

Operation Manual (Rope type Elevator)

User Guidebook

**Please, read surely this operation
manual with attention before
elevator operation for safe use**



www.sigmaelevators.com

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1. Introduction

1.1. General

This is for right and safe elevator operation. Please, read user's manual carefully before operation.

And keep well that all persons who are related to elevator can read anytime.

If you feel to understand hard, don't heist to contact to  SIGMA Elevator Company.

For the long and safe operation, Elevators need proper maintenance and inspection. The most of customer have been complete trust in  SIGMA Elevator Company through long and stable manufacture and maintenance. Your contact to  SIGMA Elevator Company about maintenance will make us appreciated.

1.2. Symbols and Signs

We define the following symbols about important items and safety for easy comprehension.

Each symbol and sign are followings.

Specially, Please note about **warning and cautious sentence**

Symbols



This is a warning symbol. If anybody does not keep warning contents, He/she may get an accident.



This is a caution symbol. It indicates an important item on usage. If anybody does not keep a caution item, elevator shall be breakdown or damaged.

Signal



General item or relative information that to be followed.



Duty Item that to be followed.



Warning on operation.



Prohibition to limit some action

1.3. Suggestions for safety

Please, Keep surely the following instructions to use elevator for all safety.



Warning



Qualified workers only

Only qualified and skilful employee is permitted to maintenance elevator. Maintenance requires qualified and skilful employee of Maintenance Company



Prohibition on lift operation in emergency

If fire, earthquake or floods has occurred, don't use elevators. Any case as above, if you operate a lift, you may be locked up inside of car with sudden stop. If you are inside of car, please, get off at safe nearest floor.



Prohibition of escape trial from car

In case you are locked up inside of car, Don't try to escape from car.

If you open the car door or emergency exit gate when a lift stopped at between floor due to power failure or other emergency, you may be fell down to pit. You must wait inside to be rescued by Maintenance Company as communicating through inter-phone.



Prohibition of heat devices

Never use the explosive or fire items in a car and hoistway. The fire may occur. Nobody can smoke in a car and any heating device cannot be installed.



Warning



Prohibition of explosive materials

Never put the explosive materials as gasoline, oil or etc at a car and around of hall.

Specially, if you leave explosive thing in case a car inside is sealed up, explosion or fire may occur.



Dropped stuff

Be cautious not to drop any stuff between a car and a hall
When you pick it up, door closing may hurt you.

In this case, please, inform maintenance manager or Maintenance Company.



Prohibition of temporary modification

Never modify the elevator for your convenience temporarily.
Unauthorized car interior, wiring and part change and addition are all cause of breakdown or accident. And these thing can affect on elevator function and quality (If required, please contact to maintenance manager or company)



Prohibition of water cleaning

Never clean the elevator and hall with water.

Electric system is weak against water. If electric items are wet by water, it will get damaged or breakdown. And electric shock accident may occur.

If it needs water cleaning, please contact to Maintenance company to get advice.



Warning



Prohibition of wet floor

Don't drop water on the car floor.

Be cautious that water is not dropped when you get in elevator with an umbrella. If dropped, clean with dried rags immediately.



Control panel lock device

Lock the control panel in machine room. It is permitted to only maintenance workers.

If control panel is left with open, somebody shall get an electric shock.



Prohibition of cover disassembling

Do not disassemble the hall button and COP cover plate.



Prohibition of other equipment

Any kind of other equipment installation, conducting and wiring is not allowed at machine room and hoistway.

It may interrupt normal traveling



Warning



Prohibition of loading in pit

Do not use the pit for loading lot.

Because there are important devices as buffer and emergency switches, loading may interrupt their function.



Key Keeping

An operation manager must keep all keys, which are related to elevators.

If key management is insufficient, rescue action may be delayed or other breakdown will occur. So, an operation manager must keep these keys -machine room, landing door, COP, Control panel - And its keeping place must be decided to limit their use and lost.



Prohibition of improper use

Do not use elevator for improper use.

It shall be a cause of accident or breakdown.



Prohibition of fork loader car

Do not use fork loader to load freight. Elevator may be damaged or get an accident



Warning



Electric energy control

Turn off the main power when control panel is under inspection



Car top access and egress guide lie (refer to Appendix1)

Whenever you access or egress to car top, keep the guideline surely. Because you may fall down by unexpected car running, Place the car operation mode to 'INSPECTION' whenever you get on the car



Pit access and egress guide line (refer to Appendix1)

Whenever you access or egress to pit, keep the guideline surely.



Rotating wheel caution

Whenever you inspect rotating items, turn off the main power. If you are so close to rotating instrument, you may get hurt.



Landing door key control

- It should be controlled by an operation manager or maintenance worker only.
- Careless handling will make you fall down to fit.
- Check if there is a car as opening door a little whenever you open landing doors. If there is no car, close landing door again
- Whenever you open the landing door, put your weight center to backward not to fall down

Please, Keep surely the following instructions to use elevator for all safety.



Caution

Guide for safe operation

Elevator is one way of modern safe transportation, but it requires plenty of responsibilities and common sense of passengers and owners. If it operates with carefully, you may use it for a long time without breakdown.

The following explains about guide and regulation that should be kept by an operation manager or owner to operate elevator properly with safe.



Reading passenger's regulation

Read this operation manual with attention before elevator operation for safe use



Operation manager

Elevator owner must hire an operation manager who has elevator operation knowledge and experience to ensure safe operation management.



Operation manager's task

Indicate a sub operation manager or agent against a case that the operation manager is absent.

* Job Scope

- a. Making of lift management regulation and its management
- b. Recording of lift breakdown and repair
- c. Making of Emergency communication network against lift breakdown or accident
- d. Making and managing of rescue or first aid system
- e. Reporting of accident
- f. Managing of standard safe device
- g. Key keeping



Caution



Elevator Inspection

Elevator owner must follow the government rule or local regulation about periodic elevator inspection and test



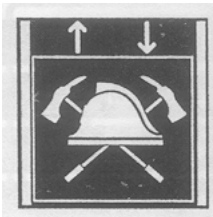
Light in top of hoistway and top floor

Hoistway and top floor require enough light.
Lighting power must be separated from main power. its switch must be installed at near of entrance.



Preparation of fire extinguisher

Install a fire extinguisher at machine room (powder type)



Use of emergency elevator

Do not use the emergency elevator for freight carrying or others. It is designed for fire fighting.
Fire fighters cannot use elevator if you use it for other aim.



Prohibition of climbing

Don't try to climb in a car by stepping handrail or wall. You may get hurt. If you need to get ceiling, use ladder.



Caution



Strange things on operation

If there is any big noise, vibration, smoke, disgusting smell, leveling error and abnormal operation, let the passenger get off to hall, and turn off main power. And inform Maintenance Company to remove abnormal condition.



Required reading of passengers guide

All passengers must note and keep the passengers guide that is noticed in a car. In case there is an operator, follow his/her instruction



Prohibition of load excess

Check the capacity of car, and be careful not to exceed load



Guardian

A person who cannot use elevator by oneself must get on together with a guardian. (Old man and children)
They can be locked up in a car because of inability.
Therefore, the guardian must get on together.



Caution



Prohibition of child alone in a car

Do not leave a child in a lift alone.

He/she may use a lift for playing or handle lift wrong



Prohibition of mischief and roughness

Don't let child do mischief in a car.

If somebody do mischief or roughness, safety system of lift may be activated. Then he/she will be locked up in a car with sudden stop.



Don't open the car door with force.

If you try to open the door with force while a lift is travelling, a lift may stop suddenly. And passengers will be locked up in a car.



Don't lean to door

Don't lean or touch the door.

If you lean or touch the door, you may fall down to floor or your hand will be hurt when the door open.

If possible, please don't stand at near of door.



Machine Room accessing

Corridor to machine room must be cleaned without hindrances.

Accessing machine room must not be interrupted in emergency condition, rescue and maintenance.



Caution



Caution of get in

Do not get in the elevator when a door is closing.
If you get in the car by force while a door is closing, you may get jammed between doors. And you may get hurt. At this time, you must press the hall button or open button in a car, and check if a door is opened



Prohibition of nuisance door operation

Don't open the door by hands or feet when a door is closing.
If you insert hands or feet when a door is closing, your hands or feet may get hurt by safety edge shoe.



Prohibition of getting caught in doors

Be careful not to get caught in doors when you get in or off the car.
If any kind of wire or cable get caught in doors, it will bring serious damage or breakdown. Please, be cautious as followings
(Dog neck wire, electric cable, long skirts, jacket with hat, long clothes, handbag, etc).



Caution of level gap

Be careful your feet when you get in or off car.
Leveling gap may happen sometimes when a car stops.
Whenever you get in or off the car, check the level gap not to fall down.



Caution



Caution of COP handling

Don't give a strong power or shock on COP and its buttons. If you give any abnormal shock, the floor button, EME Call button or other switches shall be broken. And it will be a cause of accident



Prohibition of dirty sill

Never throw away foreign substances on groove of sills. If there is any other foreign substances on the groove of sills, door operation will have problem, and it will be a cause of breakdown. Don't throw away as followings (Wastes, chewing gums, cigarette, stone, sand, pieces of concrete)



Prohibition of switch operation

Do not operate switches in COP carelessly. A lift may stop suddenly and you may be locked up in a car. Switches in COP are for only an operator and operation manager only



Caution of freight carrying

When you carry big size of freight, you must inform an operation manager for safe carrying. Freight may be dashed against a door or jam. Then, some part shall be broken. And it will bring an accident. So, an operation manager must control the freight carrying.



Caution



Caution of long size freight carrying

Don't carry the long size of freight with opening emergency exit gate.



Prohibition of sticker pasting

Only a poster that is related to safe lift operation is allowed.
The others shall be a cause of accident.



Machine room protection from snow, rain and water

Machine room that control panel is installed must be protected from snow, rain and water. Control panel shall be burnt down and some part will not operate normally if they penetrate in the top floor and top hoistway. Install the proper protecting device.

**Caution****Car light**

Elevator inside requires proper light for normal traveling.

If elevator inside is dark, there is a possibility that an accident may happen. In case a life cycle of light is finished, replace with new one.

Car light switch

In case a car light switch position is at 'OFF', the emergency light in power failure also turned off. Put the car light switch at 'ON' position in normal condition.

Caution of handcart

Be careful not to fall down or damage jamb and sill by sill level when you use a hand cart.

Fixing of freight

Put the small stuff in box with safe not to drop. If it drops on the car floor, it may interrupt a door operation or other passenger.

Caution of freight loading

Be careful not to break the glass in a car when you load freight.

Cleaning

Stop the elevator operation during cleaning for safety. And because the inside of a car is closed room, do not use washing lotion or treated oil that requires ventilation.

Action before inspection

- a. In case the lift is not at the inspection floor, do not open the landing door without safety shelter cover setting.
- b. Turn off main power or change the operation mode to 'MAINTENANCE' during maintenance.
- c. Take an action that informing maintenance or inspection for alert.

Caution in adjustment

Do not change or adjust some parts without enough comprehension.

**Caution****Use of regulation oil**

Oil that is directed by SIGMA Company must be applied. The use of other kind oil may shorten part life cycle and bring accident by interrupting normal work of safety device.

Rescue in emergency

Rescue action in emergency must be proceeded by qualified persons who have rescue training under regulation. Any action that is out of regulation may bring dangerous status.

Recording of operation



The owner or operation manager must record about main part change, repair, breakdown and accident.


2. Purpose and owner's duty

2.1. Purpose of guide book

This is for right and safe elevator operation. Please, read carefully before operation.

a. If you handle elevator wrong, it will be a cause of breakdown or accident. Please, read this user's manual before operation.

	 Caution
	<p><u>Reading of manual</u></p> <p>Please, read this manual with attention before operation for the right and safe use.</p>

 Caution
<p><u>Recording daily traveling</u></p> <p>An owner must record information like change, repair, breakdown and any accident.</p>

b. The normal operation, basic maintenance, breakdown and action under emergency are followings.

Strange things on operation

If there are any big noise, vibration, smoke, disgusting smell, wrong leveling and abnormal operation, let the passenger get off to hall, and turn off main power. And inform



 Elevator Company or other Maintenance Company to remove abnormal things.

These elevators are designed and manufactured to move passengers in building

If the load in a car over its capacity, it will be a cause of accident. Then lift will not move until load is not over its capacity with buzzer sound.

If overload buzzer rings, the last passenger must get off from car immediately. And he/she may use next service.

In case you did not keep the users guide, and it brings any kind of accident or damage, we have no in charge of responsibility. Therefore, do not use elevator for another purpose.

	 Warning
	<p><u>Prohibition of improper usage</u></p> <p>Do not use elevator for improper usage. It shall be a cause of accident or breakdown.</p>

Elevator maintenance must be proceeded by qualified company.

Only a qualified person can proceed maintenance that can ensure safe work after a danger analysis.

Any type of change or part replacement should be recorded on operation manual

If you do not keep the guide of user's manual, the accident or hazard may happen to passengers.

Only purity part, which is provided by  **SIGMA** Elevator Company, will ensure safety and function.

2.2. Duty of owner

An owner has duty that checks and manages elevators, which are properly operated. And he/she can hire an operation manager. Therefore, Making maintenance plan that makes contract to Maintenance Company is very important.

The air ventilating devices must be installed at machine room, hoistway, and car to make good condition for lift operation (General Temperature 0 ~ +40)

The user's manual must be in custody where operation manager can read anytime.

Don't leave items in the front of machine room entrance and around that interrupt room accessing.

A machine room must be always locked, and limit room accessing except qualified person.

A machine room and hall requires enough and proper lighting for normal operation.

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All space and corridors that are related to elevator cannot be used for other purpose.

The maintenance should be entrusted to qualified company for passenger's safety.

For the general maintenance, please refer to relevant item in this manual.

An emergency communication device should be available all the time.

An elevator inspection is proceeded with relevant regulation or rule

In case the lift did not operate for a long time, you must contact a skilled Maintenance Company for normal operation. Elevators need an inspection for passengers' safety.

3. Phraseology definition

Lift

As a subsidiary of building, it transports passengers and freight. It calls as elevator, escalator and wheel-chair lift.

Lift parts

Main safety items of lift

Maintenance

A checking lift operation condition and setting in good condition to protect lift breakdown through the maintenance contract that is concluded between the lift owner (Management subject) and a Maintenance Company.

Lift owner

A person / company that has a right to deal and a responsibility for a lift operation and use.

Management subject

A person / company that has a responsibility for a lift.

Inspection

- a. Final Inspection : A inspection after lift installation
- b. Periodic inspection: Before the term of inspection validity is expired, it requires more lift operation. It must be inspected at regular interval.
- c. Random inspection: A case that lift use, control system, speed, capacity or traveling distance is changed, or there is repair due to breakdown.

Inspection Institute

As an inspection institute that is designated by lift product & management regulation of local, proceeds periodic test against elevators and escalators.

Operation Manager

A person who was designated by an owner for lift management

Hand-over

Time point when installation is completed and an owner can use elevator.

Emergency

A condition or situation that a passenger needs the external help

Service start

Time point that an owner can use elevator

Repair

Replacement or repair for old or damaged part

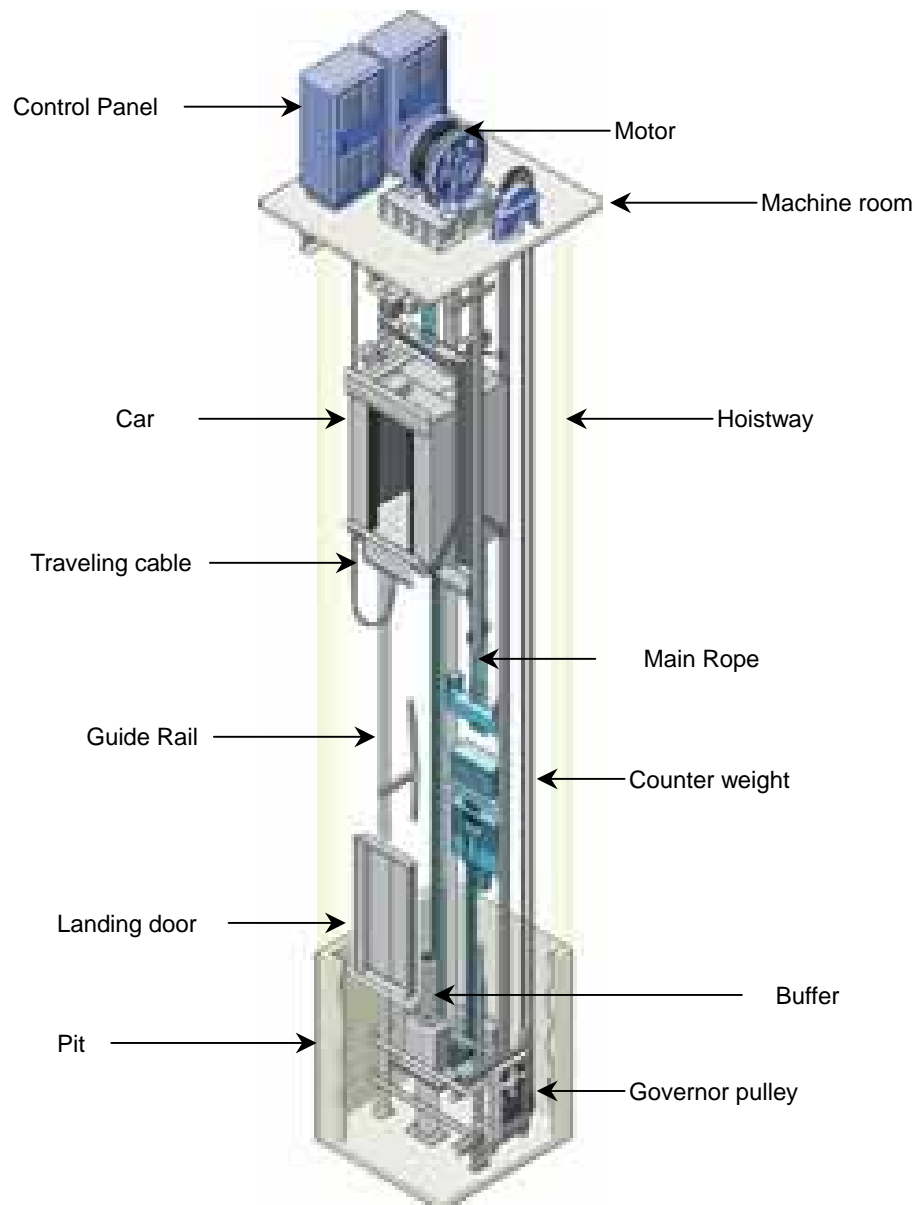
4. Guideline

The following instruction provides guide principle for normal car operation. The elevator owner must keep the safety operation regulation and inform passengers about useful operation that they can use it right way.

Note: Drawings of chapter 5 are not exactly corresponding with your lift. There were inserted to help your comprehension

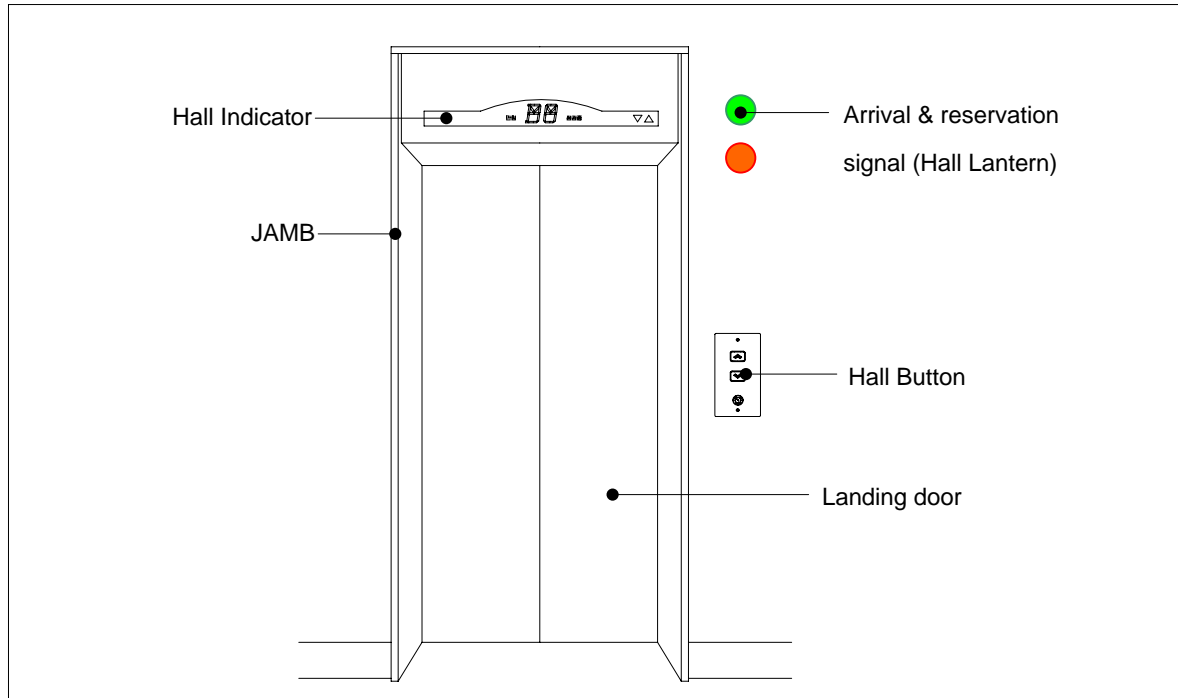
4.1 Rope type elevator structure

4.1.1 Structure and part name

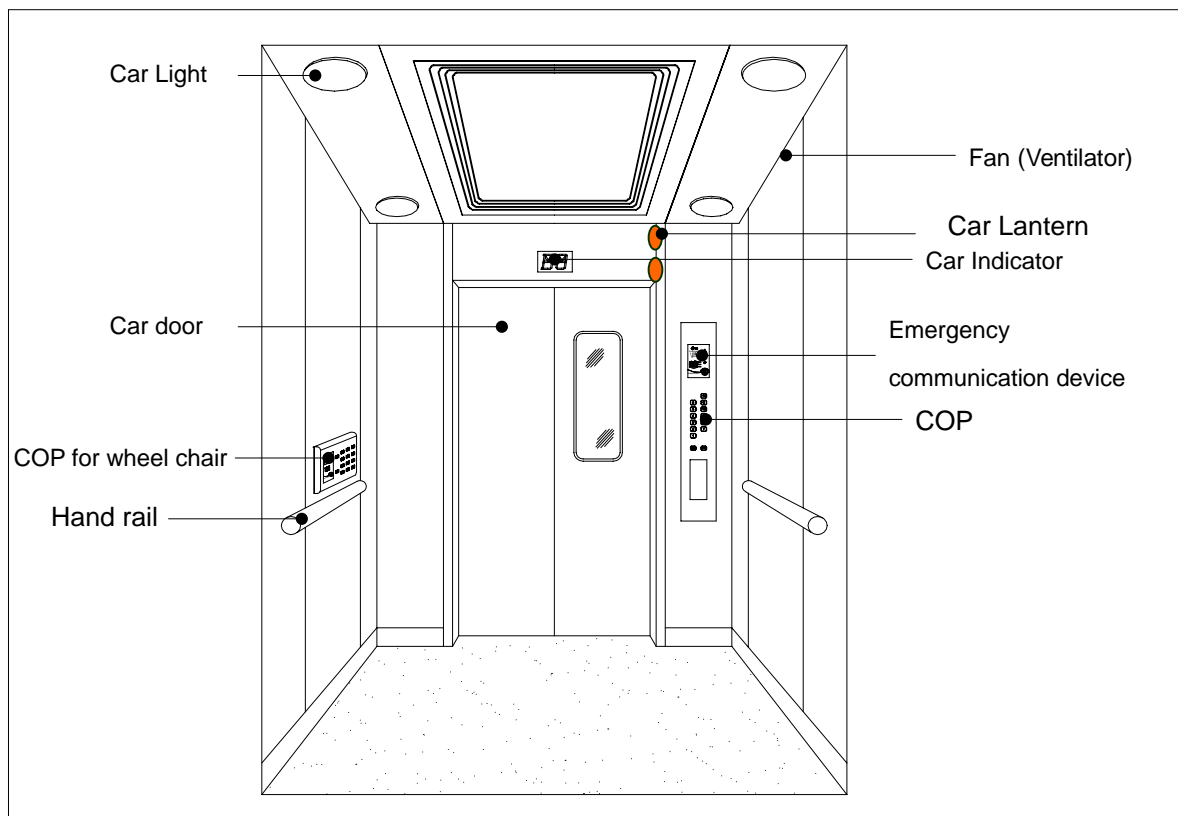


4.1.2 Hall and car inside

a. Elevator hall



b. Car inside



4.1.3 Safety devices

a. Safety Circuit

We apply various safety circuits to ensure passenger's safety. Car door must fully closed before run. If any kind of safety switch landing door lock contact or car door lock contact is opened, car will stop immediately.

b. Emergency communication device

The emergency communication button is installed at car inside. If you press the button, you can communicate with someone who is working in management room or indicated place. This device will connect to skilled operation manager, and he will help passengers rescue as soon as possible.

c. Safety edge shoe switch and Photo sensor

Elevator has contact type door reversing device. It will be opened door again, if it touches obstacles.

For the passenger's convenience, we also apply photo sensor. A door will be opened again even if it does not touch anything but detecting obstacle.

4.2 Guide for normal operation

4.2.1 Safe guideline for elevator use

Elevator is one way of modern safe transportation, but it requires plenty of responsibilities and common sense of passengers and owners. If it is operated carefully, you may use it for a long time without breakdown.

This chapter will explain about guide and regulation that should be kept by an operation manager or owner to operate elevator properly with safe.



Caution

Operation manager

Elevator owner must hire an operation manager who has elevator operation knowledge and experience to ensure safe operation management.



Caution

Operation manager's task

Indicate a sub operation manager or agent against a case that the operation manager is absent.

* Job Scope

- Making of lift management regulation and its management
- Recording of lift breakdown and repair
- Making of Emergency communication network against lift breakdown or accident
- Making and managing of rescue or first aid system
- Reporting of accident
- Managing of standard safe device
- Key keeping



Caution

Elevator Inspection

Elevator owner must follow the government rule or local regulation about periodic elevator inspection and test



Caution

Machine room accessing

Corridor to machine room must be cleaned without hindrances.
Accessing machine room must not be interrupted in emergency condition, rescue and maintenance.



Warning

Control panel lock device

Lock the control panel in machine room. It is permitted to only maintenance workers.
If control panel is left with open, somebody shall get electric shock.



Caution

Light in machine room and hall

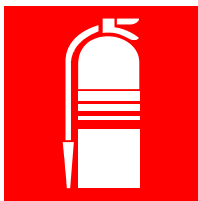
Machine room and landing hall require enough light.
Lighting power must be separated from main power, and its switch must installed at near of entrance.



Caution

Machine room protection from snow, rain and water

Machine room that control panel is installed must be protected from snow, rain and water. Control panel shall be burnt down and some part will not operate normally if they penetrate in top floor and top hoistway. Install the proper protecting device.



Caution

Preparation of fire extinguisher

Install a fire extinguisher at machine room (powder type)



Warning

Prohibition of other equipment



Any kind of other equipment installation, conducting and wiring is not allowed at machine room and hoistway.
It may interrupt normal traveling



Warning

Prohibition of loading in pit



Do not use the pit for loading lot.
Because there are important devices as buffers and emergency switches, loading may interrupt their function.



	 Warning
	<p><u>Key Keeping</u></p> <p>An operation manager must keep all keys that are related to elevators. If key management is insufficient, rescue action may be delayed or other breakdown will occur. So, an operation manager must keep these keys -machine room, landing door, COP, control panel - And its keeping place must be decided to limit their use and lost.</p>



The usage of each elevator and capacity is indicated on wall of elevator

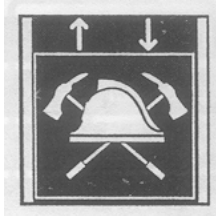
It is dangerous that using elevator for other purpose.

Be cautious that the loads in elevator exceed its designed/indicated capacity

	 Warning
	<p><u>Prohibition of improper use</u></p> <p>Do not use elevator for improper use. It shall be a cause of accident or breakdown.</p>

	 Caution
	<p><u>Prohibition of load exceeding</u></p> <p>Check the capacity of car, and be careful not to exceed load</p>

	 Warning
	<p><u>Prohibition of temporary modification</u></p> <p>Never modify the elevator for your convenience temporarily. Unauthorized car interior, wiring and part change and addition are all cause of breakdown or accident. And these thing can affect on elevator function and quality (If required, please contact to maintenance manager or company)</p>



Caution

Use of emergency elevator

Do not use the emergency elevator for freight carrying or others. It is designed for fire fighting. Fire fighters cannot use elevator if you use it for other aim.



Caution

Prohibition of climbing

Don't try to climb in a car by stepping handrail or wall. You may get hurt. If you need to get ceiling, use ladder.



Warning

Prohibition of water cleaning

Never clean the elevator and hall with water. Electric system is weak against water. If electric items are wet by water, it will get damaged or breakdown. And electric shock accident may occur. If it needs water cleaning, please contact to Maintenance company to get advice



Warning

Prohibition of wet floor

Don't drop water on car floor. When you get in elevator with umbrella, be caution not to drop water. If dropped, clean with dried rags immediately.



Caution

Strange things on operation

If there is any big noise, vibration, smoke, disgusting smell, leveling error and abnormal operation, let the passenger get off to hall, and turn off main power. And inform Maintenance company to remove abnormal condition.



Caution

Car light

Elevator inside requires proper light for normal traveling.
If elevator inside is dark, there is possibility that an accident may happen. In case life cycle of light is finished, replace with new one.



Warning

Prohibition of fork loader car

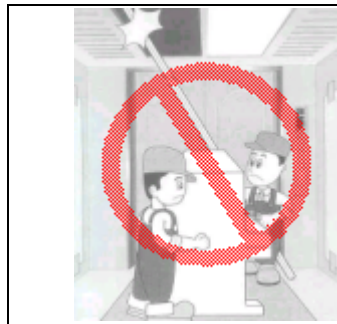
Do not use fork loader to load freight. Elevator may be damaged or get an accident



Caution

Caution of freight carrying

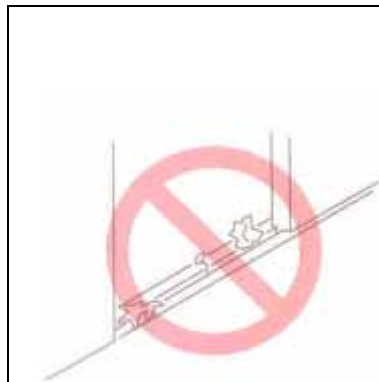
When you carry big size of freight, you must inform an operation manager for safe carrying.
Freight may be dashed against a door or jam. Then, some part shall be broken. And it will bring an accident. So, an operation manager must control the freight carrying.



Caution

Caution of long size freight carrying

Don't carry the long size of freight with opening emergency exit gate.



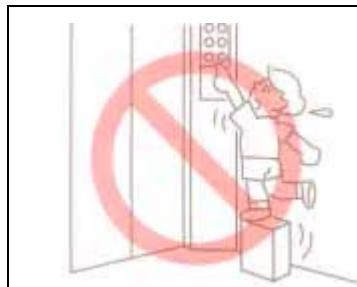
Caution

Prohibition of dirty sill

Never throw away foreign substances on groove of sills.

If there is any other foreign substance on the groove of sills, a door operation will have problem, and it will be a cause of breakdown. Don't throw away as followings

(Wastes, chewing gums, cigarette, stone, sand, piece of concrete)



Caution

Prohibition of child alone in a car

Do not leave a child in a lift alone.

He/she may use a lift for playing or handle lift wrong.



Warning

Dropped stuff

Be cautious not to drop any stuff between a car and a hall. When you pick it up, door closing may hurt you. In this case, please, inform maintenance manager or Maintenance Company.



Warning

Prohibition of explosive materials

Never put the explosive materials as gasoline or oil or etc at a car and around of hall.
Specially, if you leave explosive thing because a car inside is sealed up, explosion or fire may occur.



Warning

Prohibition of heat devices

Never use the explosive or fire items in a car and hoistway.
The fire may occur. Nobody can smoke in a car and any heating device cannot be installed.



Caution

Prohibition of sticker pasting

Only a poster that is related to safe lift operation is allowed.
The others shall be a cause of accident.



Caution

Fixing of freight

Put the small stuff in box with safe not to drop. If it drops on th car floor, it may interrupt door operation or other passenger.

Caution of freight loading

Be careful not to break the glass in a car when you load freight.

Caution of handcart




Be careful not to fall down or damage jamb and sill by sill level when you use a hand cart.

4.2.2 General guideline for normal operation

This chapter will explain about guide and etiquette that passengers must keep in the elevator for safe operation. And elevator owner or operation manager must inform the below guide to passengers to keep them.

In case of fire, earthquake or flood, don't use elevators.

Any case as above, if you operate a lift, you may be sealed up inside of a car with sudden stop.

	<div data-bbox="917 786 991 853"></div> <div data-bbox="1021 799 1153 840">Warning</div> <div data-bbox="678 875 1209 913"><u>Prohibition on lift operation in emergency</u></div> <div data-bbox="703 929 1394 1099"> <p>If fire, earthquake or floods has occurred, don't use elevators.</p> <p>Any case as above, if you operate a lift, you may be locked up inside of car with sudden stop. If you are inside of car, please, get off at safe nearest floor</p> </div>
	<div data-bbox="917 1220 991 1288"></div> <div data-bbox="1027 1234 1150 1270">Caution</div> <div data-bbox="678 1299 919 1335"><u>Reading of manual</u></div> <div data-bbox="707 1366 1315 1435"> <p>Please, read this manual with attention before operation for the right and safe use.</p> </div>
	<div data-bbox="917 1639 991 1706"></div> <div data-bbox="1027 1653 1150 1688">Caution</div> <div data-bbox="678 1718 1011 1751"><u>Prohibition of load excess</u></div> <div data-bbox="707 1785 1335 1852"> <p>Check the capacity of car, and be careful not to exceed load</p> </div>



Caution

Caution of freight carrying

When you carry big size of freight, you must inform an operation manager for safe carrying. Freight may be dashed against a door or jam. Then, some part shall be broken, and bring an accident. So, an operation manager must control this case in a car during freight carrying.



Caution

Caution of COP handling

Don't give a strong power or shock on COP and its buttons. If you give any abnormal shock, the floor button, EME Call button or other switches shall be broken. And it will be a cause of accident



Warning

Prohibition of cover disassembling

Do not disassemble the hall button and COP cover plate.



Caution

Prohibition of mischief and roughness

Don't let child do mischief in a car. If somebody do mischief or roughness, safety system of lift may be activated. Then he/she will be locked up in a car with sudden stop.



Caution

Don't open the car door with force.

If you try to open the door with force while a lift is travelling, lift may stop suddenly. And passengers will be locked up in a car.



Caution

Don't lean to door

Don't lean or touch the door.
If you lean or touch the door, you may fall down to floor or your hand will be hurt when the door open.
If possible, please don't stand at near of door.



Warning

Prohibition of escape trial from car





In case you are locked up inside of car, Don't try to escape from car.
If you open the car door or emergency exit gate when a lift stopped at between floor due to power failure or other emergency, you may be fell down to pit. You must wait inside to be rescued by Maintenance Company as communicating through inter-phone.



Warning

Prohibition of heat devices

Never use the explosive or fire items in a car and hoistway.
The fire may occur. Nobody can smoke in a car and any heating device cannot be installed.

	<div data-bbox="914 369 991 434" data-label="Image"> </div> <div data-bbox="1019 385 1155 423" data-label="Section-Header"> <h2>Warning</h2> </div> <div data-bbox="673 443 1107 483" data-label="Section-Header"> <h3><u>Prohibition of explosive materials</u></h3> </div> <div data-bbox="703 510 1399 651" data-label="Text"> <p>Never put the explosive materials as gasoline, oil or etc at a car and around of hall. Specially, if you leave explosive thing in case a car inside is sealed up, explosion or fire may occur.</p> </div>
	<div data-bbox="914 808 991 875" data-label="Image"> </div> <div data-bbox="1023 824 1153 862" data-label="Section-Header"> <h2>Caution</h2> </div> <div data-bbox="673 887 801 925" data-label="Section-Header"> <h3><u>Guardian</u></h3> </div> <div data-bbox="703 954 1393 1128" data-label="Text"> <p>A person who cannot use elevator by oneself must get on together with a guardian. (Old man and children) They can be locked up in a car because of inability. Therefore, the guardian must get on together.</p> </div>
	<div data-bbox="914 1267 991 1332" data-label="Image"> </div> <div data-bbox="1019 1283 1155 1321" data-label="Section-Header"> <h2>Warning</h2> </div> <div data-bbox="673 1344 1062 1384" data-label="Section-Header"> <h3><u>Prohibition of improper usage</u></h3> </div> <div data-bbox="703 1411 1302 1482" data-label="Text"> <p>Do not use elevator for improper usage. It shall be a cause of accident or breakdown.</p> </div>
	<div data-bbox="914 1644 991 1711" data-label="Image"> </div> <div data-bbox="1023 1659 1153 1697" data-label="Section-Header"> <h2>Caution</h2> </div> <div data-bbox="673 1722 967 1760" data-label="Section-Header"> <h3><u>Prohibition of dirty sill</u></h3> </div> <div data-bbox="703 1789 1425 2063" data-label="Text"> <p>Never throw away foreign substances on groove of sills. If there is any other foreign substances on the groove of sills, a door operation will have a problem, and it will be a cause of breakdown. Don't throw away as followings (Wastes, chewing gums, cigarette, stone, sand, pieces of concrete).</p> </div>



Caution

Prohibition of nuisance door operation

Don't open the door by hands or feet when a door is closing.
If you insert hands or feet when a door is closing, your hands or feet may be hurt by safety edge shoe.



Caution

Caution of get in

Do not get in the elevator when a door is closing.
If you get in the car by force while a door is closing, you may get jammed between doors. And you may be hurt. At this time, you must press the hall button or open button in a car, and check if a door is opened



Caution

Prohibition of getting caught in doors



Be careful not to get caught in doors when you get in or off the car.
If any kind of wire or cable get caught in doors, it will bring serious damage or breakdown. Please, be cautious as followings
(Dog neck wire, electric cable, long skirts, jacket with hat, long clothes, handbag, etc).



Caution

Caution of level gap

Be careful your feet when you get in or off car.
Leveling gap may happen sometimes when a car stops. Whenever you get in or off the car, check the level gap not to fall down

	 Warning
	<p><u>Prohibition of wet floor</u></p> <p>Don't drop water on the car floor. Be cautious that water is not dropped when you get in the elevator with an umbrella. If dropped, clean with dried rags immediately.</p>

4.2.3 Machine room lock device

Accessing of machine room must be restricted to enter. Only qualified persons can enter the room to protect wrong usage. For rescue under emergency situation and maintenance, operation manager or certified person must control machine room keys.

All corridors to machine room and CP should be safe and all kinds of changes or dangerous things must be informed Maintenance Company.

4.2.4 Safe getting in and getting off

Car stop level may be high or low according to car load and operation control.

Passengers and freights must be careful not to fall down by sill level. In case a handcart roller is too small, it may be jammed between sills. So, do not use this kind of handcart.

Be careful that not to drop foreign substances and be caught in high hill or stick between sills.

When you carry some freight, consider that load does not balanced at an edge and it must be fixed not to shake. Check and compare the real load and capacity of elevator. Operating with heavy load is danger.

Never use the fork loader to carry freight.

4.2.5 Free accessing hall

All halls must be cleaned that passengers can use elevator freely without danger. Remove all obstacles and hindrances.

4.2.6 Action for observation car

In case of observation elevator that is installed in building, it has no full concrete wall. So, it needs protection wall against falling stuff, and protection fens that person cannot close to protection wall within 2 m. This is for passenger's safe from fire or similar hazard.

4.3 Elevator operation

4.3.1 General

Elevator is designed to use easy by simple handling.

Elevator handling can be proceeded in a car and halls.



Each floor where car stop has hall button for service registration that is called as hall call

.

The lamp lighting of hall button informs passengers that a hall call is registered.

As an optional device, some lift has no function that displaying current position and running direction.

The hearing or seeing signal can be applied to inform car arrival. Sometimes, we can apply key switch at special floor for other service purpose.



The car services call buttons, which are for passenger's destinations are configured on COP (Car Operation Panel Board).

The lamp lighting of car call button informs passengers that a car service call is registered.

The hearing or seeing signal can be applied to inform car arrival. Sometimes, we can apply key switch at special floor for other service purpose

There are other switches except car call button that has other function on COP (Sometimes, we call it as OPB)

The emergency call button, Door open/close button is configured as standard SPEC.

4.3.2 Operations

a. Auto operation(High speed operation)

Elevator services automatically with a high speed against a hall call and car call without an operator.

Doors also operated automatically when elevator stops at each floor.

b. Attendant operation

An operation mode that operator controls elevator inside of elevator in case a hall is crowded with passengers.

The travel direction can be changed or passed the hall call registration by operator.

The door is opened automatically as an auto operation.

But, to make door close, it requires pressing 'Start' button in COP until car door is fully closed. If pressing button is released during door close, door will be opened again.

c. Independent operation

As an operation mode for the special person who controls elevator independently, It cancels all hall calls but car calls. (It is used at hospital generally to move urgent patient). When it stops at floor, door is opened automatically. But to make door close, it requires pressing 'CLOSE' button on COP until car door is fully closed. If pressing button is released during door close, door will be opened again.

d. Emergency operation (Fire Operation)- optional function

If the key switch or smoke detector is activated under fire that is installed at designated floor, all call of car & hall will be cancelled. And elevator will go to designated floor. After that, it will open door and stay.

If the phase 1(Fire fighting) switch is handled by firefighter, fire operation is available. At this time, only car call is acceptable. If he presses the floor button, door will close. But if he releases the close button before full of door close, the door will open again. When the door close fully, the car will go to selected floor, and stay with door closing. As he presses the open button, car door will start to open, but he releases the open button before door full open, door will close again.

e. Parking operation

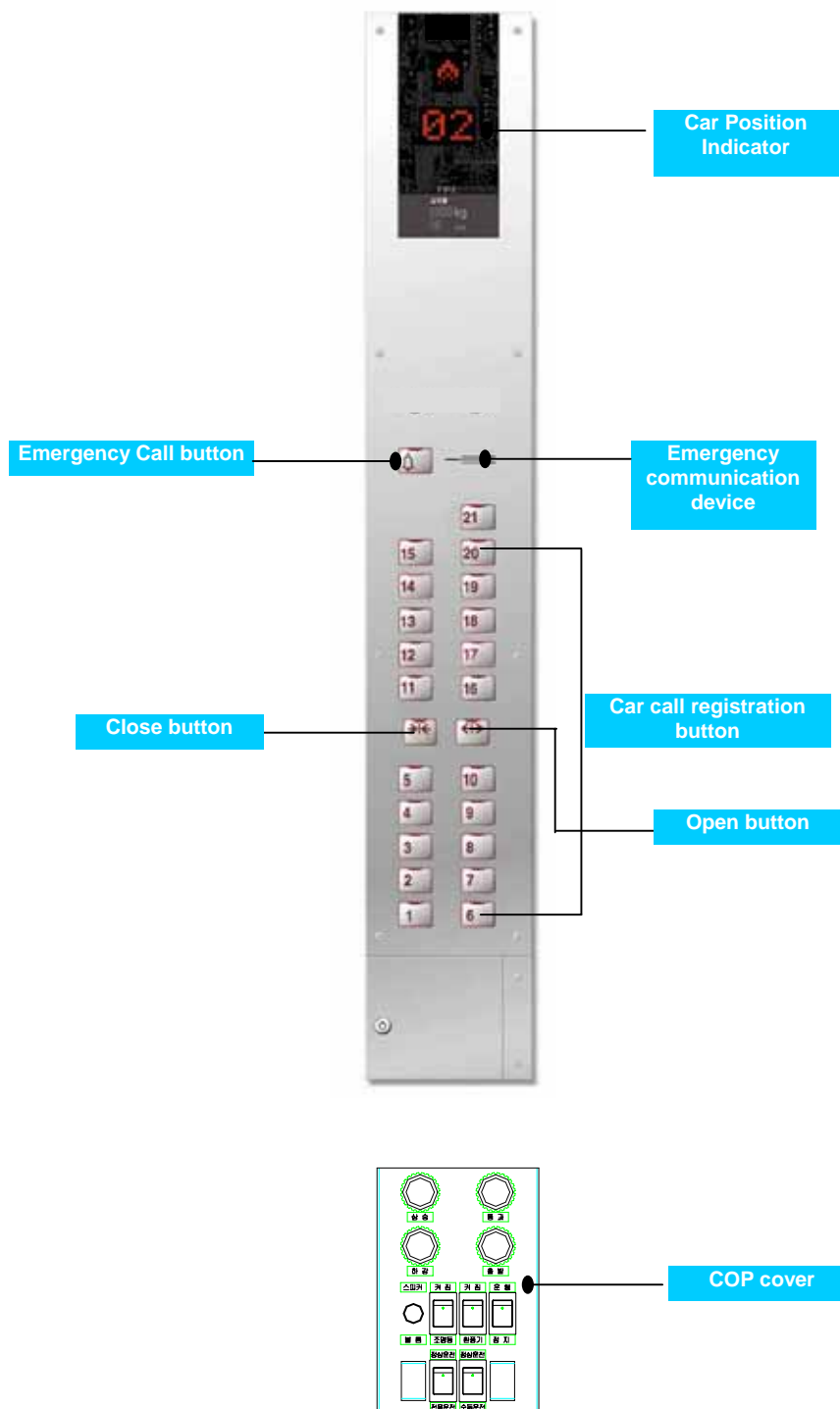
This is a function that elevator goes to rest mode to stop service for a time.

If any parking switch of hall or in managing room is turned on, elevator will go to designated floor, and open doors to get off passengers. After a few seconds, lighting will turn off. And elevator will close doors to stop service.

4.3.3 COP

a. Configuration of COP

Shape of COP is followings. (The out-appearance of COP may different according to option SPEC)



b. COP Button and switches

a) Emergency call button



Button that can communicate to guard room or management room

If you press this button, you can communicate a person who is in machine room or management room.

(If you hear beeping sound, release the button)



b) Floor button (Destination floor)

If one of them is pressed, lamp will light. As soon as elevator arrives at destination, lamp will turn off. Then, door will start open.



c) Door open button

Door will not close during this button is pressed. Even door is closed or closing, if it is pressed, door will open again.

(It will not work while elevator is traevling)





d) Door close button

Door will close if it is pressed.

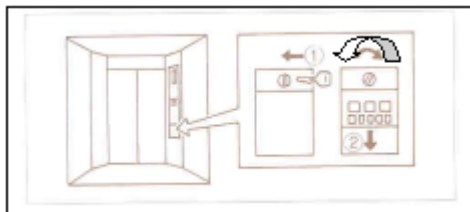
(It will not work while elevator is traveling).

c. COP switch box and cover

If the switches in COP, COP cover and hall buttons are handled immoderately, you may get in dangerous situation by accident. Specially, only operation manager, operator or qualified maintenance person must handle switches in COP.

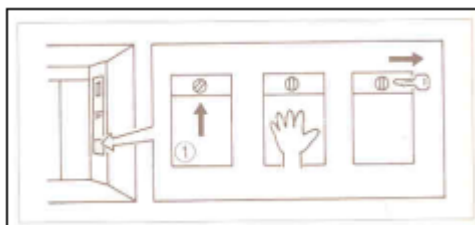
	 Caution
	<p><u>Prohibition of switch operation</u></p> <p>Do not operate switches in COP carelessly. Lift may stop suddenly and you may be strapped in a car. The switches in COP are for operator and operation manager only</p>

a) Opening of COP switch box



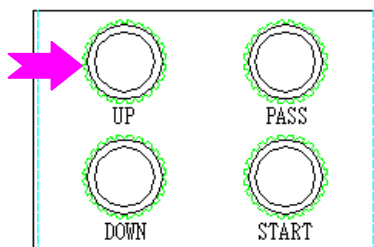
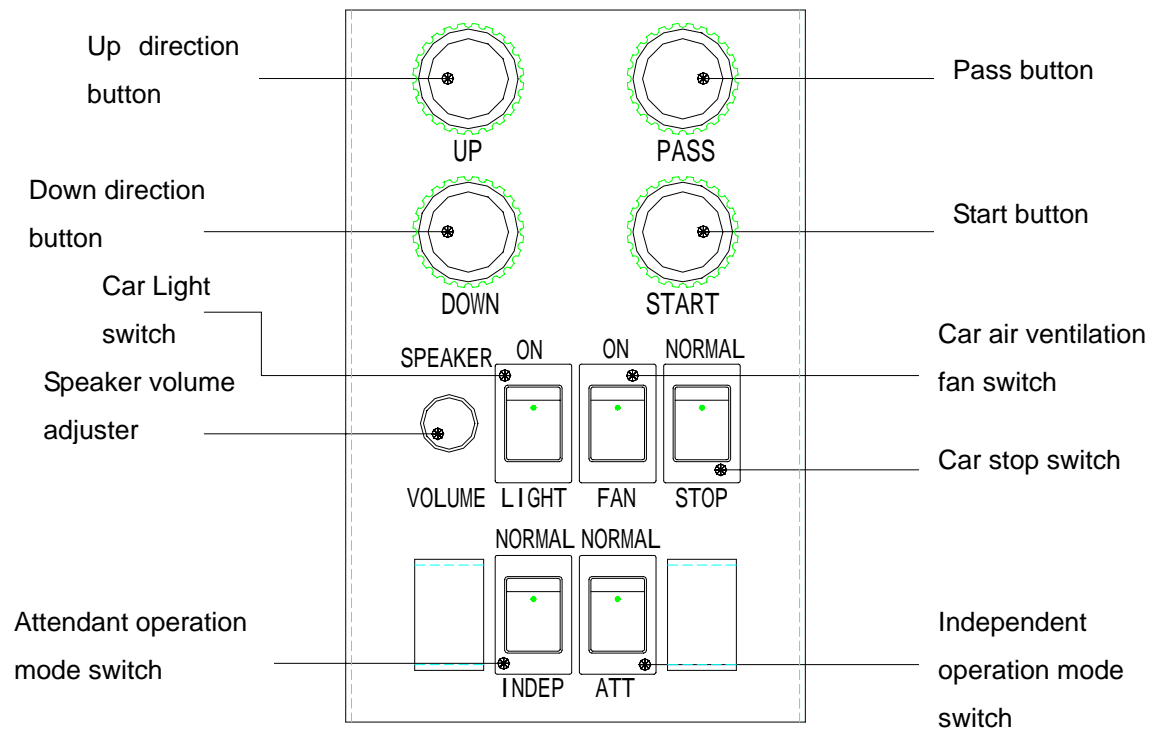
- (a) Insert key into hole of COP
- (b) Turn it to clockwise and open the cover.

b) Locking of COP switch box



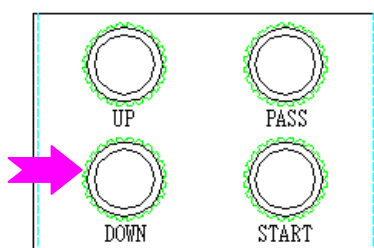
- (a) Close the COP cover
- (b) Turn the key to counter clockwise
- (c) Remove the key

c) Switches in COP box



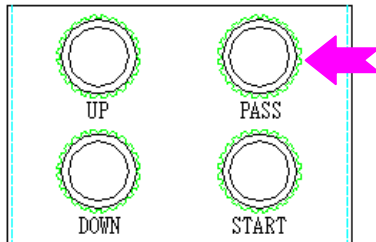
(a) Up button

Operates elevator to up direction under independent or attendant operation mode. In case this button is pressed, downward elevator changes car direction to upward



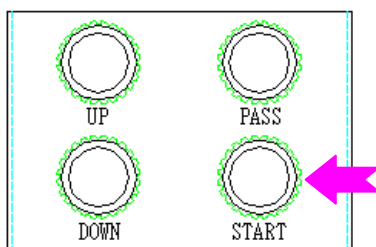
(b) Down button

Operates elevator to down direction under independent or attendant operation mode. In case this button is pressed, upward elevator changes car direction to downward



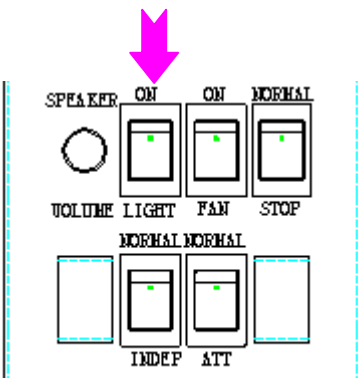
(c) Pass button

In case this button is pressed under attendant operation mode, all hall calls are cancelled, and a car goes to destination floor by car call.



(d) Start button

If the operator in a car pushes and holds this button, a car door starts to close under attendant operation mode.



(e) Car light switch

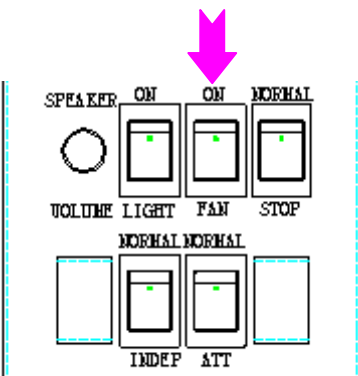
Switch that turn off or on the light in a car
If this switch is 'ON' position, car light will turn on.



Caution

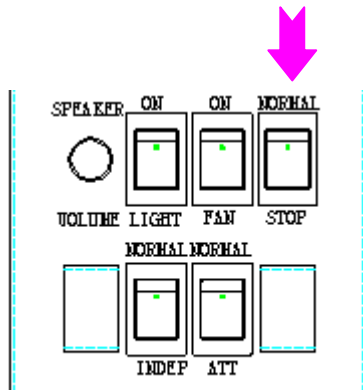
If you turn off the light key switch, the emergency light is also malfunction.

Please, put 'ON' position in normal times



(f) Fan switch

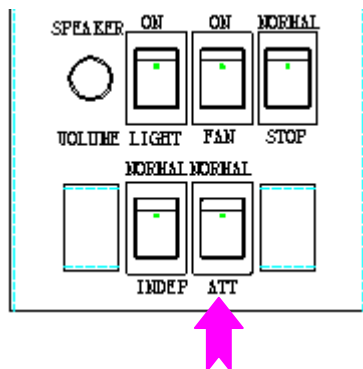
Switch that turn off or on the fan on car
If this switch is 'ON' position, fan will turn on.



(g) Emergency Stop switch

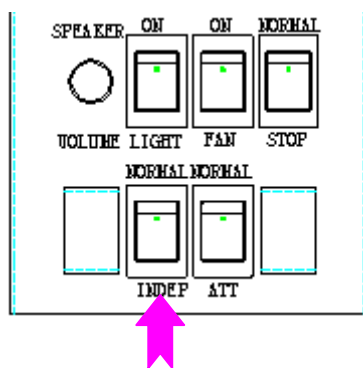
Under breakdown or maintenance work condition, if it is pulled up at any position, car will stop immediately.

For its normal operation, put the switch to 'Normal' position.



(h) Attendant operation mode switch

An operation mode that operator controls elevator inside of elevator in case hall is crowded with passengers. To enable this mode, turn on the 'ATT' switch

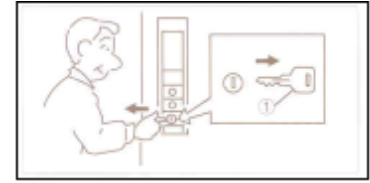
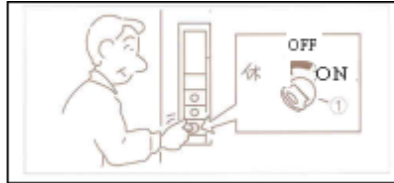


(i) Independent operation mode switch

An operation mode that the special person who controls elevator independently. To enable this mode, turn on the 'INDEP' switch

4.3.4 Canceling of parking for normal operation

a. In case parking switch is installed at hall



(a) Insert key into key switch . (b) Turn key to 「OFF」 position (c) Remove key .

b. In case parking switch is not installed at hall

Bring elevator where it to be parked, and follow as table.



Caution

Operation manager or maintenance worker only

Handling sequence	Checking point
Pull up the EM-STOP switch	Elevator stop
Turn on the Fan switch.	Fan on
Turn on the light switch	Light on
Get off from car	Check if door is closed.
Try to give hall call	Non- registration check, Door stays close condition

4.3.5 Simple Inspection list

When you complete above preparation, please, check following points.

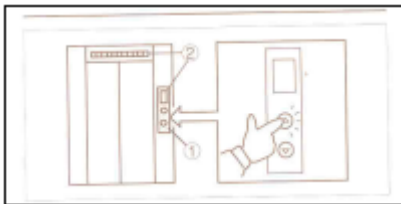
Item	Check point	Action to be taken in case of bad condition
COP	Broken or dirty buttons	Clean the part
	Buttons working condition	
	Indicator and lamp condition	If there is any damage, out of function
	Cleaning condition of car floor and wall	on part, inform Maintenance company.
Hall & Hall Button	Broken or dirty buttons & switches	Clean the part and hall.
	Buttons working condition	
	Indicator and lamp condition	If there is any damage, out of function
	Hall cleaning condition at each floor?	on part, inform Maintenance company.
Door	Door closing and opening condition	Clean the groove of car & landing sill at each floor.
	Safety shoe working condition	
	(when it is activated, door must reopen)	If there is any strange matter, inform Maintenance company
Car traveling	Abnormal operation and sudden deceleration	Clean the groove of car & landing sill at each floor.
	Abnormal noise and vibration	If there is any strange matter, inform
	Big level gap when car stop	Maintenance company.

4.3.6 Operation Mode

a. Auto operation (Normal operation)

a) Hall call

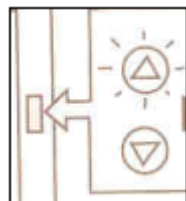
Indicators that inform car position and direction are installed at top of button or door at each floor as .



Hall button assembly has 2 buttons, one of top is for upward service, the another is for downward service.

The top floor has only one button for downward. And bottom floor has also one button for upward.

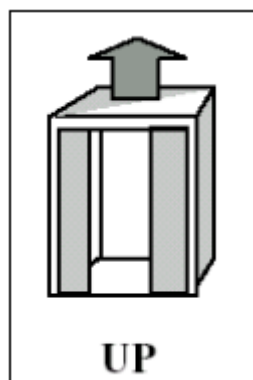
Press the button where you are going to go, then lamp of button will turned on. Wait car for service



b) In case of upward hall call registration.

If there is no service registration, car will serve directly as soon as you make a call service.

If upward hall call is registrated and elevator is running from low to high floor, car will go and stop where hall call is registrated to respond against upward hall call for service.



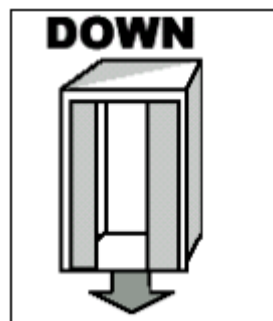
Else if upward hall call is registrated but elevator is running from high to low, car will serve downward service call first, After completion of downward service, car will go and stop where hall call is registrated to respond against upward hall call for service

If there is car call where passengers are waiting, a car will go and stop. Then passengers can get on the car. But elevator is serving for downward, a car will not respond against upward call, As soon as car arrives to bottom floor, all car call will be cancelled, this is to protect nuisance call.

Car will change traveling direction and go to serve from the nearest floor of bottom after downward service.

As car will serve against upward hall call and car call in sequence.

c) In case of downward hall call registration



If downward hall call is registered and elevator is running from high to low floor, car will go and stop where hall call is registered to respond against downward hall call for service.

Else if downward hall call is registered but elevator is running from low to high, car will serve upward service call first, After completion of upward service, car will go and stop where hall call is registered to respond against downward hall call for service.

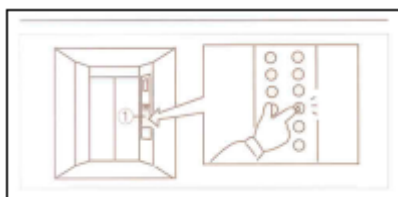
If there is a car call where passengers are waiting, a car will go and stop. Then passengers can get on the car. But elevator is serving for upward, car will not respond against downward call, As soon as car arrives to top floor, all car call will be cancelled.

Car will change traveling direction and go to serve from the nearest floor of top after upward service.

As car will serve against downward hall call and car call in sequence.

d) Car call on COP

Floor buttons are configured on COP.



Passenger can press buttons where they want to go. If pressing time is delayed or lated, traveling direction can be changed.

After registration car will close door for service.

When car is on the upward service, car will serve to car calls and hall calls of high floor. As car will serve against upward calls in sequence.

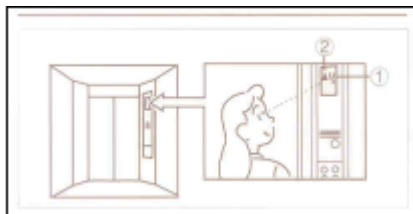
When car is on the downward service, car will serve to car calls and hall calls of low floor.

As car will serve against downward calls in sequence.

Car indicator displays the current position of car and traveling direction.

In case of full load, car will ignore the hall call by system control until passengers get off.

This is not breakdown. Because even a car responses to hall call, passengers cannot get on the car. This is normal situation for better quick service.

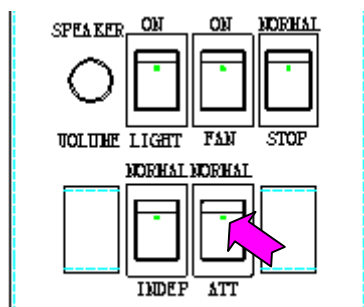


As car start to run, look at the display on indicator. Current car position will be displayed on indicator.

When elevator goes to destination. Door will open automatically. Then, get off the car with care when door open fully.

b. Attendant operation

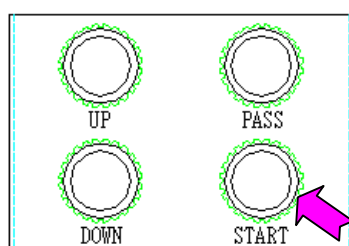
a) Operation mode change from Auto to ATT



Toggle the 'NORMAL/ATT' switch to 'ATT'. Then, door will open automatically, and car will stay at the floor with door open. If hall call or car call have registered at upper floor, the service direction is set to upward. Else if they have registered lower floor, the service direction is set to downward.

But if there is no call, car stays at current floor without direction display.

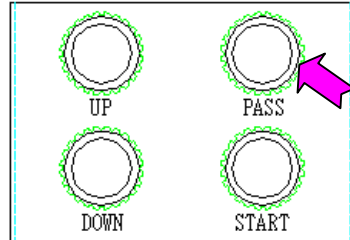
b) Door close and car service



When all passengers get in, register the destination floors. And press and hold the 'START' button until doors are closed fully.

If you release the 'START' button during door close, door will open again. When car just moves to service floor, you may take away your finger from the button.

c) In case hall call service cancellation is required due to full passengers.

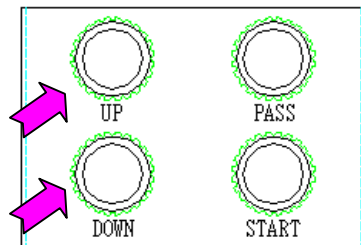


If you press 'PASS' button one time, all hall calls are ignored until next car service. And hall indicators will display 'FULL' signal.

At this time, hall button lamps that were registered would not turn off.

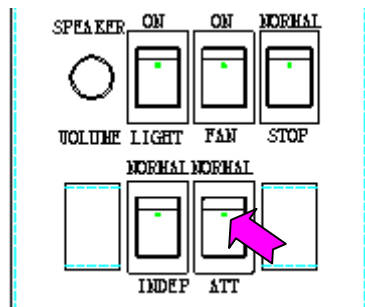
After one of car call services is finished, hall calls are available again as the call registration. So, if you want to pass hall calls, press 'PASS' button again.

d) Operation direction change



If you want to change the operation direction of car, press the 'UP' or 'DOWN' button when car stops at floor. At this time you must also change the car call floor.

e) Finishing of attendant operation

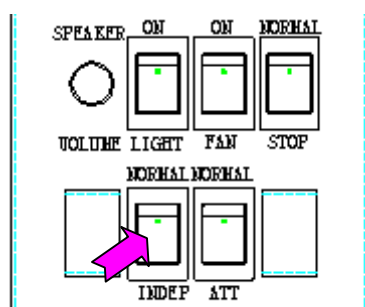


Toggle the 'NORMAL/ATT' switch to 'NORMAL'.

If you do not change the switch, car will not service for hall or car call service automatically.

d. Independent operation

a) Change of operation mode from Auto to 'INDEP'.



Toggle the 'NORMAL/INDEP' switch to 'INDEP'.

Then, door will open automatically, and car will stay at the floor with door open. And all hall calls are erased.

If car call have registered upper floor, the service direction is set to upward. Else if it has registered lower floor, the service direction is set to downward. And if there are both direction calls, it maintains current service direction.

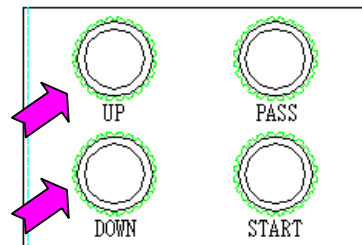
b) Door close and car service



When all passengers get in, register the destination floors. And press and hold the 'CLOSE' button until doors are closed fully.

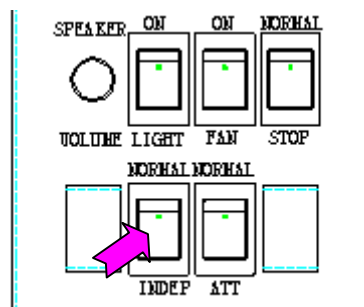
If you release the 'CLOSE' button during door close, door will open again. When car just moves to service floor, you may take away your finger from the button.

c) Operation direction change



If you want to change the operation direction of car, press the 'UP' or 'DOWN' button when car stops at floor. At this time you must also change the car call floor.

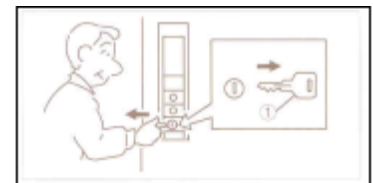
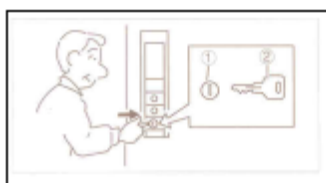
d) Finishing of attendant operation



Toggle the 'NORMAL/INDEP' switch to 'NORMAL.'

If you do not change the switch, car will not service for hall or car call service automatically.


e) Parking to stop normal operation



(a). Insert key into key switch . (b). Turn key to 「ON」 position (c). Remove key .

4.4 Guide for rescue

4.4.1 General

We,  **SIGMA** Elevator Company, will stand by everyday and time for non-respectable breakdown.

Please, check followings before informing Maintenance Company.

1. Are passengers locked up in a car?
2. All switches on COP are 'NORMAL' position?
3. Is there any jammed or broken button?
4. Is the car and landing door operation normal? And were cleaned enough?
5. Are the safety edge shoe and the photo sensor normal?
6. Does the main power of system turn on?
7. Do passengers exceed in a car? (Overload)

Person who proceeds rescue must be skilled and qualified to rescue properly.
They must have an ability to rescue by special elevator training

Anybody cannot proceed rescue without proper training or insufficient rescue sequence.
And Skilled and qualified person also must keep the rescue sequence.

If you hope that a person who is indicated by owner is going to rescue, please contact to Maintenance Company.

Person who proceeds rescue must give stabilization to passengers.
And he must explain about the current rescue process through emergency communication device that passengers can be stable.

4.4.2 Use of emergency door key

The landing door key can open the landing doors of each floor in emergency.

Only operation manager must control this key.

Check that where the elevator positioned. You can open the hall door about 1/3 only to check car position. After checking of car position, If there is a car, you can open fully but there is no car, close door again. Even though car stops due to breakdown, light in a car will not turned off. And in case of power failure (blackout), the emergency lamp will be turned on.

Don't leave the key at hall, as soon as open door, you must remove key from landing door.



Warning

Landing door key control

- It should be controlled by an operation manager or maintenance worker only.
- Carelessness handling will make you fall down to fit.
- Check if there is car as opening door a little whenever you open landing doors. If there is no car, close landing door again
- Whenever you open the landing door, put your weight center to backward not to fall down

4.4.3 Manual rescue in case of emergency

Passengers may be trapped in elevator if elevator stops at the middle of floors because of system error or power failure. This breakdown does not happen practically.

Only skilled person can rescue passengers through control panel and motor brake. So, we strongly recommend you to call Maintenance Company first, even you can rescue by yourself.



Caution

Caution on emergency escape

The manual rescue in emergency must proceed by person who is disciplined about emergency escape under indicated regulation. Non-disciplined person is not allowed to proceed rescue because it is very dangerous!



Caution

If it requires passenger rescue, inform Maintenance Company immediately without hesitates. Do not operate car until the skilled worker of Maintenance Company finishes checking and repair.

Restrict the use of emergency key that can be managed by qualified person or skilled maintenance worker

Passenger rescue sequence**Caution**

1. Close and lock the all doors surely
2. Inform passengers not to open forcibly the door during rescue work through emergency communication device (Inter-phone). And clean the halls because rescue work must be not interrupted.
3. Open the control panel door. And Turn off the main power.
4. Check that where is the car stopped.
5. Use Brake open lever to open brake
6. Open the motor brake about 2~3 seconds, then car and counter weight will move.
7. Check the direction of car
8. Try to open brake that car moves about 30cm a trial. Never open the brake too long time and distance.
9. Move the car until elevator arrives to level zone of nearest floor.
10. When elevator stops at level zone, buzzer will ring.
11. Lock the machine room and go down to rescue floor.
12. Use emergency door key to open door, and rescue passengers.
13. Check if the landing door is surely closed and locked after rescue.

4.5 Inspection and maintenance


4.5.1 Periodic test

About the periodic test, follow the local regulation.

This test must not bring any excess abrasion or stresses that make life cycle of elevator shorten. Specially, the emergency stop devices and buffers correspond to this case. They must be tested under slow speed operation with no load.

The inspector who proceeds periodic test must check the real function. Then, he makes a report for owner in most case.

4.5.2 Periodic inspection

Maintenance Company usually does the following inspection for safe elevator operation. Because the maintenance work is danger, an operation manager or owner does not usually do the following inspections. Please, make a maintenance contract to  **SIGMA** Elevator Company or other Maintenance Elevator Company in local according to local elevator regulation and law to proceed periodic inspection.



Warning

Qualified workers only

Only qualified and skilful employee is permitted to maintenance elevator. Maintenance requires qualified and skilful employee of Maintenance Company

a. Top floor

No.	Inspection part & item	Check point	Inspection term (time/month)	Action to be taken
1-1	Top floor entrance and hall	<ul style="list-style-type: none"> Hindrance on hall at top floor Proper lighting system 	1/1	<ul style="list-style-type: none"> Remove hindrance. Install proper light.
1-2	Temperature and ventilation	<ul style="list-style-type: none"> Ventilation system. Temperature at hall must maintain 0~40 	1/1	<ul style="list-style-type: none"> Check the hall ventilation. Maintain hall temperature 0~40 by air-conditioner or heater.

b. Machine room

No.	Inspection part & item		Check point	Inspection term (time/month)	Action to be taken
2-1	Control panel and Power receiving panel		<ul style="list-style-type: none"> Good fixed condition. Heat & vibration Stable operation condition Damage or abrasion of circuit breaker 	1/1	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company immediately.
2-2	Light, ventilation and cleaning in machine room		<ul style="list-style-type: none"> Other devices that is not relate to lift Heat & vibration Stable operation condition Lighting and air-ventilation. Temperature in machine room Invade of rail through window and ceiling. 	1/1	<ul style="list-style-type: none"> Remove other device If any strange condition is founded, inform Maintenance Company immediately. Provide proper light and air Maintain 0 ~40 Safe water proofing and finish
2-3	Manual handle device and brake lever		<ul style="list-style-type: none"> Arrangements of manual handle device and brake lever. 	1/1	<ul style="list-style-type: none"> Keep them at their origin position
2-4	Motor	Sheave	<ul style="list-style-type: none"> Rotating condition. Slip 	1/6	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company immediately.
		Deceleration Gear	<ul style="list-style-type: none"> Lack of lubrication oil. Its feature change Abrasion or crack of gear. Thrust condition. 	1/3	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company.
		bearing	<ul style="list-style-type: none"> Excessive heat. Strange noise 	1/6	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company immediately.

No.	Inspection part & item		Check point	Inspection term (time/month)	Action to be taken
		Motor	<ul style="list-style-type: none"> Excessive heat. Strange noise 	1/1	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company immediately.
		Brake	<ul style="list-style-type: none"> Oil on the lining and its braking control condition. Adjusted condition according to standard. Abrasion of brake drum. Abrasion of lining (over 2mm thickness) 	1/1	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company.
2-5	Governor	Car and CWT side	<ul style="list-style-type: none"> Vibration & noise Catching work condition Normal working of bearing(1/6	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company immediately.
2-6	Counter action for hoistway against earthquake		<ul style="list-style-type: none"> Damage or extension on rope guard of CWT and Car. Logical application of belt and traveling cable protection. Break away of main belt. Break away from main rail. Supposed breakdown and malfunction must not effect on operation 	1/12	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company.

c. Car inside

No.	Inspection part & item		Check point	Inspection term (time/month)	Action to be taken
3-1	Car wall. Ceiling, floor		<ul style="list-style-type: none"> Serious shape change, abrasion, rust, and corrosion. Flammable finishing materials. 	1/3	<ul style="list-style-type: none"> Be cautious the shape change, abrasion, rust, and corrosion. Apply non- flammable finishing materials.
3-2	Car door and sill		<ul style="list-style-type: none"> Serious shape change, abrasion, rust, and corrosion. Level gap (Car sill height to landing sill): 40mm. Open & close condition of door Noise due to door shoe abrasion. Break away of door 	1/1	<ul style="list-style-type: none"> Be cautious the shape change, abrasion, rust, and corrosion. If any strange condition is founded, inform Maintenance Company immediately.
3-4	Car door switch		<ul style="list-style-type: none"> Sticky switch operation. Working position and function. 	1/1	<ul style="list-style-type: none"> If any strange condition is founded, stop the elevator operation and inform Maintenance Company immediately.
3-5	Door close Safety device		<ul style="list-style-type: none"> Rapid reversed open condition. Stable reversed open condition. 	1/1	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company immediately.
3-6	Car indicator and COP		<ul style="list-style-type: none"> Damage of push buttons and switches. Clear identification of switch. Display device condition. Lock device. 	1/1	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company immediately.

No.	Inspection part & item	Check point	Inspection term (time/month)	Action to be taken
3-7	Communication device to outside	<ul style="list-style-type: none"> Function and sensitivity of alarm system and communication device <p>Inter-phone must be installed at external guard room or management room or Maintenance Company to communicate to car inside. (Duplicated installation) This is important for rescue operation.</p> <p>In case communication system is connected to only guard room, buzzer or alarm light must be installed at designated floor that somebody can make sense when a passenger in a car pushes the alarm button..</p> <p>The communication time must valid through maintenance at least 45 minutes during power failure.</p>	1/1	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company immediately.
3-8	Stop switch	<ul style="list-style-type: none"> Switch working condition. 	1/1	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company immediately.
3-9	Use, Load, Capacity board.	<ul style="list-style-type: none"> The following items must be displayed where anybody can see easily. <p>Manufacturer Capacity(Load) Speed Passenger guide board Telephone Number in Emergency Maintenance Company</p>	1/2	<ul style="list-style-type: none"> Do not remove these displays and stickers. If they were damaged, inform Maintenance Company.
3-10	Emergence Light	<ul style="list-style-type: none"> Lighting condition under power failure. Lux on floor : over 1Lux 	1/1	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company immediately
3-11	Car sill to hoistway wall distance	<ul style="list-style-type: none"> Standard: less than 125mm. Fixed fascia plate condition 	1/12	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company immediately

d. Car top

No.	Inspection part & item	Check point	Inspection term (time/month)	Action to be taken
4-1	Emergency exit switch	<ul style="list-style-type: none"> Close and open condition of EME Exit Switch working condition(If it is opened, a lift must stop). Damages of EME Exit cover. 	1/1	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company.
4-2	Door operator	<ul style="list-style-type: none"> Serous noise on door operation Abrasion and abnormal extension Manual door open condition during power failure 	1/1	<ul style="list-style-type: none"> Clean the car and landing doorsills. But in case noise is not disappeared, inform Maintenance Company. If any strange condition is founded, inform Maintenance Company..
4-3	Lock device	<ul style="list-style-type: none"> Serious abrasion condition of open device. 	1/1	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company.

No.	Inspection part & item	Check point	Inspection term (time/month)	Action to be taken
		<ul style="list-style-type: none"> ● Lock and release condition. 		
4-4	Stop switch	<ul style="list-style-type: none"> ● Switch working condition. ● Checking car stop by switch working. 	1/1	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company.
4-5	Car top Pulley	<ul style="list-style-type: none"> ● Good rotating condition. ● Noise. ● Belt Slip. 	1/6	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company.
4-6	Safety catch switch	<ul style="list-style-type: none"> ● Serious rust, foreign substances and corrosion. ● Checking car stop by switch working. 	1/3	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company.
4-7	Main rope and Governor rope	<ul style="list-style-type: none"> ● Rope replacement standard ● State of wear and broken strand ● Breaks are uniformly distributed: 4 or less broken wires in 1 strand in 1 lay are allowed b. Rope severely rusted, or the cross- sectional area of the broken wire is less than 70% of the initial cross- sectional area of the wire: 2 or less broken wires in 1 strand in 1 lay are allowed c. Breaks are unequally distributed, or concentrated on a particular strand: 12 or less broken wires per 1 lay for a 6- strand rope, 16 or less for an 8 strand rope are allowed 	1/6	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company.
4-8	Guide shoe(roller)	<ul style="list-style-type: none"> ● Serious abrasion on roller. ● Interruption on traveling. 	1/3	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company.
4-9	Main rope	<ul style="list-style-type: none"> ● Same rope tension ● Damage and foreign substances ● The condition above 4-6 is required 	1/6	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company.
4-10	Load detector	<ul style="list-style-type: none"> ● Setting and adjustment condition 	1/1	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company.
4-11	Guide rail & Bracket	<ul style="list-style-type: none"> ● Serious rust and corrosion on rail ● Fixed condition by bolt and welding. 	1/12	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company.
4-12	Counter weight	<ul style="list-style-type: none"> ● Serious rust and corrosion on bolt of CWT. ● Pulley condition ● Interruption on traveling. 	1/12	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company.
4-13	CWT pulley	<ul style="list-style-type: none"> ● Good rotating condition. 	1/6	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company.
4-14	Top floor final limit switch	<ul style="list-style-type: none"> ● Switch contact condition. ● Normal working condition ● Rust on contact point. 	1/3	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company.

No.	Inspection part & item	Check point	Inspection term (time/month)	Action to be taken
4-15	Landing sill	<ul style="list-style-type: none"> ● Serious shape change, abrasion, rust, and corrosion. ● Door open & close condition ● Abrasion of door shoe and its break- away. 	1/1	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company. ■ Clean the car and landing doorsills. But in case noise is not disappeared, inform Maintenance Company.
4-16	Door inter lock	<ul style="list-style-type: none"> ● Checking car start in case unlocked condition. ● Serious shape change, abrasion, rust, and corrosion on inter lock. 	1/1	<ul style="list-style-type: none"> ■ If any strange condition is founded, stop the elevator operation and inform Maintenance Company immediately.
4-17	Door closer	<ul style="list-style-type: none"> ● Close function test ● Serious shape change, abrasion, rust, and corrosion. 	1/3	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company.
4-18	Traveling cable	<ul style="list-style-type: none"> ● Damage of traveling cable and interruption with other device in hoistway. ● Damage of end part and bending part. 	1/6	<ul style="list-style-type: none"> ■ If any strange condition is founded, stop the elevator operation and inform Maintenance Company immediately.
4-19	Hoistway wall	<ul style="list-style-type: none"> ● Break or water leakage on hoistway wall. ● Foreign device or equipment. (Exception : speaker, smoke detector) 	1/12	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company.
4-20	Counter action for hoistway against earthquake	<ul style="list-style-type: none"> ● Damage or extension on rope guard of CWT and Car. ● Logical application of belt and traveling cable protection. ● Break away of main belt. ● Break away from main rail. ● Supposed breakdown and malfunction must not effect on operation 	1/12	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company.

■ Landing hall

No.	Inspection part & item	Check point	Inspection term (time/month)	Action to be taken
5-1	Hall button & Indicator	<ul style="list-style-type: none"> ■ Damage of push buttons and switches. ■ Clear identification of switch and display device ● Malfunction of buttons 	1/1	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company immediately.
5-2	Emergency key	<ul style="list-style-type: none"> ● Good condition of open and lock. 	1/3	<ul style="list-style-type: none"> ■ If any strange condition is founded, inform Maintenance Company


■ Pit

No.	Inspection part & item	Check point	Inspection term (time/month)	Action to be taken
6-1	Buffer	<ul style="list-style-type: none"> ● Serious rust on buffer body. ■ Enough oil filling in oil buffer. ● Fixed condition. ● Damage of spring buffer. 	1/3	■ If any strange condition is founded, inform Maintenance Company
6-2	Governor pulley	<ul style="list-style-type: none"> ■ Noise and vibration on elevator operation. ● Rope and pulley gap. ● Break away possibility of rope. 	1/6	■ If any strange condition is founded, inform Maintenance Company
6-3	Pit floor	<ul style="list-style-type: none"> ● Cleaned condition. ● Waterproofing condition. 	1/1	■ If any strange condition is founded, inform Maintenance Company
6-4	Bottom floor final limit switch	<ul style="list-style-type: none"> ■ Switch contact condition. ■ Normal working condition ● Rust on contact point. 	1/3	■ If any strange condition is founded, inform Maintenance Company.
6-5	Emergency stop switch	<ul style="list-style-type: none"> ■ Serious rust, corrosion and foreign substances. ● Normal working condition. 	1/3	■ If any strange condition is founded, inform Maintenance Company
6-6	Compensation rope/chain	<ul style="list-style-type: none"> ● Rope/Chain tension. 	1/6	■ If any strange condition is founded, inform Maintenance Company
6-7	Run-by (Buffer distance)	<ul style="list-style-type: none"> ● Refer to table 1. ● In case of spring type the distance must longer than final limit switch activating position. 	1/6	■ If any strange condition is founded, inform Maintenance Company
6-8	Traveling cable	<ul style="list-style-type: none"> ■ Damage of traveling cable and interruption with other device in hoistway. ● Damage of end part and bending part. 	1/6	■ If any strange condition is founded, stop the elevator operation and inform Maintenance Company immediately.
6-9	Load detector	<ul style="list-style-type: none"> ● Fixed condition and proper working. 	1/1	■ If any strange condition is founded, inform Maintenance Company
6-10	Counter action for pit against earthquake	<ul style="list-style-type: none"> ● Fixed condition of buffer, governor pulley. ● Break way possibility of Governor rope. 	1/12	■ If any strange condition is founded, inform Maintenance Company

■ Emergency elevator

No.	Inspection part & item	Check point	Inspection term (time/month)	Action to be taken
7-1	Car Recall switch	<ul style="list-style-type: none"> ● Exact recall operation. 	1/12	■ If any strange condition is founded, inform Maintenance Company
7-2	Fire operation	<ul style="list-style-type: none"> ● Normal operation sequence according to regulation 	1/12	■ If any strange condition is founded, inform Maintenance Company
7-3	Emergency light and guide	<ul style="list-style-type: none"> ● Clear identification. 	1/12	■ If any strange condition is founded, inform Maintenance Company

No.	Inspection part & item	Check point	Inspection term (time/month)	Action to be taken
7-4	Stand-by power (generator)	<ul style="list-style-type: none"> Exact generator operation 	1/12	<ul style="list-style-type: none"> If any strange condition is founded, inform Maintenance Company

- Above checking items can be changed due to addition of option part, new part development or maintenance skill improvement.
- The inspection and maintenance for the auto announcement device and ESMI are omitted because they have no relation to normal elevator operation.
-  **SIGMA** Elevator Company has not a responsibility or assurance such as CCTV, Card key system, and other foreign items that are applied by owner's requirement.

[Table 1]

Speed(m/min)		Minimum distance(mm)	Maximum distance (mm)	
			Car side	CWT side
Spring buffer	90m/min	150	600	900
Oil buffer	90m/min	N/A		

4.5.3 Inspection and counter action

Improper action and careless inspection against elevator that is under unstable condition will bring accident.

The elevator operation manager must check elevator through patrol checking before auto operation.





If any strange phenomenon is occurred during patrol checking, be proper counter action as following table. But in case the problem is not solved, inform Maintenance Company immediately.

[Patrol Checking]

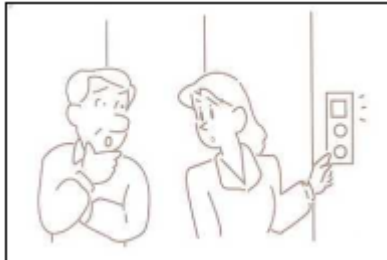
Item	Check point	Action to take
Passengers	Wrong using by passengers Nuisance calling by emergency unit Child alone in a car	Instruct right using way. Instruct that not to get in alone.
Car Inside	Car light Pasting condition of warning and use regulation? Cleaning condition of floor and wall of car	If car light is not turned on or broken, inform Maintenance Company Clean the wall and car floor.
Hall	Cigarette butt in hall Material or stuff that is easily burn	Pick them up and clean hall. Remove them.
Machine room	Improper items, explosive liquid Cleaning condition of wall and floor Temperature in machine room : Less than 40 Strange noise and smell Tools and their setting position Hindrances or obstacles in front of entrance (Including CP)	Remove the improper items in machine room Clean machine room periodically. Stop elevators, and inform Maintenance Company. Clean the obstacles and hindrances.

4.5.4 When it is considered a breakdown.

Some of strange matter can be solved by simple action. Please take counter action as followings before informing Maintenance Company. In case it does not solved, contact to Maintenance Company immediately.

Strange phenomenon	Action to be take
<p>Burning smell, noise and vibration during traveling.</p> 	<p>Stop elevator, and inform Maintenance Company.</p> 
<p>Car call does not work by car call button when car stays at floor normally.</p> 	<p>Check if the operation mode is auto operation Change 'ATT' and 'INDEP' mode to 'NORMAL'. Stop elevator, and inform Maintenance Company</p> 

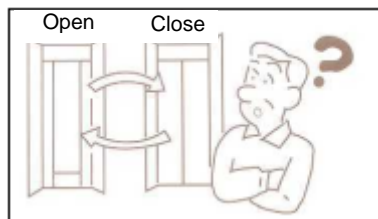
Car arrives service floor, but door does not open.



Do not allow to use elevator for passengers, and inform Maintenance Company.



Door repeats open and close operation

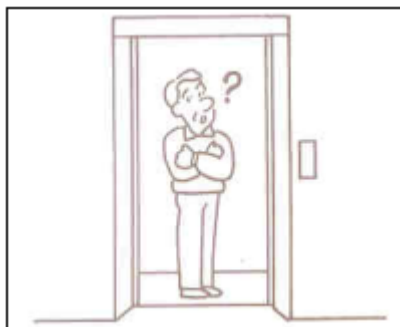


Door cannot be closed by foreign substances in groove of sill. Clean the foreign substances.

If this problem is not solved, Inform Maintenance Company



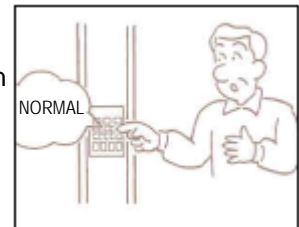
Door cannot be closed.



Check if DCO switch in COP is turned on. Set the switch to 'NORMAL'.

Check if the door open button is jammed. And press it 2~3 times.

Check if the hall button is jammed. And press it 2~3 times.



Check if the safety edge shoe is lodged by foreign substances. (In case of photo sensor, check that the hole is taped) Clean the entrance

Door is closed but elevator does not run.



Open the door again to check foreign substance in groove of car & landing sill. Clean the groove of sills.



5. Cleaning

5.1 Car interior surface

The elevator interior including doors and jambs are designed to maintain their origin status until elevator life cycle is finished. So, owner and operation manager must keep following items.

- Clean the interior surface in regular as following method.
- Specially, protect weak part and surface if elevator is used for carrying freight or similar proposes.

We recommend you to keep the following cleaning method


- **Glass:** Exclusive use of cleanser and smooth cloth or rag.
- **Stainless steel:** Exclusive use of cleanser for stainless steel and smooth cloth or rag.
 - Clean with moving to grain of stainless
 - In case of others, do not use detergent power, cream or wire brush.
- **Brass surface:** Use soap water with smooth cloth or rag first, and clean with dried rag.
 - Do not use detergent powder, cream.
- **Skin plate surface:** Use soap water with smooth cloth or rag.
 - Do not use any detergent power, cream or spray on OPB button.
- **Painted surface:** Use soap water with smooth cloth or rag.
 - Do not use any detergent powder or cream on OPB button.
- **Silicon finishing:** Use soap water with smooth cloth or rag.

5.2 Landing doors and jambs

Landing doors and jambs must be cleaned by above recommended method. And if it is required, they must be protected from damages.

5.3 Car & landing doorsills

Car and landing doorsills must be cleaned periodically.
After brushing, use vacuum clean machine.

The following safety contents are for maintenance worker of SIGMA Elevator Company. So, this part must be utilized for the operation manager's reference and comprehension about safety rule of  **SIGMA** Elevator Company.

In any case, do not try to access pit and car top. If you have any situation that you have to access pit or car top, request help of Maintenance Company.

1. Car top access / Egress

1.1. Scope

The following is a guideline for safely accessing and egressing car top. These guidelines include a safe method for capturing the car, taking and verifying control prior to accessing the car top and maintaining control until safe egress has been achieved.

1.2. Note

Prior to carrying out car top access procedures ensure that the elevator is in proper working order.

Special attention **MUST** be paid to ensure that the machine brake is correctly adjusted to specification and is verified as being good worker order.

If you do not follow this guideline, car will not run with slow speed operation due to TOCI lock error detection.

1.3. Car top access guidelines (one employee)

A recommended safe means of accessing to car top is:

- a. Turn on the light in hoistway if switch is located outside the hoistway.
- b. Call the car to which access is required.
- c. Register two car calls to lower floors.
- d. As the car begins to descend, stop the car in position for access to car top by opening the landing door with door unlocking device (landing door key). At this time, do not open fully for your safety. Open door about 10cm~20cm.
- e. Check if car top accessing is easy.
- f. Wait 10 seconds with opening door fully. And ensure that the car has not moved.
- g. Place the Emergency stop switch on car top to the 'STOP' position.
- h. Allow the door to close and lock. And register a hall call.
- i. Wait again 10 seconds at hall.
- j. Ensure that the car has not moved.
- k. Place the inspection switch on car top to 'INSPECTION' position.

- l. Place the Emergency stop switch on car top to the 'RUN' position.
- m. Allow the door to close and lock. And register a hall call.
- n. Wait again 10 seconds at hall.
- o. Ensure that the car has not moved.
- p. Open the landing door. And place the Emergency stop switch on car top to the 'STOP' position.
- q. Open and fix the landing door with door blocking device. And turn on the car top light.
- r. Remove the door-blocking device. And access to car top.
- s. Close landing door.
- t. Place the emergency stop switch on car top to the 'RUN' position.
- u. Test up operation as pressing UP/Common buttons.
- v. Test up operation as pressing DOWN/Common buttons.
- w. Operate car with slow speed to destination floor.
- x. Place the Emergency stop switch on car top to the 'STOP' position during work.

1.4. Car top Egress guidelines (one employee)

- a. Return the car to the initial access level on inspection mode
- b. Place the emergency stop switch on car top to "STOP" position.
- c. Fully open the landing door and install the door-blocking device.
- d. Turn on power for the car door
- e. Place the top of car inspection switch to the "OFF" position
- f. Turn off the light on car top
- g. Place the top emergency stop switch on car top to the "RUN" position.
- h. Remove the door-blocking device and close the landing door.
- i. Register a hall call and check that the car is operating normally.

* If it is not possible to egress at the same landing as the initial access level then the landing door lock must be independently verified prior to egress from the car top through other floor.

**Caution**

1. Special attention must be paid in ensuring that the machine brake is correctly adjusted to specifications and verified to be in good working condition.
2. Car must always be operated in inspection mode when mechanic is working on the car top.
3. If there is a fall hazard possibility on the car top, fall protection system must be used.
4. In case of common hoistway, it must be always protected and guarded from all moving equipment.
5. Proper attire would be essential so as to prevent getting entangled with other hoistway equipment during movement on car top.
6. Car top must always be clean and free from any obstacles.
7. If possible, the mechanic must position himself in the center of the car top when operating the car on inspection mode.
8. Do not store any materials on the car top.
9. Always notify fellow personnel whenever car is required to be moved (Both way communication)

2. Pit Access & Egress Procedure

2.1. Scope

The following is a guideline for safely securing the car, taking and verifying control prior to access the car top and maintaining control until safe egress has been achieved.

2.2. Pit access guide lines

- a. Verify that there is no passenger in the car by inter-phone and place a safety barricade at Main Lobby entrance to notify the public.
- b. Register two car calls - one call to the floor directly above and another at a higher floor.
- c. Open the landing door (80mm) before the car levels at the floor directly above to verify the door interlock functions and the car has stopped.
- d. Wait 10 seconds to verify the car has not moved.
- e. Fully open the landing door and install the door-blocking device.
- f. Place the top (1st) pit emergency stop switch to the "STOP" position and turn on the light switch.

- g. Close the landing door, register a hall call and wait 10 seconds.
- h. Re-open the door partially (80mm) and verify that the car has not moved.
- i. Fully open the landing door and install the door-blocking device.
- j. Place the bottom (2nd) pit emergency stop switch to the “STOP” position
- k. Exit the pit area and place the top (1st) pit emergency stop switch to the “RUN” position.
- l. Close the landing door, register a hall call and wait 10 seconds.
- m. Open the landing door hoistway (80mm) and verify that the car has not moved.
- n. Fully open the landing door and install the door-blocking device.
- o. Place the top (1st) pit emergency stop switch to the “STOP” position
- p. Relocate and reinstall door-blocking device [Type “B”] at the center of both door panels after access into the pit.
- r. Install the other door-blocking device at the edge of landing door [Type “A”] (Left side if the door-blocking device at the center is installed on the right landing door and vice versa.)
- t. Start work in the lift pit

2.3. Pit egress guidelines

- a. Fully open the landing door and install the door-blocking device.
- b. Bottom (2nd) pit emergency stop switch is turned to the “RUN” position.
- c. Return pit light switch to “OFF” position.
- d. Exit the pit area and place the 1st pit emergency stop switch to the “RUN” position, while at the lift landing entrance.
- e. Remove the door-blocking device and close the landing door.
- f. Check the car operation, prior to public usage.

(The numbers marked with are not required if there is no bottom (2nd) pit emergency stop switch)

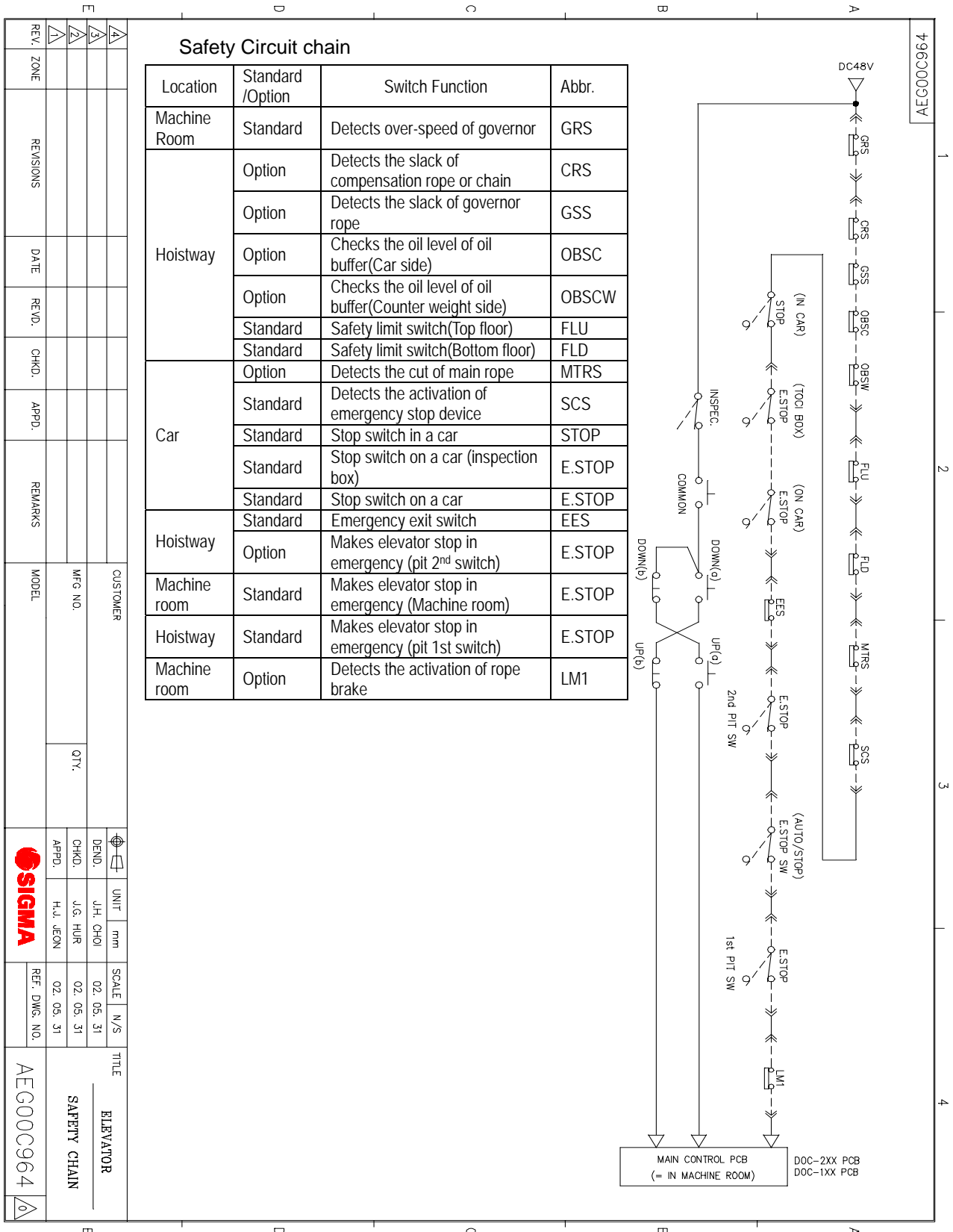


Caution

1. Wet pit should not be accessed. If it is necessary, a Job Hazard Analysis must be performed before starting work.
2. When working under a hydraulic elevator system for more than 15 minutes, Pit prop (supporter) must be installed.
3. Moving to adjacent pit in a common hoistway is strictly prohibited.

3. Safety circuit diagram

Electric diagram of Di series Control Panel.(Di1,Di2,Di5,DS4)



4. Main safety part

The following parts were listed up for part inspection during maintenance term.

Part name	Function
Motor	Main operation equipment to move elevator
Rope	Rope that connect from car to sheave.
Thimble rod	Part that fix the end of rope.
Landing door interlock	Safety switch that in case any landing door is opened, car cannot be operated by system.
Safety Gear	Operated by governor and make elevator stop safely.
Governor	In case elevator speed is faster than its standard, it breaks safety circuit line and makes elevator stop immediately through safety gear.
Spring & oil buffer	In case of emergency, it absorbs the shock of car or counter weight at pit when they fall down to bottom floor.
Final limit switch	Limits the traveling section of elevator by breaking safety circuit line of system.