



**AEA - Code of Practice**

# Maintenance requirements for lifts, escalators and moving walks

1/06/2023

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## Foreword

This AEA Maintenance Code of Practice has been produced to assist AEA members and their customers to work together and to put in place a maintenance regime to match the customer's needs and which protects the people who use and work on the products covered by the maintenance agreement.

Having selected a AEA member following this Code of Practice, customers can be confident that they have chosen a competent organisation to carry out their maintenance.

When appended to a service agreement this AEA Code of Practice places expectations on the Maintenance Contractor and on the Customer. These expectations can be summarised as follows:

### What the Customer should expect from the Maintenance Contractor

That they will:

- make a service agreement offer in accordance with the provisions of an industry standard contract/document that meets the customer's stated requirements.
- work in accordance with the relevant Work Health & Safety requirements
- carry out a Risk Assessment and a compile a Job Hazard Analysis prior to commencing work on site.
- provide an efficient plant breakdown and repair service.
- provide an agreed emergency passenger release service.
- provide an initial condition report in accordance with AS 1735.1.4, AS 1735.5.2 etc.
- complete maintenance visits in accordance with a planned maintenance program.
- inform the Responsible Person before commencing work and on completion of the work
- immediately notify the Responsible Person of any condition that is unsafe or is likely to become unsafe within a short time.
- keep the work area safe, tidy and access clear and uncluttered.
- will provide a maintenance log and update after each site visit.
- will advise customers of changes to relevant Codes, Standards and Regulations/Legislation.

### What the Maintenance Contractor should expect from the Customer

That they will:

- make available the original technical information and relevant service history of the plant together with any essential special tools supplied by the manufacturer.
- provide safe access to the work areas, including suitable safe access to all work areas and machine room/s
- act upon the recommendations of the Contractor in a timely manner particularly in respect of any unsafe condition-
- make efforts to improve the safety of the plant by taking into account the recommendations of the initial condition report in accordance with AS 1735.1.4, AS 1735.5.2 etc.
- where plant has been taken out of service due to an unsafe condition, not reinstate it until sufficient measures have been taken to restore it to safe use.
- allow for the plant to undergo a periodic thorough examination by the maintenance provider, at intervals not exceeding 12 months, in accordance with the checklists in Annex B specific to the plant installed.
- report any defects immediately to the Contractor and carry out simple daily checks as outlined in this Code of Practice.

## Introduction

This AEA code of practice addresses the maintenance of passenger and goods lifts, escalators and moving walks. The document is an industry Code of Practice, developed to improve the general standards of maintenance within the industry and to ensure that AEA members offer a consistent high level of service to their customers.

This document has been prepared to consider the following:

- a) the number of companies operating in the Australian market.
- b) the need to define a minimum level of maintenance and reporting of information to customers.
- c) increased technological sophistication of modern equipment.
- d) the variances in types of lifts, escalators and moving walks

All entities entering into maintenance agreements need to recognise what is entailed and the importance of reporting plant/equipment condition and making activities transparent with regards to what is being done or needs to be done.

It aims to enable those entities entering into a maintenance agreement to recognise and understand their responsibilities in relation to those they do business with and the need to recognise that it requires commitment from all entities for the work to be undertaken safely.

This code of practice recommends best practices to be undertaken in order to provide well-maintained equipment and safe working conditions.

Users of this document are reminded that, as a code of practice, it recommends actions to be taken by persons undertaking maintenance and the persons responsible for arranging maintenance. It does not specify requirements or recommendations for modifications or enhancements to the product in question or safe systems of work that are covered by other standards or legislation such as Work Health & Safety Act (WH&S Act) and the Work Health & Safety Regulations (WH&S Reg).

This publication does not purport to include all the necessary provisions of a maintenance contract. Users are responsible for its correct application. It should not be quoted as if it was a specification and particular care should be taken to ensure that claims of compliance are not misleading.

It has been assumed in the drafting of this document that the execution of its provisions will be entrusted to appropriately qualified and competent persons.

## 1 Scope

This code of practice offers recommendations regarding the maintenance of lifts, escalators and moving walks and what a maintenance agreement entered with a AEA member could be expected to deliver. It is a fundamental assumption of this document that both the responsible person and the maintenance contractor both work to the requirements of the WH&S legislation. Requirements for safe work practices, in standards or legislation are not repeated in this code of practice.

It does not define a frequency or minimum duration for maintenance visits but recommends annual inspection periods. Refer to the recommended inspection periods in Annex B.

This document may be applied retrospectively to an existing contract only by the mutual consent of both parties, but preferably should be used for new agreements.

### Exclusions

This document does not address the requirements of high-risk plant in special environmental condition such as lifts in potentially explosive atmospheres, mines, tunnels, wind turbines, ships or chemically aggressive atmospheres.

It does not cover non-high-risk plant related equipment installed in machinery spaces or lift wells such as smoke or fire detecting equipment, sprinklers, emergency lighting, general lighting, air conditioning, or other equipment related to the building.

**Note** – These items might be included if agreed between both parties.

Whilst the above exclusions clarify the limitation of application of this document it can still be used with care in such applications.

**Note** – This code of practice (COP) assumes that the installed equipment has been designed, manufactured and installed legally in line with Australian legislative requirements and standards.

Manufacturers / OEM data should be referenced and used when available - for specific details, information and tooling.

**Note** – State, Territory and Federal Legislation varies in-relation to high-risk plant, and plant itself has many variances in design, dependant on the associated structure. In addition to this COP the individual requirements of each item of plant must be considered.

## 2 Terms and definitions

For the purposes of this document the following terms and definitions apply.

Further technical definitions can be found in the AS 1735 Series of standards for lifts, escalators and moving walks.

**Basic tools** - hand tools and equipment that can reasonably be expected to be provided by the maintenance contractor.

*Note* – This does not include special diagnostic tools.

**Formal exclusion** - (schedule) written statement within or attached to an agreement clearly identifying items not covered by the agreement.

**Planned/Scheduled Periodic Maintenance** - all the necessary operations to ensure the safe and intended functioning of the installation and its components following the completion of the installation and throughout its life cycle.

Maintenance includes:

a) lubrication and cleaning of the plant, etc.

**However**, the following cleaning operations are not considered as maintenance items:

i) cleaning of the external parts of a lift well.

ii) cleaning of the external parts of the escalator or passenger conveyor (Internal truss clean down unless included as part of the contract documentation)

iii) cleaning of the inside of the lift car.

iv) heavy contamination of pit area or removal of water due to ingress or flooding.

b) functional checks.

c) check of passenger rescue functionality.

d) the operations of setting and adjustment.

e) repair or changing of components that are included in the maintenance agreement which may occur due to wear and tear and do not affect the characteristics of the installation.

f) the receipt and management of remote monitoring signalization from the plant.

**The** following are not considered as maintenance operations:

a) exclusions as noted in the varied maintenance agreements.

b) replacement of the installation.

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

d) rescue operations carried out by Fire or Emergency Services.

e) Supplementary Tests, and third-party inspections.

**Maintenance contractor** - a suitably qualified party that is contracted to maintain the scope of equipment scheduled in a maintenance agreement.

**Passenger** - person requiring use of a lift, escalator or moving walk etc.

**Plant** - lift, escalator or moving walk to be maintained.

**Remote monitoring** - information transmitted by the plant such as battery condition, telephone line availability, or other sensor information, as applicable.

**Reporting** - act of providing a condition report to the Responsible Person for the equipment and any necessary remedial work to ensure continued safety of the equipment.

**Responsible person** - legal entity having right of possession of a lift, escalator or moving walk and responsibility for its safe working.

*Note* - The responsible person is usually the owner or authorised duty holder, sometimes the occupier of the building in which the plant is situated.

**Responsible person's (owner) information manual** - Information provided by the installer of new equipment to the original purchaser explaining how it should be used, maintained, and dismantled. For example, as required under WH&S legislation and detailed in AS 1735.1 2016 (AS 1735.1.1 2022).

*Note 1* - the manual is the property of the owner, but it is intended that the document is made available to any maintenance contractor.

*Note 2* - the document is valuable to the owner, we therefore recommend a copy (not the original) is provided to any maintenance contractor.

*Note 3* - it is intended that the manual is updated throughout the life of the plant when modifications and changes to the original specification are made.

*Note 4* - The information manual includes information on the use of essential special tools.

**Risk assessment** - comprehensive estimation of the probability and the degree of possible injury or damage to health or equipment in a hazardous situation, to select appropriate safety measures, refer to ISO 14798

**Thorough or 3<sup>rd</sup> Party examination** - an examination conducted by a party independent of the maintenance contractor e.g. industry consultant.

**Special tools** - specific tools and / or software essential for maintenance which can only be obtained direct from the original equipment manufacturer (OEM).

*Note* - special tools may include electronic tools and software.

**User** - person making use of the services of a lift, lifting platform, escalator or moving walk.

*Note* - A user is not necessarily the same as a passenger and includes persons waiting for a lift.

**Workplace** - premises or part of premises where work is carried out

*Note 1* - This can include:

- a) any place which is accessible to those at the workplace.
- b) any means of access to/from the workplace e.g., staircase, corridor, foyer.

*Note 2* - a workplace is usually non-domestic, although the term can refer equally to domestic premises.

## 3 Purpose of maintenance

### 3.1 Maintenance objective

The level of maintenance will depend on what the responsible person wishes to achieve. The aim may be to:

- satisfy the legal requirements of the relevant Work Health and Safety Legislation
- plan financial expenditure and therefore an agreement that covers the cost of repairs will make it easy to forecast costs for coming years.
- protect the investment made in equipment and to keep it running at optimum performance.

EN81-20 defines maintenance as 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.

Regardless of the quality of the equipment purchased, it will wear and deteriorate through use.

Due to the complexity of modern systems and dangers in the work environment, only specialists trained in this field will know what to do and how to do it in safety.

In the marketplace maintenance contractors may offer products that cover more than that described within this document or may give their service agreement a commercial name different to that described here. This code of practice does not preclude such offering, but any offering should at least include what is described within this document if compliance with this code is claimed.

### 3.2 Constituents of maintenance

#### 3.2.1 Planned visits

The basic constituent of a maintenance agreement is an agreed number of planned maintenance visits.

The work to be undertaken on planned maintenance visits and the frequency of visits should be defined following the initial survey of the equipment and an assessment of maintenance requirements.

A typical schedule of work undertaken as part of a maintenance visit is shown in Annex B. Other or different items should be included in the schedule according to the equipment and the maintenance requirement identified.

The frequency of maintenance visits should be sufficient to enable the maintenance contractor to identify where items of equipment are becoming unreliable or dangerous through wear. Clearly, a higher frequency is more appropriate where the equipment can deteriorate rapidly through the intensity of its use, relative age and condition of the equipment or environmental factors. An adequate frequency of visits also allows for improved reliability and performance. Caution is therefore urged on reducing the number of visits without an adequate assessment being undertaken by, and agreed with, the maintenance contractor.



Previous maintenance information can help pinpoint environmental or other site conditions which will influence frequency of visits, e.g. high vandalism occurrence.

### 3.2.2 Callouts or breakdowns

The scope of attendance to breakdowns or calls should be defined as part of the maintenance agreement.

See 3.2.4 for calls from the emergency communications system.

Where some callouts are included and others are not included, e.g. call-outs for misuse/vandalism excluded or callouts out of normal working hours excluded, these should be clearly specified as part of the agreement.

### 3.2.3 Parts and exclusions

The extent to which the supply and replacement of parts is included as an element of the maintenance agreement should be defined. In particular, parts not included should be clearly defined.

Typically, maintenance can vary from a basic level where no replacement of parts is included to a fully comprehensive form (usually over many years) with no or very few exclusions. Typically, however, even maintenance described as “comprehensive” often has exclusions.

Exclusion could typically be:

- items such as lift car lighting, cleaning of decorative finishes inside the lift or on landings, cleaning of glass exterior of the lift car or in the lift well, hydraulic cylinders dismantling or in the case of cylinder in bore hole its inspection, concealed hydraulic pipe work.
- work outside normal working hours of the maintainer, disposal of waste materials, storage of materials and or lubricants.
- specific parts e.g., inspection or replacement of ropes, machine, control system or where components have failed due to misuse or vandalism
- Parts, assemblies, or items of equipment no longer in production (obsolete), stock or supported by the original manufacturer or alternatives legally available on the open market.

**Note** - Where a maintenance agreement has a comprehensive element to cover the replacement of parts, this is not usually consistent either with a low frequency of maintenance visits or with a short-term agreement (less than 2 years).

### 3.2.4 Emergency alarm calls

Lifts are provided with an emergency communication system linked to a call centre or nominated 24/7 manned service, the maintenance provider should ensure that alarm calls from the equipment are received and acted upon. The response of the maintenance contractor can/should be defined as part of the maintenance agreement.

The responsibility for this link is usually with the owner or authorised responsible person not the maintenance contractor.

**Note** - Attention is drawn to the requirements of AS 1735.19

### **3.2.5 Remote monitoring**

Where required to monitor the equipment as an aid for collecting data or for diagnostic purposes, the equipment might be linked to the maintenance provider's system. Several features are typically available including basic monitoring of the equipment with the ability to make some checks remotely such as gathering of data on the reliability and performance of the equipment, condition monitoring of key aspects etc.

### **3.2.6 Training in emergency release**

The training of individuals in the responsible person's organisation would usually be appropriate only where there were suitable competent and trained persons available.

Where training is agreed, this should be provided by the maintenance provider who should be invited to risk assess the equipment and assess the competence of those being offered for training and refresher training to be provided at least annually during the life of the agreement.

### **3.3 Types of maintenance, systems and features**

The following information is not prescriptive and is intended to be an informative description of typical types of maintenance offered.

Maintenance agreements between Responsible Persons and Maintenance providers will vary for every site, depending on site use, equipment type, and age of the equipment.

Any preventative maintenance to plant will help minimise breakdowns, maintain the equipment to the level when installed (notwithstanding natural wear, tear and obsolescence) and provide a level of preparation for the future.

Building owners and their responsible person/s should discuss their needs with maintenance providers during maintenance contract negotiations. This will include the level of maintenance, inclusions and exclusions.

Maintenance types can be from the basic of 'do and charge' through to fully 'comprehensive'.

Do and Charge – is where the responsible person contacts their maintenance provider when required and time and labour is charged at agreed rates. Repairs when required are usually quoted and accepted before work commences.

Comprehensive – is where there is a pre-determined contract amount, setting out what is covered and what is not, there is usually a pre-determined plan, agreed number of visits, and labour and materials are included.

Inclusions / Exclusions – can vary greatly between the do and charge to comprehensive maintenance, but some examples could be overtime, public holidays, whether technicians are required on site for specific times, what parts are chargeable, parts on site or in retainment, call response times, attendance to events etc...

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## 4. Maintainer's responsibilities

### 4.1 Pre-agreement

Prior to entering into a maintenance agreement, a prospective maintenance contractor should review the information provided by the responsible person and, if necessary, gather further details needed to make an offer. This may include surveying the plant and eliciting further details from the responsible person such as the performance history and the availability of original documentation e.g. wiring diagrams, and any essential special tools etc. Refer to requirements of WH&S Act.

From these details, the prospective maintenance contractor should make an offer including a clear explanation of the following:

- the type of maintenance agreement offered.
- the scope of what work is included in maintenance visits.
- the frequency of intended maintenance visits to be undertaken.
- parts included and exclusions.
- Provision for callouts and breakdowns.
- Handling of emergency alarm calls.
- Remote monitoring if required.
- Whether items such as landing barriers are included or to be provided by the responsible person
- Any extra provisions required e.g. attendance during Supplementary Testing or 3rd Party inspections required.

## 5. Responsible person

### 5.1 Pre-agreement

When the responsible person is intending to seek a new maintenance contractor, e.g., at the end of a warranty period or at the end of the previous maintenance agreement, the responsible person should:

- allow potential new maintenance contractors sufficient time and access to inspect/ survey the plant, if needed, prior to submitting an offer.
- make available and draw the attention of the prospective maintenance contractor to any relevant risks and hazards.
- make available the responsible person's instruction manual, records of modernisation work completed since installation, previous service history including breakdowns and repairs, records from the original test and placing into service, and the reports of any Thorough Examinations and any Supplementary Tests.
- Specify their maintenance objectives (see section 3) and advise on issues such as the frequency and intensity of usage of the plant and any additional/ special features.
- Where original manufacturers documents have been lost the responsible person should make endeavours to source replacements from the original manufacturer where possible.
- Make available any essential special tools provided with the plant. e.g., emergency release information and equipment.

## 4.2 Responsibility for work on site

Work on site is to be performed safely according to the relevant Work Health and Safety legislation without risk to those performing the work or persons in its proximity. This is **joint** responsibility of the responsible person and maintainer and always requires the close cooperation of both parties. Where issues of safety are discovered that cannot be easily addressed by procedures adopted by the maintainer, the maintainer should report them in writing to the responsible person and discuss and agree a practical resolution.

Refer to ISO 14798 Hazard and risk methodology

## 4.3 Reporting procedures

When a new maintenance contractor is appointed and takes over the maintenance of the equipment or within a reasonable time, they should survey the plant and provide an initial condition report to the responsible person. Annex A lists suggested survey checks and a reporting format, but other items might be required appropriate to the individual plant and should be identified from the survey. Thereafter, the maintenance contractor should update this report with any changes of equipment or subject to the requirements of the standards listed in Annex A.

Reports should be provided to the responsible person on an agreed regular time scale, the reports should contain the details of the plant such as:

Address where units are fitted

Location within the building (if required)

Identification Number

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Refer to ISO 14798 Hazard and risk methodology

## 5.3 Reporting procedures and retention of records

The responsible person should retain reports of the condition of plant made by a maintenance contractor and thereafter when updated.

The responsible person should keep a record of maintenance activities for each item of plant. To assist the responsible person in this task the maintenance contractor should provide the responsible person with a record of maintenance activity.

Wiring diagrams / technical information are essential for the safe investigation of faults and such diagrams are the property of the responsible person and not the maintenance company.

The responsible person should keep a record of any inspections, thorough examinations and any supplementary tests undertaken and make these available to the maintenance contractor.

The responsible persons should report in writing any issues reported by the maintenance contractor under WH&S legislation where necessary to the appropriate authorities e.g. SafeWork.

#### Date of maintenance / inspection / repair

The reports should contain details of the items inspected and / or maintained together with any recommendations.

If a critical safety problem is reported it should be ensured that it has been received by those that require the report and in a position such that agreement can be confirmed on the actions to be taken.

The report should also contain recommendations such as safety issues listed in AS 1735.1.4 and AS 1735.5.2 and improvements required by the client such as:

Adequate access to machinery spaces and work areas and, if access presents a risk of falling, the improvements required.

Adequate lighting and emergency lighting in / or around the equipment.

Adequate safety rails and access ladders.

Adequate guarding of dangerous parts and, if any unguarded machinery is present, the remedial action required.

Any hazardous electrical equipment associated with the plant with the remedial action required.

The maintenance contractor should report in writing to the responsible person any issues reportable under the WH&S Act. and the WH&S Reg

#### **4.3.1 Changes to relevant standards**

The maintenance contractor should inform the responsible person in writing of relevant changes to safety standards relevant to existing installations. e.g., AS1735.1.4, AS 1735.5.2

The responsible person should report to the maintenance contractor any tests or inspections of the electrical supply to the plant. In particular, the responsible person should report any changes which have been made including items such as voltage reduction/ optimisation systems since these may have adverse effects on plant performance and reliability.

The responsible person should monitor the operation of the plant and carry out the checks outlined in Annex D and should notify the maintenance contractor of any defects found.

#### 4.4 Qualifications, training and competence

Maintenance should be performed by competent personnel who are suitably trained, 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.

#### 4.5 Agreement renewal

Work with the person responsible to ensure a mutual agreement is entered.

#### 4.6 Removal of plant from service

The maintenance contractor should advise the responsible person that the plant will need to be removed from service as part of the maintenance work.

The maintenance contractor should display safety signs before work commences, to warn others that the plant is out of service.

If the maintenance contractor is of the opinion that the plant is in a dangerous condition, or likely to degrade to a dangerous condition before repairs can be made, then the maintenance contractor should report this to the responsible person

The maintenance contractor may isolate the plant but should not

#### 5.4 Competence of sub-contractors

The responsible person should ensure that any work carried out on plant is performed only by authorised and competent persons. Where these persons are not the regular maintenance contractor the responsible person must advise the regular maintainer of the work performed to be performed.

*NOTE* - Work by persons other than the regular maintenance contractor may have implications for the plant and the maintenance agreement in place. Following work by others, the regular maintenance contractor may therefore want to carry out operational and safety checks of the plant prior to recommencing their maintenance regime. Work by persons other than the regular maintenance contractor can also impact warranty.

#### 5.5 Agreement renewal

Where an agreement is arranged so that its renewal is automatic, the responsible person should notify the maintainer or company with which the agreement is held in advance of the renewal date, usually 90 days prior to the contract rollover. The notification of renewal should make clear any changes to terms and conditions of the maintenance agreement.

#### 5.6 Removal of plant from service

If the maintenance contractor has reported that the plant is in a condition where it should be removed from service, the responsible person should not reinstate the plant until sufficient measures have been taken to allow the plant to be returned to service.

immobilise the plant.

#### 4.7 Housekeeping

If required, the maintenance contractor, in conjunction with the responsible person, should establish procedures for the temporary protection of floor coverings and walls used to access landings and machinery spaces.

#### 4.8 Landing entrances and escalator landings

The provision of items such as landing entrance barriers are crucial for safe working. In the case that the responsible person provides these, the maintenance contractor should ensure that they are in a safe and acceptable condition. If their condition is not satisfactory, or they are not available on site, the maintenance contractor should advise the responsible person accordingly (see 4.3 reporting procedures).

#### 4.9 Emergency alarm calls

Lifts are provided with an emergency communication system linked to a call centre or nominated 24/7 manned service. The maintenance contractor should ensure that the emergency communication system:

- is working.
- Is programmed with correct numbers to reach their call centre or nominated 24/7 manned service (where using autodialler type systems).

#### 5.7 Housekeeping

If required, the responsible person, in conjunction with the maintenance contractor, should establish procedures for the temporary protection of floor coverings and walls used to access landings and machinery spaces.

The responsible person must not allow machine rooms and machinery spaces to be used for storage of materials or any other purpose.

#### 5.8 Landing entrances

Persons engaged in the maintenance and the inspection of lifts, or in effecting the release of passengers, may need to open a landing door while the car is not at that landing, e.g. in order to gain access to the pit or to the roof of the car. In such cases it is essential that the responsible person only makes the unlocking key available to trained and authorised persons.

All protective barriers should incorporate relevant safety signs.

#### 5.9 Emergency alarm calls

The emergency alarm device arrangements should be put in place by the responsible person to ensure that there is a permanently available communications link.

**Note 1** - Attention is drawn to the requirements of AS 1735.19

The responsibility for this link is usually with the responsible person.

**Note 2** - Some emergency alarm systems e.g., as provided under AS 1735.19, will not make an alarm call if a lift car is at a landing level with doors open. This is because persons are assumed not to be trapped in the lift car.

- alarm calls from the equipment are received and acted upon.
- the call centre or nominated 24/7 manned service can recognise the source of the alarm
- the operation of the emergency alarm equipment (including the line or communications link) is verified at least every 72 hours where the alarm equipment has been supplied to AS 1735.19
- as the equipment depends on a battery backup in the event of a power failure, the health of this supply is checked as part of a schedule of regular checks.

**Note** - Attention is drawn to the requirements of AS 1735 19.

At the end of the maintenance period, prior to relinquishing the maintenance agreement, the maintenance contractor should provide adequate instructions to allow the new maintenance contractor to be able to programme their new numbers into the equipment.

#### 4.10 Training in release procedures

Where training is requested by the responsible person, this should be agreed with the maintenance contractor. Prior to arranging any training, the maintenance contractor should:

- risk assess the equipment to determine the level of skill required to undertake safe rescue and release procedures.
- prepare any instructions required (if the manufacturer's instructions are not available)
- assess the competence of those being offered for training against the skill requirements identified.

The maintenance contractor should undertake the training and then assess the competence of the trainees. The scope of rescue and

#### 5.10 Trapped passenger rescue procedures

Other than the maintenance contractor's technician only approved, authorised and trained personnel of the responsible person should retain landing door unlocking keys and machinery space access keys secure and establish control measures for their issue and use.

**Note 1** - In many cases, passengers trapped in lift cars are not in immediate danger. Release and landing door unlocking procedures undertaken by untrained personnel could result in trapped passengers and others in the vicinity being placed at risk.

Rescue and release procedures should usually be carried out only by trained and competent personnel. The training of individuals in the responsible person's organisation would usually be appropriate only where there were suitable competent persons available. Reference should be made to the guidance in WH&S legislation.

**Note 2** - In some cases where lift, escalator or moving walk equipment/plant has failed,



release procedure for which they have been assessed to be competent, and the time before they need refresher training, should be clearly set out. Refresher training to be provided at least annually.

#### 4.11 End of maintenance agreement

At the end of the maintenance agreement, the maintenance provider should ensure that all documents, drawings, tools, including essential special tools, ~~software access codes~~, and equipment provided by the responsible person is handed back to the responsible person. The maintenance provider should ensure that no changes are made to the plant which result in it either becoming unavailable for use or result in it becoming not maintainable by the subsequent maintenance provider.

**Note** – The OEM may need to be contacted if lift parameters need to be changed for any reason, software access codes are not usually given out by OEM as lift parameters don't need changing under normal operating conditions.

emergency services e.g., fire and rescue services can attend site, in these circumstances upon their arrival they become responsible for release of trapped passengers and the responsible person and maintenance contractor need to support and provide advice or information as requested.

#### 5.11 End of maintenance agreement

At the end of the maintenance agreement, the responsible person should ensure that any documents, drawings, tools, including essential special tools, ~~software access codes~~, and equipment returned by the maintenance provider are retained so that they can be made available to the subsequent maintenance provider.

**Note** – See 4.11 note.

## 6 Referenced Standards or Legislation

All Standards can be revised, amended and re-published from time to time and care should be taken to ensure alignment with current maintenance agreements.

The AS 1735 Series of standards for lifts, escalators and moving walks as published from time to time should be referred to in line with the relevant plant type.

Other standards,

ASNZS 3000 2018 Electrical wiring rules (and any amendments)

Department of Communication NBN guidelines

Work Health & Safety Act

Work Health & Safety Regulations

CEN TS81-13 Safe access to the liftwell for lifts in service

EN 13015: 2001 +A1:2008; Maintenance for lifts and escalators - Rules for maintenance instructions

ISO 14798 Lifts (elevators), escalators and moving walks – Risk assessment and reduction methodology

**Note** - For further information contact the Australian Elevator Association via the following, [www.aea.org.au](http://www.aea.org.au)

## **Annex A - First inspection visit**

Before an item of plant is taken onto a maintenance agreement the proposed maintainer should inspect the item of plant to be maintained to determine its condition and the frequency of maintenance or amount of repair work that would be required to get the plant to a safe condition.

In some instances, such as tendering bulk agreement pre inspection is not always possible. In such situations an initial inspection should be made within 3 months of securing the agreement or at the first scheduled maintenance visit and a report of condition issued to the responsible person.

At a minimum but not limited to, the plant should be checked to ensure all safety circuits, contacts, switches, limits etc function as intended for the safety of all users and this should be done at time of handover.

The initial report of condition could be based on the following indicative checks (as applicable), but individual companies may wish to add or customise it in some manner according to the needs of the equipment, maintenance offered etc. This is acceptable but certain elements are essential such as the risk level for any defect or issue. For reference see AS 1735.1.4 Lifts and AS 1735.5.2 Escalators and moving walks both standards have check lists.

The condition report may result in the need for the responsible person to place an order for corrective works to be undertaken. In such situations it will assist the responsible person if they know what is vital or critical as against desirable.

Request previous maintenance records and reports of any other thorough examinations or consultants' reports.

## A.1 Electric and Hydraulic Lifts

Site address Plant identification number Agreement Number Customer contact (responsible person) phone number and name			
No	Item inspected	Priority level	Comment
1	Load Notice in the lift car		
2	Electrical schematics available		
3	Machinery access/space		If MRL refer to Top of Car access Annex E
4	Access lighting		
5	Machine room lighting/space/shaft lighting		
6	Safety signage as required		
7	Lockable main isolator		Refer 'lock out tag out' procedure Annex E.
8	Governor tripping speed label		
9	General condition of Governor groove condition, bearings etc.		
10	Machine traction sheave groove condition		
11	Machine brake condition and lining condition		It should be considered if the machine is able to drive through the brake.  Check voltage and brake excitation unit.
12	Controller general condition, cleanliness etc.		Check for 'bridges' as they can indicate other safety issues not previously resolved
13	Controller fitted with correct fuses		
14	Unenclosed controller with exposed conductive parts		To be enclosed with suitable protective cabinet
15	General condition of contactors and switches		

16	Governor tension frame condition Fitted with electrical switch		
17	Buffer condition (polyurethane degraded, hydraulic buffer fitted with switch Lubricant level		
18	Pit condition and access Pit access ladder condition		Pit should be dry and free of refuse.  Refer to Pit access procedure Annex E
19	Pit stop switches		
20	Distance from counterweight to top of buffer (measured with car level at top floor). State dimension in mm.		
21	Check emergency alarm device's		
22	Check condition of rechargeable batteries used in: <ul style="list-style-type: none"> <li>• lift car emergency lighting</li> <li>• emergency alarm devices</li> <li>• rescue systems which depend on battery backup (ARD)</li> </ul>		
23	Identification and check of any operation in the event of fire: <ul style="list-style-type: none"> <li>• Fire service operation</li> </ul>		
24	Other observations.		Any other relevant issues from the type of equipment, usage or environment.
Company contact telephone number and name..... Name of person that inspected the lift..... Date of inspection.....			

## A.2 Escalators and moving walks

Site address			
Plant identification number			
Agreement Number			
Customer contact (responsible person) phone number and name			
No	Item inspected	Priority level	Comment
1	Load notice details		
2	Electrical schematics available		
3	Machinery access/space		Areas should be dry and free of refuse
4	Access lighting		
5	Safety signage		
6	Lockable main isolator		Refer 'lock out tag out' procedure Annex E.
7	Controller general condition, cleanliness etc		Check for 'bridges' as they can indicate other safety issues not previously resolved
8	Controller fitted with correct fuses		
9	Unenclosed controller with exposed conductive parts		To be enclosed with suitable protective cabinet.
10	General condition of contactors and switches		
11	Gaps between steps/ pallets		
12	Check step/pallet to skirt clearance		
13	Check combplates for damage and missing teeth		
14	Handrail tension		
15	Chain tension		
16	Other observations		Any other relevant issues from the type of equipment, usage or environment.

Company contact telephone number and name.....

Name of person that inspected the unit.....

Date of inspection.....

## **Annex B - Typical examples of checks to be included in maintenance Lifts**

The following are checks which should be made as part of a schedule for maintenance visits. Qualified trained service technicians need to complete these checks. Not all checks would be needed on every visit and frequency of checks should be assessed depending on the equipment, its condition, usage etc. Suggested frequency is listed in the checklists below.

Other checks might be applicable on different types of lifts whereas some of these listed might not be applicable. The schedule of checks should include all the manufacturer's checks and might be modified according to the equipment, from the first inspection/survey and from later experience with the equipment.

The checks below are listed into the most critical areas of passenger and goods lifts. The most common configurations for lifts are, Geared with LMR, Gearless with LMR, Geared and Gearless without motor room (MRL) and Hydraulic, see below.

These checks can be carried out over an annual period and not necessarily during one visit/major service, where there is a bank of lifts certain inspections or checks could be done across the bank or units and others at a later maintenance visit. This can be co-ordinated with the Responsible Person.

### **Lifts**

B.1 Safety Circuit

B.2 Brake

B.3 Landing doors

B.4 Car doors

B.5 Hoistway slowdown

B.6 Safety Gear and Governor

B.7 Communication (phone)



## Lifts

### B.1 Safety Circuit

Key Component Checklist	Pass	Fail	N/A	Inspection Period		
				Service visits	1 year	5 years
<b>B.1 Safety Circuit</b> 1.0 Activate each emergency switch, e.g. pit, car, and machine room while car is moving on hand "inspection" control, the Elevator must stop immediately!	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

### B.2 Brake

Key Component Checklist	Pass	Fail	N/A	Inspection Period		
				Service visits	1 year	5 years

**B.2 Machine Brake - Geared with LMR**

1.0 Conduct a visual check of the brake components	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
1.1 Check that the fixing brackets are stiff and not being mechanically deformed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.2 Check Gap between actuating arms “toggles” and solenoid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.3 Check any Indicator Gauges to show correct adjustment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.4 Check drum for scoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.5 Check brake drum and pad are free of contamination “oil, etc”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
1.6 Check brake pad lining thickness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.7 If required ensure that lubrication points are lubricated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.8 Check that pivot points move freely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.9 Check that brake lifter is available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.10 Check the brake stroke and lift	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.11 Check Brake Monitoring switches for loose wires & correct operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.12 Check Brake Cooling contacts for correct operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.13 Check that all parts are in good condition “pay special attention to perishable parts”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
2.0 Check the gap of brake magnets or, in case of brake motors, check the play of the actuating mechanism.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
2.1 If brake is plunger type strip and check that the plunger is clean and operates freely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
2.2 Check demagnetising washer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
2.3 Check all brake circuit contacts and ensure correct operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
2.4 Observe any abnormalities of brake operation during stopping, re-level, start and travelling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
2.5 For Single Core brake, ensure that brake solenoid is not bottoming out thus stopping the brake from dropping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3.0 Perform a basic check of braking force by manually trying to turn flywheel while the lift remains stopped at floor “ensure that lift cannot move during normal operation”.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3.1 Is flywheel available in motor room YES <input type="checkbox"/> NO <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
4.0 Check for sufficient brake holding force. Using the stop button and an empty car, force an emergency stop while travelling in the up direction in inspection speed. Car should stop within 1 second.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	

5.0 \* With empty car moving at nominal speed, check the emergency stop car slide distance while travelling in the up direction.

1<sup>st</sup> Brake slide distance: mm  
 2<sup>nd</sup> Brake slide distance: mm  
 1<sup>st</sup> Time taken for brake slide: sec  
 2<sup>nd</sup> Time taken for brake slide: sec

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>

### Key Component Checklist

**Inspection Period**

Pass	Fail	N/A	Service visits	1 year	5 years
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#### B.2 Machine Brake - Gearless with LMR

1.0 Conduct a visual check of the brake components	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.1 Check that the fixing brackets are stiff and not being mechanically deformed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.2 Check hydraulic hoses for leaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.3 Check Gap between actuating arms “toggles” and solenoid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.4 Check any Indicator Gauges to show correct adjustment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.5 Check drum for scoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.6 Check brake drum and pad are free of contamination “oil, etc”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.7 Check brake pad lining thickness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.8 If required ensure that lubrication points are lubricated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.9 Check that pivot points move freely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.10 Check that brake lifter is available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.11 Check the brake stroke and lift	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1,12 Check Brake Monitoring switches for loose wires & correct operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.13 Check that all parts are in good condition “pay special attention to perishable parts”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
2.0 Check the gap of the brake magnets or hydraulic device (cover of housing must be opened).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
2.1 If brake is plunger type strip and check that the plunger is clean and operates freely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
2.2 Check demagnetising washer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
2.3 Check all brake circuit contacts and ensure correct operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
2.4 Observe any abnormalities of brake operation during stopping, re-level, start and travelling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>

3.0 Check for sufficient brake holding force. Using the stop button and an empty car, force an emergency stop while travelling in the up direction in inspection speed. Car should stop within 1 second.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.0 * Measure car slide distance in an emergency stop at nominal speed. Perform with an empty car travelling in the up direction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1 <sup>st</sup> Brake slide distance:           mm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2 <sup>nd</sup> Brake slide distance:         mm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1 <sup>st</sup> Time taken for brake slide:   sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2 <sup>nd</sup> Time taken for brake slide:   sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Key Component Checklist	Pass	Fail	N/A	Inspection Period	
				Service visits	
				1 year	5 years
<b>B.2 Machine Brake - Geared &amp; Gearless MRL</b>					
1.0 Perform a visual check of the brake mechanism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.1 Check that the fixing brackets are stiff and not being mechanically deformed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.2 Check brake drum and pad are free of contamination "oil, etc"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.3 If required ensure that lubrication points are lubricated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.4 Check drum for scoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.5 Check that the manual brake lifting mechanism is operational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.6 Ensure that brake solenoid is not bottoming out thus stopping the brake from dropping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.7 Check Gap between actuating arms "toggles" and solenoid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.8 Check brake pad lining thickness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.9 Check the brake stroke and lift	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.10 Check that pivot points move freely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.11 Check the freewheeling diode "observe brake drop" and cooling contacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.12 Observe any abnormalities of brake operation during stopping, re-level, start and travelling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.13 Check that all parts are in good condition "pay special attention to perishable parts"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.14 Check setting and operation of Brake Micro Switches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
2.0 * Perform braking test according to manufacturer instructions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>

Key Component Checklist	Pass	Fail	N/A	Inspection Period		
				Service Visit	1 year	5 years
<b>B.2 Hydraulic Elevators</b>						
1.0 Check visual leakage in the piston/ram area and shaft piping.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
1.1 Check hand pump device if available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.2 Lowering/Relevelling devices & internal valve leak check	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.3 Hydraulic oil cooling system is functioning correctly, if applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	

**\* When OEM data or documentation is not available, follow internal company technical and compliance processes.**

**If internal company processes do not provide a solution, engage an industry competent person to provide a solution.**

### B.3 Landing doors

Key Component Checklist	Pass	Fail	N/A	Inspection Period	
				Service visits	
				1 year	5 years
<b>B.3 Landing Doors</b>					
1.0 - Mechanical check: The car does not start until the mechanical lock has engaged. Check mechanical 7 mm overlap is present before the electric contact makes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.0 - Electrical check: Open each landing door individual contact from car roof while elevator is operated in inspection mode. The lowest landing door must be checked from the landing. Elevator must stop immediately!	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.0 - Conduct a visual check of all landing door guide shoes, guides and upthrusts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.1 Check that the guides fixings are all fitted and in good condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.2 Check that the door is not rusted thus affecting the guide shoe fixing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.3 Check that the guide keeper penetration is enough into the sill to stop the door coming out of the track	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.4 Check door guides and upthrusts to ensure that the landing door can't come off the track and that the door gap at the bottom of the door is correct.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.5 Check that the upthrust rollers touch the rail and can be freely rotated by hand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.6 Check the lock rollers and buffer for wear and tear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.7 Check the lock for normal operation, the 'lock rest position' should be in the locked position	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.8 Clean the track rail and clear the sill of debris and accumulated dust/dirt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.0 - If the elevator has automatic doors "self-closing", check the self-closing function for proper operation. The door must self-close and lock from fully open position and then from 200 mm from the fully close position.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5.0 - After unlocking the automatic door from outside (e.g. with triangle key) check that the door locks again by itself (if applicable).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6.0 - After unlocking the automatic door from outside (e.g. with triangle key) check that the door locks again by itself (if applicable).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
7.0 - For vertical doors ensure correct operation of the gravity mechanical catch.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

## B.4 Car doors / Car Entry Safety

Key Component Checklist	Pass	Fail	N/A	Inspection Period	
				Service visits	
B.4 Car Doors / Car Entrance Safety				1 year	5 years
1.0 - Electrical check: Ensure that the lift can't start when each car gate contact is open	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.2 Ensure that the car gate contact has positive break "mechanical knockoff"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.3 Do a function check of the car door sensors, i.e. photocells, light curtain or mechanical edge etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.4 Do a function test of the closing force limiter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.5 Do a function test of the nudging circuits / final timer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.6 Do a function test of the door open button	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.7 Ensure the car apron is installed and tightly attached	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.8 Clean the track rail and clear the sill of debris and accumulated dust / dirt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.9 Check the gaps between doors panels, car front walls and sill are not >6 mm. For glass doors a 4 mm gap between the panels and front wall is preferred to avoid finger trapping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

## B.5 Hoistway slowdown

Key Component Checklist	Pass	Fail	N/A	Inspection Period	
				Service visits	
B.5 Hoistway Slow Down monitoring				1 year	5 years
1.0 - Visually check and clean according to maintenance instructions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	



## B.6 Safety Gear and Governor

Key Component Checklist	Pass	Fail	N/A	Inspection Period	
				Service visits	
				1 year	5 years
<b>B.6 Safety Gear &amp; Governor</b>					
Note - <u>Electrical Elevator or Roped Hydraulic Elevator with Speed Governor</u>					
1.0 Conduct a visual examination. Check if all parts are movable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.1 Check the condition of governor ropes and rope fixings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.2 Check and if required lubricate safety gear and linkages	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.3 Check that the safety gear wedges clearance from the rails are correct	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.4 Check car & c/weight buffers, degradation of polyurethane or for oil level, leaks etc in hydraulic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.5 Check condition of rails for contamination (rust etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.6 Check that the rope retainers on traction sheave & pulleys are in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.7 Check and if required lubricate governor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.0 Check simultaneous engaging of safety gears and alignment between safety gear and guide shoes or roller guide by pulling the governor rope.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.0 Check seals of the speed governor and safety gear.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.1 Are the governor seals intact YES <input type="checkbox"/> NO <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.2 Was a new governor seal fitted YES <input type="checkbox"/> NO <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Car Gov. Seal N <sup>o</sup> (as applicable)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Cwt Gov. Seal N <sup>o</sup> (as applicable)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.3 Are the safety gear seals intact YES <input type="checkbox"/> NO <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.4 Was a new safety gear seal fitted YES <input type="checkbox"/> NO <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Car SG. Seal N <sup>o</sup> (as applicable)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Cwt SG. Seal N <sup>o</sup> (as applicable)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.0 Test of tripping speed of the governor with tachometer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>4.1 Car Governor spin up check (2 checks)</b>				
1. Electrical tripping speed measured: m/s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1. Mechanical tripping speed measured: m/s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Electrical tripping speed measured: m/s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Mechanical tripping speed measured: m/s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>4.2 Cwt Governor spin up check (2 checks)</b>				
1. Electrical tripping speed measured: m/s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1. Mechanical tripping speed measured: m/s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Electrical tripping speed measured: m/s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Mechanical tripping speed measured: m/s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5.0 For friction-based speed governors, conduct a function test of pull-through force with reduced tension weight. With an empty car in inspection mode, at about floor level, overbridge the safety gear contact. Safety gear must be activated, and the elevator must stop but traction sheave may continue to turn.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>5.1 Car Safety Gear type</b>				
Slow speed trip in OK: Yes / No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>5.2 Cwt Safety Gear type</b>				
Slow speed trip in OK: Yes / No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6.0 For speed governors with jaws with “separate rope brake”, perform a mechanism function test. With an empty car in inspection mode, at about floor level, overbridge the safety gear contact. Safety gear must be activated, and the elevator must stop but traction sheave may continue to turn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>6.1 Car Safety Gear type</b>				
Slow speed trip in OK: Yes / No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>6.2 Cwt Safety Gear type</b>				
Slow speed trip in OK: Yes / No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Note - Roped Hydraulic Elevator without Speed Governor</b>				
7.0 Visual check of safety gear, actuating mechanism, rope and its fixation for adjustment and cleanliness.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7.1 Check, if safety gears are equal and correct touching the rails by pulling the safety gear rope.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## B.7 Communication (phone)

Key Component Checklist	Pass	Fail	N/A	Inspection Period		
				Service visits	1 year	5 years
<b>B.7 In Car Communication device</b>						
1.0 Check connection and communication availability.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

## **Annex C - Typical examples of checks to be included in maintenance**

The following are checks which should be made as part of a schedule for maintenance visits. Qualified trained service technicians need to complete these checks. Not all checks would be needed on every visit and frequency of checks should be assessed depending on the equipment, its condition, usage etc. Suggested frequency is listed in the checklists below.

Other checks might be applicable on different types of escalators or moving walks whereas some of these listed might not be applicable. The schedule of checks should include all the manufacturer's checks and might be modified according to the equipment, from the first inspection/survey and from later experience with the equipment.

The checks below are listed into the most critical areas of escalator and moving walks.

These checks can be carried out over an annual period and not necessarily during one visit/major service, where there is a lot of escalators and moving walks on the one site certain inspections or checks could be done across certain units and others at a later maintenance visit. This can be co-ordinated with the Responsible Person.

The checks below are listed into the most critical areas of escalators and moving walks which include truss, balustrade, guards, brake and safety circuit. See below.

### **Escalator and Moving Walks**

B.8 Bottom (return) station closed

B.9 Overall length closed

B.10 Top (drive) station closed

B.11 Bottom (return) station open

B.12 Overall length open

B.13 Top (drive) station open

B.14 Final checks prior to return to service

## Escalators and Moving Walks

### C.1 Bottom station closed

Key Component Checklist	Pass	Fail	N/A	Inspection Period	
				Service visits	1 year 5 years
<b>C.1 Bottom (return/tension) station closed</b>					
1.0 Conduct a visual check of safety / warning signage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.1 Check for combs with broken teeth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.2 Check the vertical gap between combs and steps/pallets (height setting)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.3 Check the anti-climb guards for damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.4 Check restriction devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.5 Check permanent barrier/s for damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.6 Check gap between combplate and connection cover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.7 Check the gap between floor covers and floor cover frame	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.8 Check the free area / circulation space, ensure it is clear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.9 Check the combplate lighting is functioning correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.10 Check the step/pallet gap lighting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.11 Check the direction indicators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.12 Check the stop switches / emergency stops are functioning correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.13 Check the handrails for damage, cracks, damaged lips or splits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>

## C.2 Overall length closed

Key Component Checklist	Pass	Fail	N/A	Inspection Period	
				Service visits	
				1 year	5 years
<b>C.2 Overall length closed</b>					
1.0 Check step pallet chain elongation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.1 Check gap between steps and skirt panels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.2 Check function of skirt contacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.3 Check the anti-slide devices for damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.4 Check the vertical deflectors for damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.5 Check balustrade lighting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.6 Check skirt lighting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
1.7 Check handrail operation and newels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.8 Check condition of skirt panels (friction coating) if no brushes installed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>

### C.3 Top station closed

Key Component Checklist	Pass	Fail	N/A	Inspection Period		
				Service visits	1 year	5 years
<b>C.3 Top (drive) station closed</b>						
1.0 Conduct a visual check of safety / warning signage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
1.1 Check for combs with broken teeth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
1.2 Check the vertical gap between combs and steps/pallets (height setting)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.3 Check restriction devices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.4 Check permanent barrier/s for damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.5 Check the gap between combplate and connection cover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.6 Check the gap between floor covers and floor cover frame	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.7 Check the free area / circulation space, ensure it is clear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
1.8 Check combplate lighting is functioning correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
1.9 Check the step/pallet gap lighting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
1.10 Check the direction indicators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
1.11 Check the stop switches / emergency stops are functioning correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
1.12 Check the handrail for damage, cracks, damaged lips or splits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	

## C.4 Bottom station open

Key Component Checklist	Pass	Fail	N/A	Inspection Period	
				Service visits	
				1 year	5 years
<b>C.4 Bottom (return/tension) station open</b>					
1.0 Check operation of floor cover contacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.1 Check maintenance operation panel stop switch / all stop switches in the tension station	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.2 Check tension station lighting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.3 Check the condition (clean) for water, oil or rubbish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.4 Do a service brake function test, braking distance measure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.5 Check the fixation of connection cover, next to combplate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.6 Check the handrail monitoring contact / sensor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.7 Check water drainage of floor cover frame	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.8 Check function of handrail entry contacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.9 Check step/pallet chain contact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.10 Check the condition of steps/pallets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.11 Check the step/pallet band monitors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.12 Check function of combplate contacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.13 Check guarding to side walls or building balustrades	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>



## C.5 Overall length open

Key Component Checklist	Pass	Fail	N/A	Inspection Period	
				Service visits	
				1 year	5 years
<b>C.5 Overall length open</b>					
1.0 Check step upthrust contacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.1 Check step/pallet level contacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.3 Check truss lighting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.4 Generally check the inner and outer decking for damage since last inspection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.5 Check all intersection guards for damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.6 Check all between unit guards for damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

## C.6 Top station open

Key Component Checklist	Pass	Fail	N/A	Inspection Period	
				Service visits	1 year 5 years
<b>C.6 Top (drive) station open</b>					
1.0 Check operation floor cover contacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.1 Check maintenance operation panel stop switch / all stop switches in the drive station	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.2 Check drive station lighting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.3 Check drive station condition (clean) of water, oil and rubbish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.4 Check the service brake components condition, distance between the brake lever and brake guide or reserve stroke	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.5 Check the fixation of connection cover next to combplate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.6 Check the brake band/linings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.7 Check water drainage of floor cover frame	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.8 Check function of handrail entry contacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.9 Check motor coupling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.10 Mechanical blocking device	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.11 Check the operation of the safety/auxiliary brake function	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.12 Check the of the combplate contacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.13 Check the drive chain contact/sensor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.14 Check guarding to side walls or building balustrades	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>

## C.7 Final checks prior to return to service

Key Component Checklist	Pass	Fail	N/A	Inspection Period	
				Service visits	1 year 5 years
<b>C.7 Final checks prior to return to service</b>					
1.0 Check that all steps/pallets are re-installed/all components clear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.1 Check all tools removed from the installation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.2 Check all electrical bridges used for checking/testing are removed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.3 Check the unit is returned to normal operation mode	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1.4 Run the unit in both directions/at least one full revolution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
1.5 Notify Person responsible that unit is ready to be returned to service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>

## Annex D - Relevant legal framework

### D.1 Legal environment

Lifts, escalators and moving walks are subject to many pieces of legislation depending on their type, place of installation and use. The main legislation driving the need for maintenance is the Work Health and Safety Act (WH&S Act)-

Levels of legislation in Australia for lifts and escalators / moving walks



The main object of this legislation (WH&S Act) is to provide a national framework to ensure the health and safety of workers and workplaces and that workers and other persons should be given the highest level of protection against harm to their health, safety and welfare from any hazards or risks arising from work including substances or plant.

Refer to 3 Object in the Act.

Whilst there is no prescriptive or itemised content with regards to maintenance and repairs, the WH&S Act clearly indicates the responsibilities of persons who design, install, maintain, repair and alter plant, the responsibility here is both for the maintainer and responsible person (owner/PCBU).

There are penalties for not complying with these responsibilities and 'duty of care' which include fines for companies and fines and prison for individuals.

**Note** - Responsible 'duties' cannot be transferred to another person.

For more details and a copy of the legislation go to – [www.legislation.gov.au](http://www.legislation.gov.au) (which is the Federal Government site) or go to your State or Territory government site.

### D.2 Registration of Plant

Under the WH&S Act lifts and escalators/moving walks are deemed High Risk Plant.

Refer to 10 High risk plant (1B) C

Under the WH&S Act High Risk Plant must be 'Design Registered' to either a published standard or engineering principles (or a combination of the above).

Refer to Schedule 5 Part 1 and Part 5.2 / 5.3

Most State and Territory WH&S legislation has requirements about individual items of 'Plant' being registered, initially at time of commissioning and annually with the local Regulatory body e.g. SafeWork Authority in your local state or territory. This requirement is on the Responsible persons to ensure the plant is registered.

It is also required that the plant registration certificate is displayed near the plant onsite.

**Note** – Alteration to plant may require further design registration and item registration.

### **D.3 National Construction Code (NCC)**

The NCC sometimes referred to as the Building Code of Australia (BCA) does not have 'design requirements' for lifts, escalators and moving walks i.e. it does not refer to any design standards. It also does not mention maintenance or repair of plant.

It does for new installation of plant have some prescriptive content which concerns lifts, escalators and moving walks, these are seismic calculations, fire resistance (see below Fire Safety requirements lifts), energy, emergency safety and building interface requirements. When plant is repaired, altered or modernised these requirements may need to be considered.

**Note** – For more information go to – [www.ncc.abcb.gov.au](http://www.ncc.abcb.gov.au)

### **D.4 Fire Safety requirements Lifts**

Whilst the building in which plant is installed must meet certain fire safety requirements this is the responsibility of the 'person responsible' to meet this compliance.

AS 1851 Fire Safety - is the standard of rules and regulations that responsible persons need to be compliant with to help ensure all State and Territory WH&S rules are aligned.

Maintainer's responsibilities are to ensure with regards to lifts, that items under maintenance remain compliant (to the level they were initially installed to) or if the building interface changes and this effects the Fire Rating Levels (FRL) of any item of plant the person responsible is informed.

There are many areas of compliance for the building structure and interface of the lifts in a building, generally the following are the key areas for the lift/s to comply with which can be found within the NCC in the following sections, Section C Fire resistance and Section E Part E3 Lift installations.

Section C Fire resistance

C2D11 (C1.10) Fire hazard properties, there are requirements for lift car flooring, walls and ceilings.

C4D11 (C3.10) Openings in fire-isolated lift shafts, there are FRL requirements for lift landing doors and other penetrations into the fire rated lift shaft.

Section E

E3D4 (E3.3) Warning against the use of lifts in fire, warning signs

E3D5 (E3.4) Emergency lifts, general requirements

E3D9 (E3.7) Fire service controls, required in buildings with an effective height > 12 m

E3D11 (E3.9) Fire service recall control switch, recall of lifts to specified floor

E3D12 (E3.10) Lift car fire service drive control switch, allows emergency services to assist with evacuation

**Note** – NCC 2022 is the first reference clause, NCC 2019 is the reference clause in brackets

## Annex E - Responsible Person checks

In addition to those examinations and tests which building maintenance managers are responsible for having undertaken by a competent person, there are certain inspections/checks which they should carry out in their own interest.

Checks by the building maintenance manager are not a substitute for the checks to be undertaken by the maintenance contractor.

In the event of a deemed safety defect being discovered, the unit should be switched off and the maintenance contractor called.

### E.1 Regular checks for lifts

The following should be checked for operation and to check that they are free from damage.

- 1 Visual inspection of the lift car operating panel.
- 2 Check that all the indicators are working correctly.
- 3 Ensure the alarm/communication system functions correctly (Passenger Safety).
- 4 Check that the lift doors open when the 'door open' button is depressed.
- 5 Check that all position indicators on the landing are working correctly.
- 6 Check all lighting is in working order.
- 7 Check any mechanical/electronic door protection device (safety edge) such that when the safety edge is operated the door re-opens and after operation and removal of any obstruction the door closes (Passenger Safety).
- 8 Check that the floor in the immediate vicinity of the landing door is in a clean and safe condition. Check that the lift stops level at each floor.
- 9 Check the landing doors and door frames / architraves
- 10 Clean landing and car door bottom tracks/sills.
- 11 Undertake a full ascent and descent to assess for any unusual noise.

**Cautionary note:** Caution needs to be exercised when carrying out the following tasks, if in doubt contact your maintenance provider,

- Moving heavy equipment, i.e. safes and office machinery due to weight and dimensions.
- Keeping secure from other than authorised persons, the machine room/ machinery area access key and keeping control of landing door emergency release keys and the distribution of car preference control keys.
- Cleaning enclosures for glass lifts. No person should have access to the lift well without the lift maintenance technician present.

### E.2 Checks for lifts with special operation in the event of fire

Many lifts have special features e.g. for use in the event of fire or evacuation. These should be checked as follows:

- Fireman's lift switches should be checked regularly.
- A failure of the primary electrical supply should be simulated regularly to check the secondary supply and operation of the lift on the supply if provided.

- An annual test of all functions including communication systems. This should be specified to be included as part of the maintenance agreement, see Annex B.

### **E.3 Regular checks for escalators and moving walks**

1 A visual inspection of the escalator/moving walk for any deficiencies e.g., cracked glass or loose panels.

2 Check that approaches to all landings are free of obstructions and provide sufficient unrestricted space (usually at least 2.5 m deep).

3 Check that all lighting is adequate and functioning – especially at top and bottom.

4 Check that all walking surfaces are free from tripping or slipping hazards.

5 Check handrails for damage.

6 Check skirting/deflector devices are securely fixed.

7 Check that the comb plates at the top and bottom of the escalator or at the ends of the moving walk do not contain broken teeth (Passenger Safety).

8 Check that all warning signs and safety pictographs are clearly visible. Other signs or indicators e.g. for shop guide or advertisements should be kept clear of landings.

9 If all the above are acceptable and the escalator/moving walk is clear of passengers, run the unit and examine it for at least one complete cycle of the steps/ pallets. Check visually for excessive clearances (greater than 4mm) between steps/ pallets and skirting. Check that step treads and risers have no obvious signs of damage. Listen for any excessive or unusual noise. Check escalator/moving walk stop buttons.



## Annex F Basic Procedures

Lifts, escalators and moving walks require trained competent technicians to maintain, repair and undertake release of passengers when faults occur, and maintenance companies have many internal regimes to ensure the above can be undertaken with appropriate safety measures.

The following are the basics to ensure the safety of technicians and users.

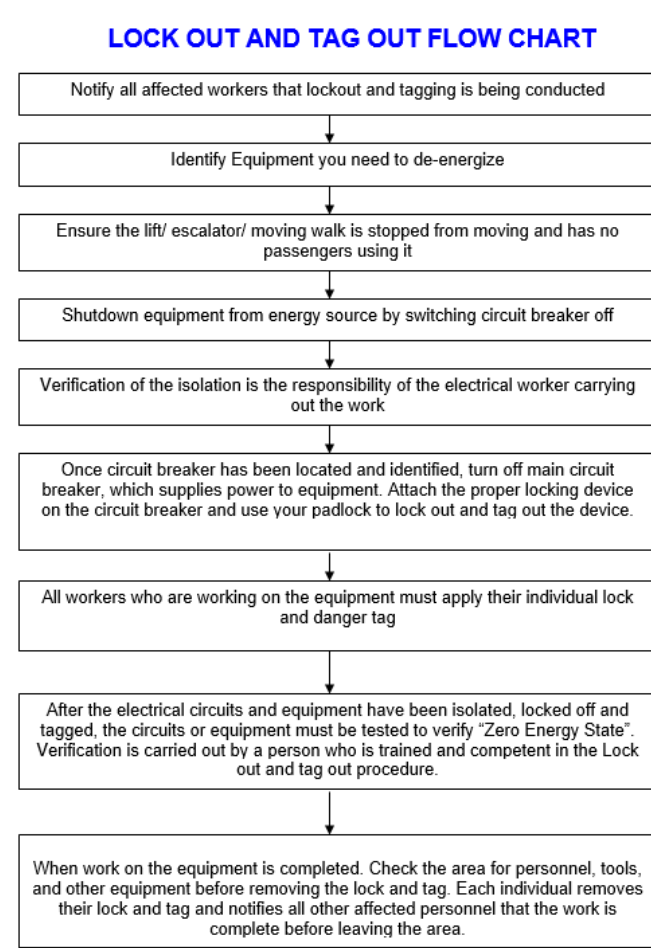
### F.1 Tag Out / Lock Out (LOTO) procedure

Purpose is to define the minimum requirements for isolation, lockout and tagout of equipment.

Qualified individuals who need to perform LOTO will need danger tags, warning tags, lock device/s and ideally an approved multimeter.

When work is performed on equipment where power is not required, the equipment must be completely de-energized (brought to “Zero Energy State”) and locked and tagged out from its power source. Verification of “Zero Energy State” must be accomplished using either a Multimeter Cat III as a minimum when performing electrical work OR verification by trying to drive the equipment using the maintenance control device.

Only the individual who LOTO (and there can be more than one individual) can remove their lock and tag.



## F.2 Pit and Car Top Access

Access and egress from the lift shaft is critical to technician safety. Entry to the pit and access to the car top is best referred to CEN/TS 81-13 Safe Access to lift wells.

**Note 1** – Maintenance companies will have their own variances on the above but essentially before committing to enter the shaft technicians ensure that the lift safeties are functioning correctly, and the lift cannot move when switched to 'inspection mode' without interaction by the technician.

**Note 2** – Pits identified as being over 2.5 m in depth under current standards will have other ways to enter the pit than via the lowest landing doors, i.e. pit access doors.

However most lifts installed prior to 2016/2017 in Australia with pits > 2.5 m deep will access the pit using a 'Deep pit access (DPA) procedure', this is where technicians use a fall arrest system to ensure safe access and egress from the lift pit.

## **Annex G Suspension Types and Maintenance Guide**

Design codes for lifts define suspension types as either steel ropes or chains EN81-20 5.5.1, but as new technologies have emerged, and we now have belts and Kevlar ropes.

All suspension types have special requirements for both maintenance and replacement.

### **G.1 Relevant Standards or Codes**

AS 3569 2010 Steel wire ropes – Product specification

This standard is for the manufacture and testing of relevant rope types. The standard does not contain information on maintenance or condemnation of ropes.

AS 1735.2 1997 Annex B (Informative) had specific information for Condemnation and Lubrication of steel ropes.

This standard is obsolete/withdrawn, and rope condemnation is not referenced in the current AS 1735 series.

ASME 17.6 Standard for Elevator Suspension, Compensation and Governor Systems, covers the material properties, design, testing, inspection and replacement criteria for suspension means. It covers steel wire ropes, aramid fibre rope and non-circular elastomeric-coated steel suspension types.

The information within this standard could be referenced.

ISO 4344 2004 Steel wire ropes for lifts, Annex E (Informative) Discard criteria for lift ropes  
This is the recommended standard for information on what to consider with regards to condemnation of ropes.

### **G.2 What should be considered during maintenance of Steel Wire Ropes**

#### Broken wires/strands

The number of visible broken wires/strands within a section of the rope.

#### Reduction in diameter

Reduction of  $\geq 6\%$  of the nominal rope diameter.

#### Age

Where ropes have been in service  $> 10$  years, but there is no definite guide.

#### Corrosion (rouge)

Ropes exuding rouge (red dust) indicate internal deterioration (rusting).

#### Tension

During maintenance indication that 1 or more ropes require adjustment in tension or tension cannot be maintained is an indicator of problems within and can lead to stress on the other ropes.

#### Unusual features / Wear

Sections of rope where shiny sections are noticed indicating wear or if during a

maintenance visit a rope appears to have been damaged.

### Lubrication

This a critical factor and the type of ropes installed on a lift should be identified by a label on the machine. Depending on the identified ropes, will determine if lubrication is required and what lubricate is to be used, noting that some ropes are not to be lubricated as part of the design of the lift system, lubrication of this design could lead to traction issues.

*Note<sup>1</sup> – If in doubt about the requirements of lubrication contact the OEM or rope manufacturer.*

*Note<sup>2</sup> – It is recommended that if it is considered that one or more ropes need replacement all ropes are to be replaced.*

## **G.3 What should be considered during maintenance of Elastomeric Coated Steel Flat Belts**

### Runs/Trips

Most types of this suspension have maximum life, which is calculated by the number of trips or runs (explain) of the lift, which is measured by 'trip counter' within the control system of the lift.

### Cleaning

Most types of this suspension have specific requirements if cleaning of the belt/s is required and if it cannot be cleaned satisfactorily, replacement should be considered.

### Unusual features/Wear/Damage

During maintenance if any new features are noticed like damage, wear or tension indifference, replacement should be considered.

*Note<sup>3</sup> – If in doubt about the requirements of any of the above, contact the OEM or belt manufacturer.*

## **G.4 What should be considered during maintenance of Kevlar ropes**

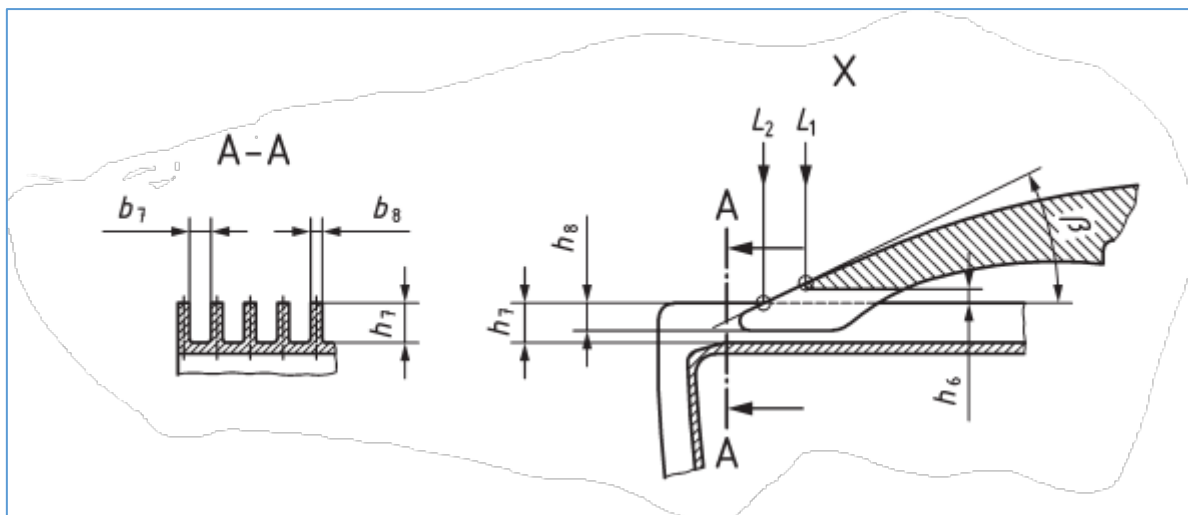
Kevlar or Aramid fibre ropes are used by some lift manufacturers, the maintenance, life cycle and/or replacement requirements of these types of suspension means are specific, O&M Manuals provided, or the OEM should be consulted to ensure the correct care is undertaken.

## Annex H Escalator and Moving Walk Combs/Comb Plate

The current design standard AS 1735.5.1 for escalators and moving walks contain details of the significant hazards for maintenance technicians and end user (public).

Escalators and moving walks when in operation have moving and fixed components.

A critical area is the interface between the moving steps or pallets and the fixed combs or combplate situated at the entry and exit of each unit.



**Note** – above extract from EN115.1

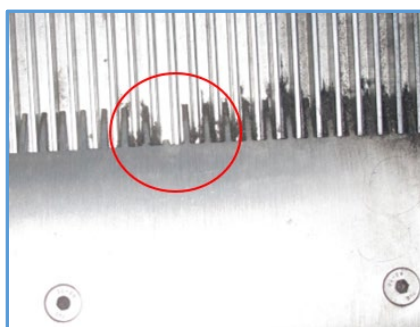
The fixed combs intermesh with the step or pallet profile with reasonably close tolerances, to avoid various foreign objects (including human entrapment) from being trapped or pulled into this interface area.

There are no specific details on when damaged or broken components should be repaired or replaced. (The American standard, ASME A17.1 Cl. 8.6.8.4 is a repair or replacement clause with regards to combs and combplates).

When combs have broken or damaged teeth there is increased risk of damage to the steps or pallets and entrapment.

Our recommendation is that any combs with a single broken tooth can remain in operation, but replacement planned, any comb with two or more broken teeth the unit be shut down until a replacement comb is installed.

Example of a comb with broken teeth.

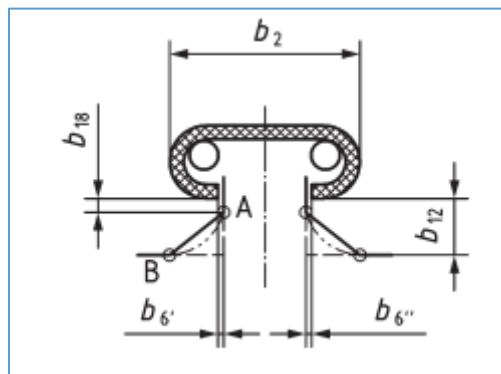


## Annex I Escalator and Moving Walk Handrails

The current design standard AS 1735.5.1 for escalators and moving walks contain details of the significant hazards for maintenance technicians and end user (public).

Escalators and moving walks when in operation have moving and fixed components.

A critical area is the interface between the user (public) and the handrail.



**Note** – above extract from EN115.1

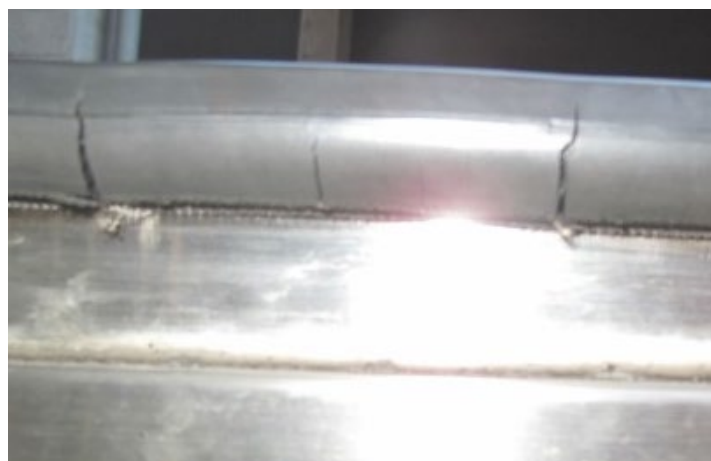
Handrails should be smooth and free from damage.

Handrails which have damage from wear from other fixed components or foreign objects need to be inspected and assessed as to their ongoing safety for the public.

Handrails which have cracking across their width should be repaired or replaced depending on the severity of the cracking, as these can cause injuries to users (public).

Hazard and Risk assessment using ISO TS 14798 can assist in determining the level of risk and whether repair or replacement need be undertaken.

Examples of a handrail with splits/cracking.





## **Annex J Lubricant types for Gearboxes (pending)**



## **Acknowledgements**

CEN for extracts from EN115.1

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