



# LEIA Safety Information Sheet

## CAR TOP CONTROL STATIONS and TOP OF CAR INSPECTION SAFE SYSTEMS OF WORK

*Prepared by the LEIA Safety and Environment Committee*

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## PREAMBLE

This Information Sheet is one of a series produced by the LEIA Safety and Environment Committee on topics relevant to the Lift and Escalator Industry. Whilst every effort has been taken in the production of these sheets, it must be acknowledged that they should be read in conjunction with the relevant legislation, codes of practice etc. They should not be taken as an authoritative interpretation of the law but guidance to it.

## INTRODUCTION

Since this information sheet was originally developed, EN81-20:2014 has been introduced and this standard requires the provision of control stations on the car roof, in the pit and in certain cases in the car, or on a platform.

At this stage, this information sheet only covers the requirements and functional checks to be made on control stations fitted on the lift car top.

### General

This information sheet results in part from a detailed risk assessment conducted in conjunction with the Safety Assessment Federation (SAFed)<sup>1</sup>, written prior to the introduction of EN81-20:2014 but still of relevance where lifts were installed to the previous standards EN81-1 and -2

When work requires access to the lift car top e.g. for the purposes of inspection, maintenance, repair, modernisation etc there is a requirement to carry out a risk assessment to ensure that a safe system of work is in place.

This will include a review of the car top control station (CTCS), of which there are many different types in use with switches in various configurations. In many cases these will not accord with the requirements prescribed in current British Standards i.e. BS EN81-20:2014 and the recommendations in BS7255:2012. This is an area of concern which this Information Sheet seeks to address.

Any travel on top of an operational lift car is only permitted where an effective car top control is fitted and fully functional. The risk assessment needs to consider:

- Are suitably laid-out controls fitted, and if so,
- Are they functioning correctly, and if so,
- Do the functional requirements comply with EN81-20:2014\*
- Two-person riding is done with an effective communication method to ensure all parties are aware when the car will move and in which direction.

\*Note: Where the functional requirements do not accord with EN81-20:2014 the risk assessment must consider the non-compliant function to determine if the unit is safe for use. Functional requirements are within Appendix 2

Other factors such as sufficient space, headroom, fall hazards, provision of a fully functioning safety gear etc. must also have been taken into account in the risk assessment.

It is usual to gain access to the lift shaft via landing doors with the lift car situated at some convenient distance from its normal position at that landing. A landing door key should be used to unlock the landing door. Before any access to the top of car, it should be decided if the work to be done will require the electrical power supply to be maintained. If not the power supply to the lift

<sup>1</sup> LEIA/ SAFed Risk Assessment Adequacy of Lift Car Top Controls Safety Information Sheet 02-1

should be isolated and locked in the off position. An appropriate notice should be displayed at the point of such isolation.

If it is necessary for the electrical supply to the lift to be maintained for the work in hand, then means should be provided to enable the normal lift control circuit to be disconnected before anyone attempts to transfer from the landing to the car top. For this purpose, the car top stop device (Stop switch) should be positioned within 1.0m of the landing threshold and thus capable of being operated from the landing before access to the car top is gained. Such a stop device is specified in EN81-20:2014.

When it is necessary for personnel to travel on top of a car, a CTCS complying with EN81-20:2014 or BS7255:2012 must be provided. Examples of acceptable layouts are provided in Appendices 3,4 and 5. Current design requirements are given in Appendix 1.

The results of the LEIA/ SAFed Risk Assessment on the Adequacy of Lift Car Top Controls confirm that, when fitted on all lifts where persons have to carry out work from the roof of the car, car top controls which are, as a minimum, compliant with EN81-20:2014 or BS7255:2012, can reduce work related risks.

It is recommended that all lifts covered within the scope of the LEIA/ SAFed document, are fitted with CTCS in accordance with EN81-20:2014 or BS7255:2012 and used with the appropriate safe working practices for car top access.

The correct operation of the CTCS functions should be verified before the car top is accessed or any work undertaken, such a process is described later in this Information Sheet.

**All travel or work on the car top must be under control of the CTCS and the person on the car top must have complete control of movement at all times.**

## Risk assessment of CTCS – different types

It is important that before accessing the shaft with the view to working on the car top an assessment be made of the car top control provisions which will fall into one of the following three categories: -

### Category 1

The layout of the CTCS is in accordance with BS EN 81-20 or BS7255:2012 (see Appendices 1 and 2) and the control station is positioned within 1.0m of the landing threshold.

If the CTCS is not positioned within 1.0m of the landing threshold there is an additional Stop switch positioned within this distance from each point of access.

### Category 2

Where the layout of the control station and the operation of the controls is as Category 1 above but the car Stop switch is not positioned within 1.0m of the landing threshold.

**Note: In this situation it is preferable that the car Stop switch should be re-located within 1.0m of the landing threshold or an additional switch installed.**

### Category 3

The CTCS and Stop switch are not in accordance with Categories 1 or 2 above i.e. non-conforming switches or buttons (switches not bi-stable, buttons not shrouded) or there is only a Stop/ Run switch or no car top controls at all.

Controls compliant with previous Standards BS EN81-1 and -2 are included in this category.

**NOTE that in the case of controls previously fully compliant with BS EN81-1 and -2 but which lack a Common or Run button, these may be upgraded to Category 1 by the addition of a Common or Run button.**

Some companies may wish to subdivide the above categories and may devise their own safe working procedures.

Examples of different types of CTCS are shown within Appendix 6

## How to proceed with 3 different Categories

### *In the case of Category 1 Car Top Controls*

Travel on the car top is permitted but prior to doing so it is essential that the integrity of the car top control functions is proved. The following procedure details such a process. Allow sufficient time for the lift to react. The use of a door-blocking device to control the doors when leaning into the shaft to access the switches must be used.

1. Check the lift is free of passengers and place out of service signs. Use an entrance barrier to protect others if necessary.
2. Place two car calls in the lift to create a demand for the lift to move. When the lift car top is above floor level at a position allowing safe access, open the landing doors with the door release key to prove that the landing lock is working at that floor.
3. Check that the lift has been stopped by the operation of the door lock rather than a normal stop at the floor below. Check also that the car is not in the door zone area to stop the lift car doors from opening.
4. Set the Stop switch on top of the lift to the STOP position on the CTCS.
5. Close the landing door and attempt to call the lift to the landing.
6. Be mindful of adjacent lifts answering call made to lift.
7. If the lift does not respond, the integrity of the Stop switch is considered proved.
8. Next verify the functioning of the CTCS Inspection/ Normal switch.
9. Open the landing doors and switch to Inspection mode on the Inspection/ Normal switch. Return the Stop switch to run position and close the landing doors
10. Attempt to call the lift to the landing
11. If the lift does not respond, the integrity of the Inspection/ Normal switch by itself is considered to be proved.

[Some companies also verify the functioning of the CTCS Inspection/ Normal switch and the Stop switch together by a similar process].

Once the correct function of the Stop and Inspection/ Normal switches have been verified access to car top can proceed.

1. With the Stop and Inspection switches both set to inspection and stop
2. Turn on the car top light (if applicable) assess the hazards and step to a safe location on the car top.
3. Identify refuge space
4. Close the landing door.
5. Assume a safe position, release the Stop switch and test the down button by use of it for a short descent.
6. During the descent, and while in Inspection mode, operate the Stop switch.
7. If the lift stops, the integrity of the Stop switch during a lift run is considered proved.
8. Release the Stop switch, move the lift again – for a short duration – in the down direction and while in the Inspection mode, release the Down button.

If the lift stops, confirmation will have been achieved that the Down button when released, will stop the lift.

If the CTCS is fitted with a Common or Run button the integrity should be proved by a similar method.

All movements of the lift should ideally be in the down direction; when this is not possible the lift should be moved down to a safe distance from the top of the lift shaft before an attempt is made to move the lift in an up direction.

If upwards travel is required then:-

1. Move the lift - again – for a short duration – in the up direction and while in the Inspection mode, release the Up button.

If the lift stops, confirmation will have been achieved that the Up button when released, will stop the lift.

Each time the movement of the lift is not required, the Stop switch must be placed in the STOP position to prevent movement of the car. Where movement is required after this has been undertaken return the switch to the STOP position as soon as the lift stops.

Under no circumstances must the Inspection/ Normal switch be returned to Normal whilst persons are on top of car.

When leaving the car top, ensure that the Stop switch is in the STOP position, open the landing doors ideally at the floor where the access verification was carried out because the correct function of that landing lock has been verified. If this is not practical then the landing lock must first be verified before egressing at that level. This can be achieved by trying to move the car on Inspection with the landing door open. Ensure Stop switch is engaged before leaving the car top.

Step on to the landing and then switch off the top of car light [if applicable] and re-set the Inspection/ Normal switch to the NORMAL position and the Stop switch to the RUN position. Close the landing door and check the correct functioning of the lift.

*In the case of Category 2 Car Top Controls*

Travel on the car top is permitted subject to the lift car being under control at all times.

Check that the lift landing door lock functions correctly by opening the landing door with door release key and creating a demand for the lift. After positioning the car as required, verify the landing door lock but before gaining access to the car top isolate the main power supply, this requires an additional person in the machine room otherwise the lift will reset if the doors are allowed to close. With the power supply locked and tagged out to prevent inadvertent operation of the lift whilst gaining access to the car top, fully open the landing doors and operate the Stop switch.

The position of the Stop switch means that verification of the correct operation of the Stop and Inspection/ Normal switches prior to using the CTCS using the method described above may be problematic as the power would first have to be isolated before each switch is operated then restored to test the correct operation of the switch.

Company procedure should be followed in these circumstances; it may be, for example, that two people are required.



*In the case of Category 3 Car Top Controls*

In the absence of a safe system of work devised to suit individual circumstances, travel on the car top is **NOT** permitted and the following procedure shall apply.

Electrically isolate the lift at the main switch where possible, lock the isolator in the off position and tag with a warning label before commencing any work on top of the lift car.

The Stop switch (if fitted) must be placed in the off position before work is commenced.

Consideration may be given to on-site labelling of the category into which each CTCS falls so as to avoid making assessments every time there is a visit to the lift. Indicators to this effect might be contained either within the machine room or on the car top.

A simple note stating that travel is not permitted may also help as appropriate.

**Note:**

References have been made to, and extracts quoted from, British Standards Specifications. It should be noted that these do not cover all the requirements, for which reference must be made to the Standards themselves.

For any clarification of this information sheet contact your company Safety Advisor or the LEIA Safety and Training Manager.

## Appendix 1 – Design requirements from BS EN 81-20

*To facilitate inspection and maintenance, a readily operable inspection control station shall be permanently installed on the car roof*

*The inspection control station shall consist of:*

- a. a switch (inspection operation switch) which shall be bi-stable, shall be protected against involuntary operation*
- b. direction push buttons “UP” and “DOWN” protected against accidental operation with the direction of movement clearly indicated;*
- c. a “RUN” push button protected against accidental operation;*
- d. a stopping device (a red mushroom-headed switch which locks in place when pressed)*

*The control station may also incorporate special switches protected against accidental operation for controlling the mechanism of doors from the car roof.*

*The inspection control station shall have a minimum degree of protection of IPXXD (EN 60529).*

*Rotary control switches must have a means of prevention of rotation of the stationary member. Friction alone is not considered sufficient.*

## Appendix 2 - Functional Requirements from BS EN81-20

### **Inspection operation switch**

*The inspection operation switch in the inspection position shall satisfy the following conditions for functioning simultaneously:*

- a. *neutralise the normal operation controls;*
- b. *neutralise any emergency electrical operation*
- c. *levelling and re-levelling shall be disabled;*
- d. *any automatic movement of power operated doors shall be prevented. Power operated closing of the door(s) shall depend on:*
  - *the operation of a direction pushbutton for car movement; or*
  - *additional switches protected against accidental operation dedicated to controlling the doors.*
- e. *the car speed shall not exceed 0.63 m/s;*
- f. *car speed shall not exceed 0.30 m/s when the vertical distance above any standing area on car roof is 2.0 m or less;*
- g. *the limits of normal car travel shall not be overrun, i.e. not exceed the stopping positions in normal operation;*
- h. *the operation of the lift shall remain dependent on the safety devices;*
- i. *if more than one inspection control station is switched to "INSPECTION", it shall not be possible to move the car from any of them unless the same push buttons on the inspection control stations are operated simultaneously;*

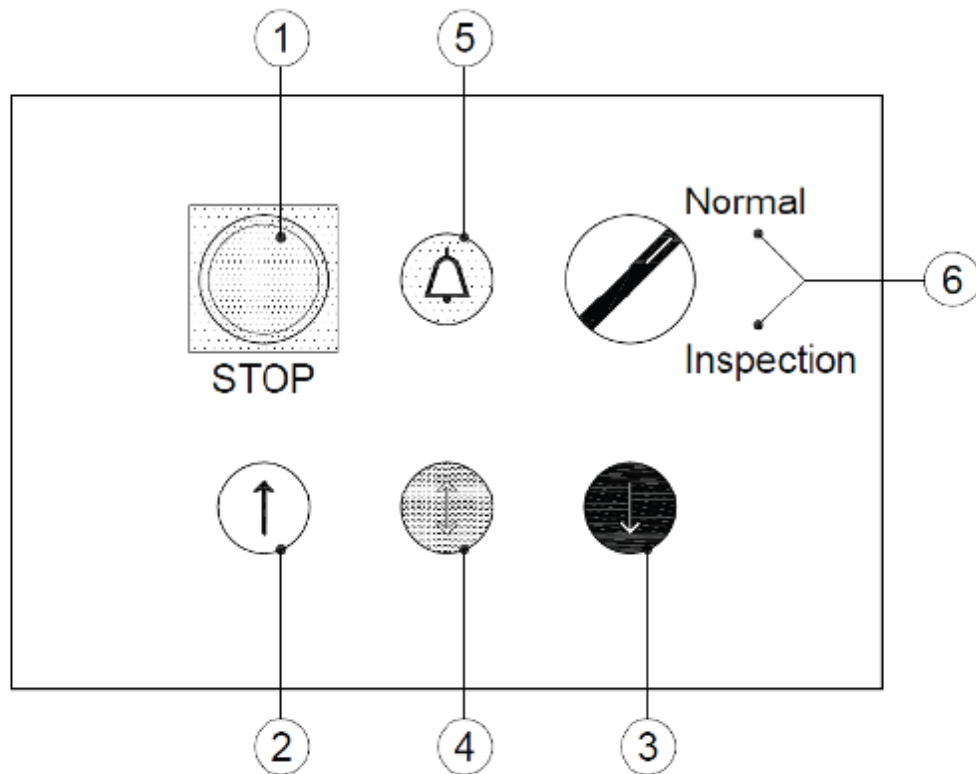
### **Return to normal operation of the lift**

*The return to normal operation of the lift shall only be effected by switching the inspection operation switch back to the "NORMAL" position.*

### **Push Buttons**

*The movement of the car in inspection operation shall solely depend on constant pressure on a direction and a "run" push buttons, which can both be operated simultaneously with one hand.*

### Appendix 3 Inspection control station layout to BS EN81-20



#### Key

- |                |                              |
|----------------|------------------------------|
| 1. Stop switch | 5. Alarm button              |
| 2. Up button   | 6. Inspection/ Normal switch |
| 3. Down button |                              |
| 4. Run button  |                              |

NOTE Placing the alarm button in the control station is optional.

On the inspection control station, the following information shall be provided

- the words **"NORMAL"** and **"INSPECTION"** on or near the inspection operation switch;
- the direction of motion identified by colours or symbols below

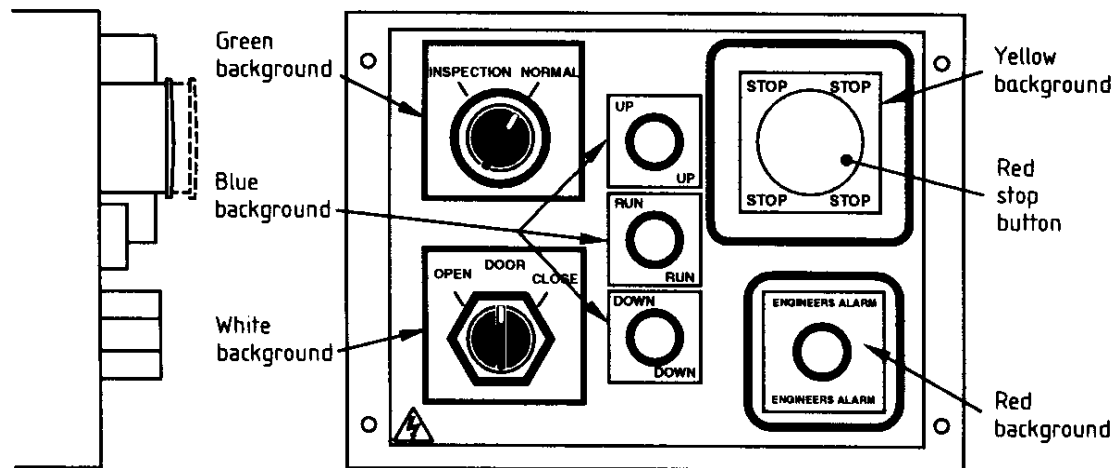
Control	Button colour	Symbol colour	Symbol reference	Symbol
UP	White	Black	IEC 60417-5022	↑
DOWN	Black	White	IEC 60417-5022	↓
RUN	Blue	White	IEC 60417-5023	↕

#### Appendix 4 Inspection control station layout to BS7255:2012

Diagram below details a layout for car top operating buttons and switches included in BS7255:2012

For full recommendations of the control functions, construction, buttons, switches, shrouds notices and covers refer to BS7255.

The mounting panel for the controls should be in the vertical plane.



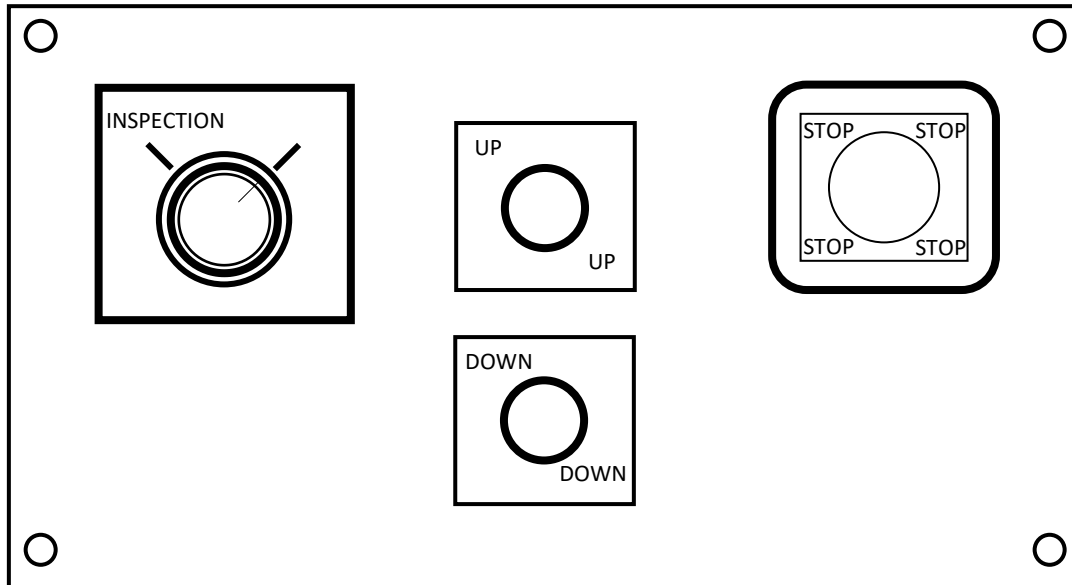
Heavy black line indicates position of shrouding around each control

Stop switch shown in stop position

Broken outline indicates run position

Red L.E.D. illuminated car top alarm button is optional

## Appendix 5 Inspection control station layout to BS EN81-1/2



This layout to Standard superseded by BS EN81-20:2014

## Appendix 6 Examples of different types of CTCS

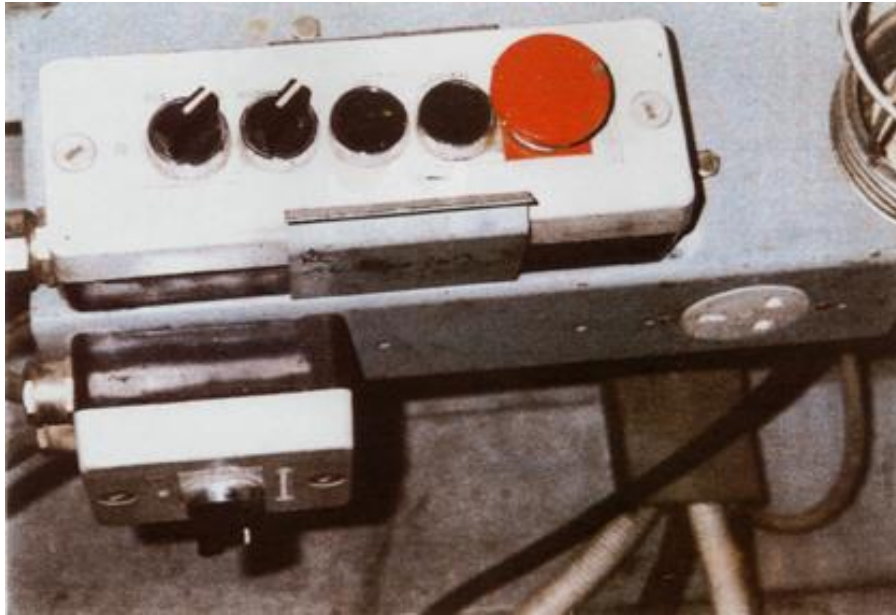


Category 1 Compliant- mounted within 1 metre of the landing threshold



Category 2 - Greater than 1 metre from the landing threshold





Category 3 – Non - Compliant Inspection/Run not shrouded. No Common/ Run button



Category 3 - Non-Compliant not shrouded and no independent Stop switch

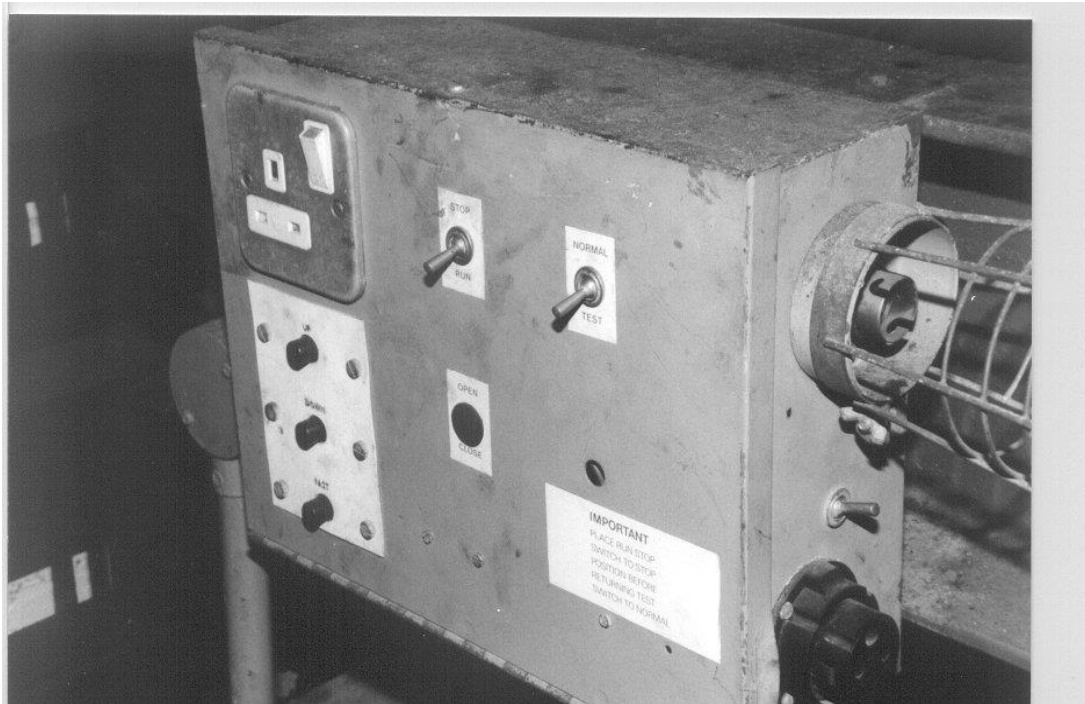




Category 3 Non-compliant - No Common/ Run button but otherwise satisfactory – Mounted within 1 metre of the landing threshold



Category 3 – Non-Compliant; Stop and Inspection/ Run switch not shrouded; Stop and Inspection switches not of correct design



Category 3 – Non - Compliant Stop, Inspection/Run Switches and Run buttons not shrouded and not of correct design



Category 3 – Non - Compliant Unshrouded Stop switch only and not of correct design