wear and proper lubrication.

(3) Inspect the hand lever and linkage for excess wear, and loose or missing cotter pins or bolts. Check the operation of the hinged car-platform sill electric contact.

(b) Hinged Hoistway Landing Sills

(1) Visually examine the sill plate for cracks, wear, broken welds, or loose rivets. Check the area under the sill for foreign material, which would prevent proper operation at the landing.

(2) Check all bolts on the counterweight housing and stop angles. Inspect the ropes or chains that connect the sill to the counterweight. Check pivot points and sheaves for wear and proper lubrication. Check the operation of the hinged hoistway landing sill. It should be possible to lower the hinged sill only when the hoistway door is fully opened.

(c) Sills and Car Floor

(1) Determine the condition of the car floor and car and landing sills. Look especially for damage to floors

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and sills as well as loose sills. Verify the clearance between the car and landing sills. See Table 3.14.3(a).

(2) A floating platform is not permitted by A17.1a–1957 and later editions or by A17.3. A floating platform is a car platform that permits operation of the car with the car gate or door open.

(3) Elevator systems may, however, use isolated platform construction that may have load weighing signaling devices. Such use is not prohibited. Try operating the car from the landing operating device with a load of 30 lb (13.6 kg) on the platform with the car gate or door in the open position. This test is to be repeated with the test load placed in various locations. The car should not operate under such conditions.

1.4.2 Periodic Test

1.4.3 Acceptance

Check that landing sills are substantially flush with the floor surface of the landings and the sill does not present a tripping hazard. Changes in level up to $\frac{1}{4}$ in. (6 mm) may be vertical and without edge treatment. Changes in level between $\frac{1}{4}$ in. (6 mm) and $\frac{1}{2}$ in. (13 mm) must be beveled, and changes in level above $\frac{1}{2}$ in. (13 mm) must be ramped.

1.4.4 References

1.4.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 108.1, 110.10d, 110.11a, 110.13a, 203.16, 210.12, and 1001.2(a)(4).

A17.1–2000 and later editions — Requirements 2.5.1, 2.11.10.3, 2.11.11.1, 2.11.13.1, 2.15.16, (NR 210.12), and 8.11.2.1.1(d).

A17.3 — Paragraphs 3.3.3 and 3.3.4.

ANSI A117.1.

1.4.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 108.1 {300.9}, 110.10d {300.11}, 110.11a, 110.13a, 203.16 {301.6}, 210.12, and 1004.2(a)(4).

A17.1–2000 and later editions — Requirements 2.5.1 {3.5}, 2.11.10.3 {3.11}, 2.11.11.1, 2.11.13.1, 2.15.16 {3.15}, (NR 210.12), and 8.11.3.1.1(d).

A17.3 — Paragraphs 3.3.3 and 3.3.4 {4.2.2}.

ANSI A117.1.

ITEM 1.5
CAR LIGHTING AND RECEPTACLES

1.5.1 Periodic Inspections

(a) Normal Illumination. Examine lighting fixtures to determine whether they are securely fastened. At least two lamps must be provided. Examine the electric lighting fixtures to verify that bulbs or tubes are guarded to prevent injury to persons in the event of breakage. If the light diffuser is of the open "egg-crate" type, the bulbs must have a protective coating to prevent shattering if broken.

(b) Auxiliary Illumination. A17.1b–1968 and later editions, and A17.3, require auxiliary illumination of passenger elevator cars in case of failure of the normal car lighting power supply. When auxiliary lighting is supplied, check its operation by disconnecting the normal lighting supply. Where the auxiliary lighting is supplied by batteries, check that such batteries are in good condition and properly maintained, and that any recharging equipment is operable. Check that the auxiliary power supply is located on each elevator.

1.5.2 Periodic Test: Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions)

Car lamps and diffusers, if provided, should be in place for all safety and buffer tests. They must remain in place during the test. Where there is a question as to the adequate capacity of the emergency power supply, an endurance test should be made.

1.5.3 Acceptance

When the hoistway doors are closed, the Code requires a minimum illumination at the landing edge of the car door sill of 5 fc (54 lx) for passenger elevator and $2\frac{1}{2}$ fc (27 lx) for freight elevators. If there is any question as to whether the illumination is adequate, require that light intensity readings be taken.

Determine whether glass has been installed and guarded to provide adequate protection for passengers in case the glass panels break or become dislodged. Glass panels and their structure must be capable of withstanding the required elevator tests without damage.

Check if glass exceeding 1 ft^2 (0.093 m^2) in area and abutting panels whose total area is greater than 1 ft^2 (0.093 m^2) meet the requirements for laminated glass in ANSI Z97.1 or 16 CFR Part 1201.

Car lights may be turned off automatically. A17.1b–1989 and later editions specify certain conditions that must be met before lights can be automatically turned off.

1.5.4 References

1.5.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 204.7 and 1001.2(a)(5).

A17.1–2000 and later editions — Requirements 2.14.7 and 8.11.2.1.1(e).

A17.3 — Paragraphs 3.4.5 and 3.4.6.

1.5.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 301.7 and 1004.2(a)(5).

A17.1–2000 and later editions — Requirements 3.14 and 8.11.3.1.1(e).

A17.3 — Paragraphs 3.4.5 and 3.4.6 {4.2.3}.

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ITEM 1.6
CAR EMERGENCY SIGNAL

1.6.1 Periodic Inspections

Elevators installed under A17.1–1955 through A17.1b–1980, which are operated without a designated attendant, must be provided with an emergency signal audible outside the hoistway, or with a telephone.

All elevators installed under A17.1b–1980 and later editions and A17.3 are required to have emergency signaling devices. A17.1–1991 and later editions require that the switch marked "ALARM" be illuminated when activated and that elevators with a travel greater than 100 ft (30.4 m) be provided with a second audible signaling device at the designated level. Operate the audible signaling device (alarm) and the means of two-way conversation. Disconnect the normal power source to check that the emergency power source will operate the lighting, alarm, and means of two-way conversation. In buildings that do not have someone in continuous attendance, check the outdoor signal or means of conversation with outside emergency service. Elevators installed under A17.1–1955 through A17.1a–1979 are required to have an emergency signaling device only if the car is operated at any time without a designated operator in the car.

A17.1b–1968 through A17.1–1971 require means of two-way conversation on automatic elevators having a travel of 65 ft (19.8 m) or more or a distance exceeding 15 ft (4.5 m) between landings. A17.1–1978 and later editions require means of two-way conversation on all automatic elevators. They are also required to operate in case of failure of the normal building power supply.

1.6.2 Periodic Test: Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions)

When there is a question as to the adequate capacity or condition of the emergency power supply, a test should be made.

1.6.3 Acceptance

1.6.4 References

1.6.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 211.1 and 1001.2(a)(6).

A17.1–2000 and later editions — Requirements 2.27.1 and 8.11.2.1.1(f).

A17.3 — Paragraph 3.11.1.

1.6.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 211.1 {306.11} and 1004.2(a)(6).

A17.1–2000 and later editions — Requirements 2.27.1 {3.27} and 8.11.3.1.1(f).

A17.3 — Paragraph 3.11.1 {4.7.8}.

ITEM 1.7
CAR DOOR OR GATE

1.7.1 Periodic Inspections

(a) Examination of Doors or Gates. Examine the car door or gates and note any broken, bent, or sprung members. Operate doors or gates to verify that they operate freely and that bottom sill-guide tracks or bottom guiding members are in place, securely fastened, and are not worn enough to permit the doors or gates to come out of their tracks at any position of their travel. Verify that all depressions and moldings are not raised or depressed from the exposed surface more than permitted by the Code. A17.1d–2000 and earlier editions allowed up to $\frac{1}{4}$ in. (6.3 mm). Collapsible-type gates are not permitted on passenger elevators installed under A17.1a–1988 and later editions. If collapsible gates are power operated, check that power opening is limited. Check finger guards on collapsible gates. Check collapsible gates for proper restraint of vertical members to restrict horizontal deflection.

(b) Test for Closed Position. With the hoistway doors or gates in the closed position, check the closed position of the car doors or gates as outlined in Item 4.2.1(b) for hoistway door or gate interlocks. A door or gate is considered to be in the closed position when the clear open space between the leading edge of the door or gate and the nearest face of the jamb or sill does not exceed 2 in. (51 mm) or, in the case of biparting doors, when the door panels are within 2 in. (51 mm) of contact with each other.

(c) Location of Car Doors or Gates. A17.3 and A17.1–1937 and later editions specify the maximum distance from the face of the car door or gate to the face of the hoistway door. Where the distance is exceeded, verify that space guards are provided on either car or hoistway doors, and that sight guards are provided for horizontally sliding hoistway doors. Take measurements to confirm compliance with these requirements.

1.7.2 Periodic Test

1.7.3 Acceptance

Verify that the car door or gate electric contact or car door interlock is inaccessible from inside the car. Verify that the distance from the face of the car door or gate to the face of the hoistway door does not exceed the Code requirements or a car door interlock is provided and the car door complies with the structural requirements in the Code. Verify openings in vertically sliding gates do not exceed the Code requirements. Verify two independent suspension means are provided for vertically sliding car doors or gates and weights for balancing or closing comply with the Code requirements. Verify that when the car is stopped within the unlocking zone and power is cut off to the door operator, the car door and connected hoistway doors can be opened by hand.

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1.7.4 References

1.7.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 112.2a, 204.4, 204.5, 204.6, 210.2(q), and 1001.2(a)(7).

A17.1–2000 and later editions — Requirements 2.5.1.5.3, 2.13.2.1, 2.14.4, 2.14.5, 2.14.6, 2.26.2 (2.26.2.15), and 8.11.2.1.1(g).

A17.3 — Paragraphs 3.4.2 and 3.4.3 and Appendix A.

1.7.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 111.7(c) {300.12}, 112.2a {300.13}, 204.4 through 204.6 {301.7}, 210.2(q) {306.4}, and 1004.2(a)(7).

A17.1–2000 and later editions — Requirements 2.5.1.5.3 {3.5}, 2.12.7.3 {3.12}, 2.13.2.1 {3.13}, 2.14.4 through 2.14.6 {3.14}, 2.26.2 (2.26.2.15), {3.26.4}, and 8.11.3.1.1(g).

A17.3 — Paragraphs 3.4.2 and 3.4.3 {4.2.3}; and Appendix A.

ITEM 1.8
DOOR CLOSING FORCE

1.8.1 Periodic Inspections

To test the door closing force, park the car at floor level and start the doors in the closing direction. Allow the doors to close between one-third and two-thirds of their normal travel and stop them. Push a force measuring device with a range appropriate to measure 30 lbf (133 N) against the stopped door, removing the stop so the door is held stationary by the force measuring device. Slowly back off on the device until the point the door just starts to move. At this point, the door and measuring forces are in equilibrium and the force can be read.

1.8.2 Periodic Test

1.8.3 Acceptance

1.8.4 References

1.8.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 112.4(b), 1001.2(a)(8), and 1002.2h.

A17.1–2000 and later editions — Requirements 2.13.4.2.3, 8.11.2.1.1(h), and 8.11.2.2.8.

A17.3 — Paragraph 2.8.1.

1.8.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 112.4(b), 301.7, and 1004.2(a)(8).

A17.1–2000 and later editions — Requirements 2.13.4.2.3, 3.14, and 8.11.3.1.1(h).

A17.3 — Paragraph 2.8.1 {Section 4.1}.

ITEM 1.9
POWER CLOSING OF DOORS OR GATES

1.9.1 Periodic Inspections

Where a door open button is provided, check that when depressed and the door is closing it causes the door to stop or to stop and reopen. Where sequence closing is provided on vertically sliding door, check its operation.

1.9.2 Periodic Test

1.9.3 Acceptance

1.9.4 References

1.9.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 112.3 and 1001.2(a)(9).

A17.1–2000 and later editions — Requirements 2.13.3 and 8.11.2.1.1(i).

A17.3 — Paragraph 2.8.2.

1.9.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 112.3 {300.13} and 1004.2(a)(9).

A17.1–2000 and later editions — Requirements 2.13.3 {3.13} and 8.11.3.1.1(i).

A17.3 — Paragraph 2.8.2 {Section 4.1}.

ITEM 1.10
POWER OPENING OF DOORS OR GATES

1.10.1 Periodic Inspections

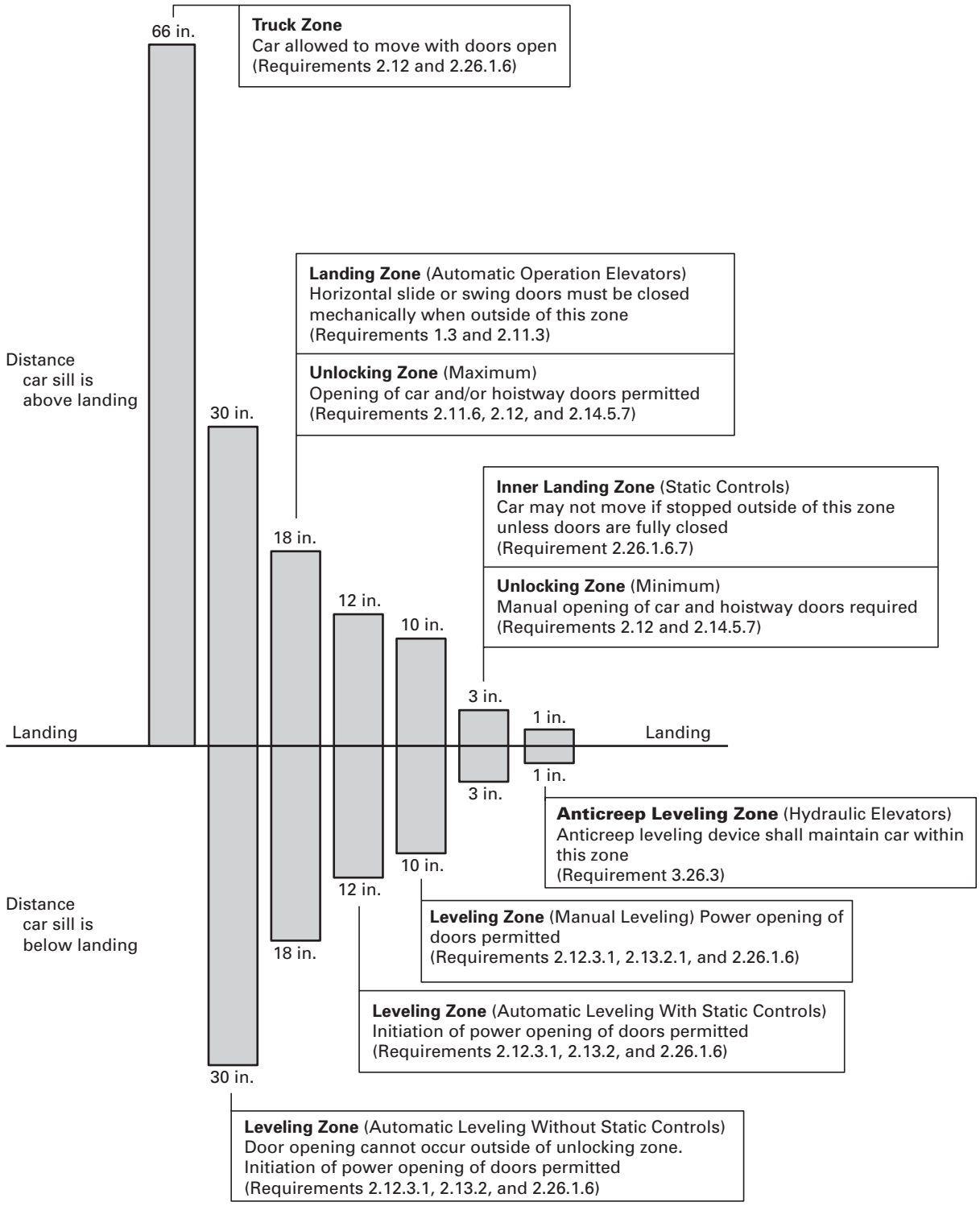
1.10.2 Periodic Test

(a) 5-Year Test, Advance Power Opening (for A17.1d–2000 and Earlier Editions); Category 5 Test, Advance Power Opening (for A17.1–2000 and Later Editions). Verify that power opening of the doors can occur only when the car is within 18 in. (457 mm) 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 doors when the car is more than 12 in. (305 mm) from the landing. Verify that the car is stopped or substantially level with the landing before the hoistway door is fully open. Also, see Fig. 1.10.2.

(b) 5-Year Test of Leveling Zone and Leveling Speed (for A17.1d–2000 and Earlier Editions); Category 5 Test of Leveling Zone (for A17.1–2000 and Later Editions). Check that the zone in which the leveling device will move the car toward the landing does not exceed 30 in. (762 mm) for an automatic device or 10 in. (254 mm) for a manual device. The leveling speed is not permitted to exceed 150 ft/min (0.76 m/s).

For static control elevators, installed under A17.1a–1988 and later editions, the person or firm installing or

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GENERAL NOTES:
(a) Refer to Requirement numbers for details.
(b) 1 in. = 25.4 mm
(c) Refer to applicable edition of the Code.

Fig. 1.10.2 Door Operation Relative to Car Position

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maintaining the elevator must provide a written checkout procedure, and demonstrate to the authority having jurisdiction that the leveling speed with the doors open is limited to a maximum of 150 ft/min (0.76 m/s) and that the limiting (or speed monitor) means is independent of the operation of the normal means to control this speed.

1.10.2.1 Electric Elevators. *5-Year Test of Inner Landing Zone (for A17.1d–2000 and Earlier Editions); Category 5 Test of Inner Landing Zone (for A17.1–2000 and Later Editions).* On static control elevators, installed under A17.1a–1988 and later editions, the person or firm installing or maintaining the equipment is required to submit a written procedure and demonstrate that the zone in which the car can move with the doors open is no more than 3 in. (76 mm) above or below the landing.

1.10.2.2 Hydraulic Elevators. For static control elevators, installed under A17.1a–1988 and later editions, the person or firm installing or maintaining the elevator must provide a written checkout procedure, and demonstrate to the authority having jurisdiction that the leveling speed with the doors open is limited to a maximum of 150 ft/min (0.76 m/s) and that the limiting (or speed monitor) means is independent of the operation of the normal means to control this speed.

1.10.3 Acceptance

1.10.4 References

1.10.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 111.12, 210.1e, 210.9c, 1001.2(a)(10), 1002.3g, 1002.3h, and 1002.3i.

A17.1–2000 and later editions — Requirements (NR 111.12), 2.26.1.6, 2.26.9 (2.26.9.3), 8.11.2.1.1(j), 8.11.2.3.7, 8.11.2.3.8, and 8.11.2.3.9.

1.10.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 111.5 {300.12}, 210.1e, 210.9(c), 306.3, and 1004.2(a)(10).

A17.1–2000 and later editions — Requirements 2.12.5 {3.12}, 2.26.1.6, 2.26.9 (2.26.9.3), 3.26.3, and 8.11.3.1.1(j).

ITEM 1.11
CAR VISION PANELS AND GLASS CAR DOORS

1.11.1 Periodic Inspections

If the glass in the door panel is less than 80% of the total surface area of the door, it is a vision panel and must conform to those requirements. Car vision panels are required to be of wire or laminated glass and have a maximum area of 144 in.^{2} (0.093 m^2) and maximum panel width of 6 in. (152 mm). A17.1d–1970 through A17.1b–1993, in addition to the above requirements, required glazing materials to conform to ANSI Z97.1 or 16 CRF Part 1201. These Standards require that the glazing material be marked as follows: ANSI Z97.1–1984 or 16 CFR Part 1201; Manufacturer's mark or designation.

The thickness of the glazing may also be shown. Verify that the glass is the right type (wired or laminated), is not cracked or broken, and is marked with glazing standard. Since ANSI Z97.1 or 16 CFR Part 1201 covers many types of glazing materials, the required marking does not assure that the glazing is laminated glass. If laminated glass is tapped lightly with the edge of a coin, the sound will be dampened and different from nonlaminated glass.

1.11.2 Periodic Test

1.11.3 Acceptance

When a glass door is provided, check the type of glass, thickness, minimum surface area, and edging.

1.11.3.2 Hydraulic Elevators. When 80% of the surface area of the door is glass, it is classified as a glass door.

1.11.4 References

1.11.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 204.2e, 204.5i, and 1001.2(a)(11).

A17.1–2000 and later editions — Requirements 2.14.2.5, 2.14.5.8, and 8.11.2.1.1(k).

A17.3 — Paragraphs 3.4.2 and 3.4.3.

1.11.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 204.2e and 204.5i {301.7}, and 1004.2(a)(11).

A17.1–2000 and later editions — Requirements 2.14.2.5, 2.14.5.8 {3.14}, and 8.11.3.1.1(k).

A17.3 — Paragraphs 3.4.2 and 3.4.3 {4.2.3}.

ITEM 1.12
CAR ENCLOSURE

1.12.1 Periodic Inspections

Verify that the car enclosure is structurally sound and is securely fastened to the platform. Verify that capacity plates and any required certificates are posted in the car. Note any evidence of alterations or additions to the car that have materially changed the car weight. Also, note any alteration to car enclosure, including decorative panels. (See Item 1.12.3.)

(a) Freight elevators installed under A17.1a–1982 and later editions, verify that signs specifying the class of loading are in place and the loading imposed on the elevator is as specified on the sign. Verify that signs restricting passenger use are posted.

(b) Freight elevators installed under A17.1–1955 through A17.1–1981 are required to have one of the following signs:

(1) "THIS ELEVATOR DESIGNED FOR GENERAL FREIGHT LOADING."

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(2) "THIS ELEVATOR DESIGNED FOR MOTOR-VEHICLE LOADING."

(3) "THIS ELEVATOR DESIGNED FOR LOADED INDUSTRIAL TRUCK WEIGHING ____ LB MAXIMUM."

On elevators not permitted to carry passengers, the following additional sign must be posted: "THIS IS NOT A PASSENGER ELEVATOR, NO PERSONS OTHER THAN THE OPERATOR AND FREIGHT HANDLERS ARE PERMITTED TO RIDE ON THIS ELEVATOR."

The above sign regarding passengers is also required by A17.3.

In elevators permitted to carry employees, the sign should read: "NO PASSENGERS EXCEPT EMPLOYEES PERMITTED."

(c) For freight elevators installed under A17.1–1984 and later editions, check the Code for required sign wording.

(d) For freight elevators installed under A17.1–1987 and later editions that are permitted to carry passengers, check to see that there are no openings, other than those required for signal, operating or communication equipment, entrances, vision panels, emergency exits, or ventilation.

(e) Napped, tufted, woven, looped, or similar materials are allowed on car enclosure walls if they meet the test requirements. Test reports should be available to indicate compliance with acceptance criteria.

(f) Note any equipment inside cars other than that used for the operation of the elevator. The Code permits lighting, heating, ventilating, and air-conditioning devices to be installed inside all cars, and permits conveyor tracks, lift hooks, and support beams mounted in the ceiling of passenger elevators. Check structural supports and clearances from floor.

(g) A17.1–1990 and later editions required the car to have an identification number on the car control station where more than one elevator's machinery is in a hoistway or machine room.

(h) A17.1–1991 and later editions required that panels be attached to the enclosure with tamper-resistant fasteners, or when the panels are removed any perforations greater than $\frac{1}{2}$ in. (13 mm) diameter be guarded.

1.12.2 Periodic Test

1.12.3 Acceptance

Check the headroom in the car. Check glass exceeding 1 ft^2 (0.093 m^2) in area (either as a single pane or for abutting panes) is either of the following:

(a) laminated glass (See Item 1.11).

(b) bonded glass with a nonorganic coating that will retain broken glass. This bonded glass must be marked as required by ANSI Z97.1 or 16 CFR Part 1201 (see Item 1.11). Check car enclosure fastening and the perforations for hang-on panels, when provided.

NOTE: This bonded glass is considered equivalent to laminated glass since it must meet testing requirements of ANSI Z97.1 or 16 CFR Part 1201; it will bond fragments and retain broken glass, and it prohibits the use of film coatings (organic-coated glass) that is easily damaged, which would render them ineffective.

Check that the car enclosure material (exposed to the car interior or the hoistway) is metal, laminated glass, or has been type-tested in its end-use configuration and that the flame spread smoke contribution, vertical burn, test and critical radiant flux of the enclosure material conform to the Code requirements. Material $\frac{1}{4}$ in. (6.4 mm) or less in thickness can be installed over an existing car enclosure, without type testing in the end-use configuration. The flame spread rating for the added material and adhesive is more severe than that required for a new car enclosure tested in its end-use configuration. If in doubt, request a copy of the test report.

Check for the minimum clear headroom.

1.12.4 References

1.12.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 204.1b, 204.1h, 207.2b, 207.4, 207.5, 211.9, 1001.2(a)(12), and 1202.5; and Sections 204 and 1104.

A17.1–2000 and later editions — Requirements 2.14.1.2, 2.14.1.8, 2.16.2.2, 2.16.4, 2.16.5, 2.29.1, 8.11.2.1.1(l), and 8.7.2.14; and requirements 2.14 and 8.3.7.

A17.3 — Paragraphs 3.4.1 and 3.7.5.

1.12.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Sections 204.1b, 204.1h {Rule 301.7} and 1104; and Rules 204.2d {301.7}, 211.9 {306.11}, 1004.2(a)(12), 1202.5, and 1203.2e.

A17.1–2000 and later editions — Requirements 2.14 {3.14} and 8.3.7; and requirements 2.29.1 {3.27}, 8.11.3.1.1(l), 8.7.2.14, and 8.7.3.13.

A17.3 — Paragraphs 3.4.1 {4.2.3} and 3.7.5 {4.2.4}.

ITEM 1.13
EMERGENCY EXIT

1.13.1 Periodic Inspections

1.13.1.1 Determine that top emergency exit panels are in place and not obstructed (see Item 3.8); and determine whether on elevators installed under A17.1–2000 and earlier editions, side emergency exit doors are closed and locked. Check the electric contact on the side emergency exit doors. Check that the key for unlocking the side emergency exit is available to elevator personnel only. Verify that any side emergency exit door is so hinged as to swing in, that it can be opened from the inside only by using a special-shaped removable key, that it can be opened from the outside by means of a nonremovable handle, and that it is provided with a properly functioning contact to cause power to be

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removed from the driving machine and brake when opened. Side emergency exits were required on passenger elevators installed to A17.1–1955 through 1990, and were permitted on passenger and freight elevators installed or altered to A17.1a–1990 through A17.1–2000; where there is an adjacent elevator within 30 in. and no intervening obstructions. Side emergency exits were required on hydraulic passenger elevators with safeties installed to A17.1–1955 through 1995, and were permitted on passenger and freight elevators installed to A17.1a–1996 and later editions. A17.1a–2002 and later editions prohibit side emergency exits.

1.13.2 Periodic Test

1.13.3 Acceptance

1.13.4 References

1.13.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 204.1e, 204.1j, 204.2d, and 1001.2(a)(13).

A17.1–2000 and later editions — Requirements 2.14.1.5, 2.14.1.10, 2.14.2.4, 8.1.2, 8.6.10.2, and 8.11.2.1.1(m).

A17.3 — Paragraph 3.4.4.

1.13.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 204.1j {301.7} and 1004.2(a)(13).

A17.1–2000 and later editions — Requirements 2.14.1.10, 3.14, 8.1.2, 8.6.10.2, and 8.11.3.1.1(m).

A17.3 — Paragraph 3.4.4 {4.2.4}.

ITEM 1.14
VENTILATION

1.14.1 Periodic Inspections

If ventilating fans are installed inside the car, verify that they are properly guarded, adequately supported and securely fastened in place and not obstructing the emergency exit. Ventilating fan blowers, if provided, are to be located above the car ceiling or outside the car enclosure.

Check that observation elevators exposed to direct sunlight, which are installed under A17.1a–1985 and later editions, are provided with forced ventilation and that an emergency power source is on each car that is capable of operating the ventilation for 1 h. The minimum capacity for this ventilation is one air change per minute.

1.14.2 Periodic Test

1.14.3 Acceptance

1.14.4 References

1.14.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 204.2c, 204.3c, and 1001.2(a)(14).

A17.1–2000 and later editions — Requirements 2.14.2.3, 2.14.3.3, and 8.11.2.1.1(n).

1.14.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 204.2c and 204.3c {301.7}, and 1004.2(a)(14).

A17.1–2000 and later editions — Requirements 2.14.2.3 and 2.14.3.3 {3.14}, and 8.11.3.1.1(n).

ITEM 1.15
SIGNS AND OPERATING DEVICE SYMBOLS

1.15.1 Periodic Inspections

Check that symbols are substituted for, or used in conjunction with, the required wording for operating devices on elevators installed under A17.1–1979 and later editions and that the main floor is identified by a star.

1.15.2 Periodic Test

1.15.3 Acceptance

1.15.4 References

1.15.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 210.13 and 1001.2(a)(15).

A17.1–2000 and later editions — Requirements 2.26.12 and 8.11.2.1.1(o).

1.15.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 210.13 {306.12} and 1004.2(a)(15).

A17.1–2000 and later editions – Requirements 2.26.12 (NR 306.12) and 8.11.3.1.1(o).

ITEM 1.16
RATED LOAD, PLATFORM AREA, AND DATA PLATE

1.16.1 Periodic Inspections

Check that the data (capacity) plate is installed inside the car.

1.16.2 Periodic Test

1.16.3 Acceptance

Measure the inside dimensions of the car 36 in. (914 mm) above the floor, inside of any panels or wall surfaces, but exclusive of any handrails and space for doors, and compute the inside net platform area. Compare this area with the maximum area permitted for the rated load. The Code includes limitations of inside net platform area in relation to the rated load for freight elevators for three classes of loading, including special requirements where the loading is by industrial trucks. Determine that signs, and capacity and data plates are provided.

1.16.4 References

1.16.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 207 and Rule 1001.2(a)(16).

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A17.3 — Section 3.7.

1.16.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 207 {Rule 301.10}, and Rule 1004.2(a)(16).

A17.1–2000 and later editions — Requirements 2.16 {3.16} and 8.11.3.1.1(p).

A17.3 — Section 3.7 {para. 4.2.4}.

ITEM 1.17
STANDBY POWER OPERATION

1.17.1 Periodic Inspections

Visually inspect transfer switch and means of transfer for evidence of damage or misuse. Verify that the key used to operate the selection switch is adequately controlled.

1.17.2 Periodic Test

1.7.2.1 Electric Elevators

(a) Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions). Have the elevator(s) taken out of normal service and placed at the floor where the standby power switch is located. Have the system transferred to standby power and operate the elevator(s) with no load in the car. Check the switch that overrides automatic sequence operation, if provided. Make several trips and stops checking for proper operation. From the machine room use a tachometer to verify that the elevator is running at normal speed especially in the up direction (speed must not exceed 125% of rated speed). If a separate power absorption means such as a resistor bank is used to absorb regenerative power, it must be connected on the load side of the elevator disconnect switch. If more than one elevator is operated from the same power source simultaneously, test the simultaneous operation.

(b) 5-Year Test, Only One Elevator on Standby Power Supply (for A17.1d–2000 and Earlier Editions); Category 5 Test, Only One Elevator on Standby Power Supply (for A17.1–2000 and Later Editions). Have the elevator placed on standby power as outlined in Item 1.17.2(a). Place the rated load on the elevator (125% rated load for passenger elevators and freight elevators that are permitted to carry passengers) and operate the elevator observing for safe operation. Use a tachometer in the machine room to verify that the overhauling load does not cause a speed increase in excess of 125% of rated speed or the governor tripping speed.

(c) 5-Year Test, More Than One Elevator Operating Simultaneously on Standby Power Supply (for A17.1d–2000 and Earlier Editions); Category 5 Test, More Than One Elevator Operating Simultaneously on Standy Power Supply (for A17.1–2000 and Later Editions). Have the elevators placed on standby power supply operation and loaded with the rated load (125% rated load for passenger elevators and freight elevators that are permitted to carry passengers) and operate all of the elevators simultaneously observing that they operate normally and will safely lower, stop, and hold. Use a tachometer to check the speed of each elevator when operating simultaneously in the down direction. Verify that each elevator stops at or near the terminal landing and before the final terminal stopping device is operated. The speed should not exceed 125% of the rated speed or the governor tripping speed.

1.17.2.2 Hydraulic Elevators

(a) Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions). Have the elevator(s) taken out of normal service and placed at the floor where the standby power switch is located. Have the system transferred to standby power and operate the elevator(s) with no load in the car. Check the switch that overrides automatic sequence operation, if provided. Make several trips and stops checking for proper operation. If more than one elevator is operated simultaneously from the same power supply, test the simultaneous operation.

(b) 5-Year Test, Only One Elevator on Standby Power Supply (for A17.1d–2000 and Earlier Editions); Category 5 Test, Only One Elevator on Standby Power Supply (for A17.1–2000 and Later Editions). Have the elevator placed on standby power as outlined in Item 1.17.2(a). Place the rated load on the elevator and operate the elevator observing for safe operation.

(c) 5-Year Test, More Than One Elevator Operating Simultaneously on Standby Power Supply (for A17.1d–2000 and Earlier Editions); Category 5 Test, More Than One Elevator Operating Simultaneously on Standby Power Supply (for A17.1–2000 and Later Editions). Have the elevators placed on standby power supply operation and loaded with the rated load and operate all of the elevators simultaneously observing that they operate normally.

1.17.3 Acceptance

In addition to the above test, verify that the means of transfer to standby power is at the designated landing and that the switch overrides any automatic sequence provided. The switch must be key operated or behind a locked door.

1.17.3.1 Electric Elevators. Check that if other building loads (such as power and lighting) are used as a means of absorption of regenerative power, such loads are transferred to standby power with the elevator(s).

1.17.4 References

1.17.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 207.8, 210.10, 211.2, 1001.2(a)(17), 1002.2g, and 1002.3e.

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A17.1–2000 and later editions — Requirements 2.16.8, 2.26.10, 2.27.2, 8.11.2.1.1(q), 8.11.2.2.7, and 8.11.2.3.5.

1.17.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 211.2 {306.11}, 1002.2g {1005.2c(6)}, and 1004.2(a)(17).

A17.1–2000 and later editions — Requirements 2.27.2 {3.27}, 8.11.2.2.7 {8.11.3.2.3(f)}, and 8.11.3.1.1(q).

A17.3 — Paragraph 3.11.2 {4.7.8}.

ITEM 1.18
RESTRICTED OPENING OF CAR OR HOISTWAY DOORS

1.18.1 Periodic Inspections

(a) All passenger elevators installed under A17.1–1980 and later editions must comply with restricted opening of the hoistway or car doors. When the car is outside a specified zone, this requires that either the hoistway door or car door can be opened no more than 4 in. (102 mm) from inside the car but the car door can be opened from outside the car without special tools. The specified zone in which restricted opening applies depends on when an elevator was installed as follows:

(1) On elevators installed under A17.1–1980 through A17.1–1982 the specified zone is outside the landing zone [18 in. (457 mm) above or below the landing].

(2) On elevators installed under A17.1–1983 through A17.1–1988 and those that must comply with A17.3 the specified zone is outside the unlocking zone. The unlocking zone is a distance set by the manufacturer between 0 in. and 18 in. (457 mm) above and below the landing. (An unlocking zone is not required.)

(3) On elevators installed under A17.1–1989 and later editions, the doors must be able to be opened from 0 in. to 3 in. (76 mm) above and below the landing [an unlocking zone is required and doors may be opened up to 18 in. (457 mm) above and below the landing]. The car or hoistway door must meet the restricted opening requirements when the car is more than 18 in. (457 mm) above and below the landing.

(b) Some manufacturers comply with this by locking the car door rather than the hoistway door. Some manufacturers incorporate the locking into the door operator, and some install vanes or other mechanisms on the doors and hoistway to achieve compliance. Follow the procedure below to verify compliance with this requirement.

(1) For elevators installed under A17.1–1980 and later editions and elevators required to comply with A17.3, have the car stopped at a point beyond 18 in. (457 mm) above and then below the landing. With the power off, attempt to manually open the car door. If the car door opens more than 4 in. (102 mm), the hoistway door must not open more than 4 in. (102 mm) from inside the car with the car in any position more than 18 in. (457 mm) above or below the landing.

(2) For elevators installed under A17.1–1989 and later editions, follow the previous procedure. If found satisfactory, have the car stopped at the 3 in. (76 mm) point and verify that the doors can be manually opened.

(3) Both of the previous checks will only be required at one or two landings if the restricted opening mechanism can be inspected from the car top.

1.18.2 Periodic Test

1.18.3 Acceptance

See Fig. 1.10.2.

1.18.4 References

1.18.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 111.12 and 1001.2(a)(18).

A17.1–2000 and later editions — Requirements (NR 111.12) and 8.11.2.1.1(r).

A17.3 — Paragraph 2.7.4.

1.18.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 111.5 {300.12} and 1004.2(a)(18).

A17.1–2000 and later editions — Requirements 2.12.5 {3.12} and 8.11.3.1.1(r).

A17.3 — Paragraph 2.7.4 {Section 4.1}.

ITEM 1.19
CAR RIDE

1.19.1 Periodic Inspections

Operate the car at normal operation speed from one terminal landing to the other, listen for unusual noise, and observe whether there is excessive or irregular motion of the car, which may indicate that the car or counterweight guide rails are not properly aligned. If such motion occurs, when on top of the car, check for loose or worn guide shoes or rollers and proper alignment of the guide rails.

1.19.2 Periodic Test

1.19.3 Acceptance

1.19.4 References

1.19.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 200 and Rules 203.2 and 1001.2(a)(19).

A17.1–2000 and later editions — Requirements 2.23, 2.15.2, and 8.11.2.1.1(s).

1.19.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 301.1a, 301.6, 1004.2(a)(19), and 1206.1a {1206.5a}.

A17.1–2000 and later editions — Requirements 3.23.1, 3.15, 8.11.3.1.1(s), and 8.6.1.6.2 {8.6.5}.

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PART 2
ELEVATOR — MACHINE ROOM

(04)

ITEM 2.1
ACCESS TO MACHINE SPACE

2.1.1 Periodic Inspections

(a) Check that permanent, safe, and convenient means of access to machine rooms and machinery spaces have been provided and maintained. Check stairways and ladders to see they are stable and secure.

(b) Check that the access door is maintained in the closed and locked position. It must be self-closing and openable from the inside without a key. For elevators installed under A17.1–1978 and later editions, also check that the door is self-locking.

2.1.2 Periodic Test

2.1.3 Acceptance

2.1.3.1 Electric Elevators. Check that access to the machine room meets the accessibility requirements of the Code. For access doors required to meet fire ratings, check for proper labeling. Access to the machine room includes passage from the top building floor to the machine room.

2.1.3.2 Hydraulic Elevators. Check that access to the machine room meets the accessibility requirements of the Code. For access doors required to meet fire ratings, check for proper labeling.

2.1.4 References

2.1.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 101.1a, 101.3a, 101.3b, 101.3c, 101.3d, and 1001.2(b)(1).

A17.1–2000 and later editions — Requirements 2.7.1.1, 2.7.3.1, 2.7.3.2, 2.7.3.3, 2.7.3.4, and 8.11.2.1.2(a).

A17.3 — Paragraph 2.2.2.

NFPA 70 or CSA C22.1, as applicable.

2.1.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 300.1, 300.2, and 1004.2(b)(1).

A17.1–2000 and later editions — Requirements 3.1, 3.7, and 8.11.3.1.2(a).

A17.3 — Paragraph 2.2.2 {Section 4.1}.

NFPA 70 or CSA C22.1, as applicable.

ITEM 2.2
HEADROOM

2.2.1 Periodic Inspections

2.2.2 Periodic Test

2.2.3 Acceptance

Verify that machine and control rooms have the minimum overhead clearances. Clear headroom measurements are taken from the floor to the bottom of the lowest obstruction below the ceiling (e.g., wiring raceways, conduit, beams).

2.2.4 References

2.2.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 101.4 and 1001.2(b)(2).

A17.1–2000 and later editions — Requirements 2.7.4 and 8.11.2.1.2(b).

2.2.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 101.4 {300.2} and 1004.2(b)(2).

A17.1–2000 and later editions — Requirements 2.4.7 {3.7} and 8.11.3.1.2(b).

ITEM 2.3
LIGHTING AND RECEPTACLES

2.3.1 Periodic Inspections

Check machine room for adequate lighting. For elevators installed under A17.1a–1988 and later editions, check that a duplex receptacle has been provided in the machine room and machinery spaces, and that it is operable.

2.3.2 Periodic Test

2.3.3 Acceptance

2.3.4 References

2.3.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 101.5a, 101.5c, and 1001.2(b)(3).

A17.1–2000 and later editions — Requirements 2.7.5.1, (NR 101.5c), and 8.11.2.1.2(c).

A17.3 — Paragraph 2.2.3.

NFPA 70 or CSA C22.1, as applicable.

2.3.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 101.5a and 101.5c {300.2}, and 1004.2(b)(3).

A17.1–2000 and later editions — Requirements 2.7.5.1 and (NR 101.5c) {3.7}, and 8.11.3.1.2(c).

A17.3 — Paragraph 2.2.3 {Section 4.1}.

NFPA 70 or CSA C22.1, as applicable.

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ITEM 2.4
MACHINE SPACE

2.4.1 Periodic Inspections

Check the condition of the equipment in the machine room, overhead machinery spaces, and machinery space located in the hoistway by examining the following:

(a) Check that overhead gratings or platforms are properly supported, and secure.

(b) Check the machine room and secondary machine rooms for any leaks in the roof or windows. Machines, control equipment, sheaves, and other machinery should be protected from the elements.

2.4.1.1 Electric Elevators. For elevators installed under A17.1–1993 and later editions where remote machine rooms or control rooms are provided, check the access to ropes and sheaves. Check the communications between the elevator car and machine room.

2.4.1.2 Hydraulic Elevators. Check that machinery is separated from other parts of the building by required enclosure. A17.1b–1989 and later editions prohibit location of machine and control rooms in the hoistway.

2.4.2 Periodic Test

2.4.3 Acceptance

2.4.3.1 Electric Elevators. For elevators installed under A17.1–1996 and earlier editions, check that a sign stating the maximum allowable floor load has been prominently displayed in all main and secondary machine rooms. The sign is required to be metal with black letters and figures at least 4 in. (102 mm) high on a white background.

Bar-type overhead gratings and platform openings and fabricated or expanded metal must comply with Code size requirements. Measure and verify openings for compliance.

2.4.4 References

2.4.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 100.3c, 100.3d, 100.5, 101.1a, 101.2, 101.8, and 1001.2(b)(4).

A17.1–2000 and later editions — Requirements 2.1.3.3, 2.1.3.4, 2.1.5, 2.7.1.1, 2.7.2.1, 2.7.8, and 8.11.2.1.2(d).

A17.3 — Paragraphs 2.2.1 and 2.2.6.

2.4.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 101.1a {300.2}, 105.2 and 105.4 {300.6}, and 1004.2(b)(4).

A17.1–2000 and later editions — Requirements 2.7.1.1 {3.7}, 2.9.2 and 2.9.4 {3.9}, and 8.11.3.1.2(d).

A17.3 — Paragraphs 2.2.2 and 2.2.6 {Section 4.1}.

ITEM 2.5
HOUSEKEEPING

2.5.1 Periodic Inspections

Check that the machine room area is not used for the storage of any flammable liquids with a flash point less than 110°F (43°C), and for materials and articles not necessary for the maintenance and operation of the elevator. Check the floor area for cleanliness, noting any accumulation of oil, grease, or dirt.

For observation elevators with glass car enclosures or hoistway enclosures, check to see that a written procedure for cleaning the glass exists. The written procedure is not required to be kept in the machine room, but must be kept on premises.

Check that the tops of cars are kept clean, dry, and are not being used for storage.

2.5.2 Periodic Test

2.5.3 Acceptance

2.5.4 References

2.5.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 1001.2(b)(5), 1206.2b, and 1206.9.

A17.1–2000 and later editions — Requirements 8.11.2.1.2(e), 8.6.4.8, and 8.6.10.3.

2.5.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 1004.2(b)(5) and 1206.1, 1206.2b {1206.5a}, and 1206.9.

A17.1–2000 and later editions — Requirements 8.11.3.1.2(e) and 8.6.1.2, 8.6.4.8 {8.6.5}, and 8.6.10.3.

ITEM 2.6
VENTILATION

2.6.1 Periodic Inspections

Check that mechanical ventilation and air conditioning are in operating condition. Check that natural machine room ventilation is open and functioning.

2.6.2 Periodic Test

2.6.3 Acceptance

Check that adequate ventilation is provided by natural or mechanical means to ensure safe and normal operation of the elevator.

2.6.4 References

2.6.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 101.5b, 102.4, and 1001.2(b)(6).

A17.1–2000 and later editions — Requirements 2.7.5.2, 2.8.4, and 8.11.2.1.2(f).

A17.3 — Paragraph 2.2.4.

2.6.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 101.5b {300.2}, 102.4, and 1004.2(b)(6).

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A17.1–2000 and later editions — Requirements 2.7.5.2 {3.7}, 2.8.4, and 8.11.3.1.2(f).
A17.3 — Paragraph 2.2.4 {Section 4.1}.

ITEM 2.7
FIRE EXTINGUISHER

2.7.1 Periodic Inspections

Check to see that a class "ABC" fire extinguisher is mounted convenient to the access door. The extinguisher should be tagged to indicate monthly check and required annual maintenance.

2.7.2 Periodic Test

2.7.3 Acceptance

2.7.4 References

2.7.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 1001.2(b)(7) and 1206.1h.
A17.1–2000 and later editions — Requirements 8.11.2.1.2(g) and 8.6.1.6.5.

2.7.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 1004.2(b)(7), and 1206.2f {1206.5a}.
A17.1–2000 and later editions — Requirements 8.11.3.1.2(g), and (NR 1206.2f) {8.6.5}.

ITEM 2.8
PIPES, WIRING, AND DUCTS

2.8.1 Periodic Inspections

Only such pipes, wiring, and ducts used in direct connection with the elevator are permitted to be installed in the machine room or machinery spaces. Check permitted sprinkler piping for any leakage. For elevators required to meet A17.3, pipes conveying gases, vapors, or liquids not connected with the operation of the elevator must be guarded so that any discharge will not affect the operation of the elevator.

2.8.2 Periodic Test

2.8.3 Acceptance

Check that sprinkler risers and return piping have been located outside the machine room and machinery spaces. Check to see that an automatic, nonresetting means independent of the elevator control is provided to disconnect the main line power to the affected elevators before the sprinkler water is discharged into the machine room or machinery spaces. A shunt trip circuit breaker activated by a heat detector is one method of meeting these requirements. The Code prohibits sprinkler activation or disconnection of main line power by smoke detectors.

2.8.4 References

2.8.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 102.1, 102.2, and 1001.2(b)(8).
A17.1–2000 and later editions — Requirements 2.8.1, 2.8.2, and 8.11.2.1.2(h).
A17.1 — Inquiry 88-26.
A17.3 — Paragraph 2.2.5.
ANSI/NFPA 13.

2.8.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 102.1 and 102.2 {300.3}, and 1004.2(b)(8).
A17.1–2000 and later editions — Requirements 2.8.1 and 2.8.2 {3.8}, and 8.11.3.1.2(h).
A17.1 — Inquiry 88-26.
A17.3 — Paragraph 2.2.5 {Section 4.1}.
ANSI/NFPA 13.

ITEM 2.9
GUARDING OF EXPOSED AUXILIARY EQUIPMENT

2.9.1 Periodic Inspections

Check that guards of auxiliary equipment are in place and secure.

2.9.2 Periodic Test

2.9.3 Acceptance

2.9.4 References

2.9.4.1 Electric Elevators. A17.1d–-2000 and earlier editions — Rules 104.1 and 1001.2(b)(9).
A17.1–2000 and later editions — Requirements 2.10.1 and 8.11.2.1.2(i).

2.9.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 104.1 {300.5} and 1004.2(b)(9).
A17.1–2000 and later editions — Requirements 2.10.1 {3.10} and 8.11.3.1.2(i).

ITEM 2.10
NUMBERING OF ELEVATORS, MACHINES, AND DISCONNECT SWITCHES

2.10.1 Periodic Inspections

For elevators installed under A17.1–1960 through A17.1b–1989, where the machinery of more than one elevator is in a single machine room, check that the number for each car has been painted, or securely attached to the drive machine and disconnect switch. A17.1–1990 and later editions numbers to be at least $1\frac{1}{2}$ in. (38 mm) in height.

2.10.2 Periodic Test

2.10.3 Acceptance

Elevator identification numbers assigned by the authority having jurisdiction should be recorded and

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cross-referenced with the manufacturers, contractors, and building identification numbers.

2.10.4 References

2.10.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 208.10, 210.4, 211.9, and 1001.2(b)(10).

A17.1–2000 and later editions — Requirements (NR 208.10), 2.26.4, 2.29.1, and 8.11.2.1.2(j).

NFPA 70 or CSA C22.1, as applicable.

2.10.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 210.4, 211.9 {306.11}, and 306.6.

A17.1–2000 and later editions — Requirements 2.26.4, 2.29.1 {3.27}, and 3.26.

NFPA 70 or CSA C22.1, as applicable.

ITEM 2.11
DISCONNECTING MEANS AND CONTROL

2.11.1 Periodic Inspections

Check that the main line disconnecting means is in good working order and securely mounted.

2.11.1.1 Hydraulic Elevators. For elevators installed under ASME A17.1a–1994 and later editions, verify that the sign "KEEP SWITCH CLOSED EXCEPT DURING MAINTENANCE, REPAIRS, AND INSPECTIONS" is placed on the switch when the anticreep device is dependent on availability of power.

2.11.2 Periodic Test

2.11.3 Acceptance

(a) Location. Check that the main line disconnecting means has been located where it is readily accessible to qualified persons.

(b) Power From More than One Source. For elevators with more than one power source, check to see that a separate disconnecting means has been provided for each source of electrical power, and that the main line disconnecting means is within sight of the equipment served. Check to see that warning signs for multiple disconnecting means, indicating parts of the control panel are not de-energized by one switch are mounted on or adjacent to the disconnecting means.

(c) Car Light Disconnecting Means. Check to see that a single means for disconnecting all ungrounded car light power supply conductors has been provided in the machine room for each car. For installations where the machinery for more than one car is in a single machine room, the disconnecting means must be numbered to correspond to the number of the elevator car whose light source the disconnecting means controls.

2.11.3.1 Electric Elevators

(a) For elevators without generator field control, the main line disconnecting means must be located within sight of the power converter or motor starter. When the disconnecting means is not within sight of the hoist machine or control panel, an additional manually operated switch should be installed adjacent to the remote equipment connected in the control circuit to prevent starting.

(b) For elevators with generator field control, the main line disconnecting means must be located within sight of the motor starter for the driver motor of the motor-generator set. When the disconnecting means is not within sight of the hoist machine, the control panel, or the motor-generator set, an additional manually operated switch should be installed adjacent to the remote equipment connected in the control circuit to prevent starting.

2.11.3.2 Hydraulic Elevators. The main line disconnecting means should be located within sight of the motor starter and should remove power from both the motor and control valve.

2.11.4 References

2.11.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 210.4 and 1001.2(b)(11).

A17.1–2000 and later editions — Requirements 2.26.4 and 8.11.2.1.2(k).

A17.3 — Paragraph 3.10.5.

NFPA 70 or CSA C22.1, as applicable.

2.11.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 306.3a(5)(b), 306.4, 306.6, and 1004.2(b)(11).

A17.1–2000 and later editions — Requirements 3.26.3.1 [3.26.3.1.4(b)], 3.26.4, 3.26, and 8.11.3.1.2(k).

A17.3 — Paragraph 3.10.5 {4.7.5}.

NFPA 70 or CSA C22.1, as applicable.

ITEM 2.12
CONTROLLER WIRING, FUSES, GROUNDING, ETC.

2.12.1 Periodic Inspections

2.12.1.1 Electric Elevators

(a) Inspection Made With Power Off. Examine all relays, switches, contactors, control circuit rectifiers, transformers, capacitors, resistors, vacuum tubes, pc boards, etc., and note

(1) any excessively worn or burned contacts, broken connectors, broken or cracked resistance grids or resistance tubes.

(2) proper fuse type and rating. No fuses should be jumped or shorted.

(3) check for

(a) jumper wires or temporary wiring changes

(b) whether the equipment is clean

(c) any accumulation of combustible materials, especially on resistance grids or wires, or on control circuit rectifiers

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(d) whether contacts of reverse-phase relay, where provided, are open

(e) excessively worn hinge pins and shunt wiring on relays or contactors

(f) check mechanical interlock between relays

(g) visually check for blocked relays or circuits defeated by any other means and ensure that there is no evidence of a safety device being rendered inoperative

(4) verify that jumpers are not stored in the machine space, truss, or pits.

(b) Inspection Made With Power On. Observe the operation of the control equipment when the elevator is run in each direction. Note any arcing of contacts, excessive heating of coils or resistance, and misalgnment of relays, contactors, and switches.

2.12.1.2 Hydraulic Elevators. Hydraulic elevators installed under A17.1c–1986 and later editions require a reverse-phase relay or other means to prevent overheating in the event of a phase failure or reversal. If a reverse phase relay is not provided, a low oil timer, line starters with phase protection, rotation sensors, and thermistors in motor and oil, etc., may be used to meet the requirement to prevent overheating in the event of a phase reversal and/or failure. The condition of the control provided should be checked.

2.12.2 Periodic Test

2.12.3 Acceptance

Check that sufficient clear working space has been provided around control panels and disconnecting means, to provide safe and convenient access to all live parts of the equipment necessary for maintenance and adjustment.

2.12.4 References

2.12.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 102.1, 210.4, 1001.2(b)(12), and 1206.1f.

A17.1–2000 and later editions — Requirements 2.8.1, 2.26.4, 8.11.2.1.2(l), 8.6.1.6.1, and 8.6.1.6.3.

A17.3 — Paragraph 3.10.

NFPA 70 or CSA C22.1, as applicable.

2.12.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 102.1 {300.3}, 306.5, 306.6, 1004.2(b)(12), 1206.1f, and 1206.5a.

A17.1–2000 and later editions — Requirements 2.8.1 {3.8}, 3.26.5, 3.26, 8.11.3.1.2(l), 8.6.1.6.3, 8.6.1.6.1, and 8.6.5.

NFPA 70 or CSA C22.1, as applicable.

ITEM 2.13
GOVERNOR, OVERSPEED SWITCH, AND SEAL

2.13.1 Periodic Inspections

2.13.1.1 Inspection Made With Power Off

(a) Examine governor fastening bolts to verify that the governor is securely fastened in place and that the governor rope is free of the governor jaws or other obstructions.

(b) Examine all linkages, gears, pins, collars, bushings, and latches that are used to connect the weights and the rope gripping devices for evidence of excessive wear and lost motion, and note whether all bearings and rubbing surfaces are not restricted by paint or other foreign substances.

(c) Lift the weights or flyballs by hand and note whether all moving parts, including the governor-rope jaws, operate freely and that there is ample room for the rotation of governor weight or flyballs in their extreme extended position. Check all parts of the governor for lubrication.

(d) Examine rope gripping surfaces.

(e) Where the governor is provided with a speed-reducing switch and an overspeed (stopping) switch, determine by operating the governor mechanism by hand, where practical, whether these switches operate.

(f) Verify that means of adjusting tripping speed and pull-through force are sealed.

2.13.2 Periodic Test

2.13.2.1 Electric Elevators

(a) Yearly Test of Governor (for A17.1d–2000 and Earlier Editions); Category 1 Test of Governor (for A17.1–2000 and Later Editions). Make a general examination of the governor-rope system, including the condition of the governor, governor rope, governor-rope tension sheave assembly, and releasing carrier. Check that the proper type of rope, identified on the governor marking plate, has been installed.

(1) With the main line switch in the open position, inspect governors by a manual extension of the governor weights to make sure there is no restriction of motion and verify that all parts, including the rope gripping jaws, operate freely. Check all bearings, pins, governor-rope grip jaws, and rubbing surfaces to make sure they are not worn excessively and are properly lubricated and free of paint.

(2) Inspection Made With Power On. Open the governor overspeed (stopping) switch, where provided, and check to be sure that the elevator cannot be operated. Reset the governor switch, and have the car operated at normal speed in each direction and note

(a) any tendency of the governor rope to slide on the sheave groove when the car is started or stopped

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(b) any eccentric or lateral motion of the governor sheave

(c) whether the rope runs free of the jaws at all times

(3) A test of the governor tripping speed is not required unless the seal on the governor has been disturbed or the inspection indicates that for other reasons a test is necessary. If a test is made, the governor must be sealed and tagged after the test.

(b) 5-Year Test (for A17.1d–2000 and Earlier Editions); Category 5 Test (for A17.1–2000 and Later Editions). After the car and counterweight guide shoes, safety parts, and governors have been inspected, check as follows:

(1) Determine the tripping speed of the governor using Table 2.13.2. The tripping speed is stamped on the governor marking plate.

(2) Have governors calibrated to the setting as shown in Table 2.13.2.

(3) The sheave must be free to rotate with no obstruction by the governor rope. To accomplish this, have the person performing the test park the elevator car about 12 in. (305 mm) below the top opening and open the main line disconnect switch.

(a) Lift the governor rope to ensure sufficient slack to spin sheave. When installing a clamp on a governor rope, be careful not to damage the rope. [See Item 2.13.2(b)(5).]

(b) With a rubber drive wheel held against the governor sheave driven by a variable speed drill motor, gradually build up the governor speed until it trips.

(c) To read the tripping speed, use a calibrated tachometer reading in ft/min (m/s). Hold the wheel inside the governor sheave groove at the centerline of the rope. Take several readings and record the average.

(4) If any adjustments are made, be sure the locknuts are tight and install a new seal. Use a No. 36 [0.106 in. (2.69 mm)] drill or smaller. Install the seal with a sealing tool. Retest as outlined above, and record the tripping speed. Check the tripping speed of the governor switches using the same procedure. Place the rope on the governor sheave.

Remove the clamp and inspect the governor rope for any damage or kinks. Reinstall all sheave and switch covers. Check the releasing carrier. On drum-operated safeties, check for slack rope between the releasing carrier and drum.

NOTE: If an elevator, for any reason, is running below the rated speed, the governor calibration must be based on the rated speed.

(5) For Class B-type safeties, check the force necessary to pull the governor rope through the governor. In no case may the pull-through force exceed one-fifth of the rated ultimate strength of the governor rope. The force required to pull the governor rope from the releasing carrier is required to be no more than 60% of the pull-through force.

One method of performing this test is as follows: The best place to check this is from the top of the car since the governor rope and release carrier are usually accessible from there. [See Fig. 2.13.2.] Make this connection fairly direct with minimum angle between the governor rope and the sling. Take special care that the attachment does not damage the governor rope. In most cases the attachment can be made to a portion of the governor rope that does not reach the governor when the car is at the upper landing. When clamps (fist grip) are used for this purpose, they should comply with non-babbitted rope fastenings as outlined in Item 3.29, and the nuts tightened with a torque wrench to the torque recommended by the manufacturer. Typical torques are 45 ft-lb (61 N·m) for $\frac{3}{8}$ in. (9.5 mm) rope, 65 ft-lb (88 N·m) for $\frac{7}{16}$ in. (11 mm) and $\frac{1}{2}$ in. (13 mm) rope, and 130 ft-lb (176 N·m) for $\frac{9}{16}$ in. (14 mm) and $\frac{5}{8}$ in. (16 mm) rope; either over- or under-tightening will likely damage the governor rope and require its replacement. A so-called "Chicago" grip that is used for pulling large diameter electrical conductors is also recommended for this connection since it would be less likely to damage the governor rope. These grips can be ordered with jaws that are machined to the diameter of the rope. Midline rope clamps that grip with a wedge conforming to the rope size may also be used. Regardless of the method used, extra care must be taken to provide a secure connection that will not damage the governor rope. Note the spring tension of the safety releasing carrier so that it can be restored to its original setting after completion of the test.

Remove the spring tension from the releasing carrier so that it will not restrain the rope. Trip the governor, and pop up the governor rope tension sheave to allow approximately 1 ft (0.305 m) movement of the governor rope without lifting the tension sheave. Operate the come-along pulling at least 6 in. (152.4 mm) of the governor rope through the governor. Note the reading on the dynamometer and compare it to the rated ultimate strength of the rope. If a release carrier is used, it must release at no more than 60% of the governor pull-through force. This can be checked with the same equipment by connecting the dynamometer and come-along between the governor rope at the releasing carrier and the existing connection and the governor rope.

After this test, perform the following three steps:

(a) Carefully inspect the governor rope at the point of connection to assure that it has not been damaged.

(b) Restore the governor release carrier.

(c) Reset and inspect the governor.

(6) Ensure the governor has been sealed and tagged.

2.13.2.2 Hydraulic Elevators

(a) Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions). Make

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Table 2.13.2 Governor Adjustment Settings

Rated Car Speed, ft/min	Car Governor Tripping Speed		Cwt. Governor [Note (1)] Tripping Speed		Car Governor Overspeed Switch Settings, Down Direction			Car Governor Overspeed Switch Settings, Up Direction	Cwt. Governor Overspeed Switch Settings
	Rqmt. 2.18.2.1, Minimum, ft/min	Rqmt. 2.18.2.1, Maximum, ft/min	Rqmt. 2.18.2.2, Minimum, ft/min	Rqmt. 2.18.2.2, Maximum, ft/min	Rqmts. 2.18.4.2.1 and 2.18.4.2.2	Rqmt. 2.18.4.2.3	Rqmt. 2.18.4.2.5	Rqmt. 2.18.4.2.4	Rqmt. 2.18.4.1
0 to 125	144	175	145	192	Not Required	Not more than 90% of car governor down tripping setting for elevators with static controls	Not more than 100% of car governor down tripping setting if a speed reducing switch is provided	Not Required	Counter weight governor overspeed switch required for any speed
150	173	210	174	231					
175	202	250	203	275	Not more than 90% of car governor down tripping setting			Not more than 100% of car governor down tripping setting	
200	230	280	231	308					
225	259	308	260	338					
250	288	337	289	370					
300	345	395	346	434					
350	403	452	404	497					
400	460	510	461	561					
450	518	568	519	624					
500	575	625	575	687					
600	690	740	691	814	Not more than 95% of car governor down tripping setting				
700	805	855	806	940					
800	920	970	921	1,067					
900	1,035	1,085	1,036	1,193					
1,000	1,150	1,200	1,151	1,320					
1,100	1,265	1,320	1,266	1,452					
1,200	1,380	1,440	1,381	1,584					
1,300	1,495	1,560	1,496	1,716					
1,400	1,610	1,680	1,611	1,848					
1,500	1,725	1,800	1,726	1,980					
1,600	1,840	1,920	1,841	2,112					
1,700	1,955	2,040	1,956	2,244					
1,800	2,070	2,160	2,071	2,376					
1,900	2,185	2,280	2,186	2,508					
2,000	2,300	2,400	2,301	2,640					

NOTE:
(1) The counterweight governor tripping speed must exceed the car governor tripping speed.

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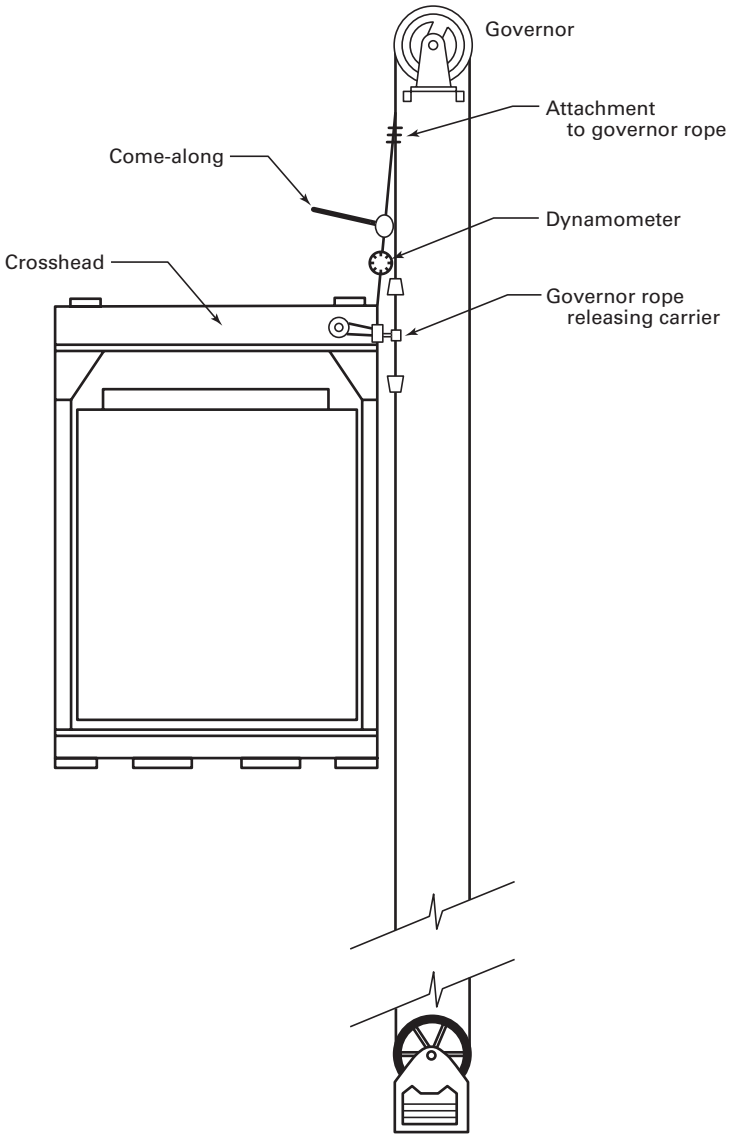


Fig. 2.13.2 Dynamometer Connections for Testing the Pull-Through of Governor Jaws

a general examination of the governor-rope system, including the condition of the governor, governor rope, governor-rope tension sheave assembly, and releasing carrier. Check to verify that the type of rope, identified on the governor marking plate, has been installed.

(1) With the main line switch in the open position, governors shall be inspected by a manual extension of the governor weights to make sure there is no restriction of motion and verify that all parts, including the rope gripping jaws, operate freely. All bearings, pins, rope grip jaws, and rubbing surfaces shall be checked to make sure they are not worn excessively, are properly lubricated, and free of paint.

(2) Inspection Made With Power On. Open the governor overspeed (stopping) switch, where provided, and check to be sure that the elevator cannot be operated in either direction. Reset the governor switch, and have the car operated at normal speed in each direction and note

(a) any tendency of the governor rope to slide on the sheave groove when the car is started or stopped

(b) any eccentric or lateral motion of the governor sheave

(b) 5-Year Test (for A17.1d–2000 and Earlier Editions); Category 5 Test (for A17.1–2000 and Later Editions). After the car and counterweight guide shoes, safety parts, and governors have been inspected, check as follows:

(1) The tripping speed of the governor shall be determined using Table 2.13.2, Governor Adjustment Settings, from A17.2, except that the tripping speed shall be based on the elevator operating speed in the down direction. The governor switch should operate before or at the application of the safety. If a tripping speed is

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stamped on the governor marking plate, it should be considered the maximum for that governor.

(2) Governors shall be calibrated to the setting as shown in Table 2.13.2 or manufacturer's marking plate, whichever is less.

(3) The sheave must be free to rotate with no obstruction by the governor rope. To accomplish this, park the elevator car about 12 in. (305 mm) below the top opening and open the main line disconnect switch.

(a) Lift the governor rope to ensure sufficient slack to spin the sheave. When installing a clamp on a governor rope, be careful not to damage the rope.

(b) With a rubber drive wheel held against the governor sheave driven by a variable speed electric drill, gradually build up the governor speed until it trips.

(c) To read the tripping speed, use a tachometer reading in ft/min (m/s). Hold the tachometer wheel at the pitch diameter of the governor sheave. Take several readings and record the average.

(4) If any adjustments are made, be sure the locknuts are tight and install a new seal. Use a No. 36 [0.106 in. (2.69 mm)] drill or smaller. Install the seal with a sealing tool. Retest as outlined above and record the tripping speed. Check the tripping speed of the governor switches using the same procedure. Place the rope on the governor sheave. Remove the clamp and inspect the governor rope for any damage or kinks. Reinstall all sheave and switch covers.

NOTE: If an elevator, for any reason, is running below the rated speed, the governor calibration must be based on the rated speed.

(5) For Type B safeties, the force necessary to pull the governor rope through the governor shall be checked. In no case may the pull-through force exceed one-fifth of the rated ultimate strength of the governor rope. The force required to actuate the releasing carrier, where provided, shall be no more than 60% of the pull-through force. One method of performing this test is as follows:

(a) The best place to check this is from the top of the car since the governor rope and release carrier, where provided, are usually accessible from there [see Fig. 2.13.2]. Make this connection fairly direct with minimum angle between the governor rope and the sling. Take special care that the attachment does not damage the governor rope. In most cases the attachment can be made to a portion of the governor rope that does not reach the governor when the car is at the upper landing. When clamps (fist grip) are used for this purpose, they shall comply with nonbabbitted rope fastenings, and the nuts tightened with a torque wrench to the torque recommended by the manufacturer. This is usually 45 ft-lb (61 N·m) for $\frac{3}{8}$ in. (9.5 mm) rope, 65 ft-lb for (88 N·m) for $\frac{7}{16}$ in. (11 mm) and $\frac{1}{2}$ in. (13 mm) rope, and 130 ft-lb (176 N·m) for $\frac{9}{16}$ in. (14 mm) and $\frac{5}{8}$ in. (16 mm) rope. Either over- or under-tightening will likely damage the governor rope and require its replacement. A so-called "Chicago" grip that is used for pulling large diameter electrical conductors is also recommended for this connection since it would be less likely to damage the governor rope. These grips can be ordered with jaws that are machined to the diameter of the rope. Midline rope clamps that grip with a wedge conforming to the rope size may also be used. Regardless of the method used, extra care must be taken to provide a secure connection that will not damage the governor rope. Note the spring tension of the safety releasing carrier so that it can be restored to its original setting after completion of the test.

(b) Remove the spring tension from the releasing carrier so that it will not restrain the rope. The governor shall be tripped, and the governor rope tension sheave propped up to allow approximately 1 ft movement of the governor rope without lifting the tension sheave. Operate the come-along pulling at least 6 in. (152 mm) of the governor rope through the governor. Note the reading on the dynamometer and compare it to the rated ultimate strength of the rope. If a release carrier is used, it must release at no more than 60% of the governor pull-through force. This can be checked with the same equipment by connecting the dynamometer and come-along between the governor rope at the releasing carrier and the existing connection and the governor rope.

(6) After this test perform the following three steps:

(a) Carefully inspect the governor rope at the point of connection to assure that it has not been damaged.

(b) Restore the governor release carrier.

(c) Reset and inspect the governor.

(7) The governor should be sealed and a metal test tag installed by the person that performed the test.

2.13.3 Acceptance

2.13.3.1 Electric Elevators

(a) Governor Tests. Check the governor marking plate to determine that it is marked with size, material, and construction of the governor rope used and the governor-tripping speed.

(b) Speed Load Tests. The use of a tachometer in making speed-load tests is required. The tachometer reading must be taken after the car has reached its constant speed. Take and record speed readings with no load in the car and with rated load in the car in both the up and down directions. Tachometer readings must be taken from the side of the governor rope or hoisting ropes. Speed readings from any other position on the governor rope or hoisting ropes will be inaccurate. Where the car is roped 2:1, the car speed is one-half the hoist rope speed.

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2.13.3.2 Hydraulic Elevators

(a) Governor Tests. Check the governor marking plate to verify that it is marked with size, material, and construction of the governor rope for which it was designed and the governor-tripping speed.

(b) Speed Load Tests. The tachometer reading must be taken after the car has reached its constant speed. Speed readings shall be taken and recorded with no load in the car and with rated load in the car in both the up and down direction. Tachometer readings must be taken by holding the tachometer wheel at the pitch diameter of the governor sheave.

NOTE: For consistency of measurement, the oil should be at normal operating temperature when checking rate speed, operating speed in the down direction, relief valve setting, etc.

2.13.4 References

2.13.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 206 and Rules 205.15, 210.2(j), 1001.2(b)(28), 1002.2c, 1002.3a, 1002.3b, 1003.2a, and 1206.1a.

A17.1–2000 and later editions — Requirements 2.18, 2.17.15, 2.26.2 (2.26.2.10), 8.11.2.1.2(bb), 8.11.2.2.3, 8.11.2.3.1, 8.11.2.3.2, 8.10.2.2.2(cc)(1), and 8.6.1.6.2.

A17.3 — Paragraphs 3.6.1 and 3.10.4(g).

2.13.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Sections 205 and 206; and Rules 301.8, 1002.2(b), 1005.2c, 1005.4, 1202.7, and 1206.1.

A17.1–2000 and later editions — Requirements 2.17 and 2.18, 3.17.1, 8.11.2.2.2, 8.11.3.2.3, 8.11.3.4, 8.7.2.19, and 8.6.1.2.

A17.3 — Paragraph 4.9.7.

ITEM 2.14
CODE DATA PLATE

2.14.1 Periodic Inspections

Check that the Code Data Plate is installed. This is the Code that is to be used for the inspection and test.

2.14.2 Periodic Test

2.14.3 Acceptance

2.14.4 References

2.14.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 215 and Rule 1200.6.

A17.1–2000 and later editions — Requirements 8.9 and 8.7.1.8.

2.14.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 309 and Rule 1200.6.

A17.1–2000 and later editions — Requirements 8.9 and 8.7.1.8.

NOTE: Items 2.15 through 2.29 apply to electric elevators only.

ITEM 2.15
STATIC CONTROL

2.15.1 Periodic Inspections

2.15.2 Periodic Test

2.15.2.1 Electric Elevators: Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions). The person or firm installing or maintaining an elevator with a driving motor employing static control without MG set should demonstrate conformance with the Code as follows:

(a) Run the car and demonstrate that there are two devices that each independently will remove power from the driving machine motor and cause the car to stop. At least one of the devices is required to be an electromechanical contactor, which also opens the driving machine brake circuit.

(b) Prevent the above electromechanical contactor from being energized and register a call. Demonstrate, with the doors closed, that the brake will not lift and the car will not move.

(c) Demonstrate that either of two contactors in the brake circuit will prevent the brake from lifting.

(d) Demonstrate that the operation of any of the electrical protective devices will cause both devices specified in Item 2.13.2(a) to remove power from the driving machine motor and, brake.

2.15.3 Acceptance

2.15.4 References

2.15.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 210.2, 210.9(d), 1001.2(b)(13), and 1003.2h.

A17.1–2000 and later editions — Requirements 2.26.2, 2.26.9.5, 8.11.2.1.2(m), and 8.10.2.2.2(m).

ITEM 2.16
OVERHEAD BEAM AND FASTENINGS

2.16.1 Periodic Inspections

2.16.1.1 Electric Elevators. Examine overhead beams to determine whether they are securely fastened to supports or firmly embedded in walls. Note any settlement of supports. Examine all exposed bolt fastenings of beams supporting machinery or sheaves.

2.16.2 Periodic Test

2.16.3 Acceptance

2.16.3.1 Electric Elevators. Examine overhead machine and sheave beam supports. Record the dimensions and span of beams and check them against layout drawings.

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2.16.4 References

2.16.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 105.1, 105.2, 105.3, and 1001.2(b)(14).

A17.1–2000 and later editions — Requirements 2.9.1, 2.9.2, 2.9.3, and 8.11.2.1.2(n).

ITEM 2.17
DRIVE MACHINE BRAKE

2.17.1 Periodic Inspections

2.17.1.1 Electric Elevators

(a) Inspection Made With Power On. Run the car and observe the operation of the brake. The brake should not chatter. It may apply on or before the completion of the slowdown and leveling operation. Check to see that the brake is automatically applied on or after normal stops. The clearance between the brake shoe and the brake drum when the car is running should not be greater than necessary to permit free running. Examine the brake pins to determine whether they are properly lubricated and not frozen, and that retainers are in place. Note any harsh and abrupt brake action. Examine brake-activated contacts (if provided) for proper operation.

(b) Inspection Made With Power Off

(1) Examine the brake and drum to determine that the brake linings are free of oil and whether there is any scoring of the drum.

(2) If the elevator has been running, the brake drum may be warm but should not be uncomfortable to the touch. A hot drum usually indicates a dragging brake shoe.

NOTE: The design of the actuating linkage of some brakes is such that a single unit or link is used both to govern the spring pressure applying the brake shoes when the brake applies and the amount of clearance between the brake shoes and the brake drum when the brake is released. With this type of design, it is possible to improperly adjust the releasing feature so that it will prevent the brake shoes from gripping the brake drum when the brake applies. The adjustment of this type of brake should be examined to determine that the adjustment is such that the brake shoes are not prevented from properly applying and that there is sufficient margin in the adjustment for the brake lining wear (no part of the brake should contact the machine for at least the thickness of the lining).

2.17.2 Periodic Test

2.17.2.1 Electric Elevators

(a) Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions)

(b) 5-Year Test (for A17.1d–2000 and Earlier Editions); Category 5 Test (for A17.1–2000 and Later Editions). For passenger elevators and freight elevators permitted to carry passengers, place 125% of rated load in the car at an upper landing and run it to the lowest landing by normal operating means. The driving machine must safely lower, stop, and hold the car with this overload. The elevator is not required to attain rated load performance under overload conditions. The car is not required to raise this load or stop level within normal limits. After the elevator has stopped, have the main line disconnect means opened and verify that the brake will hold the elevator.

2.17.3 Acceptance

2.17.3.1 Electric Elevators. For passenger elevators and freight elevators permitted to carry passengers, test the brake with 125% of rated load. Test other freight elevators with the rated load. Freight elevators designed for Class C2 loading must also be subjected to a static test with the load indicated on the car capacity plate.

Test freight elevators designed for Class C2 loading for conformance with the leveling requirements. With the load placed in the car, run the car to the lowest landing by normal operating means. The driving machine must safely lower, stop, and hold the car with its load. The elevator is not required to attain rated load performances under overload conditions.

2.17.4 References

2.17.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 207.2b, 207.8, 208.8, 210.8, 1001.2(b)(15), and 1002.3d.

A17.1–2000 and later editions — Requirements 2.16.2.2, 2.16.8, 2.24.8.3, 2.26.8, 8.11.2.1.2(o), and 8.11.2.3.4.

A17.3 — Paragraph 3.8.4.

ITEM 2.18
TRACTION DRIVE MACHINES

2.18.1 Periodic Inspections

2.18.1.1 Electric Elevators

(a) Inspection Made With Power On

(1) Have the elevator operated in each direction, making frequent stops, and observe the operation of the motor. Observe commutators for excessive sparking or brush chatter. Observe bearings for excessive noise and wear.

(2) Inspect all motor fastening bolts for tightness.

(3) Inspect the brushes; note any sparking or chattering.

(b) Inspection Made With Power Off. Examine brush holders, commutators or slip rings, and determine

(1) the condition of the brush holders and brushes.

(2) whether commutator or slip rings are burned, pitted, grooved, or scored, and are clean and free from oil; and also that the commutators are free from high mica.

(3) any accumulation of carbon, copper dust, oil, or other substances in the slot of an undercut commutator.

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(4) that exposed armature and field terminal conditions are tight. Give special attention to the shunt field connections of DC motors.

(5) that the leads are not broken or their insulation is not cracked or broken.

(6) that the motor windings are free of oil, dust, or lint deposits.

2.18.2 Periodic Test

2.18.3 Acceptance

2.18.4 References

2.18.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 208 and Rule 1001.2(b)(16).

A17.1–2000 and later editions — Requirements 2.24 and 8.11.2.1.2(p).

A17.3 — Paragraph 3.8.1.

ITEM 2.19
GEARS, BEARINGS, AND FLEXIBLE COUPLINGS

2.19.1 Periodic Inspections

2.19.1.1 Electric Elevators

(a) Inspection Made With Power On

(1) Have the elevator operated in each direction, making frequent stops. Observe if there is any excessive play or backlash in the bearings or gearing. Unusual noise or play is usually an indication of gear or thrust bearing trouble, or damage to bearing liners, rollers, or balls. It may be constructive to run the elevator at inspection speed as well as rated speed to fully observe any deterioration.

(2) Observe through the access covers to determine whether gears are carrying oil and that oil rings, chains, or other methods of feeding lubricant, where used, operate freely.

(b) Inspection Made With Power Off. Examine the oil in the gear case and bearing oil wells to determine that it is free of damaging metallic particles or other foreign substances. Check the oil level and note any leakage. Visually check the gears and sleeve bearings, where feasible, for excessive wear and scoring. Examine for any oil leaks that may damage the flexible part of the coupling and for any excessive wear.

Verify that when the flexible part of the coupling fails, it will not completely disengage from each unit. Inspect flexible couplings for wear and excess slack.

2.19.2 Periodic Test

2.19.2.1 Electric Elevators. If possible, visually inspect flexible couplings to determine that failure of the flexible element will not result in disengagement.

2.19.3 Acceptance

2.19.4 References

2.19.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 208 and Rules 1001.2(b)(17) and 1206.1a.

A17.1–2000 and later editions — Requirements 2.24, 8.11.2.1.2(q), and 8.6.1.6.2.

A17.3 — Paragraph 3.8.1.

ITEM 2.20
WINDING DRUM MACHINE AND SLACK CABLE DEVICE

2.20.1 Periodic Inspections

2.20.1.1 Electric Elevators

(a) Winding Drum Machine. For elevators installed under A17.1–1955 and later editions, winding drum machines may be used for freight elevator only. Open the main line switch and examine hoist rope fastenings in the drum. Note that the required tag indicates that the ropes have been refastened within 12 months for machines located over the hoistway and within 24 months for machines located at the bottom or at the side of the hoistway, except where provided with an auxiliary rope fastening device. Visually examine and hammer-test the drum for defects or cracks. Where ropes extend beyond their clamps or sockets, check to see that means have been provided to prevent the rope ends from coming out of the inside of the drum and interfering with other parts of the machine.

(b) Slack Cable Device. Slack cable devices are only required on winding drum machines.

(1) Inspection Made With Power Off. Determine that there is no interference with free and complete movement of the slack cable device. Determine that it is located as close as possible to the machine drum so that the switch will open with a minimum of slack rope.

(2) Inspection Made With Power On. Manually trip the slack cable device and attempt to run the car. The enclosed contact must remain open until manually reset.

NOTE: The location of slack cable switches can be found in
(a) the basement machine, in the machine itself
(b) the overhead machine, on top of the crosshead or inside or near the machine
(c) the pulley type, on overhead machine

2.20.2 Periodic Test

2.20.2.1 Electric Elevators

(a) Machine. With the car resting on its fully compressed buffers, check that at least one turn of rope is remaining on the drum.

(b) Slack Cable Device

(1) With the car running, trip the device manually using a piece of wood or similar object. The enclosed contact must remain open until manually reset.

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If there is any question about the operation of the device, lower the car onto suitable blocking in the pit and determine that the resulting slack rope will actually trip the device and stop the car.

(2) For double-belt drum machine, check that the driving belt is shifted to the idler pulley.

2.20.3 Acceptance

2.20.3.1 Electric Elevators. Check that the speed and Code limits of travel are not exceeded and that no counterweight is provided.

2.20.4 References

2.20.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 208.1, 210.2, 212.6, 212.7, 212.10, 1001.2(b)(18), 1002.2d, and 1206.3.

A17.1–2000 and later editions — Requirements 2.24.1, 2.26.2, 2.20.2, 2.20.7, 2.20.10, 8.11.2.1.2(r), 8.11.2.2.4, and 8.6.4.10.

A17.3 — Paragraphs 3.8.2, 3.10.4, 3.12.6, 3.12.7, and 3.12.9.

ITEM 2.21
BELT- OR CHAIN-DRIVE MACHINE

2.21.1 Periodic Inspections

2.21.1.1 Electric Elevators

(a) The installation of belt-drive machines or chain-drive machines was permitted for freight elevators in A17.1–1937 and previous editions when rated speeds did not exceed 60 ft/min (0.30 m/s) subject to the following:

(1) Single belt-drive machines and chain-drive machines were permitted, if provided with electrically released brakes applied directly to the driving machine and with terminal stopping devices as required for electric elevators.

(2) Chains for chain-drive machines were required to be of the multiple-link belt type.

(3) Double belt-drive machines were permitted only when driven from a line shafting supplying power for other purposes.

(b) Belt-drive and chain-drive machines were prohibited in A17.1–1955 through A17.1b–1983. In A17.1–1983 and later editions, belt-drive and chain-drive machines, also known as indirect-drive machines, were permitted subject to limitations.

Check for proper number of belts or chains. Examine belts for splice condition, proper tension, wear, burns, and for cuts and breaks in the surface. Check drive chains for excessive wear. Belts and chains are required to be replaced in matched sets. Check that all machine belt guards and chain guards are in place and secure.

Check that the broken belt or broken chain device interrupts power to the drive machine and applies the brake if any belt of chain becomes slack. Examine belt-shifting forks of double-belt machines to determine whether they are worn excessively by the edge of the belts, and check their operation while the car is being operated up and down the hoistway; note that the belts shift to the proper pulley without excessive effort.

Check all machine fastening bolts, belt guards, and chair guards. Also, check the fastenings of any platforms under ceiling machinery. Verify that the brake is located on the traction sheave or drum assembly side of the drive machine.

2.21.2 Periodic Test

2.21.3 Acceptance

2.21.4 References

2.21.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 208.9 and 1001.2(b)(19).

A17.1–2000 and later editions — Requirements 2.24.9 and 8.11.2.1.2(s).

A17.3 — Paragraph 3.8.3.

ITEM 2.22
MOTOR GENERATOR

2.22.1 Periodic Inspections

2.22.1.1 Electric Elevators. Motor-generator sets and exciters that are part of the elevator control system should operate smoothly, without excessive noise or vibration. Inspect brushes and commutators as indicated in Item 2.16.1.

2.22.2 Periodic Test

2.22.3 Acceptance Test of Generator Suicide Circuit

2.22.3.1 Electric Elevators. Make a full speed run, without releveling, with either an empty car to the bottom landing or a fully loaded car to the top landing. Observe the suicide circuit operation in the machine room.

(a) If the loop circuit is of the type that is not opened when the car stops, connect a voltmeter to brushes on the adjacent brush stems of the motor. With the suicide circuit temporarily defeated, observe whether the voltage steadily increases. If so, immediately reestablish the suicide circuit and observe a decrease in voltage, which verifies that the suicide circuit is operating.

(b) If the loop circuit is the type that is opened when the car stops, connect a voltmeter to brushes on adjacent brush stems of the motor generator and check for zero voltage with the brake set.

(c) Make a full speed run, without releveling, either with an empty car to the bottom landing or a fully loaded car to the top landing, and allow the brake to set. Observe that the machine does not pull through the

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brake, thereby ensuring that the restored suicide circuit is effective.

2.22.4 References

2.22.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 210.9f, 1001.2(b)(20), and 1003.2j.

A17.1–2000 and later editions — Requirements 2.26.9.7, 8.11.2.1.2(t), and 8.10.2.2.2(t).

ITEM 2.23
ABSORPTION OF REGENERATED POWER

2.23.1 Periodic Inspections

2.23.2 Periodic Test

2.23.3 Acceptance

2.23.3.1 Electric Elevators. If the normal power source is incapable of absorbing the energy generated by an overhauling load, a separate means such as a resistor bank must be provided on the load side of each elevator power supply line disconnecting means to absorb the regenerated power.

2.23.4 References

2.23.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 210.10, 1001.2(b)(21), and 1003.2k.

A17.1–2000 and later editions — Requirements 2.26.10, 8.11.2.1.2(u), and 8.10.2.2.2(u).

A17.3 — Paragraph 3.10.10.

ITEM 2.24
AC DRIVES FROM A DC SOURCE

2.24.1 Periodic Inspections

2.24.2 Periodic Test

2.24.2.1 Electric Elevators: Yearly Test of AC Drives From a DC Source (for A17.1d–2000 and Earlier Editions); Category 1 Test of AC Drives From a DC Source (for A17.1–2000 and Later Editions). The person or firm installing or maintaining an AC drive from a DC source should demonstrate that the elevator conforms to Code requirements.

(a) Run the car and demonstrate that either of two devices will prevent the flow of alternating current to the AC motor and cause the car to stop. At least one of the devices must be an electromechanical relay, which in its de-energized position prevents alternating current from flowing in the hoist motor.

(b) Prevent the above relay from being energized and register a call. Demonstrate, with the doors closed, that the brake will not lift and the car will not move.

(c) Demonstrate that either of two contactors in the brake circuit will prevent the brake from lifting.

(d) Demonstrate that the operation of any of the electrical protective devices will cause both devices specified in Item 2.22.2(a) to prevent the flow of alternating current to the hoist motor.

2.24.3 Acceptance

2.24.4 References

2.24.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 210.2, 210.9(e), 1001.2(b)(22), and 1003.2i.

A17.1–2000 and later editions — Requirements 2.26.2, 2.26.9.6, 8.11.2.1.2(v), and 8.10.2.2.2(m)(3).

ITEM 2.25
TRACTION SHEAVES

2.25.1 Periodic Inspections

2.25.1.1 Electric Elevators

(a) Inspection Made With Power Off. Inspect fastenings for tightness where demountable sheaves are attached to the sheave spider. Note any evidence of lost motion or misalignment of the traction sheaves with other sheaves.

Examine the traction sheaves for worn grooves and determine that all ropes seat to the same depth in the grooves. Particles of metal under rope sheaves are evidence of groove or sheave wear. Carefully examine the sheave for cracks or other deficiencies. See Item 2.24.1.

(b) Inspection Made With Power On. Excessive lubrication of the wire ropes or wear of the sheave grooves may result in reduction of traction. Test traction by operating the empty car in the up direction and stop it by opening the emergency stop switch. Any material reduction of traction may be noted by observing slippage between ropes and traction sheaves.

(c) Regrooving. Prior to regrooving any sheave or drum, check that the minimum groove bottom diameter will be maintained for structural integrity. For elevators installed under A17.1d–1986 and later editions, the sheave or drum must be marked to indicate the minimum permissible groove bottom diameter.

(d) Rope Changes. Where the material, grade, number, or diameter of ropes have changed and the existing sheave has been retained, check for approval by a licensed professional engineer or the original equipment manufacturer.

2.25.2 Periodic Test

2.25.2.1 Electric Elevators: 5-Year Test (for A17.1d–2000 and Earlier Editions); Category 5 Test (for A17.1–2000 and Later Editions). For passenger elevators and freight elevators permitted to carry employees, the driving machine must safely stop and hold the car with 125% of the rated load. See Item 2.15.2.

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2.25.3 Acceptance

2.25.3.1 Electric Elevators. Check that the sheaves and drums are permanently and legibly marked to state the minimum groove bottom diameter permissible for regrooving and required to maintain structural integrity.

2.25.4 References

2.25.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 207.8, 208.2, 208.3, 212, 1001.2(b)(23), 1202.14, 1206.1a, and 1206.1b.

A17.1–2000 and later editions — Requirements 2.16.8, 2.24.2, 2.24.3, 2.20, 8.11.2.1.2(w), 8.7.2.21, 8.6.1.6.2, and 8.6.4.1.

A17.3 — Paragraph 3.8.1.

ITEM 2.26
SECONDARY AND DEFLECTOR SHEAVES

2.26.1 Periodic Inspections

2.26.1.1 Electric Elevators. Examine the overhead secondary and deflector sheaves and test them with light blows from a small hammer. If the sound resulting from the blows is dull and flat, unlike the ring given by sound metal, sheave parts should be examined carefully for cracks.

Examine the sheaves for worn grooves and determine whether all ropes seat to the same depth in the grooves. Look for evidence of any misalignment of sheaves. Determine whether bearing bolts are secure.

Inspect sheave shafts and bearings for wear and other defects. Determine whether the shafts and bearings are adequately lubricated.

2.26.2 Periodic Test

2.26.3 Acceptance

2.26.3.1 Electric Elevators. Record and check for conformity to approved drawings and specifications; the diameter of drums, overhead sheaves, and secondary sheaves.

2.26.4 References

2.26.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 208 and Rules 1001.2(b)(24) and 1206.1a.

A17.1–2000 and later editions — Requirements 2.24, 8.11.2.1.2(x), 8.6.1.6.2.

A17.3 — Paragraph 3.8.1.

ITEM 2.27
ROPE FASTENINGS

2.27.1 Periodic Inspections

2.27.1.1 Electric Elevators. Examine that section of rope between the top of the car and the point on the counterweight side which could not be examined from the top of the car or from openings in the counterweight runway enclosure.

Where multiple roping is used, examine overhead rope anchorages (dead-end hitches). Verify that the hitch plate supporting the wire rope fastenings is mounted on the top of supporting members. (See Item 3.22.)

Verify that all lock nuts and cotter pins are in place. Verify the data shown on the rope data tag attached to one of the wire rope fastenings.

2.27.2 Periodic Test

2.27.3 Acceptance

2.27.4 References

2.27.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 105.3c and 1001.2(b)(25) and Section 212.

A17.1–2000 and later editions — Requirements 2.9.3.3 and 8.11.2.1.2(y), and 2.20.

A17.3 — Section 3.12.

ITEM 2.28
TERMINAL STOPPING DEVICES

2.28.1 Periodic Inspections

2.28.1.1 Electric Elevators

(a) Traction Machines. In some cases, the normal terminal stopping switches are located in the machine room and operated by a rope, tape, or chain attached to the car. Examine these switches for alignment, fastening, cleanliness, and general condition of operation mechanisms.

(b) Winding Drum Machines. Examine the final terminal stopping switch operated by the machine for alignment fastening, cleanliness, lubrication, and general operating condition.

2.28.2 Periodic Test

2.28.2.1 Electric Elevators

(a) Yearly Test of Normal Terminal Stopping Devices (for A17.1d–2000 and Earlier Editions); Category 1 Test of Normal Stopping Devices (for A17.1–2000 and Later Editions). Check normal terminal stopping devices as follows:

(1) Render inoperative the normal elevator stopping means.

(2) Render inoperative the emergency terminal stopping device. Do not disable the emergency terminal speed limiting device.

(3) Run the car at contract speed into the bottom terminal and demonstrate that the car slows down and stops in the vicinity of the bottom terminal.

(4) Repeat the above test at the top terminal.

(5) Restore the normal stopping means and emergency terminal stopping device. Check normal elevator operation.

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(b) 5-Year Test of Emergency Terminal Stopping and Emergency Speed Limiting Devices (for A17.1d–2000 and Earlier Editions); Category 5 Test of Emergency Terminal Stopping and Emergency Speed Limiting Devices (for A17.1–2000 and Later Editions). For static control elevators with rated speeds over 500 ft/min (2.54 m/s), installed under A17.1b–1983 through A17.1a–1991, or with rated speeds over 200 ft/min (1.02 m/s) installed under A17.1b–1992 and later editions, use emergency terminal stopping devices where required, except if an emergency terminal speed limiting device is used (see Item 3.5.2) or if the normal terminal stopping device limits the generator shunt field directly. Check as follows:

(1) Have the normal elevator stopping means disabled.

(2) Have the normal terminal stopping device disabled.

(3) Have the car run at rated speed into the bottom terminal and verify that the car stops and power is removed from the driving machine motor and brake. It is permissible for the car to restart automatically, provided that no other electrical protective device has operated.

(4) Have the above test repeated at the top terminal.

(5) Restore the normal stopping means and normal terminal stopping device. Check normal operation.

2.28.3 Acceptance

2.28.3.1 Electric Elevators. Perform the test in Item 2.28.2(a) for the bottom normal terminal stopping device in the down direction at 125% of rated load for passenger elevators and freight elevators permitted to carry passengers. The bottom normal terminal stopping devices of freight elevators not permitted to carry passengers are to be tested with rated load. The top normal terminal stopping devices for all elevators must be tested with rated load. The car should stop at or near the terminal landings with all loads, except where an automatic leveling device is provided, in which case the normal terminal stopping device should stop the car within the range of the leveling device.

2.28.4 References

2.28.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 209 and Rules 1001.2(b)(26) and 1002.3f.

A17.1–2000 and later editions — Requirements 2.25, 8.11.2.1.2(z), and 8.11.2.3.6.

A17.3 — Paragraphs 3.8.2, 3.9.1, 3.9.2, and 3.10.4.

ITEM 2.29
CAR AND COUNTERWEIGHT SAFETIES

2.29.1 Periodic Inspections

2.29.1.1 Electric Elevators. See Item 5.8.1.1.

Table 2.29.2(a) Maximum Safety Rope Pullout

For Car Safeties:	
200 ft/min or less	42 in.
201 to 375 ft/min	36 in.
Over 375 ft/min	30 in.
For Counterweight Safeties:	
All speeds	42 in.

GENERAL NOTES:
(a) 1 in. = 25.4 mm
(b) 1 ft/min = 5.08 E – 03 m/s

2.29.2 Periodic Test

2.29.2.1 Electric Elevators

(a) Yearly Test Inspection of Safeties (for A17.1d–2000 and Earlier Editions); Category 1 Test Inspection of Safeties (for A17.1–2000 and Later Editions)

(1) Examine the car and counterweight guide shoes and their fastenings to determine that they are properly secured, aligned, and adjusted. Check the gibs or rollers for excessive wear.

(2) Under normal operating conditions, the clearance between the guide rail and each rail gripping face of the safety parts is approximately equal. The distance between the rail gripping faces of the safety parts should not be less than the thickness of the guide rail plus $^{9}/_{64}$ in. (3.4 mm), with a $^{1}/_{16}$ in. (1.6 mm) minimum between either side of the rail and the gripping face. For elevators installed prior to A17.1–1955, the distance between the rail gripping faces should not be less than the thickness of the guide rail plus $^{3}/_{32}$ in. (2.4 mm).

(3) For elevators employing wood guide rails, the distance between the rail gripping surfaces should not be less than the thickness of the rail plus $^{1}/_{4}$ in. (6.4 mm).

(4) On drum-operated Type B safeties, inspect the safety rope and its deflecting sheaves and their fastenings to determine that they are not worn excessively or corroded, and that the rope sheaves are securely fastened and are in operating condition.

Safety drum rope must be of a corrosion-resistant material and not be of tiller rope construction. Before any test is made on drum safeties, ensure that the proper safety wrench is available, then pull out the safety drum rope until the safety jaws contact the rail and start to exert pressure. The movement of the safety drum rope, starting from a fully retracted position, must not exceed the values based on rated speed shown in Table 2.29.2(a).

The number of turns of rope remaining on the safety drum must be sufficient to allow for additional pullout of the safety drum rope to ensure proper operation of the safety when the governor is operated due to an overspeed condition.

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Reset the safety on completion of the above inspection. Keep sufficient tension on the safety drum rope to prevent kinking and to ensure that the rope will be evenly and uniformly wound on the safety drum with no slack.

(5) On Type A and Type B safeties that are self-releasing, it is not necessary to actuate the safety prior to a test. Inspect the mechanism to see that it is clean and lubricated and that there is no corrosion present.

(6) Before checking the adjustments of the trip (finger) rods and rollers, examine all crosshead pivot points and linkage for lost motion, loose or missing set screws, and excessive friction. Any lost motion in the actuation lever should be removed. Lost motion and the inertia of the governor-rope system may cause safety applications under normal starting conditions.

(7) With the elevator car platform at a convenient height, the safety can readily be checked from the pit to determine that

(a) all rollers are properly in place.

(b) trip (finger) rods are in position to pick up the rollers.

(c) when the governor rope is pulled to impart motion to the trip (finger) rods, the roller must move upward into the ultimate wedged positions in the safety block without restriction. The operation shall be repeated several times observing that the rollers fall toward the rail. When the "finger" engages the roller, if there is any tendency for the roller to fall away from the rail, a jam between the roller and safety block can result in a safety failure.

(d) normally, the rollers should be at the lowest point of travel resting against the guard; have the trip (finger) rods adjusted so that the rollers engage simultaneously when wedged between the roller pocket and the guide rail.

(8) The Code requires a safety mechanism switch, operated by the car safety, to be installed on all safeties. While inspecting the safety, determine that the switch contacts open before the safety jaws or rollers contact the guide rails. Then open the switch manually and determine that the car will not run when the switch is open.

(b) Yearly Test Inspection of Wood Guide Rail Safeties (for A17.1d–2000 and Earlier Editions); Category 1 Test Inspection of Wood Guide Rail Safeties (for A17.1–2000 and Later Editions)

(1) The effectiveness of safeties of this type depends on a substantial initial engagement of the toothed safety jaw with the wood guide rail in a manner to produce an increasing engagement with the rail until the car or counterweight is brought to rest. Therefore, the condition of the guide rails is a prime consideration in making an examination of the equipment.

(2) The guide rails must be of first quality selected wood with the width sized to fill the car guide shoe minus the normal running clearance. Guide rails that are more than $\frac{1}{8}$ in. (3.2 mm) undersize in width or show evidence of "combing" by the safety jaws should be replaced.

(3) From the top of the car, examine all safety operating parts including levers and linkage to be sure that all keys and set screws are in place and tight. There should not be an excessive amount of lost motion in the transmittal of movement to the finger rods actuating the safety jaws.

(4) From the pit, with the elevator car platform at a convenient height, the safety jaws can be readily examined and applied against the guide rails by pulling the governor rope. Bring the safety jaws in contact with both guide rails in such a manner that any downward motion of the car would cause the jaw teeth to dig into the rails.

(5) When a safety operating switch is provided, the motion of bringing the safety jaws in contact with the rails must be sufficient to operate the switch.

(c) Yearly Test of Safeties (for A17.1d–2000 and Earlier Editions); Category 1 Test of Safeties (for A17.1–2000 and Later Editions)

(1) After the safety has been inspected, position the car or counterweight in the lower portion of the hoistway so that it will be accessible after the test. Jump out the switches on the governor and safety (or that part of the safety circuit) that would prevent a full setting of the safety. Start the car or counterweight, whichever is being tested, in the down direction 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 actuating device before starting the car down. Run the car down until the machine stalls or drives through the hoisting ropes. Next, open the main line disconnect switch, remove any jumpers and proceed to the safety being tested.

NOTE: Examine all parts of the safety equipment to determine if anything is broken or out of order. See that all ropes are properly on the drum to fully apply the safety, be sure that not less than three turns of rope remain on the drum. This is necessary to meet the requirement of not less than three turns remaining on the drum after a rated load, rated speed test. Flexible guide clamp safeties that are drum-operated do not require any turns of rope to remain on the drum after a test.

(2) Check the platform for level. All elevators installed under A17.1–1955 and later editions must not be out of level more than $\frac{3}{8}$ in./ft (31 mm/m) in any direction.

Elevators installed prior to A17.1–1955 must not be out of level more than $\frac{1}{2}$ in./ft (42 mm/m) in any direction. Counterweight safeties may be set in the pit or just above the car. In either case, be careful of the final location so that it will be accessible after the test.

(3) Type A and self-releasing Type B safeties are released by moving the car or counterweight in the up direction. This should be accomplished with one short move. After one move, be sure that the governor has

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released the governor rope. If it is not released, move the governor sheave or the jaw to gain this release.

(4) 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. One person must be stationed on top of the car, or in the pit, to hold the governor rope so it does not overhaul while the second person releases and resets the governor. The second person should then proceed to the car or counterweight and release the safety while the first person is holding back on the rope and reinsert into the releasing carrier.

(5) Examine all of the safety parts to determine that they have returned to the normal running positions, and be sure that there is no slack in the safety rope.

(6) Inspect the guide rails for scoring and loose hardware. Dress any scored rail surface.

(7) It is not necessary to record the stopping distance in this test.

(8) Determine that all jumpers have been removed.

(d) Yearly Test of Wood Guide Rail Safeties (for A17.1d–2000 and Earlier Editions); Category 1 Test of Wood Guide Rail Safeties (for A17.1–2000 and Later Editions). With governor-operated safeties, set the governor in the applied position and run the car in the down direction from the controller to see that it will operate the safety. Continue to operate until the 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 to see that the jaws come into proper position when a slack rope is obtained.

(e) 5-Year Test of Safeties (Rated Load, Rated Speed) (for A17.1d–2000 and Earlier Editions); Category 5 Test of Safeties (Rated Load, Rated Speed) (for A17.1–2000 and Later Editions)

(1) Place the rated load on the elevator car platform using test weights, centered on each quarter symmetrically with relation to the centerline. Test counterweight safeties with no 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. Shut down adjacent cars during test. If you are testing a drum-type safety, you must shut down any car adjacent to the releasing carrier, and keep it shut down until all slack in the safety rope is under control. If a safety wrench is to be used, put it in the elevator 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.

(2) For drum-operated 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 the position at which the car safety mechanism is in the fully applied position. The opening of this switch has an effect on the safety slide, which must be taken into consideration.

(3) When testing safeties, the following steps must be considered:

(a) Before setting the car safety, tie down the counterweight safety lift lever with four wraps of No. 16 gage copper wire or equivalent. This will avoid an accidental setting of the counterweight safety by inertia. Do not block the counterweight safety; it must remain workable. Reverse the procedure for testing counterweight safeties.

(b) Most compensating-rope sheaves have a tie-down device. This device will probably lock when a safety is set. To avoid the work required to release the device, it is recommended that the device be made inoperative or be removed and the compensating-rope sheave be tied down with a line to keep it in place.

(c) Make sure that any adjustable stops on the governor tension sheave are set very close to the movable unit.

(d) Make sure that the buffers are fully extended and filled to a normal level with oil.

(4) Add the dimension of the safety rope pullout to the estimated stopping distance in order to determine the distance the car will travel after the governor is tripped. Spot the car or counterweight this distance above the point where the stop is desired. Put a reference mark on a suspension rope (chalk mark or tape). Move the car or counterweight up a few floors, far enough to reach your mark at full speed. Start the car or counterweight down and trip the governor by hand when you see the mark. Let the elevator run until the machine stops or drives through the ropes (on winding drum machines, stop at the first indication of slack rope), then immediately remove power from the hoisting machine. If a normal safety setting occurs, put all the cars back in service, except the one being worked on and the one adjacent to the releasing carrier. On an elevator with a winding drum machine, be sure to take up any slack rope before the safety is released.

(5) Remove electrical jumpers and reset the governor, unless it is a drum-operated safety. If it is drum operated, one person will go to the car top and hold the safety rope as the governor is reset. Inspect the governor for any damage.

(6) Proceed to the elevator car to release the safety. Before the safety is released, check the platform for level. On all elevators installed under A17.1–1955 and later editions, it must not be out of level more than $\frac{3}{8}$ in./ft (31 mm/m) in any direction. On elevators installed prior to A17.1–1955, it must not be out of level more than $\frac{1}{2}$ in./ft (42 mm/m) in any direction. Elevators installed prior to A17.1–1955 are allowed a greater flexibility of stopping distance than shown in Table 2.29.2(b). For gradual wedge clamp, flexible guide clamp, and wedge clamp (constant retarding force) Type B safeties, see Tables 2.29.2(c), 2.29.2(d), and 2.29.2(e).

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Table 2.29.2(b) Minimum and Maximum Stopping Distances for Type B Car Safeties With Rated Load, and Type B Counterweight Safeties With No Load in the Car

Rated Speed, ft/min	Stopping Distances	
	Minimum, ft-in.	Maximum, ft-in.
0 to 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
1,000	4-4	13-2
1,100	5-2	15-9
1,200	6-2	18-7
1,300	7-3	21-8
1,400	8-5	25-0
1,500	9-8	28-7
1,600	11-0	32-5
1,700	12-5	36-5
1,800	13-11	40-9

GENERAL NOTES:
(a) This table is for rated load, rated speed test only. Use Table 2.17.3 in the Code for rated load, overspeed test only.
(b) Use Table 2.17.3 of the A17.1 Code when performing acceptance tests.
(c) 1 ft/min = 5.08 E – m/s
(d) 1 in. = 25.4 mm

(7) Generally, it will not be possible to inspect the safety due to the location of the car; therefore, the safety must be released. To do this on other than drum-operated Type B safeties, move the car or counterweight, whichever is being tested, in the up direction. On drum-operated safeties, after checking for at least three turns of rope remaining on the drum, wind in the safety drum rope while a second person is standing on top of the car holding back on the rope. To complete the winding, he must insert the minie ball into the releasing carrier. Move the car, or counterweight, and measure the safety slide mark on the rails. The stopping distance is the average length of the continuous marks on all four rail faces after deducting the length of the safety jaw or wedge. See Item 2.29.2(f) for a detailed description of measuring safety slide marks.

(8) The stopping distance must be within the range shown in Table 2.29.2(b). The stopping distance permitted is determined by the tripping speed of the governor.

Table 2.29.2(c) Gradual Wedge Clamp Safety

Governor Tripping Speed, ft/min	Maximum Stopping Distance	Minimum Stopping Distance	
	Car + Rated Load or for Counterweight, ft-in.	Car + 150 lb, ft-in.	Car + Rated Load or for Counterweight, ft-in.
175	6-2	1-5	1-11
200	6-3	1-5	2-0
300	6-11	1-6	2-4
400	7-10	1-8	2-7
500	8-10	1-11	2-11
600	9-11	2-1	3-4
700	11-1	2-4	3-10
800	12-4	2-7	4-6
900	13-6	3-0	5-4
1,000	14-8	3-6	6-1
1,100	16-0	4-0	7-0
1,200	17-4	4-7	8-0
1,300	18-6	5-1	9-0
1,400	19-8	5-8	10-1
1,500	21-1	6-2	11-1

GENERAL NOTES:
(a) For elevators installed prior to A17.1–1955.
(b) 1 ft/min = 5.08 E – 03 m/s
(c) 1 in. = 25.4 mm

Table 2.29.2(d) Flexible Guide Clamp Safety

Governor Tripping Speed, ft/min	Maximum Stopping Distance	Minimum Stopping Distance	
	Car + Rated Load or for Counterweight, ft-in.	Car + 150 lb, ft-in.	Car + Rated Load or for Counterweight, ft-in.
175	0-10	0-5	0-6
200	0-11	0-6	0-7
300	1-7	0-7	0-8
400	2-5	0-8	1-1
500	3-5	0-11	1-6
600	4-10	1-2	1-11
700	6-5	1-6	2-5
800	8-2	1-10	3-2
900	10-4	2-2	3-11
1,000	12-7	2-7	4-8
1,100	15-2	3-0	5-8
1,200	18-0	3-6	6-8
1,300	21-1	4-0	7-10
1,400	24-7	4-7	8-11
1,500	28-0	5-2	10-0

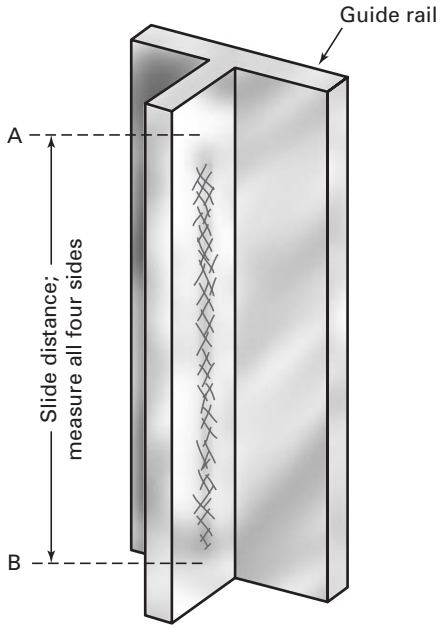
GENERAL NOTES:
(a) ft/min = 5.08 E – 03 m/s
(b) 1 in. = 25.4 mm

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Table 2.29.2(e) Wedge Clamp Safety (Constant Retarding Force)

Governor Tripping Speed, ft/min	Maximum Stopping Distance: Car + Rated Load or for Counterweight, ft-in.	Minimum Stopping Distance: Car + 150 lb, ft-in.	Minimum Stopping Distance: Car + Rated Load or for Counterweight, ft-in.
175	1-4	0-10	0-10
200	1-6	0-11	1-0
300	2-0	1-0	1-2
400	2-10	1-2	1-7
500	3-11	1-5	2-0
600	5-2	1-7	2-5
700	6-8	1-11	3-0
800	8-6	2-2	3-7
900	10-8	2-7	4-4
1,000	12-11	3-0	5-1
1,100	15-6	3-6	6-0
1,200	18-5	4-0	7-1
1,300	21-8	4-7	8-2
1,400	25-0	5-1	9-4
1,500	28-3	5-7	10-5

GENERAL NOTES:
(a) For elevators installed prior to A17.1–1955.
(b) 1 ft/min = 5.08 E – 03 m/s
(c) 1 in. = 25.4 mm



NOTES:
(1) A — Start of slide.
(2) B — End of slide.

Fig. 2.29.2(a) Safety Marks on Guide Rails, Poor Illumination

When performing a rated load, rated speed test, the rated speed is the speed at which the governor is tripped during this test.

(9) Check the rails and dress any scored surface. Also, check for any loose rail or bracket fastenings.

(10) To inspect a car safety, move the car to a convenient height above the pit floor. A counterweight safety can be inspected from the car top. Examine all parts of the equipment to determine if any are broken or out of order. Be sure that the ropes are in their sheave grooves and are properly wound on the drum. Be sure that the safety has returned to the normal running position.

(11) After the safety tests are complete

(a) remove any jumpers from the safety switches

(b) remove any line from the compensating-rope sheave

(c) replace the tie-down device or any of its parts that were removed

(d) remove any tie down that was wrapped on the car or counterweight safety lift lever

(e) readjust the safety-mechanism switch

(12) Ensure the required test tags are installed.

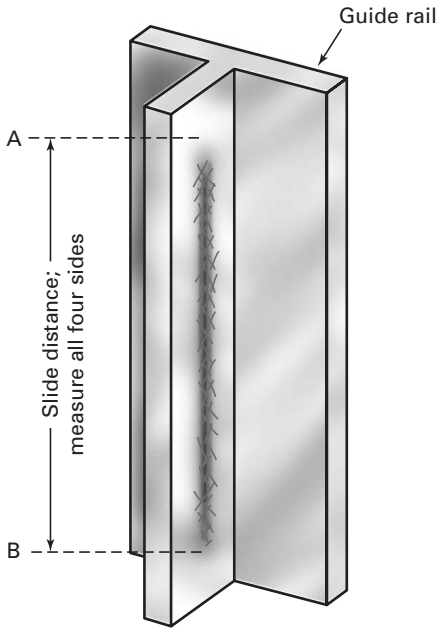
(f) Determination of Slide on the Guide Rails for Type B Safeties

(1) General. Following a safety test, there is often considerable difficulty in determining the actual slide of the safety jaws on the guide rails. In the case of a well-lubricated rail, the first action of the closing jaws is to squeeze out the film of oil or grease. This area of reduced lubrication is often mistaken for part of the mark but should not be included in the measured sliding distance. Start the measurement at the point where actual contact is made by a jaw on the guide rail and is generally indicated by a slight roughening along the line of travel of the jaw. This has a somewhat different color, the guide rail looks gray in contrast with the polished surface.

(2) Effect of Illumination. The angle of illumination and the position of the observer have much to do with the ease with which the marks may be identified. The marks showing in Figs. 2.29.2(a) and 2.29.2(b) are the same marks viewed from the same position with identical exposures but with the illumination changed from 60 deg with the light level with the end of the marks, to 45 deg with the light considerably below the marks. Often it is possible to pick up the marks with the light source almost in line with the face of the guide rail.

(3) Marks on Dry Guide Rails. When the guide rail is dry, as is the case with roller guides, the mark may be very difficult to determine as there is no disturbed film of lubricant to aid in its location. However, by carefully adjusting the position of the light source and changing the angle of vision, it is generally possible to determine the point at which the mark starts.

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NOTES:
(1) A — Start of slide.
(2) B — End of slide.

Fig. 2.29.2(b) Safety Marks on Guide Rails, Good Illumination

(4) Determination of Final Position of Jaws. As the jaws tend to bite more deeply into the guide rail after full application, even with types where the pressure of the jaws on the guide rail is designed to remain constant, there is little difficulty, as a rule, in determining the final position of the jaws. Where the guide rails are lubricated, the terminal mark may generally be indicated by the piling up of oil or grease below the safety shoe; frequently the entire print of the shoe or gib may be seen on the guide rail in the final stop position.

(5) Interrupted Marks. It occasionally happens that the safety jaws will come in contact with the guide rail and leave a mark for a certain distance, and then the mark will be lost for a distance of a few inches or perhaps a foot. This may be due to several causes, among them slight deviations in the alignment of the guide rails, variations in thickness, or the sudden engagement of the governor rope by the governor, with a following jump of the governor rope that will permit the jaws to clear for a small fraction of a second. In no case should these preliminary marks be considered in the measurement of the slide. Measure the slide from the highest point of the continuous marking only.

(6) Measurement of Stopping Distance. Determine the stopping distance by measuring the length of the marks made by the safety on both sides of each guide rail, deducting the length of the safety jaw or wedge, and taking the average of the four measurements.

2.29.3 Acceptance Test of Governor and Safeties

2.29.3.1 Electric Elevators

(a) Test Type A governor-operated safeties by operating the car at its normal speed in the down direction by tripping the governor jaws by hand. Also, test the inertia application of safety.

(b) Type B and Type C safeties are tested as outlined in Item 2.29.2(e), and must be subject to overspeed tests. Gradually increase the speed of the car until the governor causes application of the safety. Determine that the stopping distance is in compliance with the maximum and minimum slide distances allowed. On elevators equipped with AC driving machine motors, where the car with its rated load does not cause sufficient overspeed when the machine brake is released to trip the governor jaws, the safeties must be tested by operating the car at its normal speed in the down direction and tripping the governor jaw by hand.

(c) Counterweight safeties, where provided, must be tested with no load in the car.

2.29.4 References

2.29.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Sections 205 and 1306, Table 205.3, and Rules 1001.2(b)(29), 1002.2b, 1002.3a, 1003.2, and 1202.6.

A17.1–2000 and later editions — Requirements 2.17 and 8.2.6, Table 2.17.3, and Requirements 8.11.2.1.2(cc), 8.11.2.2.2, 8.11.2.3.1, 8.10.2.2, and 8.7.2.18.

A17.3 — Sections 3.5 and 3.6 and para. 3.10.4(m).

NOTE: Items 2.30 through 2.37 apply to hydraulic elevators only.

ITEM 2.30
HYDRAULIC POWER UNIT

2.30.1 Periodic Inspections

2.30.1.2 Hydraulic Elevators

(a) Motor. Have the elevator operated in the up direction, making several starts, and observe the operation of the motor, pump, and drive. Check for excessive noise, misalignment, and loose mounting.

(b) Pump. The pump should be checked for leaks around the shaft and for unusual noise that could be caused by cavitation due to a partially plugged suction line or strainer or low oil level.

2.30.3 Acceptance

2.30.4 References

2.30.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 304; and Rules 1004.2(b)(13) and 1206.5.

A17.1–2000 and later editions — Requirements 3.24, 8.11.3.1.2(m), and 8.6.5.

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ITEM 2.31
RELIEF VALVES

2.31.1 Periodic Inspections

2.31.1.2 Hydraulic Elevators: Relief Valve. Examine the relief valve and verify that it is sealed to prevent tampering. If the means of sealing the valve is not intact, test adjustment and sealing must be required.

2.31.2 Periodic Test

2.31.2.2 Hydraulic Elevators: Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions). Have an inspectors pressure gauge installed in the system. There is usually a fitting provided for this in the machine room. Test the relief valve by inching the car at slow speed against the stop ring. Then cause the controls to attempt to run the car at full speed and read the gauge. The full output of the pump should bypass at a gauge reading 150% or less of the working pressure.

After the test, check the car for proper operation and visually inspect the system for leaks. After this test, the means of adjustment must be sealed. The annual test of flexible hydraulic hose and fitting assembly (Item 2.17) may be conducted concurrently with this relief valve test.

A17.1–1971 and later editions require that the working pressure be on a plate mounted on the power unit.

2.31.3 Acceptance

2.31.3.2 Hydraulic Elevators. Check the working pressure given on the elevator layout with that on the tank plate. If these agree, verify them by installing an inspectors pressure gauge in the system, at or near the cylinder; run the car up at rated speed with rated load. The gauge should read the working pressure. For elevators with Class C2 loading, place the maximum static load on the elevator then run it down about 2 in. (54 mm) to 3 in. (76 mm) on inspection. Then turn it back on automatic and read the pressure as the car levels up. If the gauge is installed at the power unit, the pressure will be slightly more than the pressure at the cylinder. This difference is dependent on the length and configuration of the supply piping and speed of the elevator. In some cases this difference is very small and can be ignored.

2.31.4 References

2.31.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 308; Rules 303.1, 303.2, 303.4b, 1004.2(b)(13), 1005.2a, and 1006.2b; and Section 3 (Definitions).

A17.1–2000 and later editions — Requirements 3.28, 3.19.1, 3.19.2, 3.19.4.2, 8.11.3.1.2(m), 8.11.3.2.1, and 8.10.3.2.2(m); and 1.3 (Definitions).

A17.3 — Paragraph 4.4.1.

ITEM 2.32
CONTROL VALVE

2.32.1 Periodic Inspections

2.32.1.2 Hydraulic Elevators

(a) Control Valve. The valves, fittings, and interconnecting piping should be checked for pressure rating, leakage, and adequate support.

(b) Manual Lowering Valve and Anticreep Elevators. Manual lowering valve and anticreep elevators installed under the A17.1–1984 and later editions are required to have a manual lowering valve identified and located on or adjacent to the control valve.

Check the operation of the manual lowering valve and the anticreep leveling device as follows:

(1) Position the car at a landing in response to operation by the normal landing device.

(2) Lower the car by opening the manual lowering valve to initiate a downward movement. The pump motor should start when or before the car exceeds 1 in. (25 mm) from the floor.

(3) Close the manual lowering valve [the car should be within 1 in. (25 mm) of the floor when the pump motor stops].

See Item 3.7 for additional information and procedure for testing the anticreep device when there is no manual lowering valve.

2.32.2 Periodic Test

2.32.3 Acceptance

2.32.3.2 Hydraulic Elevators. Check the manual lowering valve for identification function and location.

2.32.4 References

2.32.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 303 and Rule 1004.2(b)(15).

A17.1–2000 and later editions — Requirements 3.19 and 8.11.3.1.2(o).

A17.3 — Section 4.4.

ITEM 2.33
TANKS

2.33.1 Periodic Inspections

2.33.1.2 Hydraulic Elevators

(a) Atmospheric Storage and Discharge Tanks. Visually inspect the tank for defects such as leaks, corrosion, damage, and cover to prevent entrance of foreign materials.

(1) Have the car moved to the top landing and check the hydraulic fluid level. While the car is moving up, listen for sounds that may indicate cavitation or obstructed strainers. The liquid should be above the minimum level indicated. A17.1–1955 through A17.1–

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1965 required that the minimum liquid level be clearly indicated. A17.1–1971 and later editions require that the means of checking the liquid level be accessible without removal of any cover or other parts.

(2) Observe drip pans for excess accumulation of hydraulic fluid that leaked from the system.

(b) Pressure Tanks

(1) Determine whether the tank installed under A17.1–1971 and later editions, or any replacement tank, is marked to indicate that it was made and tested in conformance with Section VIII of the ASME Boiler and Pressure Vessel Code. This may be stamped on the tank or on a data plate attached in such a manner that removal would result in its destruction. The following information should be included:

(a) name of manufacturer

(b) maximum allowable working pressure at temperature

(c) minimum design metal temperature

(d) manufacturers serial number

(e) the year built

(2) Examine for corrosion, leaks, badly corroded surfaces, or any indication of cracking or failure of the metal. If any of the above conditions exist, recommend that a hydraulic elevators static test be performed in accordance with the ASME Pressure Vessel Code. Check the tank for

(a) a pressure gauge

(b) a place to install an inspectors gauge

(c) a liquid level gauge

Verify that these are in good working order and install an inspectors gauge to check the accuracy of the permanently installed gauge.

2.33.2 Periodic Test

2.33.2.2 Hydraulic Elevators: 3-Year Inspection and Test of Pressure Tanks (for A17.1d–2000 and Earlier Editions); Category 3 Test and Test Pressure Tanks (for A17.1–2000 and Later Editions)

WARNING: Hydraulic elevators static test can be dangerous if not performed by qualified persons.

The pressure tank should be thoroughly cleaned and inspected both internally and externally. It should be subjected to Hydraulic Elevators static test at 150% of the working pressure. This is done by removing all control devices, and isolating the tank. A calibrated inspector's gauge with maximum reading twice the test pressure must be installed.

The tank is then filled completely with water. Care must be taken to remove all of the air from the tank. If air or any compressible gas is trapped in the tank, the test will become dangerous. A hand pump can then be used to provide the test pressure. The tank should be held at the test pressure for at least 1 min and inspected for leaks, distortions, or damage. Since there is no compressible fluid (air or other gas) in the tank, a very small leak will cause a rapid loss of pressure. This may be cause for replacement of the tank.

After the test, the tank must be thoroughly cleaned before returning to service.

2.33.3 Acceptance

2.33.3.2 Hydraulic Elevators. The tank should be visually inspected for damage that may have resulted from handling and installation. The data required by the ASME Boiler and Pressure Vessel Code should be verified (see Item 2.16.1.2).

2.33.4 References

2.33.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 304; and Rules 1004.2(b)(16), 1005.3b, 1203.6, and 1206.5b.

A17.1–2000 and later editions — Requirements 3.24, 8.11.3.1.2(p), 8.11.3.3.2, 8.7.3.29, 8.6.5.1, 8.6.5.2, 8.6.5.5, and 8.6.5.6.

A17.3 — Section 4.5.

ITEM 2.34
FLEXIBLE HYDRAULIC HOSE AND FITTING ASSEMBLIES

2.34.1 Periodic Inspections

2.34.1.2 Hydraulic Elevators. Visually examine flexible hydraulic hoses, fitting assemblies, and flexible couplings for evidence of leakage, slippage of hose fittings, and damage to outer hose covering sufficient to expose reinforcement or cause distortion or bulging of hose body. Such damage will warrant further test. Check hose and fitting assemblies for proper identification and permanent marking and replacement date.

2.34.2 Periodic Test

2.34.2.2 Hydraulic Elevators: Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions). From the machine room have the car inched up at slow speed until the stop ring is engaged. Then operate the system at rated speed to provide full relief valve bypass pressure for 30 s. While under pressure, observe the hose for any signs of leakage, slippage of hose fittings, damage to outer hose covering, bulging, or distortion of the hose body. Any of these signs require replacement of the hose. Have a metal tag attached to the hose in a permanent manner indicating the date of the test and the name of the person or firm that performed the test.

2.34.3 Acceptance Test

2.34.3.2 Hydraulic Elevators. Check that the hose is not installed in the hoistway or projects into or through

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Table 2.34.3 Minimum Bend Radius for SAE 100R2 Hose

From SAE J517 100R2 Hose			
ID in.	OD in.	Minimum Burst Pressure, psi	Minimum Bend Radius, in.
1/2	31/32	14,000	7
5/8	1 3/32	11,000	8
3/4	1 1/4	9,000	9 1/2
7/8	1 1/8	8,000	11
1	1 9/16	8,000	12
1 1/4	2	6,500	16 1/2
1 1/2	2 1/4	5,000	20
2	2 3/4	4,000	25

GENERAL NOTE: 1 in. = 25.4 mm

any wall. Check for twists, kinks, or sharp bending radius. See Table 2.34.3.

2.34.4 References

2.34.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 303.3c, 1004.2(b)(17), and 1005.2d.

A17.1–2000 and later editions — Requirements 3.19.3.3, 8.11.3.1.2(q), and 8.11.3.2.4.

ITEM 2.35 SUPPLY LINE AND SHUTOFF VALVE

2.35.1 Periodic Inspections

Inspect the supply line between the cylinder and the pumping unit for leaks, adequate support, vibration, or other evidence of damage. A careful examination of the piping and fittings will indicate if a replacement has been made that does not match the rest of the system. In such cases, the replacement part pressure rating should be checked by examining the rating supplied by the manufacturer. Also, inspect the piping for support to prevent undue stress due to weight of pipe or other equipment.

Check fittings for absence of corrosion, leaks, and evidence of excessive vibration. On grooved fittings, check that the housing segments are bolt pad to bolt pad, that coupling keys are in the pipe groove, that bolt heads are seated and nuts are tight.

Inspect the manual shutoff valve in the machine room for condition and leaks. Manual shutoff valves are required for elevators installed under A17.1–1977 and later editions with unexposed cylinders. A17.1–1996 and later editions require a manual shutoff valve for all elevators. Editions of the Code prior to A17.1–1993 required a material safety factor of 5 and elongation of not less than 10% for valves, fittings, and supply piping. Some valves and fittings are rated with a material safety factor of 3. In such a case, the manufacturer's published rating should be down-rated for elevator application. This can be done by multiplying the published rating by 3 and dividing by 5.

EXAMPLE: Manufacturer's rating 1,000 psi
$1000 \times 3/5 = 600$ psi

If the material elongation for the material in this example is at least 10%, the valve or fitting could be used for working pressure up to 600 psi.

2.35.2 Periodic Test

2.35.3 Acceptance

Inspect the valves and fittings as indicated under routine inspection. However, for new equipment, the factor of safety may vary inversely with the elongation of the material. This will allow a lower factor of safety if the elongation is increased. Likewise, if the elongation is decreased, the factor of safety must be increased. Therefore, it is recommended that the installer furnish documentation that the presure rating complies with the requirements of ASME A17.1 for the applicable working pressure, with data from the valve, fitting, and pipe manufacturers. Review this to verify compliance with pressure rating requirements.

If the elevator supplier has obtained a type approval from the jurisdiction, verify that all installed components are included in the type approval.

Determine that pipe fittings have been installed in locations that permit disassembly and inspection of components.

2.35.4 References

2.35.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 303.

A17.1–2000 and later editions — Requirement 3.19.

A17.3 — Paragraph 4.4.4.

ITEM 2.36 HYDRAULIC CYLINDERS

2.36.1 Periodic Inspections

2.36.2 Periodic Test

2.36.2.2 Hydraulic Elevators: Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions). This test should be performed after the relief valve test in Item 2.31 and the flexible hose test in Item 2.34. Cylinders that cannot be inspected visually should be tested in the following manner with no load in the car. Mark the location of the car at any convenient position. Open the disconnect switch for 15 min. Note the position of the car platform with respect to the reference mark. A change in car position that cannot be accounted for by visible oil leakage, valve leakage, or temperature change of the oil indicates a

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leak of the cylinder or in the underground piping and a need for further inspection, tests, or repairs.

2.36.3 Acceptance

2.36.4 References

2.36.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 302.3, 1004.2(b)(19), and 1005.2b.

A17.1–2000 and later editions — Requirements 3.18.3, 8.11.3.1.2(s), and 8.11.3.2.2.

ITEM 2.37
PRESSURE SWITCH

2.37.1 Periodic Inspections

2.37.1.2 Hydraulic Elevators. For elevators installed under A17.1–1981 and later editions, a pressure switch is required if the top of the cylinder is above the storage tank. This switch is to prevent operation of the valves if there is no pressure in the line between the down valve and cylinder. Visually inspect for condition and damage.

2.37.2 Periodic Test

2.37.2.2 Hydraulic Elevators: Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions). Test the pressure switch in the following manner:

(a) Place the car at any landing except the bottom landing.

(b) Remove one electrical lead from the pressure switch and try to run the car in the down direction. If the car will not run by normal means, open the main line disconnect switch. Connect a circuit continuity tester, such as an ohmmeter, across the pressure switch and lower the car on the buffer with the manual lowering valve.

(c) The ohmmeter should indicate that the pressure switch is open when the car comes to rest on the buffer.

2.37.3 Acceptance

2.37.4 References

2.37.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 306.14, 1004.2(b)(20), and 1005.2e.

A17.1–2000 and later editions — Requirements 3.26.8, 8.11.3.1.2(t), and 8.11.3.2.5.

ITEM 2.38
ROPED WATER HYDRAULIC ELEVATORS

2.38.1 Periodic Inspections

2.38.2 Periodic Test: 3-Year Test (for A17.1d–2000 and Earlier Editions); Category 3 Test (for A17.1–2000 and Later Editions)

Check the condition of the rod at the thread end, which is where the bolt and nut are against the plunger. This should be done on the bottom and top ends. It is very common for the rod to break where the thread and nut end are against the plunger of packing thread.

2.38.3 Acceptance

2.38.4 References

ITEM 2.39
LOW OIL PROTECTION

2.39.1 Periodic Inspections

2.39.2 Periodic Test

For elevators installed under A17.1–1993 and later editions, check that a means is provided to detect when the liquid level in the tank falls below the minimum required for the car to reach the topmost landing. Verify that when activated, the car will automatically travel to the lowest landing, cycle power-operated horizontally sliding passenger elevator doors that are equipped with reopening devices, and shut down. Also, verify that the in-car door open button (where provided) remains operative. Also, see requirement 2.11.3 of A17.1.

2.39.3 Acceptance

2.39.4 References

A17.1d–2000 and earlier editions — Rule 306.15.

A17.1–2000 and later editions — Requirement 3.26.9.

ITEM 2.40
INSPECTION CONTROL

2.40.1 Periodic Inspections

2.40.2 Periodic Test

If provided, check the operation of the inspection control device. Check that the device only permits movement by a constant pressure means, and clearly indicates the direction of travel. If a plug in control station is used, verify that it is stored in the upper pit.

2.40.3 Acceptance

Verify that when the transfer switches located at each landing are enabled, only the inspection control device can operate the equipment. Verify that the switches are properly located, manually operated, protected against accidental contact, and properly labeled. Verify that if both switches are activated, then all inspection control devices are inoperative.

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If a portable control station is used, verify that the cord does not exceed the maximum allowed length. If a plug-in portable control station is used, check that either a transfer switch is provided or that when the portable control station is plugged in, the control of the equipment is automatically transferrred to the control station.

2.40.4 References

A17.1–2000 and later editions — Requirement 6.1.6.2.2.

ITEM 2.41
MAINTENANCE RECORDS

2.41.1 Periodic Inspections

Review the maintenance records and verify that they are available to elevator personnel and that they are legible and up to date. They should include the following:

(a) description of maintenance task performed and dates

(b) description and dates of examinations, tests, adjustments, repairs, and replacements

(c) description and dates of call backs (trouble calls) or reports that are reported to elevator personnel by any means, including corrective action taken

(d) written record of the findings on the firefighter's service operation monthly test is maintained

2.41.1.1 Hydraulic Elevators. Check the record of oil usage where required. Investigate any unaccountable fluid loss.

2.41.4 References

2.41.4.1 Electric Elevators. A17.1–2000 and later editions — 8.6.1.4 and 8.6.10.1.

2.41.4.2 Hydraulic Elevators. A17.1–2000 and later editions — 8.6.1.4, 8.6.10.1, and 8.6.5.7.

ITEM 2.42
STATIC CONTROL

2.42.1 Periodic Inspections

2.42.2 Periodic Test

2.42.3 Acceptance

The person or firm installing or maintaining an elevator employing static control should demonstrate conformance with the Code as follows:

(a) If in the up direction, the pump motor is the only control means, run the car and demonstrate that there are two devices provided to remove power independently from the pump motor. At least one device shall be an electromechanical contactor.

(b) If in the up direction, the pump motor is one control means and there is a second control means (e.g., a valve), run the car and demonstrate that a device is provided to remove power independently from each control means. At least one device shall be an electromechanical contactor or relay.

(c) Prevent the above electromechanical contactor or relay from being energized and register a call. Demonstrate, with the doors closed, that the car will not move.

(d) Demonstrate that the operation of the devices specified in Items 2.21.2(a) and (b) will remove power from each control means.

2.42.4 References

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PART 3
ELEVATOR — TOP OF CAR

(04)

ITEM 3.1
TOP-OF-CAR STOP SWITCH

3.1.1 Periodic Inspections

Check the top-of-car stop switch in both directions to ensure it is functioning properly and in compliance with the Code before proceeding with the inspection.

3.1.2 Periodic Test

3.1.3 Acceptance

3.1.4 References

3.1.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 210.2(h) and 1001.2(c)(1).

A17.1–2000 and later editions — Requirements 2.26.2.8 and 8.11.2.1.3(a).

A17.3 — Paragraph 3.10.4(e).

3.1.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 306.4 and 1004.2(c)(1).

A17.1–2000 and later editions — Requirements 3.26.1, 3.26.4, and 8.11.3.1.3(a).

A17.3 — Paragraph 4.7.4(a).

ITEM 3.2
CAR TOP LIGHT AND OUTLET

3.2.1 Periodic Inspections

For elevators installed under A17.1–1979 and later editions, check that a light and outlet have been provided and that they are operational. The light must be guarded to prevent damage when accidentally hit by a person moving onto or around on the car top. For elevators installed under the 1993 ANSI/NFPA 70, verify that the outlet is GFCI protected. The 1996 ANSI/NFPA 70 requires the receptacle be the GFCI type. Test GFCI operation with either the built-in test button or GFCI tester.

NOTE: If the GFCI protection is not in the receptacle, the top car light will go out when it is tested.

3.2.2 Periodic Test

3.2.3 Acceptance

Check the GFCI receptacle operation using the test button. Use a receptacle tester to check the receptacle for grounding and polarity. The inspector is not required to have the unit disassembled but should visually inspect the installation for evidence of nonlisted components. Also, see Item 2.11.3(c) for car lighting disconnect located in the machine room.

3.2.4 References

3.2.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 204.7 and 1001.2(c)(2).

A17.1–2000 and later editions — Requirements 2.14.7 and 8.11.2.1.3(b).

A17.3 — Paragraph 3.4.5.

NFPA 70 or CSA C22.1, as applicable.

3.2.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 204.7 {301.7} and 1004.2(c)(2).

A17.1–2000 and later editions — Requirements 2.14.7 {3.14} and 8.11.3.1.3(b).

A17.3 — Paragraph 3.4.5 {4.2.3}.

NFPA 70 or CSA C22.1, as applicable.

ITEM 3.3
TOP-OF-CAR OPERATING DEVICE

3.3.1 Periodic Inspections

Check top-of-car operating device for proper operation. A17.1d–1970 and later editions and A17.3 require that the means to transfer control be on top of the car between the crosshead and the access entrance. If separate additional means are provided for making power door or automatic car leveling devices operative, verify that operation is by constant pressure means.

3.3.2 Acceptance

Confirm that top-of-car inspection operation has priority over in-car inspection operation.

3.3.3 References

3.3.3.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 204.1g, 210.1d, and 1001.2(c)(3).

A17.1–2000 and later editions — Requirements 2.14.1.7, 2.26.1.4, and 8.11.2.1.3(c).

A17.3 — Paragraph 3.10.3.

3.3.3.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 306.2 and 1004.2(c)(3).

A17.1–2000 and later editions — Requirements 3.26.1, 3.26.2, and 8.11.3.1.3(c).

A17.3 — Paragraphs 3.10.3 and 4.7.2.

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ITEM 3.4
TOP-OF-CAR CLEARANCE, REFUGE SPACE, AND STANDARD RAILING

3.4.1 Periodic Inspections

3.4.1.1 Electric Elevators. Check the refuge space for elevators installed under A17.1–1978 and later editions.

Before making any inspections or tests, determine the available top car clearance. Where possible, determine this by placing the car with its floor level with the top terminal landing. Care must be exercised in measuring this clearance from the car top as, in many existing elevators, the top clearance may be insufficient to permit a person to stand when the car floor is level with the top terminal landing. Where the clearance appears to be insufficient, stop the car at or below the top landing and the top car clearance determined as follows:

(a) Measure the distance from the top of the car crosshead to the nearest obstruction directly above it.

(b) Measure the projection of any sheaves, or other equipment mounted in or on the car crosshead, above the top of the crosshead.

(c) Measure the distance from the top of any equipment mounted on top of the car (not the car crosshead) to the nearest obstruction directly above it.

(d) For underslung car frames, measure the distance between the overhead car rope dead end hitch or overhead car sheave and the portions of the car structure directly below them.

(e) Subtract the distance, if any, the car floor is below the top terminal landing from the distances measured in Items 3.4.1(a), (c), and (d). The question of whether or not the top car clearance, as measured, is adequate or conforms to Code requirements cannot be determined until the counterweight runby and counterweight buffer stroke have been measured. (See Item 5.2.3.)

(f) Where an oil buffer is used for the counterweight and no provision is made to prevent the jump of the car upon counterweight engagement, add one-half of the gravity stopping distance.

NOTE: The projection of rope fastenings or guide shoes above the car structure is not to be considered an encroachment on the top car clearance. However, excessive projection is not permitted if interference with sheaves or other equipment would be encountered on maximum overtravel.

3.4.1.2 Hydraulic Elevators. Check the refuge space for elevators installed under A17.1–1996 and later editions. For elevators installed under A17.1–1978 to A17.1b–1995, verify that the refuge space is at least 650 in.^{2} (0.419 m^2) and at least 16 in. (406 mm) on any side with minimum vertical clearance of at least 42 in. (1 067 mm).

Before making any inspections or tests, determine the available top car clearance. Where possible, determine this by placing the car with its floor level with the top terminal landing.

Prior to A17.1–1978, neither the refuge space nor the 6 in. (152 mm) clearance shown in Fig. 3.4.1.2 was required. A17.1–1955 through 1977 required only that the top car clearance be equal to the sum of the top car runby plus 2 ft (609 mm), or the distance that any equipment projected above the crosshead or car top if there is no crosshead provided.

For elevators installed under A17.1–1955 through A17.1–1986, overhead beams or hoistway construction located vertically over car must be located at least 2 ft (609 mm) horizontally from the crosshead. For elevators installed under A17.1–1987 and later editions, the measurement should be made from the lowest part of the obstruction or beam over the car.

Care must be exercised in measuring this clearance from the car top as, in many existing elevators, the top clearance may be insufficient to permit a person to stand when the car floor is level with the top terminal landing. Where the clearance appears to be insufficient, stop the car at or below the top landing and the top car clearance determined as follows:

(a) Measure the distance from the top of the car crosshead to the nearest obstruction directly above it.

(b) Measure the projection of any sheaves, or other equipment mounted in or on the car crosshead, above the top of the crosshead.

(c) Measure the distance from the top of any equipment mounted on top of the car (not the car crosshead) to the nearest obstruction directly above it.

(d) For underslung car frames, measure the distance between the overhead car rope dead end hitch or overhead car sheave and the portions of the car structure directly below them.

(e) Subtract the distance, if any, the car floor is below the top terminal landing from the distances measured in Items 3.4.1(a), (c), and (d).

The question of whether or not the top car clearance, as measured, is adequate or conforms to Code requirements cannot be determined until the top car runby is determined.

NOTE: The projection of rope fastenings or guide shoes above the car structure is not to be considered an encroachment on the top car clearance. However, excessive projections are not permitted if interference with sheaves or other equipment would be encountered on maximum overtravel.

3.4.2 Periodic Test

3.4.3 Acceptance

3.4.3.1 Electric Elevators

(a) Measure and record the top car and counterweight clearances.

(b) Measure and verify dimensions of the refuge space.

(c) Check that a standard railing is provided where required.

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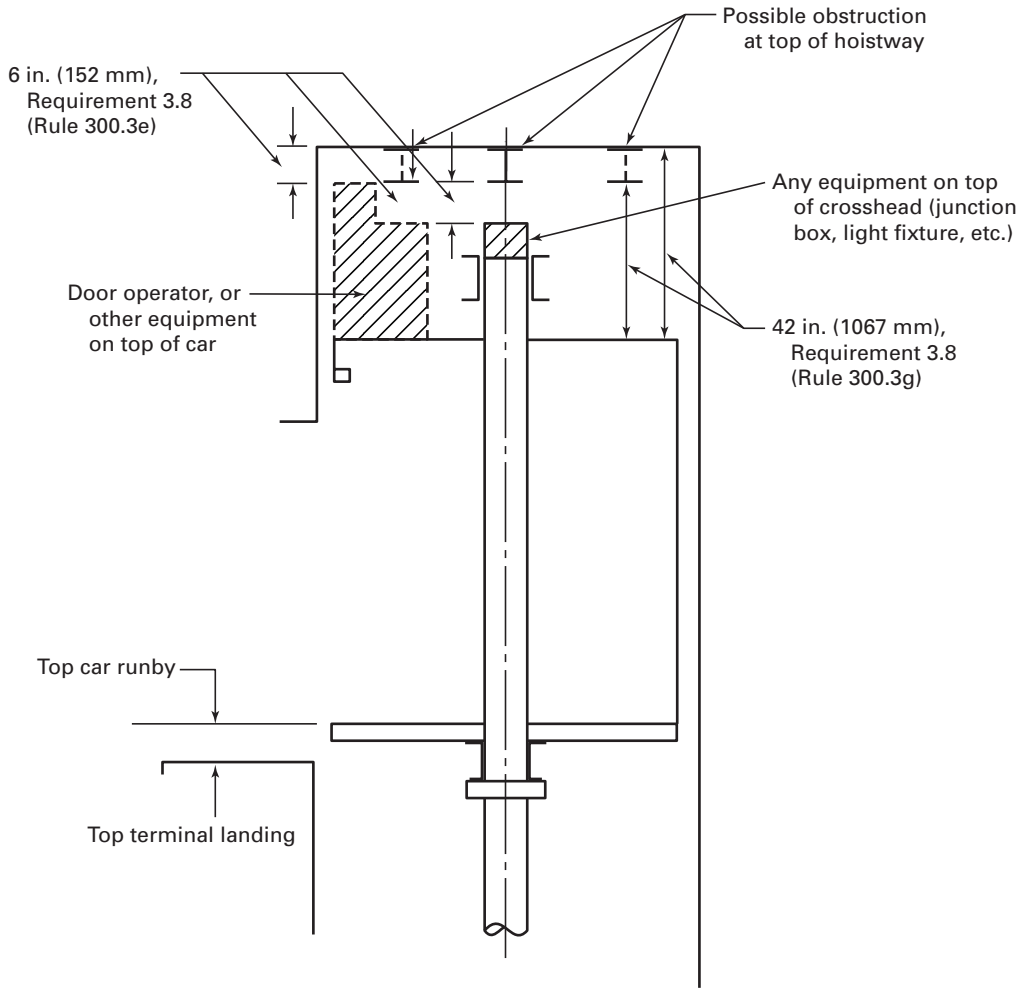


Fig. 3.4.1.2 Top Car Clearance and Runby (A17.1–1978 and Later Editions)

3.4.3.2 Hydraulic Elevators. For elevators installed under A17.1–1996 and later editions, check that the refuge space is outlined with a contrasting color.

(a) Determine the top car runby and verify existence of stop ring by inching the car against the stop ring, from outside the car (not from car top) then open the top hoistway door and measure the distance from the car platform to the top landing. The runby should be recorded.

(b) The top car clearances should be measured and recorded.

(c) Measure and verify dimensions of the refuge space.

(d) Check that a standard railing is provided where required.

3.4.4 References

3.4.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rule 1206.8 and Sections 107 and 1304.

A17.1–2000 and later editions — Requirements 8.6.4.11, 2.4, 2.10.2, 2.14.1.7, and 8.2.4.

A17.3 — Paragraph 2.4.4.

3.4.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 300.8, 302.4, 1004.2(c)(4), 1006.2a, and 1006.2c.

A17.1–2000 and later editions — Requirements 3.4, 2.10.2, 2.14.1.7{3.14}, 3.18.4, 8.11.3.1.3(d), 8.10.3.2.2(s), and 8.10.3.2.3(d).

A17.3 — Paragraph 2.4.4 {Section 4.1}.

ITEM 3.5 NORMAL TERMINAL STOPPING DEVICES

3.5.1 Periodic Inspections

3.5.1.1 Electric Elevators. Observe caution if the top car clearance is limited. Run the car to the top of its

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travel at inspection speed to examine the normal terminal stopping device.

Normal terminal stopping devices of traction elevators may be located in the machine room or overhead machinery space and mechanically connected to and driven by the car. If mechanically attached to the car, manually open the broken drive device switch with the car at rest. This should prevent the car from starting. When the normal terminal stopping devices are located in the hoistway, determine that stopping switches and cams are in correct alignment and are securely fastened. The alignment of the bottom terminal stopping device can be checked by stopping the car near the bottom terminal and sighting the alignment of the car and switch roller (see Item 5.5). The switch roller should strike the bevel of the cam. Also, determine the condition of the limit switch rollers, as reduction of the effective roller diameter due to either wear or loss of the tires may interfere with or prevent proper switch operation. The combination of excessively worn car guide shoes and limit switch rollers may cause cars to overrun their terminals.

3.5.1.2 Hydraulic Elevators. Observe caution if the top car clearance is limited. Run the car up at inspection speed to examine the normal terminal stopping device.

Normal terminal stopping devices are usually located in the hoistway. Verify that stopping switches and cams are in correct alignment and are securely fastened. The alignment of the bottom terminal stopping device can be checked by stopping the car near the bottom terminal and sighting the alignment of the cam and switch roller (see Item 5.5). The switch roller should strike the bevel of the cam. Also, determine the condition of the limit switch rollers, as reduction of the effective roller diameter due to either wear or loss of roller(s) may interfere with or prevent proper switch operation. The combination of excessively worn car guide shoes and limit switch rollers, may cause cars to malfunction.

Test the operation of the normal terminal stopping device by operating the car at inspection speed until the normal terminal stopping device can be reached by hand. Use an insulated object to actuate this device and try to move the car in the direction of the device. The car should not move in the direction of the device, but should be able to move in the opposite direction.

3.5.2 Periodic Test

3.5.2.1 Electric Elevators: Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions). Test the operation of the normal terminal stopping device by operating the car at inspection speed until the normal terminal stopping device can be reached by hand. Use an insulated object to actuate this device and try to move the car in the direction of the device. The car should not move in the direction of the device, but must be able to move in the opposite direction.

3.5.2.2 Hydraulic Elevators: Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions)

(a) Render the normal elevator stopping means and the emergency terminal stopping inoperative.

(b) Do not disable the emergency terminal speed limiting device or the normal terminal stopping device.

(c) Run the car at rated speed (from outside the car) into the bottom terminal and demonstrate that the car slows down and stops in the vicinity of the bottom terminal.

(d) Repeat the above test for the top terminal.

(e) Restore all stopping means and check for proper operation.

3.5.3 Acceptance

3.5.3.1 Electric Elevators. See Item 2.28.3.

3.5.4 References

3.5.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 207.4, 209.2, 210.2, 1001.2(c)(7), 1002.2e, 1003.2f, and 1003.3(k).

A17.1–2000 and later editions — Requirements 2.25.1, 2.25.2, 2.26.2, 8.11.2.1.3(g), 8.11.2.2.5, 8.10.2.2.2(z), and 8.10.2.3.2(k).

A17.3 — Paragraphs 3.9.1 and 3.10.4.

3.5.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 305.1a, 1002.2e {1005.2c}, 1003.3(k), and 1004.2(c)(5).

A17.1–2000 and later editions — Requirements 3.25.1.1, 8.11.2.2.5 {8.11.3.2.3}, 8.10.2.3.2(k), and 8.11.3.1.3(e).

A17.3 — Paragraphs 3.9.1 {Section 4.6} and 3.10.4.

ITEM 3.6
FINAL AND EMERGENCY TERMINAL STOPPING DEVICES

3.6.1 Periodic Inspections

3.6.1.1 Electric Elevators. Observe caution if the top car clearance is limited. Run the car to the top of its travel at inspection speed and examine the final terminal stopping device.

(a) The upper final terminal stopping device must be located as close to the terminal landing as possible without interfering with the normal terminal stopping device, but actuate before the car strikes the overhead.

(b) Check the fastening and alignment of the switch and cam. The switch roller should strike the bevel surface of the cam. If properly located and adjusted, the roller will center laterally on the cam, assuring free motion of the roller arm and positive opening of the

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switch contact without damaging the switch.

3.6.1.2 Hydraulic Elevators. A17.1d–1970 and later editions require an emergency terminal speed limiting device at the top terminal landing where the rated speed exceeds 100 ft/min (0.51 m/s) and at the bottom landing where reduced stroke buffers are used. In A17.1–1955 through A17.1c–1969 an emergency terminal stopping device was required where a reduced stroke buffer was used or the speed was over 100 ft/min (0.51 m/s). Verify that the emergency terminal stopping device functions independent of the normal stopping means and the normal terminal stopping device. Verify that the emergency terminal speed limiting device functions independent of the normal terminal stopping device and that its car speed sensing device functions independent of the normal speed control system.

Where mechanical or hydraulic emergency terminal speed limiting devices are provided, refer to the manufacturer's recommended test procedures.

Inspect the device for condition and alignment. Slowly move the car up and verify that the device will be operated by movement of the car.

3.6.2 Periodic Test

3.6.2.1 Electric Elevators

(a) Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions). Before testing final terminal stopping devices from the top of the car, determine whether the potential switch on the controller is of the manually or electrically restored type. If it is the manually restored type, operation of the final terminal stopping device should not be tested from the car unless someone is in the machine room to reset the controller switch when instructed to do so by the inspector.

Run the car up the hoistway at inspection speed until the upper final terminal stopping device may be reached by hand. Use an insulated object to actuate this device, and try to move the car in each direction. The car should not move; if it does, the inspection should not be continued until this defect is corrected.

The operation of the final terminal stopping device (final limit) and its relation to the cam can be tested by jumping out the normal terminal stopping device and running the car past the terminal floor at inspection speed. The car should stop close to the floor. It may be necessary to jump out the final terminal stopping device to move the car back to floor level. After the final terminal stopping device has been tested, remove all jumpers.

(b) 5-Year Test of Emergency Terminal Stopping Means (for A17.1d–2000 and Earlier Editions); Category 5 Test of Emergency Terminal Stopping Means (for A17.1–2000 and Later Editions). For static control elevators, see Item 2.28.2.1(b) and for emergency terminal speed limiting devices, see Item 5.3.2.

3.6.2.2 Hydraulic Elevators: Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions). Block or tie the device in the functioning position and move the car down. Then attempt to run the car up at rated speed. The emergency terminal speed limiting device should prevent the car from running in excess of 100 ft/min (0.51 m/s). The car should not run with the emergency terminal stopping device in the functioning position.

3.6.3 Acceptance

3.6.4 References

3.6.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 209.3, 1001.2(c)(8), 1002.2e, and 1003.3(k).

A17.1–2000 and later editions — Requirements 2.25.3, 8.11.2.1.3(h), 8.11.2.2.5, and 8.10.2.3.2(k).

A17.3 — Paragraph 3.9.2.

3.6.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 305.2, 1004.2(c)(6), and 1005.2.

A17.1–2000 and later editions — Requirements 3.25.2, 8.11.3.1.3(f), and (NR 1005.2).

A17.1–1955 — Rule 320.2.

ITEM 3.7
CAR LEVELING AND ANTICREEP DEVICES

3.7.1 Periodic Inspections

3.7.1.1 Electric Elevators. Examine fastenings and clearances of car leveling devices, including cams and vanes located in the hoistway.

3.7.1.2 Hydraulic Elevators. Examine fastenings and clearances of car leveling devices, including cams and vanes located in the hoistway. With the car level with the floor, place a mark on the rail relative to a guide shoe or roller. Lower it slightly more than 1 in. (25 mm) by using inspection operation. Turn the car back on normal operation and observe that it levels within 1 in. (25 mm) of the floor level for elevators installed under A17.1–1978 and later editions. For elevators installed prior to A17.1–1978 edition and/or required to comply with A17.3, observe that the car will level to within 3 in. (76 mm) of the floor. If a manual lowering valve is available in the machine room, required under A17.1–1984 and later editions, it is used as described in Item 2.32.1 for testing the anticreep device. Check that the anticreep device remains operative regardless of the position of the car and hoistway doors, emergency stop switch or in-car stop switch, hinge car platform sill electric contacts and broken rope, tape, or chain switch for normal stopping devices.

For maintained pressure hydraulic elevators, operate the car in both directions.

3.7.2 Periodic Test

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3.7.3 Acceptance

3.7.4 References

3.7.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 210.1e and 1001.2(c)(10).

A17.1–2000 and later editions — Requirements 2.26.1.6 and 8.11.2.1.3(j).

3.7.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 306.3, 306.4, and 1004.2(c)(7).

A17.1–2000 and later editions — Requirements 3.26.3, 3.26.4, and 8.11.3.1.3(g).

A17.3 — Paragraphs 4.7.3 and 4.7.4.

ITEM 3.8
TOP EMERGENCY EXIT

3.8.1 Periodic Inspections

(a) For elevators installed under A17.1–1955 through A17.1–1960, check that the top emergency exit opens outward. Verify that the exit is hinged or otherwise attached to the car and can be opened from both inside and from the top of the car without the use of special tools. For elevators installed under A17.1–1965 and later editions, and those elevators required to meet A17.3, verify that the top emergency exit is locked, and openable from the top of the car only without the use of special tools. For elevators installed under A17.1–2000, check the emergency exit electric contact.

(b) For elevators in unenclosed hoistways, top emergency exits are prohibited for elevators installed under A17.1–1989 through A17.1d–2000. On elevators in partially enclosed hoistways, installed under A17.1–2000 and later editions, check the means to facilitate emergency evacuation.

3.8.2 Periodic Test

3.8.3 Acceptance

Measure the top emergency exit size and clearances.

3.8.4 References

3.8.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 204.1e and 1001.2(c)(12).

A17.1–2000 and later editions — Requirements 2.14.1.5 and 8.11.2.1.3(l).

A17.3 — Paragraph 3.4.4.

3.8.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 204.1e {301.7} and 1004.2(c)(9).

A17.1–2000 and later editions — Requirements 2.14.1.5 {3.14} and 8.11.3.1.3(i).

A17.3 — Paragraph 3.4.4 {4.2.3}.

ITEM 3.9
FLOOR AND EMERGENCY IDENTIFICATION NUMBERING

3.9.1 Periodic Inspections

(a) For elevators installed under A17.1a–1973 and later editions, check that floor numbers have been provided in the hoistways, not less than 4 in. (102 mm) in height, placed on the walls and/or doors of the hoistway at intervals where a person on top of the car can determine the floor position. Check that floor numbers are provided and legible.

(b) For elevators installed under A17.1–1990 and later editions, check that emergency identification numbers are provided on the crosshead, or the car frame where there is no crosshead where more than one elevator's machinery is in a hoistway or machine room.

3.9.2 Periodic Test

3.9.3 Acceptance

3.9.4 References

3.9.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 100.7, 211.9, and 1001.2(c)(15).

A17.1–2000 and later editions — Requirements 2.29.2, 2.29.1, and 8.11.2.1.3(o).

3.9.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 100.7 {300.1}, 211.9 {306.11}, and 1004.2(c)(10).

A17.1–2000 and later editions — Requirements 2.29.2 {3.1}, 2.29.1 {3.27}, and 8.11.3.1.3(j).

ITEM 3.10
HOISTWAY CONSTRUCTION

3.10.1 Periodic Inspections

Check the condition of the hoistway enclosure, and remote counterweight hoistway; note any damage or loose materials.

3.10.2 Periodic Test

3.10.3 Acceptance

Determine if the hoistway enclosure conforms to the building code requirements. Inspect the hoistway enclosure for substantially flush construction. Projections should be properly beveled or protected. For elevators with no top emergency exit installed in unenclosed hoistways, determine that all landings are provided with either hoistway entrances or emergency doors.

3.10.4 References

3.10.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 100 and Rule 1001.2(c)(16).

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A17.1–2000 and later editions — Requirements 2.1 and 8.11.2.1.3(p).

A17.3 — Section 2.1.

3.10.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 300.1 and 1004.2(c)(11).

A17.1–2000 and later editions — Requirements 3.1 and 8.11.3.1.3(k).

A17.3 — Section 2.1 {4.1}.

ITEM 3.11
HOISTWAY SMOKE CONTROL

3.11.1 Periodic Inspections

For elevators required to comply with the restricted opening requirements (Item 1.18), check that the car doors can be opened from the top of the car within specified zones, without the use of special tools.

For elevators installed under A17.1–1955 through A17.1–1980, that serve more than three floors, check that one-third of the required venting is permanently open or automatically opened by a damper. All venting should be to the outside. Portions of the required vents may be closed with glass. This should consist of plain glass, a maximum of $\frac{1}{8}$ in. (3.2 mm) thick. The vent area was required to be a minimum of 3.5% of the cross-sectional area of the hoistway (3 ft^2 min.) for each car.

Verify that elevators installed under A17.1–1981 and later editions, are provided with an approved means to prevent the accumulation of smoke and hot gases in case of fire. Assure ventilation is in accordance with building code requirements and is in working order. Check that any required openings are in the open position and not locked or blocked.

3.11.2 Periodic Test

3.11.3 Acceptance

Check that means to prevent the accumulation of smoke and hot gases in case of fire is in accordance with the requirements of the building code.

3.11.4 References

3.11.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 100.4 and 1001.2(c)(17).

A17.1–2000 and later editions — Requirements 2.1.4 and 8.11.2.1.3(q).

3.11.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 100.4 {300.1} and 1004.2(c)(12).

A17.1–2000 and later editions — Requirements 2.1.4 {3.1} and 8.11.3.1.3(l).

ITEM 3.12
PIPES, WIRING, AND DUCTS

3.12.1 Periodic Inspections

Only pipes, wiring, and ducts used in connection with the elevator may be installed in the hoistway. Check sprinkler piping for leakage. For elevators required to meet A17.3, pipes conveying gases, vapors, or liquids not connected with the operation of the elevator must be guarded so that any discharge will not affect the operation of the elevator.

3.12.2 Periodic Test

3.12.3 Acceptance

Check that sprinkler risers and return piping have been located outside the hoistway. Check that shutoff valves have been provided for each branch line and are accessible outside the hoistway. Check to see that an automatic, non-resetting means is provided to disconnect the main line power to affected elevators before water is discharged into the hoistway. The Code prohibits sprinkler activation or disconnection of main line power by smoke detectors.

3.12.4 References

3.12.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 102 and Rule 1001.2(c)(18).

A17.1–2000 and later editions — Requirements 2.8 and 8.11.2.1.3(r).

A17.3 — Paragraph 2.1.4.

3.12.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 102 {Rule 300.3} and Rule 1004.2(c)(13).

A17.1–2000 and later editions — Requirements 2.8 {3.8} and 8.11.3.1.3(m).

A17.3 — Paragraph 2.1.4 {Section 4.1}.

ITEM 3.13
WINDOWS, PROJECTIONS, RECESSES, AND SETBACKS

3.13.1 Periodic Inspections

(a) Hoistway Windows. Elevators installed under A17.1–1971 and later editions are not permitted to have windows in the hoistways.

Where windows are provided in hoistways of existing elevators, verify that they are guarded on the inside or outside as required by local regulations or the Code edition in effect at the time of installation.

For elevators required to meet A17.3, check that every hoistway window ten stories or less above a thoroughfare, and every such window opening three stories or less above a roof of an adjacent building are guarded. Also, check that every exterior hoistway window has

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been identified with 4 in. (102 mm) high letters marked "ELEVATOR."

(b) Projections, Recesses, and Setbacks. Determine that guards for recesses in the hoistway enclosure opposite car openings, other than landing entrances, are in place and secured. Check that landing sill guards, dust covers, and landing entrance toe guards are securely in place.

3.13.2 Periodic Test

3.13.3 Acceptance

3.13.4 References

3.13.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 100.5, 100.6, 110.10, and 1001.2(c)(19).

A17.1–2000 and later editions — Requirements 2.1.5, 2.1.6, 2.11.10, and 8.11.2.1.3(s).

A17.3 — Paragraphs 2.1.2 and 2.1.3.

3.13.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 100.5 and 100.6 {300.1}, 110.10 {300.11}, and 1004.2(c)(14).

A17.1–2000 and later editions — Requirements 2.1.5 and 2.1.6 {3.1}, 2.11.10 {3.11}, and 8.11.3.1.3(n).

A17.3 — Paragraphs 2.1.2 and 2.1.3 {Section 4.1}.

ITEM 3.14
HOISTWAY CLEARANCES

3.14.1 Periodic Inspections

3.14.1.1 Electric Elevators. Observe the clearances between car and hoistway enclosures, between car and counterweight or counterweight screen, between the counterweight and hoistway enclosure, and between adjacent cars.

3.14.1.2 Hydraulic Elevators. Car Horizontal Clearances. Observe the clearances between car and hoistway enclosures, and between adjacent cars.

3.14.2 Periodic Test

3.14.3 Acceptance

Measure and record horizontal hoistway dimensions and clearances. See Tables 3.14.3(a) and 3.14.3(b).

3.14.4 References

3.14.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Sections 107 and 108 and Rule 1001.2(c)(20).

A17.1–2000 and later editions — Requirements 2.4, 2.5, and 8.11.2.1.3(t).

A17.3 — Section 2.4.

3.14.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Sections 108 {Rule 300.9} and 110 {Rule 300.11}; and Rule 1004.2(c)(15).

A17.1–2000 and later editions — Requirements 2.5 {3.5} and 2.11 {3.11}, and 8.11.3.1.3(o).

A17.3 — Section 2.4 {4.1}.

ITEM 3.15
MULTIPLE HOISTWAYS

3.15.1 Periodic Inspections

Observe the clearances between cars in a multiple hoistway. See Table 3.14.3(a).

3.15.2 Periodic Test

3.15.3 Acceptance

Verify multiple hoistways are constructed in compliance with the building code. Measure the running clearances between cars including equipment attached to the car.

3.15.4 References

3.15.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 100.1d and 1001.2(c)(21).

A17.1–2000 and later editions — Requirements 2.1.1.4 and 8.11.2.1.3(u).

3.15.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 100.1d {300.1} and 1004.2(c)(16).

A17.1–2000 and later editions — Requirements 2.1.1.4 {3.1} and 8.11.3.1.3(p).

ITEM 3.16
TRAVELING CABLES AND JUNCTION BOXES

3.16.1 Periodic Inspections

(a) Junction Boxes and Traveling Cable Supporting Means. Hoistway and car junction boxes should be securely fastened with covers in place. Examine the supporting means of the cable at the connection points. Where a steel member is used to support the traveling cable, examine its attachment to the hoistway or car connection point and verify that it is securely fastened. The live load on steel supporting fillers should hang in the direction of tightening of the supporting bolt or other means of fastening and the dead end taped or clamped to the live end. Examine for any evidence of wear or breaks in the steel supporting fillers, which may damage the insulation of the conductors or cause the traveling cable to release, causing strain or breakage to the conductors at the terminal lugs.

(b) Flexible Wire Mesh Automatic Tightening Devices. Where a flexible wire mesh automatic tightening device is used, examine the grip to be sure that it is securely fastened to its support at the hoistway or car connection point. Examine the eye of the grip attached to the supporting member. When a double eye attachment is used, the eyes should be attached so they share the load equally and do not exceed 15 deg from the axis of the vertical cable.

There are basically three types of flexible wire mesh automatic tightening devices (see Fig. 3.16.1):

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Table 3.14.3(a) Horizontal Clearances

Clearances Between	Maximum, in.	Minimum, in.	Rqmt. No.
Car platform and landing sill			
Side-post construction	1 1/2	1/2	2.5.1.4
Corner-post construction	1 1/2	3/4	2.5.1.4
Car and hoistway enclosure (except sides used for loading and unloading)	...	3/4	2.5.1.1
Car platform sill and hoistway enclosure for full width of hoistway opening			
Vertically sliding hoistway doors	7 1/2	...	2.5.1.5
Other than vertically sliding hoistway doors	5	...	2.5.1.5
Car and counterweight	...	1	2.5.1.2
Two adjacent cars	...	2	2.5.1.3
Counterweight and counterweight screen	...	3/4	2.5.1.2
Counterweight and hoistway enclosure	...	3/4	2.5.1.2

GENERAL NOTE: 1 in. = 25.4 mm

Table 3.14.3(b) Horizontal Distances

Distance Between Horizontally Sliding and Swinging Hoistway Door and Edge of Landing Sill	Maximum, in.	Minimum, in.	Rqmt. No.
Elevators that can be opened from car only			
New Installations	4	...	2.11.4
New or altered elevators in existing multiple hoistways			
Swinging Doors	4	...	2.11.4
Sliding Doors	5	...	2.11.4
Automatic or continuous pressure operation			
Sliding Hoistway Doors	2 1/4	...	2.11.4
Swinging hoistway doors	3/4	...	2.11.4
Swinging hoistway doors on freight elevators not accessible to general public and located in industrial type buildings	4	...	2.11.4

GENERAL NOTE: 1 in. = 25.4 mm

(1) closed type
(2) split-laced type
(3) split-rod type

Examine the grip where the eye is attached to the wire mesh section for any visible signs of wear or breakage. This point is subject to damage because of flexing of the cable. It is recommended that the lower section of the grip be secured to the traveling cable to prevent triggering (total or partial relaxing of the grip) and culminate in milking of the grip (slight movement of grip on the outer section of the traveling cable). Examine for damage caused by the securing means. The triggering of the grip may cause the cable to release, thereby placing strain or breakage on the individual conductors. Milking of the grip may cause wear to the insulation of traveling cable.

(c) Traveling Cables. Examine the traveling cables for
(1) excessive twists or kinks
(2) damage due to chafing
(3) intertwining of multiple cables

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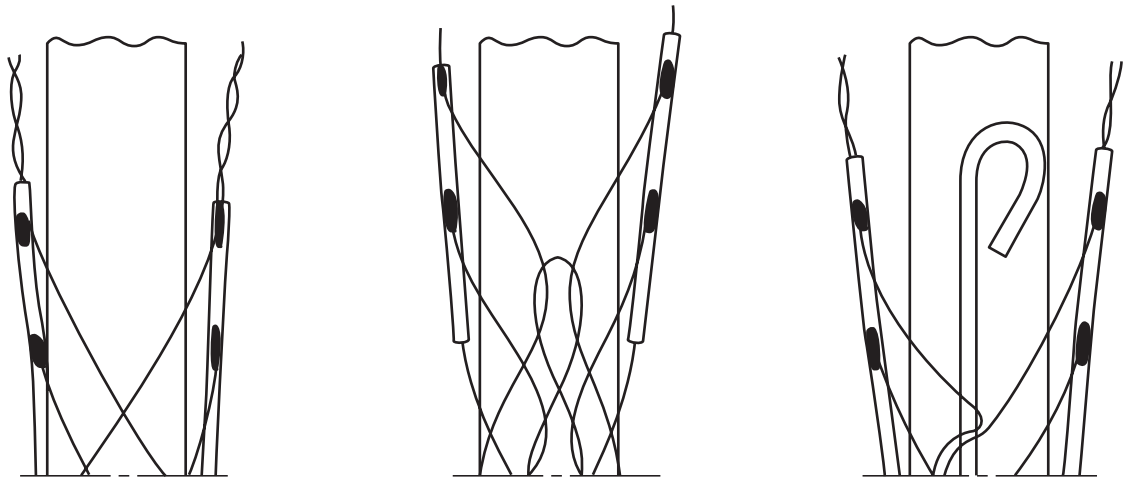


Fig. 3.16.1 Self-Tightening Grips

(4) clearance from hoistway equipment such as buffers, plungers, brackets, beams, etc.

3.16.2 Periodic Test

3.16.3 Acceptance

Check that traveling cables are properly installed, supported, and protected against damage. Traveling cables should be supported by one of the following means:

(a) by internal steel supporting member

(b) by looping the cables around supports for unsupported lengths of less than 100 ft (30.5 m)

(c) by suspending from the supports by a means that automatically tightens around the cable when tension is increased for unsupported lengths of up to 200 ft (61 m)

3.16.4 References

3.16.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 102.1 and 1001.2(c)(22).

A17.1–2000 and later editions — Requirements 2.8.1 and 8.11.2.1.3(v).

NFPA 70 or CSA C22.1, as applicable.

3.16.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 102.1 {300.3} and 1004.2(c)(17).

A17.1–2000 and later editions — Requirements 2.8.1 {3.8} and 8.11.3.1.3(q).

NFPA 70 or CSA C22.1, as applicable.

ITEM 3.17
DOOR AND GATE EQUIPMENT

3.17.1 Periodic Inspections

(a) Car and Hoistway Door and Gate Operating, Locking and Contact Devices, and Interlocking Retiring Cams

(1) Examine all hoistway and car door or gate operating motors and cams. Check locking and contact devices, switches, or other operating mechanisms located on top of the car or in the hoistway. Determine whether they are in proper working order, securely fastened in place, and properly lubricated. Check hydraulic door operators for any oil leakage.

(2) Examine any stationary or retiring cams, operating interlocks, interlock contacts, or door operators. Determine whether they are in correct alignment with the roller arm of the interlock or door operating mechanism. Check whether their travel is sufficient to ensure proper operation of the interlocks or door operators.

(3) Examine relating chains, sprockets, and wire cables for proper tension and note any excessive wear.

(4) Test hoistway door operators actuated by magnetic controls to determine the car is within the landing zone, or within the limits of the leveling zone where an automatic leveling device is provided, before the control causes the door operator to open to the hoistway door. Check that the car is at rest or substantially level with the landing before the door is in the fully open position. Air- (pneumatic) operated doors must meet similar requirements, provided they are manually controlled. The car must be within the landing zone or within the leveling zone before the door operating device is in a position to engage the door operating cam.

(5) Examine the name plates on hoistway door or gate interlocks, combination mechanical locks and electric contacts, and car door or gate electric contacts. Verify that they are of a type approved by the authority having jurisdiction. For elevators installed under A17.1–1987 and later editions, check that mercury tube switches have not been used for electric contacts.

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(6) Hoistway Door or Gate: Separate or Combination Mechanical Locks and Electric Contacts. Combination mechanical locks and electric contacts of the hoistway unit system are permitted by A17.1–1955 and later editions, on freight elevators under restricted conditions.

(a) Inspect mechanical locks operated manually from top of car, where used, with hoistway door or gate electric contacts. With the door or gate in the fully closed position, pull on the door or gate, which should be held closed by the lock. Determine whether the locking member is in a position to lock the door when or before the contact is closed by the door or gate.

(b) Where the locking members of such devices are operated by car cams, place the door or gate in the fully closed position and move the car a sufficient distance away from the floor to permit the locking member to lock the door or gate. With the car in this position, pull or push on the door, which should be held closed by the lock. Release the lock manually and open the door or gate. Then slowly close it to the position where the electric contact just closes and note whether the locking member is in a position to lock the door.

(b) Car and Hoistway Door, Gate Hangers, and Equipment

(1) Examine the condition of hoistway and car door or gate hangers, tracks, and guides to determine they are securely fastened in place, engaged and not worn, so that the doors will not come out of their guideway at any point in their travel, and are lubricated. If the guides are not made out of fire-resistive materials, check that the fire tabs are engaged in the guideway. Check that the door frames are securely fastened to the building structure.

NOTE: The requirement that hoistway door panels and guides meet certain fire-resistive criteria was specifically stated in Part 1 for horizontally sliding doors until A17.1c–1986 and for vertically sliding doors until A17.1–1984. However, where required by Rule 100.1, the entire entrance assembly is still required to meet the fire-resistive criteria, but is now specified in Section 1102.

(2) When multipanel entrances are provided, check that they are interconnected or equipped with interlocks on each driven panel for elevators installed under A17.1–1990 and later editions. A17.1–1989 and earlier editions require the panels to be interconnected. Examine interconnections of the panels of multisection doors. Determine if they are in proper condition and are securely fastened to the door panels. Examine interconnections, whether in hanger chains, ropes, or other parts, or in the door closer arms and pins. Check for any wear, which might cause the panels to become disconnected from each other and permit the car to operate with one or more of the panels open. On two-speed entrances for elevators installed under A17.1–1990 and later editions, check that the slow and fast panels are provided with a secondary mechanical interconnecting means. On center-opening doors with a single interlock, check that the interlock is operated by the nondriven panel for elevators installed under A17.1–1990 and later editions.

(3) Horizontally sliding or single section swinging doors of automatic elevators must be provided with door closers arranged to close an open door automatically if the car leaves the landing zone for any reason. Check the door closers by manually opening the doors to the fully open position, then release the doors. As they are returning to the closed position, manually stop and release the doors at approximately the half-way point and at approximately 2 in. (51 mm) from the strike jamb. Verify that the doors return to the fully closed and locked position.

(4) Examine hoistway and car door or gate counterweights to determine they are properly guided or boxed to retain the counterweight if the suspension means breaks.

(5) Examine car and hoistway door or gate suspension members together with their connections, pulleys, and pulley supports.

(c) Restricted Opening of Hoistway Doors and/or Car Doors on Passenger Elevators. For elevators required to comply with the restricted opening requirements (Item 1.18), check that the car doors can be opened from the top of the car within specified zones, without the use of special tools.

(d) Landings Locked out of Service. Determine that the following landings are not locked out of service:

(1) top and bottom landings

(2) for elevators installed under A17.1b–1989 and later editions, the designated and alternate landings for Phase I Firefighters' Service and all Phase II landings

(3) check that automatic fire doors can be opened manually from the hoistway side and that they do not lock any doors that lead to building exits

(e) Hoistway Door Interlocks: Auxiliary Lock. A 4 in. (102 mm) locking range is permitted on elevators operated from inside the car only. An auxiliary lock is required; it is incorporated either in the door closing mechanism or consists of a rack attached to the landing sill or top track and an engaging pawl on the door. When the doors are power closing, the auxiliary lock is usually placed on the closing mechanism to prevent damage.

3.17.2 Periodic Test

3.17.3 Acceptance

Check that entrance panel(s), frame hardware and transoms are labeled by a certifying agency acceptable to the authority having jurisdiction, when installed in fire-resistive construction. A single label may be provided for the complete entrance assembly. Check that interlocks or combination mechanical locks and electric contacts and car door or gate electric contacts are labeled by a certifying agency acceptable to the authority having jurisdiction.

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When gasketing material is applied to fire-resistive entrances, check that it has been tested and labeled by a certifying agency acceptable to the authority having jurisdiction.

Check that center-opening doors are mechanically interconnected or there is an interlock on each driven panel. On horizontally sliding doors provided with a single interlock, check that the door closer is attached to the leading panel that moves in the opposite direction. Check the secondary mechanical interconnecting means on multispeed doors.

3.17.4 References

3.17.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Sections 110 and 111 and Rules 210.1e and 1001.2(c)(23).

A17.1–2000 and later editions — Requirements 2.11, 2.12, 2.26.1.6, and 8.11.2.1.3(w).

A17.3 — Sections 2.6 and 2.7.

3.17.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Sections 110 {Rule 300.11} and 111 {Rule 300.12}; and Rules 210.1e {306.3} and 1004.2(c)(18).

A17.1–2000 and later editions — Requirements 2.11 {3.11}, 2.12 {3.12}, 2.26.1.6 {3.26.3}, and 8.11.3.1.3(r).

A17.3 — Sections 2.6 and 2.7 {4.1}.

ITEM 3.18
CAR FRAME AND STILES

3.18.1 Periodic Inspections

Failure of the older car frame stiles (upright structural members) has occurred sufficiently for these members to receive special attention. Make a careful examination of the stiles at the lowest bolt of the car frame crosshead gusset plate. Note any evidence of cracks on the stiles, especially directly in line with the bottom gusset bolts. If any blistering of paint is noted, scrape to expose the metal and determine its condition. If a crack appears, it is probable that it will be found to have started from the outer edge of the stile flange. Check that welded repairs and required written certification are in compliance with the Code. Wood car frames are prohibited by A17.1–1955 and later editions.

3.18.2 Periodic Test

3.18.3 Acceptance

3.18.4 References

3.18.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Sections 203 and 213 and Rules 1001.2(c)(24), 1200.4, and 1202.4a.

A17.1–2000 and later editions — Requirements 2.15, 8.8, 8.11.2.1.3(x), 8.6.2, and 8.7.2.15.1.

3.18.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 213 {Rule 302.5} and Rules 301.6 and 1004.2(c)(19).

A17.1–2000 and later editions — Requirements 8.8 {3.18.5}, 3.15, and 8.11.3.1.3(s).

ITEM 3.19
GUIDE RAILS FASTENING AND EQUIPMENT

3.19.1 Periodic Inspections

For car and counterweight guide rails, rail fastenings, car crossheads, and car guiding members, the following requirements shall be met:

(a) Examine the guide rails, paying particular attention to the condition of the surfaces and the correct alignment of the joints. Repeated operation of the car safety or improperly adjusted or loose car guide shoes that permit the safety jaws to run against the rail surfaces frequently cause serious wear or scoring of the rails and the safety jaws.

Where sliding-type guide shoes are used, determine that rails are free of lint and dirt, and are adequately but not excessively lubricated and that the proper lubricant, as indicated on the crosshead data plate has been used. Where roller guides are used, rails should be clean and dry without lubricant.

(b) Check the following fastenings to determine whether they are sound and tight, and that there are no missing bolts or guide clips:

(1) rails to brackets
(2) brackets to building construction
(3) fishplate bolts
(4) crosshead connection bolts
(5) car guide shoe bolts

3.19.1.1 Electric Elevators: Alignment of Guide Rails. If any excessive or irregular motion of the car was noted during the in the car inspection, examine guide rail alignment. Examine the counterweight guide rails for distance between guides.

3.19.1.2 Hydraulic Elevators: Alignment of Guide Rails. If any excessive or irregular motion of the car was noted during the in-the-car inspection, examine guide rail alignment. Examine the sheave guide rails as outlined above and for distance between guides. On roped-hydraulic elevators, inspect the sheave guide rails as specified above.

3.19.2 Periodic Test

3.19.3 Acceptance

3.19.3.1 Electric Elevators. For elevators installed with guide shoes, check that a metal lubrication marking plate has been securely attached to the car crosshead, readily visible, and legibly and permanently marked.

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3.19.3.2 Hydraulic Elevators. Verify that a metal lubrication marking plate has been securely attached to the car crosshead, readily visible, and legibly and permanently marked.

3.19.4 References

3.19.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 205.16, 1001.2(c)(25), and 1206.1d.

A17.1–2000 and later editions — Requirements 2.17.16, 8.11.2.1.3(y), and 8.6.4.3.

A17.3 — Paragraph 3.5.6.

3.19.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Sections 200 {Rule 301.1b} and 308; and Rules 301.1, 301.6, and 1004.2(c)(20).

A17.1–2000 and later editions — Requirements 2.23 {3.23.2}, 3.28, 3.23, 3.15.1.1.2, and 8.11.3.1.3(t).

A17.3 — Paragraph 4.9.8.

ITEM 3.20
GOVERNOR ROPE

3.20.1 Periodic Inspections

Inspect the governor rope for evidence of lubricant being added after installation as the additional lubricant may interfere with the ability of the governor to retard the governor rope and apply the safety. Check the governor rope data tag and verify that the rope complies with the specification on the governor marking plate. Inspect the governor rope as outlined in Item 3.23 for suspension ropes.

3.20.2 Periodic Test

3.20.3 Acceptance

Verify the governor rope that has been installed is the correct type, size, and construction as indicated on the speed governor data plate. See Item 2.12. Check for installation of the required governor rope data tag.

3.20.4 References

3.20.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 206.5, 1001.2(c)(26), 1202.7, and 1206.1c.

A17.1–2000 and later editions — Requirements 2.18.5, 8.11.2.1.3(z), 8.7.2.19, and 8.6.4.2.

A17.3 — Paragraph 3.6.2.

3.20.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 206.5, 301.8, 1001.2(c), 1004.2(c)(23), 1202.7, and 1206.1c.

A17.1–2000 and later editions — Requirements 2.18.5, 3.17.1, 8.11.2.1.3(z), 8.11.3.1.3(w), 8.7.2.19, and 8.6.4.2.

A17.3 — Section 3.6 and para. 4.9.7.

ITEM 3.21
GOVERNOR RELEASING CARRIER

3.21.1 Periodic Inspections

3.21.1.1 Electric Elevators. Examine the governor rope releasing carrier on top of the car. Note whether parts are rusted or caked with dirt and whether springs are broken.

3.21.1.2 Hydraulic Elevators. For roped-hydraulic elevators installed under A17.1b–1989 and later editions, examine governor rope releasing carrier, if provided. Note whether parts are rusted or caked with dirt or paint and whether springs are broken.

3.21.2 Periodic Test: 5-Year Test (for A17.1d–2000 and Earlier Editions); Category 5 Test (for A17.1–2000 and Later Editions)

Test the governor releasing carrier as outlined in Item 2.13.2(b).

3.21.3 Acceptance

3.21.4 References

3.21.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 205.15 and 1001.2(c)(27).

A17.1–2000 and later editions — Requirements 2.17.15, 8.6.2.4, and 8.11.2.1.3(aa).

A17.3 — Section 3.5.

3.21.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 205.15, 301.8, 1004.2(c)(22), and 1005.4.

A17.1–2000 and later editions — Requirements 2.17.15, 3.17.1, 8.11.3.1.3(v), and 8.11.3.4.

ITEM 3.22
WIRE ROPE FASTENING AND HITCH PLATE

3.22.1 Periodic Inspections

3.22.1.1 Electric Elevators

(a) Wire Rope Fastenings and Sheaves. Check that ropes conform to the specifications on the crosshead data plate and rope data tag. Determine that rope fastenings at both the car and counterweight ends of the ropes have been properly made up.

(b) Auxiliary Rope Fastening Devices. Where an auxiliary rope fastening device is provided, determine that the auxiliary device is not carrying the load because of rope stretch or failure at the regular rope fastening. Check that an electric switch is provided to open motor and control circuits when the auxiliary rope fastening device operates. Determine that it is properly adjusted and operational.

(c) Shackle Rods. Where the shackle rod and rope socket are separate pieces, determine that the fastening between the two parts is positive to prevent their separation.

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(d) Tapered Rope Sockets. Determine whether there are any broken wires at the point where the rope enters the socket. This is especially important in the case of the car suspension ropes of drum machines. Such breaks usually occur at rope fastenings just inside the small end of the socket and can, in many cases, be detected by prying the individual wires in the strand with a sharp instrument, such as the blade of a knife. Also, determine that the rope, where it enters the socket, has not had wire or strand lays disturbed or changed and no strands bulge out.

(1) Where babbitted metal sockets are used, note any change in color of steel wires caused by overheating when the socket was made up.

(2) Where thermosetting resin composition is used, note the manufacturers directions must be strictly followed in handling, mixing, pouring, and curing the resin material.

(3) When the embedment medium has cooled or cured, and the seizing at the small end has been removed, make a visual inspection. See Fig. 3.22.1 and Table 3.22.1.

(e) Other Rope Fastenings. U-bolt type rope clips (clamps) are prohibited for suspension ropes. Where nontapered rope fastenings such as wedge clamps, are used, check that the wedge is properly seated in the fastening.

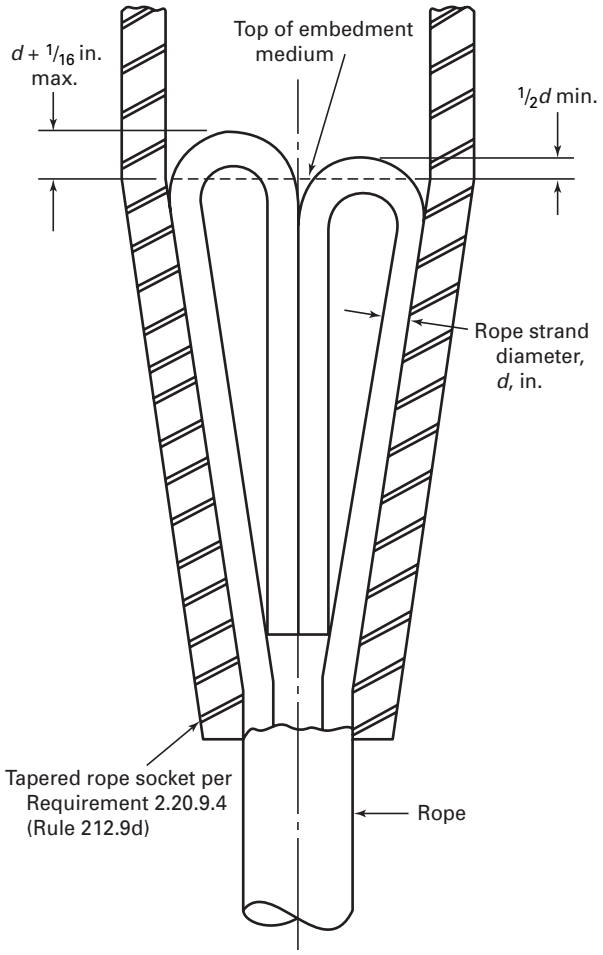
(f) Roping Arrangement

(1) Where 1:1 roping is used, determine that any steel plates used to support the rope shackle rods are attached to the underside or to the webs of the car frame members in such a manner that the fastening bolts or rivets are not in tension. Where rope equalizing springs are used, determine that shackle rods are not worn at the point where they pass through the steel supporting plate. Note any collapsed springs.

(2) Where 2:1 roping is used, examine dead end rope hitches. Determine that steel plates for supporting rope shackle rods are placed on top of the supporting beams or are located in such a manner that the bolts supporting the suspension plates are not in tension. Determine that suspension members are securely fastened and that no bending of the supporting members has occurred.

(g) Winding Drum Machines. On winding drum machines, hoisting ropes must be refastened every 12 months for machines located above the hoistway and 24 months for machines located below or beside the hoistway. At least one turn of rope must remain on the drum when the car is resting on its fully compressed buffer.

(h) Rope Equalizers. For elevators installed under A17.1–1955 through A17.1–1987, suspension rope equalizers, if provided, must be of the individual compression spring type. Other types of rope equalizers were permitted subject to the approval of the enforcing authority on the basis of adequate tensile and fatigue tests made by a qualified laboratory.



GENERAL NOTE: 1 in. = 25.4 mm

Fig. 3.22.1 Cross-Section Through Tapered Rope Socket Showing Maximum and Minimum Projection of Loops Above Embedment Medium

For elevators installed under A17.1a–1988 and later editions, single bar type equalizers may be used on winding drum machines subject to limitations. Other types of rope equalizers are required to be tested by an independent laboratory for Code compliance.

Examine rope equalizers and determine the range of their motion with the car in each of the following positions:

(1) midpoint of hoistway

(2) at top terminal landing

(3) at bottom terminal landing

If properly adjusted, the equalizer arms should be at the center of their range of motion at the midpoint of the hoistway and not be at either limit of their range of motion at the top or bottom terminal landing.

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Table 3.22.1 Projection of Rope Strands Above Embedment Medium for 6- and 8-Srand Ropes

Rope Dia., in.	Projection Above Embedment, in.	
	Maximum	Minimum
3/8	0.17	0.06
7/16	0.20	0.07
1/2	0.21	0.08
9/16	0.23	0.09
5/8	0.25	0.09
11/16	0.27	0.10
3/4	0.29	0.11
13/16	0.31	0.12
7/8	0.32	0.13
15/16	0.34	0.14
1	0.36	0.15

GENERAL NOTE: 1 in. = 25.4 mm

(i) Antirotation Device. For suspension ropes installed or replaced under ASME A17.1–1993 through A17.1–1996, check the antirotation device for proper installation. The wire rope used should be a continuous loop through the eye of each shackle and connected with at least two wire rope clips. Verify that the loop is only hand-tight so that it does not restrict the lateral motion of the shackle rods. For elevators installed under A17.1a–1997, verify that there is a means provided to prevent rotation of suspension ropes without restricting their movement.

3.22.1.2 Hydraulic Elevators (Roped-Hydraulic Elevators Installed Under A17.1b–1989 and Later Editions)

(a) Wire Rope Fastenings and Sheaves. Check that ropes conform to the specifications on the crosshead data plate and rope data tag. Verify that rope fastenings at both the car and dead end of the ropes have been properly made up.

(b) Shackle Rods. Where the shackle rod and rope socket are separate pieces, verify that the fastening between the two parts is positive to prevent their separation.

(c) Nontapered Rope Fastenings. Where nontapered rope fastenings such as wedge clamps are used, and approved by the authority having jurisdiction, review the certification and verify that the socket used is marked and identical to the one on the certification. Also, verify that the socket is installed in accordance with the manufacturer's/supplier's instructions. Inspect the socket for secure seating of the wedge and damage to the rope.

(d) Tapered Rope Sockets. Determine whether there are any broken wires at the point where the rope enters the socket. Also, verify that the rope, where it enters the socket, has not had wire or strand lays disturbed or changed and no strands bulge out.

(1) Where babbitted metal sockets are used, note any change in color of steel wires caused by overheating when the socket was made up.

(2) Where thermosetting resin composition is used, note the manufacturer's directions must be strictly followed in handling, mixing, pouring, and curing the resin material.

(3) Inspection of Socket After Pouring. When the embedment medium has cooled or cured, and the seizing at the small end has been removed, a visual inspection shall be made for

(a) retention of rope lay where it leaves the small end or the socket.

(b) full penetration of filler material as evidence by it being visible around the circumference of the small end of the socket.

(c) correct seating of the strain loops in the filler material. [See Fig. 3.22.1.]

(e) Rope equalizers, if provided, must be of the individual compression spring type. Examine rope equalizers and determine the range of their motion with the car in each of the following positions:

(1) midpoint of hoistway.

(2) at top terminal landing.

(3) at bottom terminal landing. If properly adjusted, the equalizer arms shall be at the center of their range of motion at the midpoint of the hoistway and shall not be at either limit of their range of motion at the top or bottom terminal landing.

(f) Antirotation Device. For suspension ropes installed or replaced under ASME A17.1–1993 through A17.1–1996, check the antirotation device for proper installation. The wire rope used should be a continuous loop through the eye of each shackle and connected with at least two wire rope clips. Verify that the loop is only hand-tight so that it does not restrict the lateral motion of the shackle rods. For elevators installed under A17.1a–1997, verify that there is a means provided to prevent rotation of suspension ropes without restricting their movement.

3.22.2 Periodic Test

3.22.3 Acceptance

3.22.4 References

3.22.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 212 and Rules 105.3c, 203.13, 1001.2(c)(28), 1200.5, and 1206.3.

A17.1–2000 and later editions — Requirements 2.20, 2.9.3.3, 2.15.13, 8.11.2.1.3(bb), 8.6.3, and 8.6.4.10.

A17.3 — Paragraphs 3.12.5, 3.12.8, and 3.12.9.

3.22.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 212; and Rules 105.3c, 203.13, 302.1b, 1004.2(c)(24), and 1200.5.

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A17.1–2000 and later editions — Requirements 2.20, 2.9.3.3, 2.15.13, 3.18.1.2, 8.11.3.1.3(x), and 8.6.3.

A17.3 — Paragraph 4.9.10.

ITEM 3.23
SUSPENSION ROPE

3.23.1 Periodic Inspections

3.23.1.1 Electric Elevators

(a) Wire Rope Inspection. Examine suspension ropes and note if they conform to the Code requirements.

(1) Internal breakage of wire ropes is difficult to detect and, consequently, may be a greater hazard than surface wear. The surface of the rope may show little or no wear, but if the rope is bent over a short radius, individual wires will snap and in extreme cases the rope may be broken by hand. Such failures are more likely to occur in governor and compensating ropes where the ropes are lightly loaded and the ratio of sheave diameter to rope diameter is smaller.

(2) When replacing suspension ropes, all ropes in a set must be replaced. The ropes in the set must all be from the same manufacturer and of the same material, grade, construction, and diameter.

(3) The lengths of all wire ropes in a set of suspension ropes, and consequently the rope tensions, should be substantially equal if maximum rope life and efficiency are to be obtained. If the tensions do not appear to be substantially the same, equalization of the rope lengths is recommended.

(4) If ropes are dirty or overlubricated, a proper inspection may not be possible unless the dirt or excess lubricant is removed.

(b) Wire Rope Inspection Procedure. Note that it is not possible to describe the inspection procedure for every single type of wire rope installation nor to outline every detail of the inspection procedure. Select the location from which a proper examination of the rope can best be made. For example, the suspension ropes of an overhead drum machine cannot be examined from the top of the car. See Item 2.27.1.

(1) For suspension ropes on traction machines with 1:1 roping, examination of the ropes should preferably start with the car located at the top of the hoistway and made from the top of the car, examining the ropes on the counterweight side.

(2) For traction machine ropes with 2:1 roping, examination of the ropes should preferably start with the car located at the top of the hoistway and made from the top of the car. Examine both the dead-end side and the traveling-end side of the counterweight ropes, and dead-end side of the car ropes. The remainder of the ropes can be examined at the traction sheave by moving the car up the hoistway.

(3) For overhead winding drum machines with 1:1 roping, the hoisting ropes must be examined from the overhead machinery space. Where the driving machine is located below, those portions of the ropes leading from the driving machine drum or sheave and from the counterweight to the overhead sheaves can be examined from the car top as the car descends, except for a small portion which must be examined from the pit.

(4) On all elevators, mark the ropes with chalk to indicate the location of the unexamined section of ropes and examine them later from the machine room or overhead machinery space, or from the pit.

(c) Wire Rope Inspection Criteria

(1) The following method based on field experience is recommended as a guide for the inspection and evaluation of wire ropes. Give particular attention to where the wire rope passes over sheaves, such as in relation of the position of the wire rope over sheaves with the car at terminal landings.

(a) Move the car downward 2 ft (610 mm) or 3 ft (914 mm) at a time and examine each rope at each of these stops. Note when broken wires begin to appear. Thereafter check at frequent intervals to determine the rate of increase in the number of broken wires. Any rapid increase in the number of broken wires is significant.

(b) Count the number of broken crown wires in a rope lay (see Fig. 3.23.1) measured along the length of a rope within which the spiral strands complete one turn about the axis. A lay may be considered as a section of rope approximately $6\frac{1}{2}$ times the diameter of the rope, that is, $3\frac{1}{4}$ in. (83 mm) for $\frac{1}{2}$ in. (13 mm) rope and $4\frac{1}{16}$ in. (103 mm) for $\frac{5}{8}$ in. (16 mm) rope.

Refer to the A17.1 Code for rope replacement criteria.

(2) Breaks in the valleys of the ropes, while infrequent, may be an indication of internal breaks. This is not to be confused with a broken outside wire when the original break occurred at a worn crown and a secondary fracture has occurred near the point where two adjacent strands make contact. In this case, a piece of wire has broken out and is missing, and generally both ends of the broken wire remaining are visible.

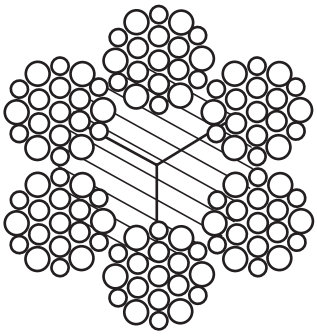
(3) Note that where preformed rope is used, greater care is required to detect broken wires that do not protrude from the surface of the rope.

(d) Governor Ropes. Governor ropes should be inspected and replaced as outlined for suspension and compensating ropes of traction machines. Check governor rope and data tag. The Code also requires the governor rope data to be shown on a metal plate attached to the speed governor.

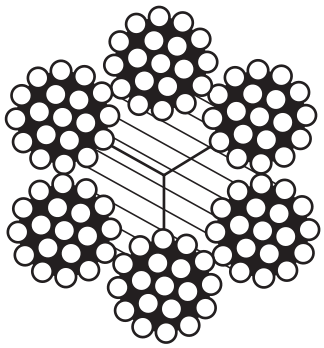
(1) If a governor rope has been replaced since the last inspection, determine that the new rope is of the same material, diameter, and construction as that specified on the governor marking plate. If not, a test of the car safety and governor is required.

(2) Ensure wire ropes that have been previously installed have not been used.

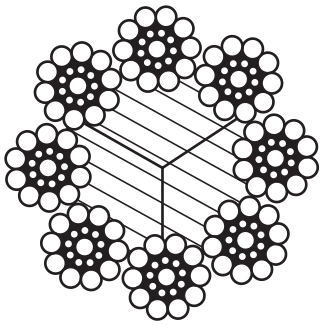
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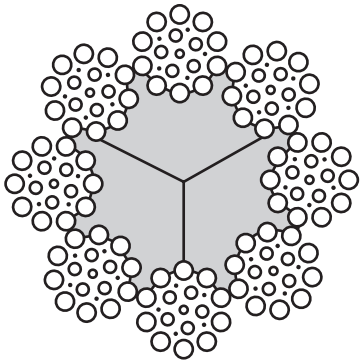
(a) 6 × 19 Suspension Rope, Warrington-Type Strand [Note (1)]



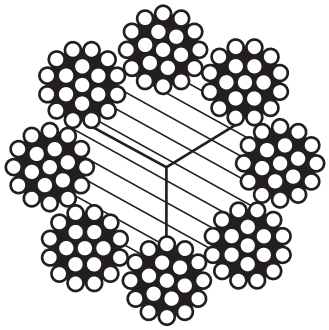
(b) 6 × 19 Suspension Rope, Filler-Wire-Type Strand [Note (2)]



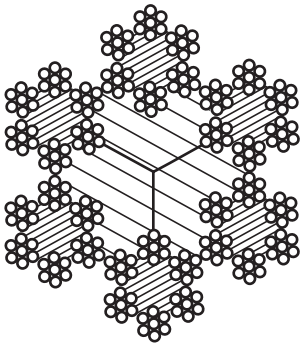
(c) Extra Flexible 8 × 19 Suspension Rope, Seale-Type Strand [Note (3)]



(d) Extra Flexible 8 × 21 Suspension Rope, Filler-Wire-Type Strand [Note (4)]



(e) Extra Flexible 8 × 25 Compensating and Governor Rope, FIller-Wire-Type Strand [Note (5)]



(f) Tiller-Rope Construction [Note (6)]

GENERAL NOTE: Sketches (a) through (f) show ropes with fiber core. Steel cores may be used in the ropes in sketches (a) through (e).

NOTES:

(1) Outer layer of strand is comprised of alternating large and small wires.
(2) Each strand includes six filler wires that are considered as not load bearing.
(3) 8 × 19 construction is more flexible than 6 × 19 and may be used over smaller sheaves.
(4) 8 × 21 construction is more flexible than 6 × 19 [sketches (a) and (b)], also more flexible than 8 × 19 [sketch (c)]. The 8 × 21 is especially designed for basement single-wrap and double-wrap traction machines, also basement drum machines, and under-slung-car installations.
(5) Each strand includes six filler wires that are considered as not load bearing.
(6) Used for hand-operating ropes. Not permitted for suspension rope or governor rope, except for replacement on old elevators with governors designed for it. This type of rope is also prohibited to connect the safety to the governor rope (Requirement 2.17.12).

Fig. 3.23.1 Typical Wire Rope Constructions

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3.23.1.2 Hydraulic Elevators (Roped-Hydraulic Elevators Installed Under A17.1b–1989 and Later Editions)

(a) Wire Rope Inspection. Examine suspension ropes and note if they conform to the Code requirements. Do not examine moving ropes with hands even if they are gloved, holding rags, cotton waste, etc. Wire rope data is required to be shown on the car crosshead data plate.

(1) Internal breakage of wire ropes is difficult to detect and, consequently, may be a greater hazard than surface wear. The surface of the rope may show little or no wear, but if the rope is bent over a short radius, individual wires will snap and in extreme cases the rope may be broken by hand. Such failures are more likely to occur in governor and compensating ropes where the ropes are lightly loaded and the ratio of sheave diameter to rope diameter is smaller.

(2) When replacing suspension ropes, all ropes in a set must be replaced. The ropes in the set shall all be from the same manufacturer and of the same material, grade, construction, and diameter, and preferably cut from the same reel.

(3) The lengths of all wire ropes in a set of suspension ropes, and consequently the rope tensions, shall be substantially equal if maximum rope life and efficiency are to be obtained. If the tensions do not appear to be substantially the same, equalization of the rope lengths shall be recommended.

(4) If ropes are dirty or overlubricated, a proper inspection may not be possible unless the dirt or excess lubricant is removed.

(b) It shall be noted that it is not possible to describe the inspection procedure for every single type of wire rope installation nor to outline every detail of the inspection procedure. The inspector shall use his best judgement in making the inspection and in selecting his location from which a proper examination of the rope can best be made. Always place the stop switch in the stop position while inspecting the rope.

(c) Move the car 2 ft (610 mm) or 3 ft (914 mm) at a time and examine each rope at each of these stops. Note when broken wires begin to appear. Thereafter, check at frequent intervals to determine the rate of increase in the number of broken wires.

(d) Count the number of broken crown wires in a rope lay [see Table 1001.2(c)(29)(a) in A17.1d–2000 and earlier editions] measured along the length of a rope within which the spiral strands complete one turn about the axis. A lay may be considered as a section of rope approximately $6\frac{1}{2}$ times the diameter of the rope, that is, $3\frac{1}{4}$ in. (83 mm) for $\frac{1}{2}$ in. (13 mm) rope and $4\frac{1}{16}$ in. (103 mm) for $\frac{5}{8}$ in. (16 mm) rope.

3.23.2 Periodic Test

3.23.3 Acceptance

3.23.4 References

3.23.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 212 and Rules 206.7, 1001.2(c)(29), 1200.4d, and 1202.14.

A17.1–2000 and later editions — Requirements 2.20, 2.18.7, 8.11.2.1.3(cc), 8.6.2.5, and 8.7.2.21.

3.23.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Sections 212 and 1307; and Rule 1001.2(c)(29), 1004.2(c)(25), 1200.4d, 1202.14, and 1203.9.

A17.1–2000 and later editions — Requirements 3.16.3; 3.20; 8.11.3.1.3(u), (w), and (y); 8.7.2.21; and 8.7.3.25.

A17.3 – Paragraphs 4.8, and 4.9.10.

ITEM 3.24
TOP COUNTERWEIGHT CLEARANCE

3.24.1 Periodic Inspections

3.24.1.1 Electric Elevators. With the car at the bottom terminal landing, check the top counterweight clearance.

NOTE: The projection of rope fastenings or guide shoes above the counterweight structure may not always be an encroachment on the top counterweight clearance. However, excessive projection should not be permitted if interference with sheaves or other equipment would be encountered upon maximum overtravel.

3.24.2 Periodic Test

3.24.3 Acceptance

3.24.3.1 Electric Elevators. Measure and record the top counterweight clearance.

3.24.4 References

3.24.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 107.1h and 1001.2(c)(5).

A17.1–2000 and later editions — Requirements 2.4.9 and 8.11.2.1.3(e).

ITEM 3.25
CAR, OVERHEAD, AND DEFLECTOR SHEAVES

3.25.1 Periodic Inspections

3.25.1.1 Electric Elevators

(a) Car Sheaves. Inspect car sheave and sheave bearings for condition and adequacy of lubrication. Verify that sheave bearings are securely fastened to the frame members. Hammer test rim and spokes of sheaves as outlined in Item 2.26. Verify that required sheave guards are in place.

(b) Overhead and Deflector Sheaves. Inspect overhead and deflector sheaves where inspection cannot be made from the overhead as outlined in Item 2.26.

3.25.2 Periodic Test

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3.25.3 Acceptance

3.25.3.1 Electric Elevators. Record and check for compliance with drawings and specifications the diameter of drums, overhead sheaves, and deflector sheaves.

3.25.4 References

3.25.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 208.

A17.1–2000 and later editions — Requirement 2.24.

A17.3 — Paragraph 3.8.1.

ITEM 3.26
BROKEN ROPE, CHAIN, OR TAPE SWITCH

3.26.1 Periodic Inspections

3.26.1.1 Electric Elevators. Check the device by opening the switch by hand, and attempt to move the car. The car should not move. Verify that the linkage attached to the switch permits free operation of the switch.

3.26.2 Periodic Test

3.26.3 Acceptance

3.26.4 References

3.26.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 209.2c(2), 210.2(f), 1001.2(c)(9), and 1002.2i.

A17.1–2000 and later editions — Requirements 2.25.2.3.2, 2.26.2.6, 8.11.2.1.3(i), and 8.11.2.2.9.

A17.3 — Paragraph 3.10.4(d).

ITEM 3.27
CROSSHEAD DATA PLATE AND ROPE DATA TAGS

3.27.1 Periodic Inspections

3.27.2 Periodic Test

3.27.3 Acceptance

3.27.3.1 Electric Elevators. Check and verify the information on the crosshead data plate, the hoist rope data tag, and the governor rope data tag.

3.27.3.2 Hydraulic Elevators. Check and verify the information on the crosshead data plate. For roped-hydraulic elevators, check and verify hoist and governor rope data tags.

3.27.4 References

3.27.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 207.3, 212.2, 1001.2(c)(11), and 1202.14.

A17.1–2000 and later editions — Requirements 2.16.3, 2.20.2, 8.11.2.1.3(k), and 8.7.2.21.

A17.3 — Paragraph 3.12.2.

3.27.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 207.3, 212.2, 1001.2(c)(11), and 1202.14.

A17.1–2000 and later editions — Requirements 3.16, 2.20.2, 8.11.2.1.3(k), and 8.7.2.21.

A17.3 — Paragraph 3.12.2.

ITEM 3.28
COUNTERWEIGHT AND COUNTERWEIGHT BUFFER

3.28.1 Periodic Inspections

(a) Check that lock nuts and cotter pins at the top and bottom of the counterweight rods are in place and that filler weights (subweights) are securely held in place.

(b) Check that the counterweight guide shoes are securely fastened to the frame and that the guiding members are not worn excessively. Also, determine if swivel-type or roller-type guide shoes are free to move as intended.

(c) Where 2:1 roping is used, inspect the counterweight sheave and bearings for condition and adequacy of lubrication. Also, determine that the sheave bearings are securely fastened to the counterweight frame and whether required sheave guards are in place. Hammer-test the sheave rim and spokes as outlined in Item 2.26.

(d) Check fastenings for compensating chains or ropes to determine that they are securely fastened to the counterweight. For elevators installed under A17.1–1960 and later editions, compensating chains are required to be fastened directly to steel counterweight frames or to a bracket, but not to tie rods. Determine that compensating chains are suspended so that they will not catch on beams or other projections in the hoistway.

(e) Verify the top counterweight clearance and bottom counterweight runby.

(f) If a counterweight is provided and the space below the hoistway is not permanently secured against access, determine that a counterweight safety is provided.

(g) Verify that a counterweight guard is in place.

3.28.1.1 Electric Elevators. Where the counterweight buffer is attached to the counterweight, determine that the buffer fastening bolts are tight. Determine that the oil buffers are filled with oil to the proper level.

Refer to Item 5.9 for buffer inspection information.

3.28.1.2 Hydraulic Elevators. Verify that a counterweight buffer is not provided.

3.28.2 Periodic Test

3.28.3 Acceptance

3.28.3.1 Electric Elevators. Counterweights without either mechanical compensation or counterweight safeties may be located in a remote hoistway. See Item 4.11.

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3.28.4 References

3.28.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Sections 201 and 202 and Rule 1001.2(c)(13).

A17.1–2000 and later editions — Requirements 2.3, 2.4.9, 2.21, 2.22, 8.11.2.1.3(m), 8.11.2.1.5(c), and 8.11.2.3.3.

A17.3 — Sections 2.1.5, 2.4.3, 3.1, 3.2, and 4.9.

3.28.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 300.8f, 301.4, 301.9, and 1308.

A17.1–2000 and later editions — Requirements 3.3, 3.4.6, 3.22.3, and 8.11.3.2.3(d).

A17.3 — Paragraphs 4.9.2 and 4.9.6.

ITEM 3.29
COUNTERWEIGHT SAFETIES

3.29.1 Periodic Inspections

Check that all moving parts of the safety are lubricated, free from corrosion, free to operate, and that under ordinary operating conditions the clearance between the guide rail and each rail gripping face of the safety components is correct. Check that rope is free of corrosion and that rope fastenings are secure. Where provided, inspect the safety drum rope and its deflecting sheaves and their fastenings to determine that they are not worn excessively or corroded and that they are in operating condition. Safety rope must be made from a corrosion-resistant material (if not a continuation of the governor rope). Use of Tiller rope is prohibited.

Check the buffer portion of Type C safeties to determine that the oil level is within allowable limits. Also, test the buffer compression switch and the oil level device for proper functioning.

3.29.2 Periodic Test

(a) Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions). Check counterweight safeties as outlined in Item 2.29.

(b) 5-Year Test (for A17.1d–2000 and Earlier Editions); Category 5 Test (for A17.1–2000 and Later Editions). Check counterweight safeties as outlined in Item 2.29.

3.29.3 Acceptance

(a) Check that a metal marking plate has been securely attached to the safety plank, readily visible, and legibly and permanently marked. Check that the date is accurate and complies with the Code.

(b) If a couterweight is provided and the space below the hoisway is not permanently secured against access, verify that a counterweight safety is provided.

(c) Test the counterweight safeties as outlined in Item 2.29.

3.29.4 References

3.29.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 205 and Rules 109,1001.2(c)(14), 1002.3a, 1003.2, and 1308.

A17.1–2000 and later editions — Requirements 2.17.12.4, 2.18.5.3, 8.11.2.1.2(y), 8.11.2.1.3(k), 8.11.2.1.3(z), and 8.10.2.2.2(z).

A17.3 — Paragraphs 3.5.2, 3.6.2, and 3.12.2.

3.29.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 205 and Rules 109, 1001.2(c)(14), 1002.3a, 1003.2, and 1308.

A17.1–2000 and later editions — Requirements 3.17, 3.6, 3.21, 8.11.2.1.3(n), 8.11.2.3.1, 8.10.2.2.2(bb), and 8.2.3.

A17.3 — Section 3.5.2.

ITEM 3.30
SPEED TEST

3.30.1 Periodic Inspections

3.30.2 Periodic Test

3.30.3 Acceptance

3.30.3.2 Hydraulic Elevators. Check and verify the information on the crosshead data plate. Have the rated load placed in the car and use a tachometer to verify the rated speed going up and the operating speed in the down direction. The following procedure is recommended:

(a) After the top-of-car refuge area, top-of-car run-by, and operation of top-of-car operating device have been verified, have the rated load placed in the car and run it to the top with the top-of-car operating device while occupying the refuge area. Be sure to include the weight of the person in and on top-of-car in the load.

(b) Have an assistant inside the car place the car on independent service, if available, and place a call to the lowest landing.

(c) Hold a tachometer against the rail and determine the operating speed in the down direction.

(d) Have the person inside the car place a call to a midlevel landing.

Hold the tachometer against the rail and determine the rated speed.

For roped-hydraulic elevators, also verify the information on the hoist rope data tag, the governor rope data tag, and the rail lubrication marking plate.

3.30.4 References

3.30.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 205.16, 300.8, 301, 1004.2(c)(8), 1006.2g, and Section 3.

A17.1–2000 and later editions — Requirements 2.17.16, 3.4 (NR 301), 8.11.3.1.3(h), 8.10.3.2.3(cc), and 1.3.

A17.3 — Section 4.9.

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ITEM 3.31
SLACK ROPE DEVICE — ROPED-HYDRAULIC ELEVATORS INSTALLED UNDER A17.1b–1989 AND LATER EDITIONS

3.31.1 Periodic Inspections

3.31.1.2 Hydraulic Elevators. Visually inspect the slack rope device to verify that there is no damage or interference with its movement.

3.31.2 Periodic Test

3.31.2.2 Hydraulic Elevators: Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions). Have the car lowered on the safety or supports in the pit to prevent the car from reaching the first floor. The device should cause power to be removed from the lowering valve. Then attempt to run the car up. The device should not allow power to the pump. Jump the device, move the car up. Then remove the jumper and attempt to run the car by normal means. The car should not operate in either direction until the slack rope device is manually reset.

3.31.3 Acceptance

3.31.3.2 Hydraulic Elevators. Inspect the device and verify it will operate if any one of the ropes becomes slack.

3.31.4 References

3.31.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 302.1b, 306.4, 1004.2(c)(26), and 1005.2f.

A17.1–2000 and later editions — Requirements 3.18.1.2, 3.26.4, 8.11.3.1.3(z), and (NR 1005.2f).

A17.3 — Paragraph 4.9.9.

ITEM 3.32
TRAVELING SHEAVE — ROPED-HYDRAULIC ELEVATORS INSTALLED UNDER A17.1b–1989 AND LATER EDITIONS

3.32.1 Periodic Inspections

3.32.1.2 Hydraulic Elevators. Inspect the sheave for the following:

(a) secure tight fastening to plunger or cylinder.

(b) means to prevent slack ropes from leaving the sheave securely in place.

(c) guide shoes seated in guide rails and condition of guides and rails.

(d) rope changes. Where the material, grade, number, or diameter of ropes have changed and the existing sheave has been retained, check for approval by a licensed professional engineer of the original equipment manufacturer.

3.32.2 Periodic Test

3.32.3 Acceptance

3.32.3.2 Hydraulic Elevators. Verify the following:

(a) sheaves exceed the minimum allowable pitch diameter

(b) sheaves are marked with the minimum permissible groove bottom diameter

(c) finished grooves or lining for ropes

(d) fillet are provided for points of changes in diameter

(e) sheave in guide rails and condition of rails and guides

3.32.4 References

3.32.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 212; and Rules 208.2, 208.3, 208.5, 301.1b, 302.1b, 307, 1004.2(c)(27), and 1203.9.

A17.1–2000 and later editions — Requirements 2.20, 2.24.2, 2.24.3, 2.24.5, 3.23.2, 3.18.1.2, (NR 307), 8.11.3.1.3(aa), and 8.7.3.25.

A17.3 — Paragraph 4.9.8.

ITEM 3.33
COMPENSATING ROPES AND CHAINS

3.33.1 Periodic Inspections

3.33.1.2 Electric Elevators. Examine compensating chains and fastenings for excessive wear, damage, or deterioration. Sash cord wear is no indication of chain damage. See Item 3.23 for inspection of compensating ropes.

3.33.2 Periodic Test

3.33.4 Acceptance

3.33.4 References

3.33.4.2 Electric Elevators. A17.1d–2000 and earlier editions — Rules 202.4, 1001.2(c)(30), and 1003.2g.

A17.1–2000 and later editions — Requirements 2.21.4, 8.11.2.1.3(dd), 8.10.2.2.3(dd), and 8.10.2.2.5(h).

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(04)

PART 4
ELEVATOR — OUTSIDE HOISTWAY

ITEM 4.1
CAR PLATFORM GUARD

4.1.1 Periodic Inspections

Place the car 2 ft (610 mm) or 3 ft (914 mm) above one of the landings with the hoistway door open and inspect the guard to determine that it is in place and securely fastened. In some cases, the guard can be inspected from the pit with the car at the bottom terminal landing.

On truck loading elevators with collapsible gates, check that a head guard, which extends the full width of the hoistway door, is provided when the vertical hoistway door opening is greater than the distance from the car platform to the car top.

4.1.2 Periodic Test

4.1.3 Acceptance

For all elevators where a car leveling or truck zoning device is provided, check that there is a smooth metal guard extending a distance below the platform floor equal to the depth of the leveling or truck zone plus 3 in. (76 mm), but not less than 21 in. (533 mm) on the entrance side of the platform. This apron must have a width equal to or greater than the widest hoistway door opening.

4.1.4 References

4.1.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 203.9 and 1001.2(d)(1).

A17.1–2000 and later editions — Requirements 2.15.9 and 8.11.2.1.4(a).

A17.3 — Section 3.3 and para. 3.2.2.

4.1.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 301.6 and 1004.2(d)(1).

A17.1–2000 and later editions — Requirements 3.15 and 8.11.3.1.4(a).

A17.3 — Paragraph 3.3.2 {4.2.2}.

ITEM 4.2
HOISTWAY DOORS

4.2.1 Periodic Inspections

4.2.1.1 Electric Elevators

(a) Manually Operated Hoistway Door. Open and close each manually operated hoistway door, examine each, including any hand-operated latches, and note any broken glass panels in the doors or any structural defects in the frames. Try to open the door by pulling on it, and also by lifting it without touching the lock or latch. If it can be opened in this manner, the lock or latch is defective, or the door has sagged so that the lock or latch is not engaging properly. Check that pull straps are in good condition and properly secured on the upper panel of vertical slide biparting doors.

(b) Closed Position of Hoistway Door or Gate. With the car door or gate in the closed position and with the hoistway door or gate fully open, close the hoistway door or gate slowly from the landing side until the maximum clear opening is reached at which the actuation of the elevator operating device will cause the car to start. Measure the distance from the nearest face of the door jamb or gate sill to the nearest edge of the door or gate, or between the meeting edges of biparting doors. Verify that from this position the door cannot be reopened from the landing side.

The measured distance should not exceed the dimensions indicated in the following paragraphs:

(1) Horizontally sliding or swinging doors or vertically sliding counterweighted doors or gates, $\frac{3}{8}$ in. (9.5 mm), except for elevators installed under A17.1–1955 through 1990, horizontally sliding doors, 4 in. (102 mm), where the conditions set forth below are met.

(a) Car is operated from inside only.

(b) The doors are power closing or equipped with door closers that will normally close the door to $\frac{3}{8}$ in. (9.5 mm) of the closed position and lock it.

(c) Hoistway doors are equipped with auxiliary locks. (Item 3.17.1).

(d) Where hoistway doors are equipped with mechanical locks and electric contacts, 2 in. (51 mm).

(2) Vertically sliding biparting counterbalanced doors, when the astragal of the upper panel is within $\frac{3}{4}$ in. (19 mm) of the lower panel. For elevators installed under A17.1–1955 through 1991, this distance was when the door was not more than $\frac{3}{4}$ in. (19 mm) from their stopped position when provided with interlocks or when more than $\frac{3}{4}$ in. (19 mm) from their stopped position when provided with interlocks or when provided with mechanical locks and electrical contacts within 2 in. (54 mm) of contact with each other. The Code prohibits overlapping rigid astragals and center latches.

(3) Check the condition of the leading edges of the entrance panels. Verify that horizontally sliding doors

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are in the closed position when the car is waiting at a landing.

(c) Hoistway Door to Sill Clearance. Verify that door panels will not appreciably deflect, deform, or come out of the guides or tracks. For horizontally sliding doors installed under A17.1b–1992 and later editions, check that safety retainers are provided at the top and bottom of the panels. Verify that the clearances between door panels with each other, their frames, and their sills have not become excessive. The requirements became effective:

Door Type	Maximum Clearance, in.	Code Edition
Horizontal slide	3/8	1955 and later
Vertical slide	1	1971 and later
Swing	3/8	1971 and later

GENERAL NOTE: 1 in. = 25.4 mm

(d) Distance Between Panel(s) or Frame. On elevators installed under A17.1–1990 and later editions with horizontally and vertically sliding hoistway doors in the closed and locked position, apply 30 lbf (133 N) using a door test scale to the leading edge of the door at the furthest point from the interlock. Measure the gap at the furthest point from the interlock. The difference shall not exceed the 1 in. (25 mm) maximum per panel.

4.2.1.2 Hydraulic Elevators

(a) Manually Operated Hoistway Door. Open and close each manually operated hoistway door, examine each, including any hand-operated latches, and note any broken glass panels in the doors or any structural defects in the frames. Try to open the door by pulling on it, and also by lifting it without touching the lock or latch. If it can be opened in this manner, the lock or latch is defective, or the door has sagged so that the lock or latch is not engaging properly. Check that the pull straps are in good condition and properly secured on the upper panel of vertical slide biparting doors.

(b) Closed Position of Hoistway Door or Gate. With the car door or gate in the closed position and with the hoistway door or gate fully open, close the hoistway door or gate slowly from the landing side until the maximum clear opening is reached, at which the actuation of the elevator operating device will cause the car to start. Measure the distance from the nearest face of the door jamb or gate sill to the nearest edge of the door or gate, or between the meeting edges of biparting doors. Verify that from this position the door cannot be reopened from the landing side.

The measured distance should not exceed the dimensions indicated in the following paragraphs:

(1) For elevators installed under A17.1–1990 and earlier editions, horizontally sliding or swinging doors or vertically sliding counterweighted doors or gates, 3/8 in. (9.5 mm), except for elevators installed under A17.1–1955 through 1990, horizontally sliding doors, 4 in. (102 mm), where the conditions set forth below are met.

(a) Car is operated from inside only.

(b) The doors are power closing or equipped with door closers that will normally close the door to 3/8 in. (9.5 mm).

(c) Hoistway doors are equipped with auxiliary locks (Item 3.23.1).

(d) Where hoistway doors are equipped with mechanical locks and electric contacts, 2 in. (54 mm).

(2) For elevators installed under A17.1–1990 and earlier editions, vertically sliding biparting counterbalanced doors, when the astragal of the upper panel is within 3/4 in. (19 mm) of the lower panel. For elevators installed under A17.1–1955 through 1991, this distance was when the door was not more than 3/4 in. (19 mm) from their stopped position when provided with interlocks or provided with mechanical locks and electric contacts within 2 in. (54 mm) of contact with each other. The Code prohibits overlapping rigid astragals and center latches.

(3) For elevators installed under A17.1–1990 and later editions, 3/8 in. (9.5 mm) except 3/4 in. (19 mm) for vertically sliding biparting counterbalanced doors. Check the condition of the leading edges of the entrance panels. Verify that horizontally sliding doors are in the closed position when the car is waiting at a landing.

(c) Hoistway Door to Sill Clearance. For elevators installed under A17.1–1993 and later editions, check the hoistway door to sill clearance. Verify that door panels will not appreciably deflect, deform, or come out of the guides or tracks. For horizontally sliding doors installed under A17.1b–1992 and later editions, check that safety retainers are provided at the top and bottom of the panels. Verify that the clearances between door panels with each other, their frames, and their sills have not become excessive. The requirements became effective:

Door Type	Maximum Clearance, in.	Code Edition
Horizontal slide	3/8	1955 and later
Vertical slide	1	1971 and later
Swing	3/8	1971 and later

GENERAL NOTE: 1 in. = 25.4 mm

(d) Distance Between Panel(s) or Frame. On elevators installed under A17.1–1990 and later editions with horizontally sliding and vertically sliding hoistway doors in the closed and locked position, apply 30 lbf (133 N) using a door test scale to the leading edge of the door at the furthest point from the interlock. Measure the gap at the furthest point from the interlock. The difference shall not exceed the 1 in. (25 mm) max. per panel.

4.2.2 Periodic Test

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4.2.3 Acceptance

Examine hoistway doors, interlocks, and mechanical locks and electric contacts (see Item 4.4). Determine whether doors meet the requirements for passenger or for freight elevators. Measure the height and width of the entrance. Measure the distances between the hoistway face of horizontally sliding or swinging doors and the hoistway edge of the landing sill [see Table 3.14.3(b)]. Also, measure the distances between the hoistway face of the hoistway doors and the car door or gate (see Item 1.7.1). Check the measured distances. Check that the doors, door frame, and entrance hardware are labeled. See Item 3.17.3.

4.2.4 References

4.2.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 110; and Rules 111.7, 210.2, and 1001.2(d)(2).

A17.1–2000 and later editions — Requirements 2.11, 2.12.7, 2.26.2, and 8.11.2.1.4(b).

A17.3 — Paragraph 3.10.4.

4.2.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 110 {Rule 300.11}; Rules 111.2b and 111.3b {300.12}; and 306.4, 1004.2(d)(2), and 1006.2h.

A17.1–2000 and later editions — Requirements 2.11 {3.11}; 2.12.2.2 and 2.12.3.2 {3.12}; and 3.26.4, 8.11.3.1.4(b), and 8.10.3.2.3(r).

A17.3 — Paragraph 4.7.4.

ITEM 4.3
VISION PANELS

4.3.1 Periodic Inspections

Where vision panels are provided, note that clear wired glass is used and is secured in place. For elevators installed under A17.1–1990 and later editions, check that the required vision panel grill is in place.

4.3.2 Periodic Test

4.3.3 Acceptance

Check that elevators with automatic or continuous pressure operation, with manually operated or self-closing hoistway doors of the vertically or horizontally sliding type, have a vision panel at all landings except at landings of automatic operating elevators where a hall position indicator is provided.

Check that all horizontally swinging doors have vision panels.

When a glass door is provided, check the type of glass, thickness, minimum surface area, and edging.

4.3.4 References

4.3.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 110.7 and 1001.2(d)(3).

A17.1–2000 and later editions — Requirements 2.11.7 and 8.11.2.1.4(c).

A17.3 — Paragraph 2.6.3.

4.3.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 110.7 {300.11} and 1004.2(d)(3).

A17.1–2000 and later editions — Requirements 2.11.7 {3.11} and 8.11.3.1.4(c).

A17.3 — Paragraph 2.6.3 {Section 4.1}.

ITEM 4.4
HOISTWAY DOOR LOCKING DEVICES

4.4.1 Periodic Inspections

On doors or gates equipped with interlocks, which are unlocked automatically by retiring cams or similar devices, when the car is in the unlocking zone place the car near each landing outside this zone above and below the landing so that the automatic unlocking device on the car cannot release the interlock. With the car away from the landing, try to open the hoistway door by hand. It should not be possible to open the door. For sliding doors on elevators installed under A17.1a–1991 and later editions, check that a force of 30 lbf (133 N) applied at the farthest point from the interlock will not open the doors more than 1 in. (25 mm) per panel. Observe the door operation and note that on closing the doors do not bounce open beyond the close position.

On vertical sliding biparting doors with retiring cams, check the alignment of the cam and interlock rollers as follows: With the doors open and the car level with the landing, observe the alignment of the interlock roller with the retiring cam and note as well that the interlock roller is near the vertical center of the retiring cam so that the retiring cam cannot operate the interlock when the car is outside the landing zone.

4.4.2 Periodic Test

4.4.3 Acceptance

Determine whether interlocks or mechanical locks and electric contacts are provided [see Item 3.17.1(a)(6)]. Note that they are inaccessible from the landing side.

Verify that the interlocks, or the mechanical locks and electric contacts, are of a type that have been tested and approved, and are marked for identification [see Item 3.17.1(a)(5)].

Check the retiring cam and note that it is permanently marked with its horizontal force and horizontal movement. Verify that the horizontal force and movement comply with minimum code requirements. Where a modernization did not replace a retiring cam, which was installed under A17.1–1960 or earlier editions, the marking would not be present. See also Item 3.17.3.

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4.4.4 References

4.4.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 111 and Rule 1001.2(d)(4).

A17.1–2000 and later editions — Requirements 2.12 and 8.11.2.1.4(d).

A17.3 — Paragraph 2.7.1.

4.4.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 111 {Rule 300.12} and Rule 1004.2(d)(4).

A17.1–2000 and later editions — Requirements 2.12 {3.12} and 8.11.3.1.4(d).

A17.3 — Paragraph 2.7.1 {Section 4.1}.

ITEM 4.5
ACCESS TO HOISTWAY

4.5.1 Periodic Inspections

(a) Unlocking Devices. Check any escutcheons on doors and verify that they are intact, securely fastened in place, and not deformed. The unlocking device key is to be kept on the premises by a person responsible for the maintenance of the elevators and only accessible to qualified persons in case of emergency. For the elevators installed under A17.1–1978 and later editions, the key way should be located at a height not greater than 6 ft 11 in. (2.11 m) above the floor.

For elevators installed under A17.1a–1997 and later editions, check that there is a hoistway door unlocking device at each landing where there is an entrance.

(b) Hoistway Access Switches. Hoistway access switches were required for all elevators installed under A17.1–1955 edition. Hoistway access switches are required under certain conditions for elevators installed under A17.1–1960 and later editions. For elevators installed under A17.1b–1983 and later editions and A17.3, the movement of the car by upper access switch is limited in the down direction to the height of crosshead above the platform and in the up direction to the length of the platform guard. Check for proper operation. Verify that the switch key is kept in a location where it is available only to authorized persons.

4.5.2 Periodic Test

4.5.3 Acceptance

4.5.4 References

4.5.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 111.6, 111.7, and 1001.2(d)(5).

A17.1–2000 and later editions — Requirements 2.12.6, 2.12.7, and 8.11.2.1.4(e).

A17.3 — Paragraph 2.7.3.

4.5.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 111.6 and 111.7 {300.12}, and 1004.2(d)(5).

A17.1–2000 and later editions — Requirements 2.12.6 and 2.12.7 {3.12}, and 8.11.3.1.4(e).

A17.3 — Paragraph 2.7.3 {Section 4.1}.

ITEM 4.6
POWER CLOSING OF HOISTWAY DOORS

4.6.1 Periodic Inspections

4.6.2 Periodic Test

4.6.3 Acceptance

Where both a hoistway door and a car door or gate are opened and/or closed by power, check that the hoistway door and the car door or gate are

(a) both of the horizontally sliding type; or

(b) both of the vertically sliding type.

4.6.4 References

4.6.4.1 Electric Elevators. A17.1d–2000 and earlier editions – Section 112 and Rule 1001.2(d)(6).

A17.1–2000 and later editions — Requirements 2.13 and 8.11.2.1.4(f).

4.6.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 112.3 through 112.6 {300.13}, and 1004.2(d)(6).

A17.1–2000 and later editions — Requirements 2.13.3 through 2.13.6 {3.13}, and 8.11.3.1.4(f).

A17.3 — Section 2.8 {4.1}.

ITEM 4.7
SEQUENCE OPERATION

4.7.1 Periodic Inspections

Check the door sequence operation on elevators with vertical biparting power-operated hoistway doors and power-operated car doors or gates.

(a) During opening operation, hoistway door should be opened two-thirds or more of its travel before car door or gate starts to open.

(b) During closing operation, the car door or gate should be closed two-thirds or more of its travel before the hoistway door starts to close.

4.7.2 Periodic Test

4.7.3 Acceptance

4.7.4 References

4.7.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 112.6, 112.3d, and 1001.2(d)(7).

A17.1–2000 and later editions — Requirements 2.13.6, 2.13.3.4, and 8.11.2.1.4(g).

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4.7.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 112.6 and 112.3d {300.13}, and 1004.2(d)(7).

A17.1–2000 and later editions — Requirements 2.13.6 and 2.13.3.4 {3.13}, and 8.11.3.1.4(g).

ITEM 4.8
HOISTWAY ENCLOSURE

4.8.1 Periodic Inspections

(a) Hoistway Enclosures. Where openwork-type enclosures and doors are permitted and used, check enclosure panels at all floors and note whether they are securely fastened in place. Also, verify that wire netting or mesh required by the applicable regulations is in place and securely fastened.

(b) Glass Curtain Walls. A17.1f–1975 and later editions permit elevator hoistways with glass curtain walls. The panels are required to be laminated glass. See Item 1.11.

4.8.2 Periodic Test

4.8.3 Acceptance

Determine whether the hoistway enclosure conforms to building code requirements for fire-resistive construction.

Verify that means to prevent accumulation of smoke and hot gases, such as venting or pressurization, are provided as required by the applicable building code. See Item 3.11.

4.8.4 References

4.8.4.1 Electric Elevators. A17.1d–2000 and earlier editions – Rules 100.1, 100.4, 100.5, and 1001.2(d)(8).

A17.1–2000 and later editions — Requirements 2.1.1, 2.1.4, 2.1.5, and 8.11.2.1.4(h).

A17.3 — Paragraphs 2.1.1 and 2.1.2.

ANSI Z97.1 or CFR Part 1201.

4.8.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 100.1, 100.4, and 100.5 {300.1}; and 1004.2(d)(8).

A17.1–2000 and later editions — Requirements 2.1.1, 2.1.4, and 2.1.5 {3.1}; and 8.11.3.1.4(h).

A17.3 — Paragraphs 2.1.1 and 2.1.2 {Section 4.1}.

ITEM 4.9
ELEVATOR PARKING DEVICES

4.9.1 Periodic Inspections

Check operation of parking (service key) device and verify that all parts of the device are free to operate and that the door cannot be opened unless the car is at the landing. For elevators installed under A17.1–1978 and later editions, the device should be located at a height not greater than 6 ft 11 in. (2.11 m) above the floor.

4.9.2 Periodic Test

4.9.3 Acceptance

See Item 4.4.3.

4.9.4 References

4.9.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rule 1001.2(d)(9).

A17.1–2000 and later editions — Requirement 8.11.2.1.4(i).

A17.3 — Paragraph 2.7.2.

4.9.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rule 1004.2(d)(9).

A17.1–2000 and later editions — Requirement 8.11.3.1.4(i).

A17.3 — Paragraph 2.7.2 {Section 4.1}.

ITEM 4.10
EMERGENCY DOORS IN BLIND HOISTWAYS

4.10.1 Periodic Inspections

For elevators installed under A17.1–1955, check that emergency doors are closed, locked, and free from fixed obstructions. Check the operation of the door electric contact. For elevators installed under A17.1–1960 and later editions, check for the above and that the emergency doors are self-closing and self-locking. Verify that a cylinder-type lock with a minimum of five-pin or five-disc combination is provided, that the key is removable only in the locked position, and that the lock can be unlocked from the landing side only. Verify that the key for this lock is accessible only to elevator personnel. Check that a sign indicating "DANGER, ELEVATOR HOISTWAY" has been provided on the landing side of each emergency door.

4.10.2 Periodic Test

4.10.3 Acceptance

Check the operation of the self-closing device and functioning of the self-locking device, and that a door electric contact is provided. Check that it can be unlocked from the landing side only through the use of the cylinder-type lock, with a key that will not unlock any other door or device in the building.

Check that the key is kept where it is available only to elevator personnel.

Verify that cylinder-type lock with a minimum of either a five-pin or five-disc combination has been provided on the landing side of the door, that the key is removable only in the locked position, and that the door can be unlocked from the landing side.

NOTE: Emergency doors in blind hoistways are required on hydraulic elevators only where car safeties are used.

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4.10.4 References

4.10.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 110.1 and 1001.2(d)(10).

A17.1–2000 and later editions — Requirements 2.11.1.1, 2.11.1.2, 8.1, and 8.11.2.1.4(j).

4.10.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 110.1 and 1004.2.

A17.1–2000 and later editions — Requirements 2.11.1.1, 2.11.1.2, 8.1, and (NR 1004.2).

ITEM 4.11
SEPARATE COUNTERWEIGHT HOISTWAY

4.11.1 Periodic Inspections

Where the counterweight runs within a separate enclosure outside the hoistway, each rope and its fastening should be inspected at the door in such enclosure nearest to the top of the hoistway. Determine that inspection doors in the counterweight enclosure meet the requirements of the Code. Instruct the operator to move the car a short distance at a time and inspect the ropes.

The Code prohibits the location of counterweights outside the elevator hoistway, except for elevators without mechanical compensation or counterweight safeties installed under the A17.1f–1975 and later editions. A17.1f–1975 through A17.1b–1983, limited separate counterweight hoistways to observation-type elevators.

Elevators installed under A17.1–2000 and later editions, confirm that the enclosed stop switch, the permanent light switch, outlet, and light are provided in the hoistway immediately inside the entry door and that all function properly.

4.11.2 Acceptance

4.11.3 References

4.11.3.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 103.1, 103.3, 110.1, and 1001.2(d)(11).

A17.1–2000 and later editions — Requirements 2.3.1, 2.3.3, 2.11.1.1, 2.11.1.2, 2.26.2.27, and 8.11.2.1.4(k).

ITEM 4.12
STANDBY POWER SELECTION SWITCH

4.12.1 Periodic Inspections

Check that the standby power selection key is kept in a location where it is available only to authorized persons.

4.12.2 Periodic Test: Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions)

See Item 1.17.2.

4.12.3 Acceptance

4.12.4 References

4.12.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 211.2, 211.8, 1001.2(d)(13), and 1002.2g.

A17.1–2000 and later editions — Requirements 2.27.2, 2.27.8, 8.11.2.1.4(l), and 8.11.2.2.7.

A17.3 — Paragraph 3.11.2.

4.12.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 207.8 {301.10}, 211.2 and 211.8 {306.11}, 1002.2g, 1004.2(d)(11), and 1005.2c.

A17.1–2000 and later editions — Requirements 2.16.8 {3.16}, 2.27.2 and 2.27.8 {3.27}, 8.11.2.2.7, 8.11.3.1.4(k), and 8.11.3.2.3.

A17.3 — Paragraph 3.11.2 {4.7.8}.

ITEM 4.13
INSPECTION CONTROL

4.13.1 Periodic Inspections

4.13.2 Periodic Test

If provided, check the operation of the inspection control device. Check that the device only permits movement by a constant pressure means, and clearly indicates the direction of travel. If a plug in control station is used, verify that it is stored in the upper pit.

4.13.3 Acceptance

Verify that when the transfer switches located at each landing are enabled, only the inspection control device can operate the equipment. Verify that the switches are properly located, manually operated, protected against accidental contact, and properly labeled. Verify that if both switches are activated, then all inspection control devices are inoperative.

If a portable control station is used, verify that the cord does not exceed the maximum allowed length. If a plug-in portable control station is used, check that either a transfer switch is provided or that when the portable control station is plugged in, the control of the equipment is automatically transferred to the control station.

4.13.4 References

A17.1–2000 and later editions — Requirement 6.2.6.2.2.

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(04)

PART 5
ELEVATOR — PIT

ITEM 5.1
PIT ACCESS, LIGHTING, STOP SWITCH, AND CONDITION

5.1.1 Periodic Inspections

(a) Check that the means of access is safe, convenient, and accessible only to authorized persons.

(1) If a pit access door is provided, check that it is locked and is self-closing and can be opened from inside the pit without a key. A17.3 also requires that this door be kept closed and locked.

(2) If access is through the lowest landing, check that the hoistway door unlocking device or access switch operates properly.

(b) If access is through the lower landing and the pit floor is more than 4 ft (1 219 mm) below the access sill, check the required pit ladder for compliance and secure fastening to the wall. If the ladder is not secure, do not use it. A17.1–1978 and later editions required a pit ladder for pit extending more than 3 ft (914 mm) below the access sill.

(c) Check that the stop switch can be reached from the access entrance and that it will prevent the car from operating by placing it in the stop position and having a person in the car attempt to move it. In addition to the other requirements in A17.1–1971 and later editions require the stop and run positions to be marked on the switch. For elevators installed under A17.1–1978 through A17.1b–1992, two-pit switches are required when the pit access is from the lowest landing and the pit depth is more than 6 ft 7 in. (2 007 mm). For elevators installed under A17.1–1993 and later editions, two-pit switches are required when the depth exceeds 66 in. (1 676 mm). Verify that either switch will stop the car.

(d) The pit light switch must be accessible from the pit access door. Turn this switch on and verify that lighting meets Code requirements. A17.1a–1988 and later editions require the bulb to be guarded externally to reduce accidental breakage. This edition also requires that a duplex receptacle be provided in the pit.

(e) From a safe position on the landing or pit access door, use a light to visually inspect the pit for the presence of water, accumulation of combustible materials, oil or other materials, or equipment not related to the elevator operation. Carefully note the location of all equipment in the pit and under the car, and identify a refuge area to use in case the car runs down unexpectedly. Note the location of cars and equipment in adjacent hoistways. Sump covers level with the pit floor are required by A17.1a–1985 and later editions. On entering the pit examine for cleanliness especially in trenches and depressions allowed for buffers, vertically sliding doors, or structural members.

Check the pit area for the installation of any pipes or ducts not related to the operation of the elevator. For elevators installed under A17.1–1993 and later editions, a permanent means of preventing the accumulation of water is required.

(f) For elevators installed under A17.1a–1988 and later editions, check that a duplex receptacle has been provided in the pit. For elevators installed under ANSI/NFPA 70-1993, check the receptacle is provided with ground-fault circuit-interrupter protection.

For elevators installed under ANSI/NFPA 70-1996 and later editions, check that the receptacle is of the ground-fault circuit-interrupter type. A single receptacle supplying a permanently installed sump pump does not require ground-fault circuit-interrupter protection.

5.1.2 Periodic Test

5.1.3 Acceptance

Examine the pit construction for Code compliance and note that the pit floor is approximately level. If the pit has a drain, verify that it is not directly connected to a sewer.

5.1.4 References

5.1.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 102, 103.2, 106.1, 210.2(g), 1001.2(e)(1), and 1206.2a.

A17.1–2000 and later editions — Requirements 2.8, 2.3.2, (NR 106.1), 2.26.2.7, 8.11.2.1.5(a), and 8.6.4.7.

A17.3 — Paragraphs 2.3.1, 2.3.2, and 2.7.3.

NFPA 70 or CSA C22.1, as applicable.

5.1.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 102 {Rule 300.3}; and Rules 106.1 {300.7}, 300.10, 306.4, 1004.2(e)(1), and 1206.2a.

A17.1–2000 and later editions — Requirements 2.8 {3.8}; (NR 106.1) {3.2}, 3.6, 3.26.4, 8.11.3.1.5(a), and 8.6.4.7.

A17.3 — Paragraphs 2.3.1, 2.3.2, and 2.7.3 {Section 4.1}; and 3.10.4.

NFPA 70 or CSA C22.1, as applicable.

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ITEM 5.2
BOTTOM CLEARANCE, RUNBY, AND MINIMUM REFUGE SPACE

5.2.1 Periodic Inspections

If there has been an obvious change such as a new buffer, buffer mounting, or rope fastenings, check the car and counterweight bottom clearances and runbys (see Item 5.2.3).

5.2.1.1 Electric Elevators. The car and counterweight runby may be less than provided upon installation, provided the car and counterweight does not strike the buffer, the top car clearances have not been reduced below that required at the time of installation or alteration (Item 3.4), and the final terminal stopping devices remain operational (Items 2.26, 3.8, and 5.4). For spring-return type oil buffers, where compression is permitted, check that any compression of the car and counterweight buffers does not exceed 25% of the buffer stroke.

Where required, examine the counterweight guard for secure fastening and placement. In some cases, removable blocking is furnished in connection with the counterweight buffer to provide adjustment following rope stretch in order to secure proper counterweight runby without shortening the ropes. If smooth metal plates are used for blocking, examine for evidence of the plates being coated with oil and picked up by the counterweight.

Check the available refuge space for elevators installed under A17.1b–1972 and later editions.

5.2.1.2 Hydraulic Elevators. Check the available refuge space for elevators installed under A17.1e–1987 and later editions.

If a counterweight is provided, the minimum counterweight runby must not be reduced below the sum of the distance the car can travel above the top terminal landing until the plunger strikes its mechanical stop plus 150 mm (6 in.).

5.2.2 Periodic Test

5.2.3 Acceptance

5.2.3.1 Electric Elevators. Check the bottom car and counterweight clearance and runby for compliance with the Code requirements. Position the car above the lower landing to allow access to the pit. These may be determined as follows:

(a) Bottom Car Runby. See Fig. 5.2.3.

(1) Measure the distance from the landing sill to the car floor sill dimension *a*.

(2) Without moving the car, measure distance from the buffer to the buffer strike plate on the bottom of the car dimension *b*. Subtract *a* from *b*; this will be the bottom car runby. Note that a negative number indicates that the car will strike the buffer when level with the bottom landing.

(3) For spring-return-type oil buffers, where compression is permitted, check that any compression of the car and counterweight buffers does not exceed 25% of the buffer stroke.

(b) Bottom Car Clearance. See Fig. 5.2.3.

(1) Measure the distance (dimension *c*) from the lowest structure member beneath the car, ignoring roller guides, platform aprons, safety jaws, and other equipment located within 12 in. (305 mm) horizontally of the hoistway wall.

(2) Measure the distance from the buffer to the buffer striking plate on the car and add the buffer stroke to this measurement *b* plus buffer stroke. Subtract *b* plus buffer stroke from *c* to obtain the bottom car clearance. Do not consider trenches, depressions, or foundation encroachments when making these measurements. Also, use these measurements to determine that no part of the car or equipment will touch the floor when the car rests on its fully compressed buffer.

(c) Bottom Counterweight Runby. With the car level with the top terminal landing, visually check the distance between the bottom of the counterweight and the top of the counterweight buffer in the pit, or where a gravity-return counterweight buffer is used, between the buffer plunger and the striker block in the pit.

For spring-return-type oil buffers, where compression is permitted, check that any compression of the car and counterweight buffers does not exceed 25% of the buffer stroke.

Check the counterweight runby against the data plate shown in the pit.

5.2.3.2 Hydraulic Elevators. Check the bottom car clearance and runby for compliance with the Code requirements. Position the car above the lower landing to allow access to the pit. These may be determined as follows:

(a) Bottom Car Runby. See Fig. 5.2.3.

(1) Measure the distance from the landing sill to the car floor sill, dimension *a*.

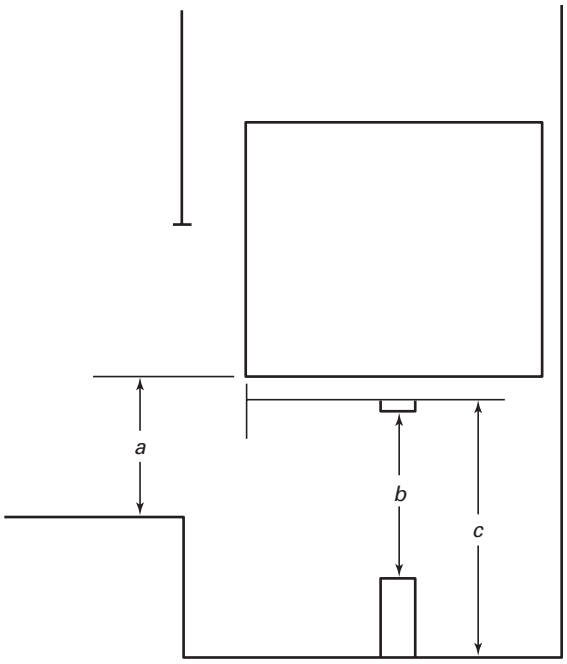
(2) Without moving the car, measure distance from the buffer to the buffer strike plate on the bottom of the car, dimension *b*. Subtract *a* from *b*; this will be the bottom car runby. Note that a negative number indicates that the car will strike the buffer when level with the bottom landing.

(b) Bottom Car Clearance. See Fig. 5.2.3.

(1) Measure the distance (dimension *c*) from the lowest structure member beneath the car, ignoring roller guides, platform aprons, and other equipment located within 12 in. (305 mm) horizontally of the hoistway walls.

(2) Measure the distance (dimension *b*) from the buffer to the buffer striking plate on the car and add the buffer stroke to this measurement. Subtract *b* plus buffer stroke from *c* to obtain the bottom car clearance. Do not consider trenches, depressions, or foundation

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Bottom car runby = $b - a$
Bottom car clearance = $c - (b +$ buffer stroke)

Example:
Buffer stroke = 10 in.
a = 24 in.
b = 30 in.
c = 66 in.

Bottom car runby = 30 in. – 24 in. = 6 in.
Bottom car clearance = 66 in. – (30 in. + 10 in.) = 26 in.

GENERAL NOTES: Minimum refuge space not less than (a) or (b) below.
(a) 24 in. by 48 in. by 24 in. high; or
(b) 18 in. by 36 in. by 42 in. high.

Fig. 5.2.3 Bottom Car Clearance Hydraulic Elevators

encroachments when making these measurements. Also, use these measurements to verify that no part of the car or equipment will touch the floor when the car rests on its fully compressed buffer.

(c) Bottom Plunger Clearance. Verify that with the car on full compressed buffers, the plunger does not strike the bottom of the casing. To do this, lower the car by inspection or manual lowering and fully compress the buffers. On spring buffers that may not be compressed easily, measure the distance from the buffer strike plate to the buffer springs with the car level with the landing (runby). Add to this distance the full stroke of the buffer. With the buffer springs removed, the car must be lowered at least the sum of the two distances.

If a counterweight is provided, verify the bottom counterweight runby and that no counterweight buffers are provided.

Check the counterweight runby against the data plate shown in the pit.

5.2.4 References

5.2.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 103.2, 107.1a, 107.1b, 201.4h, 1001.2(e)(2), 1202.14b, and 1206.8.

A17.1–2000 and later editions — Requirements 2.3.2, 2.4.1, 2.4.2, 2.22.4.8, 8.11.2.1.5(b), (NR 1202.14b), and 8.6.4.11.

A17.3 — Paragraphs 2.4.2 and 2.4.3.

5.2.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 300.8, 302.3c, 1004.2(e)(2), and 1006.2e.

A17.1–2000 and later editions — Requirements 3.4, 3.18.3.3, 8.11.3.1.5(b), and 8.10.3.2.5(c).

A17.3 — Paragraph 2.1.5.

ITEM 5.3
FINAL AND EMERGENCY TERMINAL STOPPING DEVICES

5.3.1 Periodic Inspections

5.3.1.1 Electric Elevators. The lower final terminal stopping device should be located as close to the terminal landing as possible without interfering with the normal terminal stopping device.

Where spring buffers are used, the lower terminal stopping device must stop the car before the car strikes the buffer. With the car parked as near the device as possible and the stop button in the stop position, use a light to check alignment of the device and the operating cam. The roller should be centered on the cam in such a position that the cam or roller will not be damaged when it operates. This must allow free motion of the roller arm and positive opening of the switch contact without damaging the switch. Have the car moved up

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and check that the device is securely fastened and not loose.

5.3.2 Periodic Test

5.3.2.1 Electric Elevators

(a) Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions). The operation of the final terminal stopping device (final limit) and its relation to the cam by jumping out the normal terminal stopping device and running the car past the terminal floor at slow speed. The car should stop as close to the floor as practical.

The final terminal stopping device should not function when the car is stopped by the normal terminal stopping device. Where spring buffers are used, verify that the device will function before the buffer is engaged. Measure the length of the cam and, using the bottom car runby and buffer stroke, check that the device will continue to function until the car rests on its fully compressed buffer. After this test, it will be necessary to jump the final terminal stopping device to move the car off of it.

(b) 5-Year Test of Emergency Terminal Stopping Means (for A17.1d–2000 and Earlier Editions); Category 5 Test of Emergency Terminal Stopping Means (for A17.1–2000 and Later Editions). For static control elevators see Item 2.28.2(b) and for emergency terminal speed limiting devices see Item 5.3.2.

5.3.3 Acceptance

5.3.4 References

5.3.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 209.3, 1001.2(e)(4), and 1003.2e.

A17.1–2000 and Later Editions – Requirements 2.25.3, 8.11.2.1.5(d), and 8.10.2.2.5(c).

A17.3 — Paragraph 3.9.2.

ITEM 5.4
NORMAL TERMINAL STOPPING DEVICES

5.4.1 Periodic Inspections

If the normal terminal stopping device is located in the hoistway, check that it is securely fastened, that the roller is in good condition and aligned with the cam. The alignment with the cam may have to be checked from the top of the car as described in Item 3.5.1.

5.4.2 Periodic Test

See Items 2.28 and 3.5.

5.4.3 Acceptance

5.4.4 References

5.4.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 209 and 1002.2e.

A17.1–2000 and later editions — Requirements 2.25 and 8.11.2.2.5.

A17.3 — Paragraph 3.9.1.

5.4.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 305.1, 1002.2e {1005.2c}, and 1004.2(e)(5).

A17.1–2000 and later editions — Requirements 3.25.1, 8.11.2.2.5 {8.11.3.2.3}, and 8.11.3.1.5(e).

A17.3 — Paragraph 3.9.1 {Section 4.6}.

ITEM 5.5
TRAVELING CABLES

5.5.1 Periodic Inspections

Examine the lower portion of the traveling cables and their connections to the car as outlined in Item 3.11. The cables should not touch the pit floor or rub against any other equipment. Examine visible portion of cables for wear, twist, or damage.

5.5.2 Periodic Test

5.5.3 Acceptance

5.5.4 References

5.5.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rule 102.2.

A17.1–2000 and later editions — Requirement 2.8.2.

NFPA 70 or CSA C22.1, as applicable.

5.5.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 102.2 {300.3} and 1004.2(e)(6).

A17.1–2000 and later editions — Requirements 2.8.2 {3.8} and 8.11.3.1.5(f).

NFPA 70 or CSA C22.1, as applicable.

ITEM 5.6
GOVERNOR-ROPE TENSION DEVICES

5.6.1 Periodic Inspections

Examine the governor-rope tension device and determine whether

(a) there is sufficient remaining travel of the sheave frame to maintain tension in the governor rope and that the frame is securely fastened to the hoistway

(b) the frame moves freely in its guides

(c) the operation of the sheave while the car is in motion, reveals no excessive wear of the sheave, shaft, or bearings, and that all parts are lubricated

(d) check for excess lubricant or other contaminants that may get on the governor rope

(e) with the car operating, listen for noise caused by rubbing or bearing in a failure mode

Lifting of the tension weights with the car at rest and the stop switch in the stop position may also assist in detecting defects.

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5.6.2 Periodic Test

5.6.3 Acceptance

5.6.3.1 Electric Elevators. See Item 2.28.3.

5.6.4 References

5.6.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 206.7, 1001.2(e)(7), and 1206.1a.

A17.1–2000 and later editions — Requirements 2.18.7, 8.11.2.1.5(g), and 8.6.1.6.2.

5.6.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 206.7, 301.8, 1004.2(e)(11), and 1206.1a.

A17.1–2000 and later editions — Requirements 2.18.7, 3.17.1, 8.11.3.1.5(k), and 8.6.1.6.2.

A17.3 — Paragraph 4.9.7.

ITEM 5.7
CAR FRAME AND PLATFORM

5.7.1 Periodic Inspections

Examine the car portion of the car frame accessible from the pit and determine whether all fastenings, including those between the car frame and the platform, are securely in place and that the frame is not distorted.

Examine the buffer strike plates to determine that they have not been deformed or removed.

Examine the frame and platform members and their fastenings. Distorted or straightened members, blistered paint, exuded rust from between members or around bolts or rivets, and oil bubbles on members may all be clues to a cracked or fractured member. Where examination reveals the possibility of a fracture, further investigation should be made as identified in Item 3.18.

Check any platform toe guards and aprons on entrance sides and determine whether they are securely fastened to the platform. Check platform balancing weights and determine whether they are securely fastened. Check the platform guard for secure fastening and length. If a truck zoning device is provided, the guard should meet Code requirements for this application.

If a wood car platform is provided, check the fire protection of the underside of the car platform for compliance. If a fire-retardant paint has been used, it should be in good condition. If the underside is clad with sheet metal, it must be in place.

5.7.2 Periodic Test

5.7.3 Acceptance

If a wood platform has been painted with fire-retardant paint, have the installer furnish data on the paint to verify Code compliance.

5.7.4 References

5.7.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 203.8, 203.6, 207.2b(3), and 1001.2(e)(9).

A17.1–2000 and later editions — Requirements 2.15.8, 2.15.6, 2.16.2.2, and 8.11.2.1.5(i).

A17.3 — Section 3.3.

5.7.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 308; and Rules 301.6, 302.2c, and 1004.2(e)(7).

A17.1–2000 and later editions — Requirements 3.28, 3.15, 3.18.2.3, and 8.11.3.1.5(g).

A17.3 — Section 3.3 {para. 4.2.2}.

ITEM 5.8
CAR SAFETIES AND GUIDING MEMBERS — INCLUDING ROPED-HYDRAULIC ELEVATORS INSTALLED UNDER A17.1b–1989 AND LATER EDITIONS

5.8.1 Periodic Inspections

5.8.1.1 Guide Rails

(a) Steel Guide Rails. Examine the car and counterweight guiding members and their fastenings to determine that they are properly secured, aligned, and adjusted, and that they are not worn excessively.

Determine that all moving parts of the safety are clean, lubricated, not corroded, free to operate, and that the clearance between the guide rail and each rail gripping face of the safety parts is in compliance with the Code (see note below).

Check that the rope used to connect the safety to the governor rope is securely fastened and snugly seated in the deflection sheaves without any kink or excess slack. The rope should not be corroded. On drum-operated safeties check that the safety drum rope is correctly wound on the drum. Where the safety jaws are connected with tie rods, such rods must be straight and secure.

If the safety switch is located here, inspect its condition, position, and fastening. Check to see that a metal marking plate is securely attached to the safety plank, readily visible, and legibly and permanently marked indicating the following:

(1) the maximum tripping speed, in ft/min (m/s), for which the safety may be used

(2) the maximum weight in pounds that the safety as installed is designed to stop and sustain

This marking plate has been required since A17.1–1955, but A17.3 does not require this marking plate. Prior to A17.1–1955 the safety was required to be marked with load and speed date, but no marking method was specified.

NOTE: A running clearance of $^{3}/_{32}$ in. (2.4 mm) was permitted for safeties installed under the 1937 and earlier editions of the Code. A clearance of $^{9}/_{64}$ in. (3.6 mm) is required for elevators installed

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under A17.1–1955 and later editions. This facilitates adjusting the governor rope movement (required to operate the safety mechanism to the point where the safety jaws exert pressure on the rails) to within the maximum permitted by Rule 205.11. The closer running clearance, permitted for the older safeties, may result in wear on the gripping surface of the jaws which requires careful inspection to detect, and may necessitate frequent readjustment. A17.3 does not address safety jaw running clearance but does address the safety rope pullout that often affects the safety jaw clearance. If sliding guides have been replaced with roller guides, the safety jaws must not touch the guide rail when the roller guide is at its fullest extent of movement.

(b) Wood Guide Rails. Make an examination of the following items in addition to the governor-rope system and guide rails.

(1) From the top of the car, examine all safety operating parts including levers and linkage to be sure that all keys and set screws are in place and tight. There should not be an excessive amount of lost motion in the transmittal of movement to the finger rods actuating the safety jaws.

(2) From the pit, with the elevator car platform at a convenient height, the safety jaws can be readily examined and applied against the guide rails by pulling the governor rope. The safety jaws should be brought in contact with both guide rails in such a manner that any downward motion of the car would cause the jaw teeth to dig into the rails.

(3) When a safety operating switch is provided, the motion of bringing the safety jaws in contact with the rails must be sufficient to operate the switch.

5.8.2 Periodic Test

5.8.2.1 Electric Elevators. See Item 2.29.

5.8.2.2 Hydraulic Elevators

(a) Yearly Test Inspection of Safeties (for A17.1d–2000 and Earlier Editions); Category 1 Test Inspection of Safeties (for A17.1–2000 and Later Editions)

(1) Examine the car guide shoes and their fastenings to verify that they are properly secured, aligned, and adjusted. Check the gibs or rollers for excessive wear.

(2) Under normal operating conditions, the clearance between the guide rail and each rail gripping face of the safety parts is approximately equal. The distance between the rail gripping faces of the safety parts shall not be less than the thickness of the guide rail plus $^{9}/_{64}$ in. (3.4 mm) with $^{1}/_{16}$ in. (1.6 mm) min. between either side of the rail and the gripping face.

(3) Inspect the mechanism to see that it is clean and lubricated and that there is no corrosion present.

(4) Before checking the adjustments of the trip (finger) rods and rollers, all crosshead pivot points and linkage shall be examined for lost motion, loose or missing set screws, and excessive friction. Any lost motion in the actuation lever shall be removed. Lost motion and the inertia of the governor-rope system may trip the safeties under normal starting conditions.

(5) With the elevator car platform at a convenient height, the safety can readily be checked from the pit to verify that

(a) all rollers are properly in place.

(b) trip (finger) rods are in position to pick up the rollers.

(c) when the governor rope is pulled to impart motion to the trip (finger) rods, the roller must move upward into the ultimate wedged positions in the safety block without restriction. The operation shall be repeated several times observing that the rollers fall toward the rail. When the "finger" engages the roller, if there is any tendency for the roller to fall away from the rail, a jam between the roller and safety block can result in a safety failure.

(d) normally, the rollers shall be at the lowest point of travel resting against the guard; the trip (finger) rods shall be adjusted so that the rollers engage simultaneously when wedged between the roller pocket and the guide rail.

(6) Verify that the switch contacts open before the safety jaws or rollers contact the guide rails. Then open the switch manually and verify that the car will not run when the switch is open.

(b) Yearly Test and Inspection of Wood Guide Rail Safeties (for A17.1d–2000 and Earlier Editions); Category 1 Test and Inspection of Wood Guide Rail Safeties (for A17.1–2000 and Later Editions)

(1) The effectiveness of safeties of this type depends on a substantial initial engagement of the toothed safety jaw with the wood guide rail in a manner to produce an increasing engagement with the rail until the car or counterweight is brought to rest. Therefore, the condition of the guide rails is a prime consideration in making an examination of the equipment.

(2) The guide rails must be of first quality selected wood with the width sized to fill the car guide shoe minus the normal running clearance. Guide rails that are more than $^{1}/_{8}$ in. (3.2 mm) undersize in width or show evidence of "combing" by the safety jaws shall be replaced.

(3) From the top of the car, examine all safety operating parts including levers and linkage to be sure that all keys and set screws are in place and tight. There shall not be an excessive amount of lost motion in the transmittal of movement to the finger rods actuating the safety jaws.

(4) From the pit, with the elevator car platform at a convenient height, the safety jaws can be readily examined and applied against the guide rails by pulling the governor rope. The safety jaws shall be brought in contact with both guide rails in such a manner that any downward motion of the car would cause the jaw teeth to dig into the rails.

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(5) When a safety operating switch is provided, the motion of bringing the safety jaws in contact with the rails shall be sufficient to operate the switch.

(c) Yearly Test of Safeties (for A17.1d–2000 and Earlier Editions); Category 1 Test of Safeties (for A17.1–2000 and Later Editions)

(1) After the safety has been inspected, position the car or counterweight in the lower portion of the hoistway so that it will be accessible after the test. Jump out the switches on the governor and safety (or that part of the safety circuit) that would prevent a full setting of the safety. Start the car in the down direction 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 actuating device before starting the car down. Run the car down until the safety sets and stops the car. Next, open the main line disconnect switch, remove any jumpers and proceed to the safety being tested.

NOTE: Verify that there is no excess slack in the suspension ropes that could result in the car falling should the safety slip. Examine all parts of the safety equipment to determine if anything is broken or out of order.

(2) Check the platform for level.

(3) After the safety has been examined, restore power and if necessary, jump the slack rope switch. Then release safety by moving the car in the up direction. Restore and reset the governor to operating position.

(4) Examine all of the safety parts to verify that they have returned to the normal running positions, and be sure that there is no slack in the safety rope.

(5) Inspect the guide rails for scoring and loose hardware. Dress any scored rail surface.

(6) It is not necessary to record the stopping distance in this test.

(7) Verify that all jumpers have been removed.

(d) Test of Wood Guide Rail Safeties. With governor-operated safeties, set the governor in the applied position and run the car in the down direction from the controller to see that it will operate the safety. Continue to operate until the 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 to see that the jaws come into proper position when a slack rope is obtained.

(e) 5-Year Test of Safeties [Rated Load, Rated Speed (except for where wooded guide rails are used)] (for A17.1d–2000 and Earlier Editions); Category 5 Test of Safeties [Rated Load, Rated Speed (except for where wooded guide rails are used) (for A17.1–2000 and Later Editions).

(1) Place the rated load on the elevator car platform using test weights, centered on each quarter symmetrically with relation to the centerline.

(2) Use a tachometer to determine the operating speed in the down direction with the rated load.

(3) Jump out any governor switches, or any part of the safety circuit, that will prevent a full setting of the safety. Adjacent cars shall be shut down during test.

(4) 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 the position at which the car safety mechanism is in the fully applied position. The opening of this switch has an effect on the safety slide, which must be taken into consideration.

(5) When testing safeties, the following steps must be considered:

(a) Make sure that any adjustable stops on the governor tension sheave are set very close to the movable unit.

(b) Make sure that the buffers are fully extended and filled to a normal level with oil.

(6) Add the dimension of the safety rope pullout to the estimated stopping distance in order to determine the distance the car will travel after the governor is tripped. Spot the car a distance above the point where the stop is desired. Put a reference mark on the governor with chalk. Move the car up a few floors, far enough to reach the mark at full speed. Start the car down and trip the governor by hand when you see the mark. Let the elevator run until the machine stops or the rope becomes slack then immediately remove power from the hoisting machine. The slack rope device should also open and require manual reset to operate the elevator. If a normal safety setting occurs, put all the cars back in service, except the one being tested. Before inspecting of the safety, be sure to check for excessive slack in suspension rope.

(7) Proceed to the elevator car and check the platform for level. It shall not be out of level more than $\frac{3}{8}$ in./ft (31 mm/m) in any direction.

(8) Move the car up to release the safety and reset the governor.

(9) For Type B safety, measure the slide marks on all four rail surfaces. Take the average and subtract the length of the safety jaws. This slide distance must be within the range given in the Code. It is recommended that the formulas in Part XIII of A17.1d–2000 and earlier editions be used to determine the maximum and minimum slide distance. When performing this rated load, rated speed test, the rated speed is the speed at which the governor is tripped during this test.

(10) Check the rails and dress any scored surface. Also, check for any loose rail or bracket fastenings.

(11) To inspect a car safety, move the car to a convenient height above the pit floor. Examine all parts of the equipment to determine if any are broken or out of order. Be sure that the ropes are in their sheave grooves. Be sure that the safety jaws and mechanisms have returned to the normal running position.

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(12) After the safety tests are complete, remove any jumpers from the safety switches and readjust the safety mechanism switch.

(13) Ensure the required test tags are installed.

Counterweights are seldom used on hydraulic elevators and counterweight safeties would be even less frequent. However, if they are found, they may be tested as follows.

Since counterweight safeties for hydraulic elevators are operated by breaking or slacking of the counterweight suspension means, the test shall be made by placing an extended jack and blocking under the counterweight. Then slowly move the car up allowing the counterweight to contact the safety. Then lower the jack, to obtain slack rope, to operate the safety and verify that the counterweight safety will stop and hold the counterweight, to obtain slack rope to operate the safety. It will be necessary to jump the slack rope device when conducting this test to prevent it from operating before sufficient slack rope is obtained to operate the safety. After this test the elevator should not operate until both the safety switch and the slack rope device are manually reset.

5.8.3 Acceptance

5.8.3.1 Electric Elevators. Examine the data on the safety marking plate and verify that it meets the requirements for the speed and load of the installation.

5.8.3.2 Hydraulic Elevators. The acceptance test is the same as the 5-year test (for A17.1d–2000 and earlier editions), Category 5 test of safeties (for A17.1–2000 and later editions). Examine the data on the safety marking plate and verify that it meets the requirements for the speed and load of the installation.

5.8.4 References

5.8.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 203 and Rules 205.11, 1001.2(e)(10), 1001.2b(2)(c), 1002.3a, 1206.1g, and 1202.4a.

A17.1–2000 and later editions — Requirements 2.15, 2.17.11, 8.11.2.1.5(j), [NR 1001.2b(2)(c)], 8.11.2.3.1, 8.6.4.5, and 8.7.2.15.1.

A17.3 — Section 3.5.

5.8.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Sections 205 and 1306; and Rules 301.8, 301.9, 1004.2(e)(10), 1005.2c, and 1005.4.

A17.1–2000 and later editions — Requirements 2.17 and 8.2.6; and 3.17.1, 3.17.2, 8.11.3.1.5(j), 8.11.3.2.3, and 8.11.3.4.

A17.3 — Paragraphs 4.9.6 and 4.9.8.

NOTE: Items 5.9 through 5.10 apply to electric elevators only.

ITEM 5.9
BUFFER AND EMERGENCY TERMINAL SPEED LIMITING DEVICES

5.9.1 Periodic Inspections

5.9.1.1 Electric Elevators

(a) Oil Buffers. Make the following examinations:

(1) Check the bolts holding the buffers and mounting to determine that they are tight.

(2) Check the buffer oil level by the means provided to determine that it is within the maximum and minimum allowable limits.

(3) Test the plunger for excessive side play.

(4) Verify that the plunger is free of dirt or rust.

(5) Check the buffer marking plate. A17.1–1987 and later editions require the stroke to be shown on the buffer marking plate. Check that the maximum and minimum loads, the maximum striking speed, and the oil viscosity, index number, and pour point are provided. A17.1–2000 and later editions also require that name, trademark, or file number for identification of the manufacturer and the certification markings on the buffer data plate.

(b) Spring Buffers. Check car and counterweight spring buffers to determine that

(1) they and their supports are securely fastened in place.

(2) they are vertical and in alignment with striker plates on the car or counterweight.

(3) springs are properly seated in the cup or other mounting provided.

(4) springs have not been deformed, obviously weakened, or damaged.

(5) the buffer marking plate is in place and contains all of the required information. A17.1–1986 and later editions require the number of springs to be shown on the buffer marking plate.

(6) removable springs are identified and that the marking plate indicates the identification.

(c) Solid Bumpers. Check car and counterweight solid bumpers to determine that

(1) they and their supports are securely fastened in place

(2) no damage or deterioration exists

(3) they are vertical and in alignment with the striker plates of the car or counterweight

5.9.2 Periodic Test

5.9.2.1 Electric Elevators

(a) Yearly Test of Oil Buffers (for A17.1d–2000 and Earlier Editions); Category 1 Test of Oil Buffers (for A17.1–2000 and Later Editions). Test the gravity and spring return type oil buffers by fully compressing the plunger and verifying that it will return to a full extended position in 90 s. If the buffer cannot be depressed by hand, it will be necessary to place blocking between the car or counterweight and operating downward at slow speed.

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This can be done by suspending a 4 × 4 beneath the car or counterweight in alignment with the buffer. It is usually best to operate the car at slow speed from the car top operator for this test. If the 4 × 4 cannot be suspended, it may be held in place with a 1 × 4 attached to it. This will allow the person holding it to position themselves in a safe position in case the 4 × 4 slips off of the buffer and/or the car continues to move. If possible, the person should be positioned outside the hoistway or in an adjacent pit with the adjacent pit car out of service. Test buffers on Type C safeties in the same manner.

Then place a 50 lb (23 kg) weight on spring return oil buffer and depress it 2 in. (51 mm). This can be done using a small hydraulic jack between the car and buffer. Release the buffer and verify that it will return to its fully extended position within 30 s.

Test the compression switch on gas spring return buffers by compressing the buffer ½ in. (13 mm) and using a ohmmeter to determine that the switch opens. Then move the car up, take one lead off of the switch, and verify that the car cannot operate with the switch open.

Test the buffer compression switch on Type C safety buffers by having the buffer compressed 10% of its stroke and use an ohmmeter to verify that the switch opens. Then move the car allowing the buffer to return to a fully extended position. Remove one of the leads from the switch and attempt to operate the car. The car must not operate with the lead removed. Restore the lead and remove one lead from the oil level switch. Again attempt to operate the car. This should also prevent operation of the car.

(b) 5-Year Test of Oil Buffers (for A17.1d–2000 and Earlier Editions); Category 5 Test of Oil Buffers (for A17.1–2000 and Later Editions)

(1) For car buffers, if the elevator is equipped with counterweight safeties, tie down the counterweight safety lift lever with four wraps of No. 16 gage copper wire or equivalent. This will avoid an accidental setting of the counterweight safety by inertia. Do not block the counterweight safety; it must remain workable. Reverse the procedure for testing the counterweight buffer. Place the rated load in the car. Jump out the terminal slow downs and directional switches. The final terminal stopping device must remain operative but temporarily relocated to permit full compression of the buffer. Take the cars in adjacent hoistways out of service.

(a) Full-Stroke Buffer. Move the car up sufficient to obtain rated speed and run the car into the buffer.

(b) Reduced Stroke Buffer. Temporarily reduce the speed of the car to the speed on the buffer marking plate. Then run the car into the buffer at this speed.

(c) Emergency Terminal Speed limiting Device. Where such a device is provided, determine that it is operational. Then run the car into the terminal at rated speed. The device should slow the car down so that the stop is no more severe than that produced by running the car into the buffer at the buffer design speed.

(2) After the test

(a) remove any jumpers that were installed

(b) examine the buffer for damage, excess oil loss and determine that the plunger returns to full extended position in 90 s

(c) examine the car (including car interior) for damage

(d) restore the final terminal stopping device to the proper position and test it as outlined in Item 5.4

(e) remove any tie-down that was wrapped on the car or counterweight lift lever

(f) have the required test tags installed

(3) For counterweight buffer, remove the rated load from the car and test the counterweight buffer as outlined for car buffers.

NOTE: This test is not required where Type C safeties are used.

5.9.3 Acceptance

5.9.3.1 Electric ELevators. Compare the data on the buffer marking plate with the data on the elevator layout drawings and the actual installed conditions of the elevator and verify that it meets Code requirements, especially for load rating, stroke, and speed, or number of springs.

5.9.4 References

5.9.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Section 201 and Rules 109.1, 210.2(w), 1002.3f, 1003.2e, 1206.1f, and 1308.2.

A17.1–2000 and later editions — Requirements 2.22 and 2.6, 2.26.2.22, 8.11.2.3.6, 8.10.2.2.5(c), 8.6.1.6.3, 8.2.3, and 8.3.1.3.

A17.3 — Section 3.1 and para. 3.10.4(m).

ITEM 5.10
COMPENSATING CHAINS, ROPES, AND SHEAVES

5.10.1 Periodic Inspections

5.10.1.1 Electric Elevators. Where compensating ropes or chains are used, determine that

(a) there is sufficient remaining travel of the sheave frame to maintain tension in the compensating ropes and to operate the compensating sheave switch. Ropes should have sufficient tension to remain within the sheave grooves.

(b) the sheave frame moves freely in the guides while the car is in motion.

(c) there is no evidence of excessive wear of the sheave, shaft, or bearings and all parts are lubricated.

(d) the car stops when the switch or switches operated by the compensating sheave frame are opened. Open

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these switches by hand while the car is in motion at lowest operating speed.

(e) the ropes or chains are properly hung and securely fastened to the underside of car and counterweight (see Items 3.22, 3.23, 3.28, and 3.34).

(f) inspect the portion of the compensating chains or ropes and their fastenings that could not be inspected from the car top. Where chains are used, examine for wear at mating links.

(g) if a tie-down is provided for holding the compensating-rope sheave during the operation of the safety or buffer, it should be visually examined for condition and damage.

(h) check the compensating sheave switch. Check the compensating rope tie-down, which was required for speeds exceeding 800 ft/min (4.06 m/s) in A17.1d–1970, and 700 ft/min (3.56 m/s) in A17.1–1971 to the present.

5.10.2 Periodic Test

5.10.3 Acceptance

5.10.3.1 Electric Elevators. Check the compensating rope tie-down if the rated speed is greater than 700 ft/min (3.56 m/s).

5.10.4 References

5.10.4.1 Electric Elevators. A17.1d–2000 and earlier editions) — Rules 202.4, 205.17, 210.2c, and 1001.2(e)(8).

A17.1–2000 and later editions — Requirements 2.21.4, 2.17.17, 2.26.2.3, and 8.11.2.1.5(h).

NOTE: Items 5.11 through 5.14 apply to hydraulic elevators only.

ITEM 5.11
PLUNGER AND CYLINDER

5.11.1 Periodic Inspections

5.11.1.2 Hydraulic Elevators. Examine the plunger for pitting, scoring, or corrosion that may cause excess leakage and create a safety hazard. Check that the means to collect leakage is in compliance with the Code and properly maintained.

Examine the plunger fastening to the car frame to verify that it is secure and adequately fastened to the car.

5.11.2 Periodic Test

5.11.3 Acceptance

5.11.4 References

5.11.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 302 and Rules 1004.2(e)(3) and 1206.5b.

A17.1–2000 and later editions — Requirements 3.18, 8.11.3.1.5(c), 8.6.5.1, 8.6.5.2, 8.6.5.5, and 8.6.5.6.

A17.3 — Paragraphs 4.3.1 and 4.3.2.

ITEM 5.12
CAR BUFFER

5.12.1 Periodic Inspections

5.12.1.1 Hydraulic Elevators

(a) Spring Buffers. Check car spring buffers to verify that

(1) they and their supports are securely fastened in place.

(2) they are vertical and in alignment with striker plates on the car.

(3) springs are properly seated in the cup or other mounting provided.

(4) springs have not been deformed, obviously weakened, or damaged.

(5) the buffer marking plate is in place and contains all of the required information. A17.1d–1986 and later editions require that the number of springs be indicated on the marking plate in addition to the other data.

(6) removable springs are identified and that the marking plate indicates the identification.

(b) Oil Buffers. When they are used refer to Item 5.3 for the required inspection and test.

(c) Solid Bumpers. Prior to the A17.1–1978 edition solid bumpers were allowed on passenger elevators with rated speed not exceeding 50 ft/min (0.25 m/s) and freight elevators with rated speed not exceeding 75 ft/min (0.38 m/s). A17.1–1978 did not allow the use of solid bumpers (except with Type C safeties). A17.1–1982 and later editions allow solid bumpers on hydraulic elevators that have an operating speed in the down direction of less than 50 ft/min (0.25 m/s). Check solid bumpers to verify that

(1) they and their supports are securely fastened in place

(2) no damage or deterioration exists

(3) they are vertical and in alignment with the striker plates of the car

(4) removable springs are identified and that the marking plate indicates the identification

5.12.2 Periodic Test

5.12.3 Acceptance

5.12.3.1 Hydraulic Elevators. Compare the data on the buffer marking plate with the data on the elevator layout drawings and the actual installed conditions of the elevator and verify that it meets Code requirements, especially for load rating, stroke, and speed, or number of springs.

5.12.4 References

5.12.4.1 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 301.3, 306.4, 1004.2(e)(4), 1206.1e, and 1308.2.

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A17.1–2000 and later editions — Requirements 3.22.1, 3.26.4, 8.11.3.1.5(d), 8.6.4.4, and 8.2.3.2.

A17.3 — Paragraph 4.2.1.

ITEM 5.13
GUIDING MEMBERS

5.13.1 Periodic Inspections

5.13.1.2 Hydraulic Elevators. Examine the car guiding members and their fastenings to verify that they are properly secured, aligned, and adjusted, and that they are not worn excessively. Examine for wear and proper lubrication. See also Item 3.18.

5.13.2 Periodic Test

5.13.3 Acceptance

5.13.4 References

5.13.4.1 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 308; and Rules 301.1, 1004.2(e)(8), and 1206.1d.

A17.1–2000 and later editions — Requirements 3.28, 3.23, 8.11.3.1.5(h), and 8.6.4.3.

ITEM 5.14
SUPPLY PIPING

5.14.1 Periodic Inspections

5.14.1.2 Hydraulic Elevators. Inspect supply piping as described in Item 2.18. Giving special attention to fitting and condition of piping. Piping supports are very important in pits since the pipe is subject to being stepped on. This can cause leaks and damage to connections. If a shutoff valve is in the pit, verify that it is in good condition and has an adequate pressure rating since failure of a pit valve could create a very hazardous condition.

5.14.2 Periodic Test

5.14.3 Acceptance

5.14.3.2 Hydraulic Elevators. Inspect as outlined in Item 2.35.4.

5.14.4 References

5.14.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Section 208 and Rules 1004.2(e)(9) and 1006.2f.

A17.1–2000 and later editions — Requirements 2.24, 8.11.3.1.5(i), and 8.10.3.2.2(r).

A17.3 — Paragraph 4.4.4.

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PART 6
ELEVATOR — FIREFIGHTERS' SERVICE

(04)

A17.1b–1973 and later editions and A17.3 require elevators to be provided with firefighters' service. This service was referred to previously as operation of elevators under fire or other emergency conditions.

ITEM 6.1
OPERATION OF ELEVATORS UNDER FIRE AND OTHER EMERGENCY CONDITIONS (A17.1b–1973 THROUGH A17.1b–1980)

6.1.1 Periodic Inspections

On all elevators provided with firefighters' service, check that the monthly operation log is maintained.

6.1.2 Periodic Test: Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions)

(a) General

(1) All automatic operating elevators serving three or more landings or having a travel of 25 ft (7.62 m) or more are required to return to the main floor, which is the floor providing egress from the building, or elevators without a landing at the main floor are required to return to the landing closest to the main floor or other approved landing. This is commonly referred to as Phase I Emergency Recall Operation.

(2) All automatic operating elevators having a travel of 70 ft (21.33 m) or more above the lowest grade elevation surrounding the building are required to have provisions to allow firefighters or other authorized personnel to operate the elevator on emergency in-car operation. This is commonly referred to as Phase II Emergency In-Car Operation.

(b) Phase I Emergency Recall Operation: Automatic Elevators

(1) A three-position ("ON," "OFF," and "BYPASS") key-operated switch must be provided at the main floor. When the main floor three-position key-operated switch is turned to the "ON" position, all cars must return to the main floor and park with the doors open. Elevators without a landing at the main floor must return to the landing closest to the main floor or other approved landing.

(2) The key is only permitted to be removable in the "ON" or "OFF" position.

NOTE: In order to cause as little inconvenience as possible with multiple elevator systems, it is suggested that the elevators be put back in service immediately, and one elevator at a time be isolated for individual testing.

(3) With the main floor key-operated switch in the "OFF" position and the car at the main floor, register several calls. With the inspector in the car, allow the car to run. As the car leaves the floor, have the main floor key switch turned to the "ON" position. The car must stop and reverse at or below the next available floor without opening the door(s) and return to the main floor where it is required to park with the door(s) open. As the car descends, operate the emergency stop switch to see that it has been rendered inoperative. Check that the car buttons have been rendered inoperative and that the car will not respond to any car calls. Also, determine that all call registered lights and lanterns are extinguished and remain inoperative.

(4) With the main floor key-operated switch in the "OFF" position, run the car to any floor. Then with the doors open, have the main floor key-operated switch turned to the "ON" position. Check to see that the door reopening devices for power-operated doors which are sensitive to smoke, heat, or flame are rendered inoperative. Check to see that the mechanical safety edge is still operative. With the doors open, actuate the emergency stop switch to see that it is operative. The doors may or may not close but the car must not move.

(5) Return the emergency stop switch to the "RUN" position. The automatic power-operated doors should close without delay and the car proceed to the main floor and park with the doors open.

(6) Check all call buttons to see that they are inoperative and call register lights and directional lanterns are extinguished when the main floor key-operated switch is in the "ON" position.

(7) Check to see that no stop switches other than those inside the car (i.e., pit, car top, etc.) and no safety circuits other than the door reopening devices which are sensitive to smoke, heat, or flame, as previously mentioned, are rendered inoperative when the main floor key-operated switch is in the "ON" position.

(8) With the main floor key-operated switch in the "OFF" position, activate the sensing device. A sensing device is required to be located in every elevator lobby except the main floor lobby, which when activated, will perform the same functions as previously described when the main floor key-operated switch is in the "ON" position. Sensing devices must be of the manually resetting type.

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NOTES:
(1) If the sensing system is connected to a central fire alarm system, notify proper authorities before activating.
(2) Sensing devices can be activated by using a test button if supplied, or by simulating smoke or heat and smoke conditions. Manufacturer's recommended test procedures should be followed. Use of chemical smoke may oversensitize smoke detectors.

(9) With the smoke sensor activated, turn the main floor key-operated switch to the "BYPASS" position. The elevator must return to normal service.

(c) Phase I Emergency Recall Operation: Attendant-Operated Elevators. Elevators operable only by a designated attendant in the car must be provided with both visual and audible signals.

(d) Phase I and Phase II Automatic Operating Elevators With Dual Operation. Elevators arranged for dual operation must, when on automatic operation, conform to Items 6.1.2(b) and (e), and when on attendant operation, conform to Item 6.1.2(c).

(e) Phase II In-Car Emergency Operation. Where Phase II operation is required, a three-position key-operated switch must be provided in or adjacent to the operating panel in each car. A17.1b–1973 through A17.1f–1975 required a three-position ("OFF," "ON," and "BYPASS") key-operated switch, the third position being used to bypass the interlocks. A17.1g–1976 removed the requirement for "BYPASS" position. The key must be removable in the "OFF" position only. With Phase I Service activated, turn the in-car key-operated switch to the "ON" position.

NOTE: The Inspector is cautioned to check the position of the various key switches relative to the installation date of the elevator to be tested.

(1) Check that the elevator is operable only by the car buttons and does not respond to corridor calls.

(2) Check that the doors will not open automatically at any floor except the main floor.

(3) Check that the opening of the door is controlled by a continuous pressure button or switch and that when the button or switch is released prior to the door reaching its fully open position, the door will automatically reclose.

(4) Check that fully opened doors can be closed only by registering a car call or by the use of an in-car door close button or switch.

(5) Check to see that Phase II operation once activated cannot be deactivated until the car has returned to the main floor. To do this, with the main floor key-operated switch in the "ON" position, take the car to any floor. Then turn the main floor key-operated switch 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.

(6) Turn the main floor key-operated switch to the "OFF" position or, if a smoke detector is activated, to the "BYPASS" position. Take the elevator to a floor above the main floor and turn the in-car key-operated switch to the "ON" position. Check to see that the Phase II operation does not operate unless the main floor key-operated switch is in the "ON" position or a smoke detector has been activated.

(f) Multideck Elevators. Multideck elevators should be inpsected as outlined in Items 6.1.2(b) through (e) as well as the following:

(1) The main floor key-operated switch for Phase I operation may be at either of the main floors.

(2) The in-car key-operated switch for Phase II operation must be located in the top deck. Check the operation of the in-car key-operated switch. The lower deck must be rendered out of service before the Phase II can be effective. Means for placing lower deck out of service must be located in that deck or adjacent to the entrance in the corridor.

(g) Operating Instructions and Keys

(1) Operating instructions for Phase I and Phase II service must be posted adjacent to the main floor key-operated switch. Instructions must be in letters not less than $\frac{1}{4}$ in. (6.4 mm) in height, be permanently installed, and protected against removal and defacement.

(2) All switches must be keyed alike for Phase I and Phase II operation and not be a part of building master key system. Keys must be kept on premises for the main floor switch plus a key for each in-car key-operated switch in a location readily accessible to authorized persons but not readily available to the public.

6.1.3 Acceptance

6.1.4 References

6.1.4.1 Electric Elevators. A17.1b–1973 through A17.1b–1980 — Rule 211.3.

A17.1d–2000 and earlier editions — Rules 112.3d, 112.5, 1001.2(d)(12), 1002.2f, and 1206.7.

A17.1–2000 and later editions — Requirements 2.13.3.4, 2.13.5, 8.11.2.1.4(l), 8.11.2.2.6, and 8.6.10.1.

6.1.4.2 Hydraulic Elevators. A17.1b–1973 through A17.1b–1980 — Rule 211.3.

A17.1d–2000 and earlier editions — Rules 112.3d and 112.5 {306.11}; and 1001.2(d)(12), 1002.2f, 1004.2(d)(12), and 1206.7.

A17.1–2000 and later editions — Requirements 2.13.3.4 and 2.13.5 {3.27}; and 8.11.2.1.4(l), 8.11.2.2.6, [NR 1004.2(d)(12)], and 8.6.10.1.

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ITEM 6.2
OPERATION OF ELEVATORS UNDER FIRE AND OTHER EMERGENCY CONDITIONS (A17.1–1981 THROUGH A17.1b–1983)

6.2.1 Periodic Inspections

On all elevators provided with firefighters' service, check that the monthly operation log is maintained.

6.2.2 Periodic Test: Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions)

(a) General

(1) All automatic operating elevators serving three or more landings or having a travel of 25 ft (7.62 m) or more will return to the main floor, which is the floor providing egress from the building, or elevators without a landing at the main floor must return to the landing closest to the main floor or other approved landing. This is commonly referred to as Phase I Emergency Recall Operation.

(2) All automatic operating elevators having Phase I must have provisions to allow firefighters or other authorized personnel to operate the elevator on emergency in-car operation. This is commonly referred to as Phase II Emergency In-Car Operation.

(b) Phase I Emergency Recall Operation: Automatic Elevators

(1) A three-position ("ON," "OFF," and "BYPASS") key-operated switch must be provided at the designated level. When the designated level three-position key-operated switch is turned to the "ON" position, all cars are required to return nonstop to the designated level and park with the doors open.

(2) The keys are only permitted to be removable in the "ON" and "OFF" positions.

NOTE: In order to cause as little inconvenience as possible with multiple elevator systems, it is suggested that the elevators be put back in service immediately and one elevator at a time be isolated for individual testing.

(3) With the designated level key-operated switch in the "OFF" position and the car at the main floor, register several calls. With the inspector in the car, allow the car to run. As the car leaves the floor, turn the designated level key-operated switch turned to the "ON" position. The car should stop and reverse at or below the next available floor without opening the door(s) and return to the designated level and park with the door(s) open. As the car descends, operate the emergency stop switch to see that it has been rendered inoperative. Check that the car buttons have been rendered inoperative and that the car will not respond to any car calls. Also, determine that all call-registered lights and in-car lanterns are extinguished and remain inoperative.

(4) With the main floor key-operated switch in the "OFF" position, run the car to any floor. Then with the doors open, have the main floor key-operated switch turned to the "ON" position. Check to see that the door reopening devices for power-operated doors that are sensitive to smoke, heat, or flame are rendered inoperative. Check to see that the mechanical safety edge and door operating buttons are still operative. With the doors open, actuate the emergency stop switch to see that it is operative. The doors may or may not close but the car must not move.

(5) Return the emergency stop switch to "RUN" position. The automatic power-operated doors must close without delay and the car proceed to the main floor and park with the doors open. If the elevator is equipped with vertically sliding doors with automatic or momentary pressure closing, the closing sequence should initiate and the car proceed to the designated level. If the elevator is equipped with manual doors or power-operated continuous pressure closing, the visual and audible signals should operate and when the doors close, the car should return to the designated level.

(6) Check all call buttons to see that they are inoperative and call-registered lights and directional lanterns are extinguished when the designated level key-operated switch is in the "ON" position.

(7) Check to see that no stop switches other than those inside the car (i.e., pit, car top, etc.) and no safety circuits other than the door reopening devices that are sensitive to smoke, heat, or flame, as previously mentioned, are rendered inoperative when the main floor key-operated switch is in the "ON" position.

(8) Check that the visual and audible signal device is activated.

(9) With the main floor key-operated switch in the "OFF" position, activate the smoke detector. A smoke detector is required to be located in every elevator lobby including designated level, and associated machine room, which when activated performs the same functions as previously described when the designated level key-operated switch is in the "ON" position. If the smoke detector at the designated level is activated, the elevators must return to an alternate level designated by the enforcing authority. Smoke detectors must not be self-resetting.

NOTES:

(1) If the sensing system is connected to a central fire alarm system, notify proper authorities before activating.

(2) Smoke detectors can be activated by using a test button if supplied, or by simulating smoke conditions. Manufacturer's recommended test procedures should be followed. Use of chemical smoke may oversensitize smoke detectors.

(10) With the smoke sensor activated, turn the designated level key-operated switch to the "BYPASS" position. The elevator must return to normal service.

(11) Check to see that there are no other devices other than the Phase I switch(es) or smoke detectors in

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the elevator lobbies, machine room, or hoistway that could initiate Phase I operation.

(c) Phase I Emergency Recall Operation: Attendant. Elevators operable only by a designated attendant in the car must be provided with both visual and audible signals.

(d) Phase I and Phase II Automatic Operating Elevators With Dual Operation. Elevators arranged for dual operation must, when on automatic operation, conform to Items 6.2.2(b) and (e), and when on attendant operation, conform to Item 6.2.2(c).

(e) Phase II In-Car Emergency Operation. Phase II operation requires that a two-position ("OFF," "ON") key-operated switch be provided in or adjacent to the operating panel in each car. The key must be removable in the "OFF" position only. With Phase I service activated and after the car has returned to the designated or alternate level, turn the in-car key-operated switch to the "ON" position.

(1) Check that the elevator is operable only by the car buttons and does not respond to corridor calls.

(2) Check that all corridor call buttons and directional lanterns are inoperative.

(3) Check that the opening of the door is controlled by a continuous pressure button or switch and that when the button or switch is released prior to the door reaching its fully open position the door will automatically reclose.

(4) Check that fully opened doors can be closed only by registering a car call or by the use of an in-car door close button or switch.

(5) Check to see that door reopening devices sensitive to smoke or flame are inoperative.

(6) Check to see that means provided to cancel car calls is operative by registering calls and cancelling them.

(7) Check to see that Phase II operation once activated cannot be deactivated until the car has returned to the designated or alternate level. To do this, with the designated level key-operated switch in the "ON" position and the in-car key-operated switch in the "ON" position, take the car to any floor except the designated floor. Then turn the designated level key-operated switch 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 designated or alternate level.

(8) Turn the designated level key-operated switch to the "OFF" position or, if a smoke detector is activated, to the "BYPASS" position. Take the elevator to a floor other than the designated level and turn the in-car key-operated switch to the "ON" position. Check to see that the Phase II operation does not operate even if the designated key-operated switch is turned to the "ON" position or a smoke detector has been activated.

(f) Multideck Elevators. Multideck elevators should be inspected as oulined in Items 6.2.2(b) through (e) as well as the following:

(1) The designated level key-operated switch for Phase I operation must be at the designated level served by the upper compartment.

(2) The in-car key-operated switch for Phase II operation must be located in the upper compartment. Check the operation of the in-car key-operated switch in accordance with Item 6.2.2(e).

(3) Check to see that means is provided for locking the lower deck out of service.

(g) Operating Instructions and Keys

(1) Operating instructions for Phase I service must be posted adjacent to the designated level key-operated switch. Instructions should be in letters not less than $\frac{1}{8}$ in. (3.2 mm) in height, be permanently installed, and protected against removal and defacement.

(2) All switches must be keyed alike for Phase I and Phase II operation and shall not be a part of building master key system. Keys should be kept on premises for the main floor switch plus a key for each in-car key-operated switch in a location readily accessible to authorized persons but not readily available to the public.

(h) Inspection Operation. Place the car on inspection operation and operate from top of car. Check that an audible signal sounds and that the elevator remains under control of top-of-car operating device when the Phase I key switch is in "ON" position or a smoke detector is actuated.

(i) Firefighters' Service When on Standby (Emergency Power). Elevators installed under A17.1b–1983 and later editions are required to have a manual selection switch to override an automatic sequencing of standby power. With the elevator at an upper floor, switch the power to the elevators to standby power and place the Phase I key-operated switch in the "ON" position. Activate the manual selection switch to select a car other than that selected by the automatic sequencing. If the manual selection switch is key operated, it must use the same key as the firefighters' service key.

6.2.3 Acceptance

6.2.4 References

6.2.4.1 Electric Elevators. A17.1–1981 through A17.1b–1983 — Rule 211.3.

A17.1d–2000 and earlier editions — Rules 112.3d, 112.5, 1001.2(d)(12), 1002.2f, and 1206.7.

A17.1–2000 and later editions — Requirements 2.13.3.4, 2.13.5, 8.11.2.1.4(l), 8.11.2.2.6, and 8.6.10.1.

6.2.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 112.3d, 112.5, 1001.2(d)(12), 1002.2f, and 1206.7.

A17.1–2000 and later editions — Requirements 2.13.3.4, 2.13.5, 8.11.2.1.4(l), 8.11.2.2.6, and 8.6.10.1.

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ITEM 6.3
FIREFIGHTERS' SERVICE
(A17.1–1984 THROUGH A17.1a–1988 and A17.3)

6.3.1 Periodic Inspections

On all elevators provided with firefighters' service, check that the monthly operation log is maintained.

6.3.2 Periodic Test: Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions)

Elevators required to comply with A17.3 must comply with A17.1–1987 or later editions.

(a) General. All elevators that have a travel of 25 ft (7.62 m) or more above or below the designated level (see definition) are required to conform to Rules 211.3 through 211.8.

(b) Phase I Emergency Recall Operation: Automatic Elevators

(1) A three-position ("ON," "OFF," and "BYPASS") key-operated switch must be provided at the designated level. When the designated level key-operated switch is turned to the "ON" position, all cars must return to the designated level and park with the doors open.

(2) The keys are only permitted to be removable in the "ON" or "OFF" position.

NOTE: In order to cause as little inconvenience as possible with multiple elevator systems, it is suggested that the elevators be put back in service immediately, and one elevator at a time be isolated for individual testing.

(3) With the designated level key-operated switch in the "OFF" position and the car at the designated level, register several calls. With the inspector in the car, allow the car to run. As the car leaves the floor, have someone turn the designated level key-operated switch to the "ON" position. The car should stop and reverse at or below the next available floor without opening the doors(s) and return to the designated level where it should park with the door(s) open. As the car descends, operate the emergency stop switch to see that it has been rendered inoperative. Check that the car buttons have been rendered inoperative and that the car will not respond to any car calls. Also, determine that all call registered lights and in-car lanterns are extinguished and remain inoperative.

(4) With the designated level key-operated switch in the "OFF" position, run the car to any floor. Then with the doors open, have the designated level key-operated switch turned to the "ON" position. Check to see that the door reopening devices for power-operated doors, which are sensitive to smoke or flame, are rendered inoperative. Check to see that the mechanical safety edge and "DOOR OPEN" buttons are still operative and that door closing conforms to Rule 112.5. With the doors open, actuate the emergency stop switch to see that it is operative. The doors may or may not close, but the car must not move.

(5) Return the emergency stop switch to the "RUN" position. The automatic power-operated doors should close without delay and the car proceed to the designated level and park with the doors open. If the elevator is equipped with vertically sliding doors with automatic or momentary pressure closing, the closing sequence should initiate and the car proceed to the designated level. If the elevator is equipped with manual doors or power-operated continuous pressure closing, the visual and audible signals required by Rule 211.3a(7) must operate and when the doors are closed, the car should return to the designated level.

(6) Check all call buttons to see that they are inoperative and call register lights and directional lanterns are extinguished when the designated level key-operated switch is in the "ON" position.

(7) Check to see that no stop switches other than emergency stop switch inside the car (i.e., pit, car top, etc.) and no safety circuits other than the door reopening devices, which are sensitive to smoke or flame, as previously mentioned, are rendered inoperative when the designated level key-operated switch is in the "ON" position.

(8) Check that the visual and audible signal device is activated.

(9) With the designated level key-operated switch in the "OFF" position, activate the smoke detector. A smoke detector must be located in every elevator lobby, including designated level and associated machine room, which, when activated, performs the same functions as previously described when the designated level key-operated switch is in the "ON" position. If the smoke detector at the designated level is activated, the elevator should return to an alternate level designated by the enforcing authorities unless the Phase I switch is activated. Smoke detectors must not be self-resetting.

NOTES:
(1) If the sensing system is connected to a central fire alarm system, notify proper authorities before activating.
(2) See Rule 211.3b for locations when sensing devices are not required. Smoke detectors can be activated by using a test button if supplied, or by simulating smoke conditions. Manufacturer's recommended test procedures should be followed. Use of chemical smoke may oversensitize smoke detectors.

(10) With the smoke detector activated, turn the designated level key-operated switch to the "BYPASS" position. The elevator must return to normal service.

(c) Phase I Emergency Recall Operation: Attendant-Operated Elevators. Elevators operable only by a designated attendant in the car must be provided with both visual and audible signals.

(d) Phase I and Phase II Automatic Operating Elevators With Dual Operation. Elevators arranged for dual operation, except hospital service, must, when on automatic

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operation, conform to Items 6.3.2(b) and (e), and when on attendant operation, conform to Item 6.3.2(c). The elevator must revert to automatic operation not less than 15 s nor more than 60 s after Phase I activation.

(e) Phase II In-Car Emergency Operation: Automatic Elevators. Phase II operation requires that a three-position key-operated switch must be provided in or adjacent to the operating panel in each car. The key must be removable in the "OFF," "HOLD," or "ON" positions. With Phase I service activated and after the car has returned to the designated or alternate level, turn the in-car operated switch to the "ON" position.

(1) Check that the elevator is operable only by the car buttons and does not respond to corridor calls.

(2) Check that all corridor call buttons and directional lanterns are inoperative.

(3) Check that the opening of the door is controlled by a continuous pressure button or switch and that when the button or switch is released prior to the door reaching its fully open position the door will automatically reclose.

(4) Check that fully opened doors can be closed only by continuous pressure on a door close button.

(5) Check to see that the door reopening devices sensitive to smoke or flame are inoperative.

(6) Check that the means provided to cancel car calls is operative by registering calls and cancelling them. All elevators installed under A17.1a–1985 or later editions require a separate car "CALL CANCEL" button.

(7) Check to see that Phase II operation once activated cannot be deactivated until the car has returned to the designated or alternate level. To do this, with the designated level key-operated switch in the "ON" position, and the in-car key-operated switch in the "ON" position, take the car to any floor except the designated floor. Then turn the designated level key-operated switch 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 designated or alternate level.

(8) Turn the designated level key-operated switch to the "OFF" position or, if a smoke detector is activated, to the "BYPASS" position. Take the elevator to a floor other than the designated level and turn the in-car key-operated switch to the "ON" position. Check to see that the Phase II operation does not operate even if the designated level key-operated switch is turned to the "ON" position or a smoke detector has been activated.

(9) Take the car to an upper floor and with the door closed, turn the in-car key-operated switch to the "OFF" and "HOLD" position. It should have no effect on the Phase II operation.

(10) Take the car to an upper floor and with the doors open, place the in-car key-operated switch in the "HOLD" position. The car should remain at the floor and the door close button should be inoperative. Take the car to an upper floor, and with the doors open, place the in-car key-operated switch in the "OFF" position. The car should respond as specified in Item 6.3.2(e)(7) and return nonstop to the designated level.

(f) Multideck Elevators. Multideck elevators should be inspected as outlined in Items 6.3.2(b) through (e) in addition to the following:

(1) The designated level key-operated switch for Phase I operation should be at the designated level served by the upper compartment.

(2) The in-car key-operated switch for Phase II operation must be located in the upper compartment. Check the operation of the in-car key-operated switch in accordance with Item 6.3.2(e).

(3) Check to see that means is provided for locking the lower deck out of service.

(g) Operating Instructions and Keys

(1) Operating instructions for Phase I service should be posted adjacent to the designated level key-operated switch. Instructions for operating under Phase II operation should be incorporated with or adjacent to the in-car key-operated switch. Instructions should be in letters not less than $\frac{1}{8}$ in. (3.2 mm) in height, be permanently installed, and protected against removal and defacement.

(2) All switches should be keyed alike for Phase I and Phase II operation and not be a part of building master key system. Keys should be kept on premises for the designated level switch plus a key for each in-car key-operated switch in a location readily accessible to authorized persons but not readily available to the public.

(h) Inspection Operation. Place the car on inspection operation and operate from top of car. Check that an audible signal sounds and that the elevator remains under control of the top-of-car operating device when the Phase I key switch is in the "ON" position or a smoke detector is actuated.

(i) Firefighters' Service When on Standby (Emergency Power). Elevators are required to have a manual selection switch to override an automatic sequencing of standby power. With the elevator at an upper floor, switch the power to the elevators to standby power and place the Phase I key-operated switch in the "ON" position. Activate the manual selection switch to select a car other than that selected by the automatic sequencing. If the manual selection switch is key operated, it must use the same key as the firefighters' service key.

6.3.3 Acceptance

6.3.4 References

6.3.4.1 Electric Elevators. A17.1–1984 through A17.1a–1988, Rules 211.3 through 211.8.

A17.1d–2000 and earlier editions — Rules 112.3d, 112.5, 1001.2(d)(12), 1002.2f, and 1206.7.

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A17.1–2000 and later editions — Requirements 2.13.3.4, 2.13.5, 8.11.2.1.4(l), 8.11.2.2.6, and 8.6.10.1.

A17.3 — Paragraph 3.11.3.

6.3.4.2 Hydraulic Elevators. A17.1–1984 through A17.1a–1988 — Rules 211.3 through 211.8.

A17.1d–2000 and earlier editions — Rules 112.3d, 112.5, 1001.2(d)(12), 1002.2f, and 1206.7.

A17.1–2000 and later editions — Requirements 2.13.3.4, 2.13.5, 8.11.2.1.4(l), 8.11.2.2.6, and 8.6.10.1.

A17.3 — Paragraph 3.11.3.

ITEM 6.4
FIREFIGHTERS' SERVICE
(A17.1b–1989 THROUGH A17.1d–2000)

6.4.1 Periodic Inspections

Check that the monthly operation log is maintained.

6.4.2 Periodic Test: Yearly Test (for A17.1d–2000 and Earlier Editions); Category 1 Test (for A17.1–2000 and Later Editions)

(a) General. All elevators that have a travel of 25 ft (7.62 m) or more are required to conform to Rules 211.3 through 211.8.

(b) Phase I Emergency Recall Operation: Automatic Elevators. A three-position ("ON," "OFF," and "BYPASS") key-operated switch should be located in the elevator lobby in site of the elevator. It should not be behind a locked door or cover. An additional two-position "OFF" and "ON" key-operated switch may be provided at any location.

(1) When the designated level three-position key-operated switch is turned to the "ON" position, all cars should return to the designated level and park with the doors open. For elevators installed under A17.1–1993 and later editions with two entrances at the designated level, verify that the entrance to the lobby with the Phase I key-switch opens.

(2) The key is only permitted to be removable in the "ON" or "OFF" position.

NOTE: In order to cause as little inconvenience as possible with multiple elevator systems, it is suggested that the elevators be put back in service immediately and one elevator at a time be isolated for individual testing.

(3) With the designated level key-operated switch in the "OFF" position and the car at the designated level, register several calls. With the inspector in the car, allow the car to run. As the car leaves the floor, turn the designated level key-operated switch to the "ON" position. The car should stop and reverse at or below the next available floor without opening the door(s) and return to the designated level where it should park with the door(s) open. As the car descends, operate the in-car stop switch or emergency stop switch to see that it has been rendered inoperative. Check that the car buttons have been rendered inoperative and that the car will not respond to any car calls. Also, determine that all call registered lights and in-car lanterns are extinguished and remain inoperative.

(4) With the designated level key-operated switch in the "OFF" position, run the car to any floor. Then with the doors open, have the designated level key-operated switch turned to the "ON" position.

Check to see that the door reopening devices for power-operated doors, which are sensitive to smoke or flame, are rendered inoperative. Check to see that the mechanical safety edge and "DOOR OPEN" buttons are still operative and that door closing conforms to Rule 112.5. With the doors open, actuate the emergency stop switch to see that it is operative. The doors may or may not close but the car must not move.

(5) Return the emergency stop switch to the "RUN" position. The automatic power-operated doors must close without delay and the car should proceed to the designated level and park with the doors open. If the elevator is equipped with vertically sliding doors with automatic or momentary pressure closing, the closing sequence should initiate and the car proceed to the designated level. If the elevator is equipped with manual doors or power-operated continuous pressure closing, the visual and audible signals required by Rule 211.3a(4)(c) should operate and when the doors are closed the car return to the designated level.

(6) Check all call buttons to see that they are inoperative and call register lights and directional lanterns are extinguished when the designated level key-operated switch is in the "ON" position. Position indicators, where provided, must remain in service.

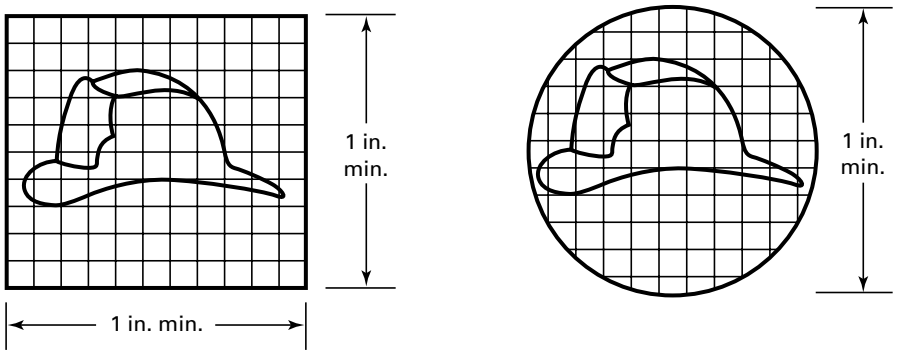
(7) Check to see that no emergency stop switches other than those inside the car (i.e., pit, car top, etc.) and no safety circuits other than the door reopening devices, which are sensitive to smoke or flame, as previously mentioned, are rendered inoperative when the designated level key-operated switch is in the "ON" position.

(8) Check installations with vertical slide doors that corridor "DOOR OPEN" and "DOOR CLOSE" buttons remain operative.

(9) Check that the visual and audible signal device is activated. For elevators installed under A17.1–1990, verify that the visual signal graphic is as shown in Fig. 6.4.2(b)(9).

(10) With the designated level key-operated switch in the "OFF" position, activate the smoke detector. A smoke detector should be located in every elevator lobby, including designated level and associated machine room, which, when activated, performs the same functions as previously described when the designated level key-operated switch is in the "ON" position. If the smoke detector at the designated level is activated, the elevator should return to an alternate level designated by the enforcing authorities. Smoke detectors may

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GENERAL NOTE: Grid is for scaling purposes only.

Fig. 6.4.2(b)(9) Visual Signal

be installed in any hoistway and must be installed in hoistways that are sprinklered. For elevators installed under A17.1–1993 and later editions, activate any smoke detectors in the hoistway at or below the lowest landing of recall. Check the elevator returns to the upper recall level. No smoke detectors, other than those referenced, or other devices are permitted to activate automatic Phase I recall. Smoke detectors must not be self-resetting.

NOTES:
(1) If the sensing system is connected to a central fire alarm system, notify proper authorities before activating.
(2) See Rule 211.3b for locations when sensing devices are not required. Smoke detectors can be activated by using a test button if supplied, or by simulating smoke conditions. Manufacturer's recommended test procedures should be followed. Use of chemical smoke may oversensitize smoke detectors.

(11) With the smoke detector activated, turn the designated level key-operated switch to the "BYPASS" position. The elevator must return to normal service. With the designated level smoke detector activated and the designated level key-operated switch in the "OFF" position, turn the additional Phase I switch, if provided, to the "ON" position. The car must remain at the alternate level.

(12) If the car is provided with an in-car "DOOR OPEN" button, take the car to an upper floor. With the door open, have the designated level key-operated switch turned to the "ON" position. The in-car "DOOR OPEN" button should remain operative until the car moves away from the landing.

(13) Turn the additional two-position Phase I switch, if provided, to the "ON" position; turn the three-position Phase I switch to the "BYPASS" position. The elevator must remain on Phase I and not return to normal service.

(c) Phase I Emergency Recall Operation: Attendant-Operated Elevators. Elevators operable only by a designated attendant in the car must be provided with both visual and audible signals.

(d) Phase I and Phase II Automatic Operating Elevators With Dual Operation. Elevators arranged for dual operation must, when on automatic operation, conform to Items 6.4.2(b) and (e), and when on attendant operation, conform to Item 6.4.2(c). The elevator must revert to automatic operation not less than 15 s nor more than 60 s after Phase I activation.

(e) Phase II In-Car Emergency Operation: Automatic Elevators. Phase II operation requires that a three position key-operated switch ("OFF," "HOLD," and "ON" in that order) be provided in the operating panel in each car. The key should be removable in the "OFF," "HOLD," or "ON" position. With Phase I service activated and after the car has returned to the designated or alternate level, turn the in-car key-operated switch to the "ON" position.

(1) Check that the elevator is operable only by the car buttons and does not respond to corridor calls.

(2) Check that all corridor call buttons and directional lanterns are inoperative.

(3) Check that the opening of the door is controlled by a continuous pressure button and that when the button is released prior to the door reaching its fully open position that the door will automatically reclose. On cars with two entrances, if both entrances can be opened at the same landing, separate "DOOR OPEN" and "DOOR CLOSE" buttons must be provided for each entrance.

(4) Check that automatic car doors or gates, opposite manual hoistway doors, operate as specified in Item 6.4.2(e)(3).

(5) Check to see that the door reopening devices are inoperative.

(6) Check that corridor door open and close buttons, if provided, are inoperative.

(7) Check that the means provided in the car operating panel to cancel car calls is operative by registering calls and cancelling them. A traveling car should stop at or before the next available landing.

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(8) Check that floor selection buttons are provided in the car to permit travel to all landings serviced by the car. These buttons must be operational, by passing all security during Phase II operation.

(9) With the car on Phase II operation, register two or more car calls and proceed to close the door. The car should proceed to the next available landing for the registered call. Once the car stops at that landing, all registered calls must be cancelled.

(10) Check to see that Phase II operation once activated cannot be deactivated until the car has returned to the designated or alternate level. To do this, with the designated level key-operated switch in the "ON" position, and the in-car key-operated switch in the "ON" position, take the car to any floor except the designated floor. Then turn the designated level key-operated switch 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 designated level.

(11) Turn the designated level key-operated switch to the "OFF" position or, if a smoke detector is activated, to the "BYPASS" position. Take the elevator to a floor other than the designated level and turn the in-car key-operated switch to the "ON" position. Check to see that the Phase II operation does not operate even if the designated level key-operated switch is turned to the "ON" position or a smoke detector has been activated.

(12) Take the car to an upper floor and with the door closed, turn the in-car key-operated switch to the "OFF" and "HOLD" position. It should have no effect on the Phase II operation.

(13) With the Phase I key-operated switch in the "ON" position, take the car to an upper floor and, with the doors open, place the in-car key-operated switch in the "HOLD" position. The car should remain at the floor.

(14) Take the car to an upper floor, and, with the doors open, place the in-car key-operated switch in the "OFF" position. Upon completion of the door closing the car should revert to Phase I operation and return nonstop to the designated or alternate level. For elevators installed under A17.1–1993 and later editions

(a) check that the door reopening device is inoperative.

(b) check that in-car "DOOR OPEN" and "DOOR CLOSE" buttons remain operative regardless of the type of doors. For vertically sliding doors, the corridor "DOOR OPEN" and "DOOR CLOSE" buttons are operative.

(c) check that the door reopens when in-car key-operated switch is placed in the "ON" or "HOLD" position before door closes completely.

(f) Multideck Elevators. Multideck elevators should be inspected as outlined in Items 6.4.2(b) through (e) in addition to the following:

FIREFIGHTERS' OPERATION

To recall elevators
Insert fire key and turn to "ON"

Fig. 6.4.2(g)(1) Phase I Instructions

(1) The designated level key-operated switch for Phase I operation should be at the designated level served by the upper compartment.

(2) The in-car key-operated switch for Phase II operation must be located in the upper compartment. Check the operation of the in-car key-operated switch in accordance with Item 6.4.2(e).

(3) Check to see that means is provided for locking the lower deck out of service.

(g) Operating Instructions and Keys

(1) Operating instructions for Phase I service should be posted adjacent to the designated level key-operated switch. Instructions for operating under Phase II operation should be incorporated with or adjacent to the in-car key-operated switch. Instructions should be in letters not less than $\frac{1}{8}$ in. (3.2 mm) in height, permanently installed, and protected against removal and defacement. The instructions must be exactly as shown in Figs. 6.4.2(g)(1) and 6.4.2(g)(2) or 6.4.2(g)(3).

All switches must be keyed alike for Phase I and Phase II operation and not be a part of building master key system. For elevators installed under A17.1b–1992 and later editions, check that all elevators in the building are keyed alike. Keys should be kept on premises for the designated level key-operated switch plus a key for each in-car key-operated switch in a location readily accessible to authorized persons but not readily available to the public.

(h) Inspection Operation. Place the car on inspection operation and operate from top of car. Check that an audible signal sounds and that the elevator remains under control of the top-of-car operating device when the Phase I key-operated switch is in the "ON" position or a smoke detector is actuated.

(i) Interruption of Power. Place the car on Phase II and go to a floor other than the designated or alternate level. Open the main line switch, then close the main line switch. The elevator should remain on Phase II operation.

(j) Firefighters' Service When on Standby (Emergency) Power. Elevators are required to have a manual selection switch to override an automatic sequencing of standby power. With the elevator at an upper floor, switch the power to the elevators to standby power and place the

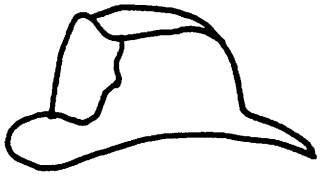
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FIREFIGHTERS' OPERATION

To operate car	Insert fire key and turn to "ON" Press desired floor button
To cancel floor selection	Press "CALL CANCEL" button
To close door	Press and hold "DOOR CLOSE" button
To open door	Press and hold "DOOR OPEN" button
To hold car at floor	With doors open, turn key to "HOLD"
To return car to recall floor	With doors open, turn key to "OFF"

Fig. 6.4.2(g)(2) Phase II Instructions (A17.1–1989 Through A17.1b–1995)

FIREFIGHTERS' OPERATION



When flashing, exit elevator

To operate car	**Insert fire key and turn to "ON" Press desired floor button**
To cancel floor selection	**Press "CALL CANCEL" button**
To close power-operated door	**Press and hold "DOOR CLOSE" button**
To open power-operated door	**Press and hold "DOOR OPEN" button**
To hold car at floor	**With doors open, turn key to "HOLD"**
To automatically send car to recall floor	**With doors open, turn key to "OFF"**

Fig. 6.4.2(g)(3) Phase II Instructions (A17.1–1996 Through A17.1d–2000)

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Phase I key-operated switch in the "ON" position. Activate the manual selection switch to select a car other than that selected by the automatic sequencing. Check that power will be transferred to the manually selected car only after the automatically selected car has stopped, normally after Phase I recall has been completed. If the manual selection switch is key operated, it must use the same key as the firefighters' service key.

6.4.3 Acceptance

6.4.4 References

6.4.4.1 Electric Elevators. A17.1d–2000 and earlier editions — Rules 112.3d, 112.5, 211.2 through 211.8, 1001.2(d)(12), 1002.2f, and 1206.7.

A17.1–2000 and later editions — Requirements 2.13.3.4, 2.13.5, 2.27.2 through 2.27.8, 8.11.2.1.4(l), 8.11.2.2.6, and 8.6.10.1.

6.4.4.2 Hydraulic Elevators. A17.1d–2000 and earlier editions — Rules 112.3d, 112.5, 211.2 through 211.8 {306.11}, 1001.2(d)(12), 1002.2f, and 1206.7.

A17.1–2000 and later editions — Requirements 2.13.3.4, 2.13.5, 2.27.2 through 2.27.8 {3.27}, 8.11.2.1.4(l), 8.11.2.2.6, and 8.6.10.1.

ITEM 6.5
ACCEPTANCE CHECKLIST FOR FIREFIGHTERS' SERVICE (ASME A17.1–2000 and CSA B44-00): AUTOMATIC ELEVATORS

NOTE: The acceptance checklist is more detailed than the "routine inspection" checklist. The routine inspection will confirm that the operation has been maintained in working order. See Nonmandatory Appendix B for the acceptance checklist.

6.5.1 Emergency Signaling Devices

6.5.1.1 "ALARM" must sound and illuminate when pressed. If rise is over 100 ft (30 m), a second device is required.

6.5.1.2 In-car emergency stop button (if present) must sound alarm.

6.5.1.3 If rise is more than 60 ft (18 m), check for two-way communication between cab and point outside hoistway.

6.5.1.4 Ensure that audible alarms and communications are functional with loss of normal power.

6.5.1.5 Check for means to communicate with machine room when required by A17.1, requirement 2.26.1.5.10(c).

6.5.2 Phase I Key Switch and Instructions

6.5.2.1 Operating instructions.

6.5.2.2 Group 3 security keys.

6.5.2.3 Labeled "FIRE RECALL" marked "RESET," "OFF," and "ON," in that order.

6.5.2.4 Provide at designated level for group.

6.5.2.5 Located in the lobby, visible and readily accessible.

6.5.2.6 The key cannot be removed in the "RESET" position. But it can be removed in the other positions.

6.5.2.7 Second switch, if present, must be at central alarm and control facility labeled "FIRE RECALL" only be two-position switch marked "OFF" and "ON" in that order.

6.5.3 Phase II In-Car Switch and Instruction

6.5.3.1 Ensure that there is a key for each Phase I, each Phase II, and each standby power selection switch in the building.

6.5.3.2 The same key is used for Phase I and Phase II and standby power for all elevators in the building.

6.5.3.3 Keys are available only to authorized emergency and firefighting personnel.

6.5.3.4 The key can only be removed in the "OFF" and "HOLD" positions.

6.5.3.5 The keys shall be Group 3 Security (see Item 8.1).

6.5.3.6 Labeled "FIRE OPERATION," marked "OFF," "HOLD," and "ON" in that order.

6.5.4 Monthly Test

6.5.4.1 Monthly test log is completed.

6.5.5 Phase I Operation While Running

Place several floor calls in the car. While going up, have the person at the designated level place the Phase I switch in the "ON" position. Where a duplicate switch is provided, verify that Phase I is initiated by placing the switch to the "ON" position. Determine the following:

(a) The car stops and reverses without opening the doors.

(b) The in-car stop switch or emergency stop switch is inoperative.

(c) Call register lights and directional lanterns are extinguished and inoperative.

(d) Position indicators, where provided, are inoperative, except in car, designated level, and central control station.

(e) The in-car door open button is rendered inoperative as soon as car moves away from the landing.

(f) Car call buttons and corridor call buttons are inoperative.

(g) The car returns to the designated level and parks with power-operated doors open. If there is more than

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one entrance at the designated landing, only the doors serving the lobby with the fire recall switch open.

(h) The visual and audible signals operate and stay on until car is at the designated level.

6.5.6 Phase I Operation With Doors Open

Place the Phase I switch to the "OFF" position and run the car to any floor. With the doors open, have the Phase I switch turned to the "ON" position and check the following:

(a) Door reopening devices sensitive to smoke or flame are inoperative immediately.

(b) If door reopening devices are rendered inoperative, the closing speed is reduced so that the kinetic energy is reduced to $2\frac{1}{2}$ ft-lb (3.5 J).

(c) The emergency stop switch or in-car stop switch is rendered inoperative as soon as the car moves away from the landing.

(d) The in-car door open button is rendered inoperative as soon as the car moves away from the landing.

6.5.7 Emergency Stop Switch and/or In-Car Stop Switch and Doors Closing

Place the Phase I switch to the "OFF" position and run the car to any floor. Activate the emergency stop switch or the in-car stop switch. With the doors open, have the Phase I switch turned to the "ON" position. Return the emergency stop switch, or in-car stop switch to the "RUN" position.

6.5.7.1 Verify that the automatic power-operated horizontal sliding doors close promptly, that other types of doors can be closed and once closed the car moves to the designated level.

6.5.8 Stop Switches and Door Buttons

While on Phase I verify that

(a) stop switches other than those inside the car remain operative

(b) for vertical sliding doors, the corridor door open and door close buttons remain operative

6.5.9 Fire Alarm Initiating Device and Operation

6.5.9.1 Verify that there is a fire alarm initiating device in each elevator lobby, the elevator machine room, and sprinklered hoistway.

In jurisdictions enforcing the NBCC, verify that there is a fire alarm initiating device in each elevator lobby, at the designated level if not sprinklered throughout and in the machine room if sprinklered.

6.5.9.2 With the car(s) on normal, have the input for main return activated and verify that the elevator commences Phase I Operation and all cars return to the designated level.

6.5.9.3 To reset operation initiated from fire alarm system, the fire alarm signal must be reset, then the Phase I switch must be cycled to "RESET" momentarily then to "OFF."

6.5.9.4 With the car(s) on normal, have the input for alternate level return activated and verify that the elevator commences Phase I operation and all cars return to the alternate level.

6.5.9.5 Car(s) should only respond to the first fire alarm input.

6.5.9.6 Activate the machine room fire alarm initiating device input and verify Phase I and all cars return to the designated level.

6.5.9.7 Activate the designated level machine room fire alarm initiating device and verify Phase I and all cars return to the alternate floor.

6.5.9.8 With the car(s) on normal, have the input for machine room return activated and verify the visual signal in the car illuminates intermittently.

6.5.9.9 In jurisdictions not enforcing the NBCC, where the fire alarm initiating device is required in the hoistway, activate the input and verify all cars return to the designated landing, except that fire alarm initiating devices installed at or below the lowest landing of recall shall cause the cars to return to the upper recall level.

6.5.10 Fire Alarm Initiating Device and Phase I Switch

6.5.10.1 Activate the alternate landing return input and observe that the elevator returns to the alternate landing.

6.5.10.2 If a two-position key switch is provided, place it in the "ON" position and verify that the elevator remains at the alternate landing.

6.5.10.3 Turn both the Phase I switch and the additional Phase I switch (when provided) to the "ON" position and verify that the car returns to the designated level.

6.5.11 Phase II Key Switch and Sign

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 check the following:

(a) The elevator can be operated only from the car buttons and will not respond to corridor calls.

(b) All corridor call buttons, door open and close buttons, and directional 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.

(c) 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 door will close without delay.

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(d) Open power-operated doors can be closed only by continuous pressure means. If the means is released before the door is fully closed, horizontal sliding doors will reopen and vertical sliding doors will stop, or stop and reopen.

(e) If two entrances can be opened and closed at the same landing, separate door open and close buttons are provided for each entrance.

(f) All door reopening devices are inoperative (except the door open button). Full-speed closing is permitted.

(g) "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.

(h) Floor selection buttons are provided and functional for all landings without restrictions.

(i) Moving car will stop at the next landing with a car call registered and remaining car calls canceled.

6.5.12 Phase II Switch in "HOLD" Position

6.5.12.1 Place the Phase II switch in the "HOLD" position and remove key. Verify that the car remains at the landing and the door close button is inoperative.

6.5.12.2 Verify that the car call buttons are inoperative.

6.5.13 Phase II Switch in "OFF" Position and Doors Closing: Power-Operated Horizontally and Vertically Sliding Doors

With the elevator away from the designated level, Phase I in effect, place the Phase II switch in the "OFF" position and verify that

(a) horizontally sliding doors close automatically and continuous pressure on the door close button will close vertically sliding doors

(b) car reverts to a Phase I type return on completion of door closing and reverts to Phase I when the doors open at the designated landing

(c) door reopening device inoperative and full-speed closing permitted

(d) door open button operative

(e) if Phase II switch turned to "ON" or "HOLD" before door is closed, it will reopen

6.5.14 Removal From Phase II

Verify that the elevator can be removed from Phase II only when

(a) Phase II switch is in "OFF" position at designated level and doors open

(b) Phase II switch is in "OFF" position and Phase I is in effect

6.5.15 Power Disconnects Open

6.5.15.1 With the elevator on Phase I, have the mainline power interrupted and restored to verify that the elevator will remain on Phase I.

6.5.15.2 With the elevator on Phase II, have the mainline power interrupted and restored to verify that the elevator will remain on Phase II.

6.5.15.3 The car is allowed to move to a position in the hoistway to reestablish position once movement is attempted.

6.5.16 Top-of-Car Operating Device

While operating from top of car, have the Phase I key switch placed in the "ON" position and verify that

(a) an audible signal sounds

(b) the elevator remains under control of the top-of-car operating device

(c) the elevator remains under the control of the hoistway access switch

6.5.17 Automatic Elevators With Attendant Operation

With elevator on attendant operation, stop at a floor and have the Phase I switch placed in the "ON" position. Verify that

(a) the audible and visual signal operates and that a parked elevator will automatically go on Phase I after a time delay between 10 s and 30 s.

(b) a moving car on attendant operation will commence Phase I operation without delay.

(c) if car is on hospital emergency service, it will remain on that operation until removed by the operator and at that point revert to Phase I Operation. The audible and visual signals in the car shall be activated immediately and remain activated until the car is returned to the designated landing. With the car on firefighter emergency operation, the elevator cannot be placed on hospital service.

6.5.18 Elevators on Phase I and Phase II, Prevention of Operation and Disabling Not Allowed

With elevator on normal operation, verify the following:

(a) Activate means other than those specified in this Code to remove elevators from normal operation, and verify that Phase I Emergency Recall Operation is not prevented.

(b) Activate input for devices that measure loads and verify that the elevator is not prevented from operating at or below the capacity that is required.

(c) Verify that an accidental ground or short circuit in equipment on landing side will not disable Phase II Operation.

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PART 7
ESCALATOR — EXTERNAL

ITEM 7.1
GENERAL FIRE PROTECTION

7.1.1 Periodic Inspections

Examine the sides and undersides of the escalator trusses and machinery spaces enclosure for damage to fire-resistive materials. A17.1a–1994 and later editions permit the use of noncombustible and limited combustible materials as defined by the building code or ANSI/NFPA 101.

Check that guards are in place for openings provided for ventilation of the driving machine and control equipment spaces. Enclosure in fire-resistive ceiling does not constitute adequate fire protection.

Verify that provisions to protect floor openings from the passage of flame, heat, and/or smoke that are required by the building code have not been damaged, removed, or defeated. Escalators installed under A17.1–1981 and later editions require protection in compliance with ANSI/NFPA 101 or local codes. Prior to A17.1–1981, A17.1 gave requirements for protection of floor opening for escalators that were not accredited as a means of egress. However, since escalators are no longer accredited as a means of egress, the inspector must refer to the local code or the Life Safety Code NFPA-101 for the protection requirement at each location.

7.1.2 Periodic Test

7.1.3 Acceptance

Verify that floor openings are protected against the passage of flame, heat, and/or smoke in accordance with the requirements of the building code.

7.1.4 References

A17.1d–2000 and earlier editions — Sections 800 and 801; and Rule 1009.2a.

A17.1–2000 and later editions — Requirements 6.1.1 and 6.1.2; and 8.10.4.1.1(a).

ITEM 7.2
GEOMETRY

7.2.1 Periodic Inspections

Inspect for evidence of change to the geometry of the balustrades and if change has been made, inspect as outlined in Item 7.2.3.

If an escalator is relocated or a new escalator is installed in existing trusses, it must comply with the current Code requirements. See Figs. 7.2.1(a), 7.2.1(b), and 7.2.1(c) for dimension requirements of existing escalators.

Verify that the overhead clearance is in compliance with local codes.

7.2.2 Periodic Test

The width of the balustrades must be the width of the step tread to the next whole inch and should not decrease in the direction of travel. For escalators installed under A17.1–1955 to A17.1–1981 editions, the width should not change abruptly nor more than 8% of the greatest width, and the maximum angle of change should not be more than 15% in the line of travel.

7.2.3 Acceptance

(a) Verify that the angle of inclination does not exceed 31 deg. If in doubt, a 30 deg/60 deg triangle, a level, and a straight edge may be used to check the incline. The straight edge may be placed on the front of several steps as shown in Fig. 7.2.3. The bubble on the level should be in the center or slightly to the left when placed as shown in the figure. If the bubble is to the right, a protractor or angle finder will be needed to verify that the incline does not exceed 31 deg.

(b) Measure the width of the step at a right angle transverse to the direction of travel.

(c) Measure and mark the centerline of each handrail and use a plumb line to find the distance from the handrail centerline to the width of the escalator or step edge.

(d) For an interior low deck escalator, measure the distance from the vertical face of the interior panels to the vertical face of the skirt panels using a machinist level and ruler [see Fig. 7.2.1(c)]. Measure the slope of the deck perpendicular to the line of travel using a machinist level and protractor.

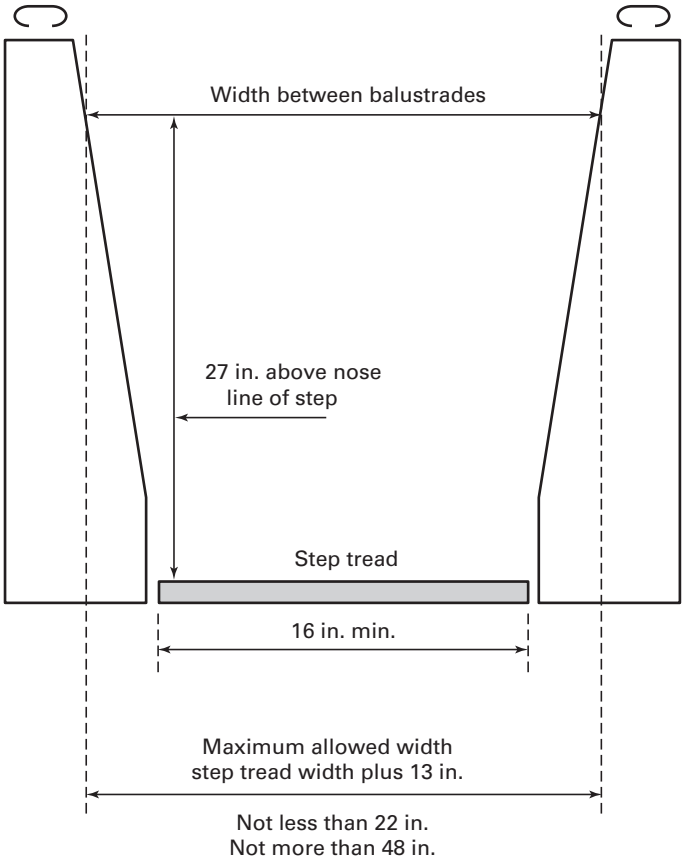
(e) Drop a plumb line to the edges of the steps and measure the distance between the centerline of the handrails to the edge of the steps.

7.2.4 References

A17.1d–2000 and earlier editions — Rules 802.1, 802.2, 802.3d, 1009.2b, 1009.2g, and 1207.5; and Appendix D.

A17.1–2000 and later editions — Requirements 6.1.3.1, 6.1.3.2, 6.1.3.3.4, 8.10.4.1.1(b), 8.10.4.1.1(n), and 8.7.6.1.5; and (NR Appendix D).

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GENERAL NOTE: 1 in. = 25.4 mm

Fig. 7.2.1(a) Dimensions for Existing Escalators (for Escalators Installed Under A17.1–1955 and A17.1–1960 Editions)

ITEM 7.3 HANDRAILS

7.3.1 Periodic Inspections

(a) Mark one location on each handrail with chalk, then operate the unit and inspect each handrail through a complete revolution. The handrails, including splices and joints, should be free of any cuts, cracks, gouges, pinch points, or any other condition that would be a hazard to passengers. Any rust or rubber filings present on the balustrade deck indicates that an internal inspection of the handrail system may be warranted.

(b) Verify that the hand or finger guards are present at the newel base. Check that the guards are in good condition and properly sized to prevent fingers or hands from being drawn into the newel. Finger guards are required under A17.1–1965 and later editions and A17.3. A17.1–1955 required that the balustrade be designed or guarded to prevent fingers and hands from being drawn into the balustrade where the handrail enters. There are several types of guards in use including resilient boots, brushes, and trap doors. Each may function differently to provide the protection. Trap doors do allow entry but prevent entrapment.

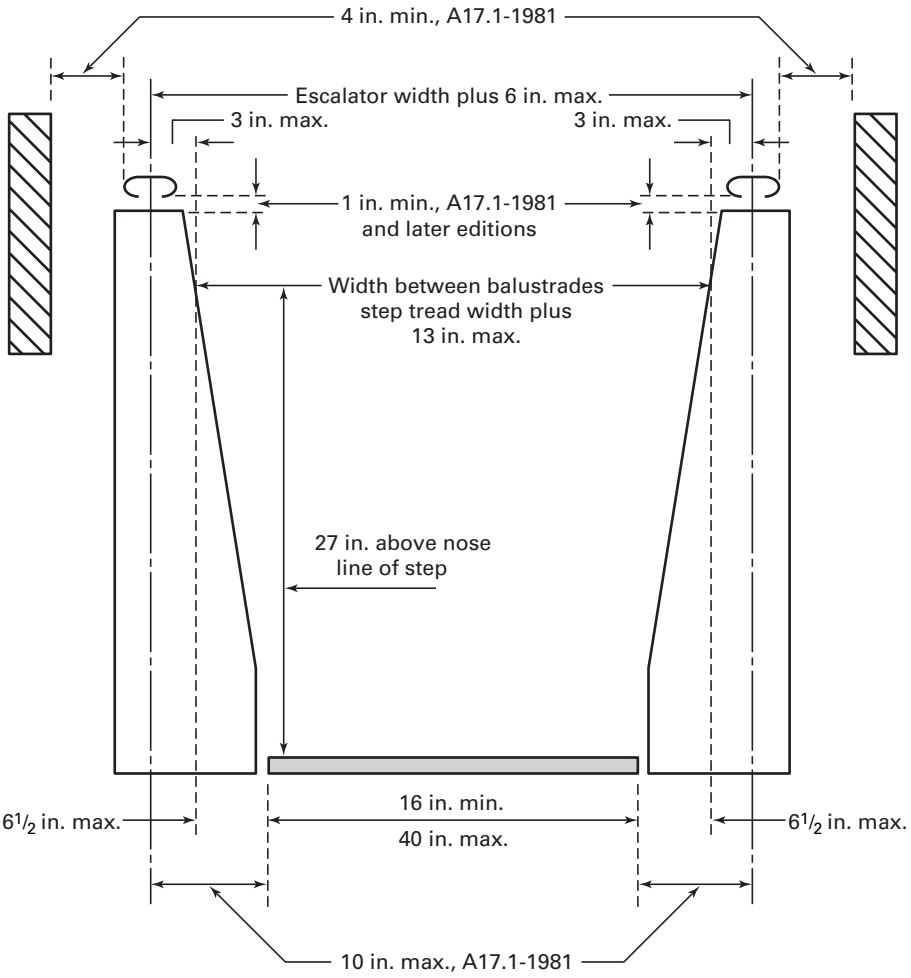
(c) Ride the escalator holding the handrails through the entire travel. The handrails should move smoothly without jerking, at substantially the same speed as the steps. The need to change grip on the handrail more than once during a single level rise would indicate a need for adjustment. At several points in the ride firmly grip the handrail and verify that it does not stall under moderate force.

(d) During this ride observe any unusual noise that may indicate the need for further inspection. Listen for noise that may indicate wear of the turn around rollers, or other parts.

(e) Check the horizontal clearance between both lips of the handrail and the handrail stand (guide).

7.3.2 Periodic Test

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GENERAL NOTE: 1 in. = 25.4 mm

Fig. 7.2.1(b) Dimensions for Existing Escalators (for Escalators Installed Under A17.1–1965 Through A17.1–1981)

7.3.3 Acceptance

Check whether each handrail extends at normal height not less than 12 in. (305 mm) beyond the escalator combplates, and verify that required clearances are present.

Check the vertical height from the step noseline to the top of the handrail.

7.3.4 References

A17.1d–2000 and earlier editions — Rules 802.2, 802.4, and 1009.2c; and Appendix D.

A17.1–2000 and later editions — Requirements 6.1.3.2, 6.1.3.4, 8.11.4.2.13, 8.6.8.12, and 8.10.4.1.1(c); and (NR Appendix D).

A17.3 — Paragraphs 5.1.5 and 5.1.6.

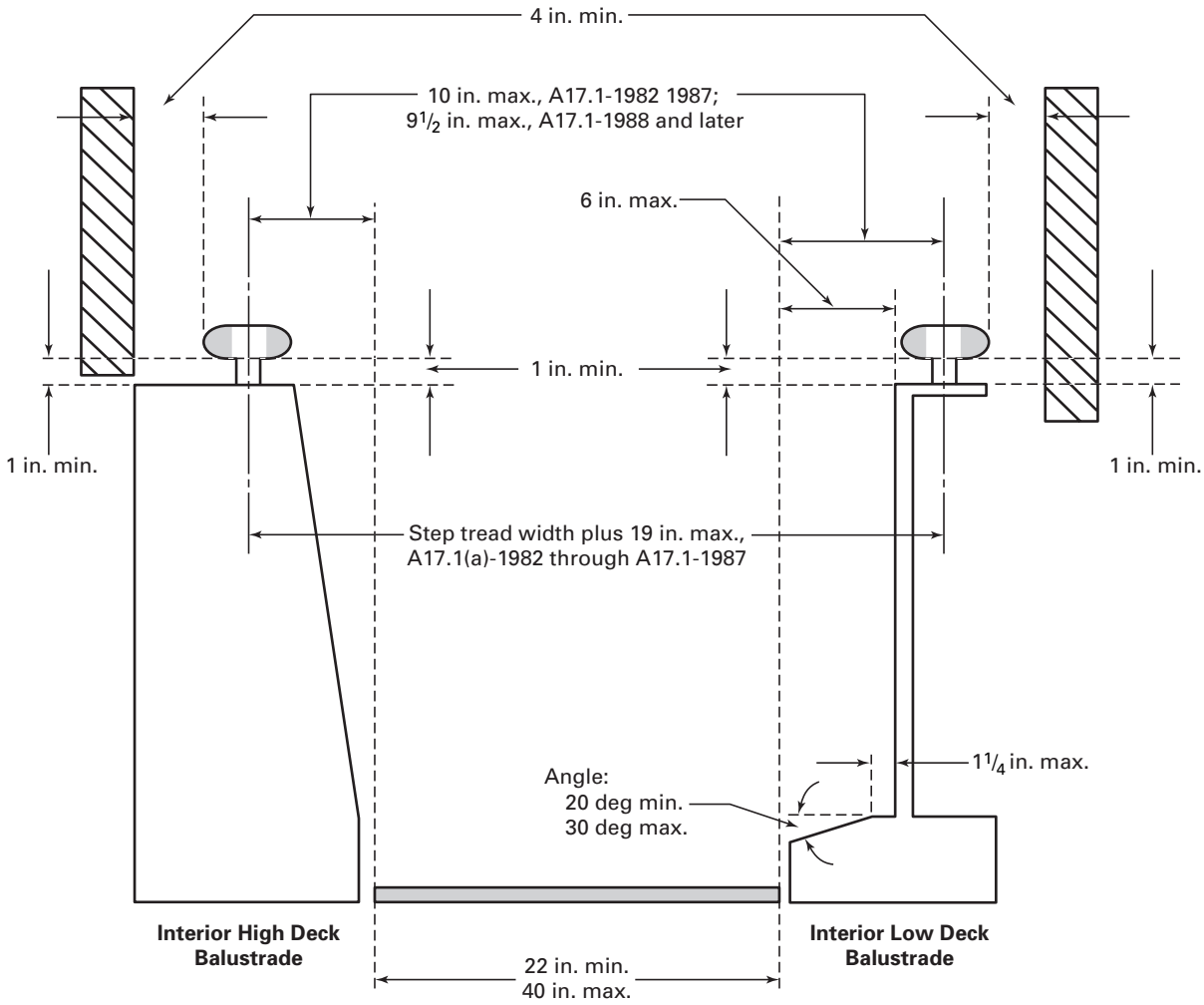
ITEM 7.4
ENTRANCE AND EGRESS ENDS

7.4.1 Periodic Inspections

(a) The floor surfaces adjacent to the landing plates must be continuous with the top of the landing plate, with no abrupt changes in elevation of more than $\frac{1}{4}$ in. (6.4 mm). Access to an egress from the escalator should be free of obstacles and tripping hazards. Check that the pit covers are present and in good condition.

(b) For escalators installed under the A17.1a–1988 and later editions and A17.3, a safety zone should be maintained free of obstacles (see Fig. 7.4.1). These Code dimensions are minimums and traffic patterns may require larger distances.

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Width of the escalator is the width of the step to the next whole inch Requirement 6.1.3.2 (Rule 802.2)

GENERAL NOTE: 1 in. = 25.4 mm

Fig. 7.2.1(c) Relationship of Escalator Parts (A17.1a–1982 and Later Editions)

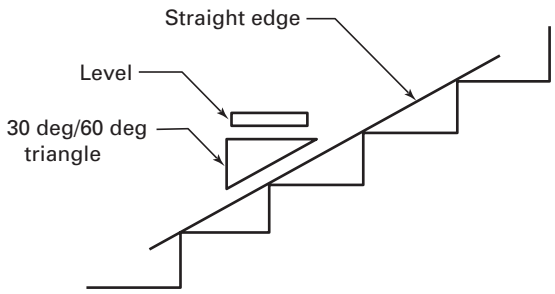


Fig. 7.2.3 Checking Incline

(c) While standing on the unit, verify that the landing and combplates provide a secure foothold and outdoor units should provide a secure foothold when wet.

7.4.2 Periodic Test

7.4.3 Acceptance

Verify that vertical headroom clearance of 7 ft (2.13 m) is provided and that the required safety zone is present.

Check that floor openings adjacent to the entire length of the wellway are protected in accordance with the applicable building code.

7.4.4 References

A17.1d–2000 and earlier editions — Rules 802.6 and 802.12.

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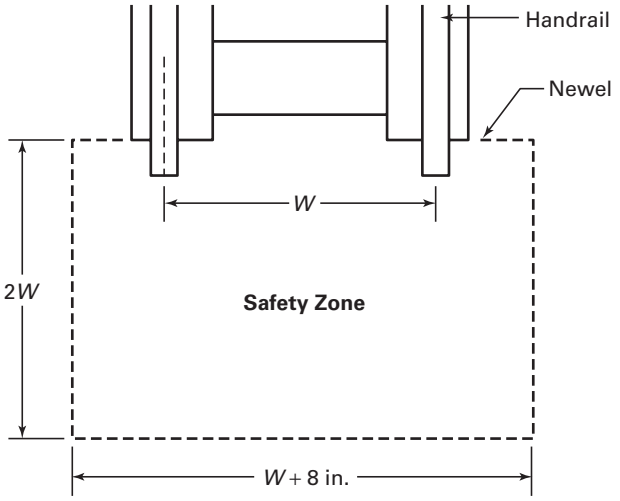


Fig. 7.4.1 Safety Zone

A17.1–2000 and later editions — Requirements 6.1.3.6, 8.6.8.15, and 6.1.3.12.

A17.3 — Paragraphs 5.5.3 and 5.5.4.

ITEM 7.5
LIGHTING

7.5.1 Periodic Inspections

Check whether the lighting at the landing plates and steps is in compliance with the applicable code by using a light meter while the escalator is operating. Take care not to cast a body shadow on the meter. Note any lamps that are not operating and their affect on the escalator lighting. For escalators installed under A17.1–1987 and later editions and A17.3, lighting must be of uniform intensity and not contrast materially with the surrounding area.

For escalators installed under A17.1–1955 through 1971, the minimum intensity was 2 fc (22 lx). A17.1–1979 required step tread lighting to be uniform throughout the run and the lighting intensity to be in accordance with local codes and ordinances for stairways. For escalators installed under A17.1–1987 and later editions and A17.3, the minimum intensity of 5 fc (54 lx) is required. For escalators installed under the A17.1–1977 and later editions, verify that green demarcation lights are present below the steps at both landings and are on when the escalator is in operation.

7.5.2 Periodic Test

7.5.3 Acceptance

7.5.4 References

A17.1d–2000 and earlier editions — Rules 806.2, 805.7, and 1009.2d.

A17.1–2000 and later editions — Requirements 6.1.7.2, 6.1.6.7, and 8.10.4.1.1(e).

A17.3 — Paragraphs 2.2.3 and 5.4.

ITEM 7.6
CAUTION SIGNS

7.6.1 Periodic Inspections

For escalators installed under A17.1–1981 and later editions and escalators that are required to comply with A17.3, verify that the required caution signs are located at both landings readily visible to boarding passengers.

For escalators installed under A17.1–1993 and later editions, verify that any additional signs are located at least 10 ft (3.05 m) horizontally from the end of the newels and that they do not impede traffic or otherwise cause persons to stop.

7.6.2 Periodic Test

7.6.3 Acceptance

7.6.4 References

A17.1d–2000 and earlier editions — Rule 805.9; and Fig. 805.9a.

A17.1–2000 and later editions — Requirement 6.1.6.9; and Fig. 6.1.6.9.1.

A17.3 — Paragraph 5.3.11.

ITEM 7.7
COMBPLATE AND COMB STEP IMPACT DEVICE

7.7.1 Periodic Inspections

Inspect the comb for missing teeth and proper mesh with each step tread (see Fig. 7.7.1). Verify proper mesh with each step tread by holding a sheet of stiff paper or a business card where the teeth mesh with the step tread, while standing well back from the plate to prevent forcing the plate down. Use of an extension with an alligator clip to hold the card is recommended.

NOTE: Telescoping pointers with alligator clips that are used to ignite water heater pilot lights are available in hardware/plumbing supply stores.

The comb teeth should mesh with and set into the tread surface so that the teeth are always below the upper surface of the treads. Any section with one or more missing or broken teeth should be replaced. For escalators installed under A17.1–1986 and later editions, the comb surfaces must contrast visibly by color, pattern, or texture.

7.7.2 Periodic Test

For units installed under A17.1b–1992 and later editions, have the operation of combplate impact devices tested as follows:

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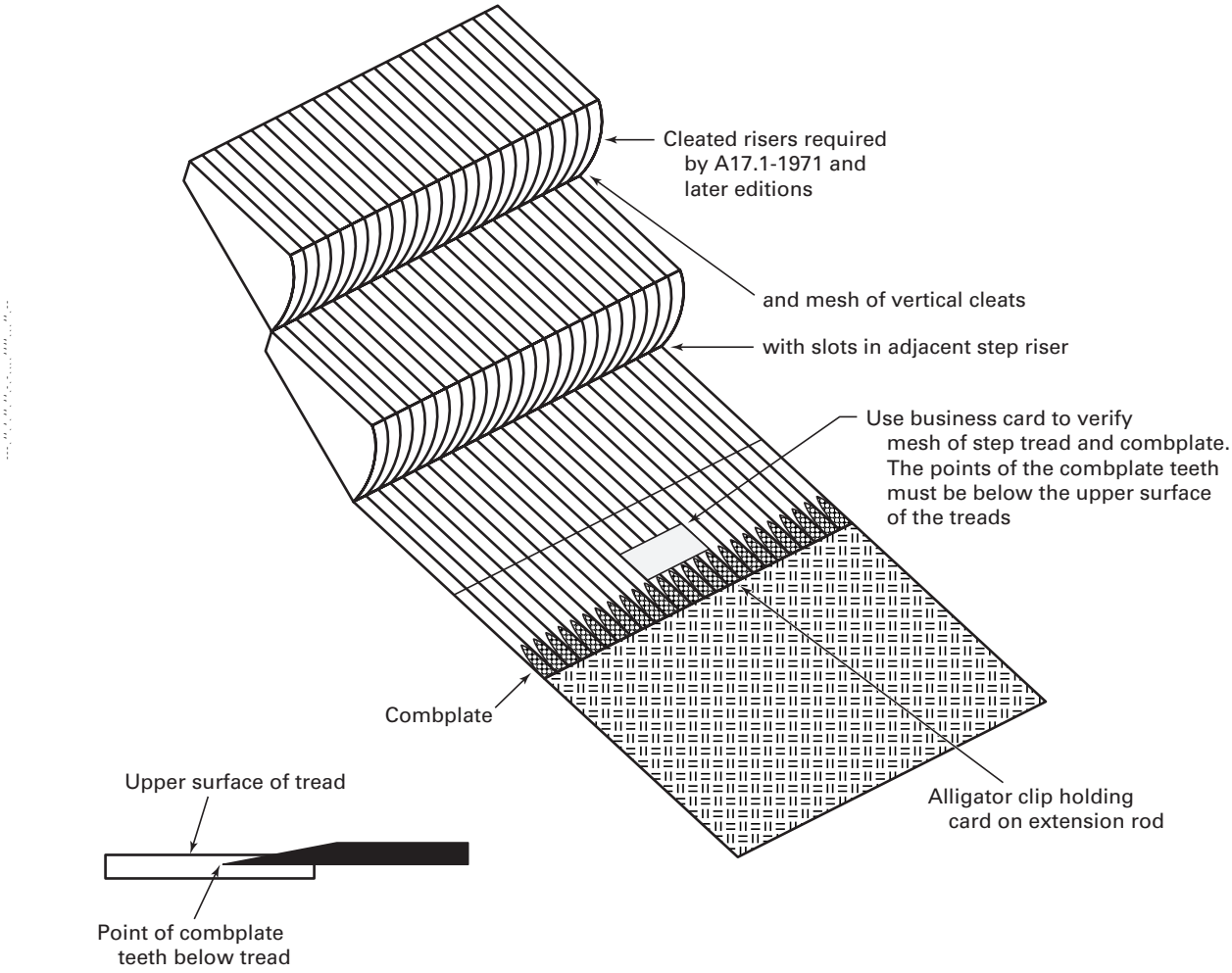


Fig. 7.7.1 Checking Step/Combplate Mesh

(a) Have a vertical force applied to the center front edge of the combplate until the device trips. Record the force required to trip the device and verify the unit will not start until manually reset.

(b) Have a force applied in the direction of travel at the front center of the combplate, increasing the force until the device trips. Record the force required to trip the device and verify the unit will not start until manually reset.

(c) Have a force applied in the direction of travel on one side of the front of the combplate, increasing the force until the device trips. Record the force required to trip the device and verify the unit will not start until manually reset. Repeat this test for the opposite side.

7.7.3 Acceptance

(a) Visually verify that the combplates are vertically adjustable and that the sections forming the comb teeth are replaceable.

(b) Place weight on the combplate and landing plate assembly to verify that the combplate and landing plate will not contact the step (see Fig. 7.7.3).

7.7.4 References

A17.1d–2000 and earlier editions — Rules 802.6, 805.3n, 807.3, 1008.2r, and 1009.2e.

A17.1–2000 and later editions — Requirements 6.1.3.6, 6.1.6.3.13, 6.1.8.3, 8.11.4.2.13, and 8.10.4.1.1(g).

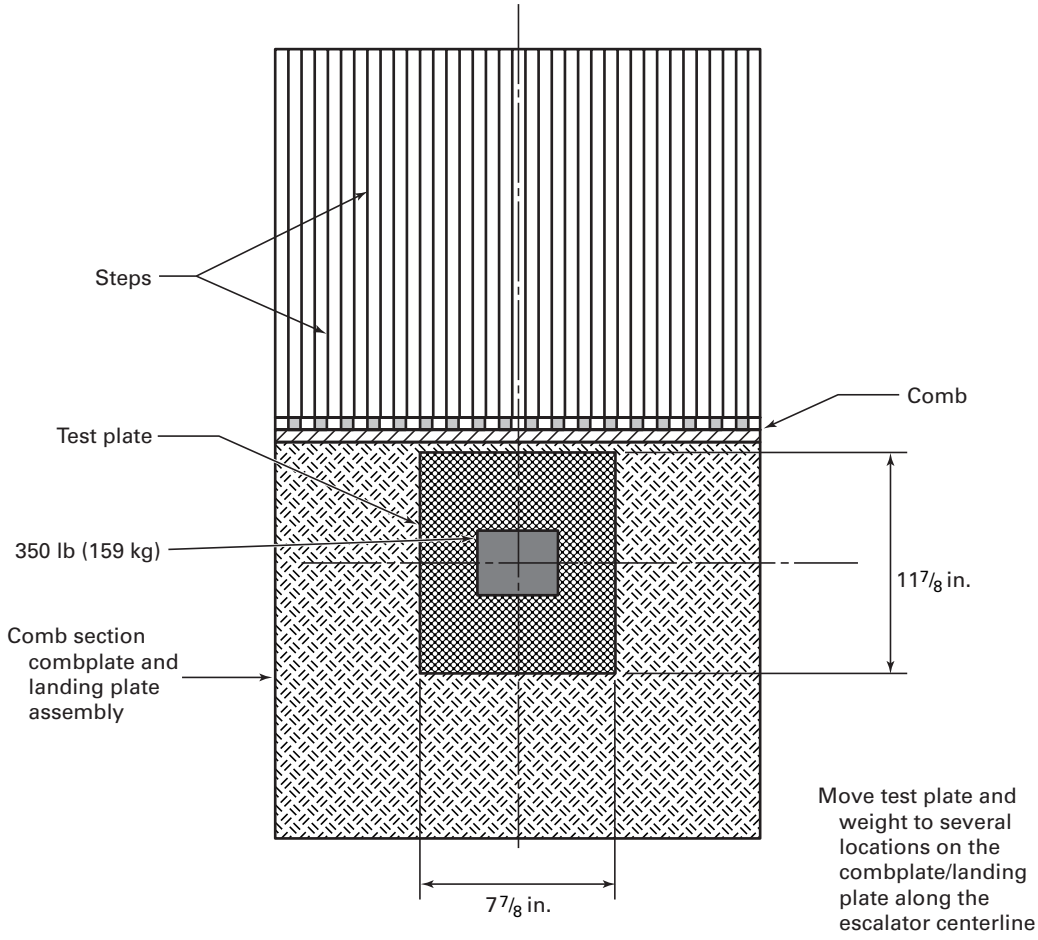
A17.3 — Paragraph 5.1.9.

ITEM 7.8
DECK BARRICADES AND ANTISLIDE DEVICES

7.8.1 Periodic Inspections

For low deck escalators installed under the A17.1c–1986 and later editions, check to see that deck barricades are firmly in place and in good condition at each end when the outer deck width exceeds 5 in. (127 mm). The

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GENERAL NOTE: 1 in. = 25.4 mm

Fig. 7.7.3 Test of Combplate/Landing Plate Assembly

barrier must extend to 4 in. (102 mm) below the handrail top. See Fig. 7.8.1(a). If the escalator is not located at the edge of a floor surface, check that the barricade(s) is in place, properly located and firmly secured on the outer deck for escalators installed to A17.1b–1995 and later editions.

On high deck escalators installed under A17.1–1981 and later editions and A17.3, check that antislide devices, where required, are in place and secure. See Fig. 7.8.1(b).

7.8.2 Periodic Test

For escalators installed under A17.1a–1988 and later editions, verify that glass and plastic replacement panels meet the requirements of ANSI Z97.1 or 16 CFR Part 1201.

7.8.3 Acceptance

All glass or plastic (glazing material) must be legibly and permanently marked 16 CFR Part 1201, "American National Standard Z97.1" or the characters "ANSI Z97.1" and shall be marked also with the manufacturer's distinctive mark or designation.

Check that all exposed fastener heads are the tamper-resistant type.

7.8.4 References

A17.1d–2000 and earlier editions — Rules 802.3i and 1009.2f.

A17.1–2000 and later editions — Requirements 6.1.3.3.10, 6.1.3.3.11, 8.6.8.11, and 8.10.4.1.1(h).

ITEM 7.9
STEPS AND UPTHRUST DEVICE

7.9.1 Periodic Inspections

(a) Mark one of the steps with chalk, then run the escalator through one complete revolution. Check that each step is present, clean, free of debris, and that the step treads and risers are in good condition.

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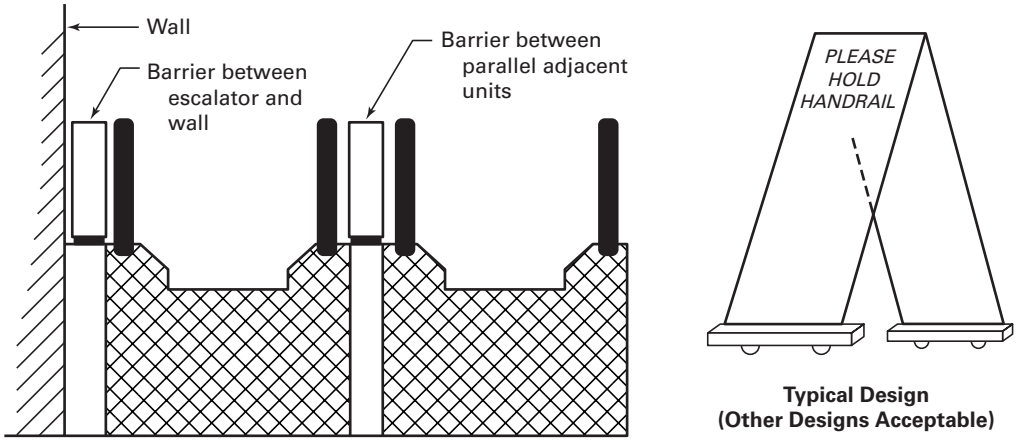
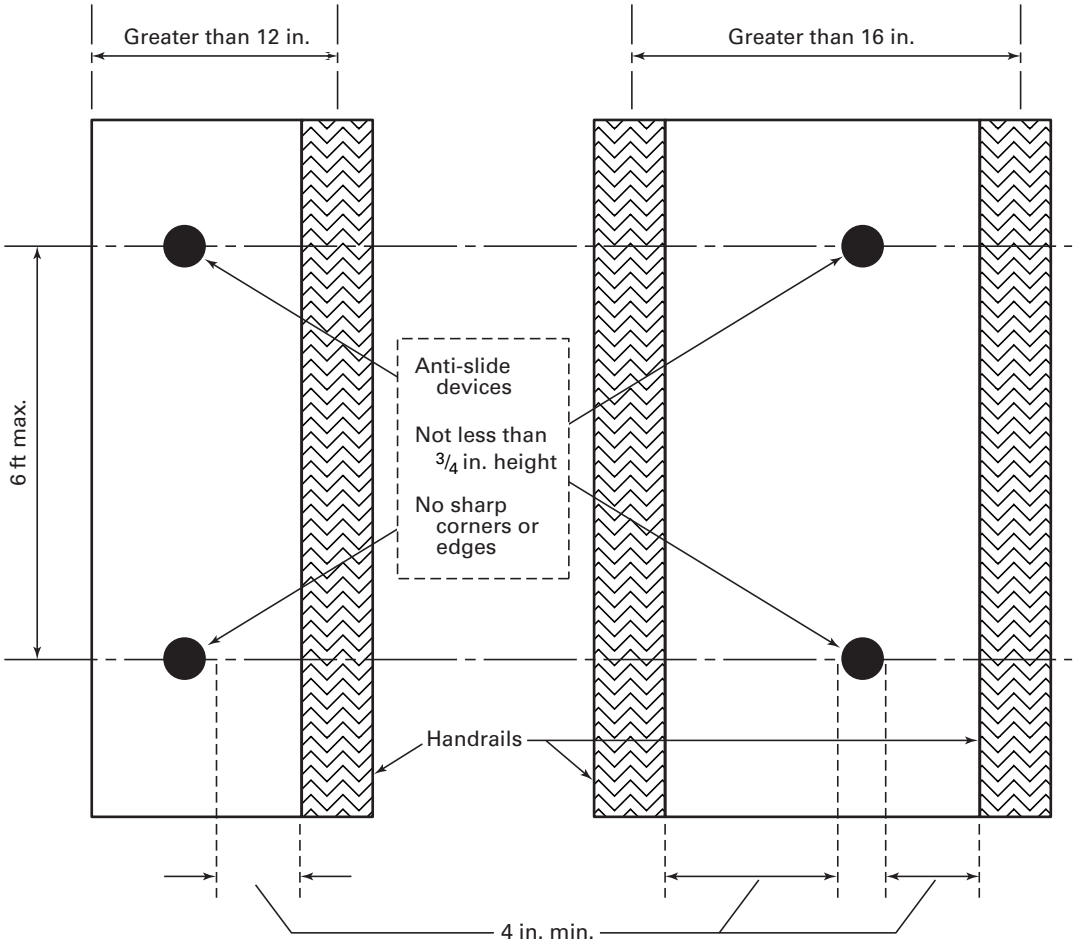


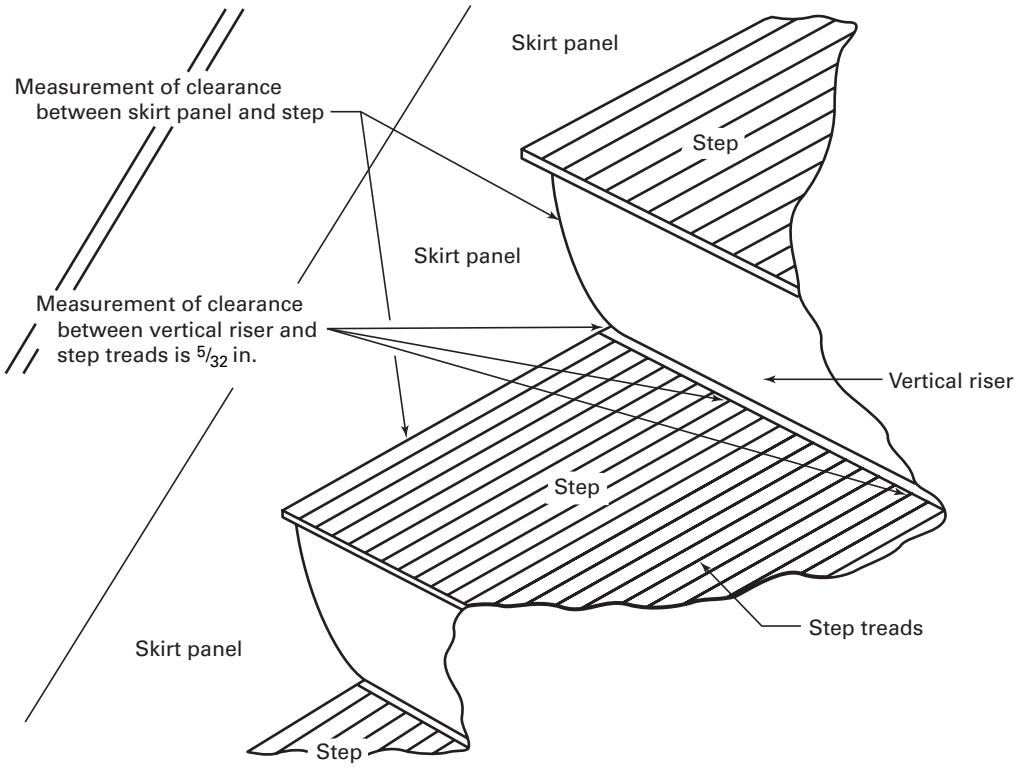
Fig. 7.8.1(a) Deck Barricade



GENERAL NOTE: 1 in. = 25.4 mm

Fig. 7.8.1(b) High Deck Balustrade Antislide Devices

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Escalators Installed Prior to the 1971 Code Edition

Fig. 7.9.1(a) Smooth Riser

(b) Check at least every tenth step, by riding on it, to verify that the following requirements are met:

(1) There is no excessive movement or play in the direction of travel, at right angles to the direction of travel and vertically. While standing on the step, a lateral shift of weight should not cause the step to strike the skirt panels.

(2) For escalators installed prior to A17.1–1971, verify that the clearance between step treads on the horizontal run (between the step and riser) is not more than $^{5}/_{32}$ in. (4 mm). A thickness gauge or a rule may be used for this purpose. With the escalator moving in the up direction lay the rule on the step and read the clearance. At least every tenth step should be checked. Cleated step risers are required for all escalators installed under A17.1–1971 and later editions, and they must mesh with the slots of adjacent step treads. Mesh can be verified by trying to fit a thin piece of stiff paper, or business card, between steps and riser while the escalator is moving in the up direction. The check should be made across the entire width. [See Figs. 7.9.1(a) and 7.9.1(b).]

For escalators installed under A17.1–2000 and later editions, check that the clearance between the steps on the horizontal run does not exceed 0.25 in. (6 mm). [See Fig. 7.9.1(c).]

(3) Use a level to check if the steps are horizontal.

(4) The tread surface should be slotted in the direction parallel to the travel so that they mesh with the combplate teeth. Verify that a cleat is formed adjacent to the skirt panel on each side of the step [see Fig. 7.9.1(d).]

(5) Check risers, cleats, and step tread surfaces. Special consideration should be given to excessive clearance and sharp edges. While standing on the step tread, verify that it provides a secure foothold.

(6) A jerking motion on the steps and excessive noise in the machinery space indicates that the drive and support system should be examined to discover the source or cause.

7.9.2 Periodic Test

For escalators installed under A17.1–1980 and later editions and those required to comply with A17.3, have the operation of the step upthrust device tested as follows:

(a) With the escalator running down, apply an upthrust force to a step to resist leveling as it enters the lower curve. This should stop the escalator.

(b) If this will not operate the upthrust device, it should be checked more closely during the internal

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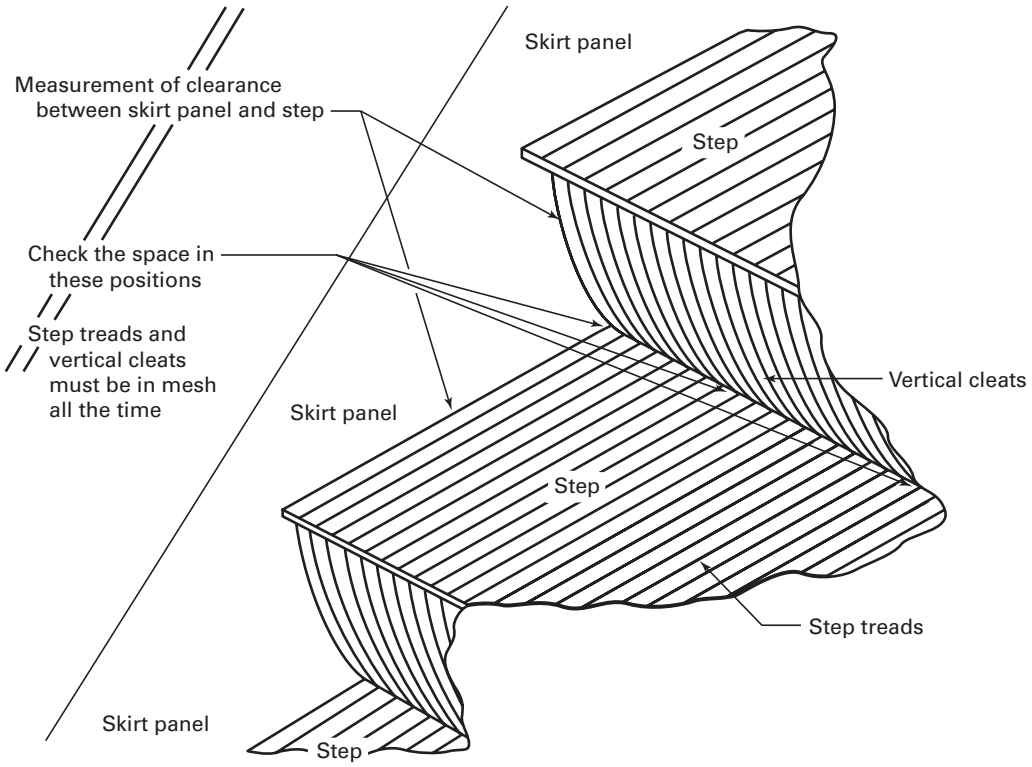


Fig. 7.9.1(b) Cleated Riser

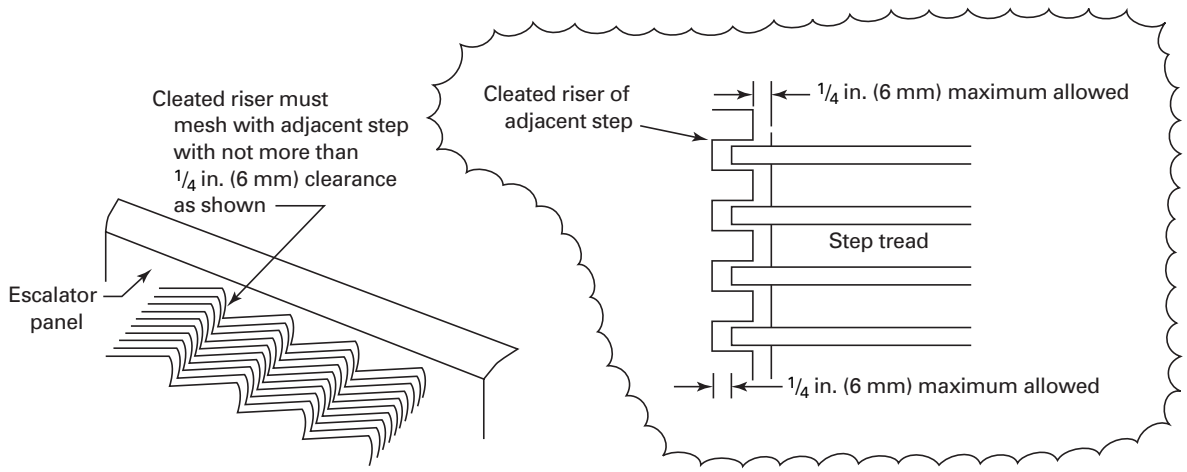


Fig. 7.9.1(c) Escalator Step Riser

inspection described in Item 2.9.2 and a meter should be used to verify that the safety circuit is opened when the upthrust device operates.

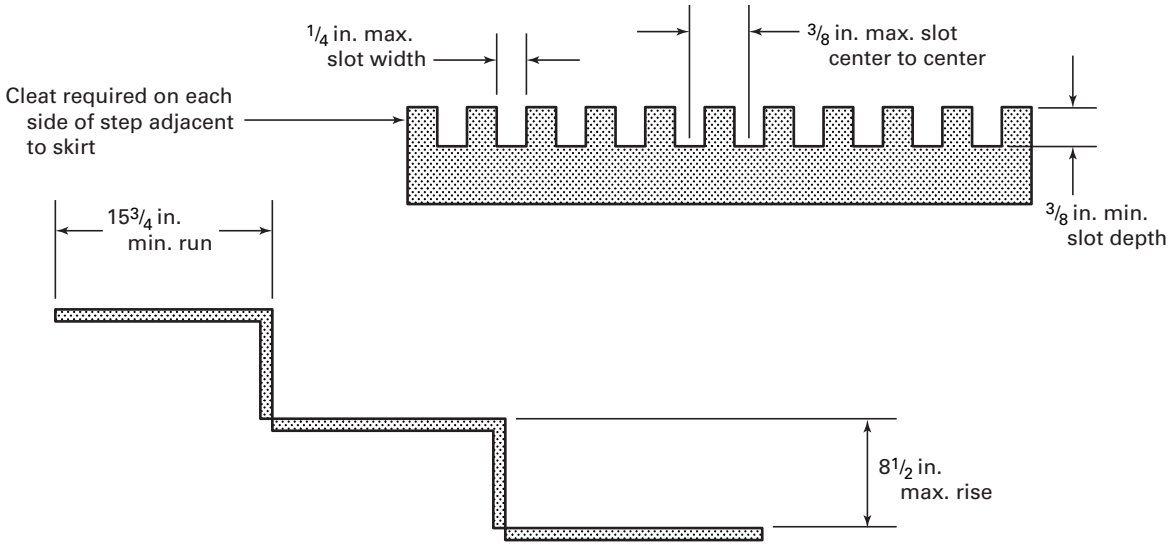
Escalators required to comply with A17.3 that have smooth risers, test the operation of the upthrust at both the upper and lower curves. Test the lower curve with the escalator running down and the upper curve with the escalator running up. This may require two pair of pliers gripping on both sides at the front of the step tread.

7.9.3 Acceptance

Review fatigue test and certification for Code compliance.

Verify that there are at least two and no more than four flat steps at each end of the escalator. Refer to Fig.

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GENERAL NOTE: 1 in. = 25.4 mm

Fig. 7.9.1(d) Escalator Step Tread [A17.1–1955 Through A17.1–1990, Rule 802.5 (Requirement 6.1.3.5)]

7.9.3 for flat step configuration identification.

Check that the materials for step frames, treads and risers, including any attachments or inserts, meet Code requirements.

Check that all steps have yellow demarcation lines on each side and along the back. Check the step dimensions for code compliance.

7.9.4 References

A17.1d–2000 and earlier editions — Section 3; and Rules 802.5, 802.6e, 802.9d, 805.3i, 1008.2i, and 1105.1.

A17.1–2000 and later editions — Requirements 1.3, 6.1.3.5, 6.1.3.6.5, 6.1.3.9.4, 6.1.6.3.9, 8.11.4.2.9, 8.6.8.6, 8.3.11.1, and Fig. I8.

A17.3 — Paragraphs 5.1.7 and 5.1.8.

ITEM 7.10 OPERATING AND SAFETY DEVICES

7.10.1 Periodic Inspections

(a) Starting Switches. Verify that a key-operated switch, located so that the steps are within sight, is the only means of starting the escalator. Verify that the key is only accessible to authorized personnel. A17.1–1937 and later editions require the use of a key to start an escalator. However, A17.1–1988 and later editions and A17.3 specifically prohibit the starting by automatic means. Start the escalator using the key-operated switch. When operating the switch, verify that the escalator steps are within sight and that no one is on the step. Where the escalator can be operated in both directions, check the switch operation in both directions. Where there is more than one key operated starting switch, the function and location of all switches shall be checked.

For units installed under A17.1–1996 and later editions, verify that the start switch operating positions are properly marked. Check that the key is only removable in the "RUN" position. Turn the switch from "RUN" to either "UP" or "DOWN" and quickly let go of the key. The switch must return to the "RUN" position. Repeat for the other direction of travel. Next turn the switch to either "UP" or "DOWN" position. Stop the unit with the emergency stop button and keep the switch in the "UP" or "DOWN" position. The unit must not restart. Repeat for the other direction of travel.

(b) Emergency Stop Switches. Operate the emergency stop switches/buttons and verify that the escalator stops. Also, verify that the stop switch cannot start the escalator. If automatic starting devices are provided (pre-1988), check that they will not function after the stop switch is operated. Verify proper labeling and signal where required. The requirements for emergency stop switches in prior editions of the Code are as follows:

(1) A17.1–1955: An emergency stop button or other type of manually operated switch, marked "STOP BUTTON" or "STOP SWITCH" shall be conspicuously and accessibly located at or near the top and bottom landing of each escalator and shall be protected from accidental contact.

(2) A17.1–1960: Emergency stop button or other type of manually operated switches having a red button or handle shall be accessibly located at or near the top

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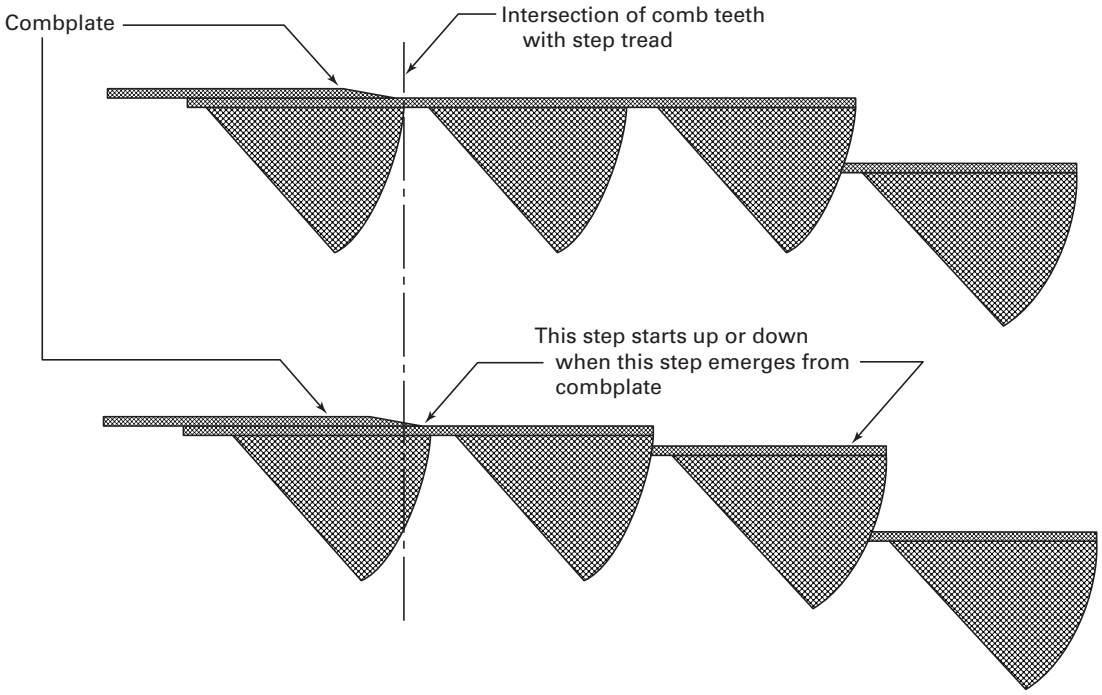


Fig. 7.9.3 Example of Two Flat Steps

and bottom landing of each escalator, and shall be protected against accidental operation.

(3) A17.1–1965 added: An escalator stop button with an unlocked cover over it that can be readily lifted or pushed aside shall be considered accessible.

(4) A17.1–1979 required that the stop button be located in the right-hand newel base facing the escalator at both landings. Handles were no longer allowed.

(5) A17.1–1983 and later editions required a readily moveable self-closing transparent cover and an 80 dBA signal when the cover is moved. The cover should be marked "Emergency Stop." The button should be in the upper right quadrant when facing the escalator for high deck balustrades, and for low deck balustrades it must be below the handrail height. Remote stop switches were prohibited under A17.1–1983 and later editions.

(6) A17.3: An accessible red stop button marked "EMERGENCY STOP" must be on the right-hand side of each entrance. Remote stop switches are prohibited.

(c) Tandem Operation. For escalators operated in tandem, A17.1–1981 and later editions and A17.3, where a common landing is shared by two units, verify that the units are electrically interlocked. The interlocks must stop the unit carrying passengers into the common intermediate landing, where bunching will occur, when the unit carrying passengers away from the landing stops. Also, verify that the interlocks assure that the units run in the same direction.

7.10.2 Periodic Test

7.10.3 Acceptance

Check that the starting switches are within reach of an emergency stop button. Start the unit and hold the start switch in the "UP" position, then actuate the emergency stop button. The unit must not restart until the start switch is placed in the "RUN" position and the starting sequence is repeated. Repeat this for the down direction and for the other start switch.

For low deck escalators, check the clearances between the handrail and the stop switch enclosure and the distance from the button to the handrail.

7.10.4 References

A17.1d–2000 and earlier editions — Rules 805.2, 805.3a, and 805.6.

A17.1–2000 and later editions — Requirements 6.1.6.2.1, 6.1.6.3.1, 6.1.6.6, and 8.6.10.2.

A17.3 — Paragraphs 5.3.1, 5.3.2, and 5.3.10.

ITEM 7.11
SKIRT OBSTRUCTION DEVICE

7.11.1 Periodic Inspections

Test the skirt obstruction device for escalators installed under A17.1–1971 and later editions and A17.3, by having the person performing the test manually trip the skirt obstruction device switches on each side of steps at each landing while the escalator is running. This can be done by placing an object such as a wooden stick

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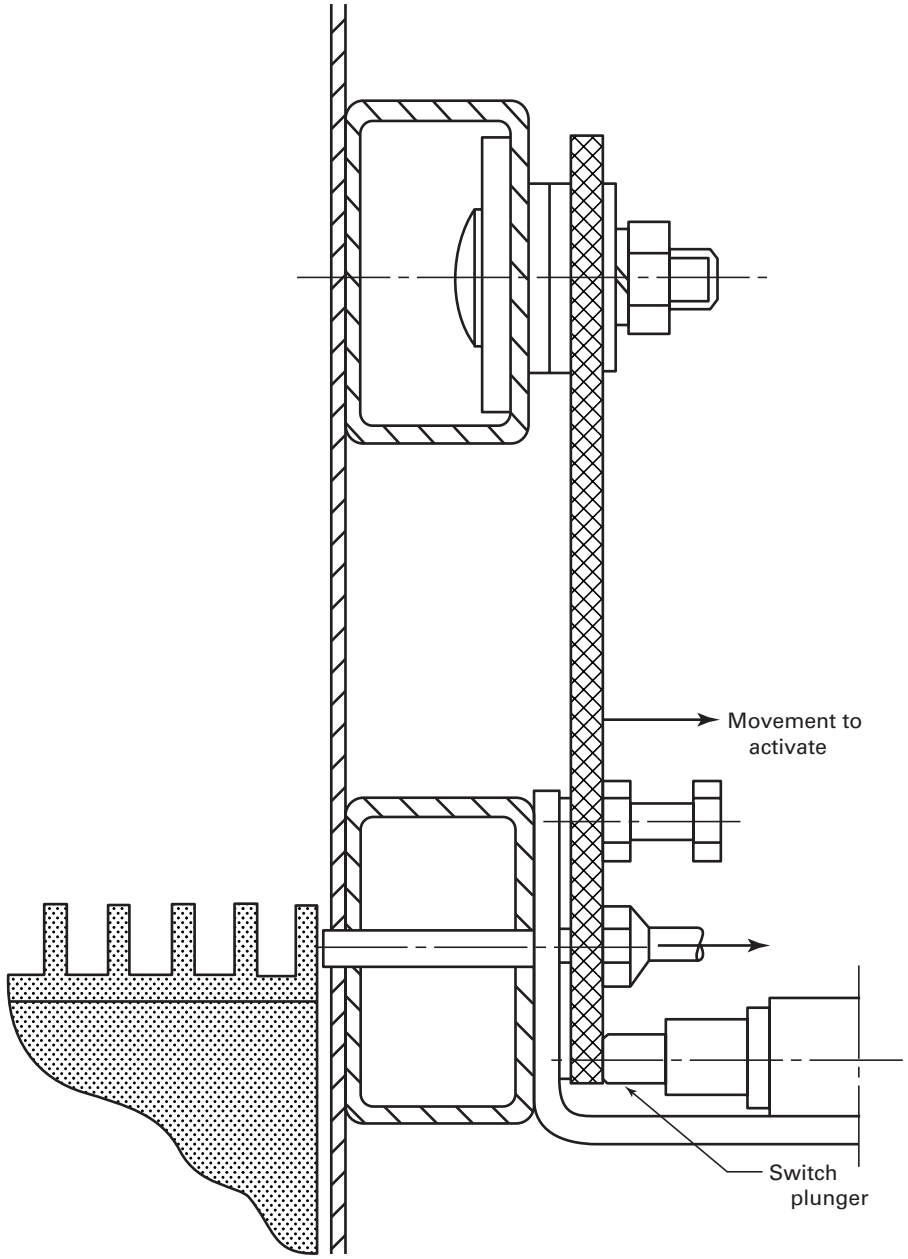


Fig. 7.11.1 Typical Skirt Obstruction Device

between the steps and the skirt as the step moves by the switch (see Fig. 7.11.1). If the switch activation requires displacement of the skirt panel, a soft hand-held rubber eraser can be used to displace the panel by holding it so that it will be drawn between the panel and skirt. A rubber kitchen spatula may also be used for this. A soft material should always be used to prevent damage to the equipment. Kicking the panel does not verify proper operation of the skirt switch. All four switches should be tested.

For escalators installed under A17.1–1983 and later editions, the maximum stopping distance should not exceed the distance from the location of the switch to the combplate for any load up to the rated load.

Escalators installed under A17.1–1971 through 1978 editions required skirt obstruction devices only at the lower landing. Prior to A17.1–1971 skirt obstruction devices were not required but were sometimes installed. If they are installed, they should be tested.

7.11.2 Periodic Test

7.11.3 Acceptance

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7.11.4 References

A17.1d–2000 and earlier editions — Rule 805.3f.

A17.1–2000 and later editions — Requirement 6.1.6.3.6.

A17.3 — Paragraph 5.3.7.

ITEM 7.12
(RESERVED)

ITEM 7.13
EGRESS RESTRICTION (ROLLING SHUTTER) DEVICE

7.13.1 Periodic Inspections

Where rolling shutters are provided to protect floor openings, check that when the shutters begin to close power is removed from the driving machine and brake, and remains off until the shutter is fully retracted. If the shutter is power operated, the building code may require a pressure sensitive leading edge to reverse direction and/or stop it when it strikes an object.

7.13.2 Periodic Test

7.13.3 Acceptance

7.13.4 References

A17.1d–2000 and earlier editions — Rule 805.3g.

A17.1–2000 and later editions — Requirement 6.1.6.3.7.

A17.3 — Paragraph 5.3.8.

ITEM 7.14
SPEED

7.14.1 Periodic Inspections

For escalators with DC motors or variable frequency drive motor controls, perform a speed test. The maximum permitted speed was 125 ft/min (0.64 m/s) for escalators installed under A17.1d–2000 and earlier editions, and 100 ft/min (0.5 m/s) for escalators installed under A17.1–2000 and later editions.

7.14.2 Periodic Test

7.14.3 Acceptance

Verify that the speed of the escalator cannot be changed without first stopping it.

Verify that the no-load speed of the escalator does not exceed the maximum permitted speed as follows:

(a) Run a tachometer wheel along the deck, skirt, or other stationary flat object when riding the escalator.

(b) Use a stop watch to time the travel from one landing to the other. Divide the travel in feet (meters) by the time in minutes (seconds) to obtain the speed in ft/min (m/s).

7.14.4 References

A17.1d–2000 and earlier editions — Rules 803.1, 805.3b, 1008.2o, and 1009.2o.

A17.1–2000 and later editions — Requirements 6.1.4.1, 6.1.6.3.2, (NR 1008.2o), and 8.10.4.1.2(l).

ITEM 7.15
BALUSTRADES

7.15.1 Periodic Inspections

Inspect the balustrades and note any cracked or broken panels. Panels and fasteners should be smooth and free of burrs and snag points. Interior panels or molding must not be raised or depressed by more than $\frac{1}{4}$ in. (6.4 mm). Check that the balustrades are totally enclosed along both exterior and interior lengths, except where the handrail enters the newel base. For escalators installed under the A17.1–1982 and later editions and A17.3, if gaps exist between interior panels, they should not be wider than $\frac{3}{16}$ in. (4.8 mm) and the edges should be beveled or rounded.

7.15.2 Periodic Test

Check that glass replacement panels are tempered for escalators installed under A17.1–1955, or tempered or shatterproof for escalators installed under A17.1–1965, and that glass or plastic replacement panels meet the requirements of ANSI Z97.1 or 16 CFR Part 1201 for escalators installed under A17.1–1971 and later editions.

7.15.3 Acceptance

Verify that the balustrades are adequately supported and meet the material, strength, and dimensional requirements.

Glass or plastic (except plastic bonded to basic support panels), if used, must meet the requirements of ANSI Z97.1 or 16 CFR Part 1201 and properly marked.

Check that components not used directly in connection with the operation of the escalator are not installed on, in, or through the escalator.

Check that the width between the balustrade interior panels does not change in the direction of travel.

7.15.4 References

A17.1d–2000 and earlier editions — Rules 802.3 and 1009.2g; and Appendix D.

A17.1–2000 and later editions — Requirements 6.1.3.3, 6.1.3.14, and 8.10.4.1.1(n); and (NR Appendix D).

A17.3 — Paragraph 5.1.1.

ITEM 7.16
CEILING INTERSECTION GUARDS

7.16.1 Periodic Inspections

Escalators installed under A17.1–1978 and later editions where the clearance of the exterior deck and the

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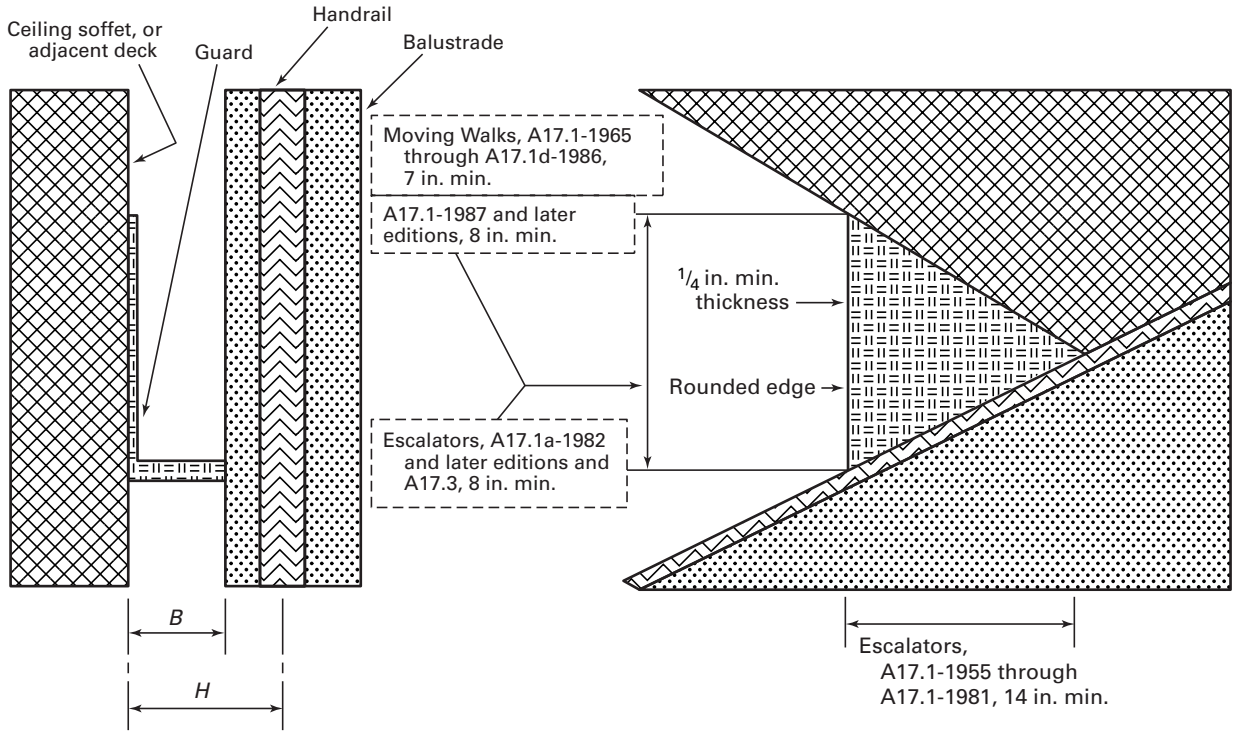


Fig. 7.16.1 Ceiling or Soffit Guard
[Requirements 6.1.3.3.9 and 6.2.3.3.7 (Rules 802.3g and 902.3g)]

ceiling or soffit is 12 in. (305 mm) or less or where the projected intersection of the exterior deck and ceiling or soffit is 24 in. (610 mm) or less from the adjacent handrail centerline, require ceiling intersection guards. This requirement was restricted to high decks for escalators installed under A17.1–1982 and later editions and A17.3 (see Fig. 7.16.1).

On low decks for escalators installed under A17.1–1982 and later editions and A17.3, where the centerline of the handrail is 14 in. (356 mm) or less from the ceiling or soffit, guards are also required.

Inspect the guards for damage and secure attachment.

7.16.2 Periodic Test

7.16.3 Acceptance

Verify that ceiling and soffit guards are correct size, in place, and secure. Check that glass or plastic guards are marked ANSI Z97.1 or 16 CFR Part 1201, or CAN/CGSB 12.1; CAN/CGSB 12.11; CAN/CGSB 12.12, as applicable.

7.16.4 References

A17.1d–2000 and earlier editions — Rule 802.3g; and Appendix D.

A17.1–2000 and later editions — Requirement 6.1.3.3.9; and (NR Appendix D).

A17.3 — Paragraph 5.1.3.

ITEM 7.17
STEP/SKIRT CLEARANCES, PANELS, AND PERFORMANCE INDEX

7.17.1 Periodic Inspections

Verify that the skirt panels are smooth for escalators installed under A17.1–1971 and later editions.

Check the clearance between the skirt panel and the step using a thickness gauge or by laying a small rule on the edge of the step to read the distance. Several steps should be checked through their entire travel. The allowable clearances are as follows (see Fig. 7.17.1):

(a) A17.1–1955 through A17.1d–1970: not more than $\frac{3}{16}$ in. (4.8 mm) with a total of both sides not more than $\frac{1}{4}$ in. (6.4 mm), except where skirt obstruction devices are installed at the lower entrance for escalators installed under the A17.1–1965 through A17.1d–1970.

(b) A17.1–1971 through A17.1–1979 editions: not more than $\frac{3}{8}$ in. (9.5 mm) on each side.

(c) A17.1–1980 through A17.1c–1999 and A17.3: not more than $\frac{3}{16}$ in. (4.8 mm) on each side.

(d) A17.1d–2000 and later editions, not more than 0.2 in. (5 mm) when 25 lbf (110 N) is laterally applied from the step to the adjacent skirt panel. Each side shall be independently tested.

For escalators installed under A17.1a–1982 through A17.1c–1999, inspect the exposed surface of the skirt panel to check whether it is either made from a low

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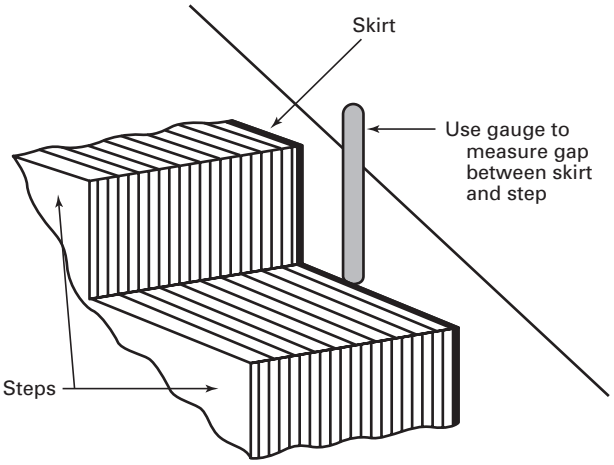


Fig. 7.17.1 Measuring Gap Between Step and Skirt

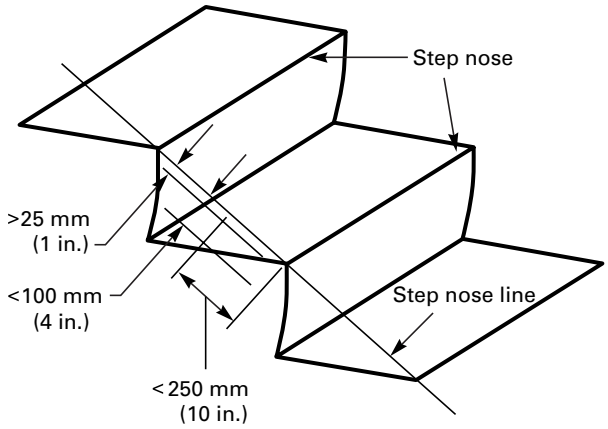


Fig. 7.17.2 Angle of Skirt Panel

friction material or treated with a friction-reducing material. The skirt panels of escalators installed prior to A17.1a–1982 should also be treated with a friction-reducing material. The panel should be tested at several places during the run and especially near the transition entrance and exit. If examination of the panels raises a question about the friction of the skirt panels, the manufacturer's recommendation should be requested and compared to the treatment schedule if available. If skirts are treated, examine the steps to verify that friction-reducing treatment has not been applied on them.

Skirt deflectors, when provided, shall be checked to ensure that all fasteners are flush and tamper resistant, that rigid elements are smooth and that exposed surfaces have their low friction material treatment intact and the dimensional, strength, and deflection requirements are met.

7.17.2 Periodic Test

Visually inspect the condition of step/skirt panel gap while the escalator is stationary. Mark a step and operate the escalator to bring other steps into view as required until every step on the escalator has been examined. Document any outstanding conditions, such as step/skirt gaps, damaged steps, damaged step treads, damaged skirt panels, mismatched skirt panel joints, or sharp edges on the edge of the step or skirt panel. Pay particular attention to the gaps between the riser portion of the step and the skirt panel.

Run the escalator in its normal direction of travel for at least two cycles of steps. If the escalator is operated in both directions, run the escalator for at least 2 cycles of steps in both the up and down directions. Visually examine the step/skirt gaps along the entire length of the escalator. Pay particular attention to the gaps at the transitions. Note any abnormal operation of the escalator such as jumping steps, irregular step movement, step/skirt panel interference, or skirt panel misalignments.

(a) Step/Skirt Performance Index Test (Moving Step). Select two steps to conduct this test. One step should be selected as a representative step. It should appear similar to the majority of the other steps on the escalator. A second step should be chosen to represent any unusual step or group of steps. Steps that appear to have been replaced, exhibit wear, show signs of damage, or move in irregular ways are candidates for the second test step. If all the steps appear similar, then the steps should be randomly selected. In any case, the test steps should be separated by at least eight steps.

If the escalator is a "DOWN" escalator, or the escalator is operated in both directions, the test step should be moved to the top of the escalator before the curved skirt panels prior to each test run, and run down during the test. If the escalator is normally operated as an "UP" escalator, then the test step should be moved to the bottom of the escalator just before the curved skirt panels prior to each test run, and run up during the test.

(1) Install the test apparatus on the step to be tested. Install a polycarbonate test specimen on the test apparatus.

(2) Orient a frictional force transducer to match the angle of the skirt panel as shown in Fig. 7.17.2.

(3) Using the test apparatus apply a 25 lbf (110 N) load between the step and skirt. The load should be maintained throughout the test.

(4) Start a new test and begin acquiring data as soon as the escalator is operating at rated speed. Data obtained prior to the escalator operating at rated speed is to be discarded. A coefficient of friction and a loaded gap measurement should be recorded every 6 in. (150 mm) at a minimum.

(5) Run the escalator continuously until the test step and apparatus reach the curved skirt panel at the opposite end of the escalator. Stop collecting data.

(6) Process the collected data.

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(7) Repeat steps (1) through (6) for both sides of both test steps. Use a new polycarbonate test specimen for each run. The index values obtained should not exceed the values specified by ASME A17.1 and/or A17.3 Codes.

(b) Loaded Gap Test (Stationary Step). This test will be conducted in the curved portions of the escalator where moving step testing was not conducted. The steps selected for this test can be the same as those used for the coefficient of friction and loaded gap, moving step tests. The escalator should be stationary while these measurements are taken.

(1) Move the step to be tested to the flat portion of the escalator at the bottom of the escalator. The edge of the combplate should be approximately 6 in. (150 mm) from the edge of the test step.

(2) Install the test apparatus on the step to be tested. Install a polycarbonate test specimen on the portion of the apparatus that touches the skirt panel.

(3) Using the test apparatus apply a 25 lbf (110 N) load between the step and the skirt.

(4) Measure and record the loaded gap.

(5) Remove the 25 lbf (110 N) load and advance device or escalator so that the device moves approximately 12 in. (300 mm) further away from the combplate.

(6) Repeat steps (3) through (5) until the test apparatus has reached the point where the coefficient of friction and loaded gap moving step test begins.

(7) Repeat steps (1) through (6) for the opposite skirt panel.

(8) Repeat the previous seven steps, but this time start at the top of the escalator and gradually move the escalator down until the apparatus has reached the area where moving step measurements were made.

The recorded loaded gap measurements should not exceed the values specified by ASME A17.1 and/or ASME A17.3 Codes.

7.17.3 Acceptance

Check that the skirt panels extend to a height of at least 1 in. (25 mm) vertically above the step tread nose line and that they meet Code deflection requirements.

7.17.4 References

A17.1d–2000 and earlier editions — Rules 802.3e, 802.3f, 802.3k, 1008.2s, 1008.2t, 1206.6b, and 1206.6c.

A17.1–2000 and later editions — Requirements 6.1.3.3.5, 6.1.3.3.6, (NR 802.3k), (NR 1008.2s), (NR 1008.2t), 8.6.8.4, and (NR 1206.6c).

ITEM 7.18
OUTDOOR PROTECTION

7.18.1 Periodic Inspections

For escalators installed under A17.1a–1988 and later editions, check that the required cover over the horizontal projection of the unit is present and in good condition. Verify that there is no accumulation of snow or freezing rain on the steps or landing plates.

7.18.2 Periodic Test

Heaters are required for escalators installed under A17.1a–1988 and later editions only if steps are subject to snow or freezing rain. Check that heaters are operational. Heaters may be located inside the unit (see Item 8.3.2).

7.18.3 Acceptance

Check that the cover extends outward from the centerline of the handrail such that a line from the edge of the cover to the handrail centerline is not less than 15 deg from the vertical. Two methods for checking this are shown in Fig. 7.18.3.

Check that the landing plates and combplates have provisions to provide a secure foothold when wet.

Check that all electrical components are weatherproof, that all wiring is identified for use in wet locations, and that they are properly installed (gaskets, seals, etc.).

7.18.4 References

A17.1d–2000 and earlier editions — Section 807; and Rules 1008.2p and 1009.2i.

A17.1–2000 and later editions — Requirements 6.1.8; and 8.11.4.2.14 and 8.10.4.1.1(q).

ITEM 7.19
MAINTENANCE RECORDS

7.19.1 Periodic Inspections

Review the maintenance records and verify that they are available to elevator personnel and that they are legible and up to date. They should include the following:

(a) description of maintenance task performed and dates

(b) description and dates of examinations, tests, adjustments, repairs, and replacements

(c) description and dates of call backs (trouble calls) or reports that are reported to elevator personnel by any means, including corrective action taken

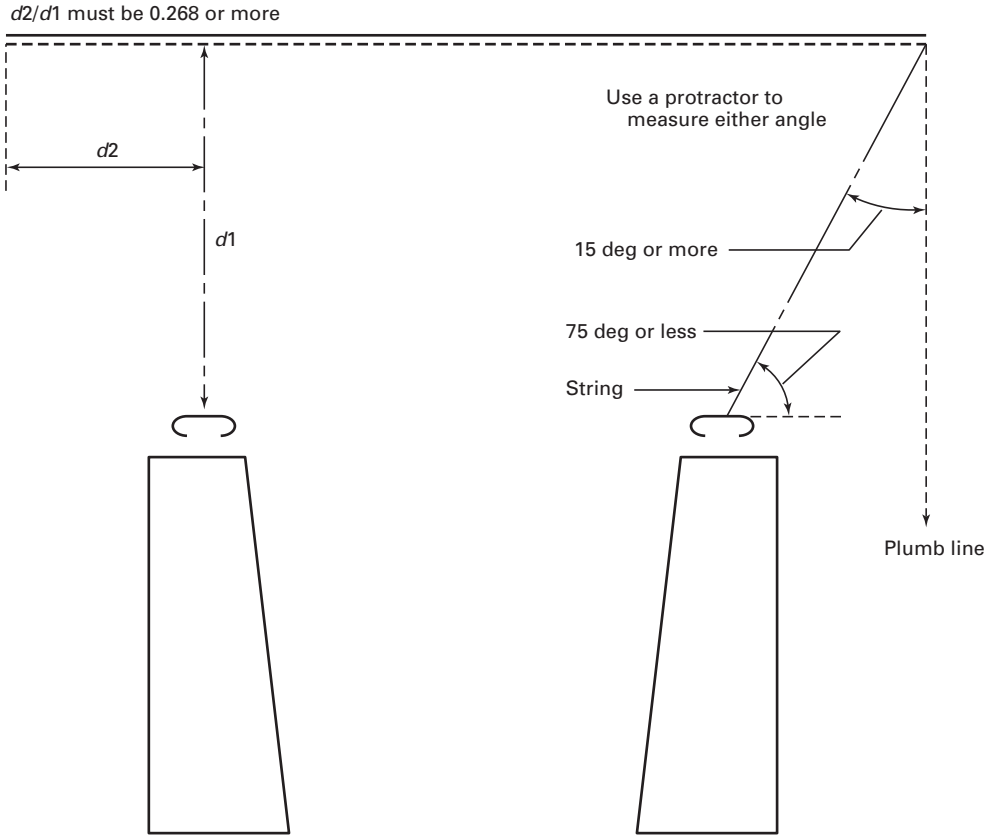
(d) verify that a start up procedure is available to authorized personnel (A17.1, requirement 8.6.10.5)

(e) electronic format is acceptable

7.19.4 References

A17.1–2000 and later editions — Requirements 8.6.1.4 and 8.6.10.5.

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Two Methods for Checking Compliance with Requirement 6.1.8.2 (Rule 807.2) Cover Requirement

Fig. 7.18.3 Escalator Cover Overlap

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PART 8
ESCALATOR — INTERNAL

ITEM 8.1
MACHINERY SPACE ACCESS, LIGHTING, RECEPTACLE, AND CONDITION

8.1.1 Periodic Inspections

For remote machine rooms, see Item 8.1.2.

8.1.2 Periodic Test

Determine that the means of access is securely fastened in place. A17.3b–1995 requires that access plates be fastened in place when no more than 30 lbf (311 N) effort is required to open them. If a door is used, verify that it is kept locked and the key is available only to authorized personnel. Check the lighting and test the receptacle. In remote machine space, check that lighting at floor level is at least 10 fc (108 lx) for escalators installed under A17.1–1981 and later editions.

Verify that the space is clean of dirt and rubbish and free of oil and combustibles. Items unrelated to escalator maintenance or operation shall not be stored in machine space. No lubricant or solvent with a flashpoint less than 110°F (43°C) shall be stored in such space. Water should not have accumulated on the floor of the space. Verify that jumpers are not stored in the machine space, hoistway, or pit. For escalators installed under A17.1–1977 and later editions, verify that the two fluorescent demarcation lamps are clean, green, and in good condition at each landing.

Verify that no penetrations exist through the sides and undersides of the machinery space and truss that compromises its fire resistance or allows physical contact with moving parts.

For escalators installed under A17.1–2000 and later editions, check that a fixed guard is in place to protect against accidental contact with the moving steps.

8.1.3 Acceptance

Check whether a reasonable means of access to the interior is provided. Where access plates are used, they should comply with the Code weight restrictions. Removal of the floor plates over the landing pit constitutes reasonable access if the opening uncovered affords ample space for the entry of one person. When an access door is provided on the side of the enclosure, verify the proper functioning of the door key and lock and that the key is only removeable in the locked position.

If fire shutters are required by the local building code, verify that they are present at ventilation openings and operate correctly. Verify that demarcation lights are located within 16 in. (406 mm) of the combplate, and properly installed, see Item 1.5.1.

Verify that the 15 A, 120 V duplex receptacle is properly located in machine rooms, under access plates and machine areas in the incline, are functional and that the light control for remote machine rooms is within easy reach of the access and can be operated without reaching or passing over any machinery components.

Check that components not used directly in connection with the operation of the escalator are not installed on, in, or through the escalator.

8.1.4 References

A17.1d–2000 and earlier editions — Section 806; and Rules 801.1, 805.7, 1008.2a, 1009.2j, and 1206.6a.

A17.1–2000 and later editions — Requirements 6.1.7; and 6.1.2.1, 6.1.6.7, 6.1.3.14, 8.11.4.2.1, 8.10.4.1.2(a), 8.1, 8.6.1.6.3, 8.6.8.14, 8.6.8.15, and 8.6.8.13.

A17.3 — Paragraph 5.5.5.

ITEM 8.2
STOP SWITCH

8.2.1 Periodic Inspections

For remote machine rooms, see Item 8.2.2.

8.2.2 Periodic Test

Test the operation of machine space stop switch(es) by placing them in the stop position. Then, make sure that everyone is clear and attempt to start the escalator with the key switch.

8.2.3 Acceptance

Check that stop switches are properly installed, correctly labeled, and operate correctly in all machine spaces or other spaces where access to the interior is provided. Where the main line disconnect switch is located, a separate stop switch is not required.

8.2.4 References

A17.1d–2000 and earlier editions — Rules 210.2, 805.3e, 1008.2b, and 1009.2k.

A17.1–2000 and later editions — Requirements 2.26.2, 6.1.6.3.5, 8.11.4.2.2, and 8.10.4.1.2(b).

ITEM 8.3
CONTROLLER AND WIRING

8.3.1 Periodic Inspections

For remote machine rooms, inspect as outlined in Item 8.3.2.

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8.3.2 Periodic Test

Examine the controller visually to verify that it is clean and that the switches, contactors, and relays and their electrical connections are in good condition. Check that the fuses are in place, properly rated, and have not been jumped or otherwise tampered with. Check for jumper wires or other changes which may indicate that safety devices have been defeated or altered. Visually examine wiring for damage and all components for evidence of overheating. Operate the main line circuit breakers to verify that all power is removed from the drive machine.

Verify that all electrical components are enclosed to prevent accidental contact. If heaters are present (see Item 7.18.2), verify that they are operational. For escalators installed under A17.1–1965 through 1985, verify that the circuit breakers will not be automatically opened by the fire alarm.

8.3.3 Acceptance

Check for proper voltage, correct wiring, and arrangement of wiring, controller, and other components.

Check numbering of drive machines and disconnects where multiple drive machines are in a machine room. Verify that disconnects are in sight of machines operated. Inspect all wiring enclosure raceways conduit, electrical metallic tubing, metal wireways, junction boxes for condition, workmanship, and fastening.

Visually inspect condition of weatherproof electrical enclosure where required on outdoor units. Verify that use of flexible conduit, armored cable, and flexible leads comply with the Code requirements.

8.3.4 References

A17.1d–2000 and earlier editions — Section 806; and Rules 807.2, 1008.2c, and 1009.2l.

A17.1–2000 and later editions — Requirements 6.1.7; 6.1.8.2, 8.11.4.2.3, and 8.10.4.1.2(c).

ITEM 8.4
DRIVE MACHINE AND BRAKE

8.4.1 Periodic Inspections

8.4.2 Periodic Test

Verify that the driving machine is properly secured, lubricated, clean, and in good condition. Visually check the driving machine fastenings and bearing caps to verify that they are tight.

Verify that the driving machine is connected to the main drive shaft by toothed gearing, a mechanical coupling, or a chain and that it is in good condition. Look for evidence of any excessive backlash in the driving gears or chains. If a chain is used to connect the driving machine to a sprocket on the main drive shaft, visually examine the chain and sprockets for wear, excessive slack, and proper lubrication. Lack of lubrication for a chain may be indicated by rouge (red rust deposits) on the side plates of the links.

For escalators installed under A17.1a–1988 and later editions, verify that cast iron links are not used. If the links appear to be cast iron, have a small hole drilled (in a low stress area) and observe the drill cuttings. If the cuttings are a fine powder, cast iron is indicated. If the cuttings are shavings, then the links are not cast iron.

Inspect any drive belts and sheaves for damage and wear. Check for proper belt tension and reasonable equality of tension in a set of belts.

Visually examine the components for signs of overheating. Verify that an electrically released mechanically applied brake is present and automatically applied when power is interrupted. It is to be located on the driving machine for units installed under A17.1–1955 through A17.1a–1957 editions. Earlier and later editions allowed the brake to be on the main drive shaft.

For escalators installed under A17.1–1983 and later editions, verify that the driving machine brake is located on the gear reducer of main drive shaft if means other than a continuous shaft mechanical coupling or toothed gearing is used to connect the motor to the gear reducer.

For escalators installed under 1983 and later editions and A17.3, the brake may be magnetically applied using a ceramic permanent magnet. Visually inspect the condition of the brake pads, drums, and discs.

If the driving machine brake is separated from the main drive shaft by a chain used to connect the driving machine to the main drive shaft, check for presence of a second brake that is required on the main drive shaft. The requirements for this additional brake on the main drive shaft are:

(a) A17.1–1955 did not require this brake to be electrically released.

(b) A17.1–1965 through A17.1–1971 did not require that the brake be electrically released type if an electrically released brake was provided on the driving machine.

(c) A17.1–1978 required this brake to be mechanically applied and capable of stopping a down running escalator with rated load.

(d) A17.1b–1983 and later editions required that both machine and main drive shaft brakes be mechanically or magnetically applied (ceramic permanent magnet) and to stop the down running escalator at a rate not to exceed 3 ft/s^2 (0.91 m/s^2).

Visually inspect all mechanisms for condition and operation.

Verify that escalators installed under A17.1b–1983 and later editions have a nameplate that specifies the required brake torque. Escalators installed under A17.1a–1988 and later editions, require that the nameplate torque be specified as breakaway, the maximum torque required to cause the brake to begin moving, or dynamic, the torque required to keep the shaft moving very slowly at a steady rate. The location where the torque is to be measured is required to be clearly indicated.

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For escalators installed under A17.1a–1991 and later editions, the nameplate is required to specify the range of brake torque and whether it is measured as breakaway or dynamic.

Have the torque tested to verify that the torque complies. The main drive shaft brake (where a chain is used to connect the driving machine and brake to the main drive shaft) should also be torque tested for escalators installed under A17.1–1983 through A17.1d–2000.

The torque wrench should have a current calibration certificate traceable to the National Bureau of Standards and have a range of at least 25% higher than the required torque.

(e) A17.3 requires the brake to be mechanically or magnetically (permanent magnet) applied and capable of stopping a down-running escalator with rated load.

8.4.3 Acceptance

Check the certification for the driving machine brake.

Check the stopping distance with no load. Compare this with the minimum stopping distance and the minimum distance from the skirt obstruction devices to the combplate against the information on the data plate.

8.4.4 References

A17.1d–2000 and earlier editions — Section 804; and Rule 1008.2d.

A17.1–2000 and later editions — Requirements 6.1.5; and 8.11.4.2.4.

A17.3 — Section 5.2.

ITEM 8.5
SPEED GOVERNOR

8.5.1 Periodic Inspections

8.5.2 Periodic Test

When a speed governor is required, test it to verify that it is functioning. Manually operate the switch or use any testing mechanisms (such as flywheel weights) that may be provided. The flyballs and all operating mechanisms must be present and in good operating condition. When the switch is opened, it should interrupt power to the driving machine. For escalators installed under A17.1–1990 and later editions, verify that the escalator cannot be started by the starting switch until the device is manually reset.

When a manual reset is required for units installed under A17.1b–1995 and later editions, turn the power off and then back on, and then try the start switch to check that the device will not reset. Also, some indication that the device has been activated needs to be provided (fault finder, etc.)

8.5.3 Acceptance

When an overspeed governor is required, verify that it activates at the proper speed, which cannot be more than 40% above the rated speed. This can be done using a rubber drive wheel driven by a variable speed drill and a tachometer. Other methods approved by the manufacturer for field testing may be used.

8.5.4 References

A17.1d–2000 and earlier editions — Rules 805.3b, 1008.2e, and 1009.2m.

A17.1–2000 and later editions — Requirements 6.1.6.3.2, 8.11.4.2.5, and 8.10.4.1.2(e).

A17.3 — Paragraphs 5.3.3 and 5.3.5.

ITEM 8.6
BROKEN DRIVE CHAIN AND DISCONNECTED MOTOR SAFETY DEVICE

8.6.1 Periodic Inspections

8.6.2 Periodic Test

(a) If the driving machine is connected to the main drive shaft by a chain, check the broken drive chain device to verify that it will apply the main shaft brake and stop the drive machine if the drive chain parts. All parts of the device should be in good condition and show freedom to move. Have the switch manually operated and verify that it will open the drive motor circuit. Common devices include a block that is held in tension by the drive chain that activates the switch when tension is lost, or a plate that depresses a switch when the drive chain strikes it. For escalators installed under A17.1–1990 and later editions, verify that the escalator cannot be started by the starting switch until the device is manually reset.

When a manual reset is required for units installed under A17.1b–1995 and later editions, turn the power off and then back on, and then try the start switch to check that the device will not reset. Also, some indication that the device has been activated needs to be provided (fault finder, etc.)

(b) If the drive motor is attached to a gear reducer by means other than a continuous shaft, coupling, or toothed gearing, check that the device provided will apply the brake if the motor becomes disconnected from the gear reducer. Have the switch manually operated and verify that all operating mechanisms are present, clean, lubricated, and in good condition. For escalators installed under A17.1–1990 and later editions, verify that the escalator cannot be started by the starting switch until the device is manually reset.

When a manual reset is required for units installed under A17.1b–1995 and later editions, turn the power off and then back on, and then try the start switch to check that the device will not reset. Also, some indication that the device has been activiated needs to be provided (fault finder, etc.)

8.6.3 Acceptance

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8.6.4 References

A17.1d–2000 and earlier editions — Rules 804.3b, 805.3d, 805.3j, and 1008.2f.

A17.1–2000 and later editions — Requirements 6.1.5.3.2, 6.1.6.3.4, 6.1.6.3.10, and 8.11.4.2.6.

A17.3 — Paragraphs 5.3.5 and 5.3.6.

ITEM 8.7
REVERSAL STOP SWITCH

8.7.1 Periodic Inspections

8.7.2 Periodic Test

Manually operate the device and verify that all operating mechanisms are present and in good condition and that the device will open the circuits to the driving machine motor and brake to stop an ascending escalator from reversing its direction of travel. For escalators installed under A17.1–1990 and later editions, verify that the escalator cannot be started by the starting switch until the device is manually reset.

When a manual reset is required for units installed under A17.1b–1995 and later editions, turn the power off and then back on, and then try the start switch to check that the device will not reset. Also, some indication that the device has been activated needs to be provided (fault finder, etc.).

There are several different types of devices that are used (friction reversal devices, speed monitoring, etc.). Therefore, the type of device will dictate the testing procedure. If the device cannot be manually operated, a written procedure must be provided by the person or firm performing the tests.

8.7.3 Acceptance

8.7.4 References

A17.1d–2000 and earlier editions — Rules 805.3h and 1008.2g.

A17.1–2000 and later editions — Requirements 6.1.6.3.8, 8.10.4.1.2(g), and 8.11.4.2.7.

A17.3 — Paragraphs 5.3.5 and 5.3.9.

ITEM 8.8
BROKEN STEP CHAIN DEVICE

8.8.1 Periodic Inspections

8.8.2 Periodic Test

Manually operate the broken step chain devices to verify that each will interrupt power to the driving machine and brake. Visually inspect each device to verify that they are in position to operate and will activate when either step chain breaks, and (where automatic tensioning is not provided) when excessive sag occurs in either step chain. For escalators installed under A17.1–1990 and later editions, verify that the escalator cannot be started by the starting switch until the device is manually reset.

When a manual reset is required for units installed under A17.1b–1995 and later editions, turn the power off and then back on, and then try the start switch to check that the device will not reset. Also, some indication that the device has been activated needs to be provided (fault finder, etc.).

8.8.3 Acceptance

8.8.4 References

A17.1d–2000 and earlier editions — Rules 805.3c and 1008.2h.

A17.1–2000 and later editions — Requirements 6.1.6.3.3 and 8.11.4.2.8.

A17.3 — Paragraphs 5.3.4 and 5.3.5.

ITEM 8.9
STEP UPTHRUST DEVICE

8.9.1 Periodic Inspections

8.9.2 Periodic Test

The operation of the upthrust device was tested during the external inspection and test in Item 1.9.2. While the steps are removed (Item 8.12.2), manually move the mechanism and visually inspect the components of the upthrust device. Visually examine the upthrust tabs on each step for damage, alignment, and attachment (see Fig. 8.9.2).

8.9.3 Acceptance

8.9.4 References

A17.1d–2000 and earlier editions — Rules 805.3i and 1008.2i.

A17.1–2000 and later editions — Requirements 6.1.6.3.9 and 8.11.4.2.9.

A17.3 — Paragraph 5.1.7.

ITEM 8.10
MISSING STEP DEVICE

8.10.1 Periodic Inspections

8.10.2 Periodic Test

For escalators installed under A17.1–1989 and later editions, test the missing step device by running the escalator with a step missing on the underside of the escalator. The device must stop the escalator before the gap resulting from the missing step emerges from the combplate.

For escalators installed under A17.1–1990 and later editions, verify that the escalator cannot be started by the starting switch until the device is manually reset.

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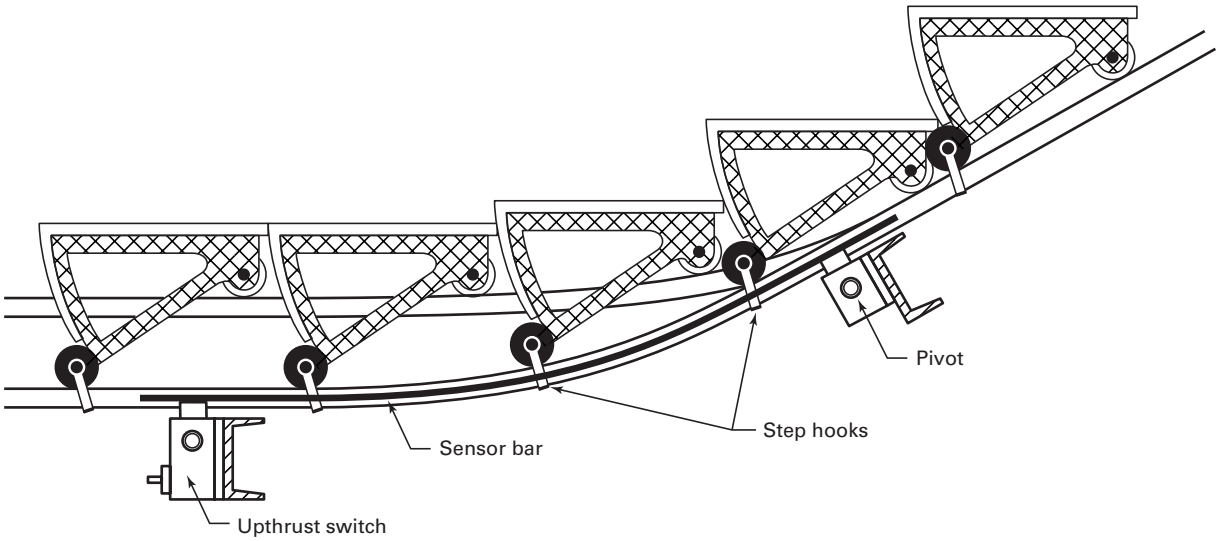


Fig. 8.9.2 Typical Step Upthrust Device

When a manual reset is required for units installed under A17.1b–1995 and later editions, turn the power off and then back on, and then try the start switch to check that the device will not reset. Also, some indication that the device has been activated needs to be provided (fault finder, etc.).

8.10.3 Acceptance

8.10.4 References

A17.1d–2000 and earlier editions — Rules 805.5 and 1008.2j.

A17.1–2000 and later editions — Requirements 6.1.6.5 and 8.11.4.2.10.

ITEM 8.11
STEP LEVEL DEVICE

8.11.1 Periodic Inspections

8.11.2 Periodic Test

For escalators installed under A17.1–1990 and later editions, visually inspect the step level devices at each end and on both sides to verify that it is in place and able to function. Have the switch manually operated to verify that it will open the safety circuit and stop the escalator.

For escalators installed under A17.1–1990 and later editions, verify that the escalator cannot be started by the starting switch until the device is manually reset.

When a manual reset is required for units installed under A17.1b–1995 and later editions, turn the power off and then back on, and then try the start switch to check that the device will not reset. Also, some indication that the device has been activated needs to be provided (fault finder, etc.).

8.11.3 Acceptance

Have the devices tested (at both ends and on each side) by mechanically lowering a step $\frac{1}{8}$ in. (3.2 mm) and operating the escalator. A smaller roller or adjustment may be used to lower the step.

8.11.4 References

A17.1d–2000 and earlier editions — Rules 805.3k, 1008.2k, and 1009.2n.

A17.1–2000 and later editions — Requirements 6.1.6.3.11, 8.11.4.2.11, and 8.10.4.1.2(k).

ITEM 8.12
STEPS, STEP CHAINS, AND TRUSSES

8.12.1 Periodic Inspections

8.12.2 Periodic Test

Have at least half of the steps removed, then move the remaining steps to the upper half of the escalator (see Fig. 8.12.2). Some escalators use the steps as the side guide means and require every sixth step to be left in to prevent the chain from falling off. Using a good light visually inspect the drip pans, undersides of steps, trusses, roller tracks, chains, handrails, and the interiors of balustrades, skirts, and newels. Verify that they are present, in good condition, clean of dirt and rubbish, and free of oil and combustibles. Visually inspect for any damage to the fire-resistive material on the escalator enclosure (see Item 8.1).

Visually inspect the chains for lubrication and buildup of dirt and grease. Lack of lubrication may be indicated by rouge (red rust deposits) on the side plates of the links.

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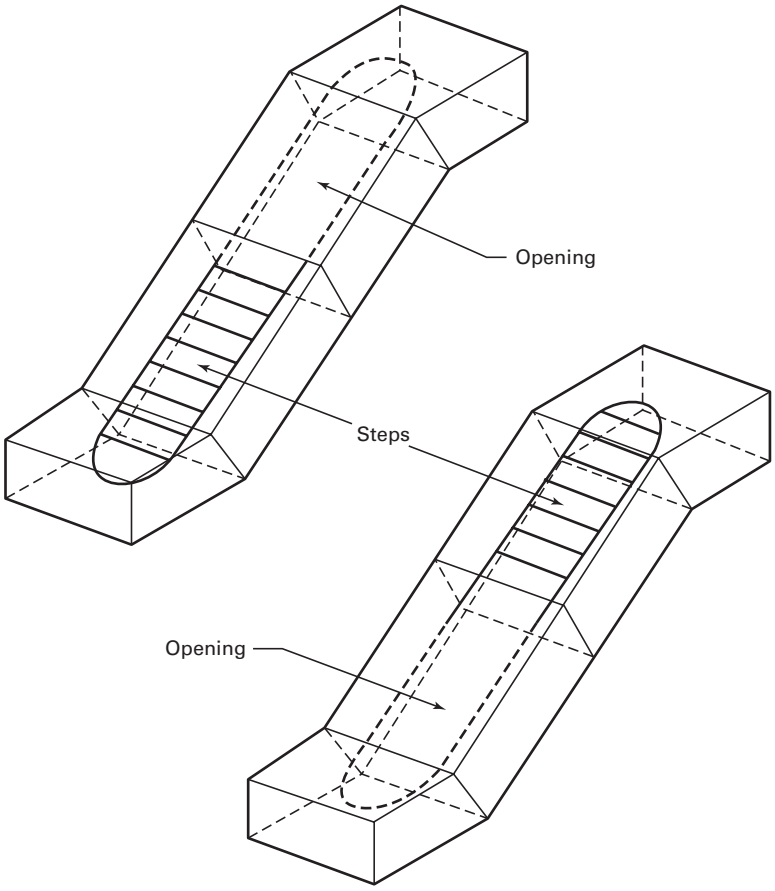


Fig. 8.12.2 Positioning of Steps for Inspection of Truss

Verify that cast iron links are not used on escalators installed under A17.1–1978 and later editions. See Item 8.4.2 for method of identifying cast iron.

Check the operation of any escalator step-chain tension devices. If they are of the automatically operated "tension-weight" type, verify that the truss is provided with a positive means to retain the weights in the truss if the weights are released.

Move the remaining steps to the lower half of the escalator and inspect the upper half in the same manner (see Fig. 8.12.2).

Inspect each of the steps for evidence of structural damage, condition of the step rollers and upthrust tabs and material. Verify that the step tread material is noncombustible or that the undersides are properly covered with fire-resistive materials. Escalators installed under A17.1–1955 through A17.1–1993 required that step frames be made of noncombustible materials. A17.1a–1994 and later editions specifically required that step frames, treads, and risers, excluding any attachments or inserts, be made of metal (except magnesium alloys) or meet certain flammability requirements.

8.12.3 Acceptance

Verify that if the tracking system fails, the running gear is retained in its guides and the step wheel tracks will prevent displacement of the steps and running gear if the chain breaks.

Verify that foreign material such as stone or concrete is not in the truss interior.

If the step rollers are not located directly under the step (i.e., located past the edges of the sides of the steps), then check that provisions (e.g., unistrut, c-channel) are made to prevent the step from falling into the truss/step band upon the loss of the step roller assemblies.

Check that components not used directly in connection with the operation of the escalator are not installed on, in, or through the escalator.

8.12.4 References

A17.1d–2000 and earlier editions — Rules 801.1, 802.7, 802.8, 802.11, 806.3, 1008.2l, 1009.2o, and 1206.6.

A17.1–2000 and later editions — Requirements 6.1.2.1, 6.1.3.5.8, 6.1.3.7, 6.1.3.8, 6.1.3.11, 6.1.3.1.4, 6.1.7.3, 8.11.4.2.12, 8.10.4.1.2(l), and 8.6.8.

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ITEM 8.13
HANDRAIL SYSTEMS AND SAFETY DEVICES

8.13.1 Periodic Inspections

8.13.2 Periodic Test

Examine the handrail drive systems to ensure that all chains, pulleys, gears, rollers, and belts are present and in good condition. The operation should be free of excessive noise and slack, which indicates wear.

(a) For escalators installed under A17.1a–1988 through A17.1b–1992, test the operation of the stopped handrail device. Have the handrail motion sensor mechanically disconnected while the unit is off and then run the unit, or grab the handrail and stall it while the escalator is running. Verify that the alarm sounds immediately and the escalator stops within 15 s.

(b) For escalators installed under A17.1–1993 and later editions, check the operation of the handrail speed monitoring device. An alarm must sound immediately if the speed of either handrail deviates from the step speed by 15% or more, and the unit must shut down if the speed deviation is continuous for more than 2 s. If holding the moving handrail cannot activate the device, then it will be necessary to activate the device by another means (disconnecting the speed sensor, changing dip switch settings on the controller, etc.). Verify that the unit cannot be started until the device is manually reset. For units installed under A17.1b–1995 and later editions, turn the power off and then back on and then try the start switch to check that the device will not reset. Also, some indication that the device has been activated needs to be provided (fault finder, etc.).

(c) For escalators installed under A17.1b–1992 and later editions, test the operation of the handrail entry device by having a soft object that will not damage the unit inserted between the handrail and hand guard. After the unit stops, verify that it cannot be restarted with the key switch until the device has been manually reset. The device need only operate in the direction of the handrail travel, except for units installed under A17.1b–1996 and later editions, the device must operate, irregardless of the direction of travel of the handrail where an opening is created in the balustrade to prevent entrapment. When a manual reset is required for units installed under A17.1b–1995 and later editions, turn the power off and then back on and then try the start switch to check that the device will not reset. Also, some indication that the device has been activated needs to be provided (fault finder, etc.).

8.13.3 Acceptance

8.13.4 References

A17.1d–2000 and earlier editions — Rules 802.4, 802.11, 805.4, 805.3m, 1008.2m, 1008.2q, and 1009.2c.

A17.1–2000 and later editions — Requirements 6.1.3.4, 6.1.3.11, 6.1.6.4, 6.1.6.3.12, 8.11.4.2.13, 8.11.4.2.18, and 8.10.4.1.1(c).

ITEM 8.14
CODE DATA PLATE

8.14.1 Periodic Inspections

Check that the Code Data Plate is installed. This is the Code that is to be used for the inspection and test.

8.14.2 Periodic Test

8.14.3 Acceptance

8.14.4 References

A17.1d–2000 and earlier editions — Rules 808, 908, and 1200.6.

A17.1–2000 and later editions — Requirements 8.9, 8.9, and 8.7.1.8.

ITEM 8.15
RESPONSE TO SMOKE DETECTORS

8.15.1 Periodic Inspections

8.15.2 Periodic Test

For units installed under A17.1a–1994 and later editions, when smoke detectors are provided that will shut down a running unit, verify that the emergency stop button alarm will sound and the unit does not shut down for at least 15 s. The unit may be tested by activating the smoke detector or by other means.

CAUTION: If the sensing system is connected to a central fire alarm system, notify proper authorities before activating.

8.15.3 Acceptance

8.15.4 References

A17.1d–2000 and earlier editions — Rule 805.8.

A17.1–2000 and later editions — Requirement 6.1.6.8.

ITEM 8.16
STEP LATERAL DISPLACEMENT DEVICE

8.16.1 Periodic Inspections

8.16.2 Periodic Test

For curved escalators, manually actuate the device on the stopped escalator. Verify that the starting switch cannot start the escalator until the device is manually reset.

8.16.3 Acceptance

8.16.4 References

A17.1d–2000 and earlier editions — Rules 805.3p, 1003.2b(20).

A17.1–2000 and later editions — Requirements 6.1.6.3.14, 8.11.4.2.21, and 8.10.4.1.2(r).

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PART 9
MOVING WALK — EXTERNAL

(04)

ITEM 9.1
GENERAL FIRE PROTECTION

9.1.1 Periodic Inspections

Examine the sides and undersides of the moving walk trusses and machinery spaces enclosure for damage to fire-resistive materials. A17.1a–1994 and later editions permit the use of noncombustible and limited combustible materials as defined by the building code or ANSI/NFPA 101.

Check that guards are in place for openings provided for ventilation of the driving machine and control equipment spaces. Enclosure in fire-resistive ceiling does not constitute adequate fire protection.

Verify that provisions to protect floor openings from the passage of flame, heat, and/or smoke that are required by the building code have not been damaged, removed, or defeated.

Moving walks installed under A17.1–1981 and later editions require protection in compliance with ANSI/NFPA 101 or local codes. Prior to A17.1–1981, A17.1 gave requirements for protection of floor opening for moving walks that were not accredited as a means of egress. However, since moving walks are no longer accredited as a means of egress, the inspector must refer to the local code or the Life Safety Code NFPA-101 for the protection requirement at each location.

9.1.2 Periodic Test

9.1.3 Acceptance

Verify that floor openings are protected against the passage of flame, heat, and/or smoke in accordance with the requirements of the building code.

9.1.4 References

A17.1d–2000 and earlier editions — Sections 900 and 901; and Rule 1009.2a.

A17.1–2000 and later editions — Requirements 6.2.1 and 6.2.2; and 8.10.4.1.1(a).

A17.3 — Paragraphs 9.1.1 and 9.2.2.

ITEM 9.2
GEOMETRY

9.2.1 Periodic Inspections

Inspect for evidence of change to the geometry of the balustrades and if change has been made, inspect as outlined in Item 9.2.3.

If a moving walk is relocated or a new moving walk is installed in existing trusses, it must comply with the current Code requirements. See Figs. 9.2.1(a) and 9.2.1(b) for dimension requirements of existing moving walks.

Verify that the overhead clearance is in compliance with local codes.

9.2.2 Periodic Test

9.2.3 Acceptance

(a) Measure the slope of the treadway at the centerline using a level and protractor or an angle finder at each incline (if any). See Fig. 9.2.3.

(b) Measure the width of the treadway at a right angle transverse to the direction of travel. See Tables 9.2.3(a), 9.2.3(b), and 9.2.3(c) for existing moving walks installed prior to 1971. For moving walks installed under A17.1–1971 and later editions, refer to A17.1a–1991.

(c) Measure and mark the centerline of each handrail and use a plumb line to find the horizontal distance from the handrail centerline to the vertical plane through the exposed treadway edge. Measure the height from the top of the handrail to the treadway at several points.

(d) For an interior low deck moving walk, measure the distance from the vertical face of the interior panels to the vertical face of the skirt panels using a machinist level and ruler [see Fig. 9.2.1(b)]. Measure the slope of the deck perpendicular to the line of travel using a machinist level and protractor.

9.2.4 References

A17.1d–2000 and earlier editions — Rules 902.1, 902.2, 902.3d, 1009.2b, 1009.2g, and 1208.5; and Appendix D.

A17.1–2000 and later editions — Requirements 6.2.3.1, 6.2.3.2, 6.2.3.3.4, 8.10.4.1.1(b), 8.10.4.1.1(n), and 8.7.6.2.5; and (NR Appendix D).

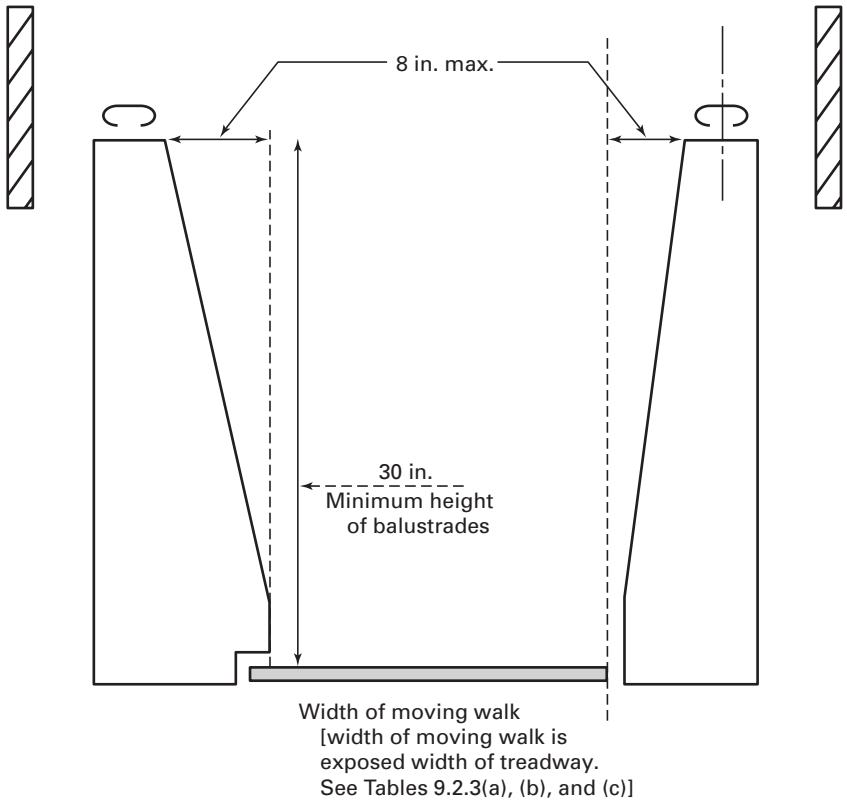
A17.3 — Paragraphs 9.3.1, 9.3.2, 9.3.3, and 9.3.6.

ITEM 9.3
HANDRAILS

9.3.1 Periodic Inspections

(a) Mark one location on each handrail with chalk, then operate the unit and inspect each handrail through a complete revolution. The handrails, including splices and joints, should be free of any cuts, cracks, gouges, pinch points, or any other condition that would be a

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GENERAL NOTE: 1 in. = 25.4 mm

Fig. 9.2.1(a) Moving Walk Geometry (for Moving Walks Installed Under A17.1–1965 Through A17.1–1980)

hazard to passengers. The undersides of the handrails should be close enough to the handrail stand to prevent any fingers from getting between the handrail and the handrail stand. Any rust or rubber filings present on the balustrade deck indicates that an internal inspection of the handrail system may be warranted.

(b) Verify that the hand or finger guards are present at the newel base. Check that the guards are in good condition and properly sized to prevent fingers or hands from being drawn into the newel. Finger guards are required under A17.1–1965 and later editions.

(c) Ride the moving walk holding the handrails through the entire travel. The handrails should move smoothly without jerking, at substantially the same speed as the treadways. The need to frequently change grip on the handrail indicate a need for adjustment. During this ride observe any unusual noise that may indicate the need for further inspection. At several points in the ride firmly grip the handrail and attempt to see if it stalls under moderate force. On many units the handrails will normally stall if it is firmly gripped and held.

(d) Listen for noise that may indicate wear of the turnaround rollers, or other parts.

(e) Moving walks installed under A17.1–1981 through A17.1–1987 editions required only one moving handrail if the slope was 3 deg or less, the width was 24 in. (610 mm) or less, and the speed was 70 ft/min or less. Moving walks installed under A17.1–1965 through A17.1–1979 did not require a moving handrail if the slope was 3 deg or less, and the speed was 70 ft/min or less. Only one handrail was required (regardless of speed or incline) if the width was less than 21 in. (533 mm). A balustrade with no moving handrail should not have any surface that can be gripped.

9.3.2 Periodic Test

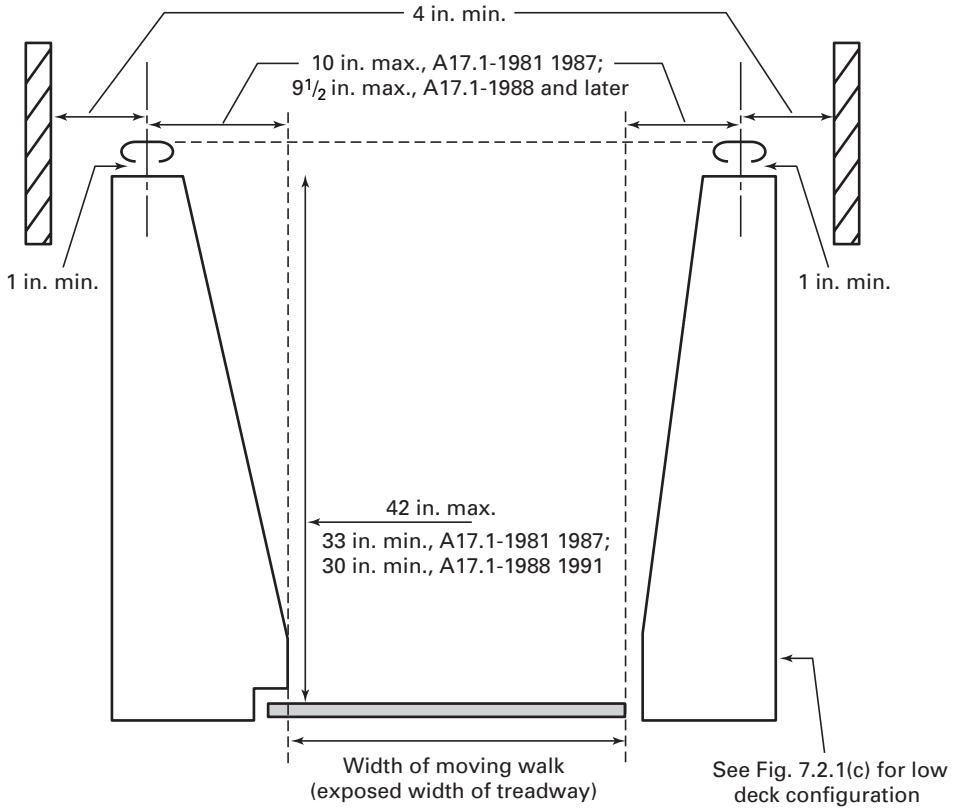
9.3.3 Acceptance

Check whether each handrail extends at normal height not less than 12 in. (305 mm) beyond the moving walk combplates, and verify that required clearances are present (see Fig. 9.3.3).

9.3.4 References

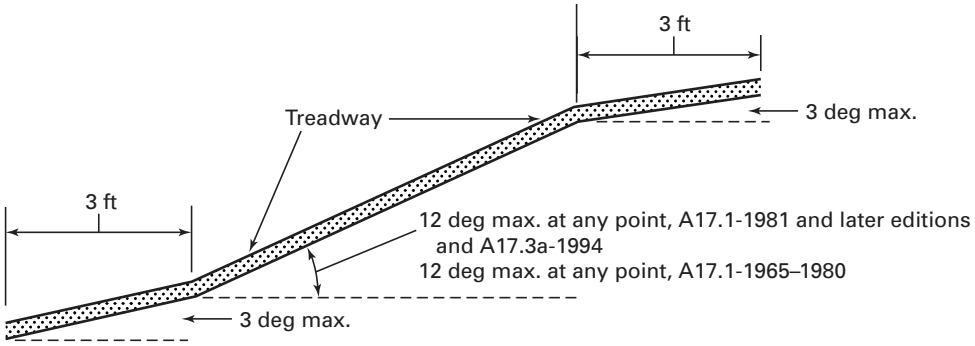
A17.1d–2000 and earlier editions — Rules 902.2, 902.4, 1008.2m, and 1009.2c; and Appendix D.

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GENERAL NOTE: 1 in. = 25.4 mm

Fig. 9.2.1(b) Moving Walk Geometry (for Moving Walks Installed Under A17.1–1981 Through A17.1a–1991)



GENERAL NOTE: 1 in. = 25.4 mm

Fig. 9.2.3 Maximum Treadway Angle

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Table 9.2.3(a) Treadway Width (A17.1–1965 Through A17.1–1970)

Maximum Treadway Slope at any Point on Treadway, deg	Maximum Moving Walk Treadway Width, in.	
	Treadway Speed, 140 ft/min Max.	Treadway Speed, Above 140 ft/min to 180 ft/min
0 to 3	Unlimited	40
Above 3 to 5	110	40
Above 5 to 8	78	40
Above 8 to 12	40	. . .
Above 12 to 15	40	. . .

GENERAL NOTES:
(a) 1 deg = 1.75 E – 02 radian
(b) 1 in.= 25.4 mm

Table 9.2.3(b) Treadway Width (A17.1–1971 and Later Editions)

Max. Treadway Slope at any Point, deg	Maximum Moving Walk Treadway Width, in.		
	Up to 90 ft/min	90.1 ft/min to 140 ft/min	140.1 ft/min to 180 ft/min
0 to 4[1]	Unrestricted	60	40
4[1] to 8	40	40	40
8 to 12[2]	40	40	Not Permitted

GENERAL NOTES:
(a) 1 deg = 1.75 E – 02 radian
(b) 1 in. = 25.4 mm

NOTES:
(1) 5 deg for units installed under A17.1–1971 through A17.1–1978.
(2) 15 deg for units installed prior to A17.1–1981.

Table 9.2.3(c) Minimum Treadway Width

A17.1–1980 and Prior Editions	A17.1–1981 and Later Editions and A17.3a–1994
16 in.	22 in.

GENERAL NOTES:
(a) 1 deg = 1.75 E – 02 radians
(b) 1 in. = 25.4 mm

A17.1–2000 and later editions — Requirements 6.2.3.2, 6.2.3.4, 8.11.4.2.13, and 8.10.4.1.1(c); and (NR Appendix D).

A17.3 — Paragraph 9.3.4.

ITEM 9.4 ENTRANCE AND EGRESS ENDS

9.4.1 Periodic Inspections

(a) The floor surfaces adjacent to the landing plates must be continuous with the top of the landing plate, with no abrupt changes in elevation of more than $\frac{1}{4}$ in. (6.4 mm). Access to and egress from the moving walk should be free of obstacles and tripping hazards. Check that the pit covers are present and in good condition. For moving walks installed under A17.1–1965 through A17.1–1987 editions the landing plate should be smooth from the line of intersection of the teeth and the treadway surface for a distance not to exceed 4 in. (102 mm) and not less than 1 in. (25 mm).

(b) For moving walks installed under the A17.1a–1988 and later editions, a safety zone should be maintained free of obstacles (see Fig. 7.4.1). These Code dimensions are minimums and traffic patterns may require larger distances.

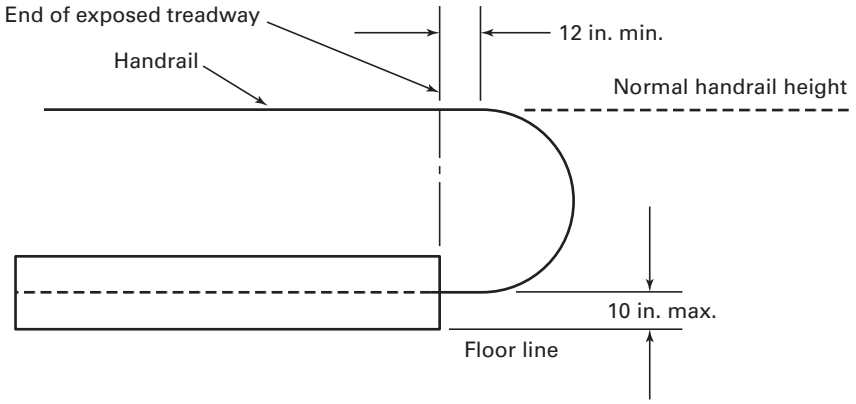
(c) While standing on the unit, verify that the landing and combplates provide a secure foothold and that outdoor units provide a secure foothold when wet.

9.4.2 Periodic Test

9.4.3 Acceptance

Verify that vertical headroom clearance of 7 ft (2.13 m) is provided and that the required safety zone is present.

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GENERAL NOTE: 1 in. = 25.4 mm

Fig. 9.3.3 Moving Walk Handrail Extension (A17.1–1971 and Later Editions)

Check that floor openings adjacent to the entire length of the wellway are protected in accordance with the applicable building code.

9.4.4 References

A17.1d–2000 and earlier editions — Rules 902.8, 907.3, and 902.16.

A17.1–2000 and later editions — Requirements 6.2.3.8, 6.2.8.3, 6.2.3.16, and 8.6.8.15.

A17.3 — Paragraph 9.4.3.

ITEM 9.5 LIGHTING

9.5.1 Periodic Inspections

Check whether the lighting at the landing plates and treadway is in compliance with the applicable code by using a light meter while the moving walk is operating. Tak care not to cast a body shadow on the meter. Note any lamps that are not operating and their affect on the moving walk lighting. For moving walks installed under A17.1–1965 and later editions, lighting must be a minimum of 5 fc (54 lx), of uniform intensity, and must not materially contrast with the surrounding area.

9.5.2 Periodic Test

9.5.3 Acceptance

9.5.4 References

A17.1d–2000 and earlier editions — Rules 906.2 and 1009.2d.

A17.1–2000 and later editions — Requirements 6.2.7.2 and 8.10.4.1.1(e).

A17.3 — Paragraph 9.7.1.

ITEM 9.6 CAUTION SIGNS

9.6.1 Periodic Inspections

For moving walks installed under A17.1–1981 and later editions and moving walks required to conform to A17.3a–1994, verify that the required caution signs are located at both entrances readily visible to boarding passengers. For moving walks installed under A17.1–1996 through A17.1d–2000, verify that any additional signs are located at least 10 ft (3.05 m) horizontally from the end of the newels and that they do not impede traffic or otherwise cause persons to stop.

9.6.2 Periodic Test

9.6.3 Acceptance

9.6.4 References

A17.1d–2000 and earlier editions — Rule 905.8; and Fig. 805.9a.

A17.1–2000 and later editions — Requirements 6.2.6.8; and Fig. 6.1.6.9.1.

A17.3 — Paragraph 9.6.11.

ITEM 9.7 COMBPLATE AND COMB STEP IMPACT DEVICE

9.7.1 Periodic Inspections

Inspect the comb for missing teeth and proper mesh with each treadway tread (see Fig. 7.7.1). Verify proper mesh with each treadway tread by holding a sheet of stiff paper or business card where the teeth mesh with the treadway tread while standing well back from the plate to prevent forcing the plate down. Use of an extension with an alligator clip to hold the card is recommended.

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NOTE: Telescoping pointers with alligator clips that are used to ignite water heater pilot lights are available in hardware/plumbing supply stores.

The comb teeth should mesh with and set into the tread surface so that the teeth are always below the upper surface of the treads. Any section with one or more missing or broken teeth should be replaced. For moving walks installed under A17.1a–1988 and later editions and moving walks required to conform to A17.3a–1994, the comb surfaces must contrast visibly by color, pattern, or texture.

9.7.2 Periodic Test

For units installed under A17.1b–1992 and later editions, have the combplate impact devices tested as follows:

(a) Have a vertical force applied to the center front edge of the combplate until the device trips. Record the force required to trip the device and verify the unit will not start until manually reset.

(b) Have a force applied in the direction of travel at the front center of the combplate, increasing the force until the device trips. Record the force required to trip the device and verify the unit will not start until manually reset.

(c) Have a force applied in the direction of travel on one side of the front of the combplate, increasing the force until the device trips. Record the force required to trip the device and verify the unit will not start until manually reset. Repeat this test for the opposite side.

9.7.3 Acceptance

(a) Visually verify that the combplates are vertically adjustable and that the sections forming the comb teeth are replaceable.

(b) Place the required weight on the combplate and landing plate assembly to verify that the combplate and landing plate will not contact the treadway (see Fig. 7.7.3).

9.7.4 References

A17.1d–2000 and earlier editions — Rules 902.8, 905.3k, 907.3, 1008.2r, and 1009.2e.

A17.1–2000 and later editions — Requirements 6.2.3.8, 6.2.6.3.11, 6.2.8.3, 8.6.8.4, 8.11.4.2.13, and 8.10.4.1.1(g).

A17.3 — Section 9.4.

ITEM 9.8
DECK BARRICADES

9.8.1 Periodic Inspections

For low deck moving walks installed under the A17.1a–1988 and later editions and moving walks required to comply with A17.3a–1994, check to see that deck barricades, when required, are firmly in place and in good condition when the outer deck exceeds 5 in. (125 mm) and the deck is more than 36 in. (915 mm) above any part of the floor. The barrier must extend to 4 in. (102 mm) below the handrail top.

9.8.2 Periodic Test

For moving walks installed under A17.1b–1989 and later editions, verify that glass or plastic replacement panels meet the requirements of ANSI Z97.1 or 16 CFR Part 1201.

9.8.3 Acceptance

All glass or plastic (glazing material) must be legibly and permanently marked 16 CFR Part 1201, "American National Standard Z97.1" or with the characters "ANSI Z97.1" and also shall be marked with the manufacturer's distinctive mark or designation.

Check that all exposed fastener heads are the tamper-resistant type.

9.8.4 References

A17.1d–2000 and earlier editions — Rules 902.3h and 1009.2f.

A17.1–2000 and later editions — Requirements 6.2.3.3.8 and 8.10.4.1.1(h).

A17.3 — Paragraph 9.3.3.6.

ITEM 9.9
TREADWAYS

9.9.1 Periodic Inspections

(a) Mark treadways with chalk, then run the moving walk through one complete revolution. Check that each treadway is continuous, unbroken, clean, free of debris, and that the treads are in good condition.

(b) Check at least every tenth pallet or a distance of approximately one-tenth the entire length, by riding on it, to verify that the following requirements are met:

(1) There is no excessive movement or play in the direction of travel, at right angles to the direction of travel, and vertically. While standing on the treadway, a shift of weight should not cause the treadway to strike the skirt panels.

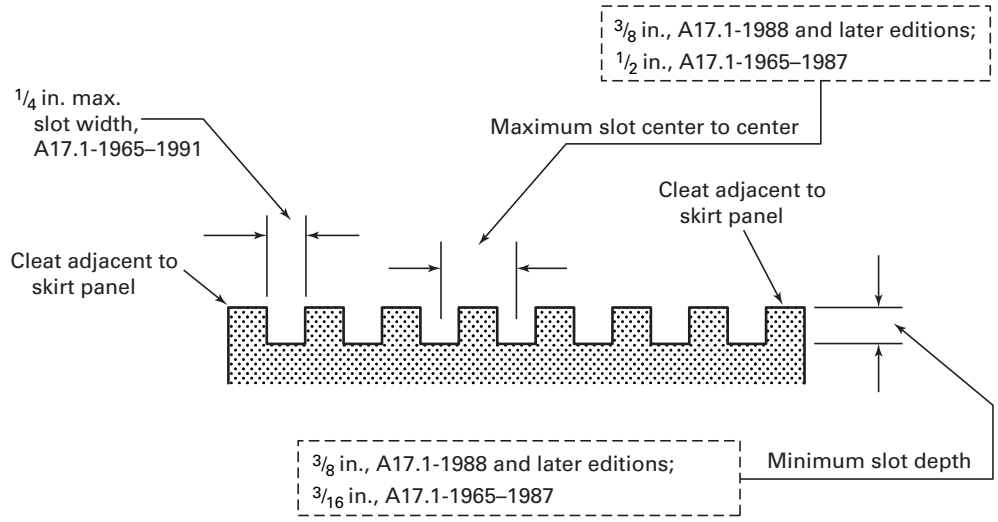
(a) Belt Type. The treadway consists of an integral belt of uniform width and thickness, made or spliced in one continuous piece forming a loop.

(b) Pallet Type. The treadway consists of closely coupled meshing pallets, or small platforms. This is similar to an escalator step without a riser.

(c) Belt Pallet Type. For moving walks installed under A17.1–1987 and earlier editions, this type was permitted. The treadway consists of a continuous integral belt supported on coupled pallets. The pallets may not ordinarily be visible when standing on the treadway.

(2) Alternate cleats on adjacent pallets should mesh so that no continuous transverse gap exist between pallets. Mesh can be verified by trying to fit a thin piece

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GENERAL NOTE: 1 in. = 25.4 mm

Fig. 9.9.1 Moving Walk Treadway Slots

of stiff paper or business card between treadways while the moving walk is moving in the up direction. The check should be made across the entire width (see Fig. 7.7.1).

(3) The tread surface should be slotted in the direction parallel to the travel so that they mesh with the combplate teeth. Verify that a cleat is formed adjacent to the skirt panel on each side of the treadway (see Fig. 9.9.1).

(4) The cleats in the treadway tread surfaces should not be damaged, broken, or worn. Special consideration should be given to excessive clearance and sharp edges. While standing on the treadway, tread verify that it provides a secure foothold.

(5) A jerking motion on the treadways and excessive noise in the machinery space indicates that the drive and support system should be examined to discover the source or cause.

(6) Use a straight edge to verify that adjacent pallets do not vary more than 1/16 in. (1.6 mm) in elevation (vertical displacement). On belt-pallet-type treadways, verify that the fasteners that attach the belt to the pallets do not project above the exposed treadway surfaces. Inspect the splices in belt-type treadways to verify that they produce a continuous unbroken treadway.

(7) For moving walks required to conform to A17.3a–1994, check that the splices of belt-type treadways are continuous and unbroken.

9.9.2 Periodic Test

9.9.3 Acceptance

Review fatigue test and certification for the Code compliance.

Check that the materials for pallet frames and treadways, including any attachments or inserts, meet Code requirements.

9.9.4 References

A17.1d–2000 and earlier editions — Rules 902.5, 902.6, 902.9, 902.11, and 1105.1.

A17.1–2000 and later editions — Requirements 6.2.3.5, 6.2.3.6, 6.2.3.9, 6.2.3.11, 8.6.8.6, and 8.3.11.1.

A17.3 — Paragraph 9.3.5.

ITEM 9.10
OPERATING AND SAFETY DEVICES

9.10.1 Periodic Inspections

(a) Starting Switches. Operate the moving walk in both directions using the key-operated start switch. When operating the switch, the exposed treadways should be within sight. Check the operation and location of this switch. A17.1b–1989 and later editions specifically prohibit automatic starting by any means. Verify that the key is only accessible to authorized personnel.

For units installed under A17.1–1996 and later editions, verify that the start switch operating positions are properly marked. Check that the key is only removable in the "RUN" position. Turn the switch from "RUN" to either "UP" or "DOWN" and quickly let go of the key. The switch must return to the "RUN"position. Repeat for the other direction of travel. Next turn the switch to either the "UP" or "DOWN" position. Stop the unit with the emergency stop button and keep the switch in the "UP" or "DOWN" position. The unit must not restart. Repeat for the other direction of travel.

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(b) Emergency Stop Switches. Operate the emergency stop switches/buttons and observe that the moving walk stops. Verify that this stop switch will not start the moving walk. If automatic starting devices are provided (pre-1988), verify that they will not function after the stop switch is operated. Verify proper labeling and signal where required. The requirements for emergency stop switches in prior editions of the Code are as follows:

(1) A17.1–1965: Emergency stop button or other type of manually operated switches having a red button or handle shall be accessibly located at or near the top and bottom landing of each moving walk, and shall be protected against operation by accident.

(2) A17.1a–1988 and later editions required a readily moveable self-closing transparent cover and an 80 dBA signal when the cover is moved. The cover should be marked "Emergency Stop." The location of the button should be in the upper right quadrant when facing the moving walk at each end for high deck balustrades, and for low deck balustrades it must be below the handrail height. Remote stop switches were prohibited and handles were not allowed.

(c) Tandem Operation. For moving walks operated in tandem, A17.1a–1988 and later editions, where traffic flow is such that bunching will occur if the moving walk carrying passengers away stops, verify that the units are electrically interlocked. The interlocks must stop the unit carrying passengers into the common intermediate landing, if the unit carrying passengers away from the landing should stop. Also, verify that the interlocks assure that the units run in the same direction.

9.10.2 Periodic Test

9.10.3 Acceptance

Check that the starting switches are within reach of an emergency stop button. Start the unit and hold the start switch in the "UP" direction, then actuate the emergency stop button. The unit must not restart until the start switch is placed in the "RUN" position and the starting sequence is repeated. Repeat this for the down direction and for the other start switch.

For low deck moving walks, check the clearances between the handrail and the stop switch enclosure and the distance from the button to the handrail.

9.10.4 References

A17.1d–2000 and earlier editions — Rules 905.1, 905.2, 905.3a, and 905.6.

A17.1–2000 and later editions — Requirements 6.2.6.1, 6.2.6.2.1, 6.2.6.3.1, 6.2.6.6, and 8.6.10.2.

A17.3 — Paragraphs 9.6.2, 9.6.3, and 9.6.9.

ITEM 9.11
(RESERVED)

ITEM 9.12
(RESERVED)

ITEM 9.13
EGRESS RESTRICTION (ROLLING SHUTTER) DEVICE

9.13.1 Periodic Inspections

Where rolling shutters are provided to protect floor openings, check that when the shutters begin to close, the power is removed from the driving machine and brake, and remains off until the shutter is fully retracted. If the shutter is power operated, the building code may require a pressure sensitive leading edge to reverse direction and/or stop it when it strikes an object.

9.13.2 Periodic Test

9.13.3 Acceptance

9.13.4 References

A17.1d–2000 and earlier editions — Rule 905.3f.

A17.1–2000 and later editions — Requirement 6.2.6.3.6.

A17.3 — Paragraph 9.6.7.

ITEM 9.14
SPEED

9.14.1 Periodic Inspections

For moving walks with DC motors, perform a speed test.

9.14.2 Periodic Test

9.14.3 Acceptance

Calculate the no load speed of the moving walk in both directions as follows:

(a) Use a tachometer to record the handrail speed by running the tachometer wheel along the deck, skirt, or other stationary flat object when riding the moving walk.

(b) Use a stop watch to time the travel from one landing to the other. Divide the travel in feet (meters) by the time in minutes (seconds) to obtain the speed in ft/min (m/s).

Refer to Tables 9.14.3(a), 9.14.3(b), and 9.14.3(c) for allowable speeds of existing equipment.

Verify that the speed of the moving walk cannot be changed without first stopping it.

9.14.4 References

A17.1d–2000 and earlier editions — Rules 903.1, 905.3b, 1008.2o, and 1009.2o.

A17.1–2000 and later editions — Requirements 6.2.4, 6.2.6.3.2, (NR 1008.2o), and 8.10.4.1.2(l).

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Table 9.14.3(a) Treadway Speed (A17.1–1981 and Later Editions)

Max Treadway Slope at Any Point on Treadway, deg	Maximum Treadway Speed, ft/min
0 to 8	180
Above 8 to 12	140

GENERAL NOTES:
(a) 1 deg = 1.75 E – 02 radian
(b) 1 ft/min = 5.08 E – 03 m/s

Table 9.14.3(b) Treadway Speed (A17.1–1965 Through A17.1–1980 Editions)

Max Treadway Slope at Point of Entrance or Exit, deg	Maximum Treadway Speed, ft/min
0 to 3	180
Above 3 to 5	160
Above 5 to 8	140
Above 8 to 12	130
Above 12 to 15	125

GENERAL NOTES:
(a) 1 deg = 1.75 E – 02 radian
(b) 1 ft/min = 5.08 E – 03 m/s

Table 9.14.3(c) Treadway Speed

Max. Treadway Slope at any Point on Treadway, deg	Max. Treadway Speed, ft/min
0 to 8	180
Above 8 to 15	140

GENERAL NOTES:
(a) 1 deg = 1.75 E – 02 radian
(b) 1 ft/min = 5.08 E – 03 m/s

ITEM 9.15
BALUSTRADES

9.15.1 Periodic Inspections

Inspect the balustrades and note any cracked or broken panels. Panels and fasteners should be smooth and free of burrs and snag points. Interior panels or molding must not be raised or depressed by more than $\frac{1}{4}$ in. (6.4 mm). Check that the balustrades are totally enclosed along both exterior and interior lengths, except where the handrail enters the newel base. For moving walks installed under A17.1a–1988 and later editions and moving walks required to conform to A17.3a–1994, if gaps exist between interior panels, they should not be wider than $\frac{3}{16}$ in. (4.8 mm) and the edges should be beveled or rounded. Check that glass or plastic panels meet the requirements of ANSI Z97.1 or 16 CFR Part 1201 for moving walks installed under A17.1–1971 and later editions and A17.3a–1994.

9.15.2 Periodic Test

9.15.3 Acceptance

Verify that the balustrades meet the material, strength, and dimensional requirements.

Glass or plastic, if used, should meet the requirements of the ANSI Z97.1, or 16 CFR Part 1201, or CAN/CGSB 12.1; CAN/CGSB 12.11; CAN/CGSB 12.12, as applicable. The glass or plastic (glazing material) must be legibly and permanently marked "16 CFR Part 1201", "American National Standard Z97.1" or the characters "ANSI Z97.1" and must also be marked with the manufacturer's distinctive mark or designation. Plastic bonded to basic support panels need not conform to ANSI Z97.1 or 16 CFR Part 1201.

Check that components not used directly in connection with the operation of the moving walk are not installed on, in, or through the moving walk.

Check that the width between the balustrade interior panels does not change in the direction of travel.

9.15.4 References

A17.1d–2000 and earlier editions — Rules 902.3 and 1009.2g; and Appendix D.

A17.1–2000 and later editions — Requirements 6.2.3.3, 6.2.3.17, and 8.10.4.1(n); and (NR Appendix D).

A17.3 — Paragraphs 9.3.3.1 and 9.3.3.2.

ITEM 9.16
CEILING INTERSECTION GUARDS

9.16.1 Periodic Inspections

Moving walks installed under A17.1–1981 and later editions where the clearance of the exterior deck and the ceiling or soffit is 12 in. (305 mm) or less or where the projected intersection of the exterior deck and ceiling or soffit is 24 in. (610 mm) or less from the handrail centerline, require ceiling intersection guards. This requirement was restricted to high decks for moving walks installed under A17.1–1987 and later editions and moving walks required to conform to A17.3a–1994. On low decks for moving walks installed under A17.1–1987 and later editions and moving walks required to conform to A17.3a–1994 where the centerline of the handrail is 14 in. (356 mm) or less from the ceiling or soffit, guards are also required.

Inspect the guards for damage and secure attachment.

9.16.2 Periodic Test

9.16.3 Acceptance

Verify that guards are correct size, in place and secure, and conform to dimensional requirements (see Fig. 7.16.1).

Check that glass or plastic guards are properly marked.

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9.16.4 References

A17.1d–2000 and earlier editions — Rule 902.3g; and Appendix D.

A17.1–2000 and later editions — Requirement 6.2.3.3.7; and (NR Appendix D).

A17.3 — Paragraph 9.3.3.5.

ITEM 9.17
SKIRT PANELS

9.17.1 Periodic Inspections

Check the clearance between the skirt panel and the treadway using a thickness gauge or by laying a small rule on the side of the treadway to read the distance. The treadways should be checked at several points along its entire travel.

For moving walks installed under A17.1–1971 and later editions and moving walks required to conform to A17.3a–1994, the horizontal clearance between the treadway and skirt panels should not exceed $\frac{1}{4}$ in. (6.4 mm). For skirtless balustrades installed under A17.1–1965, the vertical clearance between the top of the treadway and the underside of the balustrade should not exceed $\frac{1}{8}$ in. (3.2 mm).

For units installed under A17.1–1971 and later editions and moving walks required to conform to A17.3a–1994, the vertical clearance between the top of the treadway and the underside of the balustrade should not exceed $\frac{1}{4}$ in. (6.4 mm). See Fig. 9.17.1. Verify that skirt panels are smooth for moving walks installed under A17.1–1987 and later editions and moving walks required to conform to A17.3a–1994.

9.17.2 Periodic Test

9.17.3 Acceptance

Check that the skirt panels, where provided, extend to a height of at least 1 in. (25 mm) vertically above the treadway tread nose line. Skirt panels should not deflect more than $\frac{1}{16}$ in. (1.6 mm) under a force of 150 lbf (667 N). Inspect the exposed surface of the panel adjacent to the treadway for smoothness.

9.17.4 References

A17.1d–2000 and earlier editions — Rules 902.3e and 902.3f.

A17.1–2000 and later editions — Requirements 6.2.3.3.5 and 6.2.3.3.6.

A17.3 — Paragraphs 9.3.3.3 and 9.3.3.4.

ITEM 9.18
OUTDOOR PROTECTION

9.18.1 Periodic Inspections

For moving walks installed under A17.1b–1989 and later editions, check that the required cover over the horizontal projection of the unit is present and in good condition.

Verify that there is no accumulation of snow or freezing rain on the treadways or landing plates.

9.18.2 Periodic Test

Heaters are required for moving walks installed under A17.1b–1989 and later editions only if treadways are subject to snow or freezing rain. Check that heaters are operational. The heaters may be located inside the units (see Item 10.3.2).

9.18.3 Acceptance

Check that the cover extends outward from the centerline of the handrail such that a line from the edge of the cover to the handrail centerline is not less than 15 deg from the vertical. Two methods for checking this are shown in Fig. 7.18.3.

Check that the landing plates and combplates have provisions to provide a secure foothold when wet. Check that all electrical components are weatherproof, that all wiring is identified for use in wet locations, and that they are properly installed (gaskets, seals, etc.).

9.18.4 References

A17.1d–2000 and earlier editions — Rules 907, 1008.2p, and 1009.2i.

A17.1–2000 and later editions — Requirements 6.2.8, 8.11.4.2.14, and 8.10.4.1.1(q).

ITEM 9.19
MAINTENANCE RECORDS

9.19.1 Periodic Inspections

Review the maintenance records and verify that they are available to elevator personnel and that they are legible and up to date. They should include the following:

(a) description of maintenance task performed and dates

(b) description and dates of examinations, tests, adjustments, repairs, and replacements

(c) description and dates of call backs (trouble calls) or reports that are reported to elevator personnel by any means, including corrective action taken

(d) verify that a startup procedure is available to authorized personnel (A17.1–2000, 8.6.10.5)

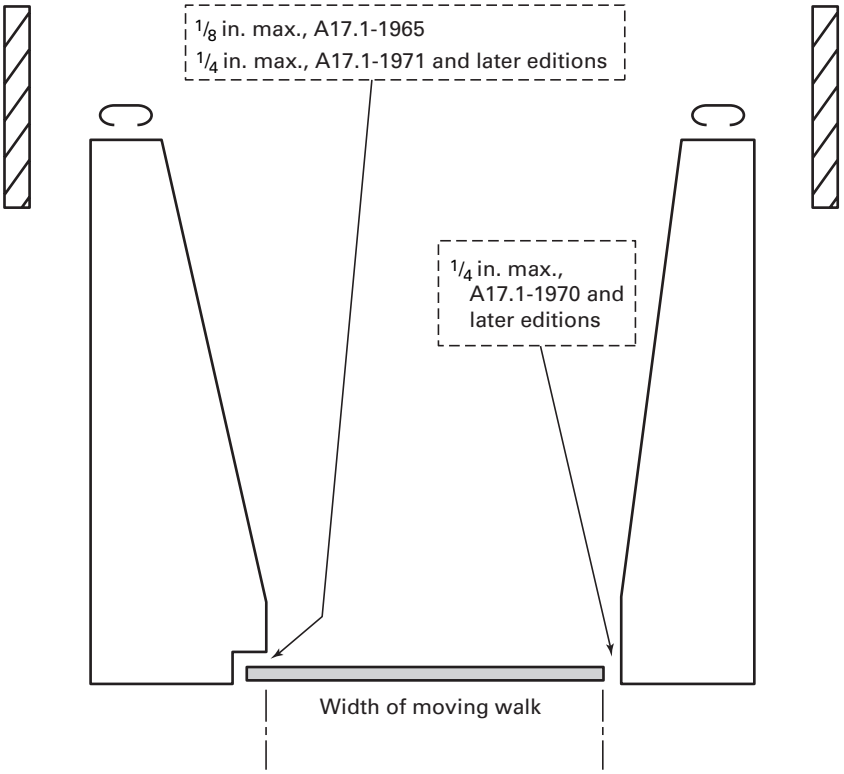
9.19.2 Periodic Test

9.19.3 Acceptance

9.19.4 References

A17.1–2000 and later editions — Requirements 8.6.1.4 and 8.6.10.5.

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GENERAL NOTE: 1 in. = 25.4 mm

Fig. 9.17.1 Treadway Clearances

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PART 10
MOVING WALK — INTERNAL

ITEM 10.1
MACHINERY SPACE ACCESS, LIGHTING, RECEPTACLE, AND CONDITION

10.1.1 Periodic Inspections

For remote machine rooms, see Item 10.1.2.

10.1.2 Periodic Test

Determine that the means of access is securely fastened in place. If a door is used, verify that it is kept locked and the key is available only to authorized personnel. Check the lighting and test the receptacle. In remote machine space, check that the lighting is at least 10 fc (108 lx) for moving walks installed under A17.1–1981 and later editions.

Verify that the space is clean of dirt and rubbish and free of oil and combustibles. Combustible items unrelated to moving walk maintenance or operation with a flashpoint less than 110°F (43°C) should not be present. Water should not have accumulated on the floor of the space. Verify that jumpers are not stored in the machine space, hoistway, or pit.

Verify that no penetrations exist through the sides and undersides of the machinery space and truss that compromises its fire resistance rating or allows contact with moving parts by the public.

For moving walks installed under A17.1–2000 and later editions, check that a guard is in place to protect against accidental contact with the moving pallets or treadway.

10.1.3 Acceptance

Determine whether a reasonable means of access to the interior is provided. Verify that the weight of access plates is in compliance with the Code requirements. Removal of the floor plates over the landing pit constitutes reasonable access if the opening uncovered affords ample space for the entry of one person. When an access door is provided on the side of the enclosure, verify that the door is locked and the key is removable only in the locked position.

If fire shutters are required by the local building code, verify that they are present at ventilation openings and operate correctly. Verify that the 15 A, 120 V duplex receptacles located in the machine space, under access plates and machine areas located along the line of travel within the unit, are functional. Verify that the light control for remote machine rooms is within easy reach of the access and can be operated without reaching or passing over any machinery components.

Check that components not used directly in connection with the operation of the moving walk are not installed on, in, or through the moving walk.

10.1.4 References

A17.1d–2000 and earlier editions — Section 906; and Rules 901.1, 907.2, 1008.2a, and 1009.2j.

A17.1–2000 and later editions — Requirements 6.2.7; and 6.2.2.1, 6.2.8.2, 8.1, 8.6.1.6.3, 8.6.14, 8.6.8.15, 8.11.4.2.1, and 8.10.4.1.2(a).

A17.3 — Paragraph 9.7.2.

ITEM 10.2
STOP SWITCH

10.2.1 Periodic Inspections

For remote machine rooms, see Item 10.2.2.

10.2.2 Periodic Test

Test the operation of machine space stop switch(es) by placing them in the stop position, then make sure that everyone is clear and attempt to start the moving walk with the key switch.

10.2.3 Acceptance

Check that proper stop switches are installed and operate correctly in all machine spaces or other space where access to the interior is provided. Where the main line disconnect switch is located, a separate stop switch is not required.

10.2.4 References

A17.1d–2000 and earlier editions — Rules 905.3e, 1008.2b, and 1009.2k.

A17.1–2000 and later editions — Requirements 6.2.6.3.5, 8.11.4.2.2, and 8.10.4.1.2(b).

ITEM 10.3
CONTROLLER AND WIRING

10.3.1 Periodic Inspections

Inspect remote machine rooms as outlined in Item 10.3.2.

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10.3.2 Periodic Test

Examine the controller visually to verify that it is clean and that the switches, contactors and relays and their electrical connections are in good condition. Check that the fuses are in place, properly rated and have not been jumped or otherwise tampered with. Check for jumper wires or other changes, which may indicate that safety devices have been defeated or altered.

Visually examine wiring for damage and all components for evidence of overheating. Operate the main line circuit breakers to verify that all power is removed from the drive machine. Verify that all electrical components are enclosed to prevent accidental contact. If heaters are present (see Item 9.18.2), verify that they are operational. For moving walks installed under A17.1–1965 through 1985, verify that the circuit breakers will not be automatically opened by the fire alarm.

10.3.3 Acceptance

Check for proper voltage, correct wiring, and arrangement of wiring, controller, and other components.

Check numbering of drive machines and disconnects where multiple drive machines are in a machine room. Verify that disconnects are in sight of machines operated. Inspect all wiring enclosure raceways conduit, electrical metallic tubing, metal wireways, junction boxes for condition workmanship and fastening. Visually inspect condition of weatherproof electrical enclosure where required on outdoor units. Verify that use of flexible conduit, armored cable, and flexible leads comply with the Code requirements.

10.3.4 References

A17.1d–2000 and earlier editions — Section 906; and Rules 907.2, 1008.2c, and 1009.2l.

A17.1–2000 and later editions — Requirements 6.2.7; and 6.2.8.2, 8.11.4.2.3, and 8.10.4.1.2(c).

NFPA 70 or CSA C22.1, as applicable.

ITEM 10.4
DRIVE MACHINE AND BRAKE

10.4.1 Periodic Inspections

10.4.2 Periodic

Determine whether the driving machine is properly secured, lubricated, clean, and in good condition. Visually check the driving machine fastenings and bearing caps to verify that they are secure and in place.

Verify that the driving machine is connected to the main drive shaft by toothed gearing, a mechanical coupling, or a chain and that it is in good condition. Look for evidence of any excessive backlash in the driving gears or chains. If a chain is used to connect the driving machine to a sprocket on the main drive shaft, visually examine the chain and sprockets for wear, excessive slack, and proper lubrication. Lack of lubrication for a chain may be indicated by rouge (red rust deposits) on the side plates of the links.

For moving walks installed under A17.1a–1988 and later editions, verify that cast iron links are not used. If the links appear to be cast iron, have a small hole drilled (in a low stress area) and observe the drill cuttings. If the cuttings are a fine powder, cast iron is indicated. If the cuttings are shavings, then the links are not cast iron.

Inspect any drive belts and sheaves for damage, wear, belt tension, and reasonable equality of tension in a set of belts.

Visually examine the components for signs of overheating. Verify that an electrically released mechanically applied brake is present and automatically applied when power is interrupted. A brake was not required for units installed under A17.1–1987 and earlier editions if the unit would not run in the down direction under rated load with the power off. The brake is to be located on the driving machine for units installed under A17.1a–1988 and later editions and moving walks required to conform to A17.3a–1994. Earlier editions allowed the brake to be on the drive shaft. For moving walks installed under the A17.1–1981 through A17.1–1987 editions, the brake may be applied to specially attached braking surfaces directly on the treadway.

For moving walks installed under A17.1–1988 and later editions and moving walks required to conform to A17.3a–1994 where means other than a continuous shaft, mechanical coupling, or toothed gearing is used to connect the motor to the reduction gear, verify that the brake is located on the gear reducer or main drive shaft. A17.3a–1994 requires this brake on the main drive shaft or a specially attached braking surface attached directly to the treadway.

For moving walks installed under A17.1a–1988 and later editions and moving walks required to conform to A17.3a–1994, the brake may be magnetically applied using a ceramic permanent magnet. Visually inspect the condition of the brake pads, drums, and discs.

If the driving machine brake is separated from the main drive shaft by a chain, used to connect the driving machine to the main drive shaft and the moving walk is capable of running by gravity with any load, check for presence of a second brake that is required on the main drive shaft. The requirements for this brake are:

(a) A17.1–1965 required this brake to be electrically released unless an electrically released brake was provided on the driving machine.

(b) A17.1a–1988 and later editions required the brake to be mechanically or magnetically applied (ceramic permanent magnets), and allowed it to be located either on the main drive shaft or a special braking surface attached to the treadway.

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For moving walks installed under the A17.1b–1983 and later editions, the brake is required to stop horizontal or a down running moving walk at a rate not greater than 3 ft/s^2 (0.91 m/s^2). Visually inspect all mechanisms for condition and operation.

Verify that moving walks installed under A17.1b–1983 and later editions have a nameplate that specifies the required brake torque. Moving walks installed under A17.1b–1989 and later editions, require that the nameplate torque be specified as breakaway, the maximum torque required to cause the brake to begin moving, or dynamic, the torque required to keep the shaft moving very slowly at a steady rate. The location where the torque is to be measured is required to be clearly indicated.

For moving walks installed under A17.1a–1991 and later editions, the nameplate is required to specify the range of brake torque and whether it is measured as breakaway or dynamic.

Have the torque tested to verify that the torque complies. The main drive shaft brake (where a chain is used to connect the driving machine and brake to the main drive shaft) should also be torque tested for moving walk installed under A17.1–1983 through A17.1d–2000. The torque wrench should have a current calibration certificate traceable to the National Bureau of Standards and have a range of at least 25% higher than the required torque.

10.4.3 Acceptance

Check the stopping distance with no load against the minimum distance information on the data plate.

10.4.4 References

A17.1d–2000 and earlier editions — Section 904; and Rule 1008.2d.

A17.1–2000 and later editions — Requirements 6.2.5; and 8.11.4.2.4.

A17.3 — Paragraph 9.5.1.

ITEM 10.5
SPEED GOVERNOR

10.5.1 Periodic Inspections

10.5.2 Periodic Test

Test speed governor when provided to verify that it is functioning. Manually operate the switch or use any testing mechanisms (such as flywheel weights) that may be provided. The flyballs and all operating mechanisms must be present and in good operating condition. When the switch is opened, it should interrupt power to the driving machine. For moving walks installed under A17.1–1990 and later editions, verify that the moving walk cannot be started by the starting switch until the device is manually reset.

A17.3a–1994 requires that the speed governor activate when the speed exceeds 20% above the rated speed. A17.1–1965 and later editions require that the speed governor activate when the speed exceeds 40% above the rated speed.

When a manual reset is required for units installed under A17.1b–1995 and later editions, turn the power off and then back on, and then try the start switch to check that the device will not reset. Also, some indication that the device has been activated needs to be provided (fault finder, etc.).

10.5.3 Acceptance

When a speed governor is required, verify that the speed governor activates at the proper speed, which cannot be more than 40% above the rated speed. This can be done on some models using a rubber drive wheel driven by a variable speed drill and a tachometer. Other methods approved by the manufacturer for field testing pulse pickup type or other electronic governors may be used.

10.5.4 References

A17.1d–2000 and earlier editions — Rules 905.3b, 1008.2e, and 1009.2l.

A17.1–2000 and later editions — Requirements 6.2.6.3.2, 8.11.4.2.5, and 8.10.4.1.2(c).

A17.3 — Paragraph 9.6.4.

ITEM 10.6
BROKEN DRIVE CHAIN AND DISCONNECTED MOTOR SAFETY DEVICE

10.6.1 Periodic Inspections

10.6.2 Periodic Test

(a) If the driving machine is connected to the main drive shaft by a chain, check the broken drive chain device to verify that it will apply the main shaft brake and stop the drive machine if the drive chain parts. All parts of the device should be in good condition and show freedom to move. Have the switch manually operated and verify that it will open the drive motor circuit. Common devices include a block that is held in tension by the drive chain that activates the switch when tension is lost, or a plate that depresses a switch when the drive chain strikes it. For moving walks installed under A17.1–1990 and later editions, verify that the moving walk cannot be started by the starting switch until the device is manually reset.

When a manual reset is required for units installed under A17.1b–1995 and later editions, turn the power off and then back on, and then try the start switch to check that the device will not reset. Also, some indication that the device has been activated needs to be provided (fault finder, etc.).

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(b) If the drive motor is attached to a gear reducer by means other than a continuous shaft, coupling, or toothed gearing, check that the device provided will apply the brake if the motor becomes disconnected from the gear reducer. Have the switch manually operated and verify that all operating mechanisms are present, clean, lubricated, and in good condition. For moving walks installed under A17.1–1990 and later editions, verify that the moving walk cannot be started by the starting switch until the device is manually reset.

When a manual reset is required for units installed under A17.1b–1995 and later editions, turn the power off and then back on, and then try the start switch to check that the device will not reset. Also, some indication that the device has been activated needs to be provided (fault finder, etc.).

10.6.3 Acceptance

10.6.4 References

A17.1d–2000 and earlier editions — Rules 904.3b, 905.3d, 905.3h, and 1008.2f.

A17.1–2000 and later editions — Requirements 6.2.5.3.2, 6.2.6.3.4, 6.2.6.3.8, and 8.11.4.2.6.

A17.3 — Paragraphs 9.6.6 and 9.6.10.

ITEM 10.7
REVERSAL STOP SWITCH

10.7.1 Periodic Inspections

10.7.2 Periodic Test

Manually operate the reverse stop switch to verify that all operating mechanisms are present and in good condition and that the device will open the circuits to the driving machine motor and brake to stop an ascending moving walk from reversing its direction of travel. For moving walks installed under A17.1–1990 and later editions, verify that the moving walk cannot be started by the starting switch until the device is manually reset.

When a manual reset is required for units installed under A17.1b–1995 and later editions, turn the power off and then back on, and then try the start switch to check that the device will not reset. Also, some indication that the device has been activated needs to be provided (fault finder, etc.).

There are several different types of devices that are used (friction reversal devices, speed monitoring, etc.). Therefore, the type of device will dictate the testing procedure. If the device cannot be manually operated, a written procedure must be provided by the person or firm performing the tests.

10.7.3 Acceptance

10.7.4 References

A17.1d–2000 and earlier editions — Rules 905.3g and 1008.2g.

A17.1–2000 and later editions — Requirements 6.2.6.3.7 and 8.11.4.2.7.

A17.3 — Paragraph 9.6.8.

ITEM 10.8
BROKEN TREADWAY DEVICE

10.8.1 Periodic Inspections

10.8.2 Periodic Test

Manually operate the broken treadway devices to verify that each will interrupt power to the driving machine and brake. Visually inspect each device to verify that they are in position to operate and that either will activate when the connecting means breaks between pallets or belt.

For moving walks installed under A17.1–1990 and later editions, verify that the moving walk cannot be started by the starting switch until the device is manually reset.

When a manual reset is required for units installed under A17.1b–1995 and later editions, turn the power off and then back on, and then try the start switch to check that the device will not reset. Also, some indication that the device has been activated needs to be provided (fault finder, etc.).

10.8.3 Acceptance

10.8.4 References

A17.1d–2000 and earlier editions — Rules 905.3c and 1008.2h.

A17.1–2000 and later editions — Requirements 6.2.6.3.3 and 8.11.4.2.8.

ITEM 10.9
(RESERVED)

ITEM 10.10
MISSING PALLET DEVICE

10.10.1 Periodic Inspections

10.10.2 Periodic Test

For moving walks installed under A17.1–1989 and later editions, test the missing pallet device by running the moving walk with a pallet missing on the underside of the moving walk. The device must stop the moving walk before the gap resulting from the missing pallet emerges from the combplate.

For moving walks installed under A17.1–1990 and later editions, verify that the moving walk cannot be started by the starting switch until the device is manually reset.

When a manual reset is required for units installed under A17.1b–1995 and later editions, turn the power

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off and then back on, and then try the start switch to check that the device will not reset. Also, some indication that the device has been activated needs to be provided (fault finder, etc.).

10.10.3 Acceptance

10.10.4 References

A17.1d–2000 and earlier editions — Rules 905.5 and 1008.2j.

A17.1–2000 and later editions — Requirements 6.2.6.5 and 8.11.4.2.10.

ITEM 10.11
PALLET LEVEL DEVICE

10.11.1 Periodic Inspections

10.11.2 Periodic Test

For moving walks installed under A17.1–1990 and later editions that are equipped with pallets and trail wheels, visually inspect the pallet level devices at each end and on both sides to verify that it is in place and able to function. Have the switch manually operated to verify that it will open the safety circuit and stop the moving walk.

For moving walks installed under A17.1–1990 and later editions, verify that the moving walk cannot be started by the starting switch until the device is manually reset.

When a manual reset is required for units installed under A17.1b–1995 and later editions, turn the power off and then back on, and then try the start switch to check that the device will not reset. Also, some indication that the device has been activated needs to be provided (fault finder, etc.).

10.11.3 Acceptance

Have the devices tested (at both ends and on each side) by mechanically lowering a pallet $\frac{1}{8}$ in. (3.2 mm) and operating the moving walk. A smaller roller or adjustment may be used to lower the pallet.

10.11.4 References

A17.1d–2000 and earlier editions — Rules 905.3i, 1008.2k, and 1009.2n.

A17.1–2000 and later editions — Requirements 6.2.6.3.9, 8.11.4.2.11, and 8.10.4.1.2(k).

ITEM 10.12
PALLETS, PALLET CHAINS, AND TRUSSES

10.12.1 Periodic Inspections

10.12.2 Periodic Test

Have at least half of the pallets removed, then move the remaining pallets to one end of the moving walk and using a good light, visually inspect the drip pans, undersides of pallets, trusses, roller tracks, chains, handrails, and the interiors of balustrades, skirts and newels to verify that they are present, in good condition, clean of dirt and rubbish, and free of oil and combustibles.

Visually inspect for any damage to the fire-resistive material on the moving walk enclosure. See Item 10.1.

Visually inspect the chains for lubrication and buildup of dirt and grease. Lack of lubrication may be indicated by rouge (red rust deposits) on the side plates of the links.

Verify that cast iron links are not used on moving walks installed under A17.1–1978 and later editions. See Item 10.4.2 for method of identifying cast iron.

Check the operation of any moving walk pallet chain tension devices. If they are of the automatically operated "tension-weight" type, verify that the truss is provided with a positive means to retain the weights in the truss if the weights are released.

Move the remaining pallets to opposite end of the moving walk and inspect the other half in the same manner.

10.12.3 Acceptance

(a) Verify that if the tracking system fails, the running gear is retained in its guides and the treadway wheel tracks will prevent displacement of the treadways and running gear if the chain breaks.

(b) Inspect the treadway support structure for compliance with the Code for the following types of walks:

(1) Slider Bed. Verify that the treadway is supported for its entire length, except where it passes a pulley support and that the bed is smooth and noncombustible.

(2) Roller Bed. Test the deflection of the treadway surface by placing a 25 lb (11.3 kg) weight on a cylinder 2 in. (51 mm) long and 1 in. (25 mm) in diameter with its long axis across the belt midway between rollers. Use a straight edge that spans the rollers and a feeler gauge or dial indicator depth gauge to measure the deflection. Perform this test on 5% of the rollers at random and verify that the deflection does not exceed 0.09 in. (2.29 mm) plus 0.004 times the distances in inches between the roller centers. Ride the moving walk and observe for roller concentricity over the full width of the belt.

(3) Edge Support Belt. When the treadway belt is transversely rigid and is supported by rollers along the edges test the slope (or tension) as follows:

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(a) The belt should be properly tensioned and a 150 lb (68 kg) weight placed on a rigid plate 6 in. (152 mm) by 10 in. (254 mm) with the 10 in. (254 mm) dimension in the direction of travel located on the treadway centerline.

(b) Use a straight edge and feeler gauge or dial indicator depth gauge to measure the deflection across the treadway from the center. The Code allowance of 3 deg maximum would result in deflection of 0.576 in. (14.6 mm) for a 22 in. (559 mm) width, 1.048 in. (26.6 mm) for 40 in. (1 016 mm) width, and 1.572 in. (39.9 mm) for a 60 in. treadway width.

(c) Inspect the center support for localized loading for distance apart [6 ft (1.789 m) max.] and distance from the underside of the treadway [2 in. (51 mm) max.].

(4) Pallet Type. Inspect the support and wheels to verify that the pallets cannot be displaced vertically more than $\frac{1}{8}$ in. (3.2 mm) should the pallet connecting means break. With the power off have two pallets disconnected at the center of the moving walk run. Find the maximum displacement by lifting on the pallet edges with a moderate force. The stop should be detected before the maximum displacement allowed by the Code is reached. Verify that foreign material such as stone or concrete is not in the truss interior.

(c) Check that components not used directly in connection with the operation of the moving walk are not installed on, in, or through the moving walk.

10.12.4 References

A17.1d–2000 and earlier editions — Rules 901.1, 902.9, 902.13, 1008.2l, 1009.2o, and 1206.6.

A17.1–2000 and later editions — Requirements 6.2.2.1, 6.2.3.9, 6.2.3.13, 6.2.3.17, 8.11.4.2.12, 8.10.4.1.2(l), and 8.6.8.

ITEM 10.13
HANDRAIL SYSTEMS AND SAFETY DEVICES

10.13.1 Periodic Inspections

10.13.2 Periodic Test

Examine the handrail drive systems to ensure that all chains, pulleys, gears, rollers, and belts are present and in good condition. The operation should be free of excessive noise and slack, which indicates wear.

(a) For moving walks installed under A17.1a–1989 through A17.1b–1992, test the operation of the stopped handrail device. Have the handrail motion sensor mechanically disconnected while the unit is off and then run the unit, or grab the handrail and stall it while the moving walk is running. Verify that the alarm sounds immediately and the moving walk stops within 15 s.

(b) For moving walks installed under A17.1–1993 and later editions, check the operation of the handrail speed monitoring device. An alarm must sound immediately if the speed of either handrail deviates from the step speed by 15% or more, and the unit must shut down if the speed deviation is continuous for more than 2 s. If holding the moving handrail cannot activate the device, then it will be necessary to activate the device by another means (disconnecting the speed sensor, changing dip switch settings on the controller, etc.). Verify that the unit cannot be started until the device is manually reset. For units installed under A17.1b–1995 and later editions, turn the power off and then back on and then try the start switch to check that the device will not reset. Also, some indication that the device has activated needs to be provided (fault finder, etc.).

(c) For moving walks installed under A17.1b–1992 and later editions, test the operation of the handrail entry device by having a soft object that will not damage the unit inserted between the handrail and hand guard. After the unit stops, verify that it cannot be restarted with the key switch until the device has been manually reset. The device need only operate in the direction of the handrail travel, except for units installed under A17.1b–1997 and later editions the device must operate irregardless of the direction of travel of the handrail where an opening is created in the balustrade to prevent entrapment. When a manual reset is required for units installed under A17.1b–1995 and later editions, turn the power off and then back on and then try the start switch to check that the device will not reset. Also, some indication that the device has been activated needs to be provided (fault finder, etc.).

10.13.3 Acceptance

10.13.4 References

A17.1d–2000 and earlier editions — Rules 902.4, 902.13, 905.1, 905.4, 905.3j, 1008.2m, 1008.2q, and 1009.2c.

A17.1–2000 and later editions — Requirements 6.2.3.4, 6.2.3.13, 6.2.6.1, 6.2.6.4, 6.2.6.3.10, 8.11.4.2.13, 8.11.4.2.18, and 8.10.4.1.1(c).

ITEM 10.14
CODE DATA PLATE

10.14.1 Periodic Inspections

Check that the Code Data Plate is installed. This is the Code that is to be used for the inspection and test.

10.14.2 Periodic Test

10.14.3 Acceptance

10.14.4 References

A17.1d–2000 and earlier editions — Rules 808, 908, and 1200.6.

A17.1–2000 and later editions — Requirements 8.9, 8.9, and 8.7.1.8.

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ITEM 10.15
RESPONSE TO SMOKE DETECTORS

10.15.1 Periodic Inspections

10.15.2 Periodic Test

For units installed under A17.1a–1994 and later editions, when smoke detectors are provided that will shut down a running unit, verify that the emergency stop button alarm will sound and the unit does not shut down for at least 15 s. The unit may be tested by activating the smoke detector or by other means.

CAUTION: If the sensing system is connected to a central fire alarm system, notify proper authorities before activating.

10.15.3 Acceptance

10.15.4 References

A17.1d–2000 and earlier editions — Rule 905.7.
A17.1–2000 and later editions — Requirement 6.2.6.7.

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NONMANDATORY APPENDIX A
INSPECTION CHECKLISTS

(04)

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Checklist for Electric Elevators

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
1	ELEVATOR — INSIDE OF CAR				
1.1	Door reopening device	112, 1001.2(a)(1)	2.13, 8.11.2.1.1(a)	2.8	
1.2	Stop switches	210.2(e), 210.2(v), 1001.2(a)(2)	2.26.2.5, 2.26.2.21, 8.11.2.1.1(b)	3.10.4(t), 3.10.4(u)	
1.3	Operating control devices	210.1a, 210.1e, 1001.2(a)(3)	2.26.1.1, 2.26.1.6, 8.11.2.1.1(c)	3.10.1, 3.10.2, 3.10.7	
1.4	Sills and car floor	108.1, 110.10d, 110.11a, 110.13a, 203.16, 210.12, 1001.2(a)(4)	2.5.1, 2.11.10.3, 2.11.11.1, 2.11.13.1, 2.15.16, 8.11.2.1.1(d)	3.3.3, 3.3.4	ANSI A117.1
1.5	Car lighting and receptacles	204.7, 1001.2(a)(5)	2.14.7, 8.11.2.1.1(e)	3.4.5, 3.4.6	
1.6	Car emergency signal	211.1, 1001.2(a)(6)	2.27.1, 8.11.2.1.1(f)	3.11.1	
1.7	Car door or gate	112.2a, 204.4, 204.5, 204.6, 210.2q, 1001.2(a)(7)	2.5.1.5.3, 2.13.2.1, 2.14.4, 2.14.5, 2.14.6, 2.26.2 (2.26.2.15), 8.11.2.1.1(g)	3.4.2, 3.4.3, Appendix A	
1.8	Door closing force	112.4(b), 1001.2(a)(8), 1002.2h	2.13.4.2.3, 8.11.2.1.1(h), 8.11.2.2.8	2.8.1	
1.9	Power closing of doors or gates	112.3, 1001.2(a)(9)	2.13.3, 8.11.2.1.1(i)	2.8.2	
1.10	Power opening of doors or gates	111.12, 210.1e, 210.9c, 1001.2(a)(10), 1002.3g, 1002.3h, 1002.3i	2.26.1.6, 2.26.9 (2.26.9.3), 8.11.2.1.1(j), 8.11.2.3.7, 8.11.2.3.8, 8.11.2.3.9		
1.11	Car vision panels and glass car doors	204.2e, 204.5i, 1001.2(a)(11)	2.14.2.5, 2.14.5.8, 8.11.2.1.1(k)	3.4.2, 3.4.3	
1.12	Car enclosure	204.1b, 204.1h, 207.2b, 207.4, 207.5, 211.9, 1001.2(a)(12), 1202.5, 1104	2.14.1.2, 2.14.1.8, 2.16.2.2, 2.16.4, 2.16.5, 2.29.1, 8.11.2.1.1(l), 8.7.2.14, 8.3.7	3.4.1, 3.7.5	

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Checklist for Electric Elevators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
1	**ELEVATOR — INSIDE OF CAR (Cont'd)**				
1.13	Emergency exit	204.1e, 204.1j, 204.2d, 1001.2(a)(13)	2.14.1.5, 2.14.1.10, 2.14.2.4, 8.1.2, 8.6.10.2, 8.11.2.1.1(m)	3.4.4	
1.14	Ventilation	204.2c, 204.3c, 1001.2(a)(14)	2.14.2.3, 2.14.3.3, 8.11.2.1.1(n)		
1.15	Signs and operating device symbols	210.13, 1001.2(a)(15)	2.16.12, 8.11.2.1.1(o)		
1.16	Rated load, platform area, and data plate	207, 1001.2(a)(16)	2.16, 8.11.2.1.1(p)	3.7	
1.17	Standby power operation	207.8, 210.10, 211.2, 1001.2(a)(17), 1002.2g, 1002.3e	2.16.8, 2.26.10, 2.27.2, 8.11.2.1.1(q), 8.11.2.2.7, 8.11.2.3.5		
1.18	Restricted opening of car or hoistway doors	111.12, 1001.2(a)(18)	8.11.2.1.1(r)	2.7.4	
1.19	Car ride	200, 203.2, 1001.2(a)(19)	2.23, 2.15.2, 8.11.2.1.1(s)		
2	**ELEVATOR — MACHINE ROOM**				
2.1	Access to machine space	101.1a, 101.3a, 101.3b, 101.3c, 101.3d, 1001.2(b)(1)	2.7.1.1, 2.7.3.1, 2.7.3.2, 2.7.3.3, 2.7.3.4, 8.11.2.1.2(a)	2.2.2	NFPA 70 or CSA C22.1, as applicable
2.2	Headroom	101.4, 1001.2(b)(2)	2.7.4, 8.11.2.1.2(b)		
2.3	Lighting and receptacles	101.5a, 101.5c, 1001.2(b)(3)	2.7.5.1, 8.11.2.1.2(c)	2.2.3	NFPA 70 or CSA C22.1, as applicable
2.4	Machine space	100.3c, 100.3d, 100.5, 101.1a, 101.2, 101.8, 1001.2(b)(4)	2.1.3.3, 2.1.3.4, 2.1.5, 2.7.1.1, 2.7.2.1, 2.7.8, 8.11.2.1.2(d)	2.2.1, 2.2.6	
2.5	Housekeeping	1001.2(b)(5), 1206.2b, 1206.9	8.11.2.1.2(e), 8.6.4.8, 8.6.10.3		
2.6	Ventilation	101.5b, 102.4, 1001.2(b)(6)	2.7.5.2, 2.8.4, 8.11.2.1.2(f)	2.2.4	
2.7	Fire extinguisher	1001.2(b)(7), 1206.1h	8.11.2.1.2(g), 8.6.1.6.5		

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Checklist for Electric Elevators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
2	ELEVATOR — MACHINE ROOM (Cont'd)				
2.8	Pipes, wiring, and ducts	102.1, 102.2, 1001.2(b)(8)	2.8.1, 2.8.2, 8.11.2.1.2(h)	2.2.5	ANSI/NFPA 13; A17.1, Inquiry 88-26
2.9	Guarding of exposed auxiliary equipment	104.1, 1001.2(b)(9)	2.10.1, 8.11.2.1.2(i)		
2.10	Numbering of elevators, machines, and disconnect switches	208.10, 210.4, 211.9, 1001.2(b)(10)	2.26.4, 2.29.1, 8.11.2.1.2(j)		NFPA 70 or CSA C22.1, as applicable
2.11	Disconnecting means and control	210.4, 1001.2(b)(11)	2.26.4, 8.11.2.1.2(k)	3.10.5	NFPA 70 or CSA C22.1, as applicable
2.12	Controller wiring, fuses, grounding, etc.	102.1, 210.4, 1001.2(b)(12), 1206.1f	2.8.1, 2.26.4, 8.11.2.1.2(l), 8.6.1.6.1, 8.6.1.6.3	3.10	NFPA 70 or CSA C22.1, as applicable
2.13	Governor, overspeed switch, and seal	206, 205.15, 210.2(j), 1001.2(b)(28), 1002.2c, 1002.3a, 1002.3b, 1003.2a, 1206.1a	2.18, 2.17.15, 2.26.2 (2.26.2.10), 8.11.2.1.2(bb), 8.11.2.2.3, 8.11.2.3.1, 8.11.2.3.2, 8.10.2.2.2(cc)(1), 8.6.1.6.2	3.6.1, 3.10.4(g)	
2.14	Code data plate	215, 1200.6	8.9, 8.7.1.8		
2.15	Static control	210.2, 210.9(d), 1001.2(b)(13), 1003.2h	2.26.2, 2.26.9.5, 8.11.2.1.2(m), 8.10.2.2.2(m)		
2.16	Overhead beam and fastenings	105.1, 105.2, 105.3, 1001.2(b)(14)	2.9.1, 2.9.2, 2.9.3, 8.11.2.1.2(n)		
2.17	Drive machine brake	207.2b, 207.8, 208.8, 210.8, 1001.2(b)(15), 1002.3d	2.16.2.2, 2.16.8, 2.24.8.3, 2.26.8, 8.11.2.1.2(o), 8.11.2.3.4	3.8.4	
2.18	Traction drive machines	208, 1001.2(b)(16)	2.24, 8.11.2.1.2(p)	3.8.1	
2.19	Gears, bearings, and flexible couplings	208, 1001.2(b)(17), 1206.1a	2.24, 8.11.2.1.2(q), 8.6.1.6.2	3.8.1	
2.20	Winding drum machine and slack cable device	208.1, 210.2, 212.6, 212.7, 212.10, 1001.2(b)(18), 1002.2d, 1206.3	2.24.1, 2.26.2, 2.20.2, 2.20.7, 2.20.10, 8.11.2.1.2(r), 8.11.2.2.4, 8.6.4.10	3.8.2, 3.10.4, 3.12.6, 3.12.7, 3.12.9	

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Checklist for Electric Elevators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
2	ELEVATOR — MACHINE ROOM (Cont'd)				
2.21	Belt- or chain-drive machine	208.9, 1001.2(b)(19)	2.24.9, 8.11.2.1.2(s)	3.8.3	
2.22	Motor generator	210.9f, 1001.2(b)(20), 1003.2j	2.26.9.7, 8.11.2.1.2(t), 8.10.2.2.2(t)		
2.23	Absorption of regenerated power	210.10, 1001.2(b)(21), 1003.2k	2.26.10, 8.11.2.1.2(u), 8.10.2.2.2(u)	3.10.10	
2.24	AC drives from a DC source	210.2, 210.9(e), 1001.2(b)(22), 1003.2i	2.26.2, 2.26.9.6, 8.11.2.1.2(v), 8.10.2.2.2(m)(3)		
2.25	Traction sheaves	207.8, 208.2, 208.3, 212, 1001.2(b)(23), 1202.14, 1206.1a, 1206.1b	2.16.8, 2.24.2, 2.24.3, 2.20, 8.11.2.1.2(w), 8.7.2.21, 8.6.1.6.2, 8.6.4.1	3.8.1	
2.26	Secondary and deflector sheaves	208, 1001.2(b)(24), 1206.1a	2.24, 8.11.2.1.2(x), 8.6.1.6.2	3.8.1	
2.27	Rope fastenings	105.3c, 1001.2(b)(25), 212	2.9.3.3, 8.11.2.1.2(y), 2.20	3.12	
2.28	Terminal stopping devices	209, 1001.2(b)(26), 1002.3f	2.25, 8.11.2.1.2(z), 8.11.2.3.6	3.8.2, 3.9.1, 3.9.2, 3.10.4	
2.29	Car and counterweight safeties	205, 1306, Table 205.3, 1001.2(b)(29), 1002.2b, 1002.3a, 1003.2, 1202.6	2.17, 8.2.6, Table 2.17.3, 8.11.2.1.2(cc), 8.11.2.2.2, 8.11.2.3.1, 8.10.2.2, 8.7.2.18	3.5, 3.6, 3.10.4(m)	
2.39	Low oil protection	306.15	3.26.9		
2.40	Inspection control		6.1.6.2.2		
2.41	Maintenance reocrds		8.6.1.4, 8.6.10.1		
2.42	Static control				
3	ELEVATOR — TOP OF CAR				
3.1	Top-of-car stop switch	210.2(h), 1001.2(c)(1)	2.26.2.8, 8.11.2.1.3(a)	3.10.4(e)	
3.2	Car top light and outlet	204.7, 1001.2(c)(2)	2.14.7, 8.11.2.1.3(b)	3.4.5	NFPA 70 or CSA C22.1, as applicable

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Checklist for Electric Elevators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
3	ELEVATOR — TOP OF CAR (Cont'd)				
3.3	Top-of-car operating device	204.1g, 210.1d, 1001.2(c)(3)	2.14.1.7, 2.26.1.4, 8.11.2.1.3(c)	3.10.3	
3.4	Top-of-car clearance, refuge space, and standard railing	1206.8, 107, 1304	8.6.4.11, 2.4, 2.10.2, 2.14.1.7, 8.2.4	2.4.4	
3.5	Normal terminal stopping devices	207.4, 209.2, 210.2, 1001.2(c)(7), 1002.2e, 1003.2f, 1003.3(k)	2.25.1, 2.25.2, 2.26.2, 8.11.2.1.3(g), 8.11.2.2.5, 8.10.2.2.2(z), 8.10.2.3.2(k)	3.9.1, 3.10.4	
3.6	Final and emergency terminal stopping devices	209.3, 1001.2(c)(8), 1002.2e, 1003.3(k)	2.25.3, 8.11.2.1.3(h), 8.11.2.2.5, 8.10.2.3.2(k)	3.9.2	
3.7	Car leveling and anticreep devices	210.1e, 1001.2(c)(10)	2.26.1.6, 8.11.2.1.3(j)		
3.8	Top emergency exit	204.1e, 1001.2(c)(12)	2.14.1.5, 8.11.2.1.3(l)	3.4.4	
3.9	Floor and emergency identification numbering	100.7, 211.9, 1001.2(c)(15)	2.29.2, 2.29.1, 8.11.2.1.3(o)		
3.10	Hoistway construction	100, 1001.2(c)(16)	2.1, 8.11.2.1.3(p)	2.1	
3.11	Hoistway smoke control	100.4, 1001.2(c)(17)	2.1.4, 8.11.2.1.3(q)		
3.12	Pipes, wiring, and ducts	102, 1001.2(c)(18)	2.8, 8.11.2.1.3(r)	2.1.4	
3.13	Windows, projections, recesses, and setbacks	100.5, 100.6, 110.10, 1001.2(c)(19)	2.1.5, 2.1.6, 2.11.10, 8.11.2.1.3(s)	2.1.2, 2.1.3	
3.14	Hoistway clearances	107, 108, 1001.2(c)(20)	2.4, 2.5, 8.11.2.1.3(t)	2.4	
3.15	Multiple hoistways	100.1d, 1001.2(c)(21)	2.1.1.4, 8.11.2.1.3(u)		
3.16	Traveling cables and junction boxes	102.1, 1001.2(c)(22)	2.8.1, 8.11.2.1.3(v)		NFPA 70 or CSA C22.1, as applicable
3.17	Door and gate equipment	110, 111, 210.1e, 1001.2(c)(23)	2.11, 2.12, 2.26.1.6, 8.11.2.1.3(w)	2.6, 2.7	
3.18	Car frame and stiles	203, 213, 1001.2(c)(24), 1200.4, 1202.4a	2.15, 8.8, 8.11.2.1.3(x), 8.6.2, 8.7.2.15.1		

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Checklist for Electric Elevators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
3	**ELEVATOR — TOP OF CAR (Cont'd)**				
3.19	Guide rails fastening and equipment	205.16, 1001.2(c)(25), 1206.1d	2.17.16, 8.11.2.1.3(y), 8.6.4.3	3.5.6	
3.20	Governor rope	206.5, 1001.2(c)(26), 1202.7, 1206.1c	2.18.5, 8.11.2.1.3(z), 8.7.2.19, 8.6.4.2	3.6.2	
3.21	Governor releasing carrier	205.15, 1001.2(c)(27)	2.17.15, 8.6.2.4, 8.11.2.1.3(aa)	3.5	
3.22	Wire rope fastening and hitch plate	212, 105.3c, 203.13, 1001.2(c)(28), 1200.5, 1206.3	2.20, 2.9.3.3, 2.15.13, 8.11.2.1.3(bb), 8.6.3, 8.6.4.10	3.12.5, 3.12.8, 3.12.9	
3.23	Suspension rope	212, 206.7, 1001.2(c)(29), 1200.4d, 1202.14	2.20, 2.18.7, 8.11.2.1.3(cc), 8.6.2.5, 8.7.2.21		
3.24	Top counterweight clearance	107.1h, 1001.2(c)(5)	2.4.9, 8.11.2.1.3(e)		
3.25	Car, overhead, and deflector sheaves	208	2.24	3.8.1	
3.26	Broken rope, chain, or tape switch	209.2c(2), 210.2(f), 1001.2(c)(9), 1002.2i	2.25.2.3.2, 2.26.2.6, 8.11.2.1.3(i), 8.11.2.2.9	3.10.4(d)	
3.27	Crosshead data plate and rope data tags	207.3, 212.2, 1001.2(c)(11), 1202.14	2.16.3, 2.20.2, 8.11.2.1.3(k), 8.7.2.21	3.12.2	
3.28	Counterweight and counterweight buffer	201, 202, 1001.2(c)(13)	2.3, 2.4.9, 2.21, 2.22, 8.11.2.1.3(m), 8.11.2.1.5(c), 8.11.2.3.3	2.1.5, 2.4.3, 3.1, 3.2, 4.9	
3.29	Counterweight safeties	205, 109, 1001.2(c)(14), 1002.3a, 1003.2, 1308	2.17.12.4, 2.18.5.3, 8.11.2.1.2(y), 8.11.2.1.3(k), 8.11.2.1.3(z), 8.10.2.2.2(z)	3.5.2, 3.6.2, 3.12.2	
3.33	Compensating ropes and chains	202.4, 1001.2(c)(30), 1003.2g	2.21.4, 8.11.2.1.3(dd), 8.10.2.2.3(dd), 8.10.2.2.5(h)		
4	**ELEVATOR — OUTSIDE HOISTWAY**				
4.1	Car platform guard	203.9, 1001.2(d)(1)	2.15.9, 8.11.2.1.4(a)	3.3, 3.2.2	

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Checklist for Electric Elevators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
4	**ELEVATOR — OUTSIDE HOISTWAY (Cont'd)**				
4.2	Hoistway doors	110, 111.7, 210.2, 1001.2(d)(2)	2.11, 2.12.7, 2.26.2, 8.11.2.1.4(b)	3.10.4	
4.3	Vision panels	110.7, 1001.2(d)(3)	2.11.7, 8.11.2.1.4(c)	2.6.3	
4.4	Hoistway door locking devices	111, 1001.2(d)(4)	2.12, 8.11.2.1.4(d)	2.7.1	
4.5	Access to hoistway	111.6, 111.7, 1001.2(d)(5)	2.12.6, 2.12.7, 8.11.2.1.4(e)	2.7.3	
4.6	Power closing of hoistway doors	112, 1001.2(d)(6)	2.13, 8.11.2.1.4(f)		
4.7	Sequence operation	112.6, 112.3d, 1001.2(d)(7)	2.13.6, 2.13.3.4, 8.11.2.1.4(g)		
4.8	Hoistway enclosure	100.1, 100.4, 100.5, 1001.2(d)(8)	2.1.1, 2.1.4, 2.1.5, 8.11.2.1.4(h)	2.1.1, 2.1.2	ANSI Z97.1 or 16 CFR Part 1201
4.9	Elevator parking devices	1001.2(d)(9)	8.11.2.1.4(i)	2.7.2	
4.10	Emergency doors in blind hoistways	110.1, 1001.2(d)(10)	2.11.1.1, 2.11.1.2, 8.1, 8.11.2.1.4(j)		
4.11	Separate counterweight hoistway	103.1, 103.3, 110.1, 1001.2(d)(11)	2.3.1, 2.3.3, 2.11.1.1, 2.11.1.2, 2.26.2.27, 8.11.2.1.4(k)		
4.12	Standby power selection switch	211.2, 211.8, 1001.2(d)(13), 1002.2g	2.27.2, 2.27.8, 8.11.2.1.4(l), 8.11.2.2.7	3.11.2	
4.13	Inspection control		6.2.6.2.2		
5	**ELEVATOR — PIT**				
5.1	Pit access, lighting, stop switch, and condition	102, 103.2, 106.1, 210.2(g), 1001.2(e)(1), 1206.2a	2.8, 2.3.2, 2.26.2.7, 8.11.2.1.5(a), 8.6.4.7	2.3.1, 2.3.2, 2.7.3	NFPA 70 or CSA C22.1, as applicable
5.2	Bottom clearance, runby, and minimum refuge space	103.2, 107.1a, 107.1b, 201.4h, 1001.2(e)(2), 1202.14b, 1206.8	2.3.2, 2.4.1, 2.4.2, 2.22.4.8, 8.11.2.1.5(b), 8.6.4.11	2.4.2, 2.4.3	
5.3	Final and emergency terminal stopping devices	209.3, 1001.2(e)(4), 1003.2e	2.25.3, 8.11.2.1.5(d), 8.10.2.2.5(c)	3.9.2	

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Checklist for Electric Elevators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
5	**ELEVATOR — PIT (Cont'd)**				
5.4	Normal terminal stopping devices	209, 1002.2e	2.25, 8.11.2.2.5	3.9.1	
5.5	Traveling cables	102.2	2.8.2		NFPA 70 or CSA C22.1, as applicable
5.6	Governor-rope tension devices	206.7, 1001.2(e)(7), 1206.1a	2.18.7, 8.11.2.1.5(g), 8.6.1.6.2		
5.7	Car frame and platform	203.8, 203.6, 207.2b(3), 1001.2(e)(9)	2.15.8, 2.15.6, 2.16.2.2, 8.11.2.1.5(i)	3.3	
5.8	Car safeties and guiding members — including roped-hydraulic elevators installed under A17.1b–1989 and later editions	203, 205.11, 1001.2(e)(10), 1001.2b(2)(c), 1002.3a, 1206.1g, 1202.4a	2.15, 2.17.11, 8.11.2.1.5(j), 8.11.2.3.1, 8.6.4.5, 8.7.2.15.1	3.5	
5.9	Buffers and emergency terminal speed limiting devices	201, 109.1, 210.2(w), 1002.3f, 1003.2e, 1206.1f, 1308.2	2.22, 2.6, 2.26.2.22, 8.11.2.3.6, 8.10.2.2.5(c), 8.6.1.6.3, 8.2.3, 8.3.1.3	3.1, 3.10.4(m)	
5.10	Compensating chains, ropes, and sheaves	202.4, 205.17, 210.2c, 1001.2(e)(8)	2.21.4, 2.17.17, 2.26.2.3, 8.11.2.1.5(h)		
6	**ELEVATOR — FIREFIGHTERS' SERVICE**				
6.1	Operation of elevators under fire and other emergency conditions (A17.1b–1973 through A17.1b–1980)	112.3d, 112.5, 1001.2(d)(12), 1002.2f, 1206.7	2.13.3.4, 2.13.5, 8.11.2.1.4(l), 8.11.2.2.6, 8.6.10.1		A17.1b–1973 through A17.1b–1980, Rule 211.3
6.2	Operation of elevators under fire and other emergency conditions (A17.1–1981 through A17.1b–1983)	112.3d, 112.5, 1001.2(d)(12), 1002.2f, 1206.7	2.13.3.4, 2.13.5, 8.11.2.1.4(l), 8.11.2.2.6, 8.6.10.1		A17.1–1981 through A17.1b–1983, Rule 211.3
6.3	Firefighters' service (A17.1–1984 through A17.1a–1988 and A17.3)	112.3d, 112.5, 1001.2(d)(12), 1002.2f, 1206.7	2.13.3.4, 2.13.5, 8.11.2.1.4(l), 8.11.2.2.6, 8.6.10.1	3.11.3	A17.1–1984 through A17.1a–1988, Rules 211.3 through 211.8
6.4	Firefighters' service (A17.1b–1989 through A17.1d–2000)	112.3d, 112.5, 211.2–211.8, 1001.2(d)(12), 1002.2f, 1206.7	2.13.3.4, 2.13.5, 2.27.2–2.27.8, 8.11.2.1.4(l), 8.11.2.2.6 8.6.10.1		

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Checklist for Electric Elevators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
6	ELEVATOR — FIREFIGHTERS' SERVICE (Cont'd)				
6.5	Acceptance checklist firefighters' service (A17.1–2000 and B44-00): automatic elevators				

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Checklist for Hydraulic Elevators

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
1	ELEVATOR — INSIDE OF CAR				
1.1	Door reopening device	112 {300.13}, 1001.2(a)(1), 1004.2(a)(1)	2.13 {3.13}, 8.11.2.1.1(a), 8.11.3.1.1(a)	2.8	
1.2	Stop switches	306.4(b)(1), 306.4(b)(6), 1004.2(a)(2)	3.26.4.2(a), 3.26.4.2(f), 8.11.3.1.1(b)	3.10.4(t) {4.7.4}, 3.10.4(u) {4.7.4}	
1.3	Operating control devices	210.1a {306.1}, 306.3, 1004.2(a)(3)	2.26.1.1 {3.26.1} 3.26.3, 8.11.3.1.1(c)	3.10.1 {4.7}, 3.10.2 {4.7}, 3.10.9 {4.7.6}	
1.4	Sills and car floor	108.1 {300.9}, 110.10d {300.11}, 110.11a, 110.13a, 203.16 {301.6}, 210.12, 1004.2(a)(4)	2.5.1 {3.5}, 2.11.10.3 {3.11}, 2.11.11.1, 2.11.13.1, 2.15.16 {3.15}, 8.11.3.1.1(d)	3.3.3 {4.2.2}, 3.3.4 {4.2.2}	ANSI A117.1
1.5	Car lighting and receptacles	301.7, 1004.2(a)(5)	3.14, 8.11.3.1.1(e)	3.4.5 {4.2.3}, 3.4.6 {4.2.3}	
1.6	Car emergency signal	211.1 {306.11}, 1004.2(a)(6)	2.27.1 {3.27}, 8.11.3.1.1(f)	3.11.1 {4.7.8}	
1.7	Car door or gate	111.7(c) {300.12}, 112.2a {300.13}, 204.4–204.6 {301.7}, 210.2(q) {306.4}, 1004.2(a)(7)	2.5.1.5.3 {3.5}, 2.12.7.3 {3.12}, 2.13.2.1 {3.13}, 2.14.4–2.14.6 {3.14}, 2.26.2 (2.26.2.15), {3.26.4}, 8.11.3.1.1(g)	3.4.2 {4.2.3}, 3.4.3 {4.2.3}, Appendix A	
1.8	Door closing force	112.4(b), 301.7, 1004.2(a)(8)	2.13.4.2.3, 3.14, 8.11.3.1.1(h)	2.8.1 {4.1}	
1.9	Power closing of doors or gates	112.3 {300.13}, 1004.2(a)(9)	2.13.3 {3.13}, 8.11.3.1.1(i)	2.8.2 {4.1}	
1.10	Power opening of doors or gates	111.5 {300.12}, 210.1e, 210.9(c), 306.3, 1004.2(a)(10)	2.12.5 {3.12}, 2.26.1.6, 2.26.9 (2.26.9.3), 3.26.3, 8.11.3.1.1(j)		
1.11	Car vision panels and glass car doors	204.2e {301.7}, 204.5i {301.7}, 1004.2(a)(11)	2.14.2.5, 2.14.5.8 {3.14}, 8.11.3.1.1(k)	3.4.2 {4.2.3}, 3.4.3 {4.2.3}	
1.12	Car enclosure	204.1b {301.7}, 204.1h, {301.7}, 1104, 204.2d {301.7}, 211.9 {306.11}, 1004.2(a)(12), 1202.5, 1203.2e	2.14 {3.14}, 8.3.7, 2.29.1 {3.27}, 8.11.3.1.1(l), 8.7.2.14, 8.7.3.13	3.4.1 {4.2.3}, 3.7.5 {4.2.4}	
1.13	Emergency exit	204.1j {301.7}, 1004.2(a)(13)	2.14.1.10, 3.14, 8.1.2, 8.6.10.2, 8.11.3.1.1(m)	3.4.4 {4.2.4}	

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Checklist for Hydraulic Elevators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
1	**ELEVATOR — INSIDE OF CAR (Cont'd)**				
1.14	Ventilation	204.2c {301.7}, 204.3c {301.7}, 1004.2(a)(14)	2.14.2.3, 2.14.3.3 {3.14}, 8.11.3.1.1(n)		
1.15	Signs and operating device symbols	210.13 {306.12}, 1004.2(a)(15)	2.26.12, 8.11.3.1.1(o)		
1.16	Rated load, platform area, and data plate	207 {301.10}, 1004.2(a)(16)	2.16 {3.16}, 8.11.3.1.1(p)	3.7 {4.2.4}	
1.17	Standby power operation	211.2 {306.11}, 1002.2g {1005.2c(6)}, 1004.2(a)(17)	2.27.2 {3.27}, 8.11.2.2.7 {8.11.3.2.3(f)}, 8.11.3.1.1(q)	3.11.2 {4.7.8}	
1.18	Restricted opening of car or hoistway doors	111.5 {300.12}, 1004.2(a)(18)	2.12.5 {3.12}, 8.11.3.1.1(r)	2.7.4 {4.1}	
1.19	Car ride	301.1a, 301.6, 1004.2(a)(19), 1206.1a {1206.5a}	3.23.1, 3.15, 8.11.3.1.1(s), 8.6.1.6.2 {8.6.5}		
2	**ELEVATOR — MACHINE ROOM**				
2.1	Access to machine space	300.1, 300.2, 1004.2(b)(1)	3.1, 3.7, 8.11.3.1.2(a)	2.2.2 {4.1}	NFPA 70 or CSA C22.1, as applicable
2.2	Headroom	101.4 {300.2}, 1004.2(b)(2)	2.4.7 {3.7}, 8.11.3.1.2(b)		
2.3	Lighting and receptacles	101.5a {300.2}, 101.5c {300.2}, 1004.2(b)(3)	2.7.5.1 {3.7}, 8.11.3.1.2(c)	2.2.3 {4.1}	NFPA 70 or CSA C22.1, as applicable
2.4	Machine space	101.1a {300.2}, 105.2 {300.6}, 105.4 {300.6}, 1004.2(b)(4)	2.7.1.1 {3.7}, 2.9.2, 2.9.4 {3.9}, 8.11.3.1.2(d)	2.2.2 {4.1}, 2.2.6 {4.1}	
2.5	Housekeeping	1004.2(b)(5), 1206.1 {1206.5a}, 1206.2b {1206.5a}, 1206.9	8.11.3.1.2(e), 8.6.1.2, 8.6.4.8 {8.6.5}, 8.6.10.3		
2.6	Ventilation	101.5b {300.2}, 102.4, 1004.2(b)(6)	2.7.5.2 {3.7}, 2.8.4, 8.11.3.1.2(f)	2.2.4 {4.1}	
2.7	Fire extinguisher	1004.2(b)(7), 1206.2f {1206.5a}	8.11.3.1.2(g), {8.6.5}		
2.8	Pipes, wiring, and ducts	102.1 {300.3}, 102.2 {300.3}, 1004.2(b)(8)	2.8.1, 2.8.2 {3.8}, 8.11.3.1.2(h)	2.2.5 {4.1}	ANSI/NFPA 13, A17.1 Inquiry 88-26
2.9	Guarding of exposed auxiliary equipment	104.1 {300.5}, 1004.2(b)(9)	2.10.1 {3.10}, 8.11.3.1.2(i)		
2.10	Numbering of elevators, machines, and disconnect switches	210.4, 211.9 {306.11}, 306.6	2.26.4, 2.29.1 {3.27}, 3.26		NFPA 70 or CSA C22.1, as applicable
2.11	Disconnecting means and control	306.3a(5)(b), 306.4, 306.6, 1004.2(b)(11)	3.26.3.1 [3.26.3.1.4(b)], 3.26.4, 3.26, 8.11.3.1.2(k)	3.10.5 {4.7.5}	NFPA 70 or CSA C22.1, as applicable

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Checklist for Hydraulic Elevators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
2	ELEVATOR — MACHINE ROOM (Cont'd)				
2.12	Controller wiring, fuses, grounding, etc.	102.1 {300.3}, 306.5, 306.6, 1004.2(b)(12), 1206.1f, 1206.5a	2.8.1 {3.8}, 3.26.5, 3.26, 8.11.3.1.2(l), 8.6.1.6.3, 8.6.1.6.1, 8.6.5		NFPA 70 or CSA C22.1, as applicable
2.13	Governor, overspeed switch, and seal	205, 206, 301.8, 1002.2(b), 1005.2c, 1005.4, 1202.7, 1206.1	2.17, 2.18, 3.17.1, 8.11.2.2.2, 8.11.3.2.3, 8.11.3.4, 8.7.2.19, 8.6.1.2	4.9.7	
2.14	Code data plate	309, 1200.6	8.9, 8.7.1.8		
2.30	Hydraulic power unit	304, 1004.2(b)(13), 1206.5	3.24, 8.11.3.1.2(m), 8.6.5		NFPA 70 or CSA C22.1, as applicable
2.31	Relief valves	308, 303.1, 303.2, 303.4b, 1004.2(b)(13), 1005.2a, 1006.2b, Definitions	3.28, 3.19.1, 3.19.2, 3.19.4.2, 8.11.3.1.2(m), 8.11.3.2.1, 8.10.3.2.2(m), 1.3 (Definitions)	4.4.1	
2.32	Control valve	303, 1004.2(b)(15)	3.19, 8.11.3.1.2(o)	4.4	
2.33	Tanks	304, 1004.2(b)(16), 1005.3b, 1203.6, 1206.5b	3.24, 8.11.3.1.2(p), 8.11.3.3.2, 8.7.3.29, 8.6.5.1, 8.6.5.2, 8.6.5.5, 8.6.5.6	4.5	
2.34	Flexible hydraulic hose and fitting assemblies	303.3c, 1004.2(b)(17), 1005.2d	3.19.3.3, 8.11.3.1.2(q), 8.11.3.2.4		
2.35	Supply line and shutoff valve	303	3.19	4.4.4	
2.36	Hydraulic cylinders	302.3, 1004.2(b)(19), 1005.2b	3.18.3, 8.11.3.1.2(s), 8.11.3.2.2		
2.37	Pressure switch	306.14, 1004.2(b)(20), 1005.2e	3.26.8, 8.11.3.1.2(t), 8.11.3.2.5		
2.38	Roped water hydraulic elevators	{NR}			
2.39	Low oil protection	306.15	3.26.9		
2.40	Inspection control		6.1.6.2.2		

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Checklist for Hydraulic Elevators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
2	**ELEVATOR — MACHINE ROOM (Cont'd)**				
2.41	Maintenance records		8.6.1.4, 8.6.10.1		
2.42	Static control				
3	**ELEVATOR — TOP OF CAR**				
3.1	Top-of-car stop switch	306.4, 1004.2(c)(1)	3.26.1, 3.26.4, 8.11.3.1.3(a)	4.7.4(a)	
3.2	Car top light and outlet	204.7 {301.7}, 1004.2(c)(2)	2.14.7 {3.14}, 8.11.3.1.3(b)	3.4.5 {4.2.3}	NFPA 70, or CSA C22.1 as applicable
3.3	Top-of-car operating device	306.2, 1004.2(c)(3)	3.26.1, 3.26.2, 8.11.3.1.3(c)	3.10.3, 4.7.2	
3.4	Top-of-car clearance, refuge space, and standard railing	300.8, 302.4, 1004.2(c)(4), 1006.2a, 1006.2c	3.4, 2.10.2, 2.14.1.7 {3.14}, 3.18.4, 8.11.3.1.3(d), 8.10.3.2.2(s), 8.10.3.2.3(d)	2.4.4 {4.1}	
3.5	Normal terminal stopping devices	305.1a, 1002.2e {1005.2c}, 1003.3(k), 1004.2(c)(5)	3.25.1.1, 8.11.2.2.5 {8.11.3.2.3}, 8.10.2.3.2(k), 8.11.3.1.3(e)	3.9.1 {4.6}, 3.10.4	
3.6	Final and emergency terminal stopping devices	305.2, 1004.2(c)(6), 1005.2	3.25.2, 8.11.3.1.3(f)		A17.1–1955, Rule 320.2
3.7	Car leveling and anticreep devices	306.3, 306.4, 1004.2(c)(7)	3.26.3, 3.26.4, 8.11.3.1.3(g)	4.7.3, 4.7.4	
3.8	Top emergency exit	204.1e {301.7}, 1004.2(c)(9)	2.14.1.5 {3.14}, 8.11.3.1.3(i)	3.4.4 {4.2.3}	
3.9	Floor and emergency identification numbering	100.7 {300.1}, 211.9 {306.11}, 1004.2(c)(10)	2.29.2 {3.1}, 2.29.1 {3.27}, 8.11.3.1.3(j)		
3.10	Hoistway construction	300.1, 1004.2(c)(11)	3.1, 8.11.3.1.3(k)	2.1 {4.1}	
3.11	Hoistway smoke control	100.4 {300.1}, 1004.2(c)(12)	2.1.4 {3.1}, 8.11.3.1.3(l)		
3.12	Pipes, wiring, and ducts	102 {300.3}, 1004.2(c)(13)	2.8 {3.8}, 8.11.3.1.3(m)	2.1.4 {4.1}	
3.13	Windows, projections, recesses, and setbacks	100.5 {300.1}, 100.6 {300.1}, 110.10 {300.11}, 1004.2(c)(14)	2.1.5, 2.1.6 {3.1}, 2.11.10 {3.11}, 8.11.3.1.3(n)	2.1.2 {4.1}, 2.1.3 {4.1}	
3.14	Hoistway clearances	108 {300.9}, 110 {300.11}, 1004.2(c)(15)	2.5 {3.5}, 2.11 {3.11}, 8.11.3.1.3(o)	2.4 {4.1}	
3.15	Multiple hoistways	100.1d {300.1}, 1004.2(c)(16)	2.1.1.4 {3.1}, 8.11.3.1.3 (p)		

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Checklist for Hydraulic Elevators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
3	ELEVATOR — TOP OF CAR (Cont'd)				
3.16	Traveling cables and junction boxes	102.1 {300.3}, 1004.2(c)(17)	2.8.1 {3.8}, 8.11.3.1.3(q)		NFPA 70, or CSA C22.1, as applicable
3.17	Door and gate equipment	110 {300.11}, 111 {300.12}, 210.1e {306.3}, 1004.2(c)(18)	2.11 {3.11}, 2.12 {3.12}, 2.26.1.6 {3.26.3}, 8.11.3.1.3(r)	2.6 {4.1}, 2.7 {4.1}	
3.18	Car frame and stiles	213 {302.5}, 301.6, 1004.2(c)(19)	8.8 {3.18.5}, 3.15, 8.11.3.1.3(s)		
3.19	Guide rails fastenings and equipment	200 {301.1b}, 308, 301.1, 301.6, 1004.2(c)(20)	2.23 {3.23.2}, 3.38, 3.23, 3.15.1.1.2, 8.11.3.1.3(t)	4.9.8	
3.20	Governor rope	206.5, 301.8, 1001.2(c), 1004.2(c)(23), 1202.7, 1206.1c	2.18.5, 3.17.1, 8.11.2.1.3(z), 8.11.3.1.3(w), 8.7.2.19, 8.6.4.2	3.6, 4.9.7	
3.21	Governor releasing carrier	205.15, 301.8, 1004.2(c)(22), 1005.4	2.17.15, 3.17.1, 8.11.3.1.3(v), 8.11.3.4		
3.22	Wire rope fastening and hitch plate	212, 105.3c, 203.13, 302.1b, 1004.2(c)(24), 1200.5	2.20, 2.9.3.3, 2.15.13, 3.18.1.2, 8.11.3.1.3(x), 8.6.3	4.9.10	
3.23	Suspension rope	212, 1307, 1001.2(c)(29), 1004.2(c)(25), 1200.4d, 1202.14, 1203.9	3.16.3, 3.20, 8.11.3.1.3(u), (w), and (y), 8.7.2.21, 8.7.3.25	4.8, 4.9.10	
3.27	Crosshead data plate and rope data tags	207.3, 212.2, 1001.2(c)(11), 1202.14	3.16, 2.20.2, 8.11.2.1.3(k), 8.7.2.21	3.12.2	
3.28	Counterweight and counterweight buffer	300.8f, 301.4, 301.9, 1308	3.3, 3.4.6, 3.22.3, 8.11.3.2.3(d)	4.9.2, 4.9.6	
3.29	Counterweight safeties	205, 109, 1001.2(c)(14), 1002.3a, 1003.2, 1308	3.17, 3.6, 3.21, 8.11.2.1.3(n), 8.11.2.3.1, 8.10.2.2.2(bb), 8.2.3	3.5.2	

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Checklist for Hydraulic Elevators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
3	**ELEVATOR — TOP OF CAR (Cont'd)**				
3.30	Speed test	205.16, 300.8, 301, 1004.2(c)(8), 1006.2g, Definitions	2.17.16, 3.4, 8.11.3.1.3(h), 8.10.3.2.3(cc), 1.3 (Definitions)	4.9	
3.31	Slack rope device — roped-hydraulic elevators installed under A17.1b–1989 and later editions	302.1b, 306.4, 1004.2(c)(26), 1005.2f	3.18.1.2, 3.26.4, 8.11.3.1.3(z)	4.9.9	
3.32	Traveling sheave — roped-hydraulic elevators installed under A17.1b–1989 and later editions	212, 208.2, 208.3, 208.5, 301.1b, 302.1b, 307, 1004.2(c)(27), 1203.9	2.20, 2.24.2, 2.24.3, 2.24.5, 3.23.2, 3.18.1.2, 8.11.3.1.3(aa), 8.7.3.25	4.9.8	
4	**ELEVATOR — OUTSIDE HOISTWAY**				
4.1	Car platform guard	301.6, 1004.2(d)(1)	3.15, 8.11.3.1.4(a)	3.3.2 {4.2.2}	
4.2	Hoistway doors	110 {300.11}, 111.2b {300.12}, 111.3b {300.12}, 306.4, 1004.2(d)(2), 1006.2h	2.11 {3.11}, 2.12.2.2 {3.12}, 2.12.3.2 {3.12}, 3.26.4, 8.11.3.1.4(b), 8.10.3.2.3(r)	4.7.4	
4.3	Vision panels	110.7 {300.11}, 1004.2(d)(3)	2.11.7 {3.11}, 8.11.3.1.4(c)	2.6.3 {4.1}	
4.4	Hoistway door locking devices	111 {300.12}, 1004.2(d)(4)	2.12 {3.12}, 8.11.3.1.4(d)	2.7.1 {4.1}	
4.5	Access to hoistway	111.6 {300.12}, 111.7 {300.12}, 1004.2(d)(5)	2.12.6, 2.12.7 {3.12}, 8.11.3.1.4(e)	2.7.3 {4.1}	
4.6	Power closing of hoistway doors	112.3–112.6 {300.13}, 1004.2(d)(6)	2.13.3–2.13.6 {3.13}, 8.11.3.1.4(f)	2.8 {4.1}	
4.7	Sequence operation	112.6 {300.13}, 112.3d {300.13}, 1004.2(d)(7)	2.13.6 {3.13}, 2.13.3.4 {3.13}, 8.11.3.1.4(g)		
4.8	Hoistway enclosure	100.1 {300.1}, 100.4 {300.1}, 100.5 {300.1}, 1004.2(d)(8)	2.1.1, 2.1.4, 2.1.5 {3.1}, 8.11.3.1.4(h)	2.1.1 {4.1}, 2.1.2 {4.1}	
4.9	Elevator parking device	1004.2(d)(9)	8.11.3.1.4(i)	2.7.2 {4.1}	
4.10	Emergency doors in blind hoistways	110.1, 1004.2	2.11.1.1, 2.11.1.2, 8.1		

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Checklist for Hydraulic Elevators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
4	**ELEVATOR — OUTSIDE HOISTWAY (Cont'd)**				
4.12	Standby power selection switch	207.8 {301.10}, 211.2 {306.11}, 211.8 {306.11}, 1002.2g, 1004.2(d)(11), 1005.2c	2.16.8 {3.16}, 2.27.2 {3.27}, 2.27.8 {3.27}, 8.11.2.2.7, 8.11.3.1.4(k), 8.11.3.2.3	3.11.2 {4.7.8}	
4.13	Inspection control		6.2.6.2.2		
5	**ELEVATOR — PIT**				
5.1	Pit access, lighting, stop switch, and condition	102 {300.3}, 106.1 [300.7}, 300.10, 306.4, 1004.2(e)(1), 1206.2a	2.8 {3.8}, 3.6, 3.26.4, 8.11.3.1.5(a), 8.6.4.7	2.3.1 {4.1}, 2.3.2 {4.1}, 2.7.3 {4.1}, 3.10.4	NFPA 70 or CSA C22.1, as applicable
5.2	Bottom clearance, runby, and minimum refuge space	300.8, 302.3c, 1004.2(e)(2), 1006.2e	3.4, 3.18.3.3, 8.11.3.1.5(b), 8.10.3.2.5(c)	2.1.5	
5.4	Normal terminal stopping devices	305.1, 1002.2e {1005.2c}, 1004.2(e)(5)	3.25.1, 8.11.2.2.5 {8.11.3.2.3}, 8.11.3.1.5(e)	3.9.1 {4.6}	
5.5	Traveling cables	102.2 {300.3}, 1004.2(e)(6)	2.8.2 {3.8}, 8.11.3.1.5(f)		NFPA 70 or CSA C22.1, as applicable
5.6	Governor rope tension device	206.7, 301.8, 1004.2(e)(11), 1206.1a	2.18.7, 3.17.1, 8.11.3.1.5(k), 8.6.1.6.2	4.9.7	
5.7	Car frame and platform	308, 301.6, 302.2c, 1004.2(e)(7)	3.28, 3.15, 3.18.2.3, 8.11.3.1.5(g)	3.3 {4.2.2}	
5.8	Car safeties and guiding members — including roped-hydraulic elevators installed under A17.1b–1989 and later editions	205, 1306, 301.8, 301.9, 1004.2(e)(10), 1005.2c, 1005.4	2.17, 8.2.6, 3.17.1, 3.17.2, 8.11.3.1.5(j), 8.11.3.2.3, 8.11.3.4	4.9.6, 4.9.8	
5.11	Plunger and cylinder	302, 1004.2(e)(3), 1206.5b	3.18, 8.11.3.1.5(c), 8.6.5.1, 8.6.5.2, 8.6.5.5, 8.6.5.6	4.3.1, 4.3.2	
5.12	Car buffer	301.3, 306.4, 1004.2(e)(4), 1206.1e, 1308.2	3.22.1, 3.26.4, 8.11.3.1.5(d), 8.6.4.4, 8.2.3.2	4.2.1	

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Checklist for Hydraulic Elevators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
5	**ELEVATOR — PIT (Cont'd)**				
5.13	Guiding members	308, 301.1, 1004.2(e)(8), 1206.1d	3.28, 3.23, 8.11.3.1.5(h), 8.6.4.3		
5.14	Supply piping	208, 1004.2(e)(9), 1006.2f	2.24, 8.11.3.1.5(i), 8.10.3.2.2(r)	4.4.4	
6	**ELEVATOR — FIREFIGHTERS' SERVICE**				
6.1	Operation of elevators under fire and other emergency conditions (A17.1b–1973 through A17.1b–1980)	112.3d {306.11}, 112.5 {306.11}, 1001.2(d)(12), 1002.2f, 1004.2(d)(12), 1206.7	2.13.3.4, 2.13.5 {3.27}, 8.11.2.1.4(l), 8.11.2.2.6, 8.6.10.1		A17.1b–1973 through A17.1b–1980, Rule 211.3
6.2	Operation of elevators under fire and other emergency conditions (A17.1–1981 through A17.1b–1983)	112.3d, 112.5, 1001.2(d)(12), 1002.2f, 1206.7	2.13.3.4, 2.13.5, 8.11.2.1.4(l), 8.11.2.2.6, 8.6.10.1		A17.1b–1981 through A17.1b–1983, Rule 211.3
6.3	Firefighters' service (A17.1–1984 through A17.1a–1988 and A17.3)	112.3d, 112.5, 1001.2(d)(12), 1002.2f, 1206.7	2.13.3.4, 2.13.5, 8.11.2.1.4(l), 8.11.2.2.6, 8.6.10.1	3.11.3	A17.1–1984 through A17.1a–1988, Rules 211.3–211.8
6.4	Firefighters' service (A17.1b–1989 through A17.1d–2000)	112.3d, 112.5, 211.2–211.8 {306.11}, 1001.2(d)(12), 1002.2f, 1206.7	2.13.3.4, 2.13.5, 2.27.2–2.27.8 {3.27}, 8.11.2.1.4(l), 8.11.2.2.6, 8.6.10.1		
6.5	Acceptance checklist for firefighters' service (A17.1–2000 and B44-00): automatic elevators				

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Checklist for Escalators

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
7	ESCALATOR — EXTERNAL				
7.1	General fire protection	800, 801, 1009.2a	6.1.1, 6.1.2, 8.10.4.1.1(a)		
7.2	Geometry	802.1, 802.2, 802.3d, 1009.2b, 1009.2g, 1207.5, Appendix D	6.1.3.1, 6.1.3.2, 6.1.3.3.4, 8.10.4.1.1(b), 8.10.4.1.1(n), 8.7.6.1.5		
7.3	Handrails	802.2, 802.4, 1009.2c, Appendix D	6.1.3.2, 6.1.3.4, 8.11.4.2.13, 8.6.8.12, 8.10.4.1.1(c)	5.1.5, 5.1.6	
7.4	Entrance and egress ends	802.6, 802.12	6.1.3.6, 8.6.8.15, 6.1.3.12	5.5.3, 5.5.4	
7.5	Lighting	806.2, 805.7, 1009.2d	6.1.7.2, 6.1.6.7, 8.10.4.1.1(e)	2.2.3, 5.4	
7.6	Caution signs	805.9, Fig. 805.9a	6.1.6.9, Fig. 6.1.6.9.1	5.3.11	
7.7	Combplate and comb step impact device	802.6, 805.3n, 807.3, 1008.2r, 1009.2e	6.1.3.6, 6.1.6.3.13, 6.1.8.3, 8.11.4.2.13, 8.10.4.1.1(g)	5.1.9	
7.8	Deck barricades and antislide devices	802.3i, 1009.2f	6.1.3.3.10, 6.1.3.3.11, 8.6.8.11, 8.10.4.1.1(h)		
7.9	Steps and upthrust device	Definitions, 802.5, 802.6e, 802.9d, 805.3i, 1008.2i, 1105.1	1.3, 6.1.3.5, 6.1.3.6.5, 6.1.3.9.4, 6.1.6.3.9, 8.11.4.2.9, 8.6.8.6, 8.3.11.1, Fig. I8	5.1.7, 5.1.8	
7.10	Operating and safety devices	805.2, 805.3a, 805.6	6.1.6.2.1, 6.1.6.3.1, 6.1.6.6, 8.6.10.2	5.3.1, 5.3.2, 5.3.10	
7.11	Skirt obstruction device	805.3f	6.1.6.3.6	5.3.7	
7.12	Reserved				
7.13	Egress restriction (rolling shutter) device	805.3g	6.1.6.3.7	5.3.8	

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Checklist for Escalators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
7	**ESCALATOR — EXTERNAL (Cont'd)**				
7.14	Speed	803.1, 805.3b, 1008.2o, 1009.2o	6.1.4.1, 6.1.6.3.2, 8.10.4.1.2(l)		
7.15	Balustrades	802.3, 1009.2g, Appendix D	6.1.3.3, 6.1.3.14, 8.10.4.1.1(n)	5.1.1	
7.16	Ceiling intersection guards	802.3g, Appendix D	6.1.3.3.9	5.1.3	
7.17	Step/skirt clearances, panels, and performance index	802.3e, 802.3f, 802.3k, 1008.2s, 1008.2t, 1206.6b, 1206.6c	6.1.3.3.5, 6.1.3.3.6, 8.6.8.4		
7.18	Outdoor protection	807, 1008.2p, 1009.2i	6.1.8, 8.11.4.2.14, 8.10.4.1.1(q)		
7.19	Maintenance records		8.6.1.4, 8.6.10.5		
8	**ESCALATOR — INTERNAL**				
8.1	Machinery space access, lighting, receptacle, and condition	806, 801.1, 805.7, 1008.2a, 1009.2j, 1206.6a	6.1.7, 6.1.2.1, 6.1.6.7, 6.1.3.14, 8.11.4.2.1, 8.10.4.1.2(a), 8.1, 8.6.1.6.3, 8.6.8.14, 8.6.8.15, 8.6.8.13	5.5.5	
8.2	Stop switch	210.2, 805.3e, 1008.2b, 1009.2k	2.26.2, 6.1.6.3.5, 8.11.4.2.2, 8.10.4.1.2(b)		
8.3	Controller and wiring	806, 807.2, 1008.2c, 1009.2l	6.1.7, 6.1.8.2, 8.11.4.2.3, 8.10.4.1.2(c)		
8.4	Drive machine and brake	804, 1008.2d	6.1.5, 8.11.4.2.4	5.2	
8.5	Speed governor	805.3b, 1008.2e, 1009.2m	6.1.6.3.2, 8.11.4.2.5, 8.10.4.1.2(e)	5.3.3, 5.3.5	
8.6	Broken drive chain and disconnected motor safety device	804.3b, 805.3d, 805.3j, 1008.2f	6.1.5.3.2, 6.1.6.3.4, 6.1.6.3.10, 8.11.4.2.6	5.3.5, 5.3.6	

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Checklist for Escalators (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
8	ESCALATOR — INTERNAL (Cont'd)				
8.7	Reversal stop switch	805.3h, 1008.2g	6.1.6.3.8, 8.10.4.1.2(g), 8.11.4.2.7	5.3.5, 5.3.9	
8.8	Broken step chain device	805.3c, 1008.2h	6.1.6.3.3, 8.11.4.2.8	5.3.4, 5.3.5	
8.9	Step upthrust device	805.3i, 1008.2i	6.1.6.3.9, 8.11.4.2.9	5.1.7	
8.10	Missing step device	805.5, 1008.2j	6.1.6.5, 8.11.4.2.10		
8.11	Step level device	805.3k, 1008.2k, 1009.2n	6.1.6.3.11, 8.11.4.2.11, 8.10.4.1.2(k)		
8.12	Steps, step chains, and trusses	801.1, 802.7, 802.8, 802.11, 806.3, 1008.2l, 1009.2o, 1206.6	6.1.2.1, 6.1.3.5.8, 6.1.3.7, 6.1.3.8, 6.1.3.11, 6.1.3.1.4, 6.1.7.3, 8.11.4.2.12, 8.10.4.1.2(l), 8.6.8		
8.13	Handrail systems and safety devices	802.4, 802.11, 805.4, 805.3m, 1008.2m, 1008.2q, 1009.2c	6.1.3.4, 6.1.3.11, 6.1.6.4, 6.1.6.3.12, 8.11.4.2.13, 8.11.4.2.18, 8.10.4.1.1(c)		
8.14	Code data plate	808, 908, 1200.6	8.9, 8.7.1.8		
8.15	Response to smoke detectors	805.8	6.1.6.8		
8.16	Step lateral displacement device	805.3p, 1003.2b(20)	6.1.6.3.14, 8.11.4.2.21, 8.10.4.1.2(r)		

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Checklist for Moving Walks

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
9	MOVING WALK — EXTERNAL				
9.1	General fire protection	900, 901, 1009.2a	6.2.1, 6.2.2, 8.10.4.1.1(a)	9.1.1, 9.2.2	
9.2	Geometry	902.1, 902.2, 902.3d, 1009.2b, 1009.2g, 1208.5, Appendix D	6.2.3.1, 6.2.3.2, 6.2.3.3.4, 8.10.4.1.1(b), 8.10.4.1.1(n), 8.7.6.2.5	9.3.1, 9.3.2, 9.3.3, 9.3.6	
9.3	Handrails	902.2, 902.4, 1008.2m, 1009.2c, Appendix D	6.2.3.2, 6.2.3.4, 8.11.4.2.13, 8.10.4.1.1(c)	9.3.4	
9.4	Entrance and egress ends	902.8, 907.3, 902.16	6.2.3.8, 6.2.8.3, 6.2.3.16, 8.6.8.15	9.4.3	
9.5	Lighting	906.2, 1009.2d	6.2.7.2, 8.10.4.1.1(e)	9.7.1	
9.6	Caution signs	905.8, Fig. 805.9a	6.2.6.8, Fig. 6.1.6.9.1	9.6.11	
9.7	Combplate and comb step impact device	902.8, 905.3k, 907.3, 1008.2r, 1009.2e	6.2.3.8, 6.2.6.3.11, 6.2.8.3, 8.6.8.4, 8.11.4.2.13 8.10.4.1.1(g)	9.4	
9.8	Deck barricades	902.3h, 1009.2f	6.2.3.3.8, 8.10.4.1.1(h)	9.3.3.6	
9.9	Treadways	902.5, 902.6, 902.9, 902.11, 1105.1	6.2.3.5, 6.2.3.6, 6.2.3.9, 6.2.3.11, 8.6.8.6, 8.3.11.1	9.3.5	
9.10	Operating and safety devices	905.1, 905.2, 905.3a, 905.6	6.2.6.1, 6.2.6.2.1, 6.2.6.3.1, 6.2.6.6, 8.6.10.2	9.6.2, 9.6.3, 9.6.9	
9.11	Reserved				
9.12	Reserved				
9.13	Egress restriction (rolling shutter) device	905.3f	6.2.6.3.6	9.6.7	
9.14	Speed	903.1, 905.3b, 1008.2o, 1009.2o	6.2.4, 6.2.6.3.2, 8.10.4.1.2(l)		

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Checklist for Moving Walks (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
9	**MOVING WALK — EXTERNAL (Cont'd)**				
9.15	Balustrades	902.3, 1009.2g, Appendix D	6.2.3.3, 6.2.3.17, 8.10.4.1(n)	9.3.3.1, 9.3.3.2	
9.16	Ceiling intersection guards	902.3g, Appendix D	6.2.3.3.7	9.3.3.5	
9.17	Skirt panels	902.3e, 902.3f	6.2.3.3.5, 6.2.3.3.6	9.3.3.3, 9.3.3.4	
9.18	Outdoor protection	907, 1008.2p, 1009.2i	6.2.8, 8.11.4.2.14, 8.10.4.1.1(q)		
9.19	Maintenance records		8.6.1.4, 8.6.10.5		
10	**MOVING WALK — INTERNAL**				
10.1	Machinery space access, lighting, receptacle, and condition	906, 901.1, 907.2, 1008.2a, 1009.2j	6.2.7, 6.2.2.1, 6.2.8.2, 8.1, 8.6.1.6.3, 8.6.14, 8.6.8.15, 8.11.4.2.1, 8.10.4.1.2(a)	9.7.2	
10.2	Stop switch	905.3e, 1008.2b, 1009.2k	6.2.6.3.5, 8.11.4.2.2, 8.10.4.1.2(b)		
10.3	Controller and wiring	906, 907.2, 1008.2c, 1009.2l	6.2.7, 6.2.8.2, 8.11.4.2.3, 8.10.4.1.2(c)		NFPA 70 or CSA C22.1, as applicable
10.4	Drive machine and brake	904, 1008.2d	6.2.5, 8.11.4.2.4	9.5.1	
10.5	Speed governor	905.3b, 1008.2e, 1009.2l	6.2.6.3.2, 8.11.4.2.5, 8.10.4.1.2(c)	9.6.4	
10.6	Broken drive chain and disconnected motor safety device	904.3b, 905.3d, 905.3h, 1008.2f	6.2.5.3.2, 6.2.6.3.4, 6.2.6.3.8, 8.11.4.2.6	9.6.6, 9.6.10	
10.7	Reversal stop switch	905.3g, 1008.2g	6.2.6.3.7, 8.11.4.2.7	9.6.8	
10.8	Broken treadway device	905.3c, 1008.2h	6.2.6.3.3, 8.11.4.2.8		
10.9	Reserved				
10.10	Missing pallet device	905.5, 1008.2j	6.2.6.5, 8.11.4.2.10		
10.11	Pallet level device	905.3i, 1008.2k, 1009.2n	6.2.6.3.9, 8.11.4.2.11, 8.10.4.1.2(k)		

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Checklist for Moving Walks (Cont'd)

Item	Check	A17.1–1996 Section/Rule	A17.1–2000 Requirements	A17.3 Section/Para.	Comments
10	MOVING WALK — INTERNAL (Cont'd)				
10.12	Pallets, pallet chains, and trusses	901.1, 902.9, 902.13, 1008.2l, 1009.2o, 1206.6	6.2.2.1, 6.2.3.9, 6.2.3.13, 6.2.3.17, 8.11.4.2.12, 8.10.4.1.2(l), 8.6.8		
10.13	Handrail systems and safety devices	902.4, 902.13, 905.1, 905.4, 905.3j, 1008.2m, 1008.2q, 1009.2c	6.2.3.4, 6.2.3.13, 6.2.6.1, 6.2.6.4, 6.2.6.3.10, 8.11.4.2.13, 8.11.4.2.18, 8.10.4.1.1(c)		
10.14	Code data plate	808, 908, 1200.6	8.9, 8.7.1.8		
10.15	Response to smoke detectors	905.7	6.2.6.7		

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NONMANDATORY APPENDIX B
ACCEPTANCE CHECKLIST

(04)

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Acceptance Checklist for Firefighters' Service (A17.1–2000 and B44-00): Automatic Elevators

GENERAL NOTE: Pass = meets requirement; Fail = does not meet requirement; NA = not applicable.

ELEVATOR ID No. _____ BUILDING _____
ADDRESS: _____ DATE: _____
INSPECTED BY: _____ INSPECTOR I.D. No. _____
SIGNATURE: _____

Item	Check	A17.1–2000 and B44-2000	Pass	Fail	NA
6.5.1	**Emergency Signaling Devices**	2.27.1			
6.5.1.1	"ALARM" must sound and illuminate when pressed. If rise is over 30 m (100 ft), second device is required.	2.27.1.1.1, 2.27.1.1.1(d)(2)			
6.5.1.2	In-car emergency stop button (if present) must sound alarm.	2.27.1.1.1			
6.5.1.3	If rise is more than 18 m (60 ft), check for two-way communication between cab and point outside hoistway.	2.27.1.1.2			
6.5.1.4	Ensure that audible alarms and communications are functional with loss of normal power.	2.27.1.1.3			
6.5.1.5	Check for means to communicate with machine room when required by requirement 2.26.1.5.10(c) of A17.1.	2.27.1.3			
6.5.2	**Phase I Key Switch and Instructions**	2.27.3.1, 2.27.7, 2.27.8			
6.5.2.1	Operating Instructions	2.27.7.1			
6.5.2.2	Group 3 Security Keys	2.27.8			
6.5.2.3	Labeled "FIRE RECALL" marked "RESET," "OFF," and "ON" in that order.	2.27.3.1.1(b), 2.27.3.1.1(a)			
6.5.2.4	Provide at designated level for group.	2.27.3.1.1(a)			
6.5.2.5	Located in the lobby, visible and readily accessible.	2.27.3.1.1(c)			
6.5.2.6	The key cannot be removed in the "RESET" position. But it can be removed in the other positions.	2.27.3.1.3			
6.5.2.7	Second switch, if present, must be at central alarm and control facility labeled "FIRE RECALL" only be two-position switch marked "OFF" and "ON" in that order.	2.27.3.1.2			
6.5.3	**Phase II In-Car Switch and Instruction**	2.27.8, 2.27.3.3			
6.5.3.1	Ensure that there is a key for each Phase I, each Phase II, and each standby power selection switch in the building.	2.27.8			
6.5.3.2	The same key is used for Phase I and Phase II and standby power for all elevators in the building.	2.27.8			
6.5.3.3	Keys are available only to authorized emergency and firefighting personnel.	2.27.8			
6.5.3.4	The key can only be removed in the "OFF" and "HOLD" positions.	2.27.3.3			
6.5.3.5	The keys shall be Group 3 Security (see A17.1, requirement 8.1).	2.27.8			
6.5.3.6	Labeled "FIRE OPERATION," marked "OFF," "HOLD," and "ON" in that order.	2.27.3.3			
6.5.4	**Monthly Test**	8.6.10.1			
6.5.4.1	Monthly test log is completed.				
6.5.5	**Phase I Operation While Running** Place several floor calls in the car. While going up, have the person at the designated level place the Phase I switch in the "ON" position. Where a duplicate switch is provided, verify that Phase I is initiated by placing the switch to the "ON" position. Determine the following:	2.27.3			
6.5.5(a)	The car stops and reverses without opening the doors.	2.27.3.1.6(b)			
6.5.5(b)	The in-car stop switch or emergency stop switch is inoperative.	2.27.3.1.6(c)			

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Acceptance Checklist for Firefighters' Service (A17.1–2000 and B44-00): Automatic Elevators (Cont'd)

GENERAL NOTE: Pass = meets requirement; Fail = does not meet requirement; NA = not applicable.

Item	Check	A17.1–2000 and B44-2000	Pass	Fail	NA
6.5.5(c)	Call register lights and directional lanterns are extinguished and inoperative.	2.27.3.1.6(f)			
6.5.5(d)	Position indicators where provided are inoperative, except in car, designated level, and central control station.	2.27.3.1.6(f)			
6.5.5(e)	The in-car door open button is rendered inoperative as soon as car moves away from the landing.	2.27.3.1.6(i)			
6.5.5(f)	Car call buttons and corridor call buttons are inoperative.	2.27.3.1.6(f)			
6.5.5(g)	The car 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.	2.27.3.1.6(a)			
6.5.5(h)	The visual and audible signals operate and stay on until car is at the designated level.	2.27.3.1.6(h)			
6.5.6	**Phase I Operation With Doors Open** Place the Phase I switch to the "OFF" position and run the car to any floor. With the doors open, have the Phase I switch turned to the "ON" position and check the following:	2.27.3.1.6			
6.5.6(a)	Door reopening devices sensitive to smoke or flame are inoperative immediately.	2.27.3.1.6(e)			
6.5.6(b)	If door reopening devices are rendered inoperative, the closing speed is reduced so that the kinetic energy is reduced to $2\frac{1}{2}$ ft-lb (3.5 J).	2.27.3.1.6(e)			
6.5.6(c)	The emergency stop switch or in-car stop switch is rendered inoperative as soon as the car moves away from the landing.	2.27.3.1.6(c)			
6.5.6(d)	The in-car door open button is rendered inoperative as soon as the car moves away from the landing.	2.27.3.1.6(i)			
6.5.7	**Emergency Stop Switch and/or In-Car Stop Switch and Doors Closing** Place the Phase I switch to the "OFF" position and run the car to any floor. Activate the emergency stop switch or the in-car stop switch. With the doors open, have the Phase I switch turned to the "ON" position. Return the emergency stop switch, or in-car stop switch to the "RUN" position.	2.27.3.1.6			
6.5.7.1	Verify that the automatic power-operated horizontal sliding doors close promptly, that other types of doors can be closed and once closed the car moves to the designated level.	2.27.3.1.6(d)			
6.5.8	**Stop Switches and Door Buttons** While on Phase I verify that	2.27.3.1.6(c), 2.27.3.1.6(g)			
6.5.8(a)	Stop switches other than those inside the car remain operative.	2.27.3.1.6(c)			
6.5.8(b)	For vertical sliding door, the corridor door open and door close buttons remain operative.	2.27.3.1.6(g)			
6.5.9	**Fire Alarm Initiating Device and Operation**	2.27.3			
6.5.9.1	Verify that there is a fire alarm initiating device in each elevator lobby, the elevator machine room, and sprinklered hoistway. In jurisdictions enforcing the NBCC, verify that there is a fire alarm initiating device in each elevator lobby, at the designated level if not sprinklered throughout and in the machine room if sprinklered.	2.27.3.2.1, 2.27.3.2.2			
6.5.9.2	With the car(s) on normal, have the input for main return activated and verify that the elevator commences Phase I Operation and all cars return to the designated level.	2.27.3.2.3			
6.5.9.3	To reset operation initiated from fire alarm system, the fire alarm signal must be reset, then the Phase I switch must be cycled to "RESET" momentarily then to "OFF."	2.27.3.1.6(k)			
6.5.9.4	With the car(s) on normal, have the input for alternate level return activated and verify that the elevator commences Phase I Operation and all cars return to the alternate level.	2.27.3.2.4			
6.5.9.5	Car(s) should only respond to the first fire alarm input.	2.27.3.2.5			

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Acceptance Checklist for Firefighters' Service (A17.1–2000 and B44-00): Automatic Elevators (Cont'd)

GENERAL NOTE: Pass = meets requirement; Fail = does not meet requirement; NA = not applicable.

Item	Check	A17.1–2000 and B44-2000	Pass	Fail	NA
6.5.9.6	Activate the machine room fire alarm initiating device input and verify Phase I and all cars return to the designated level.	2.27.3.2.3(b)			
6.5.9.7	Activate the designated level machine room fire alarm initiating device and verify Phase I and all cars return to the alternate floor.	2.27.3.2.3(b)			
6.5.9.8	With the car(s) on normal, have the input for machine room return activated and verify the visual signal in the car illuminates intermittently.	2.27.2.4			
6.5.9.9	In jurisdictions not enforcing the NBCC, where the fire alarm initiating device is required in the hoistway, activate the input and verify all cars return to the designated landing, except that fire alarm initiating devices installed at or below the lowest landing of recall shall cause the cars to return to the upper recall level.	2.27.3.2.3(c)			
6.5.10	**Fire Alarm Initiating Device and Phase I Switch**				
6.5.10.1	Activate the alternate landing return input and observe that the elevator returns to the alternate landing.	2.27.3.2.3(b)			
6.5.10.2	If a two-position key switch is provided, place it in the "ON" position and verify that the elevator remains at the alternate landing.	2.27.3.1.2			
6.5.10.3	Turn both the Phase I switch and the additional Phase I switch (when provided) to the "ON" position and verify that the car returns to the designated level.	2.27.3.1.6(j)			
6.5.11	**Phase II Key Switch and Sign** 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 check the following:	2.27.3.3.1			
6.5.11(a)	The elevator can be operated only from the car buttons and will not respond to corridor calls.	2.27.3.3.1(a)			
6.5.11(b)	All corridor call buttons, door open and close buttons, and directional 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.	2.27.3.3.1(b)			
6.5.11(c)	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 door will close without delay.	2.27.3.3.1(d)			
6.5.11(d)	Open power-operated doors can be closed only by continuous pressure means. If the means is released before the door is fully closed, horizontal sliding doors will reopen and vertical sliding doors will stop, or stop and reopen.	2.27.3.3.1(e)			
6.5.11(e)	If two entrances can be opened and closed at the same landing, separate door open and close buttons are provided for each entrance.	2.27.3.3.1(d)			
6.5.11(f)	All door reopening devices are inoperative (except the door open button). Full-speed closing is permitted.	2.27.3.3.1(g)			
6.5.11(g)	"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.	2.27.3.3.1(h)			
6.5.11(h)	Floor selection buttons are provided and functional for all landings without restrictions.	2.27.3.3.1(i)			
6.5.11(i)	Moving car will stop at the next landing with a car call registered and remaining car calls canceled.	2.27.3.3.1(j)			
6.5.12	**Phase II Switch in "HOLD" Position**	2.27.3.3.2			
6.5.12.1	Place the Phase II switch in the "HOLD" position and remove key. Verify that the car remains at the landing and the door close button is inoperative.	2.27.3.3.2			
6.5.12.2	Verify that the car call buttons are inoperative.	2.27.3.3.2			

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Acceptance Checklist for Firefighters' Service (A17.1–2000 and B44-00): Automatic Elevators (Cont'd)

GENERAL NOTE: Pass = meets requirement; Fail = does not meet requirement; NA = not applicable.

Item	Check	A17.1–2000 and B44-2000	Pass	Fail	NA
6.5.13	**Phase II Switch in "OFF" Position and Doors Closing: Power-Operated Horizontally and Vertically Sliding Doors** With the elevator away from the designated level, Phase I in effect, place the Phase II switch in the "OFF" position and verify that:	2.27.3.3			
6.5.13(a)	horizontally sliding doors close automatically and continuous pressure on the door close button will close vertically sliding doors	2.27.3.3.3			
6.5.13(b)	car reverts to a Phase I type return on completion of door closing and reverts to Phase I when the doors open at the designated landing	2.27.3.3.3(a)			
6.5.13(c)	Door reopening device inoperative and full-speed closing permitted.	2.27.3.3.3(a)			
6.5.13(d)	Door open button is operative.	2.27.3.3.3(a)			
6.5.13(e)	If Phase II switch turned to "ON" or "HOLD" before door is closed, it will reopen.	2.27.3.3.3(a)			
6.5.14	**Removal From Phase II** Verify that the elevator can be removed from Phase II only when:	2.27.3.3			
6.5.14(a)	Phase II switch is in "OFF" position at designated level and doors open	2.27.3.3.5			
6.5.14(b)	Phase II switch is in "OFF" position and Phase I is in effect	2.27.3.3.4			
6.5.15	**Power Disconnects Open**	2.27.3.4			
6.5.15.1	With the elevator on Phase I, have the mainline power interrupted and restored to verify that the elevator will remain on Phase I.	2.27.3.4			
6.5.15.2	With the elevator on Phase II, have the mainline power interrupted and restored to verify that the elevator will remain on Phase II.	2.27.3.4			
6.5.15.3	The car is allowed to move to a position in the hoistway to reestablish position once movement is attempted.	2.27.3.4			
6.5.16	**Top-of-Car Operating Device** While operating from top of car, have the Phase I key switch placed in the "ON" position and verify that:	2.27.6			
6.5.16(a)	an audible signal sounds				
6.5.16(b)	the elevator remains under control of the top-of-car operating device				
6.5.16(c)	the elevator remains under the control of the hoistway access switch				
6.5.17	**Automatic Elevators With Attendant Operation** With elevator on attendant operation, stop at a floor and have the Phase I switch placed in the "ON" position. Verify that:	2.27.5.2			
6.5.17(a)	the audible and visual signal operates and that a parked elevator will automatically go on Phase I after a time delay between 10 s and 30 s.	2.27.5.2(a)			
6.5.17(b)	a moving car on attendant operation will commence Phase I operation without delay.	2.27.5.2(b)			
6.5.17(c)	if car is on hospital emergency service, it will remain on that operation until removed by the operator and at that point revert to Phase I operation. The audible and visual signals in the car shall be activated immediately and remain activated until the car is returned to the designated landing. With the car on firefighter emergency operation, the elevator cannot be placed on hospital service.	2.27.5.3			
6.5.18	**Elevators on Phase I and Phase II Prevention of Operation and Disabling Not Allowed** With elevator on normal operation, verify the following:	2.27.3.1.6.1(l), 2.27.3.1.6.1(m), 2.27.3.3.6			
6.5.18(a)	Activate means other than those specified in this Code to remove elevators from normal operation, and verify that Phase I emergency recall operation is not prevented.	2.27.3.1.6(l)			

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GENERAL NOTE: Pass = meets requirement; Fail = does not meet requirement; NA = not applicable.

Item	Check	A17.1–2000 and B44-2000	Pass	Fail	NA
6.5.18(b)	Activate input for devices that measure loads and verify that the elevator is not prevented from operating at or below the capacity that is required.	2.27.3.1.6(m)			
6.5.18(c)	Verify that an accidental ground or short circuit in equipment on landing side will not disable Phase II operation.	2.27.3.3.6			

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