



# Guidelines for Modernising Existing Lifts



# **Guidelines for Modernising Existing Lifts**





## Why Modernising Existing Lifts

Lift is an important mode of transport which we use every day in Hong Kong, a city with a high density of tall buildings. Heavy use means that wear and tear of lift parts is inevitable, and responsible persons for lifts (including lift owners, and those who have the management or control of lifts) are required by law to ensure proper maintenance and repairs of their lifts.

Existing lifts in Hong Kong have been installed in different decades. Although existing lifts were installed to the level of technology appropriate at the time, rapid technology advancement in recent years means that some existing lifts are not exactly state-of-the-art. It must be emphasised that existing lifts, if properly maintained and periodically examined, are safe. Information relating to the basic safety equipment in lifts can be observed in Page 4. There is room for improvement to make them more safe, reliable and comfortable.

## Purpose of Guidelines

These Guidelines aim to help responsible persons ('RP's) for lifts implement enhancement and modernisation solutions to make their existing lifts more safe, effective, reliable and comfortable.

As the RPs for lifts, you have full discretion as to whether or not you wish to adopt the recommended enhancement solutions in these Guidelines. Should you decide to do so, please liaise with your engineering consultant or registered lift contractor to review the feasibility of modernising your lift.



## Duties of Responsible Persons for Lifts

According to the Lifts and Escalators Ordinance (Cap. 618), RPs shall cause a registered lift contractor to carry out periodic maintenance of the lifts. For major alteration or modernisation works, the RPs shall employ a registered lift contractor to carry out the works, and arrange a registered lift engineer to examine and test the lift thoroughly upon completion of the works.

In general, RPs should arrange preventive maintenance and repairs for the lift on an on-going basis. Where major alteration/modernisation works is necessary, RPs should employ a registered lift contractor to conduct inspection and examination for the lift. If wear is found in existing lift installation, improvements can be made by necessary replacement or modernisation works. Upon completion of replacement and modernisation works, RPs should arrange a registered lift engineer to examine and test the lift.

### Tips

The RPs should consider factors such as space availability, technical feasibility and cost implications before deciding on whether to replace major components of existing lifts or install new safety equipment.



Responsible persons for lifts ('RP's) should



1. Ensure regular maintenance by a registered lift contractor



2. Pro-actively identify improvement needs for existing lifts through the process of regular maintenance



3. If any of the improvement needs is identified, it is necessary to implement modernisation works to enhance the safety, reliability and comfort of existing lifts



## Basic Safety Equipment in Lifts

### Door Locking Device

Lift must be equipped with outer doors (landing doors) and inner doors (car doors) mechanical door locks to securely hold the landing doors and car doors in locked position in order to prevent any hazard.

### Buffer

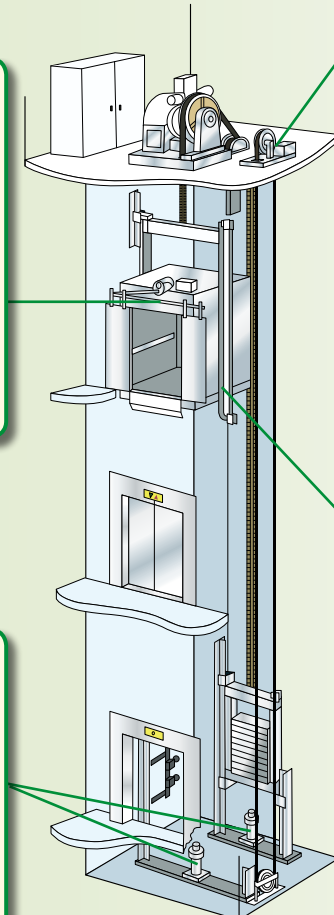
Buffer acts as additional safety protection. The main function is to reduce the impact of the lift car, and minimize injuries if there is malfunctioning of the safety gear when the lift fails.

### Overspeed Governor

If the lift car exceeds a predetermined speed, the overspeed governor will activate the safety device, bringing the lift car to a stop.

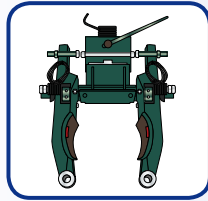
### Safety Gear

If the lift car exceeds a predetermined speed, the safety gear will grip the guide rails and bring the lift car to a stop even if the suspension devices break.



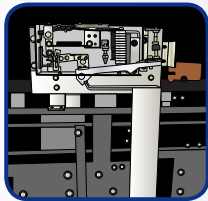
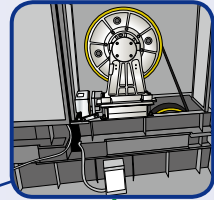


## Applicable Solutions for Enhancing Requirements of Existing Lifts

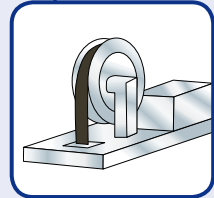
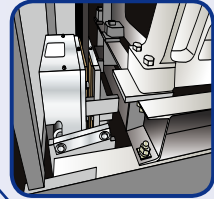


1. Install a double brake system

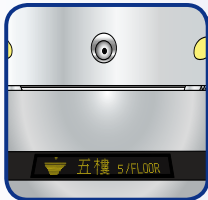
2. Install an unintended car movement protection device on the brake system



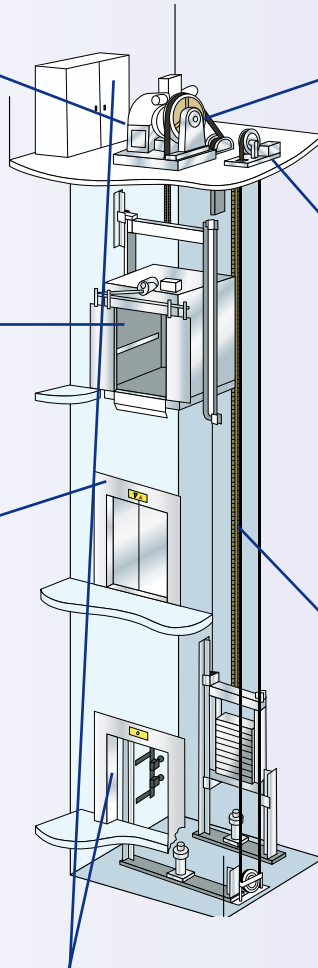
4. Install advanced car door mechanical lock and door safety edge



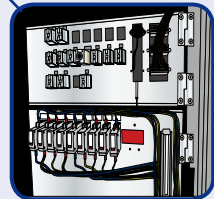
3. Install an ascending car overspeed protection device



5. Add an intercom & CCTV system



7. Add automatic rescue devices



6. Install an obstruction switch to protect suspension ropes



## Seven Solutions for Enhancement of Older Lifts

Seven solutions have been identified with the greatest potential benefit for safety, reliability and comfort enhancement in older lifts. The first four solutions should be considered with priority, whereas the remaining three solutions should be considered according to the actual situation or individual need. The applicable solutions for enhancing requirements of existing lifts shown on page 5 are elaborated as follows:-

### **Solution 1: Install a Double Brake System**

Older lifts may be fitted with only one brake and so the failure of parts could cause a lift car to stop ineffectively. Installing a redundant braking system can enhance safety as it has all the main brake parts in two sets, so that in the event of one set of parts fails, the other set of parts will ensure the safe operation of the lift.



A modern double brake system has two independent braking systems, each of which is normally electrically monitored.

Lifts installed before 2002 may not be up to this technical level. RPs should consider installing such system.

### **Solution 2: Install an Unintended Car Movement Protection Device**

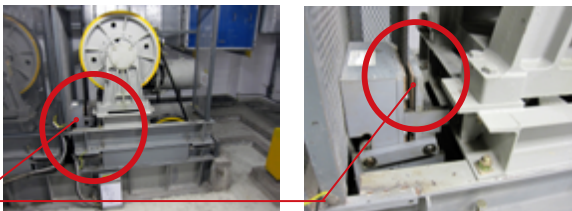
Unintended movement of the lift car whilst the doors are open and passengers are entering or exiting the lift car could result in injuries. To prevent unintended car movement, lift owners are advised to upgrade the braking system with built-in redundancy and self-monitoring features,



such as rope gripper. Such devices can protect the lift car from any unintended movement away from the landing position, thus enhancing passenger safety.

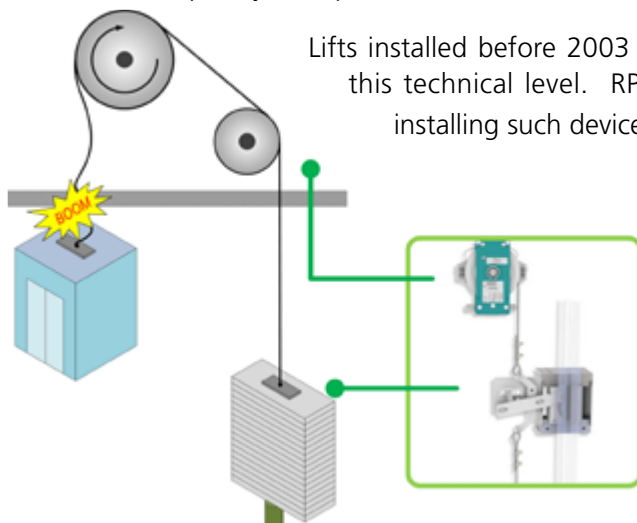
Lifts installed before 2007 may not be up to this technical level. RPs should consider installing such device.

*Diagram showing the operation of rope gripper: if unintended car movement is detected, the rope gripper will be activated to stop the lift.*



### **Solution 3: Install an Ascending Car Overspeed Protection Device**

Installing an ascending car overspeed protection device can protect an ascending car from accidentally overspeeding. This can reduce the risk of the ascending lift car from accidentally hitting the top of the lift well, and thus protecting passengers from injuries. The protection device detects and stops any overspeed movement of the ascending lift car.



Lifts installed before 2003 may not be up to this technical level. RPs should consider installing such device.





#### ***Solution 4: Install Car Door Mechanical Lock and Door Safety Edge***

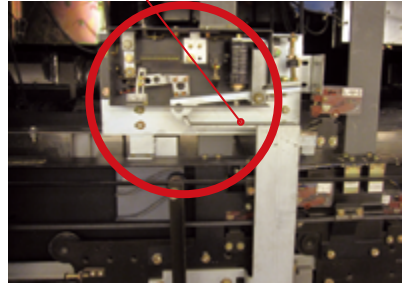
The benefit of installing car door mechanical lock in older lift cars is to prevent passengers inside the lift car from forcibly opening the lift doors, which can be dangerous. The benefit of installing the door safety edge is to automatically initiate re-opening of the door should a passenger be struck by the door as it is closing.

Lifts installed before 1984 may not be up to this technical level, and RPs are recommended to install such device.

*Safety Edge*



*Door Lock*



To ensure the lift is more reliable and comfortable for riding, RPs are also recommended to consider the following solutions while carrying out the lift modernisation works.

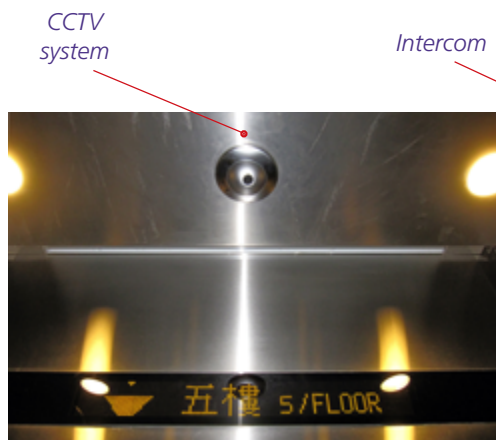


### **Solution 5: Add an Intercom and CCTV System**

If trapped in a lift, passengers can always press the alarm bell for help, but experience shows that it is not the best option. Installing an intercom system makes it possible for trapped passengers to communicate directly with management office staff who can take speedy action to call Fire Services Department and lift contractor. Some advanced intercom systems also allow passengers to directly contact a 24-hour call centre of the registered lift contractor for assistance.

RPs may also consider installing a closed-circuit television (CCTV) system which comprises a camera in the lift car and an emergency alarm push button with buzzer (or alarm bell), all connected to the building management office. Management office staff can also monitor the CCTV video captured round the clock and take speedy action during emergency.

Lifts installed before 1997 may not be equipped with such intercom and CCTV system. Lift owners are desired to install such system.





### **Solution 6: Install an Obstruction Switch to Protect Suspension Ropes**

Excessive wear and tear of suspension ropes is a major cause of ropes breakages. The provision of an obstruction switch can prevent the excessive wear and tear of the suspension ropes and sheaves during breakdown, which can happen when the movement of the lift car or counterweight is obstructed while the motor is still in operation.



*Obstruction Switch installed in the Control Panel*

Lifts installed before 1984 may not satisfy this requirement. Lift owners are desired to install such device.

### **Solution 7: Add Automatic Rescue Devices**

Passengers may be trapped inside a lift car in case of power failure. If an advanced automatic rescue device is installed, it can maintain the lift in a momentary operation for the safe exit of passengers, and prevent them from being trapped. When normal power supply fails, the device detects the voltage dip, uses back-up battery power to move the lift to the nearest landing floor and opens the doors to release the passengers. The lift will then remain out of service until normal power supply is resumed.





## Summary of Seven Enhancement Solutions

	Enhancement Solution	Benefit
1.	Install a redundant brake system	Older lifts with one brake may lead to ineffective braking should the brake fail. If a redundant brake system is installed, the lift will be able to stop safely even if one set of the brake fails.
2.	Install an unintended car movement protection device on the brake system	It can prevent any unintended lift car movement, passengers will be safer as they go in and out of a lift.
3.	Install an ascending car overspeed protection device	Prevent overspeed of an ascending lift car. Increased safety and reliability of lift operation.
4.	Install car door mechanical lock and door safety edge	Prevent passengers inside the lift cars from forcibly opening the lift door, and from being struck by the lift door as it is closing. Passengers will be safer as they enter and exit the lift.
5.	Add an intercom and CCTV system	It enables trapped lift passengers to communicate instantly with management staff, speedy rescue action for trapped passengers.
6.	Install an obstruction switch to protect the suspension ropes	When the movement of the lift car or counterweight is obstructed while the motor is still in operation, it will cause excessive wear and tear of the suspension ropes and sheaves. This enhancement solution prevents from excessive wear and tear of suspension ropes and sheaves, so that the lift is more safe and reliable for riding.
7.	Add automatic rescue device	Prevent passengers from being trapped in case of power failure. Increased reliability of lift operation.



## Next Steps for Responsible Persons for Lifts

RPs are recommended to consult registered lift contractors and consider the feasibility of implementing the safety devices/equipment. They can consult their engineering consultant or registered lift contractor on the technicalities, and implement the improvement solutions in a stepwise approach. Such enhancement works could be made in a stepwise and incremental upgrading approach.

RPs should also note that any equipment, including its components or parts, used to replace the old one during major alteration works, that the registered lift contractor shall be in full compliance with current legislative requirements under the Lifts and Escalators Ordinance and the Codes of Practice.

For further enquiries, please contact EMSD by phone 2333 3762.

## Benefits of Enhancement

By carrying out enhancement works, RPs of existing lifts will

- Upgrade the older lifts to a level of technology comparable to today's state-of-the-art standards
- Cause the lift more reliable and comfortable for riding



## **Government Funding Assistance and Integrated Building Maintenance Assistance Scheme**

The Urban Renewal Authority (URA) and the Hong Kong Housing Society (HKHS) has launched the “Integrated Building Maintenance Assistance Scheme (IBMAS)” on 1 April 2011. With one-stop service, the scheme aims to encourage owners and Owners Corporations (O.C.) of domestic or composite buildings to rehabilitate their buildings. Under the IBMAS, the O.C. can obtain technical support and financial assistance in carrying out the comprehensive building maintenance works where the lift modernizing works can be included. Building owners can make various applications under IBMAS, including the “Building Maintenance Grant Scheme for Elderly Owners” administrated by HKHS on behalf of the Government and the “Building Safety Loan Scheme” administrated by Buildings Department.

For further information and enquiries, please contact the hotline at 3188 1188 or browse the following websites:

<http://www.buildingrehab.org.hk/Rehabilitation-Resources/Schemes?lang=en-US>  
[http://www.hkhs.com/eng/business/pm\\_ibmas.asp](http://www.hkhs.com/eng/business/pm_ibmas.asp)





General Legislation  **EMSD**

3 Kai Shing Street, Kowloon, Hong Kong  
Tel : (852) 1823  
Fax : (852) 2504 5970  
Website : [www.emsd.gov.hk](http://www.emsd.gov.hk)  
E-mail : [info@emsd.gov.hk](mailto:info@emsd.gov.hk)



Printed on recycled paper