



Building and Construction Authority

# LIFT MAINTENANCE OUTCOME GUIDEBOOK

Version 1.0

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## INTRODUCTION

The goal of this guidebook is to provide the reader with a clearer understanding of the lift maintenance requirements specified in Part 1 of the First Schedule of the Building Maintenance and Strata Management (Lift, Escalator and Building Maintenance) Regulations 2016.

*For the Lift Maintenance Outcome Guidebook, BCA would like to thank the Singapore Lift & Escalator Contractors & Manufacturers Association (SLECMA) for their contributions.*

## DISCLAIMER

This guide has been prepared by the Building and Construction Authority (BCA) to provide practical information on the various maintenance outcomes expected from proper lift maintenance only.

This guidebook is **not intended to be**:

- a legal interpretation of provisions in the Acts or Regulations; and/or
- a substitute for independent legal advice.

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# 1. Door open control

## Check

Ensure that when the door open button in the stationary **lift car** is pressed, the lift doors must **reopen and stay open**.



Door open button check - lift car

## 2. Door protective devices

### Check

Ensure that upon activation of any door protective devices and sensors (e.g. lift curtain, door safety edge), the doors **must** reopen.



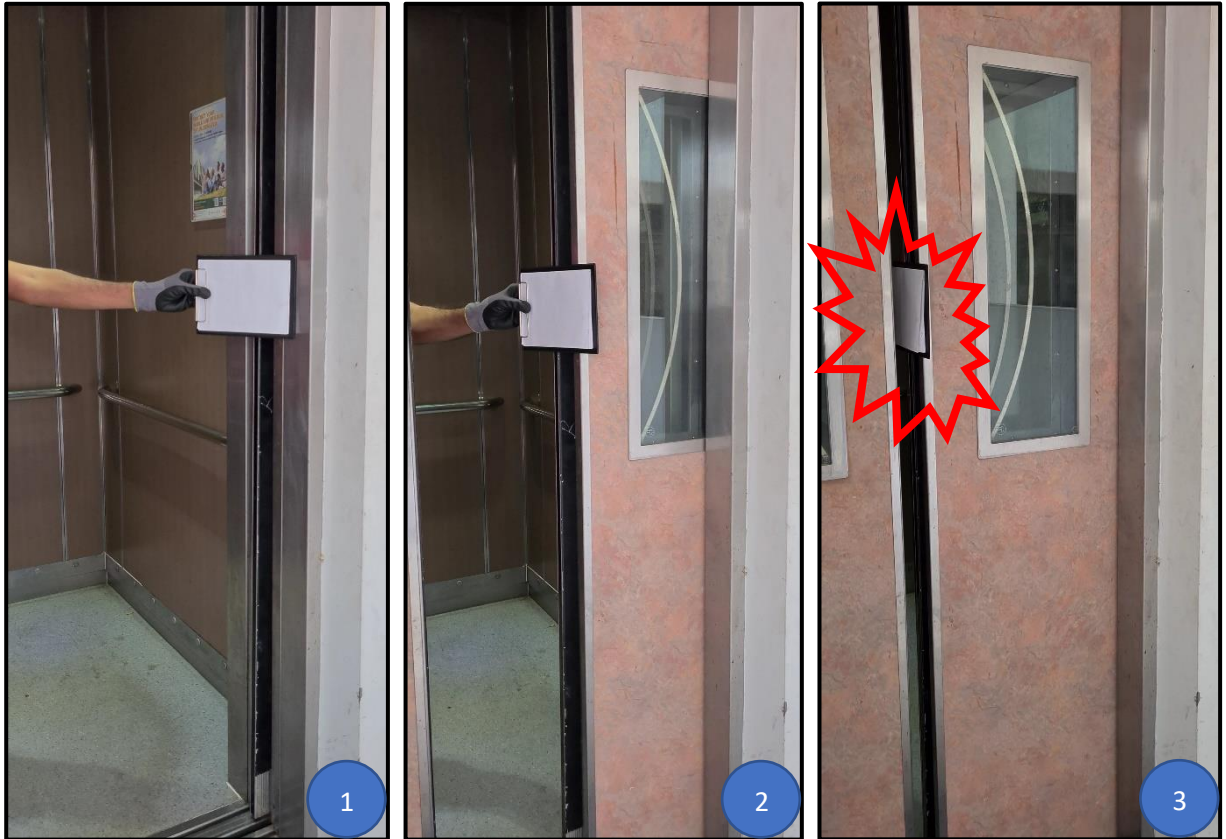
Light curtain



Door safety edge

## Prevent

Faulty door protective devices and sensors could potentially hurt lift users if the doors do not reopen upon activation.



Faulty door protective device

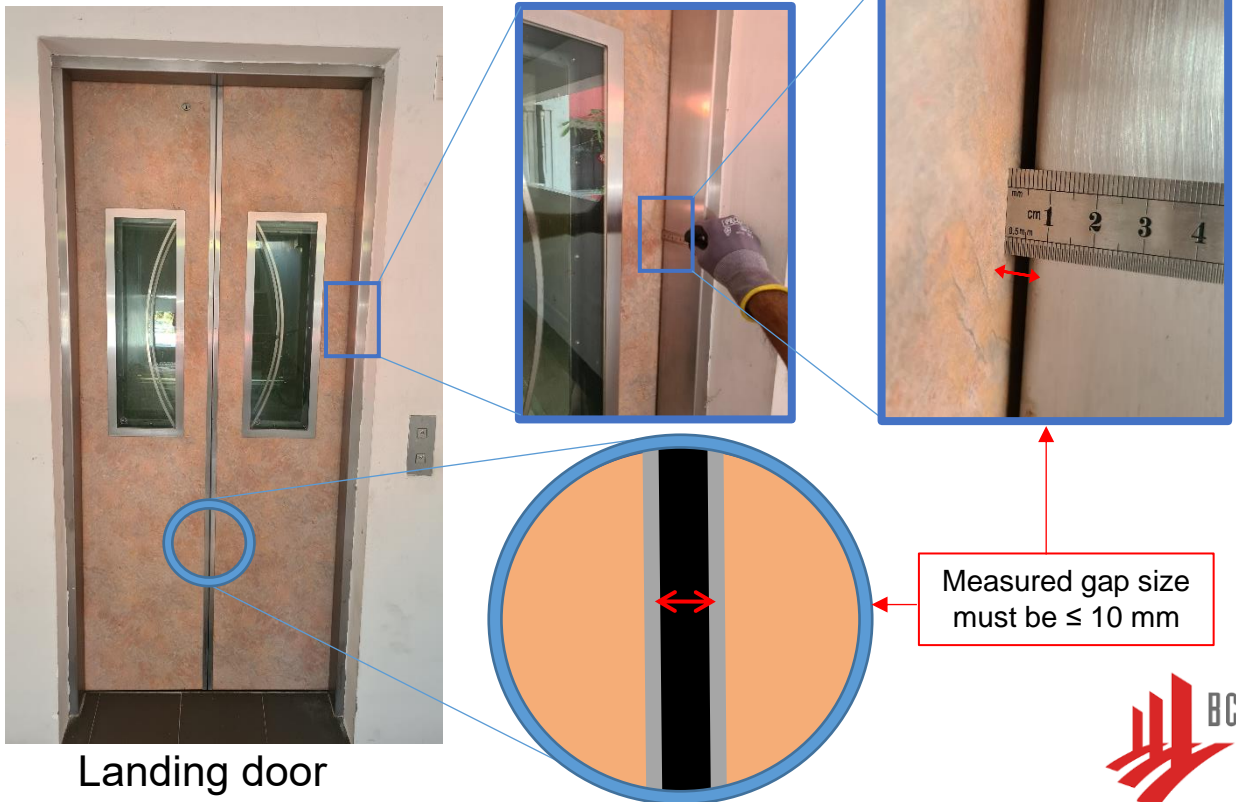
# 3. Lift doors

## Check



### *Lift Landing Door*

Use a gauge or measuring instrument to ensure that the gap at lift landing doorway, the clearance between lift landing door panels and uprights, lintels or sills must **not be more than 10 mm**.



## Check



### Lift Car Door

Use a gauge or measuring instrument to ensure that the clearance between lift car door panels and uprights, lintels or sills must **not be more than 10 mm**. The gap at lift car doorway must **not be more than 12 mm**.



Car door



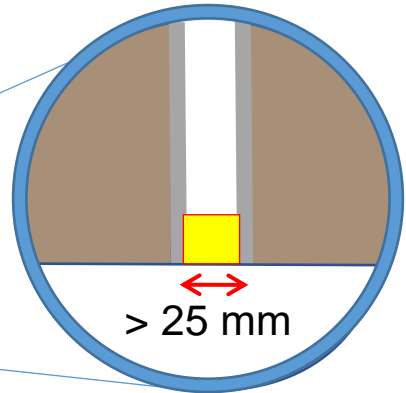
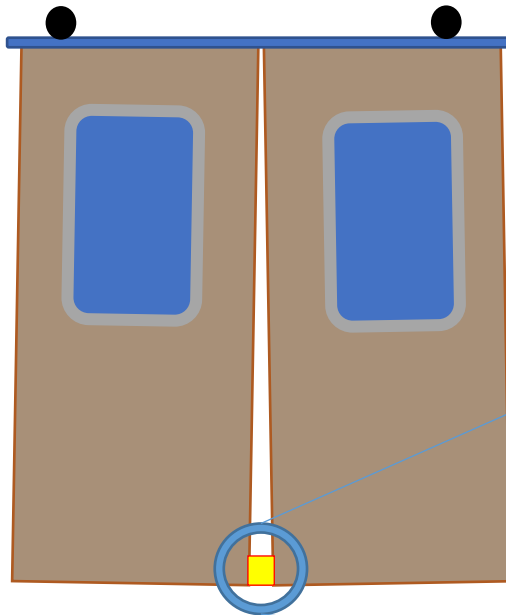
Measured gap size  
must be  $\leq 10$  mm

Measured gap size  
must be  $\leq 12$  mm



## Check

Make sure that when an obstruction of more than **25 mm\*** is placed at the car door sill level, with the landing doors in closed position, the **lift must not move**.



*\*Note: 25 mm obstruction is applicable for lift entrance height which is not more than 2.1 m (if lift entrance height is more than 2.1 m, for every 0.5 m increment in height, the obstruction at lift car doorway may be increased by 3 mm)*

## Check

Make sure that the lift car can only move when the lift car door is closed, and the lift landing doors are closed and locked.



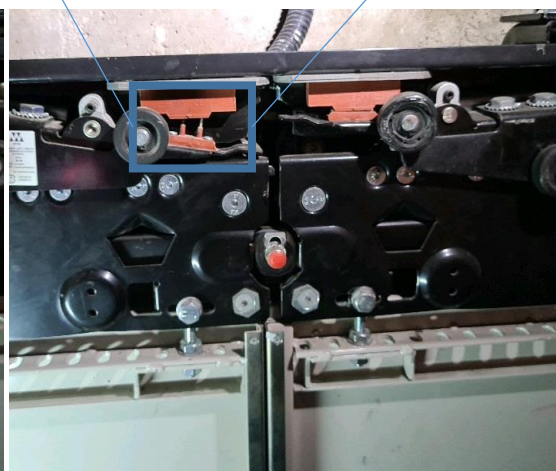
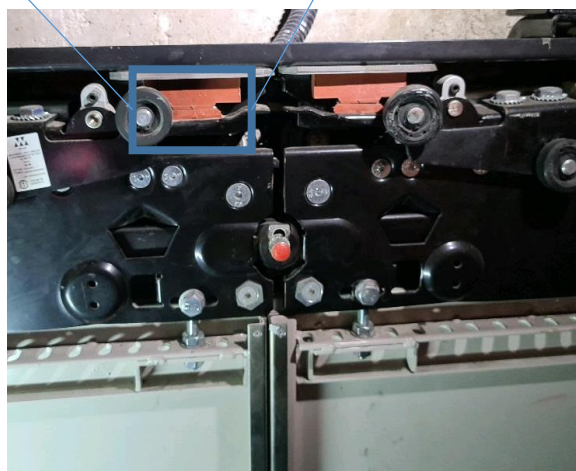
Check that when the door electrical contact switch is open, the lift car cannot move.



Open  
Switch



Lift car  
unable to  
move while  
switch open



Open door electrical contact switch

# 4. Lift car emergency alarm

## Check

Press the lift car emergency alarm to check if it can be heard from outside the lift well and at the designated floor.



Alarm button check

# 5. Lift car intercom

## Check

Test the intercom system to make sure that the voice communication can be heard in both directions.



Intercom system

# 6. Emergency power supply for lift car lighting and ventilation

## Check



Test that the Emergency Battery Operated Power Supply (EBOPS) is working.

Test by pressing the test button on the EBOPS and see that the battery is discharging.



Step 1



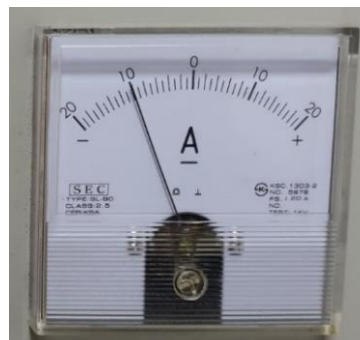
Press the Test button on EBOPS



Step 2



Confirm that it is discharging



## Check

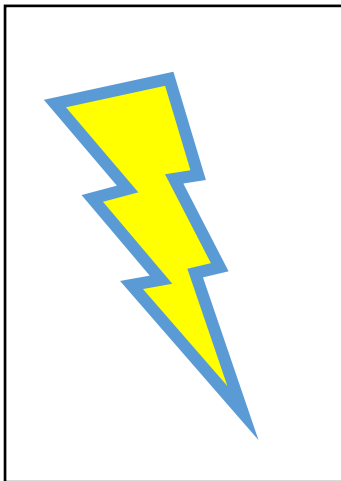
Test that the emergency power supply is working.



Physically check to ensure that the **light and fan** in the lift car are working when single-phase power supply is turned off.

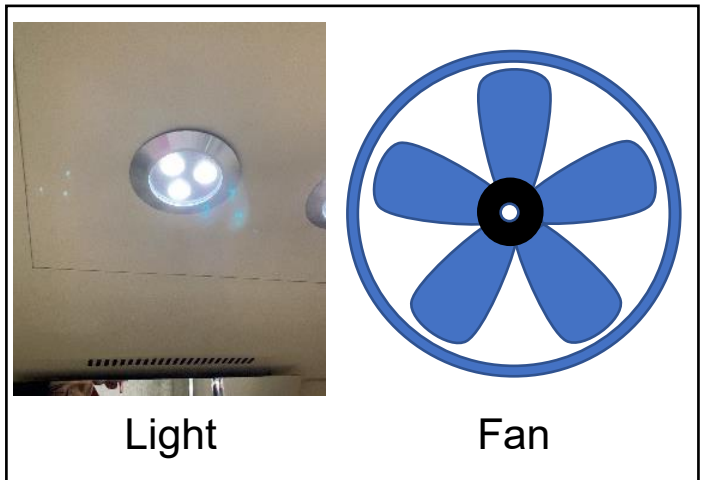
Step 1

Switch "OFF"  
Power supply



Step 2

Check if a light and a fan in  
the lift car is working



Light

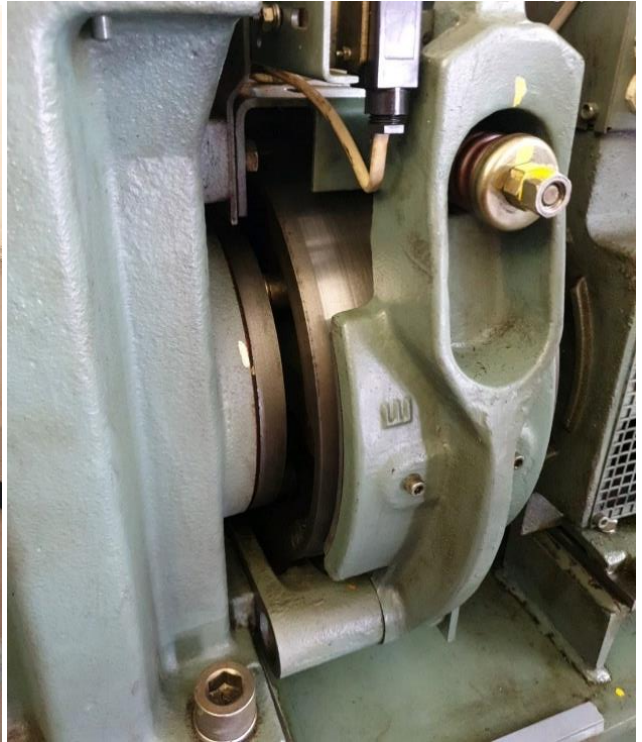
Fan

# 7. Lift machine and drive

## Check

Ensure that the lift machine and drive are **securely mounted**.

Ensure that the moveable parts, joints and gear box are **well lubricated**.



Secure lift machine and drive

## Prevent

Oil leakage must not occur at the lift machine and drive.



Oil leakage at lift machine and drive



## Check

Sheave wear can be detected by looking at the level of depression of the rope on the sheave grooves.



Lift drive machine

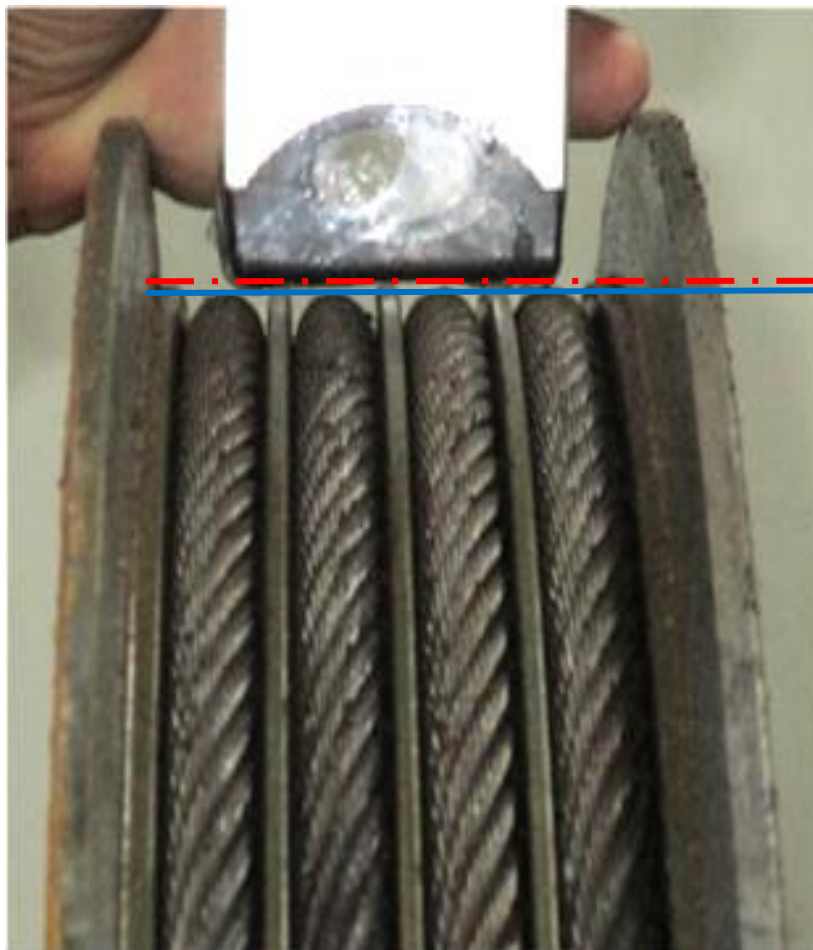


Rope on sheave

Check for  
rope  
protrusion

## Prevent

Excessive wear of the sheave can affect the grip and lifespan of the ropes. It could also produce undesirable noise and vibration.



Rope not protruding from sheave

Worn-out sheave

# 8. Brakes of lift machine and drive

## Check

Make sure brakes are not contaminated or at risk of being contaminated with **oil or grease**.



Brakes, when activated, must cause lift car to slow down, stop and stay at stopping position.



Oil free

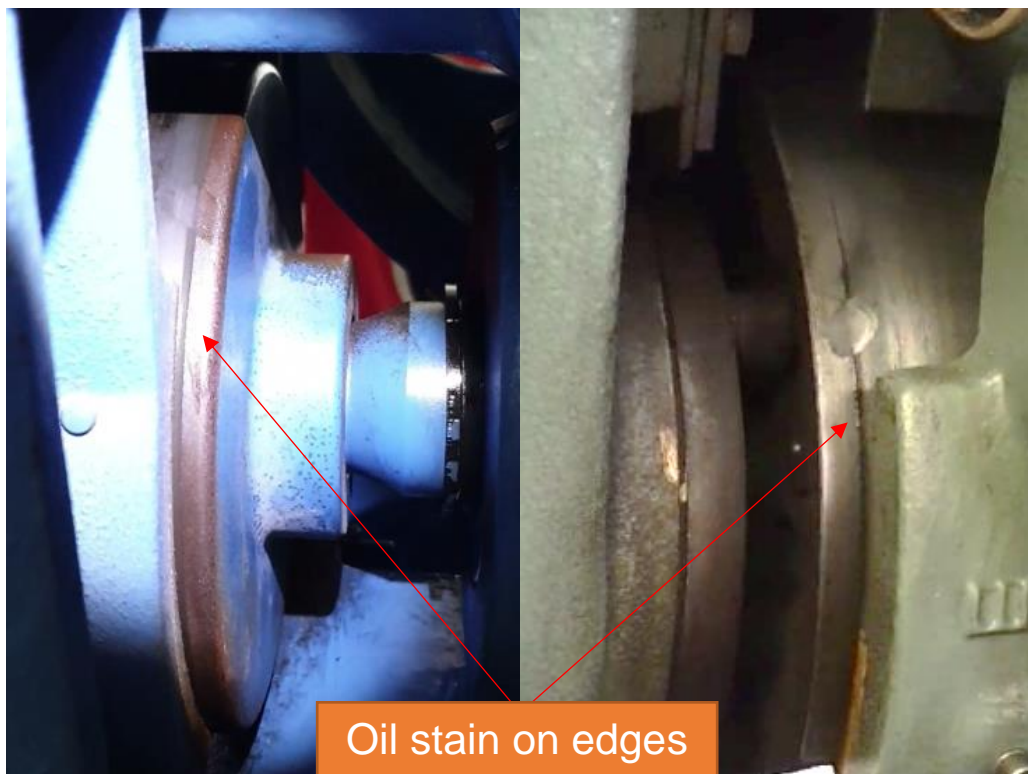
Oil free brakes

## Prevent

Oil or grease contamination of brakes would reduce braking power which could lead to unsafe lift operation.



Contamination is unacceptable even if only a thin layer is seen on braking surface or its edges.



Oil contamination on edge of  
brake drum

# 9. Overspeed governor

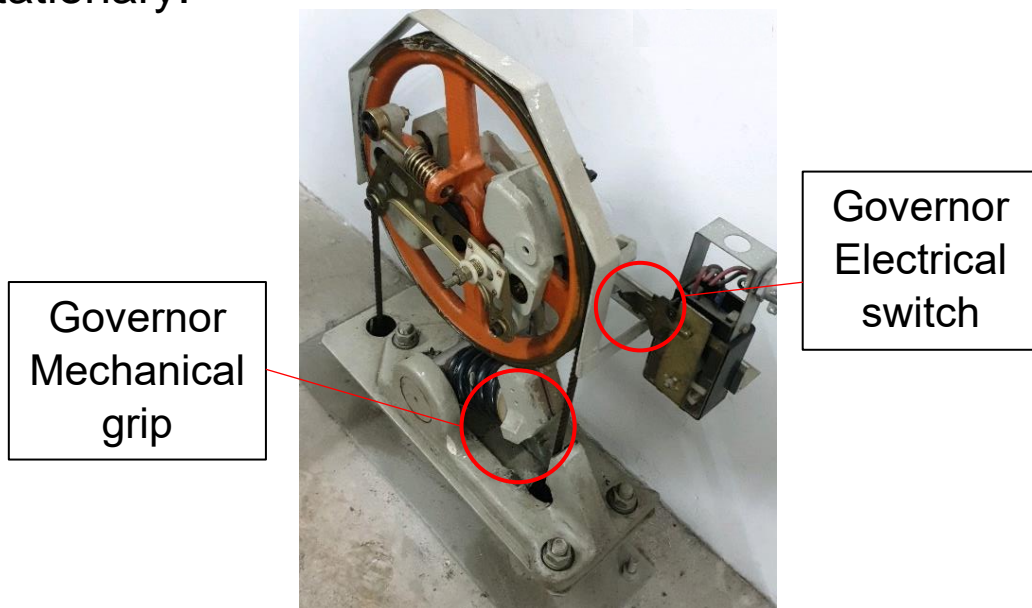
## Check

Ensure that the overspeed governor can activate the lift safety gear.



Test the governor by mechanically tripping it. Movement of components should be fast and smooth and be able to grip the governor rope.

Also test by tripping the electrical switch. Upon tripping the electrical switch, lift must stop and remain stationary.



Overspeed governor

## Check

The rope slack switch must be triggered before the tensioning sheave contacts the ground.



Using a gauge (e.g. Vernier Caliper) take the average of at least three measurements of the rope diameter to check that it is within manufacturer's specifications.

Rope slack switch



Governor rope  
tensioning sheave



Governor rope  
diameter measurement

# 10. Ropes

## Prevent

Main rope and compensation ropes must not show signs of corrosion or excessive wear and tear.



Rusty ropes



Worn-out belt\*

\*Note: Prior approval is required from BCA for the use of a belt system

## Prevent

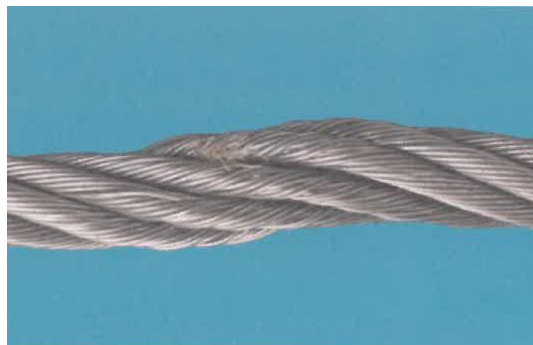
All ropes must not show signs of damage or deterioration.



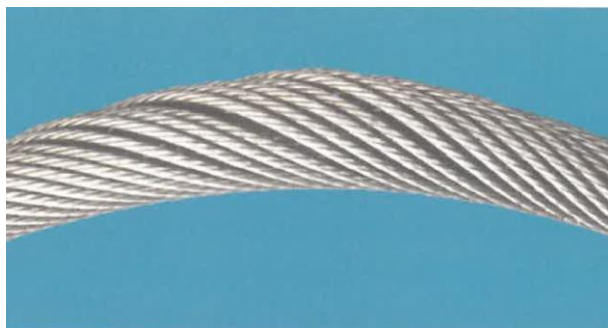
Typical modes of deterioration\*:



Wire protrusion



Kink



Birdcage



Waviness

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# 11. Compensation rope and compensation rope sheave tie-down and tensioning

## Check

When the lift is in operation, compensation rope and compensation rope sheave tie-down must always be properly tensioned and guided.



Compensation rope sheave tie-down

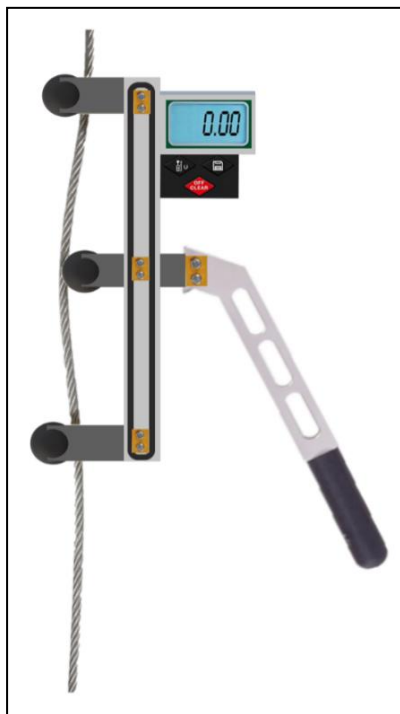
# 12. Main rope and compensation rope

## Check

Ensure that the main ropes are in good condition and that they are properly and equally tensioned.



Use a wire rope tension measurement device to check if wire ropes are equally tensioned.



Rope tension measurement device

## Check

A good indication of uniform rope tensioning is by checking that the amount of spring compression is comparable.



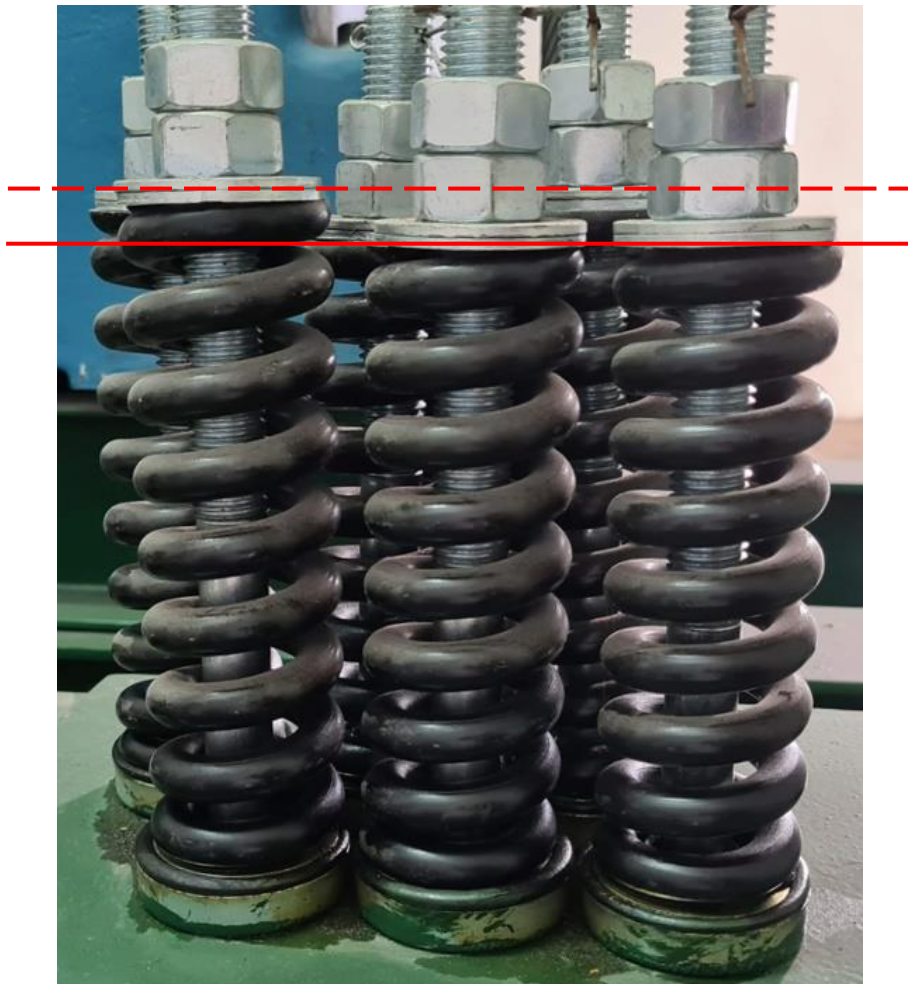
*Note: This may not be a good test method for very stiff springs.*



Even spring compression

## Prevent

Uneven spring compression is an indication of uneven rope tensioning.



Uneven spring compression

# 13. Buffer

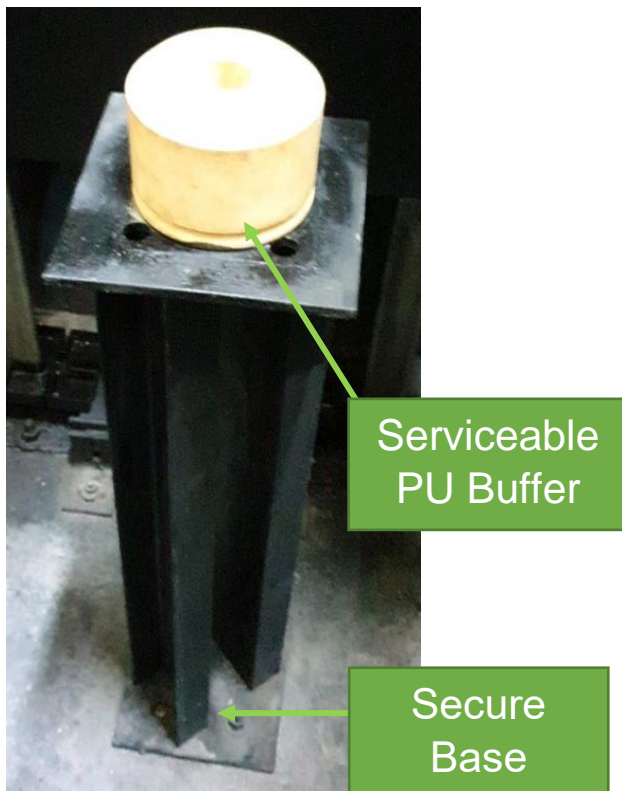
## Check



Make sure the buffer is securely attached and in a good condition.

For hydraulic buffer, ensure that there is enough hydraulic oil in buffer, as indicated by oil level gauge.

For polyurethane (PU) buffers, ensure that it is in a serviceable condition and within the stated life span.



## Prevent

The buffers must not be shaky or unstable.

Replace PU buffers when they are expired, damaged or have turned brittle.



Poor condition of buffer will prevent cushioning of lift car in case of an impact, increasing the risk of injury.



Damaged / Brittle  
PU Buffer

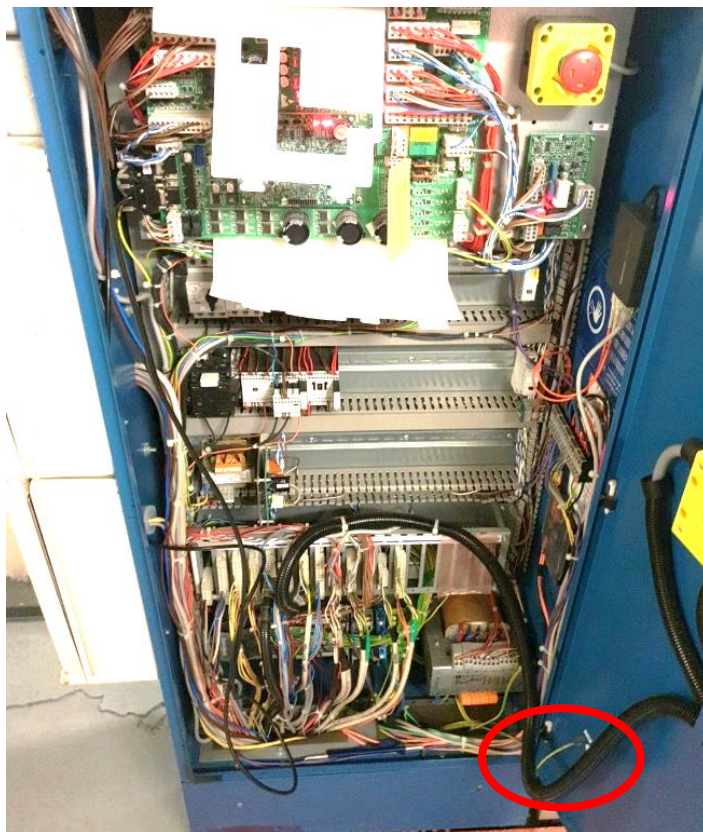


Insufficient  
Hydraulic Oil

# 14. Controller and electrical system

## Check

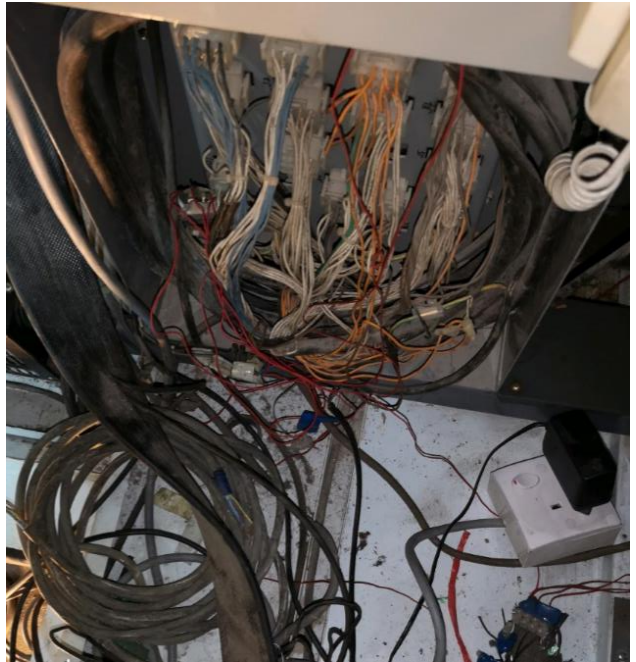
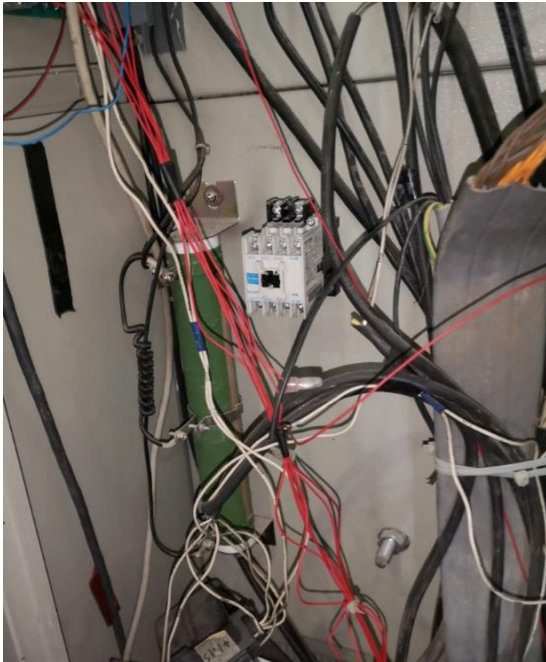
Ground and earth of controller, electronic and electrical systems and circuit boards must be firmly secured and well maintained.



Well secured electrical system with earth

## Prevent

Controller and electrical system must not show heat marks and poor wiring such as loose wires.



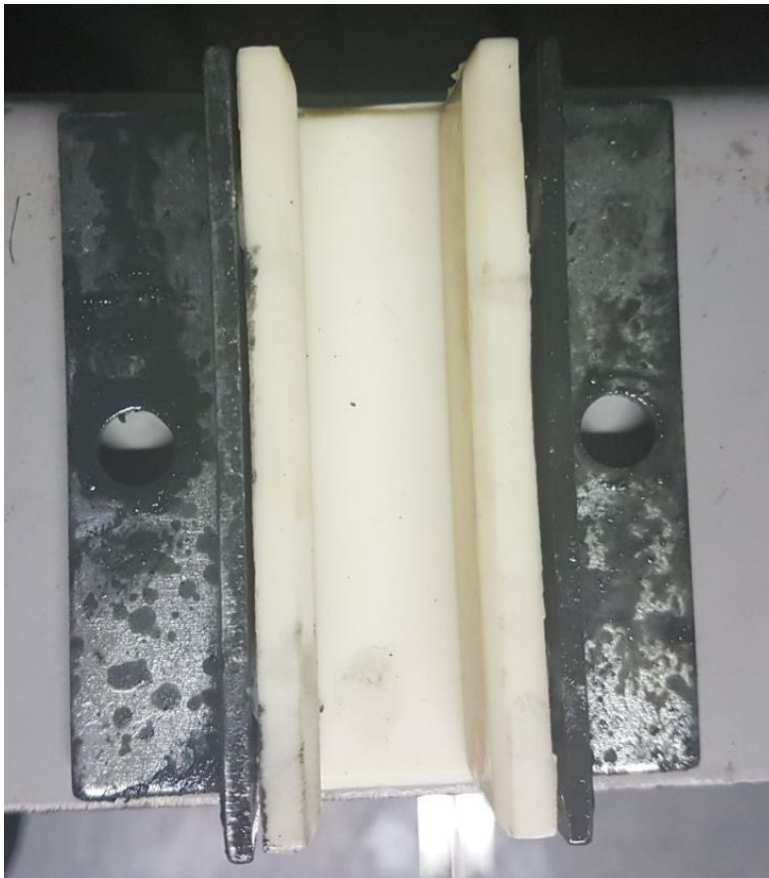
Untidy electrical system



# 15. Guide shoes or rollers of lift car and counterweight

## Check

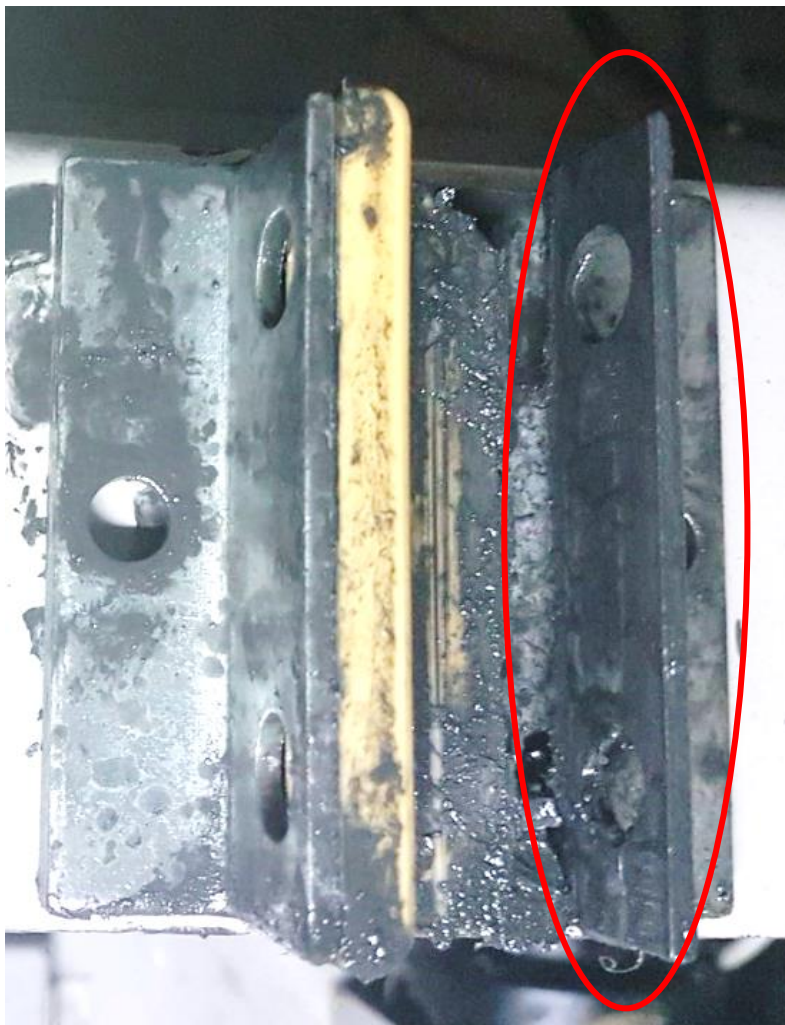
Make sure that the lift car and counterweight must always be guided by guide shoes or rollers.



Guide shoe

## Prevent

Guide shoes or rollers must not be missing or worn out.

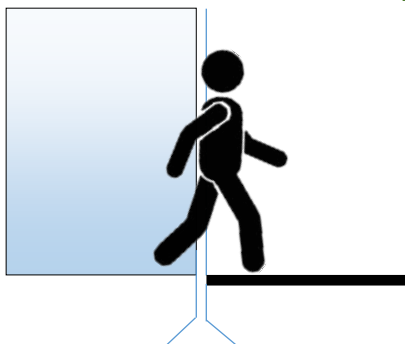
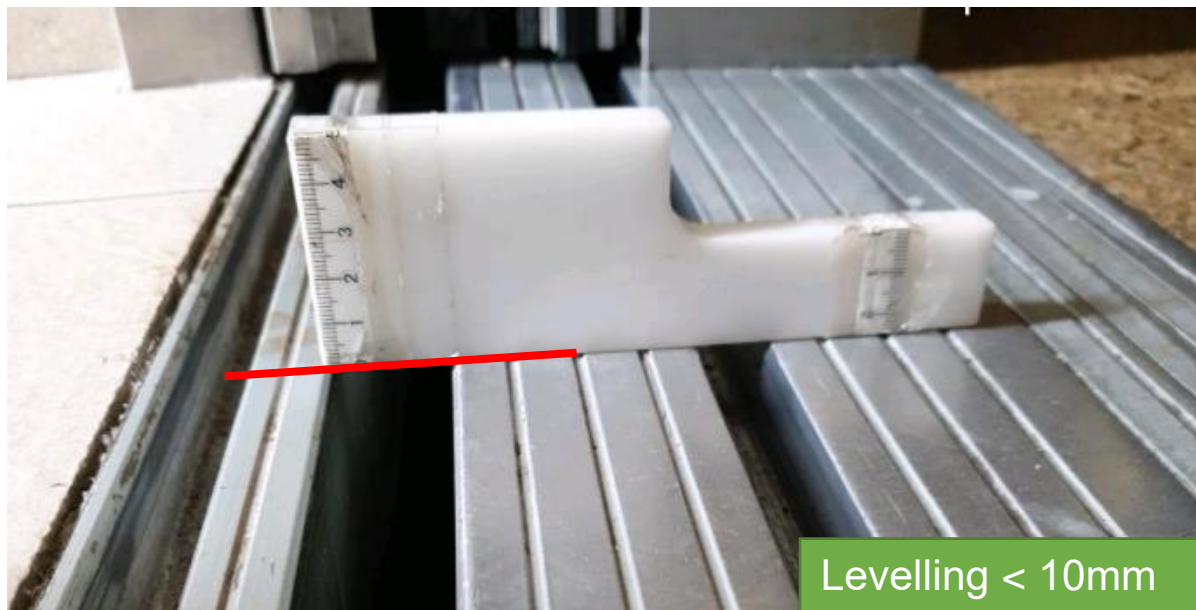


Missing guide shoe

# 16. Stopping or level accuracy

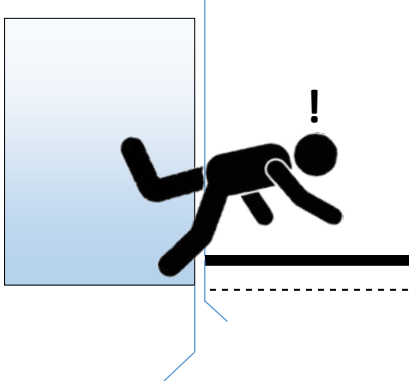
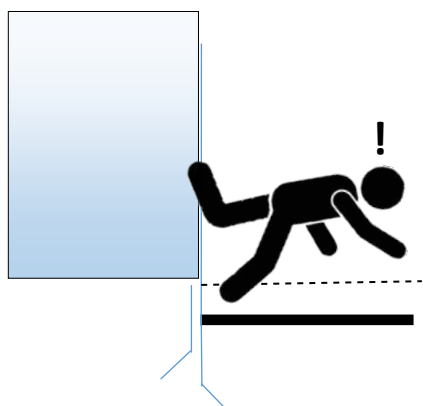
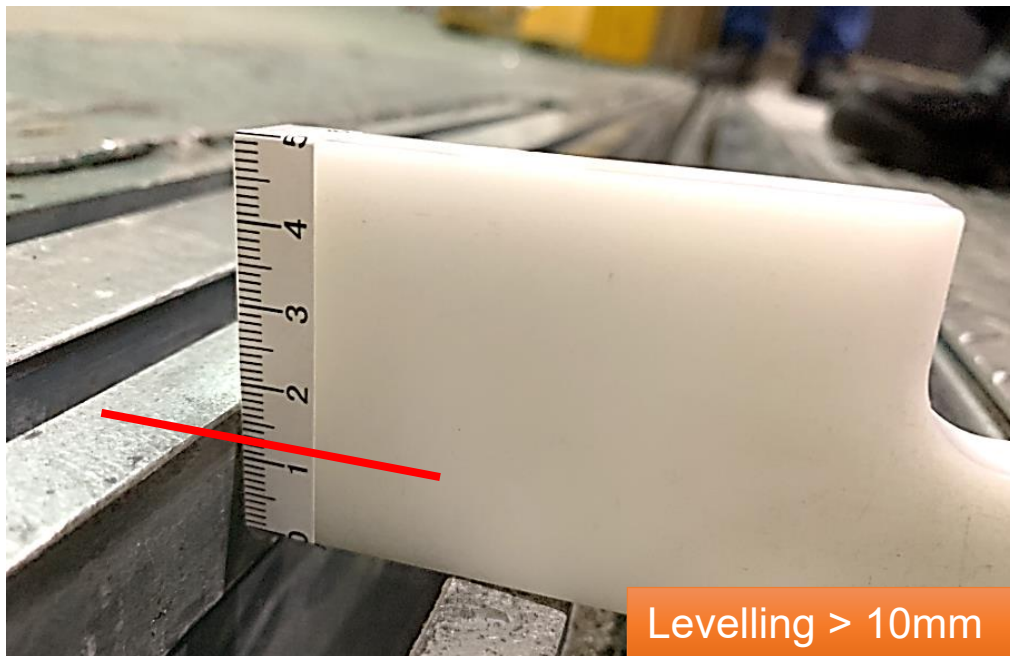
## Check

Make sure that the stopping accuracy of the lift car floor **must be  $\pm 10\text{mm}$** .



## Prevent

Prevent poor leveling as it is a tripping hazard.



# 17. Safety gear

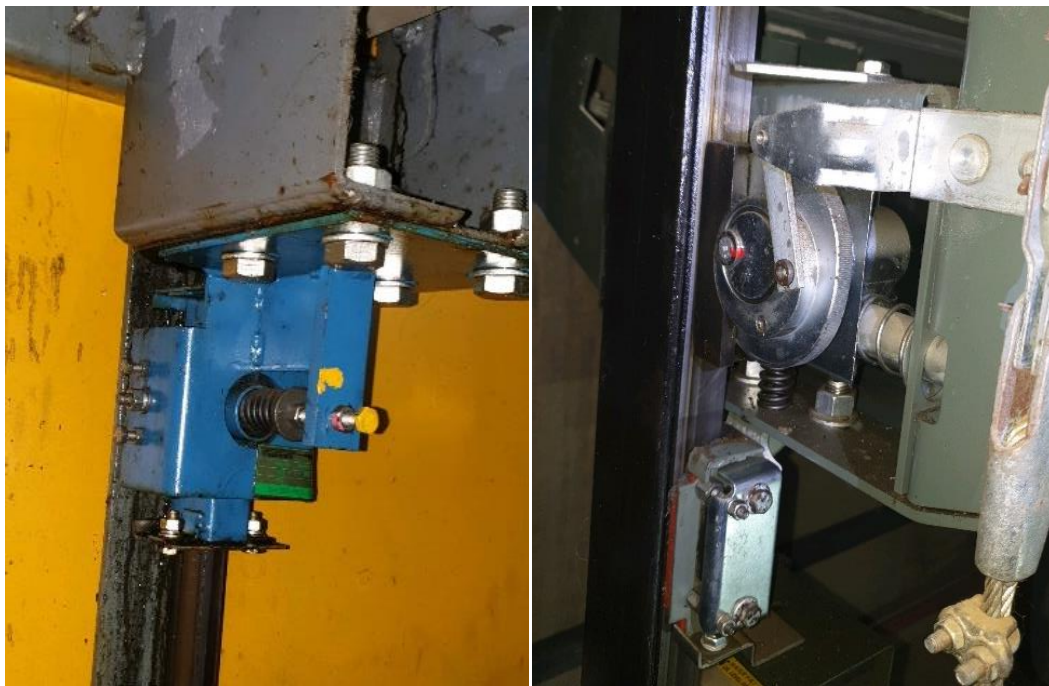
## Check

Ensure that the safety gear is always maintained and functioning.



When activated, it must be able to **stop and hold** the lift car and the counterweight within the allowable distance.

Conduct visual checks and test the free play of device.



Safety gear components

# 18. All lift parts

## Prevent

Ensure that the level of corrosion, wear and tear of all parts of lift must not affect the safe operation of the lift.



Excessive wear on  
deflector sheave



Rust on lift machine

# 19. Housekeeping - machinery and lift motor room

## Check

Ensure that the machinery and lift motor room is clean and tidy.



Clean and tidy motor room

## Prevent

Do not store unwanted or irrelevant material in machinery and lift motor room



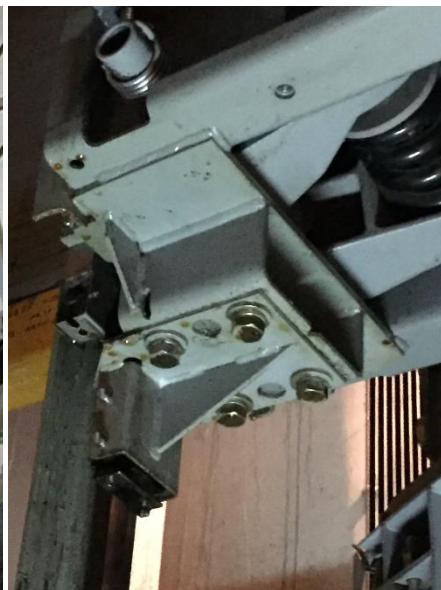
Poor housekeeping of motor room



## 20. Housekeeping - lift pit and hoistway

### Check

Ensure that the lift pit and hoistway is kept clean and tidy.



Clean and tidy lift pit

## Prevent

Do not store unwanted or irrelevant material in lift pit.

Do not let rubbish accumulate in the pit as it could lead to fire.



Poor housekeeping of lift pit and hoistway

# 21. Housekeeping - lift car top

## Check

Ensure proper housekeeping of lift car top and no rubbish or unnecessary items are stored on it.



Clean and tidy lift car top

## Prevent

Rubbish and unauthorized items on lift car top can get in your way which can lead to accidents or damage equipment.



Poor housekeeping of lift car top