

TECHNICAL REPORT

**ISO/TR
11071-1**

First edition
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AMENDMENT 1
1999-04-15

Comparison of worldwide lift safety standards —

Part 1: Electric lifts (elevators)

AMENDMENT 1: References to Japanese standards

Comparaison des normes mondiales de sécurité des ascenseurs —

Partie 1: Ascenseurs électriques

AMENDEMENT 1: Références aux normes japonaises



Reference number
ISO/TR 11071-1:1990/Amd.1:1999(E)

Foreword

ISO (the International Organization for Standardization, is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The main task of ISO technical committees is to prepare International Standards. In exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard («state of the art», for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

Amendment 1 to ISO/TR 11071-1, which is a Technical Report of type 3, was prepared by Technical Committee ISO/TC 178, *Lifts, escalators, passenger conveyors*, Working Group 4.

ISO/TR 11071 consists of the following parts, under the general title *Comparison of worldwide lift safety standards*:

- *Part 1: 1990, Electric lifts (elevators)*
- *Part 2: 1996, Hydraulic lifts (elevators)*

NOTE It is intended that an amendment 1 to Part 2 will provide similar references to Japanese and Australian standards.

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Introduction

Technical report ISO/TR 11071-1:1990 consists of a comparison of the requirements of lifts (elevators) as covered by the following safety standards for electric lifts that were used in various countries or regions at the end of 1989:

- a) CEN - European Standard EN 81: *Part 1, Lifts and service lifts* [Edition 1985 - as presented in BS 5655-1:1986 (excluding national Appendix)];
- b) ASME - ASME/ANSI A17.1 *Safety code for elevators and escalators* (Edition 1987 including the A17.1a-1988 and A17.1b-1989 addenda);
- c) CSA - CSA Standard CAN3-B44 *Safety code for elevators* (Edition 1985, including Supplement 1-1987);
- d) USSR - USSR *Elevator design and safe operation code* (Edition NEDRA, 1971 as presented in English version NEDRA 1972);
- e) CMEA - Elevator safety regulations of the Council for Mutual Economic Assistance.

The intention of the Technical Report was to provide reference information to assist national committees when reviewing and revising individual standards. This process was expected to initiate a gradual convergence of the technical requirements.

The original Technical Report did not include the safety requirements and standards used in Japan.

At the initiative of Technical Committee ISO/TC 178, experts from the Japanese Elevator Association provided ISO/TC 178 Working Group 4 with comprehensive reports on the Japanese safety standards system and with tables comparing their requirements with those in the five listed safety standards. It should be noted that since the publication of ISO/TR 11071-1, the CMEA has been put out of use and USSR [NEDRA, 1971] standard withdrawn and replaced with a new code for the Russian Federation [PUBEL:1992]. Furthermore, the ASME and CSA standards have been revised and new editions published.

By Resolution No. 1995/117; however, ISO/TC 178 asked WG 4 to review the material prepared by Japanese experts with the intention of publishing it as an amendment to ISO/TR 11071-1:1990, rather than revising and updating the whole 1990 edition.

This amendment does not replace compared safety standards from the 1990 edition. The information contained in this Technical Report does not necessarily represent the opinions of the standards-writing organizations responsible for the development of the safety standards being compared, and they should be consulted regarding interpretations of their requirements.

NOTE ISO/TR 11071-1 and this amendment do not deal with lift rated loads and suspension ropes. The subjects are, however, covered in ISO/TR 11071-2, published in 1996, in clauses 7 and 8, which include tables and analysis of corresponding requirements in CEN, ASME and CSA standards as related to both electric and hydraulic lifts (elevators).

Comparison of worldwide lift safety standards —

Part 1: Electric lifts (elevators)

AMENDMENT 1: References to Japanese standards

This amendment illustrates Japanese lift safety requirements in relation to the requirements of all standards covered in the original Technical Report, ISO/TR 11071-1:1990.

This amendment consists of the following:

- a) reproduction of the original 1990 tables, with the addition of the Japanese requirements in new columns in tables 3.3.2.3, 3.9.2 and 3.10.2 of clause 3;
- b) additions to the previous annex A, reproducing the original 1990 tables but incorporating a new column «JAPAN»;
- c) addition of a new annex D containing information on the Japanese safety standards system with regard to lifts.

These tables may therefore be inserted to replace the original tables in ISO/TR 11071-1:1990.

This amendment does not constitute a general review of ISO/TR 11071-1:1990.

Table 3.3.2.3: Comparison of Components' Ratings (Percentage of Rated Load)

Component	CEN	ASME	CSA	USSR	CMEA	JAPAN
Rope traction	Dynamic: 125 % (9-Notes)	Dynamic: 125 % (208.2)	Dynamic: 125 % (3.10.2.2)	Dynamic: 110 % (7.3.10)	Dynamic: 110 % (3.3)	Dynamic: 125 % (passenger) 120 % (freight) [BSLJ-EO-129.9(6)]
				Static: 200 % (7.3.9b)	Static: 200 % (3.3)	Static: 125 % (passenger) 120 % (freight) [BSLJ-EO-129.9(6)]
Mechanical brake alone from rated speed	125 % (12.4.2.1)	* (208.8)	125 % (3.10.8.2)	110 % (7.3.10)	110 % (4.4.4)	125 % (passenger) 120 % (freight) [BSLJ-EO-129.9(6)]
Safety gear**	100 % (9.8.1.1)	125 % (205.3)	125 % (3.7.4.1)	110 % (7.3.10)	Not available	100 % [JIS A4302-4.2.1(6)]

* Holding capacity for 125 %. There are no requirements in ASME for deceleration from any speed at any load.

** CEN and USSR safety gear is tested in free-fall, ASME and CSA in overspeed with 100 % rated load.

Table 3.9.2: Assumption 7 as applied in current standards

Assumption	CEN	ASME	CSA	USSR	CMEA	JAPAN
Static force						
Landing Doors	300 N (7.2.3)	1110 N [110.11e(7)]	2500 N (2.11.10.4.7)	No spec.	No spec.	No spec.
Car Enclosure	300 N (8.3.2.1)	334 N (204.1c)	330 N (3.6.1.3)	No spec.	No spec.	No spec.
Impact	No spec.	No spec.	5000 N (2.11.10.5)	No spec.	No spec.	No spec.
Force distribution	No spec.	No spec.	No spec.	No spec.	No spec.	No spec.

Table 3.10.2: Assumption 8 as applied in current standards

Assumption	CEN	ASME	CSA	USSR	CMEA	JAPAN
Average retardation*						
Safety gear	1 g (9.8.4)	1 g (205.8b)	1 g (3.7.9.2)	1 g (4.9.1)	Not available	1 g (JIS A 4302)
Buffers	1 g (10.4.3.3)	1 g (201.4b)	1 g (3.3.5.2)	No spec.	Not available	1 g [BSLJ-EO-129.9(9)]
Maximum retardation						
Safety gear	No spec.	No spec.	No spec.	2,5 g 0,04 s (4.7.5)	2,5 g 0,04 s (3.3)	No spec.
Buffers duration	2,5 g 0,04 s (10.4.3.3)	2,5 g 0,04 s (201.4b)	2,5 g 0,04 s (3.3.5.2)	2,5 g 0,04 s (4.0.1)	No spec.	2,5 g 0,04 s [BSLJ-EO-129.9(9)]
* Average retardation levels exceeding 1g can occur with a lightly loaded car during safety or buffer application.						

NOTE: 1g = 9,81 m/s².

After Annex A, page 23, of the original report: Insert the following explanatory text below the existing notes and Legend, and insert the replacement tables.

- (1) Column «JAPAN» is added based on the requirements in the following laws and standards.

BSLJ	Building Standard Law of Japan
BSLJ-EO.....	Building Standard Law Enforcement Order
JIS.....	Explanation of technical standard for elevators and escalators
JEAS.....	Japanese Industrial Standard
GUIDELINE.....	Japan Elevator Association Standard
ELEC	Guideline for design and construction of elevators, escalators and play facilities
	Technical standard concerning electric installation

- (2) In other columns, the bracketed numbers cross-reference rules in individual standards CEN, ASME etc (see Introduction).

- (3) The following abbreviations and symbols are used in the tables.

<u>Notation</u>	<u>Meaning</u>
No Spec	There is no rule covering the specific subject
N/A	The question is not applicable to the specific standard for various reasons
-	Same as «No spec» or «N/A»
?	The requirement in the standard is not clear, or the data were not available at the time of publication of the report
>	Greater than
<	Less than
≤	Up to (less or equal)

The following lift safety requirements are not covered in the tables, but specific Japanese requirements exist.

(a) Earthquake requirements

A seismic sensor is required to be set up in the machine room to control the operation of elevators. When an earthquake occurs, the car should be stopped at the nearest floor. Item 129 Article 7 of the Building Standard Law Enforcement Order provides that the following should be considered according to structural earthquake-proof standards:

- the stress and deflection in the equipment and the material of each elevator part caused by earthquakes should be within the allowable stress of the material and fixed tolerances of the equipment (e.g. strength of guide rail and rail bracket);
- elevator equipment should be securely fixed so as to not, be moved, fall down, or be damaged by earthquakes (e.g., derailment-restraint of counterweight and earthquake-proof fixings of machine room equipment);
- traction sheaves should be so constructed as to keep ropes in place in the case of earthquakes (e.g., provision of deep-grooved sheaves and installation of retaining guards for ropes);
- travelling cables should be guarded from damage by projections in hoistway during the earthquake.

(b) Fire emergency elevators

Fire emergency elevators are required to be installed in buildings exceeding 31 m in height, according to Item 2 of Article 34 of the Building Standards Law of Japan.

Regulations prescribe the details for fire emergency elevators, such as necessary units, location in the building, structure of hoistway, machine room, elevator hall, and the operation.

Table A1A: Spaces and Clearances - Part 1 of 5

REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
1. Top car clearances for traction elevators (With counterweight on fully compressed buffers in all except JAPAN columns)	(5.7.1) (see Note 1)	(107.1e & k) (see Note 1)	BSLJ-EO 129-6(5) and JIS A 4302 4.1.4	(2.8.5) (see Note 1)	(4.1.7)	1937-79 (2)
1.1 Guided travel of car.....min.	0,1 m + 0,035 v ²	See 200.8	Top car clearance (TCC) in this column means car frame to overhead floor or beam distances when car is level with top landing	See 3.2.8	See 4.3.4	?
1.2 Free height above a specific area of the car roof.....min.	1 m + 0,035 v ²	1,07 m + possible car jump		No spec.	0,75 m	0,75m (2.22)
1.3 Well roof to car crosshead.....min.	0,3 m + 0,035 v ²	0,60 m + 0,035 v ²	Rated speed (unit: m/s)	0,60 m + 0,035 v ²	0,2 m + 0,06 v ² or 0,5 m v = rated speed 0,5 if oil buffers	No spec
1.4 Well roof to equipment on car top (except 1.5).....min.	same as 1.3	0,15 m + 0,035 v ²	≤ 0,75	0,15 m + 0,035 v ²	0,2 m + 0,06 v ²	?
1.5 Well roof to guide shoes, rope attachments, door header of vert. sliding doors.....min.	0,1 m + 0,035 v ²	> 0 + 0,035 v ²	> 0,75	> 0 + 0,035 v ²	same as 1.3	No spec
Note 1: 0,035 v ² represents 1/2 gravity stop distance with 115% rated speed. This may be reduced:	multiplied by 1/2 if v ≤ 4m/s 1/3 if v > 4m/s min. 0,25 m	replaced by 1/2 buffer stroke (107.1e (4)b)	≤ 1,0	≤ 1,5		
			> 0,75	≤ 1,0		
			≤ 1,5	≤ 2,0		
			> 2,0	≤ 2,5		
			> 2,5	≤ 3,0		
a) If slow down control is used, 0,035 v ² may be:			> 3,0	≤ 3,5	No spec	No spec
b) If comp. rope tie-down, 0,035 v ² may be reduced	see 5.7.1.4 min. 0,2 m	See 107.1e (4)b min. 0,0 m	> 3,5	≤ 4,0		
			> 4,0			
					No spec	No spec
2. Top counterweight clearance (with car on compressed buffers)	(5.7.1.2)	(107.1h)	No spec	(2.8.8)	(4.1.7)	—
2.1 Guided travel of counterweight.....min.	same as 1.1	same as 1.1	No spec	same as 1.1	same as 1.1	No spec
2.2 Well roof to counterweight.....min.	No spec	same as 1.4	No spec	same as 1.4	same as 1.3	No spec
3. Refuge space on car top	(5.7.1.1(d))	(107.1k)	No spec	(2.8.11)	(4.1.7.2)	—
3.1 Minimum area.....	Rect. block	0,419 m ²	No spec	(1,07x0,76)m ²	No spec	No spec
3.2 Minimum height.....	(0,5x0,6x0,8) m	same as 1.2	No spec	same as line 1.3	same as 1.2	No spec

Table A1A: Spaces and Clearances - Part 2 of 5

	REQUIREMENTS	CEN	ASME	JAPAN					CSA	USSR	CMEA			
				JIS A 4302 4.2.4	IF SPRING BUFFER			IF OIL BUFFER						
4.	Bottom runby	N/A	(107.1b & d)	m/s	V ≤ 0,125	< V ≤ 0,25	< V ≤ 0,5	0,5 > V	No spec	No spec	No spec			
4.1	Minimum car & CW runby min.	No spec	0 to 0,3 m depends on type of buffer & motor control		M I N	75 mm	150 mm	225 mm				300 mm		
4.2	Maximum car runby max.	No spec	610 mm		150									
4.3	Maximum CW runby max.	No spec	914 mm	M A X	CAR			600	No spec					
				CWT			900			No spec				
5.	Pit clearances (with car on fully compressed buffers in CEN and ASME columns)	(5.7.3.3)	(107.1a)	JIS A 4302 4.2.4								(2.8.1)	(4.1.10)	1933-79 (2.21)
5.1	Pit floor and the lowest portion of car structure (except 5.2) min.	0,5 m	0,6 m	For rated speed: (m/s)		Pit Depth (m)						0,6 m	0,75 m	0,5 m
5.2	Pit floor to guide shoes, roller, safety gear blocks, toe guards, car door min.	0,1 m	> 0	≤ 0,75		1,2						> 0	No	0,1 m
5.3	Sufficient space for a rectangular block	(0,5x0,6x 1,0) m	No spec	> 0,75		1,4						No spec.	No spec.	No spec.
				> 1,0		1,6								
				> 1,5		1,8								
				> 2,0		2,0								
				> 2,5		2,3								
				> 3,0		2,7								
				> 3,5		3,3								
				> 4,0		4,0								

Table A1A: Spaces and Clearances - Continuation of Part 2 of 5

	REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
6.	Well to entrance-side-car clearances						
6.1	Car without car doors.....	(11.3 & 5.4.4)	(204.4a) NOT PERMITTED	Not permitted	(3.6.4.1) Not permitted	(4.5.5) Not permitted	1933-79
6.1.1	Car sill to inner well face.....max.	20 mm	—	—	—	—	25 mm (2.5)
6.1.2	Car entrance header to inner face (if car entrance height less than 2.5m).....min. max.	70 mm 120 mm	— —	— —	— —	— —	No spec No spec
6.1.3	Projection permitted – if not bevelled.....max.	2 mm	—	—	—	—	5 mm (2.4)
6.1.4	Projection permitted – if bevelled.....max.	5 mm	—	—	—	—	No spec

Table A1A: Spaces and clearances - Part 3 of 5

	REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
6.	Well to entrance-side-car clearances						
6.2	Car with car doors	(5.4.3 & 11.2)	(110.10/108.1e&d)	BSLJ-EO 129-6.(4)	(2.11.9.1/2.9.4 & 2.9.5)	(4.1.14 & table 1)	1933-79
6.2.1	Car sill to landing sill.....min. max.	No spec 35 mm	13 mm (19*) 38 mm *Corner car guides	No spec 40 mm BSLJ-EO 129-6.(4)	13 mm (20*) 32 mm *corner car guides	15 mm 50 mm	25 mm (2.9) 45 mm (2.5)
6.2.2	Car sill to inner well face		127 mm	125 mm	125 mm	125...swing 200...1-slide 250...2-slide	No spec
a)	limited to.....max.	150 mm					
b)	except for vertical sliding doors to max.	200 mm	190 mm	No spec	190 mm	250 mm	No spec
c)	except if car door lock provided max.	Not limited	No spec	No spec	Not limited	No spec	No spec
d)	specific cases.....max.	20 mm through height max. 500 mm	No spec	No spec	No spec	No spec	No spec
6.2.3	Car door panel to landing door panel max.	120 mm (11.2.3)	140 mm (204.4e)	No spec	140 mm (3.6.4.3)	No spec	120 mm 1933-79 (29)
	— swinging landing door + car gate max.	No spec	102 mm	—	100 mm	No spec	120 mm
	— swinging landing door on freight elevator.....max.	No spec	Not spec'd max. but permitted	—	165 mm	No spec	No spec

Table A1A: Spaces and clearances - Part 4 of 5

	REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
7.	<u>Other horizontal well clearances</u>	(11.4 & 5.6.2)	(108.1a, b, c)		(2.9.1/2/3)	(table 1)	1933-79 (2.9)
7.1	Car to well enclosure.....min. (except sides covered in 6).....max.	No spec	19 mm	No spec	20 mm	25 mm (50*) *if wire mesh well (250-650) mm	25 mm (50*) *if wire mesh well No spec
7.2	Car to counterweight.....min. max.	50 mm No spec	25 mm No spec	No spec No spec	25 mm No spec	50 mm 250 mm	50 mm No spec
7.3	Counterweight to well enclosure.....min.	No spec	19 mm	No spec	20 mm	25 mm (50*) *if wire mesh well	25 mm (50*) *if wire mesh well
7.4	Counterweight to CWT guard.....min.	No spec	19 mm	No spec	20 mm	No spec	No spec
7.5	Car to CWT guard.....min.	No spec	No spec	No spec	13 mm	No spec	10 mm
7.6	Car to car in multiple wells.....min.	300 mm (without partition)	51 mm	No spec	150 mm	No spec	No spec
8.	<u>Clearances in machine room (MR) & machinery spaces (MS)</u>	(6.3.2/6.4.2.2)	(101.4/100.3f 101.3d)	BSLJ-EO 129-8.1	(2.3.4/2.3.7/ 2.2.3.6/2.3.3.5)	(6.1.5/6.1.6)	1933-79
8.1	Clearances around panel or cabinet		ANSI/NFPA 70: 620-70 & 110-16 (102.1 & 210.4)		C.22.1:38-44 (2.4.1 & 3.12.4.1)	—	
8.1.1	In front						
a)	Depth.....min.	0,7 m	0,9 m (0-150V) 1,1 m (151-600V)	0,5 m	0,75 m	0,75 m	
b)	Width.....min.	0,5 m (Note 1)	0,762 m	No spec	No spec	0,5 m	
8.1.2	At rear if openable.....min.	No spec	same as front	same as front	0,6 m	0,5 m	
8.2	Clearance near parts requiring maintenance & inspection						
a)	Clearance.....min.	(0,5 x 0,6) m	same as 8.1	0,5 m	0,45 m (2.3.7)	0,5 m	0,5 m (3.2)
b)	Accessway to those areas.....min.	0,5 m	110-16(c)	0,5 m	0,45 m	0,5 m	0,5 m (3.2)
c)	Accessway if no moving parts.....min.	0,4 m	110-16(c)	0,5 m	0,45 m	0,5 m	0,5 m (3.2)

Table A1A: Spaces and Clearances - Part 5 of 5

	REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
8.3	Clear headroom in MR & MS Exceptions:	1,8 m	2,13 m	BSLJ-EO 129-8.(2) 2,0 m	2,13 m	2,2 m	1,8 m (3.2)
a)	Space for sheaves only.....min.	1,5 m	1,07 m	BSLJ-EO 129-8.(2) 1,5 m	1,07 m	0,8 m	?
b)	Space for governor & selector.....min.	1,5 m	1,37 m	BSLJ-EO 129-8.(2) 1,5 m	1,37 m	No spec	?
8.4	Clear vertical distance above rotating parts.....min.	0,3 m	No spec	No spec	No spec	No spec	No spec
8.5	If difference in MR floor levels exceeds this height, stairs or ladders and guard rails must be provided	0,5 m (6.3.2.4)	0,38 m (100.3f)	0,23 m BSLJ-EO 129-8.(5)	0,4 m (2.2.3.6)	0,35 m (6.1.9)	0,35 m (3.6)
8.6	Machine room door – width.....min. height.....min.	0,6 m 1,8 m	0,76 m 1,83 m	0,7 m 1,8 m BSLJ-EO 129-8.(4)	0,75 m 2,03 m	No spec No spec	No spec No spec
8.7	Machine room access trap door.....min.	0,8 ' 0,8 m (6.3.3.2)	Prohibited	Prohibited	Prohibited (2.3.3.2c)	Prohibited (6.1.11)	No spec
8.8	Pulley room access trap door.....min.	same as 8.7	(762 x 762) mm (101.3d(a))	No spec	(750 x 750) mm (2.3.3.5.1b)	No spec	No spec

Note 1: Respecting CEN entry in line 8.1.1(b): The width of the clearances in front of the panel or cabinet must be the full width of the panel or the cabinet or 0.5m, whichever is greater.

Table A2A: Door Systems and Interlocks - Part 1 of 4

	REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
1.	DOOR PANELS Elastic deformation allowed for panels (deflection/force)	15 mm/300 N (7.2.3)	No specs	BSLJ-EO 129-6.(1) Hoistway shall be provided with strong walls or enclosures and doors for emergency exits: the same in this Section) which are so constructed that persons or articles outside the elevator shafts cannot come in contact with cages or counterweights.	No specs	—	No spec
2.	-Max horizontal force without permanent deformation ③ -applied at ③ -Area of application of testing force ③	300 N either side 5 cm ²	1110 N (110.11e-7) landing side 100 cm ²	No spec for forces	2500 N (2.11.10.4.7) landing side 100 cm ²	— — —	No spec No spec
3.	Maximum horizontal force without displacement exceeding 20 mm ③ -area of application of the force ③ -maximum upwards force of 1000 N and simultaneous horizontal force on 1000 N from landing side	No specs No specs No	No specs No specs No		5000 N (2.11.10.5.2) 900 cm Yes (2.11.10.5.3)	No spec No spec No	No spec No spec No
4.	Minimum vertical force on door hanger tracks	No specs	4 times load up + down (110.11b)		4 times load up + down (2.11.10.3.4)	—	No spec
5.	Maximum force to prevent closing Measured at.....	150 N (7.5.2.1.1) 1/3 to 2/3 of travel	133 N (112.4b) 1/3 to 2/3 of travel	(JEAS-511A) 147 N center of travel	135 N (2.13.4(d)) 1/3 to 2/3 of travel	120 N (4.2.5) No specs	150 N (726-77.1-5.5) ?
6.	LOCKS/CONTACTS/LINKAGE/UNLOCKING Locking device required? Unlocking zone.....	Yes (7.7.3) +/-200 mm (7.7.1) doors +/-350 mm if auto.	Yes (111.1) +/- 254 mm if manual levelling +/- 762 mm if auto levelling +/- 76 mm if solid state control (210.1e)	Yes [BSLJ-EO 129.9.(2)] +/- 200 mm	Yes (2.12.1.1/2) +/- 255 mm if manual levelling +/- 460 mm if auto levelling +/- 75 mm if solid state control (3.12.1.3)	Yes (4.2 & 3) +/- 150 mm	Yes (6.1) +/- 250 mm (7.6) auto levelling
7.	Type of contact for (6)	safety contact (7.7.3.1)	positive opening (111.3b(1))	Required: "Devices to prevent the cage from moving unless all the doors are closed." BSLJ-EO 129-9.(1)	positive opening (2.12.2.1.1)	safety contact —	safety contact (6.4)
8.	Minimum engagement for locking pin	7 mm (7.7.3.1.1)	No spec	No spec for design	6 m (2.12.2.1.3)	—	No spec

Table A2A: Door Systems and Interlocks - Part 2 of 4

	REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
9.	Is metal required for locking elements?	Yes	No spec	No spec	No spec	No spec	No spec
10.	Force applied to lock in open direction (min)	1000 N (7.7.3.1.6)	No spec	No spec	1000 N (2.12.2.1.6)	No spec	—
10a)	Locking action by: Gravity.....	Yes (7.7.3.1.7)	Yes (111.3b(2))	No spec	Yes (2.12.2.1.2)	No spec	—
	Permanent magnet.....	Yes	No	No spec	No	No spec	?
	Compression spring.....	Yes	Yes	No spec	Yes	No spec	?
10b)	Positive linkage.....	No	Yes	No spec	Yes	No spec	?
	Self-closing of landing doors required with car out of landing zone	Yes (7.7.3.2)	yes (110.3(a))	No spec	Yes (2.11.6.4)	Yes (4.2.3)	—
11.	Is emergency unlocking.....Required?	Yes—each door (7.7.3.2)	Yes – at access landing (111.9/10) except as in 12	No spec	Yes – at access landing (2.12.9) except as in 12	No	No (6.2)
	 Permitted?	N/A	Yes – on other landings	N/A	Yes – on other landings (2.12.10)	Yes (4.2.14)	Yes (6.2)
12.	Holstway switch required or forbidden?	No spec	required if hw door locked w/car at landing	No spec	required on the 2nd landing if 900mm to car top	Yes	—
13.	Parking device required?	No	Yes (111.8)	No spec	Yes (2.12.8)	Yes	—
14.	Neutralization by single action prohibited?	Yes (7.7.5.1)	No spec (111.3d)	No spec	No – see location (2.12.5 & 2.12.2.1.1)	Yes	Yes (6.2)
15.	Specs for linkage of multipanels	Vague (7.7.6.2)	Yes safety factors (110.11g)	No spec	Yes safety factors (2.11.10.4.10)	—	—
16.	Door contact required on trailing panels?	Yes (7.7.6.2)	No (111.3b(4))	No spec	No (2.12.2.1.7)	Yes	Yes (7.5)
17.	Opening of landing doors.....in landing zone from inside car.....out of landing zone	required (8.11.1) permitted, except prohibited if 5.4.3.2.2 applicable	required (111.12) prohibited	No spec	required (3.6.5.6) required in power off otherwise prohibited	Yes	} Not allowed
	max. force	300 N	334 N (204.5h)	No spec	200 N	No spec	

Table A2A: Door Systems and Interlocks - Part 3 of 4

	REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
	TESTING						
18.	Type test required?	Yes (7.7.3.1.6)	Yes (111.6a)	No spec	Yes (2.12.4)	—	No spec
19.	To be carried on complete doors?	Yes if multipanels (F.1.1.1)	No	No spec	No	—	—
20.	No. of cycles with lubrication during test	1 000 000 (F.1.2.2.1.1)	—	No spec	—	—	—
21.	No. of cycles with original lubricant	—	100 000 (1101.4)	No spec	100 000 (11.4.4.2)	—	—
22.	No. of cycles without lubricant	—	25 000	No spec	25 000	—	—
23.	No. of cycles in moisture atmosphere	—	10 000+20+15 000	No spec	10 000+20+15 000	—	—
24.	Electrical current during endurance test? (with no "break") Voltage: Current:	Yes (F.1.2.2.1) rated 2x rated	Yes (1101.3a) 115 V 1/2 A (DC)	No spec JIS A4302	Yes (11.4.3.1) 115 V 1/2 A (DC)	— — —	— — —
25.	Static test (force) – see 10 above	1000 N	—	No spec	—	—	—
25a)	Forces & retreating cam movement test	—	Yes (1101.4a)	No spec	Yes (11.4.4.8)	No spec	—
26.	Dynamic test (weight/fall)	4 kg. *0.5 m	—	No spec	—	—	—
27.	Misalignment test	—	Yes (1101.4e)	No spec	No (11.4.4.6)	—	—
28.	Electrical checks: "break AC" number voltage amps power factor	Yes (F.1.2.4.2.1) 50 times 110 % rated 1 100 % 0.7	Not contemplated — — — —	No spec	Not contemplated — — — —	—	—

Table A2A: Door Systems and Interlocks - Part 4 of 4

	REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
29.	Electrical checks: "break DC" number voltage amps	Yes (F.1.2.4.2.2) 20 times 110 % rated 110 % rated	Yes (1101.4b) 1000 times 230 V 2 A	No spec	Yes (11.4.4.3) 1 000 times 230 V 2 A	—	—
30.	Minimum contact opening	4 mm or 2*2 mm	No specs	No spec	No specs	—	—
31.	Minimum creep distances	6 mm (14.1.2.2)	No specs	No spec	No specs	—	—
32.	Minimum air gaps	6 mm (14.1.2.2)	No specs	No spec	No specs	—	—
33.	Insulation tests	according IEC	(1101.4f)	No spec	(11.4.4.7)	—	—
34.	All lock tests to include linkage	Yes (F.1.3.1)	No spec	No spec	No spec	—	No spec

General note: In this table, it is considered that the locking system consists not only of the lock itself, but also of the panels, their hangers, the tracks, the bottom guides and the linkage elements (in the case of multipanels doors). Specific cases are ignored.

Table A3A: Kinetic Energy - Part 1 of 1

	REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
	POWER OPERATED HORIZONTALLY SLIDING DOORS:	(7.5.2.1)	(112.4/5)	JEAS-511	(2.13.4/5)	(4.2.5)	
1.	FORCE:						
1.1	To prevent door closing.....max.	150 N	133 N (130 lbf)	147 N (15 kg)	135 N	118 N (12 kgf)	
1.2	Measured in portion of travel.....	1/3 to 3/3* *Full close	1/3 to 2/3	(Residential) 1/2	1/3 to 2/3	No spec	
2.	KINETIC ENERGY OF AUTOMATIC DOORS:						
2.1	If re-opening device is provided.....max.	10 J	9,49 J (7ft. lbf)	No spec	10 J	7,84 J (0,8 kgm)	
2.2	If re-opening device is not provided or made inoperative.....max.	4 J both	3,39 J (2,5ft lbf) calculated	No spec No spec	3,5 J calculated	3,92 J (0,4 kgm) No spec	
2.3	Energy calculated or measured.....						
2.4	Energy calculated/measured at average closing speed over door's travel, less at each end of travel:						
	-if centrally closing door.....	25 mm	25 mm (1 in)	No spec	25 mm	No spec	
	-if side closing door.....	50 mm	51 mm (2 in)	No spec	50 mm	No spec	
2.5	Measuring device specified.....	Yes	No	No spec	No	No	
3.	KINETIC ENERGY OF CONTINUOUS PRESSURE BUTTON operated doors may exceed that in 2.1.....	Yes	Yes	No spec	Yes	No spec	
	-if the average closing speed is limited to.....max.	0,3 m/s	Not limited	No spec	Not limited	No spec	
	-if certain requirements related to CPB operation and location fulfilled.....	Not mentioned	Yes (112.3b)	No spec	Yes (2.13.3.2)	No spec	

Table A4A: Traction - Part 1 of 1

	REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
1.	MAXIMUM: Machine shall not raise empty car with counterweight on buffers -counterweight, with car on buffers.....	Yes (9.3.1) No spec	No spec No spec	No spec No spec	Yes (3.10.2.2) Yes (9.2.3b)	Yes (4.4.2) Yes (4.4.2)	1083-78 (3.3)
2.	MINIMUM STATIC: -car with this percentage of rated load ... passenger ... freight*** -shall not break traction when stationary in the lowest landing.....	125 % (9.note 1) 150 % (D.2.h.3) Yes	125 % (208.2c) 100 % Yes	125 % [BSLJ-EO 129.9.(6)] 120 % [BSLJ-EO 129.9.(6)] Yes	125 % (3.10.2) 100 % Yes	200 % (7.3.9) 200 % Yes	200 % (3.3) 200 % Yes
3.	MINIMUM DYNAMIC -car with this percentage of rated load..... -shall not break traction out of control ****when making downwards - emergency stops - normal stops	125 % (D.2.h) Yes (D.2.h) —	(1002.3a) *(208.2c) No spec Yes (1002.3d)	BSLJ-EO 129.9.(6) 125 % 120 % Yes Yes	125 % 100 % Yes (9.2.3) Yes (3.10.2.2)	110 % (7.3.10) No spec No spec	110 % (3.3) ? ** ?
4.	MAXIMUM SPECIFIC PRESSURE of ropes in grooves limited	Yes (9.3.2)	No spec	No spec	No spec	No spec	No spec
5.	MINIMUM DRIVE SHEAVE-ROPE diameter ratio	40 (9.2.1)	40 (208.2b)	40 [BSLJ-EO 129-4.2.(1)]	40 (3.10.2.1)	45 if > 1,4 m/s 40 if ≤ 1,4 (4.4.4)	? (3.1)
6.	Car – counterweight mass ratio -limited in standard -design data verified at inspection	No Yes (D.2.h.4)	No No	No No	No No	No No	? ?
*Explicitly not specified. However, consider other rules that a passenger lift must be able to safely lower, stop and hold a car with 125% rated load from the rated speed or the speed at which governor overspeed switch is set. **Similar assumption should be applied as for ASME. ***See 2.1.2 for terminology. ****"Out of control" means that car may accelerate.							

Table A5A: Passengers Cars Instantaneous Safeties - Part 1 of 2

	REQUIREMENTS	CEN	ASME	JAPAN	CSA*	USSR	CMEA
1.	Car direction for setting	down only (9.8.1.1)	down only (205.6)	down only BSLJ-EO 129-9.(7)	down only* (3.7.7)	down only (4.7.1)	down only (3.1) 727-77/2080-80
2.	Ability to operate in free fall	Yes	Yes (205.8a)	No spec	Yes (3.7.9.1)	Yes (4.7.1)	?
3.	Acceptable load in car	100 % nominal	125 % nominal (205.3)	100 % nominal JIS A4302 4.2.1.(6)	125 % nominal (3.7.4.1)	110 % nominal (7.3.10)	?
4.	Upper speed limit for plain instantaneous	0,63 m/s (9.8.2)	0,75 m/s (205.8)	0,75 m/s [BSLJ-EO 129-9.2]	0,75 m/s (3.7.9)	1,00 m/s (4.7.4)	No limit
5.	Upper speed limit if buffered effect (Type C)	1,00 mm/s	2,50 m/s	No spec	2,50 m/s	No spec	—
6.	Oil buffer required for (5)	No (9.8.6.2)	Yes	No spec	Yes	No spec	—
7.	Tripping by overspeed	Yes (9.8.3.1)	Yes (205.7)	Yes [BSLJ-EO 129-9.(7)]	Yes (3.7.8.1)	Yes (4.7.3)	Yes (3.1)
8.	Tripping by inertia or equivalent	No	Yes	No spec	Yes	No	—
9.	Release by lifting the car only	Yes (9.8.5.1)	Optional (205.9c)	No spec	Yes (3.7.10.3.2)	Yes	Yes (3.1)
10.	Deceleration limit specified	No	No	No spec	No	$\leq 25 \text{ m/s}^2$ (4.7.5) or more if $< 0,04 \text{ s}$	30 m/s^2 (3.3) 25 m/s^2 (3.3)
11.	Type test required	Yes (note 1) (F.3.2)	No	Yes [JEAS-517]	No	No	Yes (3.1)
12.	Test required at lift acceptance	Yes (D.2.i)	Yes (1003.2b)	Yes [JIS A4302 4.2.1.(6)]	Yes (9.2.1)	Yes (7.3.12)	Yes (3.2)
13.	Load in car for (12)	100 % nominal	100 % nominal	638 N (65 kg)	100 % nominal	110% nominal (7.3.10)	110 % (4.4.4)
14.	Speed of car for (12)	100 % nominal	100 % nominal	slow speed	gov. trip speed (9.2.1.2)	gov. trip speed (7.3.14)	100%
15.	Type D safeties recognized (free wheeling pinion on rack)	No	No	No	Yes (3.7.6d)	No	—
	*See "Note respecting CSA standard" in Table A5 - Part 2						

NOTE 1: The type test conditions are such that the safety must be able to absorb 2 times the kinetic energy of the falling mass.

Table A5A: Progressive Safeties - Part 2 of 2

	REQUIREMENTS	CEN	ASME	JAPAN	CSA*	USSR	CMEA
1.	Car direction for setting	down only (9.8.1.1)	down only (205.6)	down only BSLJ-EO 129-9.(7)	down only* (3.7.7)	down only (4.7.1)	down only (3.1) 727-77/2080-80
2.	Ability to operate in free fall	Yes	Yes (note 2)	No spec	Yes (note 2)	Yes (4.7.1)	—
3.	Acceptable load in car	100 % nominal	125 % nominal (205.3)	100 % nominal JIS A4302 4.2.1.(6)	125 % nominal (3.7.4.1)	110 % nominal (7.3.10)	—
4.	Upper speed limit	No limit	No limit	No limit	No limit	No limit	No limit
5.	Tripping by overspeed governor only	Yes	Yes (205.7)	Yes [BSLJ-EO 129-9.(7)]	Yes *(3.7.8.1)	Yes (4.7.3)	—
6.	Tripping by inertia or equivalent	No	No	No spec	No	No	—
7.	Release by lifting the car only	Yes (9.8.5.1)	No specs (205.7)	No spec	Yes (3.7.10.3.2)	No spec	—
8.	Deceleration limit specified	Yes	Yes (1306)	Yes [JIS A4302 4.2.1(6)]	Yes (G6.1)	$\leq 25 \text{ m/s}^2$ (4.75) or more if £0.045	25 m/s ² (3.3)
9.	Type test required	Yes (F.3.3)	No	Yes [JEAS-517]	No	No	Yes (3.1)
10.	Test required at lift acceptance	Yes (note 1) (D.2.1.2)	Yes (1003.2d)	Yes [JIS A4302 4.2.1(6)]	Yes (9.2.1)	Yes (7.3.12)	Yes (3.2)
11.	Load in car for (10)	125 % nominal	100 % nominal	638 N (65 kg)	100 % nominal	110 % nominal (7.3.10)	110 % (4.4.4)
12.	Speed of car for (10)	levelling or inspection speed	gov. trip speed	slow speed	gov. trip speed	gov. trip speed (7.3.14)	100%

*Note respecting CSA standard: Entries in CSA column are based on 1985 edition of CSA code. Refer to item 8.2.7 in this report. The 1990 CSA code requires

(i) protection against uncontrolled overspeed in up and down directions, (ii) permits tripping by other than governor, (iii) permits freefall and overspeed by separate devices, (iv) requires protection against uncontrolled car movement at any speed with the landing and car door open.

NOTE 1: The capacity of the gear is determined by the type test and corresponds to the car with 100% rated load.

NOTE 2: See ASME A17 Interpretation Book No. 11-Inquiry 86-2.

Table A6A: Overspeed Governors - Part 1 of 4

REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
1. GOVERNOR TRIPPING SPEED — CAR DOWNWARDS						
1.1 Maximum	see table A6A— pg.3	see table A6A—pg.3	For rated speed (RS): RS ≤ 0,75 m/s: 1,13 m/s RS > 0,75 m/s: 140 % of RS [BSLJ-EO 129-9.(7)]	see table A6—pg.3	see table A6—pg.3	see table A6—pg.4
1.2 Maximum percentage of rated speed	115 % (9.9.1)	115 % (206.2a)	No spec	115 % (3.8.2.1)	115 % (4.8.1)	115 % (2.1.1)
2. OVERSPEED SWITCH						
2.1 Required	Yes (9.9.11)	Yes (note 1)	Yes	Yes (note 3)	No	—
2.2 As necessary part of governor	No (9.9.11)	Yes	Yes	Yes	—	—
3. MAXIMUM TRIPPING SPEED OF OVERSPEED SWITCH as percentage of governor trip. speed (see 1 above) "RS" means rated speed	Any direction 100 % (9.9.11.1) if RS ≤ 1 m/s then 115 % of RS	In down direction 90 % if RS = 0,75 to 2,5 m/s 95 % if RS > 2,5 m/s 100 % if static control reducing switch (206.4b)	•if RS ≤ 0,75 m/s 1,05 m/s •if RS > 0,75 m/s 130 % of RS [BSLJ-EO 129-9.(5)]	In down direction 90 % if RS = 0,75 to 2,5 m/s 95 % if RS > 2,5 m/s 90 % if static control 100 % with speed reducing switch (3.8.4.2)	No spec	N/A
		In up direction 100 % (206.4b4)		In up direction 100% (3.8.4.2(c))		
4. INERTIA OPERATION FOR INST. SAF. REQ'D	No	Yes (205.8a)	No	Yes (3.7.9.1.c)	No	—
5. AUTOMATIC RESETTING REQUIRED	No	No	No	No	No	—
6. SWITCH FOR NON-AUTO RESETTING REQUIRED	Yes (9.9.11.2)	Note 2 (206.4c)	No	Note 2 (3.8.4.3)	No	—
7. GENERATED MINIMUM FORCE						
7.1 X times force required by safety gear	2 X (9.9.4)	1.67 (205.15)	No spec	1.67 (3.7.19)	Not specified	—
7.2 Absolute minimum	300 N	No spec	No spec	No spec	No spec	—
8. GOVERNOR ROPE						
8.1 Minimum diameter (mm)	6 (9.9.6.3)	9.5 (206.5a)	No spec	9.5 (3.8.5.1)	7 (4.10.3)	—
8.2 Factor of safety	8 (9.9.6.2)	5 (206.5a)	No spec	5 (3.8.5.1)	No spec	8 (727-77-2.6)
8.3 Sheave to rope ratio (min.)	30 (9.9.6.4)	32-42 (206.7)	No spec	32-42 (3.8.7.6)	25-35 (4.4.3)	25-35 (727-77-2.6)
8.4 Slack rope contact required	Yes (9.9.11.3)	jawless—No	No	jawless—No	Yes (4.8.2)	—
8.5 Jaws grip required	No	jawless—Yes	No	jawless—Yes	No	—
		No	No	No	N/A	N/A

Note 1: Except governors for rated speed less than 0.76 m/s without static control (206.4a)

Note 2: Switch in item #2 and also switch on safeties must be of a manually reset type

Note 3: Except on elevators with squirrel cage motors regardless of speed (3.8.4.1.1)

Table A6A: Overspeed Governors - Part 2 of 4

	REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
9. 9.1 9.2	COUNTERWEIGHT GOVERNOR Not required if speed equal or less than (m/s) Max. tripping speed -% of (1.1)	1,0 (9.8.3) 110 % (9.9.3)	0,76 (205.7a) 110 % (206.2b)	1,0 [BSLJ-EO 129-9-2] 110 % [BSLJ-EO 129-9.(7)]	0,76 (3.7.8.1) 110 % (3.8.2.2)	No spec —	— 110 % (...- 2.2)
10.	TEST TYPE REQUIRED	Yes (F.4)	No	Yes [GUIDELINE 8.3]	No	No	No
11.	ACCEPTANCE TEST REQUIRED	Yes (D.2.i)	Yes (1003.2)	Yes [JIS A4302 4.2.1 (6)]	Yes (9.2.1)	Yes (7.3.12)	—
12.	PERIODIC TEST REQUIRED	Yes (E.1)	Yes (1002.2c)	Yes [JIS A4302 4.2.1 (6)]	Yes (B1.5.1)	Yes (7.4)	—

COMPARISON OF WORLDWIDE SAFETY STANDARDS FOR LIFTS
Table A6A — Overspeed Governors - Tripping Speeds - Part 3 of 4

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COMPARISON OF WORLDWIDE SAFETY STANDARDS FOR LIFTS

Table A6A — Overspeed Governors - Part 4 of 4

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Table A7A: Spring Buffers - Part 1 of 3

REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
1. Maximum rated speed for bumpers	Not permitted	Not permitted	No. spec.	Not permitted	0,5 m/s	0,7 m/s (4.2) ³
2. Maximum rated speed for springs	1 m/s (10.3.3)	1 m/s (201.1a)	1 m/s [BSLJ-EO 129-9.(9)]	1 m/s (3.3.1)	0,0 for bed lifts see note 1	0 m/s for bed lifts —
3. Strokes	see table A7A-p2	See table A7A-p2	see table A7A-p2 RS ≤ 0,5 m/s :38 mm and over 0,5 < RS ≤ 0,75 :64 mm and over 0,75 < RS ≤ 1,0 :100 mm and over BSLJ-EO 129-9.(9)	see table A7-p2	see note 1	—
4. Minimum stroke	0,065 m (10.4.1)	0,038 m (201.3a)	0,038 m [BSLJ-EO 129-9.(9)]	0,038 m (3.3.4.1)	see note 1	—
5. Car rated load to be considered	100 % (10.4.1.2)	1 00% (201.3b)	No spec.	100 % (3.3.4.2)	110 % (4.9.1)	—
6. Force at full compression (ratio to max suspended load)	2,5 ≤ R ≤ 4	2 < = R < = 3	No spec.	2 ≤ R ≤ 3	see note 1	—
7. Type test	No	No	No	No	No	Yes (3.1)
8. Data required at lift acceptance	spring curve	None	None	None	None	loading (4.5)
9. Stroke and load rating marked on buffer	No	Yes (201.3c)	No	Yes (3.3.4.3)	No	—
10. Test at life acceptance	static D.2(1)	No (1003.2e)	No	No (9.2.2.1)	dynamic (7.3.10)	Yes (3.2)

Note 1: The retardation limits (9.81 m/s² average and 2.5 m/s² maximum) applicable to hydraulic buffers seem to apply to spring buffers also.
Governor tripping speed and 0 to 110% rated load must be considered (4.9.1)

COMPARISON OF WORLDWIDE SAFETY STANDARDS FOR LIFTS

Table A7A — Spring Buffers - Part 2 of 3

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Table A7A: Hydraulic Buffers - Part 3 of 3

REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
1. Limits of application	None	none	None [BSLJ-EO 129-9.(9)]	None	None	None
2. Minimum stroke in relation to speed (V = rated speed in m/s, $g = 9,81 \text{ m/s}^2$)	($1,15 \cdot V$)/2(2*g)	($1,15 \cdot V$)/2(2*g)	($1,15 \cdot V$)/2(2*g)	($1,15 \cdot V$)/2(2*g)	(ovsp)/2(2*g)	—
3. Absolute minimum stroke	None	none	None	None	None	—
4. Max mean deceleration (Note 1)	1 g (10.4.3.3)	1 g (201.4b)	1 g [BSLJ-EO 129-9.(9)]	1 g (3.3.5.2)	1 g (4.9.1)	727-77 2080-80
5. Not to exceed 2,5*g more than 0.04 s	Yes	Yes	Yes [BSLJ-EO 129-9.(9)]	Yes	Yes	—
6. Car rated load to be considered for (4) + (5)	100 %	68 kg to 100 % (full range)	100 % [BSLJ-EO 129-9.(9)]	68 kg to 100 % (full range)	0 kg to 110 % (full range)	0 to 110 % Yes (4.2)
7. Reduced stroke buffers permitted	Yes (10.4.3.2)	Yes (201.4a2)	Yes [BSLJ-EO 129-9.(5)]	Yes (3.3.5.1)	No	—
8. If rated speed $\leq 4 \text{ m/s}$, min stroke	50 % of (2)	50 % of (2)	50 % of (2) [BSLJ-EO 129-9.(5)]	50 % of (2)	—	—
9. But min stroke for (8)	0,42* m	No spec	No spec.	No spec	—	—
10. If rated speed $> 4 \text{ m/s}$, min stroke	33,3 % of (2)	33,3 % of (2)	33,3 % of (2) BSLJ-EO 129-9.(9)	33,3 % of (2)	—	—
11. But with min stroke for (10)	0,42* m	0,46* m	0,46 m [BSLJ-EO 129-9.(9)]	0,46* m	—	—
12. Switch for checking full extension	Yes (10.4.3.4)	Yes, if gas return (201.4e(3))	No	No	No	Yes (4.3)
13. Type test	Yes (F.5)	Yes (201.4g)	Yes	Yes (3.3.5.10)	Yes (4.9.3)	Yes (3.1)
14. Acceptance test	Yes (D.2e)	Yes (1003.2e)	Yes	Yes (9.2.2.2)	Yes (7.3.10)	Yes (3.2)
*Minimum stroke in (9) and (11) translates to this speed below which reduced stroke buffers in (8) and (10) are not permitted.	50 %..2,5 m/s 33,3 %..2,5 m/s	50 %..no spec. 33,3 %..2,6 m/s	50 %..No spec. 33,3 %..2,6 m/s	50 %..No spec spec 33,3 %.. 2,6 m/s	N/A N/A	N/A N/A

Note 1: None of the codes specifies if the average must be based on time or on distance. Calculations ready made in ANSI and CSA, as well as the minimum given by the CEN formula indicate that the mean deceleration considered is based on distance.

Table A8A: Braking Systems - Part 1 of 2

	REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
1.	Electromechanical brake alone must be able to handle:			BSLJ-EO 129-9.(6)			
1.1	In DOWN direction - this % of rated load - from this % of rated speed	125 % (12.4.2.1) 100 %	125 %** 0 % (208.8)	125 % (Passenger, Bed) 120 % (other than above) 100 %	125 %** 0 % (3.10.8.2)	200 % (2.3.9) 0 %	1083-78 200 % (4.4.3) 0 %
1.2	In UP direction - this load	No spec.	No spec.	125 % (Passenger, Bed) 120 % (other than above)	Empty car (3.10.8.3.2c)	No spec	No spec
	- from this speed	No spec	No spec.	100 %	gov. trip sp.	No spec	No spec
2.	Braking system, including (1) and other braking means (eg, electric) must be able to handle						
2.1	This % of rated load	125 % (D.2d)	125 %**	125 % (Passenger, Bed) 120 % (other than above)	125 %**	110 % (7.3.10)	1083-78 110 % (4.4.4)
2.2	From this % of rated speed	100 %	100 % (1002.3d)	100 %	100 % (3.10.8.2)	100 %	100 %
3.	The brake shall be held off:						
		by continuous flow of current (12.4.2.3)	electrically (208.8)	electrically [BSLJ-EO 129-9.(6)]	electrically (3.10.8.1)	implied electrically (5.1.3/4)	?
4.	Current to brake controlled by at least this number of devices (contactors)	2 (12.4.2.3.1)	2 (210.9c)	No spec.	2 (3.12.9c)	No spec	?
5.	Checking of contactors at every stop required	Yes* (12.4.2.3.1)	In specific case (210.9d & e)	No spec.	Yes (3.12.9.d)***	No (see item 10)	?
6.	Delay in brake application in emergency	Not permitted (12.4.2.3.3)	Not permitted (210.8)	Not permitted [BSLJ-EO 129-9.(6)]	Not permitted (3.12.8.2)	Not permitted	?
7.	Brake application by	Springs/weights (12.4.2.5)	Springs/gravity (208.8)	Springs	Springs/gravity (3.10.8.1)	No spec (4.4.4)	Springs/weights

Notes: *: At least at the next change in the direction of motion

**: Where ASME or CSA column indicate 125% rated load, it should read 100% for freight lifts

***: In 1990 edition of CSA

Table A8A: Braking Systems - Part 2 of 2

	REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
8.	Mechanical brake components in two sets with one set able to slow down rated load	Yes (12.4.2.1)	No	No spec.	No	No	?
9.	Retardation limited	Yes (12.4.2.1)	No	No spec.	No	No	?
10.	Electrical checking of brake	No	No	No spec.	No	Yes (5.1.4b)	?
11.	Permanent label for brake setting required	No	No	No spec.	Yes (3.10.8.3)	No	?
12.	Acceptance test with load/speed%	125 %/100 % (D.2d)	125 %** 100 % (1002.3d)	No spec.	125 %** 100 % (9.2.3)	110 %/100 % (7.3.10)	Yes (2080-80) (3.1)
13.	Periodic Test	Visual (E.1)	As in 12	No spec.	Yes (B1.3.1)	200 %/0 % (7.3.8) Yes (7.3.1b)	Yes (3.1)
**See Note on Part 1 — Table A8A							

Table A9A: Electrical Devices - Part 1 of 5

	REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
1.	Check on closed position of - well auxiliary doors/traps (A) - pit access doors (A) - access opening on observation lifts (A)	Yes (5.2.2.2.2) Yes (5.7.3.2) —	Yes (110.1e) No (106.1d4) —	Yes [BSLJ-EO 129.9.(1)] Yes —	Yes (2.11.1.1f) in specific case Yes (2.11.1.3)	— Yes (5.1.27k) —	727-77.7
2.	Check on locking of car doors (A) in cases specified in rule ⑥	Yes (5.4.3.2.2) (5.4.3.2)	No	No spec.	Yes (3.6.4.2.4) (3.6.4.2.2)	—	727-77.7.2
3.	Landing/car door automatic reopening device (D) - horizontal sliding - always required: - if kinetic energy above a set limit: - vertically sliding landing and car doors if automatic or momentary pressure	Yes (7.5.2.1.1.3) N/A (8.7.2.1.1.3) Not permitted (7.5.2.2 & 8.7.2.2)	No Yes (112.5) Yes (112.3d3)	No No No	No Yes (2.13.5) Yes (2.13.3.4.2c)	No Yes (4.2.5) —	— — 726-77.1.5.5 727-77.7.5
4.	Check on locking of landing doors (A)	Yes (7.7.3.1)	Yes (111.3) (210.2p)	Yes [BSLJ-EO 129.9.(2)]	Yes (2.12.2)	Yes (5.1.6a)	—
5.	Check on landing doors closed as a part of #4 or separate (A)	Yes (7.7.4)	Yes (111.5) (210.2p)	Yes [BSLJ-EO 129.9.(1)]	Yes (2.12.7)	Yes (5.1.6a)	727-77.6.4
6.	Check on closed position of landing door panels which are not locked (A) - if panels directly mechanically related - if panels indirectly related only by ropes chains, etc.	No (7.7.6.2) Yes (7.7.6.2)	No (111.3b4a) No (111.3b4)	Yes [BSLJ-EO 129.9.(2)] Yes [BSLJ-EO 129.9.(1)]	No (2.12.2.1.4a) No (2.12.2.1.4)	No (5.1.7) Yes (5.1.7)	727-77.7.5
8.	Hoistway access switch, overriding #4 to 6(A)	Not permitted	Yes (111.9e)	No spec.	Yes (2.12.9.3)	—	—
9.	Check on retracted position of hinged or moveable car sills (A)	—	Yes (210.2u)	No spec.	Yes (2.12.2.22)	—	(726-77.1.4.4)
10.	Photocells for doorless cars if permitted (D)	Yes (8.8)	Not permitted	Not permitted	Not permitted	—	—
11.	Check on closed position of car door (A)	Yes (8.9.2)	Yes (204.4b) (111.7c)	Yes [BSLJ-EO 129.9.(1)]	Yes (3.6.4.2.4)	Yes (5.1.6)	727-77.7.5

Notes: (A) Electric safety device in a form of safety contacts (switches) see 2.2 in TR 11071-1:1990)

(B) Electric safety device in a form of safety circuit (see 2.2 in TR 11071-1:1990)

(D) Protective device

Entry (A) means that the device must be of that type. Entry (A or B) means that the device may be of either type.

For CEN the entries based on CEN APPENDIX A, for other codes based on rules.

Table A9A: Electrical Devices - Part 2 of 5

	REQUIREMENTS	CEN	ASME	JAPAN	CSA	USSR	CMEA
12.	Check on locking or closing of car - top emergency traps (A) - side emergency doors - panels on observation elevators	locking (8.12.5.2) locking (8.12.5.2) —	No (204.1e) closing (210.2s) —	BSLJ-EO 129-5.(4) locking locking No spec.	closing (3.6.1.5d) closing (3.6.2.4.2g) locking (3.6.2.5e)	— — —	1933-79.2.12 — —
13.	Check on extension of 2 suspension ropes or clearances if permitted (A)	Yes (9.5.3)	Not permitted (212.4)	No spec.	Not permitted (3.14.3)	Yes (5.1.27d)	727-77.7.2
14.	Check on compensation ropes (A) - tension or lower sheave limit - rebound or upper sheave limit	Yes (9.6.1b) Yes (9.6.2)	Both (210.2c)	No spec. No spec.	both (3.12.2.3)	both (5.1.27g) (5.1.28)	
15.	Check on the operation of car safety gear (A)	Yes (9.8.8)	Yes (205.7b)	No spec.	Yes (3.7.8)	Yes (5.1.27c)	727-77.3.4
16.	Check on the car overspeed by - a device on governor or other device - device of type A or B	both (9.9.11.1) both	governor (206.4) (A) only	governor [BSLJ-EO 129-9.(5)] (A) only [BSLJ-EO 129-9.(5)]	governor (3.8.4) (A) only	governor (5.1.28) ?	727-77.2.3
17.	Check on non-automatic resetting of governor (A)	Yes (9.9.11.2)	No* (206.4c)	Yes [BSLJ-EO 129-9.(5)]	No* (3.8.4.3)	No* (5.1.28)	—
18.	Check on tension in the governor rope (A)	Yes (9.9.11.3)	Yes (206.7) (lawless only)	No spec.	Yes (3.8.7.2) (lawless only)	Yes (5.1.27h)	
19.	Check on buffer return to normal position - pit buffers..... - type C safeties buffers.....	Yes (10.4.3.4) Yes (9.8.6.2)	If gas return (201.4e(3)) Yes (201.8b(7))	No spec. No spec.	No Yes (3.7.9.2h)	Yes (5.1.27j) —	727-77.4.3 —
20.	Check for slack rope or chain on drum machines (A)	Yes (10.6.1)	Yes (210.2a)	Yes [BSLJ-EO 129-9.(11)]	Yes (3.12.2.2)	Yes (5.1.27d)	
21.	Electrical checking on traction (D)	Yes (10.6.2)	No	No spec.	No	No	—

Note: *Electric device No. 17 not necessary because governor switch (No. 16) and car safety gear switch (No. 15) must be a manually reset type.