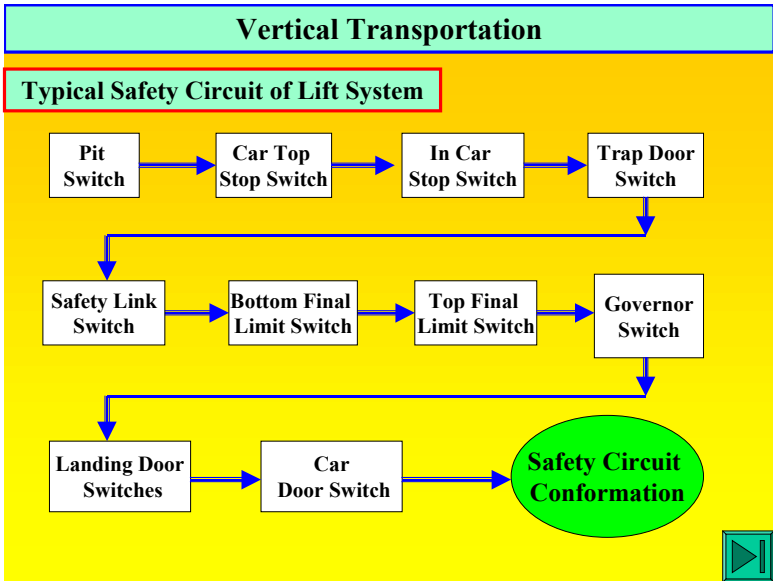
Typical Safety Circuit of a Lift System

For those who have attended our seminar on lift maintenance on 31st Aug 2002, you may recall the illustration of the lift safety features in a lift system. The following diagram shows a typical safety circuit of a lift system, which was explained during the seminar. These are the major and basic safety requirement for a lift system, and some lifts may have more than these.

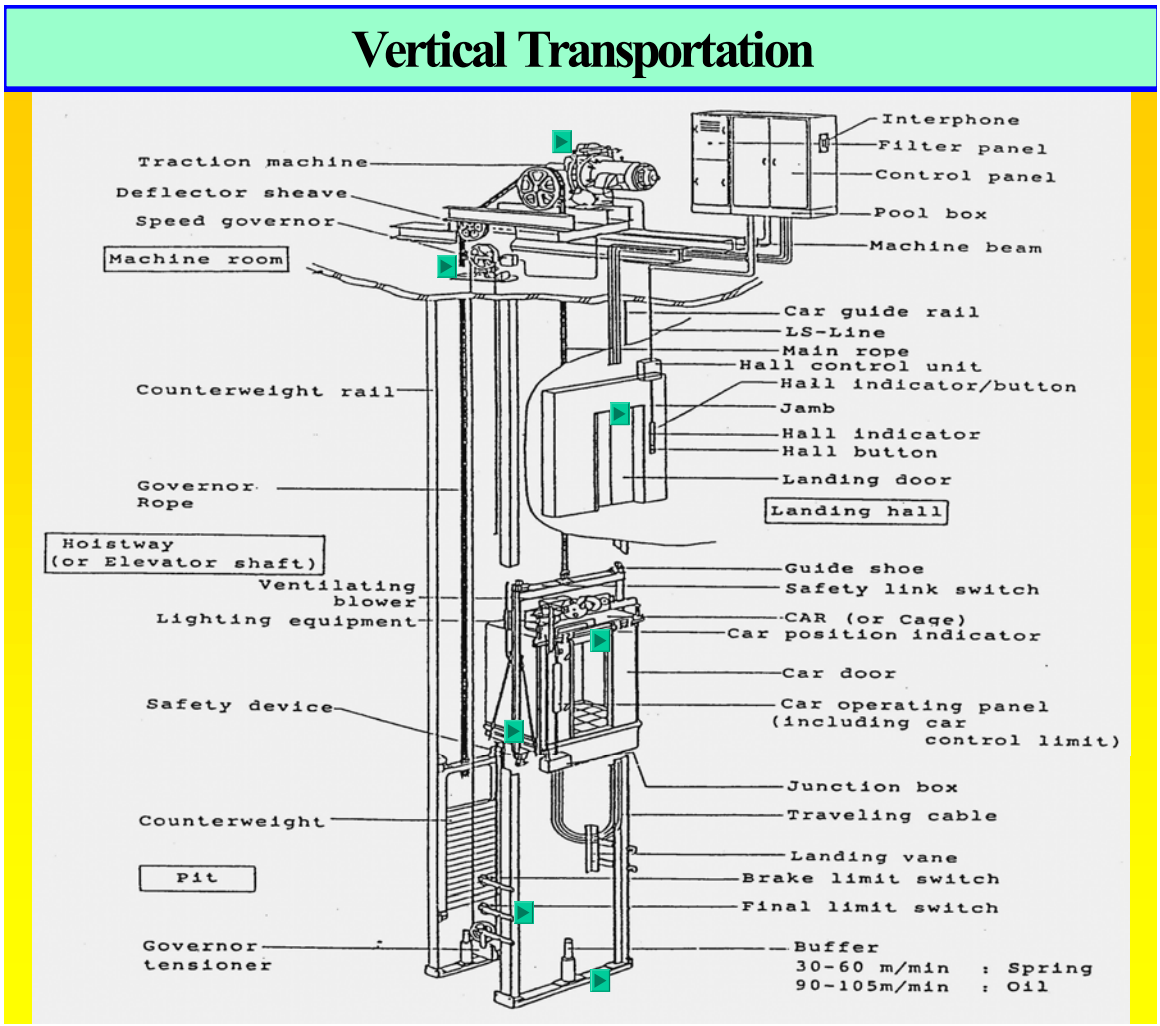


As you can see, these safety features are connected in series such that if any of these safety features is opened or disconnected, the power supply to the lift system will be cut off. The lift will not be in operation, or in breakdown mode.

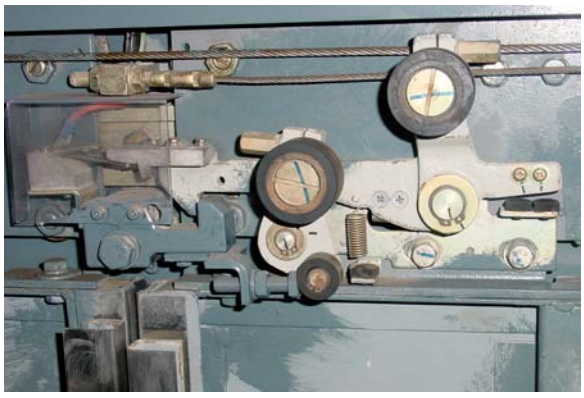
In one of the condominium in Bukit Timah, the original lift maintenance company (OLMC) was requested to take back the lift maintenance after these lifts were maintained by other companies for sometimes. The OLMC conducted an inspection before taking back the lift maintenance contract and several safety features were found not in order. These are shown in the following pictures 1, 2 and 3. As the lifts were found unsafe, they were shut down immediately until the faulty parts were replaced, the safety circuits were checked, trouble-shoot, reconnected and fully tested.

What are these safety features?

As you can recall from the seminar, there are many safety features located in many areas of the lift system. The following picture shows a typical lift system with their major components located all over the lift system.

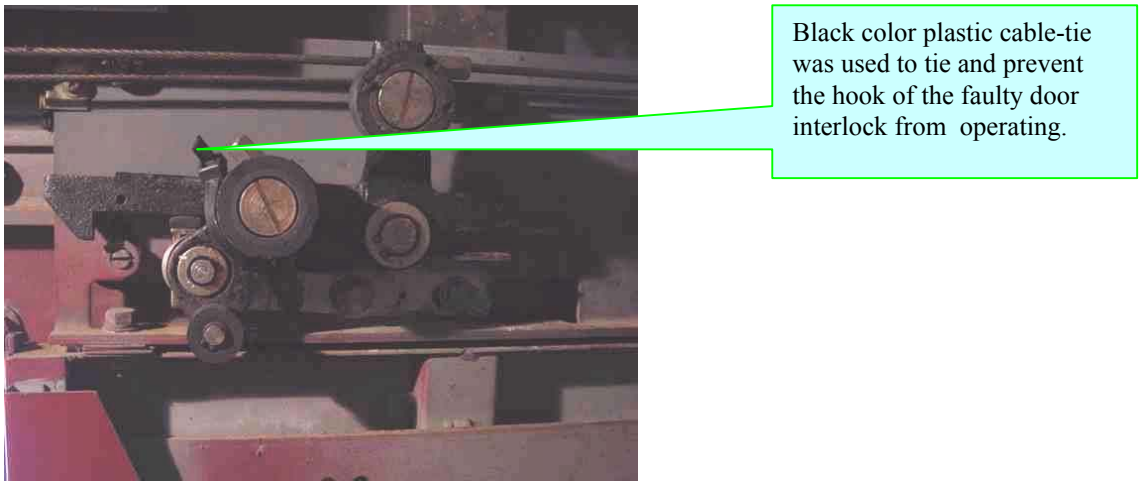


The door interlock safety switch is located at the top of every landing door operating device. The picture below shows a typical landing door interlock in a closed position.



As can be seen from here, the lock is attached to the top of the landing door panel. When the 2 door panels are closed, the hook of the lock interlocks with the locking system and at the same time, it activates the door safety switch, which is connected in series by a pair of wires to the central safety circuit. When the switch is activated, the safety circuit is considered closed and safe for the lift to operate.

What would happen to the lift if the door safety feature is breached?



Picture 1.

As you can see from the above picture 1, which was taken from the site. This hook of the door interlock was tied with black color cable-tie to by-pass the locking and safety function. It was quite obvious that the door lock device was already faulty and would not be able to close properly such that there would be constant breakdown. Probably, the contractor was unable to replace the faulty hook due to in-availability of spare part. To prevent lift breakdown, he took the illegal action to tie the hook and make the safety feature not in operation.

What is the consequence of the door lock hook tied?

The door lock hook will not be able to lock the door panels when the landing doors are closed. Therefore, the landing doors can be opened from the landing side. At the landing side (lift lobby), if you push open the door panels, you are able to open the doors. The lift car would still be able to run since the safety switch is not activated. It is possible for the lift car which is in vertical motion, to shear off the inquisitive person's head, or limbs. The opened doors without the lift car at the landing, would also allow the person to walk into the lift hoistway and fall to his death.

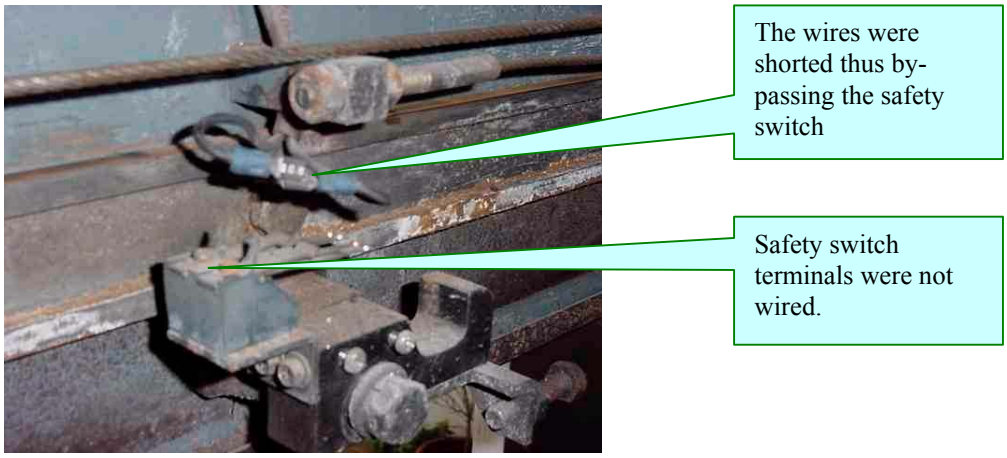
The victim could be you, or your child.

Picture 2

In the above picture 2, the door interlock switch box was found badly burnt. Contacts were burnt away with no door safety protection.

How can this happen?

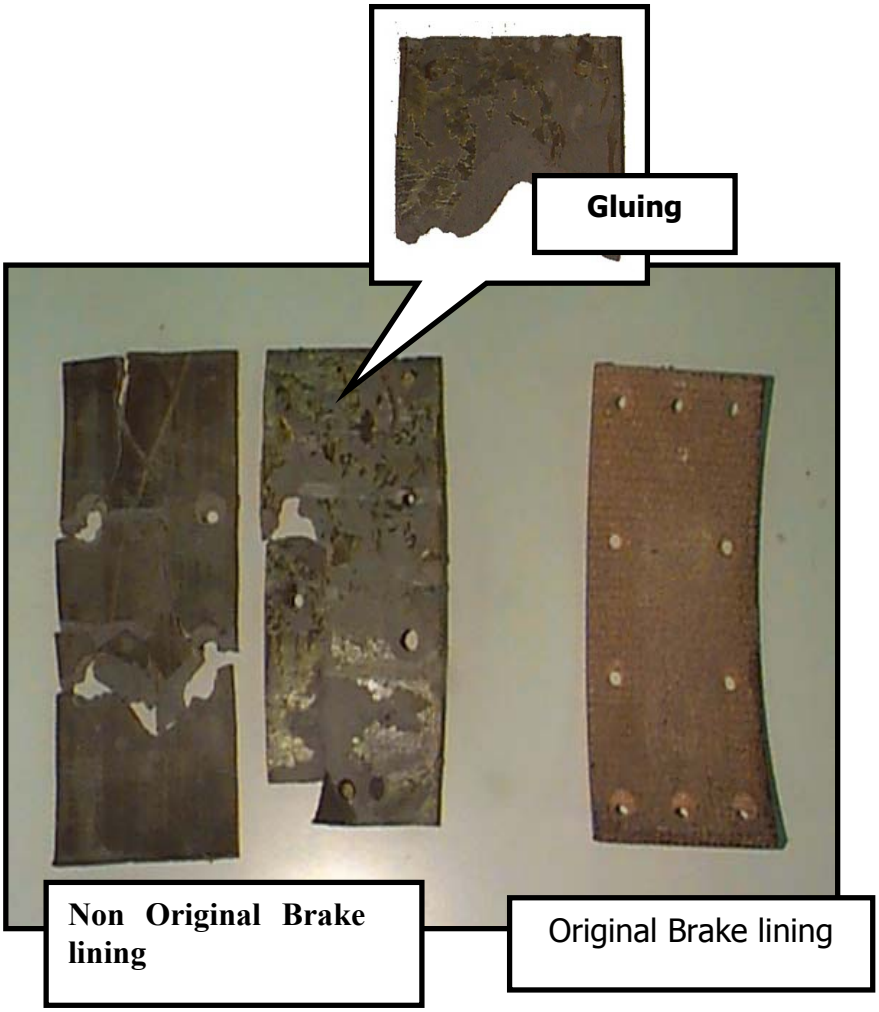
There are many lift landings in a lift, and so there would be many door interlocks. If any one of these door interlocks is not in good order, or not adjusted properly, frequent lift breakdown will happen. To avoid complaint from the lift users, the contractor may choose to "short the safety switch" with some wires. By doing so, the safety switches will be "permanently in operation", regardless whether these safety switches are being operated by the landing doors. The smart Alex has found a way to avoid lift breakdown with or without safety switches. Unfortunately, he has also burnt away the switches. Why bother to replace the faulty parts. After all, without safety switches, there would be less breakdown.



Picture 3

In the above picture 3, the door interlock contacts (parts of the switch) were not connected to the switch terminals. Instead, the wires were found shorted with wires.

The reasons for doing so are very obvious if you understand the above explanation so far.



Picture 4

Picture 4 above was found in another site. The lifts were maintained by another company for sometime.

The management agent requested a load test to be done, probably due to suspected irregularities. According to the lift code, the brake should hold 100% of the rated load. However, it was found that the brake failed to hold even at 80% of the rated capacity. Upon investigation, it was discovered that non-original part of the brake components was used and improper method of replacement was done.

The failure of the brake can shear off your body between the car and the landing, as you walk into this lift with faulty brake.

These safety breaches can result in serious accident and endanger the life of people using the lift. SLECMA would like to advise all owners and MCST members to engage qualified lift company to maintain their lifts. In case of doubt, you are welcome to contact us. Owners or the MCST Council members have a Duty of Care for the lift users.