



LEIA Safety Information Sheet

Fall Protection

Prepared by the LEIA Safety and Environment Committee

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PREAMBLE

This Information Sheet is one of a series produced by the LEIA Safety and Environment Committee on topics relevant to the Lift and Escalator Industry. Whilst every effort has been taken in the production of these sheets, it must be acknowledged that they should be read in conjunction with the relevant legislation, codes of practice etc. They should not be taken as an authoritative interpretation of the law but guidance to it.

INTRODUCTION

The general principles set out in the Work at Height Regulations (see LEIA/ SAFed Lift & Escalator Industry Guidance for Working at Height) are to:

| Avoid | Prevent a fall | Minimise consequences | Ladders |
|--|--|--|--|
| <ul style="list-style-type: none"> • Avoid the work at height if possible | <ul style="list-style-type: none"> • Collective Measures <ul style="list-style-type: none"> • Vertical Screens in shafts • Guard rails around a car top or at the edge of a roof • Car top extensions • Scaffolds • Personal Measures <ul style="list-style-type: none"> • Harness and work restraint lanyard | <ul style="list-style-type: none"> • Collective Measures <ul style="list-style-type: none"> • Move lift car to lowest point in shaft • Safety nets • Air bags • Personal Measures <ul style="list-style-type: none"> • Harness and work arrest lanyard | <ul style="list-style-type: none"> • Low risk and short duration tasks may be undertaken on ladders • A risk assessment should be carried out prior to use |

Collective measures are always to be given priority over personal measures.

All work at height should be the subject of thorough risk assessment to ensure necessary steps are implemented so that the work can be carried out safely. All work at height must be properly planned and organised and everyone who works at height, or who organises work at height, must be trained and competent to do so. Planning must include planning for emergencies including rescue of persons suspended after falling.

When work on lifts is undertaken in customer premises the provision of permanently fixed guard rails/barriers on the top of lift cars in many cases will be beyond the control of the lift company and indeed may not be physically possible due to constraints of the building.

In circumstances where preventing the fall by fixed barriers is not possible, personnel still need protection and there may be no other option but to select personal fall protection equipment. The most suitable equipment must be selected.

THE PROVISION OF PERSONAL FALL PROTECTION EQUIPMENT SHOULD BE SEEN AS THE FINAL OPTION AND SHOULD ONLY BE SELECTED IF GENUINELY UNAVOIDABLE – NOT AS A CONVENIENT OPTION.

TYPES OF EQUIPMENT

Personal fall protection equipment falls into 2 categories:

- Work Restraint Equipment - prevents the person reaching an edge from which a fall could occur.
- Fall Arrest Equipment – arrests the fall using a shock absorbing device. This mitigates the distances and consequences of the fall.

Remember, preventing the fall must be given priority over mitigating the distance and consequences of the fall.

WORK RESTRAINT EQUIPMENT

The user wears a body harness and is attached to a secure point by a fixed tether. In practice this is likely to be a lanyard capable of being adjusted to suit different locations.

The principle is that the lanyard prevents access to the edge from which the person could fall (e.g. the unprotected edge of a lift car roof). If the edge cannot be reached then no fall is possible.

It should be noted that:-

- The lanyard or tether must prevent access to the edge.
- If an adjustable lanyard is used then it must be correctly adjusted to prevent any edge being reached.

When using an adjustable lanyard, self-discipline by the user is required to ensure the device is correctly adjusted. If this fails to happen a fall is possible and there is a higher risk of injury if a fall occurs while wearing incorrectly adjusted work restraint equipment.

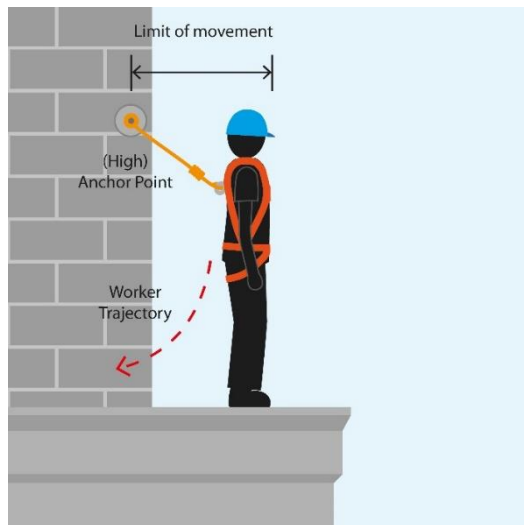


Adjustable Work Restraint Lanyard

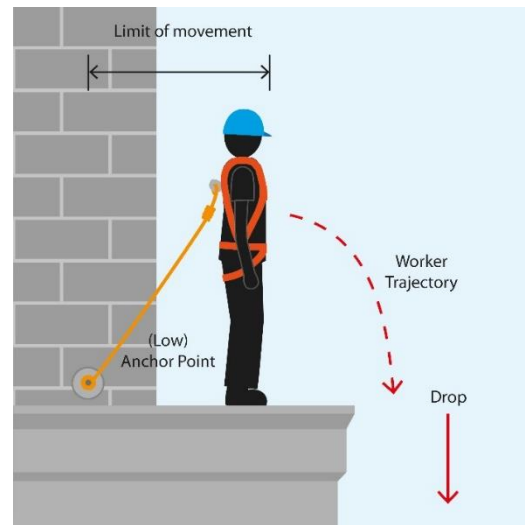
ANCHOR POINTS FOR WORK RESTRAINT

If an attachment on an operational lift is required then ideally a purpose made fixing point on top of the car should be used (but see also note to Anchor Points For Fall Arrest below). If anchorage around the crown bar is used it must not be able to move if this changes the length of the tether which could expose the user to the fall hazard. (See Figure below)

Anchor Points for Work Restraint:



High anchor point limits potential for a fall



Low anchor point may not prevent a fall

FALL ARREST EQUIPMENT.

The user wears a full body harness and is attached to a secure point via either a lanyard including a shock absorber, inertia reel block or similar device. The anchorage point must be chosen carefully (See below).

The principle is that if the user falls the lanyard shock absorber or inertia reel device arrests the falling person before they hit anything or are injured by the impact of the fall.

A fall arrest lanyard with a shock absorber must not be used with a belt

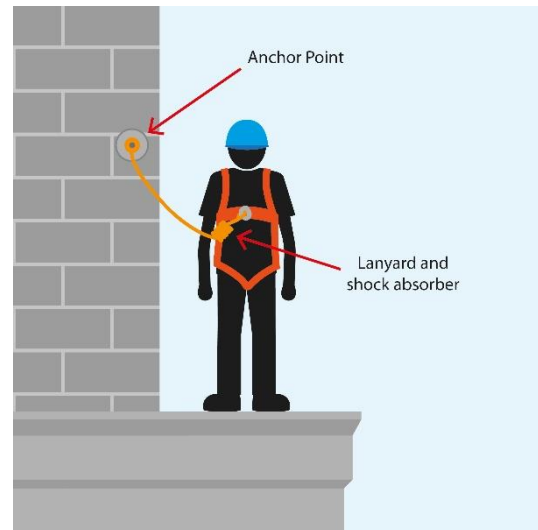


Fall-arrest Lanyard with Shock Absorber

This equipment may be suitable for some applications particularly in a construction environment; if it is selected then:

- A rescue procedure will need to be considered and in place when the work is undertaken.
- Clear distances/spaces into which a person can fall need to be available.
- Anchor points should be as high as possible.

If a person were to be suspended in a harness and unable to rescue themselves (e.g. if they were unconscious) there is risk of death or serious injury from suspension syncope (See below).



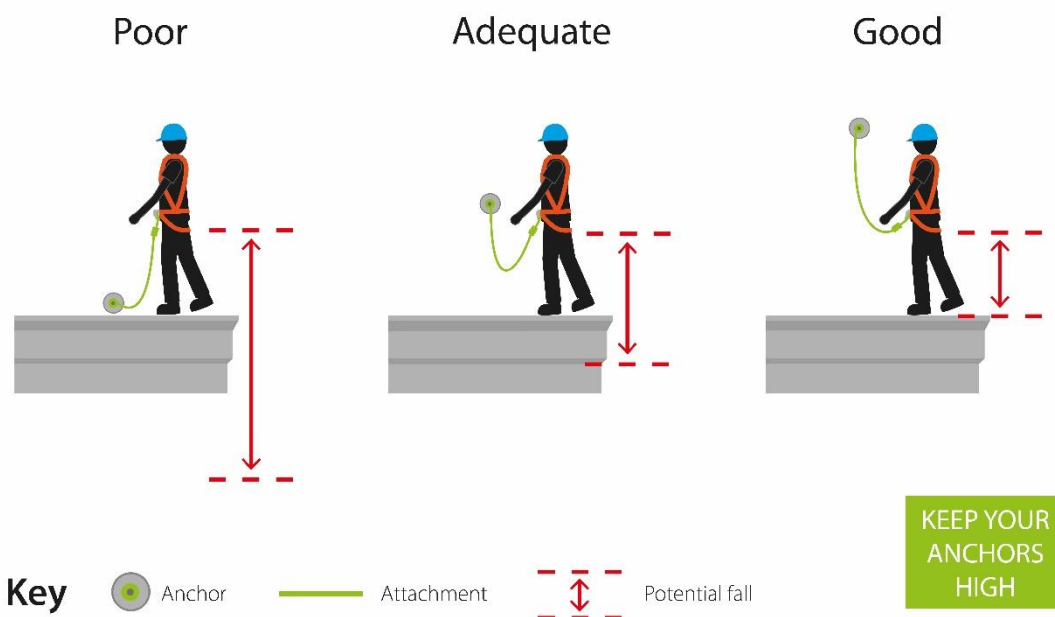
Principle of Fall Arrest

ANCHOR POINTS FOR FALL ARREST

If a lanyard with a fall arrest shock absorber is used then the anchor point must be chosen such that it is capable of accepting a shock load (Minimum 12kN or 1.2 tonnes)

Account needs to be taken of the consideration that high anchor points may be difficult to achieve in a lift environment.

In the lift industry, where single man working is common, the use of personal fall arrest equipment is problematic. Anchor points are often at low level, clear fall spaces cannot be guaranteed and the need for urgent recovery is important, it is for these reasons there is major concerns and the use of fall arrest for single man working is not recommended.



It is important to remember when using fall protection equipment that the anchorage point should be of adequate strength and be suitably located (see above diagrams). If the lift is operational, it is vital that the choice of the anchorage point is carefully considered so that the user is not endangered should the lift move. If an attachment on an operational lift is required then ideally a purpose made fixing point on top of the car should be used (but see note below). Attachment to scaffolding during the installation stage, prior to the car being mobile, is acceptable, provided that the scaffold conforms to the legal requirements and the attachment point will take the load.

NOTE: Purpose made anchor devices (structural anchors or eye bolts, anchor devices employing horizontal flexible lines and anchor devices employing horizontal rigid rails) are considered to be PPE and will need regular inspection and CE marking (see WAHSA Guidance TGN03 and TGN04).

INSPECTION OF WORK RESTRAINT AND FALL PROTECTION EQUIPMENT

The user of work restraint and fall protection equipment must have received training in the correct use and maintenance of the equipment. The harness should visually be inspected by the user on each occasion it is used, paying particular attention to:-

- Webbing - check for cuts, even ones as small as one millimetre, abrasions, chemical damage, etc
- Snap Locks - check for damaged or distorted hooks, springs and jaws
- Stitching - check for broken, cut or worn threads, seams etc
- Lanyards - check for signs of wear
- Inertia Reels – check for damage to casing and lanyard
- Tactile checks – softening or hardening of webbing

A lanyard that has been used to arrest a fall should be discarded and never be reused.

A harness that has arrested a fall must be taken out of service and inspected by a competent person before re-use.

IF ANY DAMAGE OR DEFECT IS FOUND IN THE EQUIPMENT IT IS NOT TO BE USED and should be passed to a competent person for repair.

NO UNAUTHORISED MODIFICATION OR ADAPTION SHOULD BE MADE FROM THE MANUFACTURERS SPECIFICATION

Further advice, including detailed examples of defective equipment can be found in the HSE guidance INDG367 'Inspecting fall arrest equipment made from webbing or rope'.

In addition, regular formal inspections (minimum 12-monthly, although heavily used equipment may need more frequent inspection) should be conducted by a designated competent person who should record the inspection. No unauthorised modification or adaptation should be made from the manufacturer's specification.

Harnesses and lanyards should be replaced in accordance with the manufacturer's recommendations.

Harnesses and lanyards should comply with appropriate British Standards:

- BS EN 354 – Lanyards,
- BS EN 355 – Energy Absorbers,
- BS EN 361 – Full body harnesses and
- BS EN 363 – Fall Arrest Systems

Other British Standards cover other fall arrest equipment.

RESCUE/RECOVERY OF FALLEN PERSON

Should a fall occur it is important that recovery of the person is undertaken promptly especially if the person is injured or unconscious so that they cannot move. If someone is left hanging motionless in a harness then a phenomenon known as suspension syncope (or suspension trauma) can occur. This is caused by a number of factors but particularly the harness restricts the blood circulation which ultimately affects vital organs such as the brain, heart and kidneys. It can be exacerbated by other factors such as shock or injury caused by the fall itself and lack of movement whilst hanging in the harness. Loss of consciousness can result and a conscious casualty should be encouraged to gently move their legs to stimulate circulation.

It is therefore essential that whenever fall protection equipment is worn thought and planning has been given to how safe rescue will be achieved should a fall occur. All persons involved must be made aware of the phenomenon and the need for prompt recovery.

FURTHER INFORMATION

Joint LEIA/ SAFed document: Lift & Escalator Industry Guidance for Working at Height, Safety Information Sheet 12 available to download from the Member's pages of the LEIA website www.leia.co.uk

British Standards are available from <https://shop.bsigroup.com/>

The Work at Height Safety Association (WAHSA) produces technical guidance on most aspects of PPE for use in work at height:

- TGN01 – Guidance on the selection, use, maintenance and inspection of retractable type fall arresters
- TGN02 - Guidance on the use of single and twin energy absorbing lanyards
- TGN03 - Guidance on inspecting eyebolts for personal fall protection
- TGN04 - Guidance on the selection, use, maintenance and inspection of anchor devices
- TGN05 - Guidance on the selection, use, maintenance and inspection of connectors
- TGN06 - Guidance on the use and inspection of mobile man anchors to BS EN 795 class E
- TGN07 - Guidance on the suitability of abseil rails. Design, selection, use, maintenance and inspection
- TGN08 - Guidance on connector safety

These are available for free download from <http://www.wahsa.org.uk/guidance-notes/>

INDG367 'Inspecting fall arrest equipment made from webbing or rope'

This is available for free download from <http://www.hse.gov.uk/pubns/indg367.htm>

For any clarification of this information sheet contact your company Safety Advisor or the LEIA Safety and Training Manager.