

Vehicle lifts —

Part 1b: Specification for fixed lifts

Committees responsible for this British Standard

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- Associated Offices Technical Committee
- Association of Loading Equipment Manufacturers
- British Work Platform Association
- Construction Plant-hire Association
- Department of Industry, Mechanical Engineering
- Electricity Supply Industry in England and Wales
- Federation of Wire Rope Manufacturers of Great Britain
- Garage Equipment Association
- Health and Safety Executive
- London Transport Executive
- Post Office

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Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 Definitions	1
3 General requirements	1
4 Special requirements	6
5 Instructions for installation, maintenance and examination	7
Appendix A Recommendations for installation	8
Appendix B Recommendations for maintenance and examination	8
Appendix C Recommendations for the safe use of lifts in service	12
Figure 1 — Surface-mounted lift	3
Figure 2 — Flush-mounted lift	3
Figure 3 — Recessed lift, drive-through application	4
Figure 4 — Recessed lift, back-off application	5
Figure 5 — Axle and chassis supporting lift	7
Figure 6 — Overbalance type	7
Figure 7 — Strut-supported type	7
Figure 8 — Layout for certificate for testing	9
Figure 9 — Link plate depth	11
Table 1 — Wire rope discard criteria	10
Table 2 — Chain extension criteria	11
Publications referred to	Inside back cover

Foreword

This British Standard has been prepared under the direction of the Mechanical Engineering Standards Committee after consultation with the Automobile Standards Committee, as a result of requests from industry, and has been based on proposals from the Society of Motor Manufacturers and Traders. BS AU 161 was originally published in 1973 and dealt with both fixed lifts and mobile lifts. It has been decided to publish the revised standard in two Parts: Part 1 “Fixed lifts” and Part 2 “Mobile lifts” (in course of preparation). It is intended to defer withdrawal of BS AU 161:1973 until Part 2 of this revision also is published.

This Part of this standard sets out various performance requirements that are intended to ensure that vehicle lifts have an adequate performance and are safe in operation.

In particular, it is hoped that inadvertent operation of the lifts will be prevented by the use of the “dead man” type of control, which requires a positive action by the operator to lower the lift. Particular attention is drawn to the fact that heavy vehicles (above 3 tonnes) should be manually chocked, because experience has shown that once such vehicles are set in motion, their motion cannot be successfully arrested by the automatic chocks provided.

In order to help users operate their lifts safely, recommendations on installation, maintenance and examination, and on the safe use of lifts in service have been included in Appendix A, Appendix B and Appendix C, respectively.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard specifies requirements for the performance of fixed vehicle lifts.

NOTE 1 Recommendations for the installation, maintenance and safe use of lifts in service are included in Appendix A, Appendix B and Appendix C.

NOTE 2 The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this Part of this British Standard the following definitions apply.

2.1

vehicle lift

a fixed appliance that is designed to raise the whole of a vehicle to a height of not less than 0.5 m and not more than 2.0 m, and that is designed to be used solely for the purpose of examining and working on the vehicle while in a raised position

NOTE 1 Lifts or hoists for the use or transference of vehicles, goods, materials or persons from one level to another are not covered by this definition.

NOTE 2 The vehicle lifts are of the wheel-, axle- or frame-supporting type and:

- a) of the single- or multi-ram type;
- b) of the single- or multi-post type.

NOTE 3 The vehicle lifts are powered by the following means:

- a) hydraulic, including both fully- and semi-hydraulic systems;
- b) pneumatic;
- c) mechanical;
- d) electrical;
- e) manual;
- f) or any combination of a) to e).

2.2

design load

the load that a lift complying with the requirements of this standard has been designed to carry (see 3.11)

2.3

safe working load

the load for which a lift has been certified (see A.5)

2.4

maximum design pressure

the hydraulic or pneumatic pressure corresponding to the design load (2.2)

3 General requirements

3.1 Factor of safety

3.1.1 General. All lifts shall be capable of statically supporting an applied load of 25 % above the design load without permanent deflection or failure of any part. In the case of wheel-supporting lifts, the runways shall be capable of supporting a static load of 25 % above the design load specified for each wheelbase shown on the marking plate (see 3.11).

A type test of the lift with the above-mentioned applied load shall be carried out by the manufacturer.

3.1.2 Mechanical parts. Load-bearing mechanical parts not referred to elsewhere in 3.1 shall not be stressed to more than one-third of the tensile strength of the material. Where any mechanical part is subjected to shock loading the static factor of safety shall be not less than 6 : 1.

3.1.3 Wire rope. Each wire rope shall be capable of supporting its design load with a factor of safety of not less than 5 : 1, based on the minimum breaking load of the rope. Sheaves and drums shall be provided with adequate rope retainers. Each rope shall be issued with a test certificate such as Form 87¹⁾.

3.1.4 Chains. Each chain shall be capable of supporting its design load with a factor of safety of not less than 5 : 1, based on the calculated breaking load of the chain.

NOTE Breaking loads for leaf chains are given in BS 5594.

Each chain shall be issued with a test certificate such as Form 97²⁾.

3.1.5 Terminations. The strength of each termination shall be at least 80 % of that of the rope or chain.

3.1.6 Hydraulics and pneumatics. All rams, cylinders and associated pipework and fittings shall be capable of withstanding a pressure of twice the maximum design pressure without permanent distortion or failure.

All pressure hoses and their associated fittings shall be capable of withstanding a pressure of four times the maximum design pressure without permanent distortion or failure.

3.2 Holding the load. Every lift shall be capable of holding its design load as soon as lifting ceases. If the internal friction of the drive is insufficient for this purpose, a suitable automatic brake shall be provided.

¹⁾ H and SE Form 87 is obtainable from HMSO.

²⁾ H and SE Form 97 is obtainable from HMSO.

3.3 Electrical equipment. All electrical equipment and wiring supplied with the lift shall comply with the requirements of the relevant British Standards.

NOTE Account has to be taken of the current IEE “Regulations for the Electrical Equipment of Buildings”³⁾ and the requirements of the local authority in whose area the lift is installed.

3.4 Control means. The control device for raising and lowering the lift shall be of the type that automatically returns to the “off” or “neutral” position when released by the operator and shall be so designed that the “dead man” feature cannot be readily overridden. The control device shall be of such a type, or be so positioned, that it cannot be inadvertently operated.

The direction of movement of the lift shall be indicated by arrows on the control device. Where this device is a lever operating in the vertical plane, it shall be constructed in such a way that the up movement raises the lift and the down movement lowers the lift.

Adequate operating instructions shall be given clearly on a plate attached to the lift.

NOTE In common with other “dead man” controllers, the return of the handle to the “off” position will initiate action to bring the lift to a halt, but this does not imply that the lift will be able to stop instantaneously. In the case of semi-hydraulic lifts, the control handle should always be held in the down position when the lift is returned to the ground until all pressure is exhausted from the system. Controls should be so situated that the operator has a clear view of the space beneath the lift before descent commences.

3.5 Rate of descent. Every lift shall be equipped with a device that in the event of failure of the lifting mechanism will prevent the lift from descending at a rate greater than 0.1 m/s when carrying its design load.

The ram assembly of a hydraulic lift shall include an orifice or other restriction to control the transfer of hydraulic fluid so that, in the event of a failure of the hydraulic piping which feeds the ram or cylinder, the lift will not descend at a rate greater than 0.1 m/s when carrying its design load.

3.6 Chocks

3.6.1 Lifts with a design load of up to and including 3 tonnes. Where a wheel-supporting lift is installed to allow approach and departure from either end, automatic chocks, at least two at each end of the lift, shall be provided at the approach and departure ends of wheel-supporting runways and they shall automatically rise into position in the first 300 mm of ascent and shall not retract automatically before the last 300 mm of descent.

Where a wheel-supporting lift is installed to allow approach and from end only, the opposite end shall be provided with automatic chocks as already specified or permanent chocks.

The width of automatic or permanent chocks shall extend from a point not more than 70 mm from the inner flange of the runway to a point not more than 70 mm from the outer flange, measured on the flat. The part of the chocks that first comes into contact with the tyre shall be not less than 100 mm high.

Automatic and permanent chocks shall be capable of arresting any unpowered movement of vehicles with a mass equivalent to the design load of the lift.

NOTE Manual chocks may be used in addition to or in combination with automatic chocks.

3.6.2 Lifts with a design load above 3 tonnes.

Portable chocks shall be provided that are capable of preventing any unpowered movement of the vehicle, once it is positioned on the lift, when the chocks are placed in front of and behind at least one of the wheels of the vehicle.

3.7 Ramps. The angle or slope of the approach and departure ramps shall not exceed 20° from the horizontal.

Hinged ramps shall, when the lift is fully lowered, be capable of lifting so as to provide at least the minimum toe clearance specified in 3.8.

3.8 Toe clearance

3.8.1 General. Toe clearance as described in 3.8.2 and 3.8.3 shall be provided along the outer edge of exposed moving structures not normally covered by the vehicle.

3.8.2 Wheel-supporting lifts

3.8.2.1 Surface-mounted lifts. Toe clearance shall be provided by a minimum clearance space, as shown in Figure 1, of 120 mm × 50 mm.

3.8.2.2 Flush-mounted lifts. Toe clearance shall be provided by hinged flaps, as shown in Figure 2, of at least 120 mm width. The flaps shall not be capable of being rotated below the horizontal or by more than 75° in the upward direction. After rotation, the flaps shall return to the horizontal position automatically. These flaps shall be capable of withstanding the loads that are encountered in normal practice.

³⁾ Published by and obtainable from the Institution of Electrical Engineers, Savoy Place, London WC2R 0BL.