European
Lift Association

# BASIC SAFETY PRACTICES FOR LIFTS

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# INTRODUCTION

Installing, maintaining, repairing, and modernizing lifts are activities leading to exposure to specific risks. In order to mitigate these risks and help promote an injury-free workplace, professionals are therefore required to follow specific safety practices and work methods.

This ELA "Basic Safety Practices" booklet gathers general and specific safety practices which should be followed at all times.

This booklet has been designed, in the first instance, for providers of installation, maintenance, repair, and modernization services for lifts. These service providers have a legal obligation and responsibility to protect their employees against any risks related to their activities. The booklet provides guidance in quoting examples of protection means which – when put in place adequately – will help attain the best level of protection to, among others, contractor's and subcontractor's employees.

It is also the company responsibly to identify, understand and comply will all the applicable local, regional, country and European requirements and laws.

Equally, this booklet has also been designed for the employees. Indeed, the employee is responsible for following the safety practices and for using the protection equipment provided by his/her company. The booklet will help him/her to understand the risks and, where needed, to require the necessary additional protection means from his/her company.

Safety practices are generally based upon common sense. They have been set following the lessons learnt from many years of incidents, some of them very serious and leading to death.

Some of the safety practices are particularly important: these are the VITAL rules. As clearly stated, these rules are VITAL for the preservation of life itself. Should they not be followed, the result could be very serious or even fatal injuries.

# INTRODUCTION

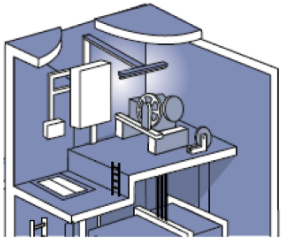
This ELA “Basic Safety Practices” booklet addresses most of the risks and situations encountered in the lift activity. It provides guidelines and examples on how to protect against the risks and help starting the safety journey. However, this booklet should not be seen as an exhaustive set of rules covering all the complexity of our work. It remains the responsibility of the company concerned to conduct its own risk assessment and provide the right preventive measures.

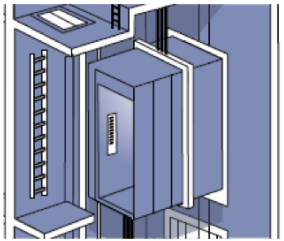
Your business as a contractor or subcontractor and your life as a worker depend on the strict application of all safety practices. Ensure their respect and respect them at all times.

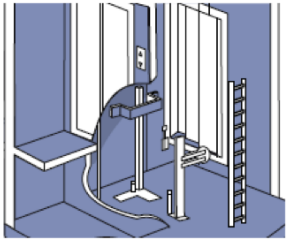
Finally, in case of a doubt, should anyone feel that the situation is not fully under control, STOP working immediately and ask for support.

The Editing Team

## Summary of the risks :








Electrical hazard


Crushing hazard on unprotected moving equipment


Risk of hurt on ceiling


Asbestos


Risk of fall – access to machine and/or machineroom


Risk of slip


Risk of tripping


Electrical hazard


Crushing hazard on unprotected moving equipment


Risk of crush on top of the hoistway and adjacent unit


Falling objects


Risk of fall from the top of the car


Risk of slip


Risk of tripping


Asbestos


Electrical hazard


Crushing hazard on unprotected moving equipment


Risk of crushing by the car, counterweight or adjacent elevator


Falling objects


Risk of fall from the landing or pit ladder


Risk of slip


Risk of tripping

# PERSONAL PROTECTIVE EQUIPMENT (PPE)

Like all professionals – firemen, policemen, welders etc. – or any sportsman – fencing, martial art – wearing personal protective equipment allows one to perform the activity in the best safe conditions.

The company has the responsibility to provide this Personal Protective Equipment to all their employees.
The employee has the responsibility to wear and use them and require them to be replaced if damaged.

2 types of protective equipment are presented:

- The personal protective equipment which protects the body from an injury.
- The means of fall protection which prevents the employee from falling from heights.

# PERSONAL PROTECTIVE EQUIPMENT (PPE)

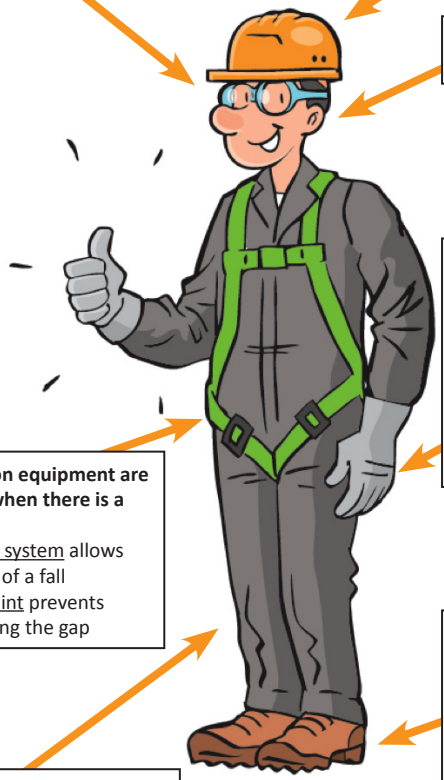
**Glasses:**
- Are mandatory when there is a risk of flying objects (such as drilling, grinding…)
- Recommended when using chemical products

**Safety helmet required:**
- When there is a risk of falling objects
- Are mandatory on all construction sites

*Check the helmet following the manufacturer's recommendation!*

**Protective caps are:**
- Recommended all times to protect against injuries in small machine room or work in the hoistway

**Ear protection:**
- Mandatory if noise > 85 dB(A)



**Required gloves:**
- Heavy duty gloves when doing manual handling.
- Cut protective when performing repairs, using tools, etc.
- Electrical gloves for work on potential live equipment
- Chemical gloves when using chemical products.

**Fall protection equipment are mandatory when there is a risk of fall:**
- Fall Arrest system allows the arrest of a fall
- Fall Restraint prevents approaching the gap

**Safety shoes:**
- Anti-slip, anti-perforating.
- Toe protection against falling objects.
- A heel to get a better grip when climbing a ladder
- Preferably providing protection for the ankle

**Working clothes:**
- Protect against cuts, dirt, etc.
- Identify the company

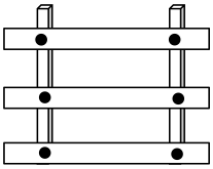
**Avoid wearing:**
- Metal watches, bracelets, necklaces, rings etc. when working on a live electrical equipment
- Unfitted clothes that could be caught in unprotected moving equipment
- Ties, scarves that could be caught in unprotected moving equipment

**Remember:**
- Additional safety requirements such as glasses, high visibility jacket… could be required locally!

# FALL PROTECTION EQUIPMENT

## Primary protection means: the balustrade or guardrail

A balustrade or guardrail should always have at least the following component:




Check the dimension in local regulation!

**Guardrail or balustrade shall be installed if a risk of fall exists as defined in the local regulation (for example, gap>30 cm and working area >2 m):**

- On top of the car
- On top of temporary working platform.
- On a scaffold.
- On edge of a building.
- In hoistway / shaft opening.

## Secondary protection means: fall arrest system or fall restrain system

### Fall Arrest System: STOPS the fall

**Fall Arrest System includes:**

→ Body harness EN 361
→ Short lanyard EN 355 with shock absorber
→ Connectors to attach the harness EN 362

### Fall Restraint System: PREVENTS a fall

**Fall Restraint includes:**

→ Body harness EN 361 **OR**
→ Belt EN 358
→ Adjustable lanyard EN 355
→ Connectors to attach to harness EN362

**All fall protection equipment:**

- **Is individual: every employee exposed shall be provided with one**
- **Must be formally inspected *1/year* by a competent person (supplier or any trained person)**
- **Must be checked before each use**

## Hooking points

### On the top of the car, unit in service

The car beam is generally considered as an adequate hooking point for the fall arrest system.
*The company to list the authorized hooking points.*

**When working on the car:**

- Attach after accessing
- Detach before egressing

This is to prevent still being attached when putting the unit back in service.

### Other situations: the life line

Example of life line:

Life line made of cord with its attachment point for harness

Retractable life line

The life line shall be fixed to an adequate hooking point with the right capacity as per local regulation. The life line shall be protected against sharp edge.

**Use life line when working on:**

- Temporary platform
- On a car when ropes have been removed
- On a car partially assembled, suspended by chain or hoisting device
- A ladder when working on top of the counterweight

# FATAL & SERIOUS ACCIDENTS PREVENTION

In the Lift Industry, employees are exposed to risks which – if not fully identified and adequately managed – may lead to a fatal or serious accident.

The present chapter aims to help any employee and company understanding what the main risks are and help them identify effective means of protection. The list is based on lift industry experience and knowledge of serious accidents but however cannot be considered as fully exhaustive.

## ACCESSING THE SITE – NEW EQUIPMENT – CONTROL OF MECHANICAL ENERGY

### DESCRIPTION OF THE RISK

Risk of being hurt by a falling object can occur when walking on a construction site and a worker drops a tool or materials.

### PROTECTION MEANS

**VITAL RULE:**
**ALWAYS** wear a safety helmet when working on a construction site.
**ALWAYS** be careful of workers working above when accessing the site or the building.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Personal Protective Equipment:**
• Safety helmet.

**Check the safety helmet following the manufacturer's recommendation!**

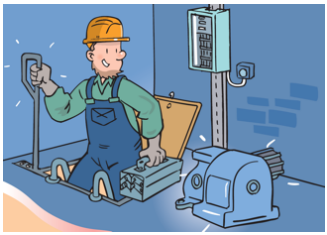
## ACCESS TO THE MACHINE ROOM OR THE PULLEY ROOM – TRAP ACCESS – FALL PROTECTION

### DESCRIPTION OF THE RISK

Risk of falling from unsuitable access equipment if:
- unsafe ladder (damaged, too short or can't be secured to a fixing point)

Risk of falling from unsuitable access equipment if:
- unsafe trap (not robust enough, too heavy, no system to prevent accidental closing etc.)

### PROTECTION MEANS



**VITAL RULE:**
**ALWAYS** check condition of ladder and trap before use.

**NEVER** use improvised access equipment.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Safe Access Equipment:**
- Ladder in good condition (not broken, damaged or fragile).
- Ladder with non-slip feet.
- Fixed ladder or hooking system to secure the ladder.
- Secured and robust trap.
- Handle to facilitate the access and good balance.

**Personal Protective Equipment:**
- Boots with clean, non-slip soles.
- Protective cap.

**Safe procedure:**
- Check that the access equipments are safe.
- Keep 3 points of contact when climbing up the ladder
- **NEVER** stay positioned on the trap: it may not be robust.
- **ALWAYS** close the trap (public and employee protection)
- If the access is not safe, inform the company.

The issue should be raised with your company who should inform the customer and/or inspection body (if relevant) to help and find an appropriate solution.

## ACCESS TO THE MACHINE ROOM OR THE PULLEY ROOM – ACCESS TO ROOF – FALL PROTECTION

### DESCRIPTION OF THE RISK

Risk of falling from unprotected edge if:
- Edge is within less than 3 m from the access path to the machine room or pulley room.

### PROTECTION MEANS

**VITAL RULE :**
**NEVER** approach an unprotected edge.
**ALWAYS** ensure that fall protection is in place if a fall exists with 3 m from the access path to the machine room or pulley room.
**ALWAYS** use a portable light if no proper lighting is in place.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Safe Access:**
- Edge of the building protected by a compliant guardrail.

**Personal Protective Equipment:**
- Fall protection system and appropriate hooking point.

**Safe procedure:**
- Check that the access is safe.

If the access does not meet the criteria above, inform the company.

The issue should be raised with your company who should inform the customer and/or inspection body (if relevant) to help and find an appropriate solution.

## WORK IN THE MACHINE ROOM – FALL PROTECTION

### DESCRIPTION OF THE RISK

Risk of falling through unprotected hole from an open trap or when lifting equipment through the trap.

### PROTECTION MEANS

**VITAL RULE:**
**NEVER** work in close proximity of an unprotected opening without appropriate fall protection equipment.

If a barrier cannot be used, **ALWAYS** wear protective equipment attached to a hooking point in the machine room.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Safe Access:**
- Compliant guardrail around the trap.

**Personal Protective Equipment**
- Personal fall protection with the lanyard attached to an appropriate hooking point (such as a specially created point or an adequate beam).

**Safe procedure:**
- Install a compliant guardrail if none exists.
- Identify the appropriate hooking point for fall protection.
- Wear personal fall protection with the lanyard attached.
- No employee shall stay within the vicinity of the fall hazard if not wearing any kind of fall protection equipment.

If the access does not meet the criteria above, inform the company.

The issue should be raised with your company who should inform the customer and/or inspection body (if relevant) to help and find an appropriate solution.

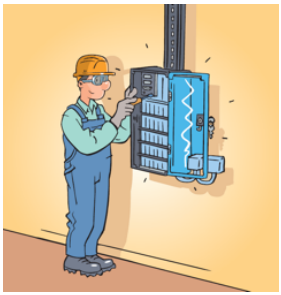
## WORK IN THE MACHINE ROOM – CONTROL OF ELECTRICAL ENERGY

### DESCRIPTION OF THE RISK

Risk of being electrocuted when:
- Taking measurements on electrical equipment.
- Replacing or repairing an electrical component or any equipment which can be powered with 110V DC or 50V AC and more (controller, selector, machine, main line switch, junction box, door lock…).
- Working in close proximity of the energized equipment.

**Check if local regulation requires a mandatory certification for all exposed employees!**

### PROTECTION MEANS



**VITAL RULE :**
**ALWAYS** lock out and tag out the equipment before performing any work on the electrical equipment, except when measuring values during fault finding.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Lift Equipment Protection:**
- Energized equipment is protected against accidental contact (IP2x).
- Electric shock protection devices.

**Personal Protective Equipment:**
- Insulated gloves.
- Safety glasses to avoid flashover injuries if exposed to live equipment.
- Testing device or measurement device depending on local constraint.
- Locks and tools to prevent 3rd party putting the power back on.

**Safe procedure:**
Before working on the live equipment:
- Switch off all the power sources of the unit (main power, car light, etc.).
- Apply locks in order to prevent 3rd party switching the power back on.
- Verify that the testing device/multi-meter is working properly on a known source.
- Verify that there is no power left on the equipment with the testing device/multi-meter for every individual phase.

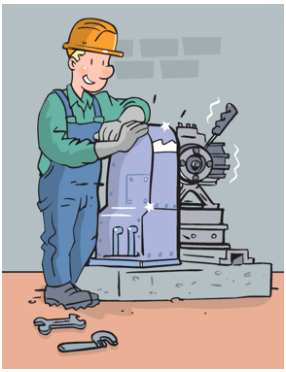
When replacing the main line switch: each worker is required to use an individual lock to ensure supply is not reconnected.

## WORK IN THE MACHINE ROOM – WORK ON ROTATING / MOVING EQUIPMENT

### DESCRIPTION OF THE RISK

Risk of crushing or amputation when:
- Working on moving equipment such as ropes, sheave, selectors etc.
- Working in close proximity of unprotected equipment.

### PROTECTION MEANS



**VITAL RULE:**
**ALWAYS** lock out and tag out the equipment before performing any work on the moving/rotating equipment.

**NEVER** get in close proximity to unprotected moving/rotating equipment.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Personal Protective Equipment:**
- No tie, scarf, loose clothing, etc. worn in proximity of moving equipment.

**Lift Equipment Protection** – Check that:
- Sheave, ropes are protected by a guard covering the nip points.

**Safe procedure:**
Before working on the equipment:
- Switch off the power of the unit.
- Apply locks in order to prevent 3rd party switching the power back and ensure the unit can't move.

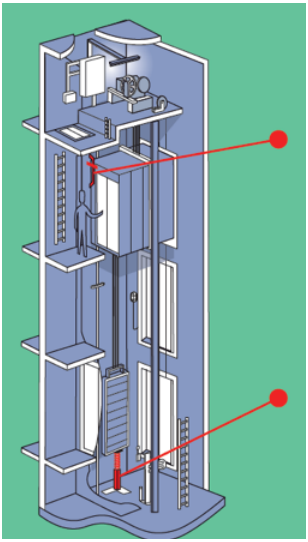
- If using the emergency rescue operation (ERO), ensure that no one gets in close proximity.

## WORK IN THE MACHINE ROOM – WORK ON THE BRAKE
## CONTROL OF MECHANICAL ENERGY

### DESCRIPTION OF THE RISK

When working on the brake, the movement of the sheave is free and can lead to an uncontrolled movement of the car.

### PROTECTION MEANS



**VITAL RULE:**
**ALWAYS** check the brake condition.
**ALWAYS** check proper adherence of ropes into the sheaves.
**ALWAYS** secure the cam to prevent one to open the manual landing door.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Example of a safe procedur**e
Before working on the brake:
- Check the brake condition and adherence.
- Secure the cam to prevent anyone opening the manual landing door.
- Land the counterweight on the buffer.

An additional precaution can be to block the sheave to prevent uncontrolled movement.

On drum machine:
The car should be landed on its buffer or if slack rope, movement shall be prevented by preventing the drum from moving.

## WORK ON THE LANDING – SERVICE & RENOVATION – FALL PROTECTION

### DESCRIPTION OF THE RISK

Risk of an employee or a member of the public falling through unguarded opening when the landing door is open and the car is not behind.

### PROTECTION MEANS


**VITAL RULE:**
**ALWAYS** protect the working area at landings.
**ALWAYS** inform the customer that the lift is not available.
**ALWAYS** verify that the landing doors are mechanically locked when closing the landing doors and before leaving site.
**NEVER** leave the landing doors wide open when working in pit.
**NEVER** open wide the landing doors when the car is not behind.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Safe procedure:**
When opening the landing doors:
- Install protective barrier if possible.
- Take a stable position to keep firm footing.
- Preferably open the bottom floor landing doors.
- Only open a few centimeters to prevent falling.

When working on the car from the landing:
- Position the car so that it is comfortable to work.
- Switch off the unit to prevent potential electrocution if working on electrical equipment (junction box, door operator…).

When accessing the hoistway:
- Position the car safely: no more than 50 cm from landing.

In case the car is stopped between floors (trapped passengers or renovation):
- Check the opening under the car.
- Ensure the opening does not allow anyone to fall underneath.

## WORK ON THE LANDING – WORK ON MOVING / ROTATING EQUIPMENT

### DESCRIPTION OF THE RISK

Risk of crushing or amputation when working on moving equipment such as the car door operator, landing door panels or car doors.

### PROTECTION MEANS

**VITAL RULE:**
**ALWAYS** lock out and tag out the equipment before performing any work on the moving/rotating equipment.

**NEVER** come in close proximity to unprotected moving/rotating equipment.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Personal Protective Equipment:**
- Protective gloves
- No tie, scarf, loose clothing etc. worn in proximity of moving/rotating equipment.

**Safe procedure:**
- Switch off the power of the unit if power is not needed.
- When opening/closing the landing/car doors or manipulating the car door operator, be aware of the kinetic energy to control the movement and keep body parts away from nip points.

## WORK ON THE LANDING – NEW EQUIPMENT – FALL PROTECTION

### DESCRIPTION OF THE RISK

Risk of an employee or a worker of the construction site falling through the unprotected hoistway opening.

### PROTECTION MEANS

Effective barricade installed in front of the hoistway to prevent site workers and employees falling in the hoistway

**VITAL RULE:**
**ALWAYS** ensure voids and openings are protected by suitable guardrails in compliance with current standards.

**Important!** When the mechanic is working in the hoistway, protection against falling objects must be in place (see p 27).

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Hoistway protection:**
- Fixed guardrails to current standards shall be installed to protect lift employees and other workers.

**Personal Protective Equipment:**
- Fall protection equipment if a fall hazard exists.
- Suitable anchorage for lanyard at the hoistway opening.

**Safe procedure:**
In case a guardrail needs to be installed or if a ladder needs to be used in the vicinity of the opening, a personal fall protection shall be used:
- Install a specific hooking point for the lanyard at hoistway opening.
- Tie off the body harness.
- Protect the working area to prevent other workers falling into the hoistway opening.

Before the work starts, the company should have a risk assessment process to check that the hoistway conditions is as per the installation requirements.

If the hoistway conditions are not met by the General Contractor, work shall stop and company must be informed.

## ACCESS THE HOISTWAY – ACCESS THE TOP OF THE CAR – CONTROL OF THE ELEVATOR

### DESCRIPTION OF THE RISK

Risk of being crushed in the hoistway when working on the top of the car.

### PROTECTION MEANS


**VITAL RULE:**
**ALWAYS** take control of the lift before accessing the hoistway by switching off the power or activating STOP and INSPECTION buttons after they have been checked separately.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Lift safety equipment:**
- free space or refuge or alternative means of safety distances.
- STOP button.
- Inspection switch.

**Safe procedure:**
Before accessing the top of the car:
- Switch off the power of the unit and apply lock to prevent anyone putting power back on, **OR** :
- Send the car several floors below (minimum 2).
- Open the hoistway door with the release key.
- Check that the car stops when landing doors safety contact opens.
- Stop the car no more than 50 cm above the floor to safely access.
- Push the STOP button, close the doors, push the call buttons and check that the car did not move.
- Open the doors, push the INSPECTION button, release the STOP button back to normal, close the doors, push the call buttons and check that the car did not move.
- Open the landing doors and push the STOP button back.

⚠ Assess other potential risks such as fall from the car top or adjacent unit running in the same hoistway, etc.

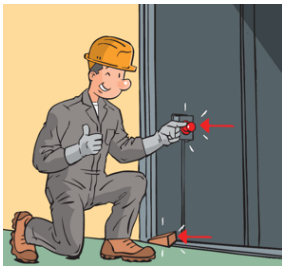
This procedure may need to be customized depending upon the technology.

## ACCESS THE HOISTWAY – ACCESS TO THE PIT – CONTROL OF THE ELEVATOR

### DESCRIPTION OF THE RISK

Risk of being crushed by the car or the counterweight when accessing and working in pit.

### PROTECTION MEANS



For lifts with deep pits, typically foreseen in high rise and high-speed buildings, there are additional considerations due to extra stop with verification and access ladder usage.

**VITAL RULE:**
**ALWAYS** take control of the lift before accessing the hoistway by switching off the power or activating STOP after it has been checked.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Lift safety equipment** – Check presence of:
- STOP button.
- Pit ladder.

**Safe procedure:**
Before accessing the pit:
- Enter the pit through the bottom landing door or access door
- Switch off the power of the unit and apply lock to prevent anyone to put power back.

**OR :**
- Send the car to the top floor.
- Open the hoistway door with the release key before the car arrives at the floor.
- Check that the car stops when landing doors safety contact opens.
- Push the STOP button, close the landing doors and push the call button to check if the STOP switch is effectively working.
- Prevent the landing doors from closing completely (leave no more than 15 cm opening) by using a door blocking device.

A screwdriver is not an appropriate tool.

If there is no pit STOP Switch: Switch off the power.

## WORK IN A HOISTWAY – TOP OF THE CAR / INSIDE THE CAR – FALL PROTECTION

### DESCRIPTION OF THE RISK

Risk of falling from the top of the car


Risk of falling from inside the car when exposed to a fall hazard

### PROTECTION MEANS

**VITAL RULE:**
**ALWAYS** ensure voids and openings are protected by suitable barriers in compliance with current standards.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Equipment on the car:**
• Fixed balustrade to current standards on car top, see page 8.

**Personal Protective Equipment:**
• Fall arrest or fall restraint system.
• Suitable anchorage for lanyard on the top of car.

**Safe procedure:**
Before accessing the car:
• Check for balustrade.
• If no balustrade or it is unsuitable, wear the appropriate fall protection attached to suitable anchorage point.

**ALWAYS** attach the harness when on the top of car.
**ALWAYS** detach the harness before leaving the top of car.

## WORK IN A HOISTWAY – MOVING IN THE HOISTWAY – CONTROL OF THE MECHANICAL ENERGY

### DESCRIPTION OF THE RISK

Risk of being crushed by an equipment when moving the car in the hoistway (counterweight, Bracket, etc.).

Risk of being crushed on top of the hoistway if insufficient space on the top of the hoistway.

### PROTECTION MEANS

**VITAL RULE:**

**NEVER** ride the lift in normal speed.
**NEVER** ride the lift if there is no control (or inspection box).

**EXAMPLE OF SPECIFIC PROTECTION MEANS :**
**Lift safety equipment:**

- Free space or refuge or alternative means of safety distances (eg; above the top rail of the balustrade)
- Control or inspection box.
- Limit switch.
- Inspection limit switch.

**Safe procedure:**
When riding the top of the car:

- **ALWAYS** position yourself in the center of the car when riding.
- **ALWAYS** activate the STOP button after a ride.
- **ALWAYS** check the door lock when getting out at a different floor.
- **ALWAYS** opt to ride down rather than up as it reduces the risk of being hit by the counterweight or fixed equipment in the hoistway.

In renovation, if limit switches are not in place and a risk of crushing exists if the space is not sufficient:

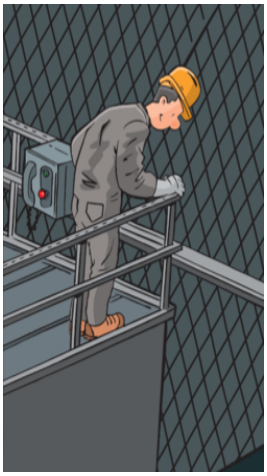
- Install props under the counterweight with the right length to allow space on the top of the hoistway.

## WORK IN A HOISTWAY – ADJACENT UNITS – CONTROL OF THE ELEVATOR

### DESCRIPTION OF THE RISK

Risk of being crushed by an adjacent running unit or any other equipment which may be moving (adjacent counterweight etc.).

### PROTECTION MEANS



**VITAL RULE:**
**ALWAYS** prevent the movement of the adjacent lift by switching off its power or activating its STOP in pit or on the top of the car.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Lift safety equipment:**
- Full screen is in place along the entire height of the hoistway if distance with adjacent moving equipment is less than 50 cm
- Screen in pit.

**Safe procedure if no screen is in place and there is a risk of having the body outside of the car contours:**
Before accessing the top of the car or the pit:
The adjacent unit shall not move accidently:
- Switch off the power of the adjacent unit and apply locks to prevent anyone putting power back on.

**OR :**
Remove adjacent unit from normal service by taking control of the lift using methods described in access to the pit (page 21) and access to the car top (page 21)

## WORK IN A HOISTWAY – WORK ON THE HYDRAULIC LIFTS – CONTROL OF MECHANICAL ENERGY

### DESCRIPTION OF THE RISK

When working on the hydraulic system, on the pipe or cylinder, the risk of having a free fall of the car is significant, potentially resulting in crushing hazard if the employee is working in pit.

### PROTECTION MEANS

Prop of the right capacity and installed under the car to prevent from falling in pit in case of a major hydraulic failure

Handle closed and removed

**VITAL RULE:**
**ALWAYS** close the safety handle (if existing).
**ALWAYS** land the car on props or suspend the car with 2 safety means when working on the hydraulic system.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Lift safety equipment:**
• Safety bracket that allow to mechanically secure the car.

**Tools & equipment:**
• Slings or props in good condition and right weight capacity.
• Safety brackets.

**Safe procedure:**
Before working on the hydraulic system, mechanical energy shall be secured:
• Close the safety handle (if existing).
• Land the car on the brackets specially designed (if equipped).
**OR**
• Install adequate capacity prop, secure it to prevent from falling.
• Land the car on props from the machine room.
**OR**
• Secure the car by 2 slings or hoisting devices.

Take any measure to avoid 3rd party putting the system back on by:
• Locking out and tagging out the unit.
• Removing the handle off.

In case work in pit is long (for example, more than 15 min), mechanical protection as described above is imperative.

## WORK IN A HOISTWAY – WORK ON A LADDER – FALL PROTECTION

### DESCRIPTION OF THE RISK

Risk of fall from the ladder in case:
- The ladder slips if not adequately secured.
- The ladder is not in good condition.

The risk can occur typically when working on the top of the counterweight or deflection sheave on top of the hoistway in repair or renovation.

### PROTECTION MEANS

**Work on ladder is allowed only for very short period of time. Otherwise, other means shall be identified (platform, scaffold, etc).**

**Check local regulations!**

**VITAL RULE:**
**ALWAYS** secure the ladder from bracing with cords or slings.
**ALWAYS** wear fall protection if a fall hazard exists and **ALWAYS** when feet are above 2 m.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Tools & equipment:**
- Ladder in good condition.
- Fall protection equipment.

**Safe procedure:**
Before working on the ladder:
- Install a lifeline in the hoistway to prepare a proper hooking point for the body harness.
- Secure the ladder so that it will not move.

When working on the ladder:
- Tie off the body harness to the lifeline.

## WORK IN A HOISTWAY –FALLING OBJECTS (RENOVATION & NEW EQUIPMENT) – MECHANICAL ENERGY

### DESCRIPTION OF THE RISK

Risk of injury by a falling object can occur when:
- Working in the hoistway while an object falls through unprotected holes in the hoistway.
- Working in the hoistway while a colleague is working above in the machine room or on the top of the car and drops a tool or equipment.
- Working in the hoistway while another colleague installs a lift in the adjacent hoistway not being protected by a screen or other means.

### PROTECTION MEANS

**VITAL RULE:**
**ALWAYS** wear a safety helmet when working on a construction site or whenever a risk of falling objects exists in repair / renovation.
**ALWAYS** ensure that all holes into the hoistway are protected.
**NEVER** allow stacked work.
**NEVER** leave any tool or equipment on guide brackets or beams that could ultimately fall down.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Personal Protective Equipment:**
- Safety helmet.

**Safe procedure:**
Before working in the hoistway:
- Protect **all** holes by a fixed plate or guard.
- Protect the hoistway opening by guardrail **and** a net covering the entire opening.
- Organize the activity in the hoistway or common hoistway to eliminate stacked work.

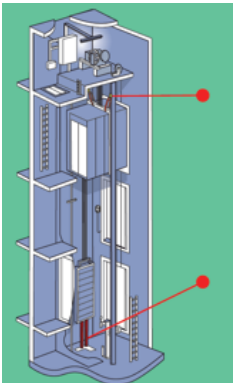
When working in the hoistway:
- Work from inside of the car as much as possible: any falling object will be stopped by the top of the car or ceiling.

## WORK IN A HOISTWAY – WORK ON ROPES (RENOVATION & NEW EQUIPMENT)

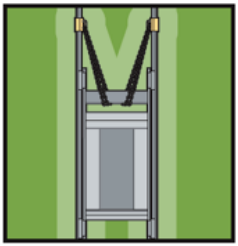
### DESCRIPTION OF THE RISK

When working on the suspension system e.g. replacing ropes, this can lead to :
- Free fall of the car.
- Free fall of the counterweight.

### PROTECTION MEANS



Car secured by 2 slings and counterweight secured on props



Car secured by 2 independent slings attached to rail graber

**VITAL RULE:**
**ALWAYS** secure the car and the counterweight by 2 independent means when ropes are removed.
**ALWAYS** trigger the safeties.
**NEVER** remove more than 50% of the ropes, if possible.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Tools & equipment:**
- Slings in good condition and adequate weight capacity.
- Props in good condition and adequate weight capacity.

**Lift equipment:**
- Safeties are triggered: governor and car is blocked.

**Safe procedure:**
Before removing the ropes:
- Position the car at the proper height.
- Position the car on the safeties.
- Secure the car by 2 independent means: 2 slings or hoisting devices. If one fails, the system will be secured by the other one.
- Install props under the counterweight.
- Secure the props from falling (onto the guide for example).

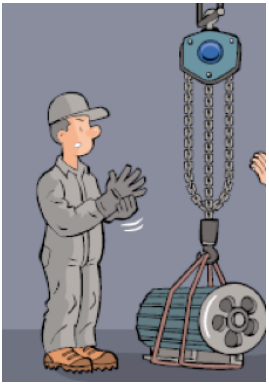
## CONTROL OF HIGH RISK ACTIVITIES – HOISTING AND RIGGING ACTIVITIES

### DESCRIPTION OF THE RISK

Risk of falling equipment if hoisting practice is inadequate:
- Car or counterweight insufficiently secured.
- Damaged sling or hoisting equipment.

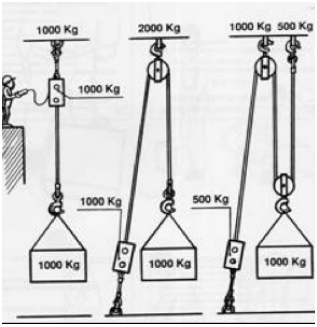
Risk of fall with the car if rigging practice is inadequate:
- Gravity center insufficiently identified.

### PROTECTION MEANS



**VITAL RULE:**
**ALWAYS** ensure that the hoisting and rigging equipment is formally verified as per the local laws, are in good condition and properly rated for the load to be lifted and suspended.
**ALWAYS** protect slings from sharp edges with packing.
**NEVER** walk / stand under suspended load.
**NEVER** used, damaged or unknown capacity equipment.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Tools & equipment:**
- Certified hoisting tools: slings, shackles, hooking points shall be rated for the maximum load and in good conditions.
- Certified hoisting device, rated for the maximum load:
  - To hoist material only (chain hoist).
  - To hoist material and employee (e.g. Tirak).




**Safe procedure:**
<u>Before lifting or rigging:</u>
Check the weight of the equipment.
- Use the right hooking point, shackle, sling and hoisting equipment accordingly.
- Test the hooking point with specific equipment: it is usually the one that fails first .

<u>When lifting equipment (machine, controller etc):</u>
- Identify the center of gravity to minimize unexpected swinging.

**NEVER** hold the equipment with the hand: it can be crushed. Use a cord to control the movement.

## CONTROL OF HIGH RISK ACTIVITIES – SCAFFOLD

### DESCRIPTION OF THE RISK

Risk of fall from the scaffold.

Risk of falling with the scaffold if inadequately built.

**Check if certification is required by law for scaffold and scaffolder.**

### PROTECTION MEANS

**VITAL RULE:**
**ALWAYS** ensure it has been built and checked by an authorized person.
**NEVER** remove any barrier or planking.
**NEVER** use an incomplete scaffold.
**ALWAYS** respect the maximum capacity and check if it is visibly displayed.
**ALWAYS** ensure inspection by an authorized person.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Tools & equipment:**
- Certified scaffold.

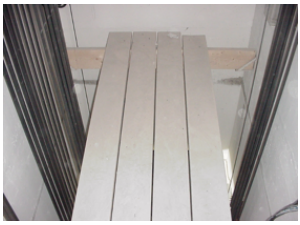
**Safe procedure:**
- Check that the scaffold is secured to the structure.
- Ensure that there is safe access to the scaffold with a fixed ladder.
- Ensure that the platform is in good condition, guardrails are in place.
- **NEVER** climb onto the guardrails.

**Any defect shall be raised with the company and the scaffold shall not be used.**

**Note:**
Even if the primary protection mean relies on the properly built car platform, it is recommended to wear a body harness and be tied off to a life line suspended in the hoistway.

## CONTROL OF HIGH RISK ACTIVITIES – TEMPORARY FIXED WORKING PLATFORM

### DESCRIPTION OF THE RISK

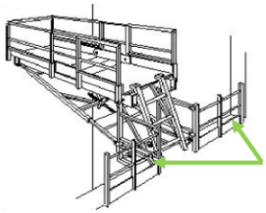


Risk of fall from a temporary fixed working platform
Risk of falling with the temporary fixed working platform if inadequately built or inadequate guardrails

**Check if certification is required by law for platform and platform installer!**

### PROTECTION MEANS

Safe and robust platform with guardrails protecting from falling



Safe metal working platform

**VITAL RULE:**
**ALWAYS** ensure it has been built and checked by an authorized person.
**NEVER** remove any barrier or planking.
**NEVER** use an incomplete working platform.
**ALWAYS** respect the maximum capacity and check if it is visibly displayed.
**ALWAYS** ensure a safe fixed mean of access to the platform.
**ALWAYS** ensure inspection by an authorized person.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Tools & equipment:**
- Certified working platform.
- Certified shoe, adequately calibrated to capacity of the platform.
- High quality materials.

**Safe procedure:**
- Check that the temporary fixed working platform is robust.
- **ALWAYS** respect the maximum capacity.
- Ensure that there is safe access with a fixed ladder.
- **NEVER** climb onto the guardrails.
- **ALWAYS** wear a body harness attached to a life line to prevent falls in case the platform collapses.

**Any defect shall be raised with the company**

**Note:**
Even if the primary protection mean relies on the properly built car platform, it is highly recommended to wear the body harness and be tied off to a life line suspended in the hoistway.

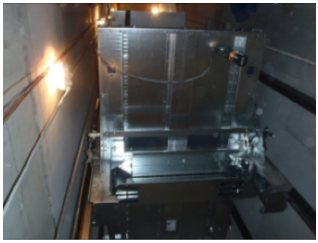
## WORK IN A HOISTWAY – CAR USED AS A TEMPORARY MOVING PLATFORM – (RENOVATION & NEW EQUIPMENT)

### DESCRIPTION OF THE RISK

Risk of fall from the moving platform.

Risk of fall with the car if inadequately built.

### PROTECTION MEANS



Car connected to the ropes and governor in place

**VITAL RULE:**
**ALWAYS** ensure that 2 independent safeties are in place:
- Ropes and governor.
- Or ropes and additional safety.
- Or special hoisting device authorized to lift persons and an additional safety device.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Tools & equipment:**
- Certified safeties (governor or additional safety).
- Certified hoisting device in good condition and right capacity.
- Certified hooking points with the right capacity.

**Safe procedure:**
- **ALWAYS** respect the maximum capacity.
- **ALWAYS** install the governor and the ropes as soon as possible and/or as per the installation method.
- **ALWAYS** use proper hoisting equipment.
- **ALWAYS** install the appropriate balustrade on top of the car.
- **ALWAYS** ensure inspection by an authorized person.

**Note:**
Even if the primary protection means relies on the properly built car platform, it is highly recommended to wear fall protection tied off to a life line suspended in the hoistway.

**It is recommended to have an audio visual system fixed under the car to inform other mechanics of the movement of the car when doors safeties are disabled.**

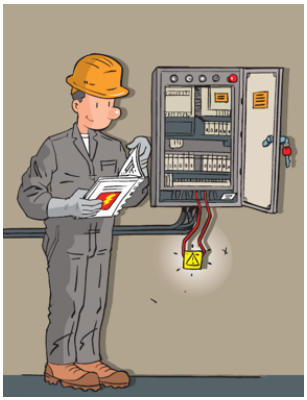
## CONTROL OF HIGH RISK ACTIVITIES – DEFEATING A SAFETY CIRCUIT

### DESCRIPTION OF THE RISK

Risk of being crushed when accessing/working/egressing the hoistway.

Similar risks exist for members of the public in the situation that the landing door safety has been disabled.

### PROTECTION MEANS



**VITAL RULE:**
Defeating a circuit shall be the last option when no other alternatives exist: **NEVER** defeat a circuit for a long period.

**NEVER** leave a shunt (shorting wire) in place when leaving the site.

**NEVER** install a shunt in any hoistway equipment (lock, car lock, emergency stop etc): it is not visible and may be forgotten.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Tools & equipment:**
- Company approved shunts, 1 m long coloured cables to make it visible.

**Safe procedure:**
Before installing a shunt:
- Remove the lift from normal operation.
- Identify precisely the circuit to be defeated with the electrical diagram
- If there is no other alternative method than shorting it, conduct a risk assessment.
- **ALWAYS** use 1 m long coloured cable, properly authorized.
- **ALWAYS** check the electrical diagram to be sure to place the shunt on the right circuit.
- **NEVER** short the entire safety chain.
- Install the shunt when the power is off to prevent electrocution.

If riding in the hoistway is necessary:
- **ALWAYS** test STOP and INSPECTION before shunt is placed!

Before leaving the site:
- **ALWAYS** check all the safeties after having removed the shunt.

## CONTROL OF HIGH RISK ACTIVITIES – ASBESTOS

### DESCRIPTION OF THE RISK

Asbestos in brakes – risk of severe health effects if brake lining are removed without precautions.

Asbestos on hoistway walls – risk of severe health effects if put in contact or removed without precautions.

### PROTECTION MEANS


**VITAL RULE:**

**NEVER** touch materials in the machine room or hoistway.

**NEVER** work on equipment that contains asbestos without having the proper training and protective equipment.

**ALWAYS** be alert for different asbestos containing materials.

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**

**Review the local regulation to identify mandatory training, safety protective tools and equipment!**

**Safe procedure:**
The company must ask the customer for the record of asbestos before commencing work.

If asbestos has to be removed to perform maintenance, repair or modernization/replacement, it has to be done by a specialized company or by specially certified mechanics.

# FREQUENT ACCIDENTS PREVENTION

Hopefully, fatal and serious accidents represent a minor proportion of the accidents reported by the companies.

This chapter aims to present the risks that are the source of the most frequent accidents which occur. These accidents are, most of the time, not specific to lift work.
Although not usually fatal they can still lead to painful injuries.

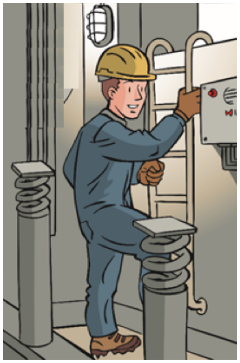
Consequently, these risks must not be neglected and appropriate measures as suggested in the examples shall be taken. Again, this list is not exhaustive and it is the responsibility of every company and employee to conduct a proper risk assessment and to comply with the communicated rules.

## ACCESS THE HOISTWAY – ACCESS TO THE PIT

### DESCRIPTION OF THE RISK

Risk of falling, slipping when accessing or egressing the pit if:
- There is no ladder for pit > 1 m.
- Ladder is not adequate.
- Ladder is not used.
- Floor is slippery.

### PROTECTION MEANS



**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Lift safety equipment:**
- Pit ladder.
- Pit ladder is within reach from the landing.
- Pit ladder is secured and safe.

**Safe procedure:**
Before accessing the pit:
- Check the position and condition of the ladder if any.
- Block the door with the door blocking device in order to prevent the door from closing.
- Ensure that the STOP button is working properly (see p. 20) and is activated.
- In a safe and stable position, reach for the ladder.

When egressing the pit:
- Keep the STOP button activated.
- Take the ladder and climb up safely.
- Once safe on the landing, release the STOP.
- Close the landing doors and verify these are mechanically closed.
- Keep 3 points of contact on the ladder

Use the pit ladder or a portable ladder. **NEVER** jump in pit!

If the pit ladder is unsafe, it should be raised with your company who should inform the customer and/or inspection body (if relevant) to help and find an appropriate solution.

# FREQUENT ACCIDENTS PREVENTION

## SLIP, TRIP, FALL

### DESCRIPTION OF THE RISK

Risk of falling on stairs when there is poor lighting or stairs are in poor condition

Risk of falling when the ground is wet, uneven, with a small step etc…

**These accidents are some of the most frequent!**

### PROTECTION MEANS

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**

**Protective Personal Equipment:**

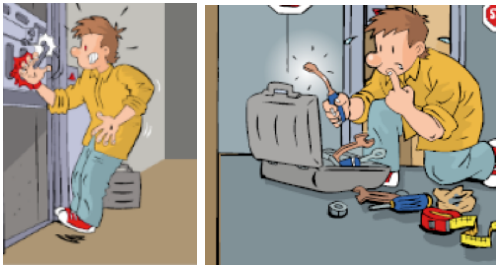
- Anti-slip shoes.
- Shoes with a heel to give a better grip on ladder.

**Safe procedure:**

- **ALWAYS** keep a firm footing.
- **ALWAYS** watch for wet floor, slippery floor, icy conditions…
- **ALWAYS** be aware of the time switch.
- **ALWAYS** use the handrail when going down the stairs, or keep points of contact where there is none (use the wall as a support).
- **NEVER** rush, particularly down the stairs.
- **NEVER** use your mobile when walking or climbing down stairs.

## SAFE USE OF HAND TOOLS

### DESCRIPTION OF THE RISK



Risk of slipping of tools if the spanner, screwdriver or bolt is in poor condition.

### PROTECTION MEANS

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**
**Tools and protective equipment:**

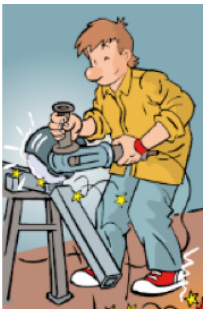
- CE-marked and authorized by the company.
- Hammer in good condition, fixed head with sound handle.
- Spanners in good condition, not burred or splayed.
- Screwdrivers with good insulation, not broken or worn.

**Safe procedure:**

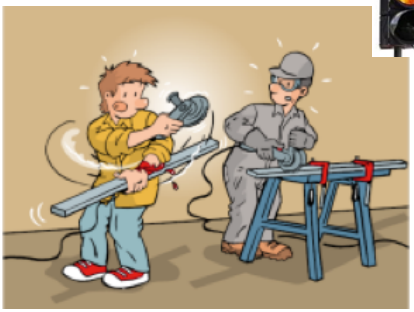
- **ALWAYS** check the equipment is in good condition before use.
- **ALWAYS** wear cut protective gloves.
- **ALWAYS** use the appropriate equipment (an adjustable wrench is less safe than a spanner which is less safe than a hex key).
- **NEVER** use an electrician's screwdriver for mechanical work.
- **NEVER** use damaged tools.
- **ALWAYS** use the correct sized tool for the job.

## SAFE USE OF ELECTRICAL PORTABLE TOOLS

### DESCRIPTION OF THE RISK

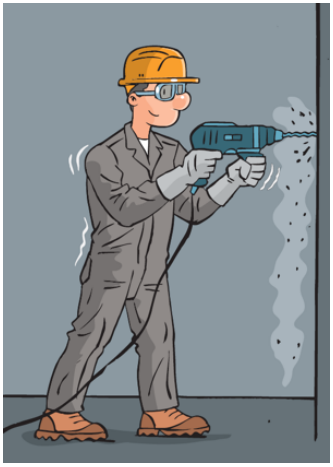


Risk of dust in the eye, risk of cuts, laceration, flying particles and fire.



Risk of cuts, laceration when using cutting tools.

### PROTECTION MEANS



**EXAMPLE OF SPECIFIC PROTECTION MEANS:**

**Tools and protective equipment:**

- CE-marked and authorized by the company.
- Glasses and protective gloves.
- Tool (vice-grip…) to maintain the piece firmly in place.
- Grinder and drill equipped with a handle to get a firm grip.

**Safe procedure:**

- **ALWAYS** check the good condition of the equipment before use (overall condition, cable is not damaged, protection in place).
- **ALWAYS** use the drill and grinder with 2 hands.
- **ALWAYS** wear glasses and gloves when drilling, grinding.
- **ALWAYS** check that the grinder disk is within the limit date of use.
- **ALWAYS** have a hot work permit if required.
- **NEVER** use damaged tools.
- **NEVER** hold the piece with the hand when drilling or grinding: secure it firmly in place with the correct tool.
- **NEVER** cut upwards with angle grinder.

Ear protection should be used when drilling or grinding.

## SAFE USE OF CHEMICALS

### DESCRIPTION OF THE RISK

Risk of loss of conscious, disease or health issues in case of use of dangerous products.

Risk of explosion if flammable product is used in close proximity to hot work or lit cigarettes.

### PROTECTION MEANS

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**

**Selection of the product:**

- Only use the chemicals approved by the company: usually, poisonous or toxic products are not necessary in lift industry.
- **NEVER** buy products not approved by the company.
- **ALWAYS** check the Material Safety Data Sheet which describes the potential dangers & safety precautions to take for each product.

**Tools and protective equipment:**

- Gloves and glasses if a risk of splashing exists.
- Suitable Respiratory Protective Equipment.

**Safe procedure:**

- **ALWAYS** wear gloves to avoid product penetration through the skin.
- **ALWAYS** use small quantities in non-ventilated areas (pit).
- **ALWAYS** put the cap back on after use.
- **NEVER** smoke, grind or weld in close proximity to flammable product.
- **NEVER** transfer a chemical product into an unidentified can.
- Read and follow the “precautions for use” as written on the container.
- **NEVER** store volatile chemicals / aerosols in non-ventilated areas (pit)

## MANUAL HANDLING

### DESCRIPTION OF THE RISK

Risk of back injuries when lifting equipment.

Risk of cuts, laceration if the load falls down.

Risk of falls or slips when handling the equipment.

### PROTECTION MEANS

**EXAMPLE OF SPECIFIC PROTECTION MEANS:**

**Tools and protective equipment:**
- Protective gloves.
- Handling equipment if the load is heavy (as defined in the risk assessment or as per the regulation).

**Safe procedure:**
- **ALWAYS** keep the back straight and use the legs to lift the load.
- **ALWAYS** place the hands so that they don't get crushed.
- **ALWAYS** scan the route to identify possible risks of fall and slip.

# FREQUENT ACCIDENTS PREVENTION

Other risks that have not been developed in the present booklet but which can however be relevant:

- Risk of a fire.
- Risk related to welding activities.
- Risk related to the specificity of the site (nuclear plant, chemical plant, explosive atmosphere etc).
- Risks related to the use of vehicles.
- …

This document was prepared by experts of the Education & Training Working Group and Quality, Safety, Environment and Education Committee of the European Lift Association

The brochure is illustrated by drawings from Zack, zackvdh@gmail.com.

The brochure is also available on the ELA website at **www.ela-aisbl.org**



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