

Vedlikehold av heiser og rulletrapper Regler for vedlikeholdsinstruksjoner

Maintenance for lifts and escalators
Rules for maintenance instructions

Nasjonalt forord

Den engelskspråklige versjonen av europeisk standard EN 13015:2001+A1:2008 er fastsatt som Norsk Standard NS-EN 13015:2001+A1:2008 i november 2008.

Denne standarden erstatter NS-EN 13015:2001.

National foreword

The English language version of European Standard EN 13015:2001+A1:2008 has been adopted as Norwegian Standard NS-EN 13015:2001+A1:2008 in November 2008.

This standard supersedes NS-EN 13015:2001.

English Version

Maintenance for lifts and escalators - Rules for maintenance instructions

Maintenance pour les ascenseurs et les escaliers
mécaniques - Règles pour les instructions de maintenance

Instandhaltung von Aufzügen und Fahrtreppen - Regeln für
Instandhaltungsanweisungen

This European Standard was approved by CEN on 21 June 2001 and includes Amendment 1 approved by CEN on 29 June 2008.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.







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EN 13015:2001+A1:2008 (E)

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Foreword

This document (EN 13015:2001+A1:2008) has been prepared by Technical Committee CEN/TC 10, "Lifts, escalators and moving walks", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2009, and conflicting national standards shall be withdrawn at the latest by January 2009.

This document includes Amendment 1, approved by CEN on 2008-06-29.

This document supersedes EN 13015:2001.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1**.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EC Directive(s).

A1 For relationship with EC Directive(s), see informative Annexes ZA, ZB and ZC, which are integral parts of this document. **A1**

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

0 Introduction

This European Standard is a type C standard as stated in EN 1070.

Only correct and preventative maintenance performed by a competent maintenance person in conformity with the maintenance instructions can ensure the safe and intended functioning of an installation.

In this Standard it is assumed that the installation to be maintained has been legally placed on the market.

1 Scope

This European Standard specifies the elements necessary for the preparation of the instructions for the maintenance operations, as in 3.1, which are provided for new installed passenger lifts, goods passenger lifts, accessible goods only lifts, service lifts, escalators and passenger conveyors.

This European Standard does not cover:

- a) instructions for the installation and the dismantling;
- b) any legal examinations and tests based on national regulations.

Existing installations are not covered by this Standard, but it can be taken as a reference.

2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies (including amendments).

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EN 81-1, *Safety rules for the construction and installation of lifts - Part 1: Electric lifts*

EN 81-2, *Safety rules for the construction and installation of lifts - Part 2: Hydraulic lifts*

EN 81-3, *Safety rules for the construction and installation of lifts - Part 3: Electric and hydraulic service lifts*

☐ deleted text ☐

prEN 81-7, *Safety rules for the construction and installation of lifts - Part 7: Rack and pinion lifts*

☐ deleted text ☐ EN 81-28, *Safety rules for the construction and installation of lifts - Part 28: Remote alarms on passenger and goods passenger lifts*

☐ EN 115-1 ☐, *Safety rules for the construction and installation of escalators and passenger conveyors*

☐ EN ISO 14121-1:2007, *Safety of machinery - Risk assessment – Part 1: Principles (ISO 14121-1:2007)* ☐

ISO 3864 ☐ series ☐, *Safety colours and safety signs*

3 Definitions

For the purposes of this European Standard, the definitions in EN 81-1, EN 81-2, EN 81-3, ☐ deleted text ☐ prEN 81-7, ☐ deleted text ☐ EN 81-28, ☐ EN 115-1 ☐, ☐ EN ISO 14121-1 ☐, and the following apply:

3.1**maintenance**

all the necessary operations to ensure the safe and intended functioning of the installation and its components after the completion of the installation and throughout its life cycle.

Maintenance includes:

a) lubrication, cleaning, etc.;

However, the following cleaning operations can be not considered as maintenance:

1) cleaning of the external parts of the well;

2) cleaning of the external parts of the escalator or passenger conveyor;

3) cleaning of the inside of the car.

b) checks;

c) passenger rescue operations;

d) the operations of setting and adjustment;

e) repair or changing of components which may occur due to wear or tear and do not affect the characteristics of the installation.

The following are not considered as maintenance operations:

a) changing of a major component such as the machine, the car, the control panel, etc., or safety component such as safety gear, etc., even if the characteristics of the new component are the same as the original;

b) replacement of the installation;

c) modernisation of the installation, including the changing of any characteristic of the installation (such as speed, load, etc.);

d) rescue operations carried out by Fire Brigades

3.2**maintenance organisation**

company or part of company where competent maintenance person(s) carry out maintenance operations on behalf of the owner of the installation

3.3**competent maintenance person**

designated person, suitably trained (see EN ISO 9000 series), qualified by knowledge and practical experience, provided with necessary instructions and supported within their maintenance organisation to enable the required maintenance operations to be safely carried out

3.4**manufacturer**

natural or legal person who takes responsibility for the design, manufacture and placing on the market either of safety components for lifts or of machinery (escalator, passenger conveyor, service lift and accessible goods only lift)

3.5**installer**

natural or legal person who takes responsibility for the design, manufacture, installation and placing on the market of lifts

3.6**installation**

completely installed passenger lift or good passenger lift or accessible goods only lift or service lift or escalator or passenger conveyor

3.7**owner of the installation**

natural or legal person who has the power of disposal of the installation and takes the responsibility for its operation and use

3.8**rescue operation**

operation starting after receiving notification of a person(s) trapped in a lift and finishing by releasing the trapped person(s)

4 Elaboration of maintenance instructions**4.1 General**

The installations covered by this European Standard shall be maintained in good working order in accordance with the installer's instructions. To this effect, regular maintenance of the installation shall be carried out, to ensure, in particular, the safety of the installation. The safety of an installation shall take into account the ability to be maintained without causing injury or damage to health.

Regular maintenance of the installation shall be carried out to ensure the reliability of the installation.

The access and the associated environment shall be maintained in good working order in accordance with the installer instructions.

The instructions for maintenance of an installation according to the Lifts Directive shall be provided by the installer, as defined in 3.5, after completion of the installation, as a result of a risk assessment.

The instructions for maintenance of the safety components of lifts shall be provided by the manufacturer to the installer as respectively defined in 3.4 and 3.5.

The instructions for maintenance of an installation according to the Machinery Directive shall be provided by the manufacturer, as defined in 3.4, when placed on the market, and be the result of a risk assessment.

In order that the aim of the maintenance instructions can be achieved, they shall be formulated so that they can be clearly and easily understood by competent maintenance persons.

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The competence of the maintenance person within the maintenance organisation shall be continuously updated.

NOTE The owner of the installation should be informed that the qualification of the maintenance organisation is in conformity with the regulations applicable in the country in which the installation operates ; if no regulations exist, the qualification can be ensured by a certified quality system in accordance with EN ISO 9001 supplemented if necessary to take into account the specific features of the installation.

The installer/manufacture shall provide maintenance instructions intended for the owner of the installation (see 4.3.2) including information intended for the maintenance organisation (see 4.3.3).

4.2 Elements to be taken into account for the maintenance instructions

When preparing the content of the maintenance instructions (see 4.3, clauses 5 and 6) the following elements shall be taken into account:

- a) the specifications and the intended use of the installation (type of installation, performance, type of goods to be transported, type of users, etc.);
- b) the environment in which the installation and its components are installed (weather conditions, vandalism, etc.);
- c) any restriction of use;
- d) the result of the risk assessment (see clause 5) for every working area and for every task to be undertaken;
- e) the specific maintenance instructions provided by the manufacturer of safety components;
- f) in case of components other than safety components, where maintenance is necessary, the maintenance instructions provided by the manufacturer of these components.

4.3 Information to be included in the maintenance instructions**4.3.1 General**

The maintenance instructions shall contain information relating to the tasks of the owner and respectively the maintenance organisation.

4.3.2 Information to the owner of the installation

The information relating to the tasks of the owner of the installation shall include the following:

4.3.2.1 The need for the owner to keep the installation in a safe operating condition. To fulfil this the owner shall use a maintenance organisation complying with the requirements of the Standard.

NOTE It is recommended to inform the owner of the installation about the need to use a maintenance organisation with adequate and proper insurance cover provided by an insurance company.

4.3.2.2 The need for the owner to take care of any National regulations and other requirements, where relevant, and their implications on maintenance.

4.3.2.3 The need for planned maintenance to be carried out by a maintenance organisation, at the latest when the installation is put into service or if the installation is to remain unused for a long period of time before first being put into service.

4.3.2.4 The importance for the owner of the installation to have the same maintenance organisation in the case of several installations having common well/spaces and/or machine room.

4.3.2.5 The need for the owner of a passenger-/goods passenger lift to keep, as described in ~~Annex A1~~ deleted text ~~Annex A1~~, EN 81-28, the two-way means of communication efficient and linked to a 24 h rescue service for the whole of the time that the installation can be used.

4.3.2.6 The need for the owner to remove the passenger-/goods passenger lift from service when the two-way means of communication is out of order.

4.3.2.7 The need for the owner to put the installation out of service in case of dangerous situations.

4.3.2.8 The need for the owner of the installation to inform the maintenance organisation:

- a) immediately about any perceived abnormal operation of the installation or abnormal change in its direct environment;
- b) immediately after putting the installation out of service in the case of a dangerous situation;
- c) after any rescue intervention by their authorised and instructed person(s) (see clause 6);
- d) before any modification related to the installation and/or its environment or use;

NOTE The owner of the installation should obtain from the company carrying out the relevant modification the maintenance instructions for the maintenance organisation.

- e) before any authorised third party inspection or works other than maintenance works are carried out on the installation;
- f) before taking the installation out of service for a prolonged period of time;
- g) before putting the installation back into service after a prolonged period of non operating time.

4.3.2.9 The need for the owner of the installation to take into consideration the consequences of the risk assessment carried out by the maintenance organisation (see 4.3.3.4 and 5.1).

4.3.2.10 The need for the owner of the installation to make sure that the risk assessment for maintenance is carried out:

- a) if the maintenance organisation is replaced;
- b) if the use of the building and/or the installation changes;
- c) after a major modification of the installation or of the building;
- d) if it is the case, after an accident involving the installation.

4.3.2.11 The need for the building owner to ensure, through a risk assessment, that :

- a) their premises are safe and free from risk to health as far as is practicable. This includes access to the premises and installation equipment, and articles or substances used according to the regulation for the Use of Work Equipment at the Workplace;
- b) the persons using the premises are informed about any remaining risks;
- c) any action to be done as a consequence of his risk assessment is carried out.

Regarding the access ways to areas reserved to maintenance persons, the need for the owner of the installation to inform the maintenance organisation, in particular about:

- 1) the access ways to be used and fire evacuating procedures from the building;
- 2) the place where the keys of the reserved areas can be found;
- 3) if necessary, the persons who shall accompany the maintenance persons to the installation;
- 4) if necessary, personal protective equipment to be used in the access ways, and, possibly, where this equipment can be found.

The information shall be made available also on site to the maintenance organisation.

4.3.2.12 The need for the owner of the installation to ensure that the name and the telephone number of the maintenance organisation are always available to the user of the installation, permanently affixed and clearly visible.

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4.3.2.13 The need for the owner of the installation to ensure that the keys of machine and pulley room doors (trap doors) and of inspection and emergency doors (trap doors) are permanently available in the building and are used only by persons authorised to gain access.

4.3.2.14 The need for the owner of the installation to provide, in all circumstances, safe access to the building and to the installation for the maintenance organisation involved in the rescue of persons.

4.3.2.15 The need for the owner of the installation to keep the access to working areas and working rooms safe and free for the maintenance persons and to inform the maintenance organisation about any hazard or change in the workplace and/or the access ways (lighting, obstructions, ground conditions, etc.).

4.3.2.16 In addition to those examinations and tests which the owner of the installation entrusts to the maintenance organisation, the need for the owner to carry out periodically, in their own interests, the following:

a) for lifts:

A full ascent and descent to assess any changes in the quality of the ride or damage to the equipment.

Typical items to be checked to ensure that they are in place, undamaged and functioning correctly are:

- landing doors and bottom door tracks;
- stopping accuracy;
- indicators that are not located in a reserved area;
- landing push controls;
- car push controls;
- door open controls;
- two-way means of communication in the car which provides permanent contact with a rescue service;
- normal car lighting;
- door reversal device;
- safety signs/pictograms.

For goods only and service lifts the checks to be carried out are the same, when relevant.

b) for escalators/passenger conveyors:

A full travel in both directions, when they exist, to assess any changes in the quality of the ride or damage to the equipment.

Typical items to be checked to ensure that they are in place, undamaged and functioning correctly are:

- all lighting and indicators;
- emergency stopping device;
- hand rails;
- skirting/deflector devices;
- combs ;
- safety signs/pictograms;
- approximation of speed between handrail and steps/pallets;
- steps/pallets;

- balustrade and panels;
- head guard and decking;
- safe and unobstructed access to entry and exit areas.

4.3.3 Information for the maintenance organisation

The information relating to the tasks of the maintenance organisation shall include the following:

4.3.3.1 The need to carry out the work of maintenance in conformity with the maintenance instructions and based on systematic maintenance checks.

After these checks, the maintenance organisation shall decide in conformity with the maintenance instructions what is required to be done.

A list of typical examples of maintenance checks to maintain the installation is shown in **annex A**.

NOTE Due to the fact that the components can be different in design and operation, it is therefore not possible to give specific guidelines in this Standard.

4.3.3.2 The need to update the original maintenance instructions if the installation changes its intended use and/or the environmental conditions existing on the completion of the installation.

NOTE The maintenance organisation should be provided by the owner of the installation with the relevant maintenance instructions where modifications are carried out on the installation.

4.3.3.3 The need for the maintenance organisation to ensure that a risk assessment for any working area and for any maintenance operation has been carried out taking into account the installer's maintenance instructions and all information supplied by the owner of the installation.

4.3.3.4 The need for the maintenance organisation to inform the owner of the installation about any work to be carried out as a consequence of a risk assessment especially for the access and/or the environment related to the building/installation.

4.3.3.5 The need to carry out a maintenance plan so that preventive maintenance is suitable for the installation and maintenance time is as short as reasonably practicable, without reducing the safety of persons, in order to minimise the non-operational time of the installation.

4.3.3.6 The need to adapt the plan for maintenance so as to take account of any predictable failures, e.g. those due to misuse, mishandling, deterioration, etc.

NOTE For this purpose a remote monitoring system, based on EN 627, which is able to report events or defects, helps to provide information.

4.3.3.7 The need to carry out maintenance operations by competent maintenance persons (see 3.3) and provided with the necessary tools and equipment.

4.3.3.8 The need to maintain the competency of maintenance persons.

4.3.3.9 The need to carry out the maintenance periodically.

NOTE The actual frequency of maintenance interventions can be more accurately determined where a remote monitoring system is connected to the installation.

In determining the frequency of maintenance interventions, the following non-exhaustive list should be considered:

- number of trips per year, operating time and any non operating periods of time;
- age and condition of the installation;
- location and type of building in which the installation is installed, as well as the needs of the users and/or the kind of goods transported;
- local environment where the installation is situated, as well as external environmental elements, e.g. weather conditions (rain, heat, cold, etc.) or vandalism.

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4.3.3.10 The need to provide a 24 h, all year round call-out service for rescue of persons.

NOTE A remote monitoring system can be used to provide information in order to improve the response to a call-out.

4.3.3.11 The need to keep records of the result of each intervention due to a failure of the installation. These records shall include the type of failures in order to detect any repetition. They shall be available to the owner of the installation on request.

4.3.3.12 The need to put out of service the installation if the maintenance organisation is aware of a dangerous situation, detected during the maintenance, which cannot be eliminated immediately, and to inform the owner of the installation of the need to keep it out of service until repaired.

4.3.3.13 The need to be organised to provide the necessary spare parts for any repair.

4.3.3.14 The possible need for attendance of a competent maintenance person(s), given reasonable notice, for any inspection carried out by an authorised third party or for building maintenance works to be carried out in the areas reserved for the maintenance organisation.

4.3.3.15 The need to inform in due time the owner of the installation about necessary progressive upgrading of the installation.

4.3.3.16 The need to organize rescue operations, even with subcontractor(s), and to make provision for circumstances such as fire, panic, etc.

5 Risk assessment

5.1 General

Before an installation is placed on the market, it is necessary that the installer/manufacture carries out a risk assessment in accordance with the Lifts Directive (95/16/EEC) respectively the Machinery Directive (98/37/EEC). Every risk shall be limited as much as reasonably possible by means of safety measures and suitable instructions. The instructions can never replace a safety measure which can be provided to reduce the risk.

It is necessary to determine the different intervention procedures of the maintenance operations and to determine the appropriate safety measures for each of these procedures.

The use of diagnostic systems (e.g. remote monitoring system, based on EN 627) may support fault finding, improve the maintainability of the installation and reduce the exposure of maintenance persons to hazards.

Safety in maintenance operations of the installation is ensured by adopting safety measures and providing instructions. Safety measures on the installation and in the building shall be provided by the installer and by the owner of the installation respectively.

For any working area, it is necessary to identify the list of the specific hazards related to health and safety and to carry out a risk assessment for any maintenance operation, including access to the working area.

For this purpose, the following should be taken into account:

- a) presence of one or more maintenance persons in a working area;
- b) foreseeable actions of persons other than maintenance persons (e.g. person switching on or off power circuits and dependent circuits or lighting circuits or trying to use the installation during maintenance operations, etc.);
- c) possible states of the installation (normal or abnormal due to a foreseeable failure of its component parts, external disturbances, disturbance of its power supply, etc.).

Annex B gives a list of examples of elements to be taken into account in any risk assessment for maintenance operations. However, several methods¹⁾ are available for the systematic assessment of risk. An example is given in **EN ISO 14121-1:2007**, annex B.

5.2 Information for the maintenance organisation

For safe maintenance and to provide relevant instructions, it is necessary, first of all, to identify the maintenance operations.

In particular, maintenance operations are:

- a) those operations considered necessary for a correct and safe functioning of the installation and its components after the completion of the installation;
- b) those operations considered necessary during the "life" of some components, determining, as far as possible, the time or condition after which the functioning or the integrity of the component is not longer ensured even if correctly maintained.

In carrying out specific maintenance operations, if it is necessary to neutralise some safety functions (e.g. an electric safety device), the hazard identification shall be taken into account for such a situation.

It is necessary to inform and warn the maintenance persons about:

- residual risks, i.e. those for which risk reduction by design and safeguarding techniques are not - or not totally - effective;
- risks that arise from the necessary removal of certain guards to carry out specific maintenance operations.

The maintenance instructions and warnings shall prescribe the procedures and operating modes intended to overcome these risks and, if it is necessary, to specify personal protective equipment, instruments, tools and provisions to be used.

6 Information to the owner for lift rescue operations

The information to the owner shall include at least :

6.1 The need for person(s) authorised by the owner of the installation to rescue trapped passengers to be trained by the maintenance organisation.

NOTE As an alternative the owner of the installation can arrange training for their authorised person(s) by a competent third party in conformity with the maintenance instructions.

6.2 The need to ensure that the training is appropriate to the specific installation and updated.

6.3 The need to ensure his authorised person(s) rescue people only through landing doors.

6.4 The need to ensure that the maintenance organisation is called when the owner's authorised person(s) are not able to move the car through the use of the manual and/or electric emergency devices.

6.5 The need to inform their authorised person(s) about any conditions for which only the maintenance organisation shall carry out a rescue operation.

¹⁾ ISO TS 14798 "Lifts (elevators), escalators and passenger conveyors - Risk analysis methodology" can be used as a specific reference for carrying out risk assessment.

EN 13015:2001+A1:2008 (E)**7 Markings, signs, pictograms and written warnings**

If the risk assessment of the maintenance organisation indicates that additional specific warnings are required for the purpose of maintenance, these shall be affixed directly on the installation/component or, when this is not possible, in the close vicinity.

Markings, signs, pictograms and written warnings shall be readily understandable and unambiguous. Readily understandable signs and pictograms shall be used in preference to written warnings.

Signs or written warnings carrying only "DANGER" shall not be used.

Information affixed directly on the installation/component shall be permanent and legible.

Any markings, signs, pictograms and written warnings affixed on the installation shall be renewed if they become illegible.

Written warnings shall be drawn up in the official language(s) of the country in which the installation is located.

8 Format of the maintenance instruction handbook

The maintenance instruction handbook for any installation shall contain at the front at least the following:

- a) type of installation, with its serial number, to which the instructions apply;
- b) title of the handbook;
- c) date of issue;
- d) name and address of the installer/manufacture;
- e) name of the publisher, when different from the installer/manufacture.

In the handbook:

- a) all units used shall be SI units;
- b) all pages shall be provided with a means to detect missing pages (numbers);
- c) all references to other documents shall be in full.

Warnings shall state the hazard, the related risks and the appropriate safety measure.

Type and size of print shall ensure the best possible legibility. Safety warnings and/or precautions shall be emphasised through the use of colours or symbols and/or large print. Where possible, signs shall comply with ISO 3864:1984.

Instructions for maintenance shall be given in the official language(s) of the country in which the installation is located. If more than one language is to be used, each language shall be readily distinguished from the other(s), and efforts shall be made to keep the translated text and the relevant illustration together.

Documents giving instructions for maintenance shall be produced in durable form (i.e. they shall be able to survive frequent handling) or triplicate copies shall be provided.

Annex A (informative)

Typical examples of checks to be taken into account in maintenance instructions

A.1 Electric lifts

General	Check all components are clean and kept free from dust and corrosion.
Pit area	Check for excess oil/grease at bottom of guides. Check the pit area is clean, dry and free from debris.
Anti-rebound device and switch (where fitted)	Check for free movement and operation. Check for equal tension of ropes. Check switch where fitted. Check lubrication.
Buffers	Check oil level. Check lubrication. Check switch where fitted. Check fixings.
Drive motor/Generator	Check bearings for wear. Check lubrication. Check condition of commutator.
Gear box	Check gear for wear. Check lubrication.
Traction sheave	Check condition and grooves for wear.
Brake	Check braking system. Check parts for wear. Check stopping accuracy.
Controller	Check cabinet is clean, dry and free from dust.
Overspeed governor and tension pulley	Check moving parts for free movement and wear. Check operation. Check switch.
Main rope diverter pulley(s)	Check condition and grooves for wear. Check bearings for abnormal noise and/or vibrations. Check guarding. Check lubrication.
Car/Counterweight guides	Check for film of oil where required on all guide surfaces. Check fixings.
Car/Counterweight guide shoes	Check guide shoes/rollers for wear. Check fixings. Check lubrication where necessary.
Electric wiring	Check insulation.
Lift car	Check emergency lighting, car buttons, key switches. Check fixings of panels and ceiling.
Safety gear(s)/Ascending car over speed protection means	Check moving parts for free movement and wear. Check lubrication. Check fixings. Check operation. Check switch.
Suspension ropes/chains	Check for wear, elongation and tension. Check lubrication only where intended.

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Rope/chains terminations	Check for deterioration and wear. Check fixings.
Landing entrances	Check operation of landing locks. Check doors for free running. Check door guiding. Check door gaps. Check wire rope, chain or belt when used, for integrity. Check emergency unlocking device. Check lubrication.
Car door	Check door closed contact or lock. Check doors for free running. Check door guiding. Check door gaps. Check wire rope or chain when used for integrity. Check passenger door protective device. Check lubrication.
Floor level	Check stopping accuracy at landing.
Final limit switches	Check operation.
Motor run time limiter	Check operation.
Electric safety devices	Check operation. Check electric safety chain. Check correct fuses are fitted.
Emergency alarm device	Check operation.
Landing controls and indicators	Check operation.
Well lighting	Check operation

A.2 Hydraulic lifts

General	Check all components are clean and kept free from dust and corrosion.
Pit area	Check for excess oil/grease at bottom of guides. Check the pit area is clean, dry and free from debris.
Buffers	Check oil level. Check lubrication. Check switch where fitted. Check fixings.
Tank unit	Check hydraulic fluid level. Check tank and valve unit for leakage.
Jack	Check for oil leakage.
Telescopic jack	Check for synchronisation.
Controller	Check cabinet is clean, dry and free from dust.
Overspeed governor and tension pulley	Check moving parts for free movement and wear. Check operation. Check switch.
Main rope pulley(s)	Check condition and grooves for wear. Check bearings for abnormal noise and/or vibrations. Check guarding. Check lubrication.
Car/Balancing weight / jack guides	Check for film of oil where required on all guide surfaces. Check fixings.
Car/Balancing weight / jack guide shoes	Check guide shoes/rollers for wear. Check fixings. Check lubrication where necessary.
Electric wiring	Check insulation.

Lift car	Check emergency lighting, car buttons, key switches. Check fixings of panels and ceiling.
Safety gear / Pawl / Clamping devices	Check moving parts for free movement and wear. Check lubrication. Check fixings. Check operation. Check switch.
Suspension ropes /Chains	Check for wear, elongation and tension. Check lubrication only where intended.
Ropes/chains terminations	Check for deterioration and wear. Check fixings.
Landing entrances	Check operation of landing locks. Check doors for free running. Check door guiding. Check door gaps. Check wire rope, chain or belt when used, for integrity. Check emergency unlocking device. Check lubrication.
Car door	Check door closed contact or lock. Check doors for free running. Check door guiding. Check door gaps. Check wire rope or chain when used for integrity. Check passenger door protective device. Check lubrication.
Floor level	Check stopping accuracy at landing.
Final limit switch	Check operation.
Motor run time limiter	Check operation.
Electric safety devices	Check operation. Check electric safety chain. Check correct fuses are fitted.
Emergency alarm device	Check operation.
Landing controls and indicators	Check operation.
Well lighting	Check operation
Anti-creep device	Check operation
Rupture valve/One way restrictor	Check operation.
Pressure relief valve	Check operation.
Manual lowering valve	Check operation.
Hand pump	Check operation.
Hose/Pipe work	Check for damage and leakage.

A.3 Escalators and passenger conveyors

Controller	Check cabinet is clean, dry and free from dust.
Gear box	Check gear and associated parts Check lubrication
Drive motor	Check bearings for wear Check lubrication.
Brake	Check braking system. Check parts for wear.
Auxiliary brake	Check braking system. Check parts for wear.
Intermediate gear box	Check gear and associated parts

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	Check lubrication
Main drive chain	Check for tension and wear. Check lubrication.
Step/pallet chain	Check for tension and wear. Check lubrication.
Step/pallet	Check step/pallet and step/pallet wheels for integrity.
Conveyor belt	Check for condition and tension.
Drive belt	Check for condition and tension.
Clearances	Check step to step and step to skirting clearances.
Combs	Check condition. Check meshing with steps, pallets or belt.
Comb plate	Check clearances and operation.
Handrails	Check for free running and condition. Check tension. Check synchronisation between step/pallet band and the handrail.
Track system	Check for condition and wear. Check fixings.
Safety devices	Check operation.
Deflector devices	Check condition.
Lighting	Check operation.
Display	Check operation.
Signs/pictograms	Check condition.
Balustrade	Check condition of panels. Check fixings of interior claddings.

Annex B (informative)

Examples of elements to be taken into account in risk assessment for maintenance operations

Table B.1: Lift

Elements	Maintenance areas					
	Car	Machinery spaces	Pulley spaces	Areas outside the lift ²⁾	Pit	Car roof
Unsuitable access (ladders not secure, no hand-rails, unsuitable trap-door, obstacle on car roof, etc.)						
Unauthorised entry						
Inadequate lighting (including access)						
Uneven floor surface (holes, projections)						
Slippery floor surface						
Strength of the floor						
Unsuitable dimensions (passages, maintenance places)						
Identification of the car position						
Indirect contact with electricity						
Switches						
Contact with moving parts (ropes, pulleys)						
Unexpected movements						
Crushing by moving parts (car, counterweight, balancing weight, jack, other lifts)						
Voids between car and well						
More than one lift in the same area						
Overhead beams and sheaves						
Refuge volume(s)						
Manual handling						
More than one maintenance person working						
Absence of a means of communications						
Ventilation and temperature for persons						
Unexpected water/dirt						
Dangerous substances						
Falling objects						
Entrapment						
Means/controls for rescue operations						
Fire						

Relevant

not relevant

²⁾ Areas to carry out maintenance operations on the external equipment of the lift, on the external part of the enclosures and, from the outside, on equipment placed in the well, machinery or pulley spaces.

Table B.2: Escalator/passenger conveyor

Elements	Maintenance areas					
	Machinery spaces	On step/pallet band	Inside step/pallet band	Upper and lower landings	Control cabinet	Machine room (external drives)
Access and entry						
Inadequate lighting (including access)						
Falls/slips						
Falling on machine						
Falling over balustrade						
Contact with moving machinery						
Indirect contact with electricity						
Crushing and shearing (step to step or comb/ step to skirting)						
Gaps in balustrade						
Intersection between floors and/or escalators						
Persons on the step band						
Safety switches and emergency stopping device(s)						
Inspection control						
Intersection between fixed and moving parts						
Unintentional start/stop						
Machine moving (other than on power)						
More than one maintenance person working						
Manual operation						
Falling objects						
Unexpected water/dirt						
Contamination by oil and grease						
Dangerous substances						
Fire						
Missing step/pallet						

 Relevant

 not relevant

Annex ZA (informative)

A1 Relationship between this European Standard and the Essential Requirements of EC Directive 98/37/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 98/37/EC on machinery, amended by 98/79/EC.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard, except clauses 4.3.2.11, 4.3.2.14, 4.3.2.15, 4.3.3.5, 4.3.3.13, 4.3.3.14, 4.3.3.15 confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements maintenance instructions in item 1.7.4 of Annex I of that directive and associated EFTA regulations.

WARNING — Other requirements and other EC Directives may be applicable to the product(s) falling within the scope of this standard. **A1**

Annex ZB (informative)

A1 Relationship between this European Standard and the Essential Requirements of EC Directive 2006/42/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 2006/42/EC on machinery.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard, except clauses 4.3.2.11, 4.3.2.14, 4.3.2.15, 4.3.3.5, 4.3.3.13, 4.3.3.14, 4.3.3.15 confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements maintenance instructions in item 1.7.4 of Annex I of that directive and associated EFTA regulations.

WARNING — Other requirements and other EC Directives may be applicable to the product(s) falling within the scope of this standard. **A1**

Annex ZC (informative)

A1 Relationship between this European Standard and the Essential Requirements of EC Directive 95/16/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 95/16/EC on lifts.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard, except clauses 4.3.2.11, 4.3.2.14, 4.3.2.15, 4.3.3.5, 4.3.3.13, 4.3.3.14, 4.3.3.15 confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements maintenance instructions in item 6 of Annex I of that directive and associated EFTA regulations.

WARNING — Other requirements and other EC Directives may be applicable to the product(s) falling within the scope of this standard. **A1**

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