HITACHI

MACHINE ROOM ELEVATOR
MODERNIZATION

UPGRADE
of Elevators with Machine Rooms

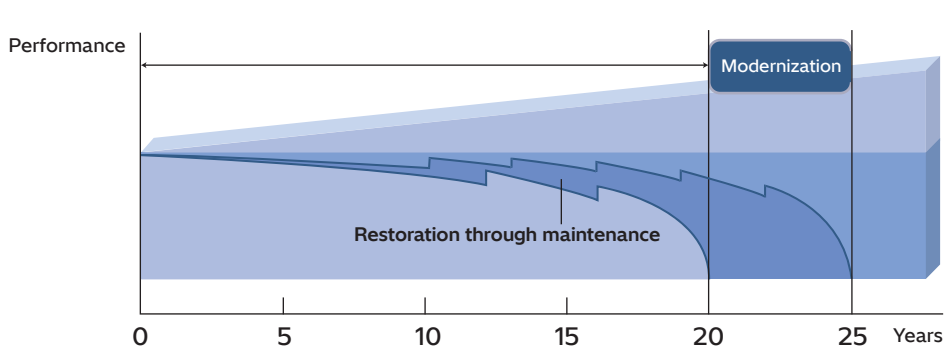
Modernization: Why? And When?

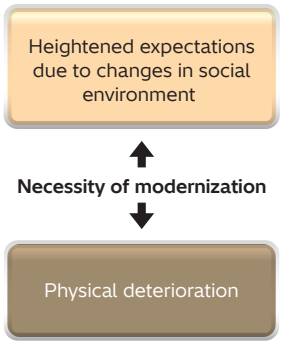
The recommended interval for modernization is 20-25 years

With long-term use, elevators deteriorate and their performance declines. This causes various problems, such as increasing failure or requiring longer time for maintenance. Hitachi recommends appropriate timing of modernization for elevators as well as the whole building facilities to ensure safety and comfort for end users.

Life span of elevator

The necessity of modernization





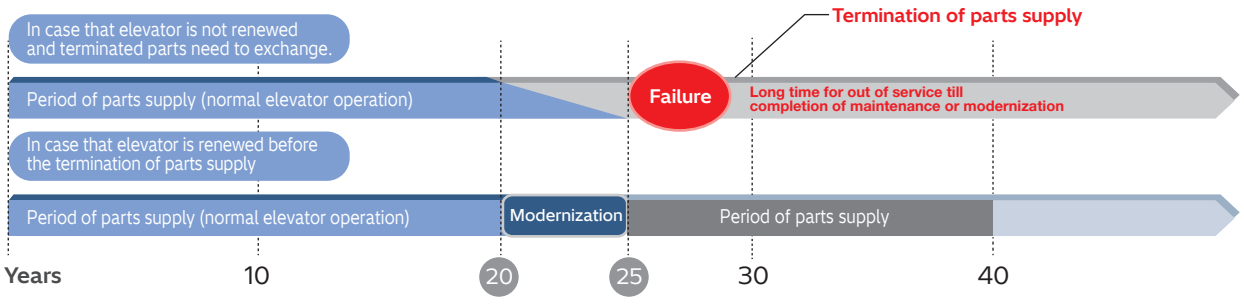
Elevators and other building equipment should have appropriate maintenance regularly considering long life cycle. But it is not possible to prevent deterioration completely in spite of constant maintenance. Once a certain amount of time has passed, elevators require modernization of dilapidated parts and systems. Hitachi recommends elevator modernization after 20 years of installation because of the design life span of the main system.

Problems caused by dilapidation

Failure	*Increased*
Longer time for maintenance	*Increased*
Safety and quality	*Reduced*
Number of components no longer in production	*Increased*
Appearance and image	*Worsened*

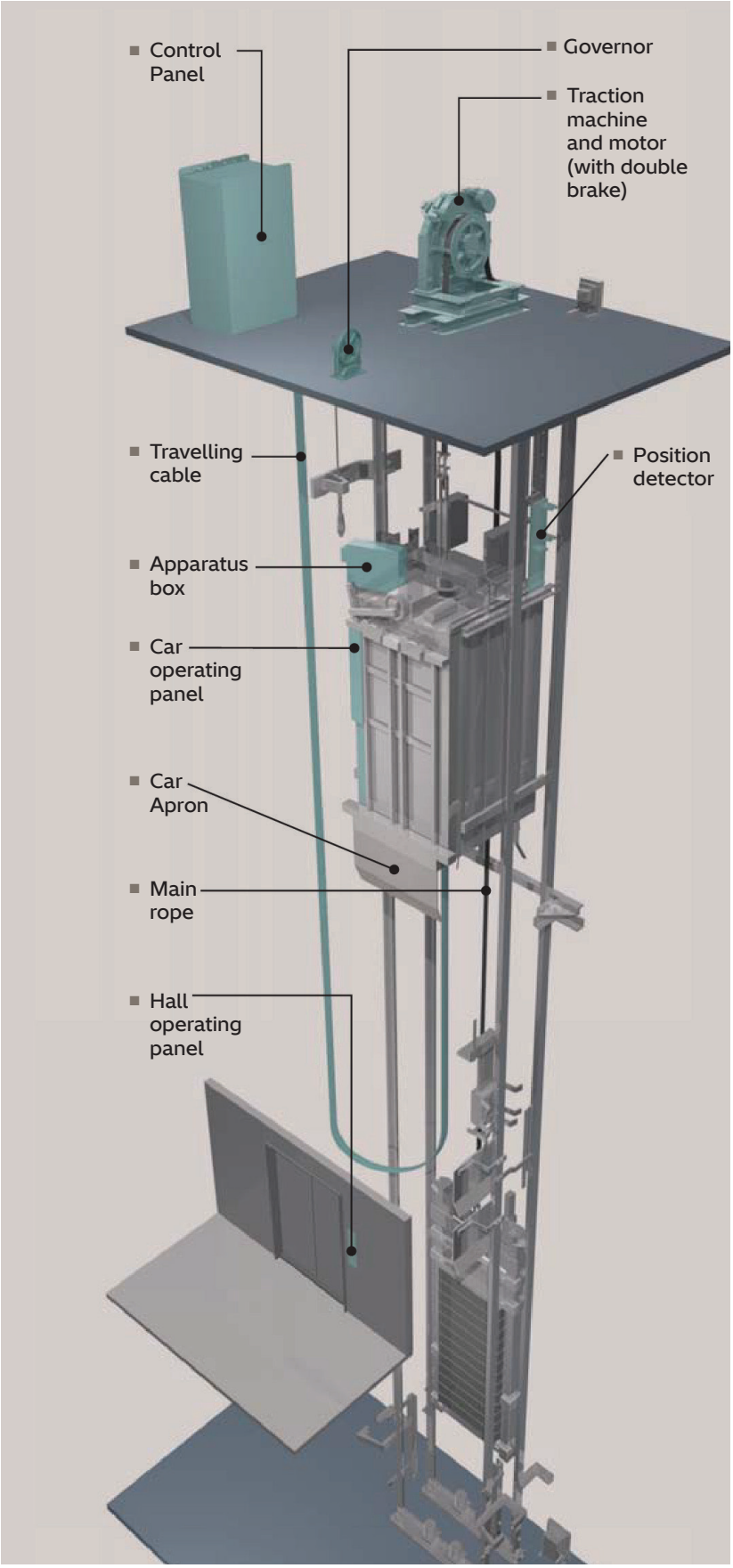
The increasing risks of failure beyond 20 years

The termination of parts supply and the timing of modernization



Contents of Modernization

Major components to be replaced



Picture for illustrative purposes only

Benefits of Modernization

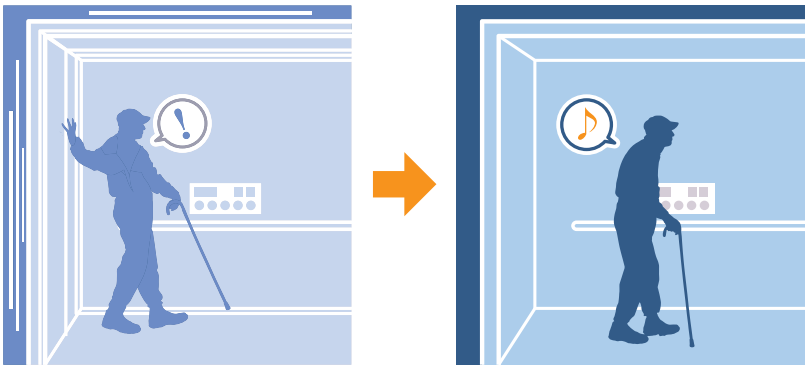
Machine Room

Gearless traction machine with double brake

By replacing a machine with the gearless traction machine that features a double brake, safety can be enhanced. Additionally, the efficiency of the motor and gears have been increased, resulting in improved energy saving. The latest operation control reduces machine room noise and elevator car vibration, improving the ride comfort.

Further Enhancement Of Riding Comfort

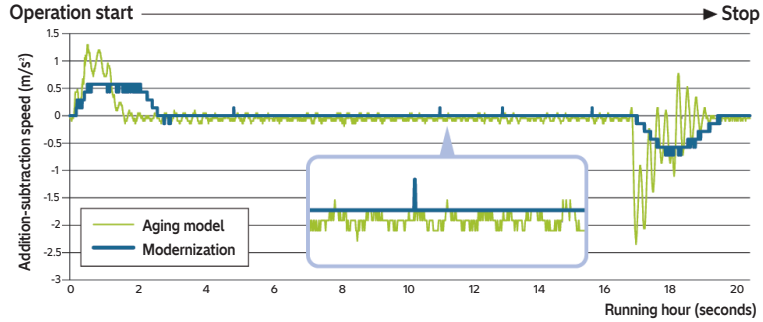
The latest operation control reduces machine room noise and elevator car vibration, and improves riding comfort.



Reduction Of Shocks When Starting And Stopping

Less vibration and noise in motion, and reduced shocks when starting and stopping. The result is a quiet and smooth ride comfort.

Comparison of riding comfort



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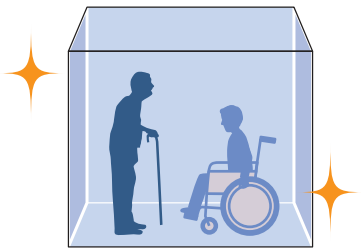
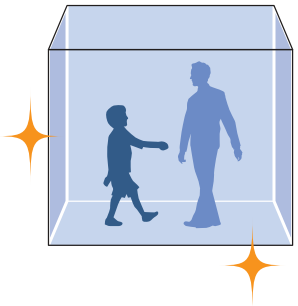
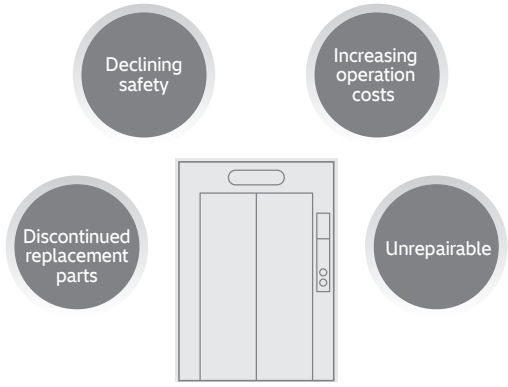
Benefits of Modernization

Modernization replaces the key components of elevators, such as the traction machine that is analogous to the "heart" of the human body and the control panel that corresponds to the "brain", with the latest models. By enabling the latest safety features to be added, Modernization delivers safety, peace of mind, and comfort that will last well into the future.

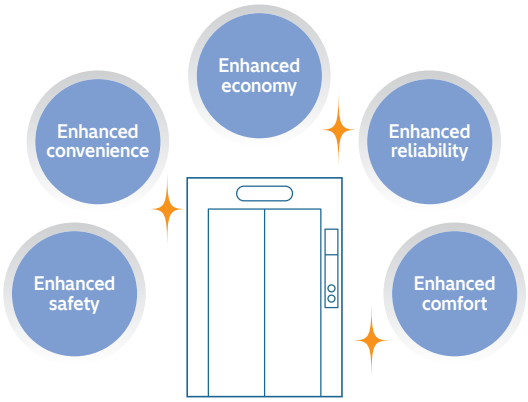






Dilapidated Elevator

Modernization



Effects Of Modernization

A gentle, comfortable ride that creates a more pleasant elevator experience

A barrier-free design is made possible by achieving a smooth and comfortable ride and minimizing the height difference between the floor of the elevator and the hall.

An environmentally-conscious elevator with an energy-saving design

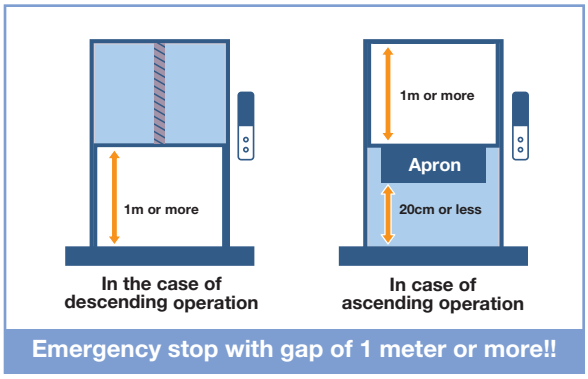
With regenerative system, making use of the energy generated by an elevator when travelling downwards with a heavy car load or upwards with a light car load, the traction machine acts as a power generator to transmit power back to the electrical network in the building.

A more comfortable elevator that's easy for anyone to use

By incorporating performance and functions with a view to the evolution of technology, we make great improvements not only to safety but convenience and comfort as well.

New Function

Unintended car movement protection



If the elevator should start moving unexpectedly while the doors are open, this safety device immediately detects it and prevents the elevator from moving with the doors open.

Operation Flow

Malfunction of drive control device, brake, etc.

Circuit separate from drive control device detects movement with doors open.

Continually operating “redundant brake” is activated.

Car stops.

Following check by qualified engineer, operation is restored.

Ascending car over speed protection

In the event that the elevator is moving upwards at an abnormally high speed, the brakes will be automatically engaged and the elevator will cease operation.

Automatic rescue device for power failure

Operation Flow

Detect power failure.

“POWER FAILURE” is announced inside the elevator car, and the emergency lighting turned on.

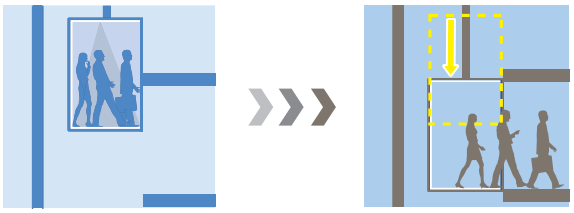
Check the status of safety systems.

Stop on the nearest floor and open the doors.

The door closes automatically after predetermined time.

Resume normal operation automatically after power supply recovers.

When a power failure is detected, the drive power supply switches over to battery power, and the elevator automatically moves to the nearest floor and releases the passengers for safety. This lessens the worry of being shut in the elevator by a power outage in a building with no private generator equipment.



Fireman Operation

In the event that the fireman switch is turned on, the elevator returns to the designated floor and will be ready for firemen's use.

New Function

Multi-beam door sensor

In the event that the beam paths are obstructed, this sensor, installed at the edge of the doors, will keep the doors open.

Rescue operation

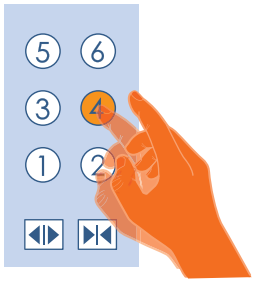
When the elevator reaches objective floor but the doors cannot be opened due to something has caught in the door of the elevator hall or sill, elevator moves to the next floor and opens the door.

Door open time adjustment

The duration of the door open timing is tailored to usage conditions, substantially improving operational efficiency.

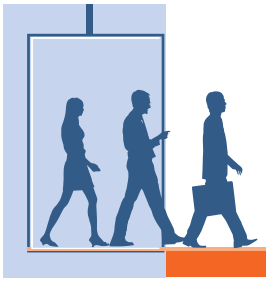
Floor “deselect” function

This function allows passenger to cancel the selection of a floor which is accidentally pressed by pressing the button again. (This thus eliminates unnecessary stops.)



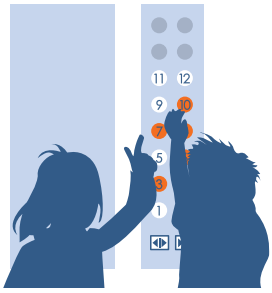
Nearest landing door operation

In the event that a temporary failure occurs during normal operation, the elevator moves slowly to the next floor in order to prevent trapping failure if safety device is not activating.



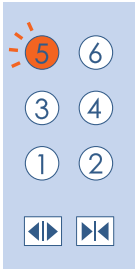
Mischievous call cancellation

In case that large number of calls are registered while there are only few passengers, the calls are determined to be mischievous and will be automatically cancelled upon responding to the next call. This function eliminates unnecessary stops.



Car floor button flashing

When the car approaches a destination floor, the button for that floor blinks to provide advance notice of arrival.



Automatic turn-off of elevator light and fan

In case that the elevator is not in use, the light and ventilation fan in the elevator are automatically turned off to conserve energy.

New Function

● : Standard, ◎ : Option

No.	Name		Description	
Operating systems				
1	Simplex collective control		This is a fully automatic operation used for a single elevator system. Hall calls registered in the travelling direction are responded to sequentially and when all calls in that direction are cleared, calls in the opposite direction are responded to. When there are no more calls, the elevator will stop at the last floor served.	●
2	Duplex collective control		This is a fully automatic operation used for a two-elevator system. Hall calls are responded to by whichever elevator that can serve the hall call in the shortest period. When there are no more calls, one of the elevators will stand by at the stand by floor while the other elevator will stay at the last floor served.	◎
3	Group Control	F1-10	This is a simplified group control system used to operate three or four elevators. The system provides a control to assign the elevator car nearest to the floor where a new hall call is registered.	◎
4		F1-100	This is a group control system used to operate three to six elevators in a medium-sized building. This control system uses “reference-trajectory control”, which is based on the theory used in the highest model of the “future reference trajectory control”.	◎
5		F1-600	This is a group control system used to operate three to eight elevators in a large-sized building. This system consists of 3 smart system: “future reference-trajectory control”, "learning system", "intelligent system".	◎
Safety functions				
1	Abnormal speed protection function		In the event that the elevator is moving downwards at an abnormally high speed, the brakes will be automatically engaged and the elevator will cease operation.	●
2	Out of door-open zone alarm		In the event that the elevator stops out of the door-open zone of a selected floor, doors will not open, and an alarm will be triggered in the elevator.	●
3	Rescue operation		When the elevator stops out of the door-open zone, it will move to the nearest floor at slow speed to release passengers.	●
4	Nearest landing door operation		In the unlikely event of malfunctions during operation, the elevator automatically goes to the nearest floor at slow speed and doors will open to prevent passengers from being trapped inside.	●
5	Overload detection system		In the event of overloading, this system will activate an audio/ visual signal to prevent the elevator from moving.	●
6	Door safety return system		In the event of door overload, such as when passengers get their fingers, hands or personal belongings caught in the door, this system automatically detects this and either re-closes or re-opens the doors to prevent injury.	●
7	Unintended car movement protection system		If the elevator should start moving unexpectedly while the doors are open, this safety device immediately detects it and prevents the elevator from moving with the doors open.	●
8	Micro-leveling		Automatic correction of elevator landing level when subjected to varying car load.	●
9	Car emergency lighting		In the event of a power failure, an emergency light inside the elevator will be automatically activated.	●
10	Emergency battery		In the event of a power failure, this emergency supply allows the operation of alight, fan and alarm bell.	◎ *2
11	Multi-beam door sensor		In the event that the beam paths are obstructed, this sensor will keep the doors open.	●
12	Door safety edge		Mechanical safety units are installed on both sides(2PCO) or one side(2S2P) of the elevator doors. In the event of passengers coming into contact with the safety edges of closing doors, the doors will immediately reopen.	●
13	Ascending car over speed protection		In the event that the elevator is moving upwards at an abnormally high speed, the brakes will automatically engaged and the elevator will cease operation.	●
Service functions				
1	Automatic return function		After all the calls have been served, the elevator will return to the pre-set stand by floor and stands by.	◎ *1
2	Attendant operation		For this system, the stop floor is manually set by an attendant, such as in a department store.	◎
3	Independent operation		This operation system is used when there is a need to serve special passengers. Under this operation, all hall calls are disabled for the elevator and it is reserved for exclusive use of the special passengers.	◎
4	Door open prolong button		In the event that this button on the car operation board is pressed, the elevator doors remain open for a pre-set period of time.	◎
5	Parking operation		The elevator can be parked at the designated floor with a key switch.	◎
6	Floor lock out operation		Specific service floors can be locked-out by activating a switch.	◎
7	Interphone system		An interphone system is provided for emergency communication between the elevator and the master unit (in the supervisory panel, etc.).	●

New Function

● : Standard, ◎ : Option

No.	Name	Description	
User services			
1	Door open time adjustment	The duration of the door open timing is tailored to usage conditions, substantially improving operational efficiency.	●
2	Full load bypass operation	In the event that the elevator is fully loaded, this operation will not respond to any hall calls and will only respond to the car calls.	◎
3	Mischievous call cancellation	In the event that a large number of calls is registered by a small number of passengers, the calls are determined to be mischievous and will be automatically cancelled upon responding to the next call. This eliminates unnecessary stops.	●
4	Floor "deselect" function	This function allows passengers to cancel the selection of a floor which is accidentally pressed by pressing and hold the button for 1 second. (This eliminates unnecessary stops.)	◎
Accessibility			
1	Car floor button flashing	The registered car destination floor button flashes when the car approaches the destination floor.	●
Information functions			
1	IC auto announcement	Preset standard messages are announced to the passengers.	◎
Energy-saving functions			
1	Automatic turn-off of elevator light and fan	In the event that the elevator is not in use, the light and ventilation fan in the elevator are automatically turned off to conserve energy.	●
2	Regenerative function	When travelling downwards with a heavy car load or upwards with a light car load, the traction machine acts as power generator to transmit power back to the electrical network in the building.	●
Emergency operations			
1	Automatic rescue device for power failure	In the event of power failure, this system automatically switches to battery power to bring the elevator to the nearest floor.	◎
2	Earthquake emergency operation	In the event that an earthquake is detected, the elevator will stop at the nearest floor. (This function is not applicable to building with private lobby layouts).	◎
3	Emergency operation for Power failure	In the event of building power failure, the elevator can be operated by the building standby generator to move the elevator to the designated floor.	◎
4	Fire emergency operation	In the event of fire, the elevator is automatically brought to the designated floor where it remains inoperative for passengers safety.	●
5	Fireman operation	In the event that the fireman switch is turned on, the elevator returns to the designated floor and will be ready for firemen's use.	◎
Other functions			
1	Maintenance operation	Elevator operates at lower speed during maintenance.	●

*1 Included in the standard configuration when duplex collective control or group control are selected

*2 Included in the standard specifications for Singapore and Malaysia

Note

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