AS 1735, Part 3—1982
UDC 621.876-83
SfB (66)

Australian Standard 1735, Part 3—1982

SAA LIFT CODE
Part 3—ELECTROHYDRAULIC LIFTS: PASSENGER AND GOODS

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

E

THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENTAL ORGANIZATIONS and departments were officially represented on the committee entrusted with the preparation of this standard:

Association of Consulting Engineers Australia

Association of Independent Lift Companies

Australian Chamber of Commerce

Board of Fire Commissioners of New South Wales

Building Owners and Managers Association of Australia Limited

Confederation of Australian Industry

Department of the Capital Territory

Department of Housing and Construction

Department of Industrial Affairs and Employment, S.A.

Department of Industrial Relations, N.S.W.

Department of Labour and Industry, Tas.

Department of Labour and Industry, Vic.

Department of Labour and Industry, W.A.

Department of Employment and Labour Relations, Qld

Department of Mines and Energy, N.T.

Department of Public Works, N.S.W.

Institution of Engineers, Australia

Insurance Council of Australia

Lift Manufacturers Association of Australia

Royal Australian Institute of Architects

This standard, prepared by Committee ME/4, Lift Installations, was approved on behalf of the Council of the Standards Association of Australia on 29 January 1982, and was published on 17 May 1982.

This standard was issued in draft form for comment as DR 81147.

AUSTRALIAN STANDARD

THE DESIGN, INSTALLATION, TESTING AND OPERATION OF LIFTS, ESCALATORS AND MOVING WALKS

known as the
SAA LIFT CODE

Part 3
ELECTROHYDRAULIC LIFTS: PASSENGER AND GOODS

AS 1735, Part 3—1982

First published (included in AS CA3) 1935
Revised 1947
Revised (Part 3) 1966
Revised 1968
Revised and issued as AS 1735, Part 3 1975
Second edition 1982

PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY, N.S.W.

ISBN 0 7262 2499 5

PREFACE

This edition of this standard was prepared by the Association's Committee on Lift Installations to supersede the 1975 edition.

This standard deals with electrohydraulic lifts designed for carrying passengers or goods or both.

Where requirements for electrohydraulic lifts are the same as those for electric lifts, cross-reference has been made to AS 1735, Part 2, in order to avoid unnecessary repetition. Several sections, e.g. liftwell enclosures, door locks, suspension ropes and attachments, and car doors, have been completely cross-referenced to the relevant sections in AS 1735, Part 2.

A maximum rated speed of 1 m/s (speed with rated load in the up direction) has been specified, and the maximum speed in the down direction has been related to the rated speed and to the type of installation, whether passenger or goods. A hydraulically cushioned ram stop or a top overtravel limit switch is required for rated speeds above 0.5 m/s.

Particular attention has been paid to the design of rams and cylinders, and to cylinder protection by means of a waterproof caisson where the cylinder is below ground level.

Top and bottom clearances for cars and counterweights of suspended electrohydraulic lifts have been separately treated from clearances for direct-acting installations.

A minimum space for man clearance is provided in the pit beneath the car, with dimensions allowing either a crouching space or a standing-up space. A minimum area for man clearance is also specified, adjacent to the crosshead of the car, when the ram is fully extended against its stop.

Landing doors are required to close automatically if for any reason the car should drift downwards from an upper landing. An anti-creep levelling device is provided to prevent the car from sinking more than 150 mm below the landing irrespective of whether the landing door is open or closed.

A pressure test has been included, as Section 512 of AS 1735, Part 10.

This edition includes the following technical changes from the 1975 edition:

(a) Section 44 has been amended to permit the use of hydraulic hoses.

(b) Clause 46.3 has been amended to allow the use of a volume of oil which is just sufficient for safe operation.

(c) Clause 52.2.1 has been amended in line with the amendment of Clause 12.27 of AS 1735, Part 2.

Other changes of an editorial nature have been made to bring the standard into line with current SAA editorial policy.

This standard requires reference to the following standards:

AS 1074	Steel Tubes and Tubulars Threaded or Suitable for Threading with Pipe Threads of Whitworth Form
AS 1250	SAA Steel Structures Code
AS 1392	Precast Concrete Pressure Pipes
AS 1711	Asbestos Cement Pressure Pipes
AS 1722	Pipe Threads of Whitworth Form
AS 1723	Centrifugally Cast Grey Iron Pressure Pipes (Excluding Pipes with Bolted Gland Joints)
AS 1735	SAA Lift Code Part 1—General Requirements Part 2—Electric Lifts: Passenger and Goods Part 10—Tests
AS 1835	Seamless Steel Tubes for Pressure Purposes
AS 1836	Welded Steel Tubes for Pressure Purposes
AS 2129	Flanges for Pipes, Valves and Fittings
AS B226	Hydraulic Hose
AS CB15	SAA Pipe Welding Code
BS 1600	Dimensions of Steel Pipe for the Petroleum Industry
BS 1640	Steel Butt-welding Pipe Fittings for the Petroleum Industry
BS 1740	Wrought Steel Pipe Fittings (Screwed BSP Thread)
ANSI B2.1	Pipe Threads
ANSI B36.10	Pipe, Steel

CONTENTS

Page

SECTION 40. SCOPE AND GENERAL

40.1 Scope 5
40.2 Maximum Permissible Speed 5
40.3 Beams, Supports and Foundations for Cylinders, Machines and Overhead Sheaves 5
40.4 Pressure Test After Erection 5
40.5 Devices to Hold Car Above Lowest Floor 5

SECTION 41. MACHINE ROOMS AND MACHINERY SPACES

41.1 General 6
41.2 Location Relative to Liftwell 6

SECTION 42. ACCESS TO OVERHEAD SHEAVES 6

SECTION 43. HYDRAULIC DRIVING MACHINES

43.1 Type 7
43.2 Rams 7
43.3 Cylinders 12

SECTION 44. HYDRAULIC LINES

44.1 General 14
44.2 Rigid Lines 14
44.3 Hoses 14

SECTION 45. VALVES

45.1 Working Pressures 16
45.2 Pump Relief Valve 16
45.3 Check Valve 16
45.4 Door Lock Valve 16
45.5 Flow Restriction Valve 16
45.6 Manual Lowering 16

SECTION 46. TANKS

46.1 Material 16
46.2 Capacity 16
46.3 Means for Checking Liquid Level 16
46.4 Covers and Venting 16
46.5 Factor of Safety 16

SECTION 47. DIRECT-ACTING ELECTROHYDRAULIC LIFTS—CLEARANCES FOR CARS AND COUNTERWEIGHTS

47.1 Clearance at Bottom of Car 17
47.2 Car Buffer Clearance 17
47.3 Top Overtravel 17
47.4 Clearance of Car at Top Landing (with Ram Fully Extended against its Stop) 17
47.5 Clearance at Top of Flying Counterweight 17
47.6 Clearance at Bottom of Flying Counterweight 17

SECTION 48. SUSPENDED ELECTROHYDRAULIC LIFTS—CLEARANCES FOR CARS AND COUNTERWEIGHTS

48.1 Clearance at Bottom of Car 19
48.2 Car Buffer Clearance 19
48.3 Compressed Ram Clearance 19
48.4 Clearance of Car at Top Landing 19
48.5 Top Overtravel 19
48.6 Clearance at Top of Flying Counterweight 19
48.7 Clearance at Bottom of Flying Counterweight 19

SECTION 49. CAR AND COUNTERWEIGHT BUFFERS

49.1 Car Buffers 20
49.2 Counterweight Buffers 20
49.3 Flying Counterweight Buffers 20

SECTION 50. PITS

50.1 General Requirements 20
50.2 Pits Not Extending to Lowest Floor of Building 20

SECTION 51. LIFTWELL ENCLOSURES 21

SECTION 52. LANDING DOORS

52.1 Landing Doors Required 21
52.2 Closing of Landing Doors 21

SECTION 53. LOCKING OF LANDING DOORS

53.1 General Requirements 22
53.2 Parking of Attendant-controlled Lift Cars 22

SECTION 54. DOOR LOCKS 22

SECTION 55. CLEARANCES IN WELLS AND ENCLOSURES

55.1 General Requirements 22
55.2 Flushness of Liftwell 22

SECTION 56. PIPING IN LIFTWELLS OR MACHINE ROOMS 22

SECTION 57. SUSPENSION ROPES 22

SECTION 58. ROPE ATTACHMENTS AND FITTINGS 23

SECTION 59. SHEAVES AND PULLEYS 23

SECTION 60. COUNTERWEIGHTS AND FLYING COUNTERWEIGHTS

60.1 General Requirements 23
60.2 Mass of Flying Counterweight 23

SECTION 61. GUIDES FOR LIFT CARS AND COUNTERWEIGHTS

61.1 General Requirements 24
61.2 Stresses and Deflections in Steel Car Guide Rails 24

SECTION 62. RATED CAR CAPACITY AND CLASSES OF LOADING 24

Page

SECTION 63. CAR CONSTRUCTION
63.1 General Requirements 24
63.2 Car Frames for Direct-acting Lifts 24

SECTION 64. CAR DOORS 25

SECTION 65. POWER OPERATION OF CAR AND LANDING DOORS 25

SECTION 66. ELECTRICAL INSTALLATION 25

SECTION 67. EARTHING
67.1 General Requirements 25
67.2 Earthing of Electrical Apparatus Installed on Lift Cars 25

SECTION 68. PRECAUTIONS IN WIRING 25

SECTION 69. OPERATING DEVICES AND CONTROL EQUIPMENT 26

SECTION 70. ELECTRICAL PROTECTIVE DEVICES
70.1 General Requirements 26
70.2 Top Overtravel Limit Switch 26
70.3 Anti-creep Levelling Device 26
70.4 Normal Limit Switches 26
70.5 Door Lock Valve 26
70.6 Flying Counterweight Overtravel Limit Switch 26

SECTION 71. TERMINAL STOPPING DEVICES
71.1 General Requirements 27
71.2 Normal Limit Switches (Slowing Down and Stopping) 27
71.3 Top Overtravel Limit Switches 27
71.4 Anti-creep Levelling Device 27
71.5 Flying Counterweight Bottom Overtravel Limit Switch 27

SECTION 72. INDICATORS, ANNUNCIATORS, ALARMS, TELEPHONES, ETC 28

SECTION 73. CAR AND COUNTERWEIGHT SAFETY GEAR 28

SECTION 74. SPEED GOVERNORS 28

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
THE DESIGN, INSTALLATION, TESTING AND OPERATION OF LIFTS, ESCALATORS AND MOVING WALKS

PART 3—ELECTROHYDRAULIC LIFTS: PASSENGER AND GOODS

SECTION 40. SCOPE AND GENERAL

40.1 SCOPE. This standard sets out requirements for electrohydraulic lifts for carrying passengers and goods. It includes requirements for design, manufacture, installation and operation.

This standard is complementary to AS 1735, Parts 1 and 2, but the requirements of this standard take precedence over corresponding requirements of those standards.

40.2 MAXIMUM PERMISSIBLE SPEED. The rated speed of an electrohydraulic lift (see Clause 2.471 of AS 1735, Part 1), shall not exceed 1 m/s.

The speed in the down direction, under full load conditions, shall not exceed the value given in Table 40.2, as appropriate, provided however that in no case shall the down-speed exceed 1.4 m/s. For a lift designed for carrying passengers and goods, the speed in the down direction shall comply with the requirements given in Table 40.2 for passenger lifts.

TABLE 40.2
MAXIMUM SPEED IN DOWN DIRECTION

Lift installation	Maximum down-speed increase over rated speed	
	Rated speed not more than 0.5 m/s percent	Rated speed more than 0.5 m/s but not more than 1 m/s percent
Passenger	50	40
Goods	60	50*

*Maximum down-speed 1.4 m/s.

40.3 BEAMS, SUPPORTS AND FOUNDATIONS FOR CYLINDERS, MACHINES AND OVERHEAD SHEAVES. The beams, floors and other structures for the support of cylinders, machines, diverting or overhead sheaves shall comply with the relevant requirements of Clauses 4.2 to 4.6 of AS 1735, Part 2.

40.4 PRESSURE TEST AFTER ERECTION. After erection and before being put into service, the equipment shall be subjected to a hydraulic pressure test as described in Section 512 of AS 1735, Part 10.

40.5 DEVICES TO HOLD CAR ABOVE LOWEST FLOOR. For direct-acting electrohydraulic lifts, devices shall be provided to hold the car above the lowest floor, in accordance with the following requirements:

(a) Suitable means shall be provided to—

(i) support the car above the lowest landing so as to give an access space of at least 600 mm during service and repair of hydraulic equipment in the pit;

(ii) hold down the car during pressure tests required by Section 512 of AS 1735, Part 10. The supporting means required in (a)(i) above, or equivalent means, shall also be in position during such tests, as a precaution against the car descending in the event of any failure.

(b) The equipment provided may be a combined unit to meet the requirements of (a) above.

(c) The equipment under (a)(i) above shall remain on site and, where practicable, in the pit, provided that it will not restrict the mechanical and man clearances specified in Clause 47.1; alternatively this equipment shall be stored in the machine room.

Such equipment shall be identified as to its use.

(d) Permissible stresses in the supporting means shall comply with the requirements of Clause 6.1.1 of AS 1250; and fixings thereof, if used, shall be designed with a factor of safety of 2 on yield strength, based on the fully loaded car.