

8 Aug 2018

**All Lift Contractors, Owners and  
Other Interested Parties**

**MINISTRY OF MANPOWER (MOM) & BUILDING AND CONSTRUCTION AUTHORITY (BCA) JOINT  
ADVISORY – RISK CONTROL MEASURES FOR LIFT MAINTENANCE WORK**

Recently, a lift-maintenance worker was pinned against the top of the lift shaft when the lift was used to travel to the uppermost storey of the building. The person using the lift was not aware that a worker was on top of the lift car. The worker was conveyed to hospital where he succumbed to his injuries and passed away the following day.

2 Lift Contractors and owners, are advised to ensure that their lifts, when installed, comply with the prevailing code of practice (SS 550:2009 – Code of Practice for Installation, Operation and Maintenance of Electric Passenger and Goods Lifts), especially those requirements related to the car top clearance.

3 In addition, occupiers and employers, and other persons in control of similar workplaces and work activities, are advised to consider the following risk control measures to prevent such accidents from recurring:

**Risk Assessment**

4 Occupiers and employers shall conduct a thorough Risk Assessment (RA) for all work activities to manage any foreseeable risk that may arise while carrying out lift maintenance. The RA shall include, but not be limited to, the following areas:

- Entrapment on lift car top
- Hit by stationery parts in lift hoist way
- Contact with electrical terminations
- Fall through gap between lift and hoist way; and
- Exposure to asbestos brake lining

**Energy Isolation**

5 It is critical to ensure that hazardous energy sources are properly de-energised and isolated before commencing lift maintenance work. This is to prevent the lift from being accidentally

energised prior to the completion of maintenance work. A Lockout and Tagout (LOTO) procedure shall also be implemented.

6 When removing a lift from service, ensure that the lift car is empty and appropriate hazard signs and/or entry barriers are in place. These are important hazard communication tools.

### **Pre-Maintenance Check**

7 Before working on top of a lift car, maintenance personnel shall observe the following:

- Place the lift in maintenance or inspection mode
- Check for proper operation of the lift car top controls
- Ensure there are means to interrupt the control circuit for preventing undue or unintended car movement during maintenance
- Verify that necessary control measures have been implemented for all foreseeable risks
- Familiarise with the procedures for safe re-activation of lift car movement
- Check with the manufacturer or supplier on whether existing brake linings in the lift motor to be serviced contain asbestos. Documentary proof can be provided or in lieu of that, an asbestos survey can be conducted to ascertain the presence of asbestos in the brake linings.

### **Maintenance Requirements**

8 Lift service contractors should also be familiar with the maintenance outcome requirements detailed under the Building Maintenance and Strata Management (Lift, Escalator and Building Maintenance) Regulations 2016 (the “Regulations”). The Regulations prescribes a set of 20 maintenance outcomes (see Annex A) that must be achieved by the lift service contractor during the monthly maintenance.

### **Emergency Procedure**

9 Maintenance personnel shall be familiar with the emergency response procedures in order to deal with emergencies promptly and safely.

10 Depending on the emergency situation, appropriate responses shall be developed prior to work commencement. Emergency stop devices shall be readily accessible by the maintenance personnel to allow all sources of energy to be immediately and safely disconnected in response to an incident or hazardous situation. Self-rescue may be carried out only when the hazards are known and the worker can initiate the self-rescue in a safe manner. If self-rescue is not possible, support from trained emergency response personnel (e.g. SCDF or a co-worker) may be required.

11 It is important to provide effective means of communication between maintenance personnel within and outside the lift hoist way (e.g. through use of radio communication devices) during maintenance work and with rescue personnel during emergencies.

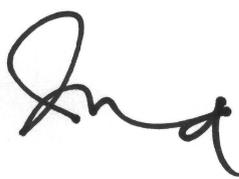
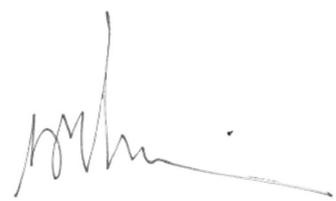
## **Asbestos Hazard during Lift Maintenance Work**

12 Brake linings containing asbestos may be found in lift motors, especially so in older lifts. There is a possibility that asbestos fibres may be released due to wear and tear of the linings over a period of time. Hence, it is important to check for asbestos hazard before commencing lift maintenance work.

13 If it is ascertained that the lift brake lining contains asbestos (through documentary proof or asbestos survey), safe work procedures for work involving asbestos shall be established and the work carried out shall comply with the WSH (Asbestos) Regulations Part III – General Provisions for work involving asbestos. Maintenance personnel shall be equipped with suitable respiratory protection and be trained in asbestos hazard. Maintenance work involving replacement of asbestos brake lining shall only be carried out by an Approved Asbestos-Removal Contractor and an asbestos work notification is required to be submitted to MOM prior to the commencement of work.

Should you need further information, you can refer to the following resources:

- MOM website on workplace safety and health  
<https://www.mom.gov.sg/workplace-safety-and-health>
- BCA Lift Safety website  
[https://www.bca.gov.sg/LiftSafety/lift\\_industry.html](https://www.bca.gov.sg/LiftSafety/lift_industry.html)

<p>Er. Mohd Ismadi for COMMISSIONER FOR WORKPLACE SAFETY AND HEALTH MINISTRY OF MANPOWER</p> 	<p>Er. Hashim Mansoor for COMMISSIONER OF BUILDINGS BUILDING AND CONSTRUCTION AUTHORITY</p> 
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Date of Issue	Classification	Circular no.
8 Aug 2018	Lifts	OSHD/SPECS/ESB/LE/04-2018

## Annex A

<i>Areas of maintenance</i>	<i>Requirements</i>
1. Door open control	<p>(a) When lift car doors and lift landing doors are opened and the button controlling the opening of those doors is pressed, the opened lift car doors and lift landing doors must stay open.</p> <p>(b) When lift car doors and lift landing doors are partially closed and the button controlling the opening of those doors is pressed, the partially-closed lift car doors and lift landing doors must reopen.</p>
2. Door protective devices	Lift car doors and lift landing doors must be operational at all times and reopen upon activation of door protective devices.
3. Lift car doors and lift landing doors	<p>(a) Lift car movement must only be allowed when lift car doors are closed and landing doors are closed and locked, and —</p> <ul style="list-style-type: none"><li>(i) the gap at lift car doorway is not more than 12 mm;</li><li>(ii) despite sub-paragraph (i), when there is obstruction at lift car door sill, the upthrust rollers of lift car doors are set such that the gap at lift car doorway is not more than 25 mm if lift entrance height 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 gap at lift car doorway may be increased by 3 mm);</li><li>(iii) the gap at lift landing doorway is not more than 10 mm;</li><li>(iv) the clearance between lift car door panels is not more than 10 mm; and</li><li>(v) the clearance between lift car door panels and uprights, lintels or sills, is not more than 10 mm.</li></ul> <p>(b) When lift landing doors are detected to be opened or unlocked during lift car movement, an emergency stop must be initiated immediately.</p> <p>(c) When lift car doors are detected to be opened during lift car movement, an emergency stop must be initiated immediately.</p> <p>(d) There must be no signs of excessive wear and tear of lift car doors and lift landing doors (or any component of the lift car door or lift landing door, including doors hoes, rollers, hangers and linkages).</p>
4. Lift car emergency alarm	<p>When lift car emergency alarm button is pressed, the alarm must be audible from —</p> <ul style="list-style-type: none"><li>(a) outside the lift well; and</li><li>(b) the designated floor as defined in SS 550:2009.</li></ul>
5. Lift car intercom	When lift car intercom button is pressed, the intercom system must function as intended.

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| 6.  | Emergency power supply for lift car lighting and ventilation                             | Emergency power supply for lift car lighting and ventilation fan must remain functioning when normal power supply to lift car is disrupted.  |
| 7.  | Movement of lift car   | Abnormal sounds or vibrations must not occur during any movement of the lift car.  |
| 8.  | Housekeeping   | Machinery, machinery space, lift pit, hoistway and lift car top must be kept clean, tidy and free from discarded items and debris.   |
| 9.  | Lift machine and drive (including motor, gear box, drive sheave and motor generator set) | <ul style="list-style-type: none"> <li>(a) Oil leakage must not occur in lift machine and drive.</li> <li>(b) Moveable parts, joints and gear box must be sufficiently lubricated.</li> <li>(c) Lift machine and drive must be securely mounted.</li> </ul>  |
| 10. | Brakes of lift machine and drive   | <ul style="list-style-type: none"> <li>(a) Brakes must not be contaminated with, or be at risk of being contaminated with, any oil or grease.</li> <li>(b) Brakes, when activated, must cause lift car to slow down, stop and stay at stopping position.</li> <li>(c) If lift is fitted with additional brake system for preventing uncontrolled lift car motion, the brake, when activated, must cause the lift car to stop and stay at stopping position.</li> </ul> |
| 11. | Direct current machine   | <ul style="list-style-type: none"> <li>(a) Carbon brush length must be within the tolerance as recommended by the manufacturer.</li> <li>(b) Insulation at carbon brush holders must not show any sign of carbon particle build-up which may cause flash-over and burning.</li> <li>(c) The commutator must be free from any foreign deposit and must not cause any sparking when in operation.</li> </ul>   |
| 12. | Overspeed governor   | <ul style="list-style-type: none"> <li>(a) At all times when lift is in operation, overspeed governor must function as intended and be able to activate lift safety gears.</li> <li>(b) Governor ropes must not show any sign of excessive wear and tear, in accordance with manufacturer's recommendations or, where manufacturer's recommendations are not available, the requirements in ISO 4344:2004.</li> </ul>  |
| 13. | Main rope and compensation rope  | <ul style="list-style-type: none"> <li>(a) Main rope must be properly and equally tensioned.</li> <li>(b) Main rope and compensation rope must not show any sign of excessive wear and tear, in accordance with manufacturer's recommendations or, where manufacturer's recommendations are not available, the requirements in ISO 4344:2004.</li> </ul>   |
| 14. | Compensation rope and compensation rope sheave tie-down and tensioning                   | At all times when lift is in operation, compensation rope and compensation rope sheave tie-down must be properly tensioned and guided, in accordance with manufacturer's recommendations.  |

15. Buffer
- (a) There must be sufficient oil in buffer, as indicated by oil level gauge, in accordance with manufacturer's recommendations.
  - (b) Buffer must provide effective cushioning upon impact to protect passengers in lift car at all times when lift is in operation.
16. Controller and electrical system
- (a) Ground and earth of controller and electrical system must be firmly secured.
  - (b) Controller must initiate immediate stopping of lift car and prevent lift movement under any condition that is unsafe to passengers and maintenance workers.
  - (c) Safety switches must function as intended at all times when lift is in operation.
17. Guide shoes or rollers of lift car and counterweight
- (a) Lift car and counterweight must be guided by guide shoes or rollers at all times when lift is in operation.
  - (b) Guide shoes or rollers must not cause wear and tear of guide rails.
18. Safety gear
- (a) Safety gear must be maintained and functioning at all times when lift is in operation.
  - (b) Safety gear, when activated, must be able to stop and hold the lift car and counterweight within the allowable distance in accordance with SS 550:2009.
19. All lift parts
- Level of corrosion, wear and tear of all parts of lift must not affect the safe operation of the lift.
20. Stopping or level accuracy
- The stopping accuracy of the lift car floor must be  $\pm 10\text{mm}$ .