BRITISH STANDARD

BS 7980:2003
+A1:2012

Vehicle lifts — Installation, maintenance, thorough examination and safe use — Code of practice

ICS 43.180; 53.020.99

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British Standards

Committees responsible for this British Standard

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Garage Equipment Association

Health and Safety Executive

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17053 Corrigendum No. 1	30 April 2007	
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Contents

Foreword

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution. This British Standard has been prepared by Subcommittee MHE/12/-/1. It has been based on proposals from the Garage Equipment Association using the annexes from BS AU 161-1b:1983 and BS AU 161-2:1989. These standards dealt with both fixed and mobile vehicle lifts and have been superseded by BS EN 1493.

BS 7980:2003+A1:2012 supersedes BS 7980:2003, which is withdrawn.

The start and finish of text introduced or altered by Amendment No.1 is indicated in the text by tags A1 A1. Minor editorial changes are not tagged.

This standard sets out various guidance and recommendations to ensure that vehicle lifts are installed, maintained, thoroughly examined and used in a safe manner.

The Health and Safety Executive (HSE) commends the use of this British Standard to those who have duties under the Health and Safety at Work etc. Act 1974 [1]. This British Standard was drawn up with the participation of HSE representatives and will be referred to in relevant HSE publications.

It has been assumed in the drafting of this British Standard that the execution of its provisions is entrusted to appropriately qualified and competent people.

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot 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 19 and a back cover.

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1 Scope

This British Standard provides guidance and recommendations for persons responsible for the installation, maintenance and thorough examination of vehicle lifts. It also provides guidance and recommendations on the safe use of vehicle lifts in garages and similar establishments.

This standard applies to fixed, mobile and movable vehicle lifts, which are not intended to lift persons but are designed to raise vehicles totally, for the purpose of examining and working on or under vehicles whilst in the raised position.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 4800:2011, *Schedule of paint colours for building purposes*.

[A1] *Text deleted.* [A1]

BS 7671, *Requirements for electrical installations —* [A1] *IET Wiring Regulations. Seventeenth edition.* [A1]

BS EN 1493:2010, *Vehicle lifts*.

[A1] BS ISO 4309:2010, *Cranes — Wire ropes — Care and maintenance, inspection and discard.*

ISO 4347:2004, *Leaf chains, clevises and sheaves — Dimensions, measuring forces and tensile strengths.* [A1]

3 Terms and definitions

For the purposes of this British Standard, the following terms and definitions apply.

3.1
vehicle lift
lifting device with guided load carrying device for lifting land based means of transport such as cars, motorcycles, lorries, buses, trams, rail vehicles, industrial trucks and similar, and designed for working on or under the load

NOTE The guidance of the load-carrying device is given by the supporting structure. Additional information regarding vehicle lifts is given in Annex A.

3.1.1
manually driven vehicle lift
vehicle lift where the carrying device is driven by manual effort

3.1.2
power driven vehicle lift
vehicle lift where the carrying device is not driven by manual effort

3.1.3
fixed vehicle lift
vehicle lift fixed permanently to a single location

3.1.4
[A1] *Text deleted.* [A1]

3.1.5
mobile vehicle lift
movable vehicle lift equipped with wheels, rollers, etc. such that it can be moved from one place to another [A1] or be transportable, with or without load depending on design [A1]

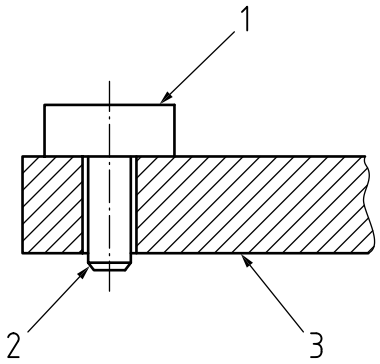
3.2
competent person
person who has such practical and theoretical knowledge and such experience as is necessary to carry out their work and is aware of the limits of his/her own competence, expertise and knowledge

3.3
rated capacity
maximum load that a lift has been designed to carry
NOTE This was previously known as safe working load (SWL).

3.4
load carrying device
part(s) of the vehicle lift that supports the load, either by direct contact with the vehicle or through contact with pick-up plates or pads
NOTE Load carrying devices include tracks, carrying arms or other mechanical devices designed to raise and support a vehicle by designated lifting points.

3.5
carrying arm
load carrying device attached at one end, directly or indirectly to the lifting element and supporting the load at its other end
NOTE Carrying arms are usually used on two column lifts.

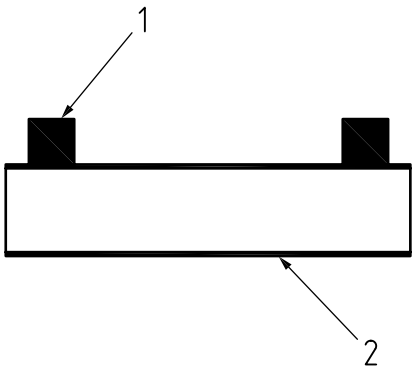
3.6
pick-up plate
part of the load carrying device, e.g. on two column lifts with carrying arms, which has direct contact with the vehicle and which has an assigned position on the load carrying device (see Figure 1)



Key
1 Pick-up plate
2 Pin
3 Load carrying device

Figure 1 — Pick-up plate

3.7
pick-up pad
vehicle supporting pad which has direct contact with the vehicle but which does not have an assigned position, e.g. pads used on wheel free systems with platforms (see Figure 2)



Key

1 Pick-up pad

2 Platform

Figure 2 — Pick-up pad

3.8
lifting element
medium through which a force is transmitted from the power source to the load carrying device

NOTE Lifting elements include hydraulic and pneumatic cylinders, lead screw and nut systems as well as any flexible connections such as steel wire ropes and chains.

3.9
catching device
device which holds the load carrying device in case of failure of the lifting element

3.10
safety switch
switch in which the opening contacts are directly connected to the control mechanism without springs or flexible elements

NOTE The whole of the specified opening of the contacts can be achieved by operation of the control mechanism through its intended travel using the force stated by the manufacturer of the switch (see BS EN 60947-5-1:〈A1〉 2004+A1 〈A1〉, **2.1**).

3.11
wheel track
distance between the centre lines of the wheels on one axle or between centre lines of wheel pairs on twin wheel axles

3.12
blocked-up
physically prevented from fully lowering to the ground thus creating a clearance under the moving parts

4 Installation and commissioning of fixed vehicle lifts

4.1 General

Fixed vehicle lifts should be installed and commissioned by a competent person in accordance with the manufacturer's instructions. 〈A1〉 The installer should supply the manufacturer's English language operation and maintenance instructions with the lift. 〈A1〉

4.2 Positioning

4.2.1 *General*

The vehicle lift should be installed taking account of its position and the accessibility of all parts so that periodic examinations, testing, maintenance and repairs can be readily and safely carried out.

〉A1〈 The suitability of the floor or surface, e.g. concrete, etc., should be assessed in order to confirm its capability of supporting localized loads that could be imposed by the maximum loads on the vehicle lift. 〈A1〉

Regulation 6 of LOLER [2] requires that lifting equipment is positioned or installed in such a way as to reduce, to as low as is reasonably practicable, the risk of the equipment or load striking a person. Therefore, in addition to the positioning of the lift, the lifting operation being carried out should be assessed before the equipment is installed.

Fixed vehicle lifts should be positioned so that throughout their range of movement any moving part is either at least 600 mm away from, or not more than 12 mm away from the nearest fixed structure. Fixed vehicle lifts should be not less than 600 mm away from any other adjacent fixed structure throughout the movement of the lift.

Where a fixed vehicle lift is installed adjacent to any other equipment that moves vertically, the clearance between the equipment and the lift should be at least 600 mm.

Consideration should be given prior to installation to the position of adjacent doorways and other possible hazards.

4.2.2 *Surface and recessed lifts*

4.2.2.1 *General*

The installation of surface and recessed lifts should provide toe protection. If the lift is fitted into a recess it can be blocked-up to provide toe protection beneath the moving structure. If this is not possible, toe protection should be provided in accordance with 〉A1〈 Figure 4 or Figure 5 〈A1〉 as appropriate, where the dimensions should be taken from the extremity of the toe protection. Toe protection can also be achieved if, during the lowering of the lift, the movement is automatically halted at a distance of 120 mm before the danger position. The movement can then be restarted by operation of an additional lowering control or by releasing and reactivating the normal lowering control. It is essential that the final portion of the travel is accompanied by an audible warning signal. In either case it is also essential that it is not possible to override the stopping device such that the lift travels to its initial position without stopping.

Vehicle lifts with CE Marking and modifications to existing vehicle lifts should conform to 〉A1〈 BS EN 1493:2010, **5.17.2** 〈A1〉 regarding safety distances for toe protection 〉A1〈 (see Figure 3) 〈A1〉.

〉A1〈

Dimensions in millimetres

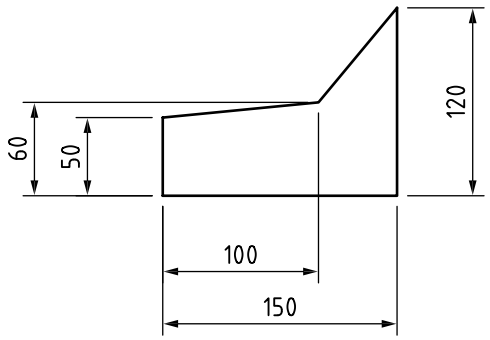


Figure 3 — Clearance for feet

〈A1〉

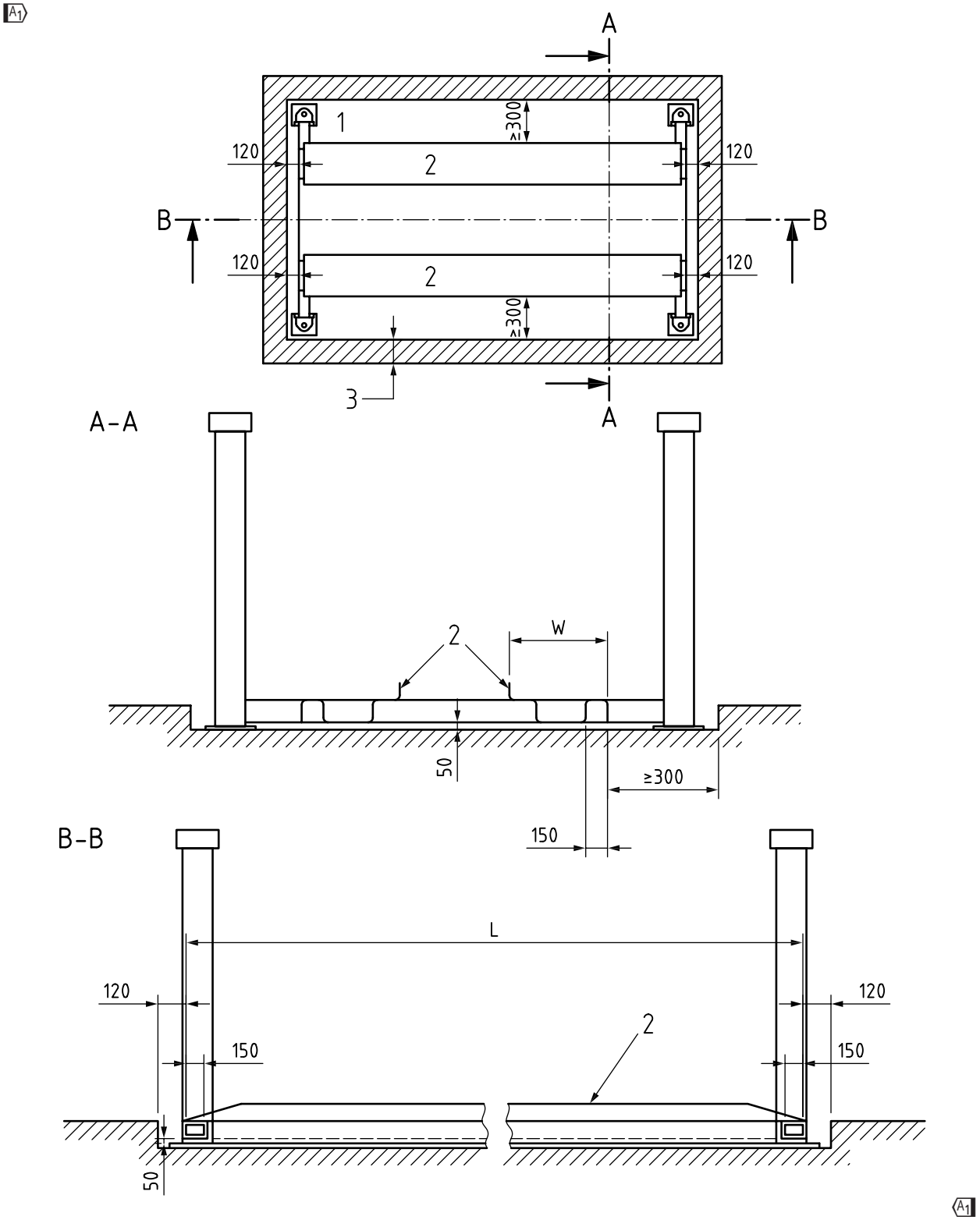
4.2.2.2 *Drive through application (see 〉A1〈 Figure 4 〈A1〉)*

It is essential that toe clearance is provided by having:

a) a minimum space of 120 mm between the exposed end of the moving structure and the recess end wall together with a minimum clearance space of 150 mm × 50 mm below the moving structure;

b) a minimum space of 300 mm between the exposed outer side of moving platforms and the recess side wall together with a minimum clearance space of 150 mm × 50 mm below the moving platforms.

All dimensions are in millimetres



Key

1 Edge of recess

2 Moving runway

3 300 mm Marking

Figure 4 — Recessed lift, drive through application

4.2.2.3 *Drive-on, back-off application (see [A1] Figure 5 [A1])*

It is essential that toe clearance is provided by having:

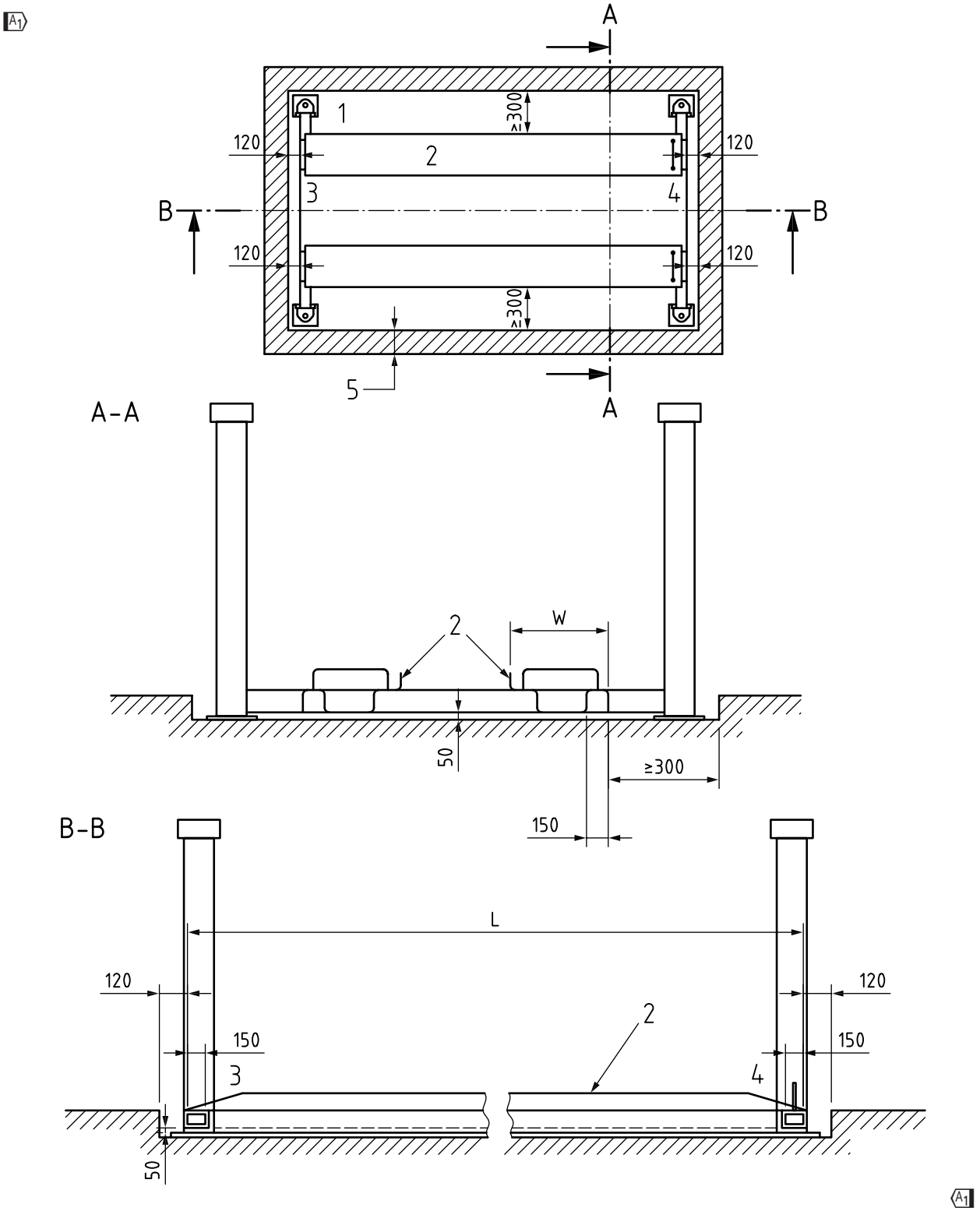
a) a minimum space of 120 mm between the exposed end of the drive-on end of the moving structure and the recess end wall together with a minimum clearance space of 150 mm × 50 mm below the moving structure;

b) a minimum space of 300 mm between the exposed end of the dead end of the moving structure and the recess end wall together with a minimum clearance space of 150 mm × 50 mm below the moving structure;

c) a minimum space of 300 mm between the exposed outer side of moving platforms and the recess side wall together with a minimum clearance space of 150 mm × 50 mm below the moving platforms.

NOTE The dead end of the lift can be positioned in close proximity to a flush vertical wall providing the lift is positioned in accordance with **4.2.1**.

All dimensions are in millimetres



Key

1 Edge of recess
2 Moving runway
3 Drive on end
4 Dead end
5 300 mm Marking

Figure 5 — Recessed lift, back-off application

4.2.3 *Marking of the floor*

The floor should be clearly marked for a distance of 300 mm from the edges of the recess (see ⟩A1⟨ Figure 4 or Figure 5 ⟩A1⟨). The markings should be 100 mm wide yellow stripes conforming to 08 E 51 of BS 4800:2011 on a 300 mm pitch angled at 45°.

NOTE Attention is drawn to the Health and Safety (Safety Signs and Signals) Regulations 1996 [3] (see also ⟩A1⟨ BS ISO 7010 ⟩A1⟨).

4.3 Water separator

Where compressed air is used to control hydraulic lifts, an automatic water separator should be incorporated in the air supply line.

4.4 Thorough examination after installation

Regulation 9 of LOLER [2] requires that vehicle lifts are thoroughly examined by a competent person after installation and before being put into use. A report of the thorough examination should be provided confirming whether the lift has been installed correctly and is safe to use.

A load test should be carried out as part of the thorough examination to check for faults with the installation or the floor. Load tests should be carried out using the manufacturer's rated maximum capacity of the lift. The test loads should result in an even loading of the lifting elements and be of proven accuracy to within ±1.0%. If test loads are proven on a weighbridge, the weighbridge should have been calibrated within the previous 12 months.

Tests should be carried out over the full operational travel of the lift and include all operations and accessories. The lift should be examined before, during and after load testing to ascertain whether:

— the floor shows any sign of cracking;
— the lift structure and especially welds, show any signs of cracking;
— there are any excessive deflections under load;
— there are any permanent deformations after removal of the load;
— the lift starts and stops instantaneously throughout its travel;
— there is any evidence of hydraulic creep or oil leaks (see **6.3.4.2**);
— checks required by the competent person are satisfactory;
— rope anchorages are secure;
— final assembly of the vehicle lift conforms to the manufacturer's specification.

It might be desirable to test the lift at a lesser load than the rated capacity if grounds exist for this to be considered. In this case the marking of the rated capacity on the lift should be changed to suit the actual load used and the details recorded in the report of thorough examination.

The results of the load test should be provided, together with the first report of thorough examination following that load test. These should be available with the lift throughout its life together with the results of all tests, inspections, maintenance and repairs. Each subsequent report of thorough examination should be retained for a period of at least two years following examination.

NOTE 1 Attention is drawn to LOLER [2] regarding the availability of information.

In the event of replacement or major repair to load carrying or structural components of the lift, or the re-installation, or a change to the rated capacity, the lift should undergo a load test and thorough examination before being put back into use. A new test certificate and report of thorough examination should be provided for the user. Lifting nuts, ropes and chains are regarded as wearing items and therefore a load test is not required following normal replacement of these items by a competent person. ⟩A1⟨ Replacement ropes and chains should be provided with a declaration of conformity or a manufacturer's load test certificate. Replacement load nuts, when supplied by the original equipment manufacturer (OEM), require no additional documentation, however, if supplied by a third party, then evidence of their suitability in accordance with BS EN 1493 should be available.

Where replacement safety nuts or combined load and safety nut assemblies are supplied by a third party, they are safety components as defined in the Supply of Machinery (Safety) Regulations 2008 [4], and should be provided with a declaration of conformity.

NOTE 2 This does not apply to such OEM supplied parts. ⟩A1⟨

5 Commissioning of mobile vehicle lifts

5.1 General

Mobile vehicle lifts should be commissioned by a competent person in accordance with the manufacturer's instructions.

When up-grading mobile vehicle lifts by the addition of more columns, these new units should be both electrically and mechanically compatible. Different models or capacities should not be mixed in a set of mobile columns. The up-grade should be carried out and checked by a competent person before being put into use.

5.2 Testing

All load testing and certification of mobile vehicle lifts (whether singles, pairs, sets of 4, 6 or 8) is carried out by the manufacturer. All necessary certificates and English language operating instructions or technical manuals should be delivered with the mobile vehicle lift.

In the event of replacement or major repair to load carrying or structural components of the lift, or a change to the rated capacity, the lift should undergo a load test and thorough examination before being put back into use. A new test certificate and report of the thorough examination should be provided for the user. Lifting nuts, ropes and chains are regarded as wearing items and therefore a load test is not required following normal replacement of these items by a competent person. Lifting nuts, ropes and chains should be provided with a declaration of conformity or a manufacturer's load test certificate.

5.3 Electrical supply

The user should utilize an electrical source that incorporates over-current protection, non-automatic isolation and switch for each single lifting unit and multiple unit mobile vehicle lift in addition to the protection provided by the manufacturer.

The electrical supply to the lift should also embody an earth leakage circuit breaker having appropriate characteristics in accordance with BS 7671 〚A1〛 *Text deleted* 〚A1〛.

If the work area has a number of multi-phase electrical sockets that can be used to power the vehicle lift it is essential that they are wired in the same phase relationship.

5.4 Controls

Prior to lifting a load the mobile vehicle lift should be connected to an electrical supply and operated to verify that the direction of motion conforms to the indicators on the controls. Each manual control should be checked individually in order to operate the lift throughout the full travel of all motions so that limiting devices are proved operational.

6 Maintenance, inspection and thorough examination of fixed and mobile vehicle lifts

6.1 General

Thorough examinations of vehicle lifts are carried out under the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) [2]. These regulations are also concerned with other matters such as the strength, positioning and use of lifting equipment.

The duty to maintain vehicle lifts and to provide suitable lifting equipment falls within the scope of the Provision and Use of Work Equipment Regulations 1998 (PUWER) [5].

Although they are separate individual activities, thorough examination, inspection, operator checks and maintenance should be considered as a related package to ensure the ongoing integrity of vehicle lifts.

The owner/employer should ensure that the vehicle lift is maintained in accordance with the manufacturer's maintenance manual and instructions, to ensure it is safe, in efficient working order and in good repair. All necessary maintenance should be carried out within a safe system of work.

Maintenance and testing of electrical equipment should be carried out at regular prescribed intervals by competent persons. Recording of the results and values measured provides a baseline figure for assessing any subsequent deterioration in performance and quality.

6.2 Routine inspection and maintenance

In unusual situations, for example vehicle manufacturing assembly lines, where the use or environment is more onerous than that normally found in vehicle repair shops or similar establishments, the inspection/maintenance regime should reflect this in terms of frequency and stringency.

The following is a guide to the normal schedule of routine maintenance carried out on vehicle lifts. The employer should supply the manufacturer's English language maintenance instructions with the lifts and these should be adhered to where they differ from this schedule.

a) DAILY INSPECTIONS

Vehicle lifts should undergo a daily visual inspection by the operator to ensure their serviceability. If used less frequently inspections should be carried out prior to starting work. Inspections vary according to the type of equipment but should include inspection of the following:

1) steel wire ropes and lifting chains for damage, corrosion or lack of adjustment;

2) hydraulic equipment and connections for leaks;

3) support pads, adapters or blocks for wear or damage;

4) ⟨A1⟩ arm locking for full, automatic engagement, automatic chocks and height limit devices for correct operation. ⟨A1⟩

b) MONTHLY INSPECTIONS/MAINTENANCE

Vehicle lifts should also undergo monthly inspection/maintenance during which:

1) steel wire ropes, lifting chains, carriage rollers and pulley pins are lubricated;

2) the security of all foundation anchor bolts is checked;

3) any screw and nut lubrication systems are topped up with the correct lubricant.

c) SIX MONTHLY INSPECTIONS/MAINTENANCE

Vehicle lifts should also undergo 6 monthly inspections/maintenance during which:

1) ⟨A1⟩ the condition of steel wire ropes and pulleys is checked. Check the ropes for flattening, corrosion or broken wires. Examine the ropes in accordance with the discard criteria given in BS ISO 4309:2010, Clause **6**. Renew load suspension wire ropes after a maximum period of 6 years irrespective of their apparent condition.

NOTE This interval may be shortened due to the operating environment, utilization, duty and previous rope replacement history. This recommendation for wire rope replacement does not replace but complements the normal 6 monthly inspection. ⟨A1⟩

2) the condition of lifting chains and pulleys for wear, corrosion or damage is checked. Examine the chains in accordance with **6.3.5**;

3) the hydraulic oil level is checked/topped up;

4) the operation of limit switches and other travel limit devices are checked;

5) the electrical equipment and wiring is checked for burnt or loose connections and terminations;

6) the operation of lifting arm locking devices and telescopic arm stops is checked;

7) welds and load bearing or structural components are checked for cracks or damage;

8) drive chains, sprockets and bearings are lubricated;

9) all bearings, pivot pins and other moving parts are lubricated;

10) tightness of all nuts and bolts is checked;

11) load nuts, safety nuts and lifting screws are checked for wear or damage. Check load nut wear against criteria given by the manufacturer. Where the load nut has reached the prescribed limit of wear renew both the load nut and the associated safety nut together.

12) drive chains are checked for wear and adjustment;

13) chain sprockets and pulleys are checked for wear;

14) condition of drive belts is checked and tension adjusted if necessary;

15) roller and guide blocks are examined for evidence of wear;

16) the lift is examined for signs of corrosion;

17) the lift is examined for evidence of permanent deformation or fatigue;

18) catching devices are inspected to ensure correct operation and that they are intact, securely fitted and not damaged or worn beyond serviceable limits;

〉A1〈 19) lifting arms are fully extended and checked for free play, which should not exceed the lift manufacturer's guidelines or, in the absence of such information, the diameter of the circular pick up plates or shortest side of the rectangular type. 〉A1〈

A record of all 6 monthly inspections/maintenance and all repairs should be kept and be retained with the lift throughout its working life.

6.3 Thorough examinations of vehicle lifts

6.3.1 *General*

Regulation 9 of LOLER [2], requires that employers ensure that lifting equipment which is exposed to conditions causing deterioration, which is liable to result in a dangerous situation, is thoroughly examined periodically by a competent person. As persons routinely work beneath suspended loads the thorough examinations should be carried out at intervals not exceeding 6 months.

NOTE Schemes of examination can allow for different periods between thorough examinations in certain circumstances following an assessment of condition, environment and duty cycle.

The thorough examination should encompass all aspects of the vehicle lift including structural and mechanical integrity, assessing wear and deterioration and confirm the operation of all safety devices where practicable.

The vehicle lift should be examined without load to enable a thorough assessment to be carried out. Removal of guards is essential to enable key components to be closely examined.

In cases where dismantling is necessary, the employer should provide appropriate assistance for the competent person.

In cases where there are grounds for concern and the condition of key components can neither be ascertained nor substantiated by documentary evidence, the competent person might require further dismantling and/or testing to be undertaken.

Following the thorough examination the competent person should produce a report of thorough examination. In cases where a defect is found involving an existing or imminent risk of serious personal injury, LOLER [2] requires that a copy of the report be forwarded to the appropriate enforcing authority for the premises, i.e. The Local Authority or the Health and Safety Executive.

6.3.2 *Thorough examination points*

NOTE The following guidance on the scope of thorough examination of vehicle lifts is not intended to be exhaustive, nor is it intended to detract in any way from the authority of the competent person carrying out the thorough examination.

A thorough examination should include the following points.

a) Visually examine the electrical supply for physical condition of wiring, burnt or loose connections, and damaged or deteriorating wiring. Examine deadman controls for operation.

b) Visually examine columns for alignment, damage or distortion. Examine base plates for distortion and plate to column welds for cracks. Examine holding down bolts for security or deformation.

c) Check the motor(s) and drive arrangement for security/fit of parts, wear, damage or deformation.

d) Check the marking of rated capacity, operating instructions, manufacturers details, hazard identification marking, isolator identification etc. are present.

e) Check safety clearances, e.g. toe trapping points between lift arms/platform and floor and working clearances between the lift and walls/roofs.

f) Check for evidence of adequate maintenance, e.g. lubrication.

g) Examine the upper and lower limit switches and upper terminal limit, if fitted, and their operating rods/cables for correct operation/adjustment, wear, damage, deterioration and security/fit of parts.

h) Examine the obstacle limit switch and safety pawl/fail safe device/safety switches and their operating mechanism/rod/cable for correct operation/adjustment, wear, damage, deterioration and security/fit of parts.

i) Check the lifting carriages, lifting arms and support pads and stops for damage, deformation and cracks. 〉A1〈 Lifting arms are fully extended and checked for free play, which should not exceed the lift manufacturer's guidelines, or in the absence of such information, the diameter of circular pick up plates or shortest side of the rectangular type. 〉A1〈

j) Examine the lifting arm telescopic stops and automatic pivoting devices for correct operation, wear, damage, distortion and security/fit of parts.

k) Examine the lifting carriage synchronization mechanism for correct operation, and associated mechanism for wear, damage and security/fit of parts. If cable or chain operated, check the slack chain/cable switch for operation. Check the cable/chain and associated sheaves/sprockets and pins for wear, damage, deterioration, security and fit of parts.

l) Check the ramp/platform structure for damaged, distorted members, cracked or broken welds, deterioration or corrosion. Examine guide rollers and their attachments for correct adjustment, wear, damage, deterioration, security and fit of parts.

m) Examine ramp stops, fixed and automatic chocks, for security and correct operation.

n) Examine the mechanical locking devices and catching devices and associated components for correct adjustment/operation, wear, damage, distortion, cracks, security and fit of parts.

o) Examine the "wheel free" mechanism for correct operation of locking device, damage or distortion.

p) Examine chains and chain anchorages, see **6.3.5**.

q) Examine ropes and rope anchorages, associated pulleys, pins and rope retainers for wear, broken wires, damage, distortion, corrosion, security and fit of parts. Examine ropes against the discard criteria detailed in A1 BS ISO 4309 A1.

Where any wire rope is judged to require renewal or has failed, replace all wire ropes serving a similar application on the lift. Where a wire rope has been damaged during the installation of the lift or rope, renewal of the single damaged rope is acceptable.

A1 *Text deleted.* A1

Mark all ropes with date identification on installation of the vehicle lift and mark subsequent rope renewals with the date of installation and retain all records.

A thorough examination should include a functional and operational test through all motions.

6.3.3 ***Screw drive vehicle lift***

In addition to the general aspects, a thorough examination of a screw drive vehicle lift would also include the following points.

— Examine leadscrews and their bearings for wear or damage.

— Examine load nuts and safety nuts for wear, damage or distortion.

— Where load nut monitoring switches are fitted, check for their correct adjustment, security and functionality at each examination.

6.3.4 ***Hydraulic drive vehicle lift***

6.3.4.1 *General*

In addition to the general aspects, a thorough examination of a hydraulic drive vehicle lift would also include the following points.

— Examine the operating cylinder and its ram for leakage, scores, damage and deterioration. Check seals for leakage, damage or deterioration. Check cylinder fixings/connections for damage, distortion, cracks, security/fit of parts.

— Check the hydraulic oil for condition and correct level.

— Check hydraulic/pneumatic pipework for leaks and security of fixings.

6.3.4.2 *Hydraulic drive vehicle lift (buried cylinders)*

In addition to the aspects given in **6.3.4.1**, a thorough examination of a hydraulic drive vehicle lift with buried cylinders would also include the following points.

— Assessment of creep under load where applicable.

— Examine the vehicle support frame and its connections to the ram top for distortion, damage, deterioration, cracked or broken welds, security/fit of parts.

— Examine the pipework to control valves and control valves for deterioration, damage, leakage and security/fit of parts.

Due consideration should be given to the condition of the buried cylinder. In the absence of any relevant manufacturer's recommendations pertaining to the in-service testing of the cylinder, a pressure test to 1.5 times the maximum design pressure should be carried out once every 4 years.

In the event of failure to hold the pressure for a period of 15 min to within 5 % of the initial pressure and if the cause cannot be ascertained, the cylinder should be withdrawn for further examination.

In addition, the withdrawal of cylinders should be considered at 12 yearly intervals where the condition cannot be ascertained by close visual examination.

[A1] NOTE Modern electric/hydraulic drive lifts do not normally require the above tests as the in-ground cassette containing all parts is usually readily accessible, however where any concerns exist, i.e. evidence of corrosion on cylinder, unexplained creeping, etc. then the competent person may call for such tests. [A1]

6.3.5 *Chains*

NOTE Only leaf type chains conforming to [A1] ISO 4347 [A1] are recommended for use as a load carrying chain in vehicle lift applications and, therefore, this guide covers only this type of chain construction.

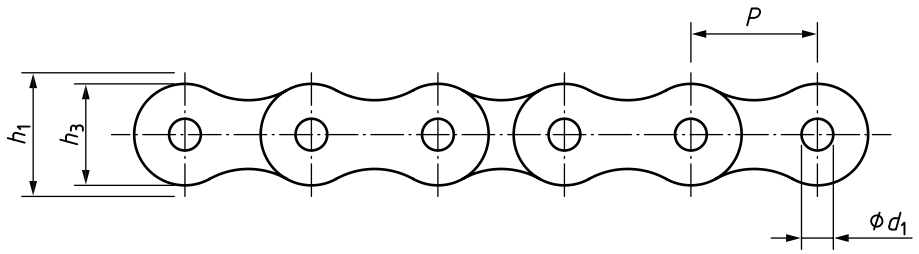
All load suspension chains, terminations and attachments should be thoroughly examined by a competent person at least once every 6 months. The purpose of this examination is to determine the physical condition of the chain and assess the condition in relation to further use. The competent person might suggest the chain is renewed if it is thought to be unsafe for further use.

Before carrying out examination of the load-carrying chains, they should be thoroughly cleaned. If it is not possible to examine the whole of the chains while in situ, then they should be removed.

In deciding the condition of a chain, the following criteria should be used as a guide.

a) Check the chains for wear on the link plate edges, i.e. the wear caused by running over sheaves.

The maximum reduction in plate depth should be not more than 5 % of the total plate depth h_3 as shown in [A1] Figure 6 [A1]. The correct h_3 dimension can be ascertained from [A1] ISO 4347 [A1] and by measuring a portion of the chain that does not run over the sheave, e.g. a portion near the chain anchor point.



[A1] Figure 6 [A1] — Link plate depth

b) Examine the chains for cracked or missing link plates.

c) Examine the chains for elongated holes in the outer link plates (head of pin in danger of pulling through).

d) Examine chains for loose or worn pins with damaged heads.

e) Examine the chains for evidence of rust or corrosion, particularly on inner faces of link plates.

f) Check for extension of the chains.

The extension should be measured over portions of the chain at a minimum of three separate locations and particularly where the chain passes over a sheave. The maximum extension of the chain should not exceed [A1] 3 % [A1] measured over 10 pitches.

NOTE Whilst carrying out this check the length of chain being measured is held taut.

It is permissible, in the case of a lift where the chains remain in situ, to apply a suitable load to the lifting members in accordance with checking procedures given by the manufacturer. As an alternative, where the manufacturer does not issue specific instructions, [A1] the self weight of the carriage is deemed as an acceptable load. [A1]

〈A1〉 *Text deleted.* 〈A1〉

Chains that fail any of the criteria given in items a) to f) should be replaced.

Examination should take account of the individual factors. However, deterioration frequently results from a combination of factors giving an additive effect. The competent person should take this into account when making the decision either to discard the chains or to allow them to remain in service. In all cases the competent person should investigate whether the deterioration has been caused by a defect in the appliance.

If the deterioration has been caused by a defect in the appliance, the competent person should recommend action to overcome the defect before new chains are fitted.

Where any chain is judged to require replacement or to have failed, all chains serving a similar application on the item of equipment should be replaced.

Where a chain has been damaged during the installation of the lift or chain, renewal of the single damaged chain is acceptable.

Each chain should be issued with a certificate confirming its adequacy, for example a Declaration of Conformity or a test certificate. All chains should be marked with date identification on installation of the vehicle lift and subsequent chain renewals.

Where chains have been removed and cleaned for examination purposes, they should be lubricated in accordance with the manufacturer's instructions before replacement.

7 Safe use of fixed vehicle lifts

7.1 General

Regulation 9 of PUWER [5] requires that employers ensure that all persons who use work equipment have received adequate training for purposes of health and safety, including training in methods which might be adopted when using the work equipment, any risks which such use can entail and precautions to be taken.

If appropriate to the safe use of the equipment, all locking devices, where fitted, should be seen to be engaged at the operating height before any work is carried out from or under the fixed vehicle lift. Where locking devices are provided at only one height, lifts should not be used or left unattended at intermediate heights.

Where work is carried out from an elevated fixed vehicle lift it is essential that the lift is fitted with proper working platforms and guard rails.

〈A1〉 Before a fixed vehicle lift is raised/lowered, the floor area in and around the lift should be cleared of all persons and obstructions. 〈A1〉

Any ancillary equipment used on the fixed vehicle lift should be of a type suitable for the lift, and be fitted and used in accordance with the manufacturer's instructions.

7.2 Chassis-supporting vehicle lifts

It is essential that vehicles or the lifting arms are precisely positioned in accordance with the manufacturer's instructions to ensure correct weight distribution on the chassis-supporting vehicle lift and correct contact with load bearing points so that the vehicle is in a stable state.

〈A1〉 An assessment of the vehicle's 'centre of gravity' should be made; for most rear wheel drive cars this lies in the area just behind the front seats and for front wheel drive cars this is further forward, generally in-line with the dashboard area. Knowing this helps to position the vehicle correctly, however, care should be taken that any additional weight of items in car boots or rear of vans does not affect the centre of gravity. 〈A1〉

If vehicles have to be driven over the supporting arms, these should be fully lowered prior to loading the vehicle. Telescopic arms should be adjusted clear of wheel tracks. Channels in the floor that accommodate any part of the lifting arms or platforms should be cleaned out at regular intervals.

The removal of a major component, for example the engine, should not give rise to an unstable condition.

[A1] The engine of a vehicle should not be started or be allowed to continue running once the chassis-supporting vehicle lift has been raised from the ground unless it is essential for a vehicle testing operation.

This applies particularly to vehicles with automatic transmissions as these can have a fault that could cause the vehicles wheels to revolve. [A1]

7.3 Wheel-supporting vehicle lifts

To minimize unequal loading of the wheel-supporting vehicle lift, the vehicle weight should be distributed as evenly as possible.

To prevent vehicles running off or slipping off the sides of platforms, wheels should be centred on the platforms. On some types of lift this can be achieved by first adjusting the platforms to the correct track width.

It is essential that vehicles are secured in position on the wheel-supporting vehicle lift to prevent them rolling off. Chocks placed in front of and behind at least one wheel are recommended as one method of achieving this.

The engine of a vehicle should not be started or be allowed to continue running once the wheel-supporting vehicle lift has been raised from the ground unless it is essential for a vehicle testing operation. This applies particularly to vehicles with automatic transmissions as these can have a fault that could cause vehicles to move, and special precautions should be taken, for example wheel chocks.

Care should be taken to ensure the vehicles do not become unstable when one or more of their wheels are raised from the platform.

Some single-ram lifts are capable of being turned when partially or fully raised and therefore, before they are fully lowered, the lift should be in the correct position relative to any floor recesses.

Floor-mounted axle stands should not be used in order to achieve a partial wheel-free state of a vehicle on a single-ram lift capable of being turned when raised.

8 Safe use of mobile vehicle lifts

8.1 General

Regulation 9 of PUWER [5] requires that employers ensure that all persons who use work equipment have received adequate training for purposes of health and safety, including training in methods which might be adopted when using the work equipment, any risks which such use can entail and precautions to be taken.

Mobile vehicle lifts should be operated only on hard floors or surfaces capable of supporting localized loads of 1.75 N/mm^2 that could be imposed by the maximum loads on the mobile vehicle lift. The slope on such floors or surfaces should not exceed 1 in 200 in any direction. Account should be taken of any fixed obstruction in the working area that would impede the safe working of the equipment.

The mobile vehicle lift should be prevented from moving horizontally before raising a load and should not be moved whilst laden. The lift should not be used on uneven floors and gratings, and manhole covers are to be avoided. It is essential that care is exercised when moving unladen lifting units on sloping floors.

The area in which vehicles are lifted should be chosen with care to ensure that other vehicles manoeuvring within the premises do not encroach upon this area. In particular, the workshop entrances and exits should not be obstructed. There should be sufficient headroom to raise the vehicle to the full elevation of the mobile vehicle lift. The minimum clearance between the unit/load and adjacent fixed structures should be 600 mm.

If appropriate to the safe use of the equipment, all locking devices, where fitted, should be seen to be engaged at the operating height before any work is carried out from or under the mobile vehicle lift. Where locking devices are provided at only one height, lifts should not be used or left unattended at intermediate heights.

Where work is carried out from an elevated mobile vehicle lift it is essential that the lift is fitted with proper working platforms and guard rails.

Before a mobile vehicle lift is lowered, the floor below should be cleared of all obstructions.

Any ancillary equipment used on the mobile vehicle lift should be of a type suitable for the lift, and be fitted and used in accordance with the manufacturer's instructions.

8.2 Wheel-supporting mobile vehicle lifts

To minimize unequal loading of the wheel-supporting mobile vehicle lift, the vehicle weight should be distributed as evenly as possible.

To prevent vehicles running off or slipping off the sides of platforms, wheels should be centred on the platforms. On some types of lift this can be achieved by first adjusting the platforms to the correct track width.

It is essential that vehicles are secured in position on the wheel-supporting mobile vehicle lift to prevent them rolling off. Chocks placed in front of and behind at least one wheel are recommended as one method of achieving this.

On mobile vehicle lifts that embody forks to engage the wheels, the correct adapter appropriate to the vehicle wheel size should be used to prevent the wheel passing through the forks in the event of a tyre deflation.

The engine of a vehicle should not be started or be allowed to continue running once the wheel supporting mobile vehicle lift has been raised from the ground unless it is essential for a vehicle testing operation.

Care should be taken to ensure the vehicles do not become unstable when one or more of their wheels are raised from the platform.

If a lifting unit is to be lowered independently it is essential that alternative means of supporting the vehicle are first provided, for example axle stands.

8.3 Chassis-supporting mobile vehicle lifts

It is essential that vehicles or the lifting arms are precisely positioned to ensure even weight distribution on the chassis-supporting mobile vehicle lift and correct contact with load bearing points so that the vehicle is in a stable state.

The removal of a major component from a vehicle, for example the engine, should not give rise to an unstable condition.

9 Existing equipment

Vehicle lifts that were manufactured prior to CE Marking should be adapted, to ensure they do not pose unacceptable risk to people's health and safety.

All vehicle lifts in use should have the following attachments/devices fitted to reduce the risk of accidents:

a) all-round toe protection;

b) hold to run controls;

c) a suitable method of electrical isolation;

d) chocks to prevent any unpowered movement of vehicles;

e) arm locking devices.

All attachments/devices fitted to reduce the risk of accidents should be kept in efficient working order and in good repair.

Annex A (informative)
Additional information regarding vehicle lifts

There are many different types of vehicle lifts incorporating different means of hoisting, which can be mechanical screw or hydraulic operation often incorporating suspension ropes or chains. The most common vehicle lifts have two or four posts, but other designs are in service, which include:

— single, three or six post;

— single and multiple hydraulic cylinders;

— movable and multiple mobile column lifts;

— scissor, inflatable and parallelogram lifts;

— short stroke lifts that support vehicle wheels, chassis or other designated lifting points.

NOTE Short stroke lifts are floor mounted vehicle lifts with a maximum vertical travel of not more than 500 mm, which are not designed for working under the raised load.

Vehicle lifts are normally power driven but some types are available which are manually driven, for example some motorcycle lifts.

A vehicle lift can have the ability to tilt the load carrying device about a horizontal axis parallel to or perpendicular to the main axis of the lifted vehicle.

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