Operating Manual

SEH series

Construction Hoist

Manufacturing year: .....

Serial number: .....

Manufactured and distributed by:

450-658-0094
91 Ch des Patriotes
St-Mathias-sur-Richelieu
Québec, J3L 6B6, Canada

Table of content :

1 Preface

Who should read this operating manual?

- Assembly and operating personnel working on the machine
- Machine maintenance personnel (cleaning/servicing)

What does this operating manual contain?

In this operating manual, you will find instructions regarding:

- Intended use
- Residual risks
- Safety
- Operation
- Troubleshooting
- Customer service

This operating manual communicates important information that is a prerequisite for working safely and economically with the machine. The assumption is made that the machine is equipped with all possible options.

What you should do straightaway!

Read this operating manual carefully before assembly and commissioning, and observe all notes, especially the safety instructions.

What does this operating manual not contain?

This operating manual is not a repair manual!
You will not find any documents regarding repair work in this operation manual.

What should you consider when re-selling the machine?

If you sell the machine, you must pass on this document with the annual inspection entries and spare parts list to the purchaser.

2 Safety

2.1 Explanations of symbols and notes

2.1.1 Health and safety symbol

DANGER! You will find this symbol next to all safety instructions where there is a risk to the life and limbs of individual. Observe these instructions and behave yourself with care!

2.1.2 Attention note

ATTENTION! Is found at points where special informations and/or rules and prohibitions regarding damage prevention are given to prevent damage to the equipment.

2.1.3 Note

NOTE Is found at points where information is given about using the machine economically or instructions are given regarding the correct working procedure.

2.2 General safety

The machine is built according to the current status of technology and is safe to operate. However, due to its work processes the machine has parts and areas that cannot be protected without impairing the function and operating capacity of the unit. For this reason, good personal safety practice is required to protect personnel and equipment. Risks can arise from this equipment if it is used incorrectly by untrained personnel or for non-intended purposes.

- Before transport, installation, commissioning, dismantling and maintenance, read and observe the machine installation and operating manuals and safety notes!

Read and understand the installation and operating manual first; during work is too late!

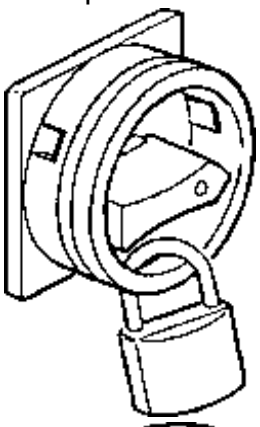
- Keep the operating manual accessible, in close proximity, inside or close to the machine.
- The generally valid, legal and other binding provisions for accident prevention and environmental protection in the respective country in which the machine is being operated are considered a supplement to the assembly and operating manual (e.g. wearing personal protective gear such as hard hat, safety shoes, etc.)
- Observe the attached notices and warning signs.
- Only work while wearing close fitting clothing, safety shoes and hard hat. Do not wear jewellery such as necklaces and rings. There is a risk of injury from getting caught or being pulled in.
- Find a doctor immediately if there's any injuries or accidents.

Consequences of not complying with safety instructions

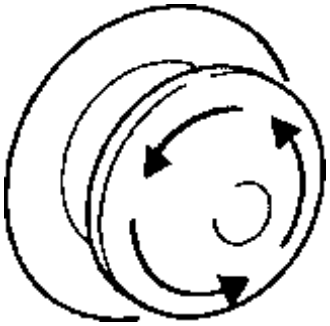
Non-compliances with safety instructions can result in danger both for personnel, as well as for the environment and the machine. Non-compliance can lead to the forfeit of any compensation claims.

2.3 Operating safety

- The machine must be set up and dismantled according to the installation manual and under supervision of an authorized person specified by the contractor.
- Install the equipment so it is exactly vertical, stable and anchor it to the building.
- Observe the load bearing capacity of the equipment.
- Only use the machine in a technically fault-free condition; use in a safety and risk conscious manner while observing the operation manual.
- Immediately remedy to faults that could impair safety.
- Immediately shutdown the machine if there are safety-relevant changes to the unit or its operating behavior, and report the fault to the company management or its representative.
- Do not make any changes, mount parts on or modify the machine. This also applies to installing and adjusting safety features, such as e.g. limit switches.
- Do not change, remove, override or bypass safety devices.
- Immediately renew damaged and/or removed notices and warning signs as well as safety labels.
- If work is interrupted, switch off the machine at the main switch and secure against switching on again with a padlock.



- In situations that present a risk to the operating personnel or the machine, shut down the machine by pressing the **EMERGENCY STOP** button.
  ∞ SEE SECTION 7.6 SHUTTING DOWN IN AN EMERGENCY, ON PAGE 36
- Bring down to ground and shut down the machine when wind speeds exceed >45 mi/h (>72 km/h).



2.3.1 Inspection procedures

- Inspections before commissioning, recurring inspections and intermediate inspections must be carried out according to local rules and regulations.
- The results of the recurring inspection must be recorded, written in the appendix of this operation manual.

2.3.2 Safety notes for assembly, operation and transport

- Before starting work on working site, acquaint yourself with the working environment, e.g. obstacles in the work and traffic area, ground load bearing capacities and necessary safeguarding of the construction site from public transport.
- Only load and transport equipment that has been carefully dismantled, packed and securely attached.
- Always secure the machine against unauthorized uses!
- Position the load securely on the car. Any material that could slip or fall must be secured.
- Do not stand or work beneath the car!
- Do not place objects under the car.
- Evenly position loads in the car, observe max. load bearing capacity.
- Store material at a safety distance of min. 20 in (50cm) from moving parts of the machine.
- Any accompanying persons must comply with instructions given by the operating person; in particular, they must not step over material that is being carried in the car.
- Check for externally recognizable damages, noises and defects. Immediately report any changes or malfunctions determined to the company management or its authorized representatives. If necessary, shut down and secure the machine immediately.

2.3.3 Safety instructions for maintenance

- Switch off the power (e.g. remove main plug) before maintenance work.
- The car must be secured using appropriate means (setting mechanism) when work is carried out under the car.
- Only allow servicing and repair work to be carried out by authorized, qualified personnel. In this case, pay attention for example to the special risks present during work on electrical systems. You must respect local rules and regulations concerning electrical work.
- Properly reinstall every dismantled safety devices once maintenance work is complete.
- **Important!** Independent conversions or changes to the machine impair safety and are not permitted.
- Spare parts must correspond to the technical requirements of the manufacturer. Only use original Fraco spare parts.

2.4 Promoting use of operating manuals

Operating/utilisation manuals are parts of rules that a contractor puts together to ensure safe operational procedures. This refers to binding instructions that the contractor issues within the context of his management rights. The employees are obliged to follow these instructions.
The contractor must fulfill the instructions for preventing work-related accidents and must instruct the insured party about risks occurring during their work and the measures for averting said risks. These requirements can be fulfilled with the support of operating/utilisation manuals.

2.5 Employees must be informed about the following:

- The potential risks when working with the hoist and the necessary protective measures and codes of conduct including instructions in the case of danger and about first aid.
- Type and scope of regular inspections for checking that the unit is in a condition safe for work (SEE SECTIONS 9, 10 AND 11).
- Maintenance.
- Resolve malfunctions.
- Environmental protection.
- Safe handling of electrical equipment.
- The user must ensure cleanliness and clarity at the place where the machine is set up by using instructions and checks.
- The responsibilities during installation and dismantling, as well as during operating and maintenance, must be clearly regulated by the operator and adhered to by all persons so that no unclear competencies occur with regard to safety.
- The user must accept the obligation to operate the machine only in fault-free condition. He/she is obliged to report immediately to his/her supervisor any changes occurring to the equipment that affect safety.
- Observe attached notices and warning signs.
- The user must make sure that no unauthorized persons are located on or near the machine.

3 Intended use and area of application

The machine is a construction hoist intended for provisional use on construction sites for transporting material and/or between 25-40 persons depending on the actual model, who can exit the car at installed and secured landing deck.

- The SEH is intended for provisional use on constructions sites for transporting persons and material. It may only be used on construction sites by instructed personnel who can exit the car at installed and secured landing deck.
- Landing level safety gates are absolutely necessary even when using it purely as a material hoist. The hoist may only be operated once these landing level safety gates have been installed!
- The maximum number of persons is limited from 25 to 40 depending on the actual model.
- The SEH is controlled with a choice of 4 speeds: **Normal speed** 0-130 ft/min (0-40 m/min), **Medium speed** 0-200 ft/min (0-60m/min), **High speed** 0-300 ft/min (0-90 m/min) and **Very high speed** 0-330ft/min (0-100 m/min) (with counterweight).
  NOTE: The speed availability depends on the model.
- Operation is only permitted at wind speeds of up to 45 mi/h (72 km/h). If wind forces are greater, the car must be lowered to ground level and work must be stopped!
- Some machines are equipped with an overload device which switches off the travel movement in both directions when the load bearing capacity is exceeded; a red warning lamp lights up on the car control panel. This device is optional and may not be present.

Manual Joystick Operator Control

For markets using supervising operators for driving the hoist.

- Base enclosure, 12ft (3.66 m) high
- The control can only be operated from the car, by using the Manual Joystick Operator Control (MJOC). For markets using supervising operators for driving the hoist

Exceptions:

- During assembly/disassembly or maintenance, only the car control on the roof may be active, the joystick must be switch off.

- The SEH MJOC can be installed up to a distance of 2-20 in (50- 500 mm) of the wall depending on which market you are using the elevator. Also, sliding gate can be mounted to the entry point (with or without ramp) on the landing level entry side of the car. This sliding gate design at the entry point also dictates which landing level safety gates (with sliding doors or double doors) have to be used.

3.1 The following belongs to intended uses,

- That the assembly, operation and maintenance (installation and operation manual) provided by the manufacturer are complied with.
- That the foreseeable misconduct of other persons is taken into consideration.
- That the local rules and regulations are followed.

3.2 Consequences of non-intended use of the equipment

- Danger for life and limb of the user or a third party.
- Damage to machine and other tangible assets.

3.3 Requirements of assembly personnel

The machine may only be assembled, operated and maintained by authorized persons who can guarantee to handle it appropriately based on their training or knowledge and practical experience, and who are aware of the risks. These persons must be appointed by the contractor for assembly, dismantling and maintenance tasks. These persons should have a competency card issued by local authorities, union or by Fraco.

3.4 Operating personnel

The machine may only be operated by persons who can guarantee to handle it appropriately based on their training or knowledge and practical experience. These persons must:

- Be appointed by the contractor to operate the machine.
- Be correspondingly instructed and informed about the risks.
- Be acquainted with the operation manual.
- Follow local rules and regulations.

Residual risks

There are residual risks in spite of all the precautions met.
Residual risks are potential and not obvious risks, such as e.g.:

- Injuries from uncoordinated work.
- Hazards from a malfunction in the control system.
- Hazards when working on the electrical system.
- Hazards from damage to the load carrying device.
- Hazards from an incorrectly secured load falling.
- Hazards from high wind speeds > 45mi/h, (>72 km/h).
- Hazards from entering and leaving the car.
- Hazards with high sound levels.

Usage of ear protecting device are recommended

4 Technical data

4.1 General data

FRACO SEH-650		
Drive output Power consumption VFC Traction power of drives	Specific for each unit (See unit's identification and technical plate or project specific engineering package for electrical data)	
Lifting speed:	0-130 ft/min (0-40 m/min), 0-200 ft/min (0-60 m/min), 0-300 ft/min (0-90 m/min), 0-330 ft/min (0-100 m/min)	
Triggering speed of over-speed safety brake	6.40 ft/s (1.95 m/s) typical, specific to each unit, see technical data plate	
Type of mast section	26 in x 26 in (650 mm x 650 mm)	26 in x 36 in (650 mm x 900 mm)
Weight of mast section	One rack: 339 lbs (154 kg) Two racks: 394 lbs (179 kg)	One rack: 363 lbs (165 kg) Two racks: 418 lbs (190 kg)
Length of one mast section	59.37 in (1 508 mm)	
Maximum payload	4,500 lbs (2 000 kg) 6,000 lbs (2 700 kg) 7,000 lbs (3 200 kg)	
Maximum assembly height	1300 ft (400 m)	
Maximum mast distance over the last anchor	30 ft (9 m)	
Typical anchor spacing	30 ft (9 m)	
Mast bolt	M24-3.00 x 260 mm Lg Grade 8.8 zinc with 2 washers and nylon lock nut.	
Mast bolt tightening	258 lbs-ft (350 Nm)	
Load capacity during assembly	3,300 lbs (1 500 kg)	
Maximum spacing between cable guides	Max 20 ft (6 m) with cable trolley	
Dimensions of sliding gates: • Clear gate width • Clear gate height	 5.0ft (1.5m) 6.6ft (2.0m)	
Max. Dynamic wind pressure: • During assembly • While operating • While shutdown	 q=2.1 psf (100 N/m²) ⇒ 28 mi/h (45 km/h) q=5.2 psf (250 N/m²) ⇒ 45 mi/h (72 km/h) See local regulation	
Horizontal force when loading and unloading	Reduced to 20 % load capacity	

- Some machines are equipped with an overload device which switches off the travel movement in both directions when the load capacity is exceeded; a red warning lamp lights up on the car control. This device is optional and may not be present.

4.2 Data depending on model

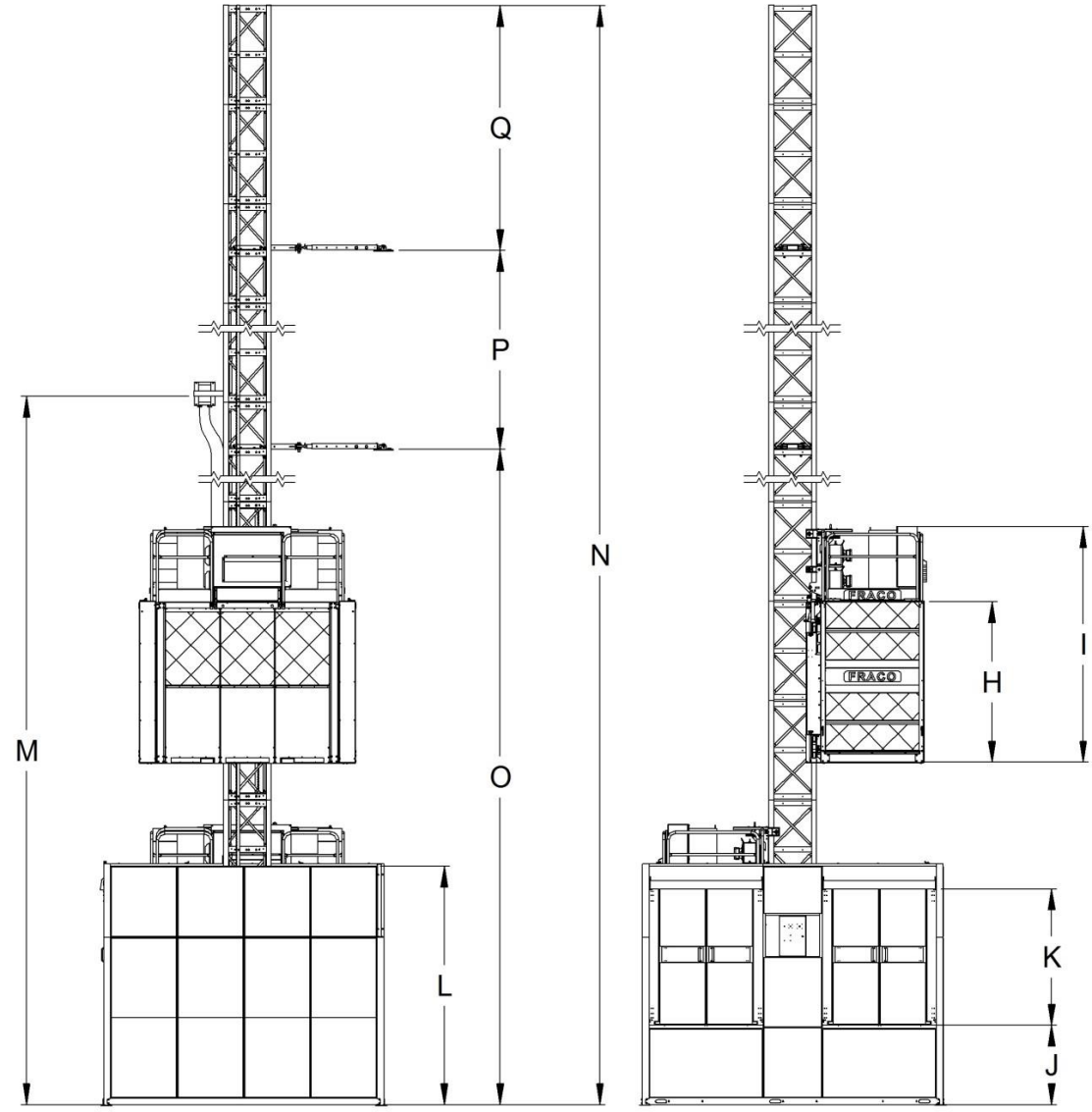
MODEL TYPE	SEH-4500	SEH-6000	SEH-7000
CAPACITY			
Load capacity	4,500 lb (2 000 kg)	6,000 lb (2 700 kg)	7,000 lb (3 200 kg)
Lifting speed 50Hz/60Hz	0-300 ft/min (0-90 m/min)	0-330 ft/min* (0-100 m/min)*	0-330 ft/min* (0-100 m/min)*
Max lifting height	1,300 lb (400 kg)	1,300 lb (400 kg)	1,300 lb (400 kg)
Erection crane capacity	440 lb (200 kg)	440 lb (200 kg)	440 lb (200 kg)
CAR DIMENSIONS			
Internal dimension (Width x Length x Height)	57 in x 126 in x 86 in (1.45m x 3.20m x 2.18m)	57 in x 150 in x 86 in (1.45m x 3.81m x 2.18m)	57 in x 150 in x 86 in (1.45m x 3.81m x 2.18m)
Door opening (Width x Height)	56 in x 80 in (1.43m x 2.04m)	56 in x 80 in (1.43m x 2.04m)	56 in x 80 in (1.43m x 2.04m)
ELECTRICAL DATA			
Power supply range	Specific for each unit (See unit's identification and technical plate or project specific engineering package for electrical data		
No. of motors			
VFC Vacon type			
Power cable guide system	Cable trolley	Cable trolley	Cable trolley
WEIGHTS			
Car including machinery	7,000 lb (3 200 kg)	7,500 lb (3 400 kg)	8,300 lb (3 800 kg)

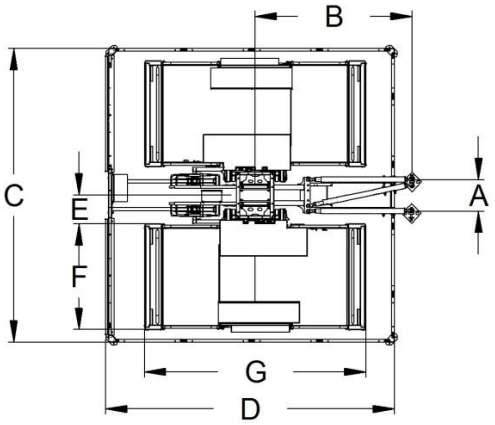
*Counterweight is required for speed of 330 ft/min (100 m/min)
Models are available in single or twin car set up

4.3 Options available

Lifting speed	0-130 ft / min (0-40 m / min)
	0-200 ft / min (0-60 m / min)
	0-300 ft / min (0-90 m / min)
	0-330 ft / min (0-100 m / min)*
Car width x length	57 in x 126 in (1.45 m x 3.20 m)
	57 in x 150 in (1.45 m x 3.81 m)
	57 in x 162 in (1.45 m x 4.11 m)
Power supply	480V 60Hz
Counterweight	7,000 lbs (3 200 kg)
Counterweight equipment	1,400 lbs (640 kg)
C-door	79 in x 94 in (2.00m x 2.30m)

4.4 General dimensions





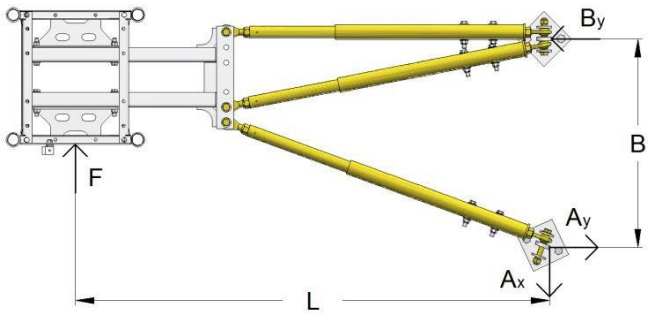
	Description	SEH-4500	SEH-6000	SEH-7000
A	Spacing between anchor plates (minimum)	min 29 in (0.73 m)	min 29 in (0.73 m)	min 29 in (0.73 m)
B	Distance between center of mast and anchor plates	max 110 in (2.8 m)	max 110 in (2.8 m)	max 110 in (2.8 m)
C	Width of ground enclosure: • Single unit • Double unit	 112 in (2.8m) 173 in (4.4m)	 112 in (2.8m) 173 in (4.4m)	 112 in (2.8m) 173 in (4.4m)
D	Length of ground enclosure	168 in (4.3m)	168 in (4.3m)	168 in (4.3m)
E	Distance between center of mast and car	17 in (0.43m)	17 in (0.43m)	17 in (0.43m)
F	External width of car	61.5 in (1.56m)	61.5 in (1.56m)	61.5 in (1.56m)
G	External length of car	126 in (3.2 m)	154 in (3.9 m)	154 in (3.9 m)
H	External height of car (without drive unit)	96 in (2.44 m)	96 in (2.44 m)	96 in (2.44 m)
I	External height of car (with drive unit)	140 in (3.56 m)	140 in (3.56 m)	140 in (3.56 m)
J	Level of ground enclosure door	49 in (1.25m)	49 in (1.25m)	49 in (1.25m)
K	Height of ground enclosure door	84.5 in (2.15m)	84.5 in (2.15m)	84.5 in (2.15m)
L	Height of ground enclosure	144 in (3.66 m)	144 in (3.66 m)	144 in (3.66 m)
M	Height of junction box	Min (N / 2) + 5'-0"	Min (N / 2) + 5'-0"	Min (N / 2) + 5'-0"
N	Height of mast	Max 1,300 ft (400m)	Max 1,300 ft (400m)	Max 1,300 ft (400m)
O	Height of first anchor	Max 30 ft (9m)	Max 30 ft (9m)	Max 30 ft (9m)
P	Distance between anchors	Max 30 ft (9m)	Max 30 ft (9m)	Max 30 ft (9m)
Q	Maximum height over last anchor	Max 30 ft (9m)	Max 30 ft (9m)	Max 30 ft (9m)

*Standard dimensions only, optional car will differ.

4.5 Mast tie forces

The mast tie forces can be found in the following tables, depending on the assembly height and assembly situation. The peak forces occurring for the represented assembly geometry are given; **they do not yet include any safety factors. (NON-FACTORED EFFORTS)**

The assembly geometry shown in the figure shows the corresponding mast tie forces Ax, Ay and By from wind forces.



Standard mast tie distance = 30 ft (9 m)
Max distance over the last tie = 30 ft (9 m)

IMPORTANT
Always refer to the engineering package for specific tie loads to the structure.

SEH-4500

Mast height h = 500 ft (150 m); load capacity = max. 4,500 lbs (2 000 kg)

Geometry		Mast tie forces		
L	**B**	**A_x**	**A_y**	**B_y**
64.5 in (1.64 m)	29 in (0.73 m)	4,600 lb (20.5 kN)	10,300 lb (45.9 kN)	10,300 lb (45.9 kN)
64.5 in (1.64 m)	50 in (1.27 m)	4,600 lb (20.5 kN)	6,000 lb (26.7 kN)	6,000 lb (26.7 kN)
110 in (2.80 m)	29 in (0.73 m)	4,600 lb (20.5 kN)	17,600 lb (78.4 kN)	17,600 lb (78.4 kN)
110 in (2.80 m)	50 in (1.27 m)	4,600 lb (20.5 kN)	10,200 lb (45.4 kN)	10,200 lb (45.4 kN)

The values in the table apply for each wall bracket.

SEH-6000

Mast height h = 500 ft (150 m); load capacity = max. 6,000 lbs (2 700 kg)

Geometry		Mast tie forces		
L	**B**	**A_x**	**A_y**	**B_y**
64.5 in (1.64 m)	29 in (0.73 m)	4,600 lb (20.5 kN)	10,300 lb (45.9 kN)	10,300 lb (45.9 kN)
64.5 in (1.64 m)	50 in (1.27 m)	4,600 lb (20.5 kN)	6,000 lb (26.7 kN)	6,400 lb (28.5 kN)
110 in (2.80 m)	29 in (0.73 m)	4,600 lb (20.5 kN)	17,600 lb (78.4 kN)	17,600 lb (78.4 kN)
110 in (2.80 m)	50 in (1.27 m)	4,600 lb (20.5 kN)	10,200 lb (45.4 kN)	10,300 lb (45.9 kN)

The values in the table apply for each wall bracket.

SEH-7000

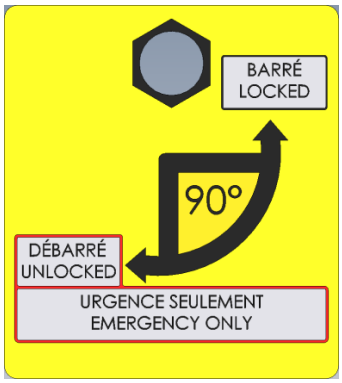
Mast height h = 500 ft (150 m); load capacity = max. 7,000 lbs (3 200 kg)

Geometry		Mast tie forces		
L	**B**	**A_x**	**A_y**	**B_y**
64.5 in (1.64 m)	29 in (0.73 m)	5,100 lbs (22.7 kN)	10,900 lbs (48.6 kN)	12,100 lbs (53.9 kN)
64.5 in (1.64 m)	50 in (1.27 m)	5,100 lbs (22.7 kN)	6,300 lbs (28.1 kN)	7,400 lbs (33.0 kN)
110 in (2.80 m)	29 in (0.73 m)	5,100 lbs (22.7 kN)	19,000 lbs (84.6 kN)	20,200 lbs (90.0 kN)
110 in (2.80 m)	50 in (1.27 m)	5,100 lbs (22.7 kN)	11,000 lbs (49.0 kN)	12,100 lbs (53.9 kN)

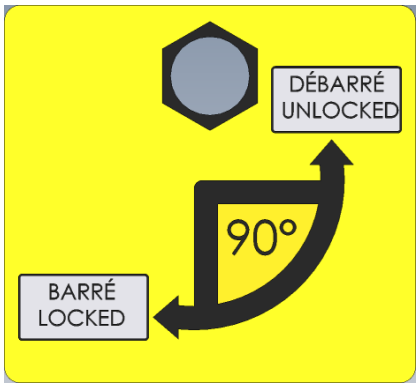
The values in the table apply for each wall bracket.

For dimensions outside of these values, please contact Fraco's technical department.

4.6 Summary of the stickers, plates and notices



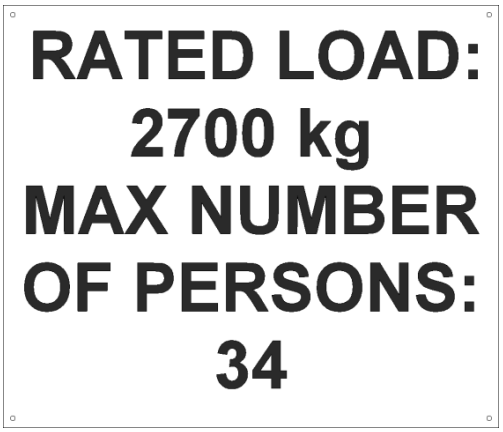
Item No. FSC-0001
(Sliding door)



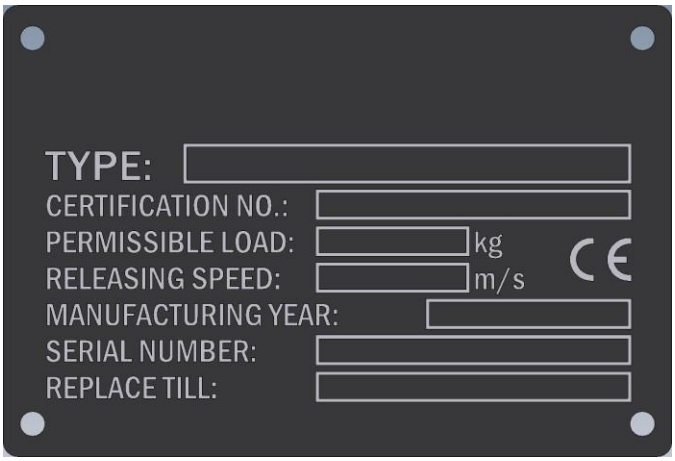
Item No. FSC-0012
(Roof access)

Item No. 30490084

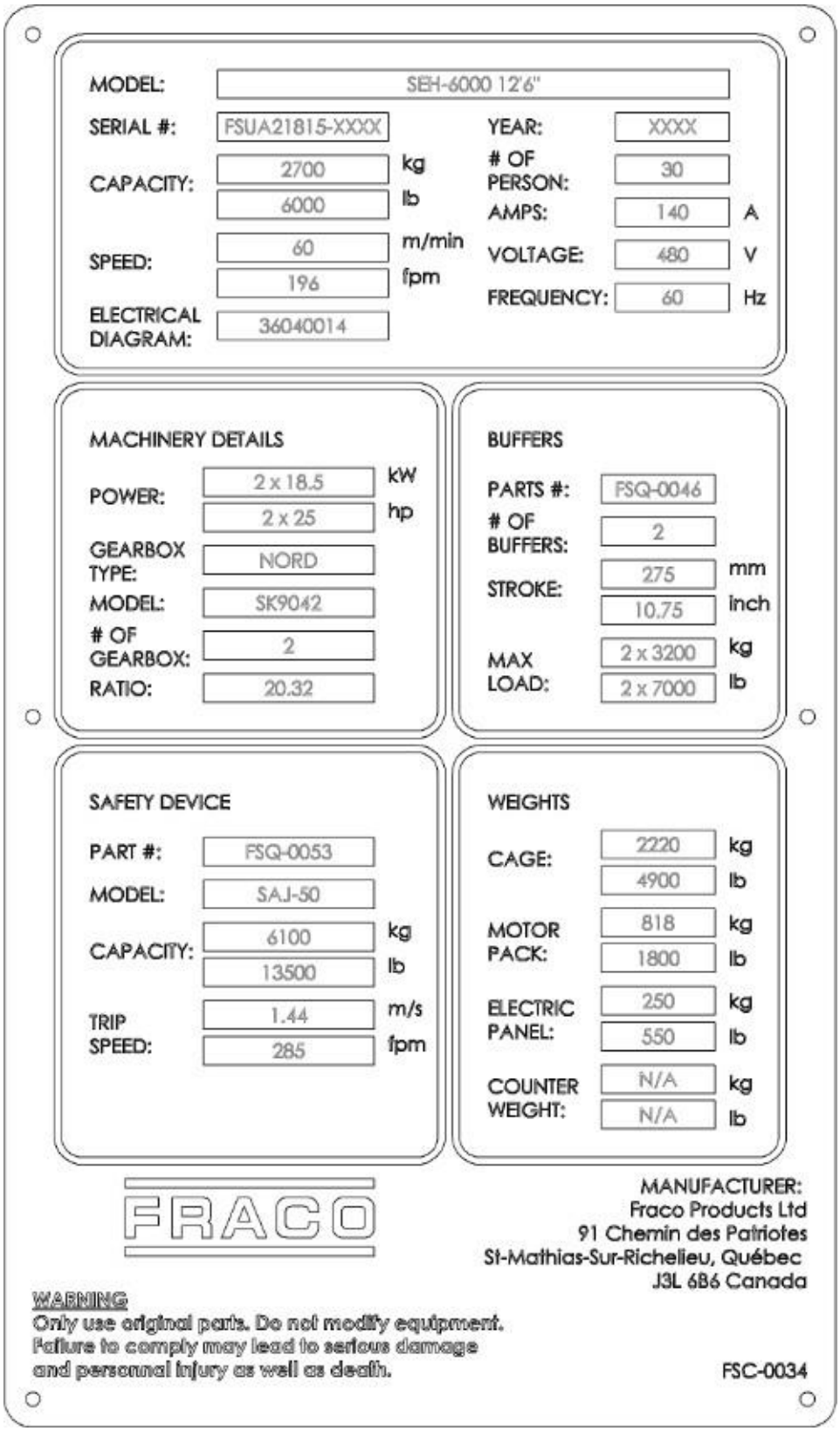
Item No. FSC-0003
(Car control)



Item No. FSC-0007
(Car control)



Item No. FSC-0008
(Safety brake)

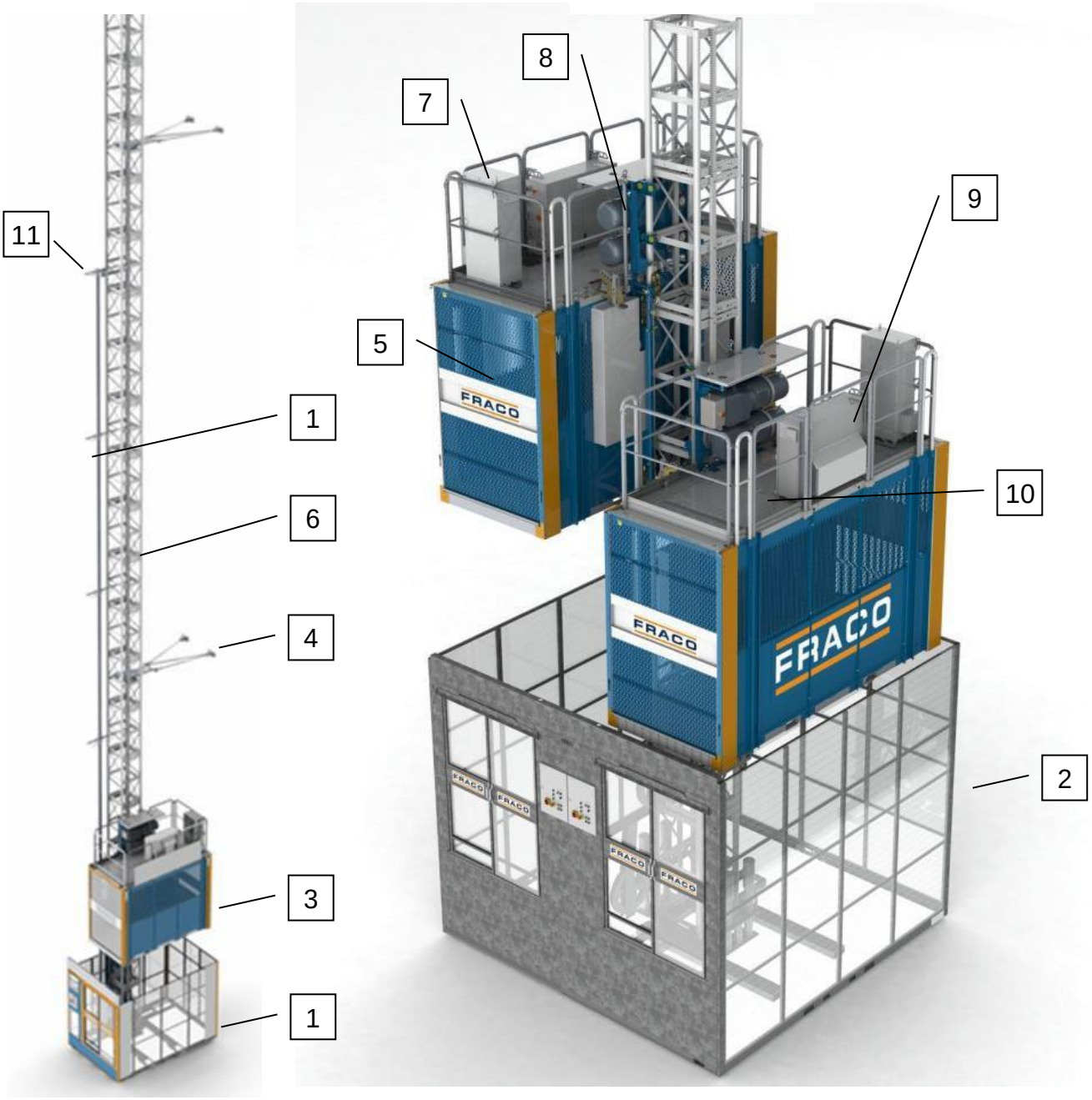


Item No. FSC-0034
(Data sign)
Picture as reference only

4.7 Equipment

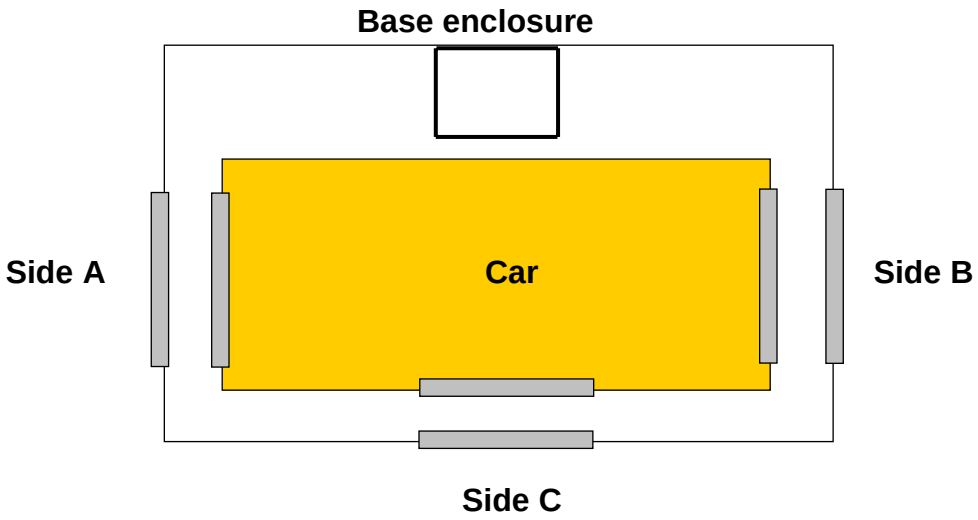
4.7.1 Fraco SEH single or twin

Simple **Double**



1 = 12ft (3.66 m) single enclosure
2 = 12ft (3.66 m) double enclosure
3 = Car
4 = Tie In
5 = Sliding gates with or without ramp
6 = Mast section
7 = Power panel roof (AS2)
8 = Drive motors
9 = Brake resistor
10 = Roof hatch
11 = Cable guide

4.7.2 Ground enclosure



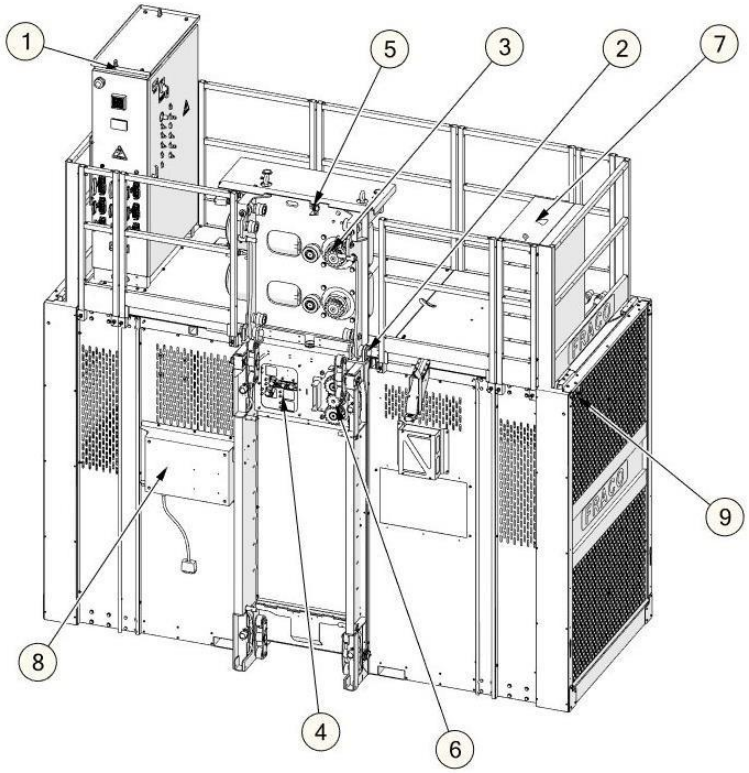
- Fraco SEH is designed with a 12 ft (3.66m) base enclosure.
- An enclosure must be assembled around the hoist at a distance of at least 20in (50 cm).
- The 12 ft (3.66m) base enclosure on the Fraco SEH is designed with a double door.

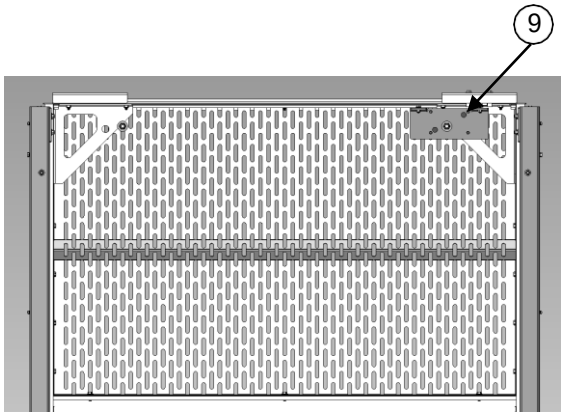
Standard application

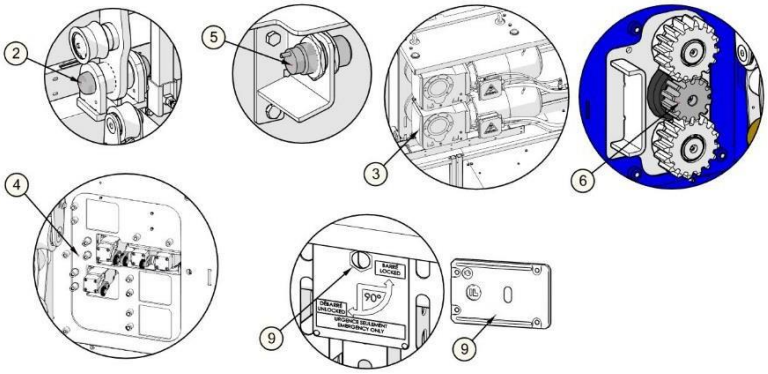
- The "A" side is the access point to the ground station.
- The "B" side is the transfer point to the landing level.
  - Note: side "A" and "B" can be inverted if needed during installation.
- The "C" side is linked to side A or B during installation.

4.7.3 Electrical switch boxes and drives

1 = AS2 (Power panel)
2 = Overload cell (***Optional***)
3 = Drive motors
4 = Limit switches
5 = Inductive sensors
6 = Safety device
7 = Brake resistor
8 = AS3 (Operator's panel)
9 = Door interlock

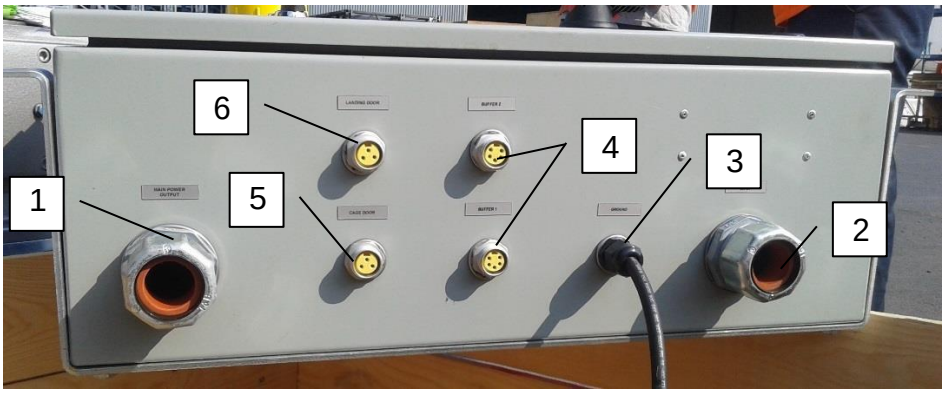






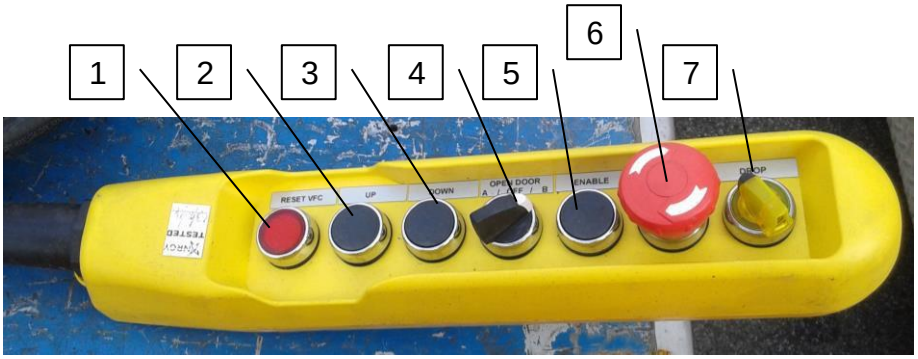
4.7.4 Ground box AL0 (Under view)

1 = Outgoing Main power supply (480V)
2 = Incoming Main power supply (480V)
3 = Ground cable
4 = Buffer limit switches (5 pin)
5 = Landing door or fence door (3 pin)
6 = Cage doors (3 pin)



4.7.5 Universal remote control

1 = Reset VFC
2 = Move unit UP
3 = Move unit DOWN
4 = OPEN Door selector switch
5 = Enable (combine with #2, #3 & #7)
6 = Emergency stop button
7 = Drop test switch



4.7.6 Sliding gate

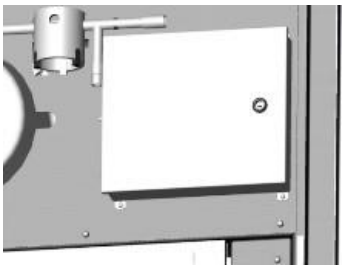
The sliding gates may only be opened if the car is stopped on a landing and if the door lock blue release switch on car control panel has lighten up. i.e. when it is in front of the sliding gate or barrier of the base enclosure or in front of a landing level safety gate.

∞ REFER TO SECTION 7.5.3 SLIDING GATE, ON PAGE 34

4.7.7 Toolbox

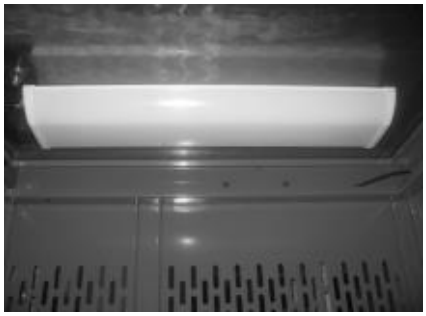
In the toolbox you will find:

- Equipment to adjust the tandem rollers.
- Safety brake wrench.
- Equipment to release brakes.
- Key to power panel.
- Universal T-tool.
- Filling gun.



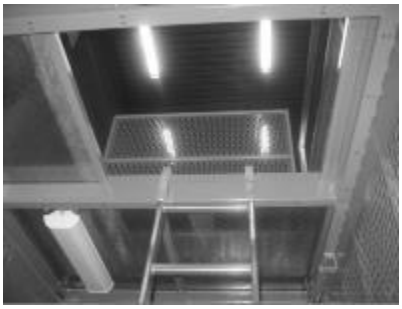
4.7.8 Car lighting

- The car lighting ***(1)*** is activated by the car control light switch located on control panel AS3.
- In case of power failure, the emergency lightning is powered via a battery backup system and automatically lights up.



4.7.9 Roof hatch

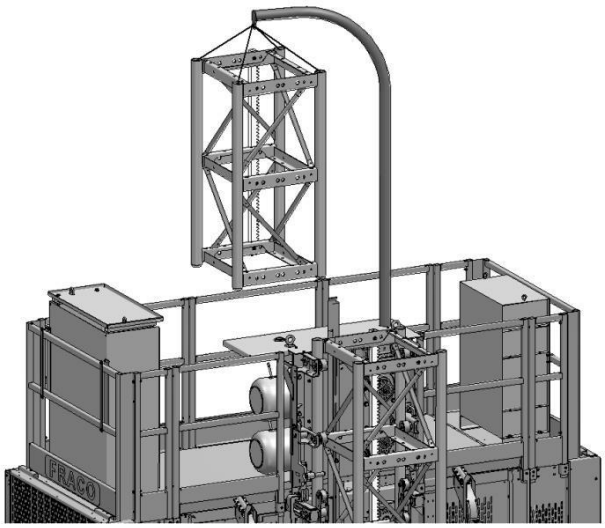
You can use the roof hatch to access the roof. Follow the panel next to the hatch for opening instructions.



4.7.10 Self erecting device

When assembling the masts, the approx. 420 lb (190 kg) mast sections can be lifted and assembled onto previously assembled mast sections using the self erecting device.

- Hang the self erecting device onto the top of the car strut
- Hook suspended cross beam onto the mast section.
- Wind up the mast section using the electrical winch.
- Swivel mast section to the mast and attach.
- Unhook suspended cross beam and wind off the mast.



NOTE:

If you are using an electric wrench, you can plug it into the power panel AS2.

5 Requirements for the installation site

5.1 Foundation requirements

- The foundation must be horizontal and have sufficient load bearing capacity.
- Depending on the assembly height, concrete or thick steel sheeting (for example) can be used as load distributing base supports.
- The size of the concrete pad depends on the installation (model, height number of car). Typically, a concrete pad should have a thickness of at least 12" (300mm).
- The size will vary from 13'-9" x 9'-10" (4.2 m x 3.0 m) à 18'-0" x 10'-0" (5.5 x 3.1 m) for single unit and 13'-9" x 15'-9" (4.2 m x 4.8 m) à 18'-0" x 16'-1" (5.5 x 4.9 m) for a double unit.
- The foundation should be above ground or be drained.
- If there is a risk of frost heave, the foundation must be isolated.
- All foundation specifications should be detailed in the installation engineering package.
- The total weight (see table) of the SEH and mast sections are transferred into the ground via the base unit support.

5.2 Point load with 26"x26" (650mm x 650mm) mast section

Assembly height	SEH 4500 single	SEH 4500 twin	SEH 6000 single	SEH 6000 twin	SEH 7000 single	SEH 7000 twin
50 ft (15 m)	34,000 lb (15 440 kg)	60,850 lb (27 660 kg)	38,600 lb (17 530 kg)	69,750 lb (31 690 kg)	43,300 lb (19 690 kg)	78,800 lb (35 800 kg)
100 ft (30 m)	39,500 lb (17 950 kg)	67,400 lb (30 640 kg)	44,100 lb (20 040 kg)	76,300 lb (34 670 kg)	48,900 lb (22 210 kg)	85,400 lb (38 810 kg)
150 ft (46 m)	45,000 lb (20 460 kg)	73,950 lb (33 610 kg)	49,600 lb (22 550 kg)	82,850 lb (37 650 kg)	54,450 lb (24 740 kg)	92,000 lb (41 820 kg)
200 ft (61 m)	50,550 lb (22 960 kg)	80,500 lb (36 590 kg)	55,150 lb (25 050 kg)	89,400 lb (40 630 kg)	60,000 lb (27 270 kg)	98,650 lb (44 820 kg)
250 ft (76 m)	56,050 lb (25 470 kg)	87,050 lb (39 570 kg)	60,650 lb (27 560 kg)	95,950 lb (43 610 kg)	65,550 lb (29 800 kg)	105,250 lb (47 830 kg)
300 ft (91 m)	61,550 lb (27 980 kg)	93,600 lb (42 550 kg)	66,150 lb (30 070 kg)	102,500 lb (46 590 kg)	71,150 lb (32 330 kg)	111,850 lb (50 840 kg)
350 ft (107 m)	67,100 lb (30 480 kg)	100,150 lb (45 520 kg)	71,700 lb (32 570 kg)	109,050 lb (49 570 kg)	76,700 lb (34 860 kg)	118,500 lb (53 850 kg)
400 ft (122 m)	72,600 lb (32 990 kg)	106,700 lb (48 500 kg)	77,200 lb (35 080 kg)	115,650 lb (52 550 kg)	82,250 lb (37 390 kg)	125,100 lb (56 850 kg)
500 ft (152 m)	83,600 lb (38 000 kg)	119,800 lb (54 450 kg)	88,200 lb (40 090 kg)	128,750 lb (58 510 kg)	93,400 lb (42 440 kg)	138,300 lb (62 870 kg)
600 ft (183 m)	94,650 lb (43 010 kg)	132,900 lb (60 410 kg)	99,250 lb (45 110 kg)	141,850 lb (64 470 kg)	104,500 lb (47 500 kg)	151,550 lb (68 880 kg)
700 ft (213 m)	105,650 lb (48 030 kg)	146,000 lb (66 360 kg)	110,300 lb (50 120 kg)	154,950 lb (70 430 kg)	115,650 lb (52 560 kg)	164,800 lb (74 900 kg)
800 ft (244 m)	116,700 lb (53 040 kg)	159,100 lb (72 320 kg)	121,300 lb (55 140 kg)	168,050 lb (76 390 kg)	126,750 lb (57 610 kg)	178,000 lb (80 910 kg)
1,000 ft (305 m)	138,750 lb (63 070 kg)	185,300 lb (84 230 kg)	143,350 lb (65 160 kg)	194,300 lb (88 310 kg)	149,000 lb (67 730 kg)	204,500 lb (92 940 kg)
1,300 ft (396 m)	171,850 lb (78 100 kg)	224,600 lb (102 090 kg)	176,450 lb (80 200 kg)	233,650 lb (106 190 kg)	182,400 lb (82 900 kg)	244,200 lb (110 980 kg)

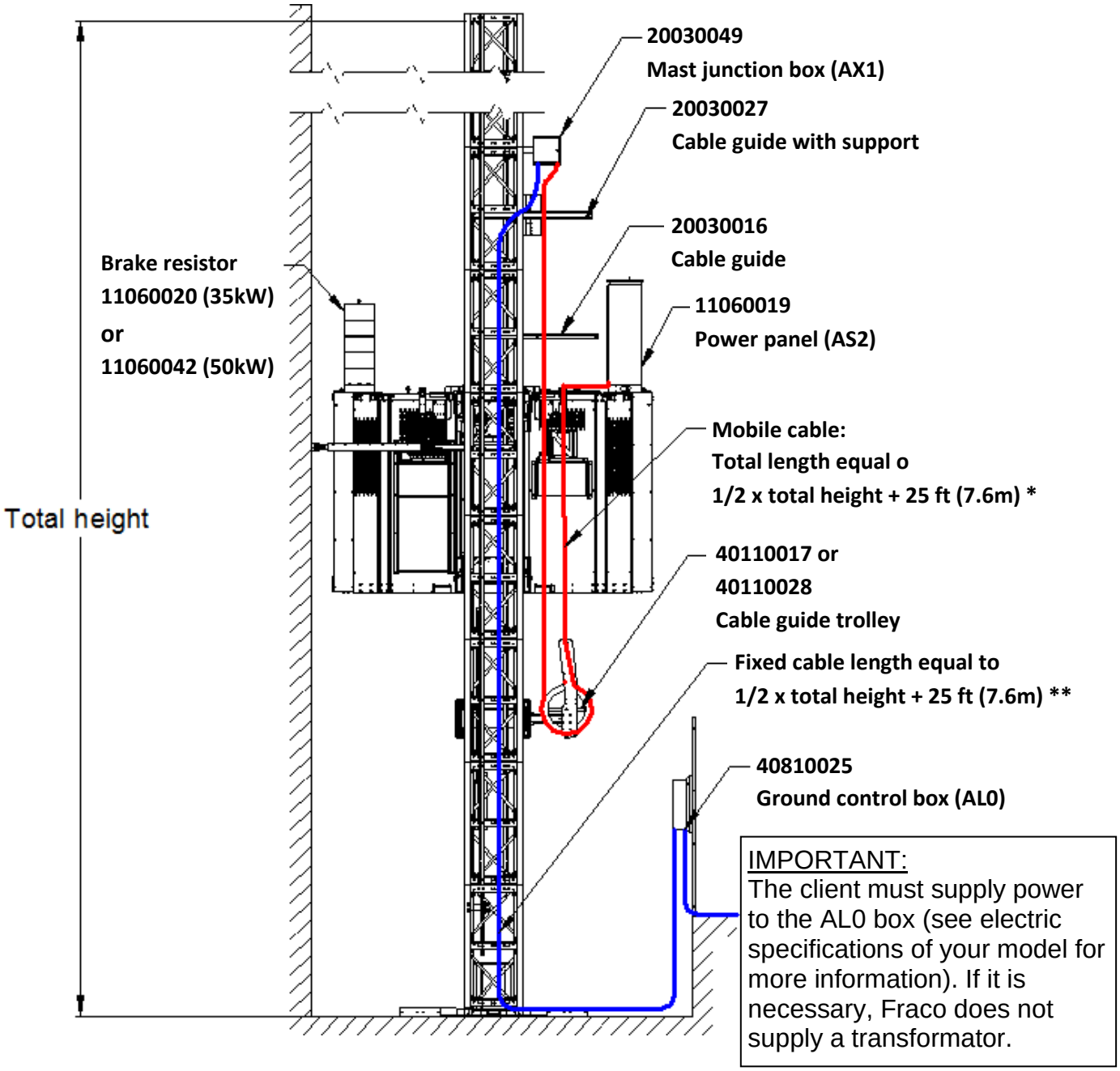
5.3 Point load with 26"x36" (650mm x 900mm) mast section

Assembly height	SEH 4500 single	SEH 4500 twin	SEH 6000 single	SEH 6000 twin	SEH 7000 single	SEH 7000 twin
50 ft (15 m)	46,450 lb (21 120 kg)	84,400 lb, (38 370 kg)	52,000 lb (23 640 kg)	95,350 lb (43 340 kg)	58,700 lb (26 680 kg)	108,350 lb (49 250 kg)
100 ft (30 m)	53,400 lb (24 270 kg)	92,550 lb (42 070 kg)	58,950 lb (26 800 kg)	103,500 lb (47 040 kg)	65,700 lb (29 860 kg)	116,550 lb (52 980 kg)
150 ft (46 m)	60,350 lb (27 430 kg)	100,700 lb (45 770 kg)	65,900 lb (29 950 kg)	111,650 lb (50 740 kg)	72,700 lb (33 050 kg)	124,750 lb (56 710 kg)
200 ft (61 m)	67,300 lb (30 590 kg)	108,850 lb (49 470 kg)	72,850 lb (33 110 kg)	119,800 lb (54 450 kg)	79,700 lb (36 230 kg)	132,950 lb (60 430 kg)
250 ft (76 m)	74,250 lb (33 750 kg)	117,000 lb (53 170 kg)	79,800 lb (36 260 kg)	127,950 lb (58 150 kg)	86,700 lb (39 410 kg)	141,150 lb (64 160 kg)
300 ft (91 m)	81,200 lb (36 900 kg)	125,150 lb (56 880 kg)	86,750 lb (39 420 kg)	136,100 lb (61 850 kg)	93,700 lb (42 590 kg)	149,350 lb (67 880 kg)
350 ft (107 m)	88,150 lb (40 060 kg)	133,300 lb (60 580 kg)	93,700 lb (42 580 kg)	144,250 lb (65 560 kg)	100,700 lb (45 780 kg)	157,550 lb (71 610 kg)
400 ft (122 m)	95,100 lb (43 220 kg)	141,450 lb (64 280 kg)	100,650 lb (45 730 kg)	152,400 lb (69 260 kg)	107,700 lb (48 960 kg)	165,750 lb (75 340 kg)
500 ft (152 m)	109,000 lb (49 530 kg)	157,700 lb (71 680 kg)	114,500 lb (52 050 kg)	168,700 lb (76 670 kg)	121,750 lb (55 320 kg)	182,150 lb (82 790 kg)
600 ft (183 m)	122,850 lb (55 850 kg)	174,000 lb (79 090 kg)	128,400 lb (58 360 kg)	184,950 lb (84 070 kg)	135,750 lb (61 690 kg)	198,550 lb (90 240 kg)
700 ft (213 m)	136,750 lb (62 160 kg)	190,300 lb (86 490 kg)	142,300 lb (64 670 kg)	201,250 lb (91 480 kg)	149,750 lb (68 050 kg)	214,950 lb (97 700 kg)
800 ft (244 m)	150,650 lb (68 470 kg)	206,600 lb (93 900 kg)	156,200 lb (70 980 kg)	217,550 lb (98 880 kg)	163,750 lb (74 420 kg)	231,350 lb (105 150 kg)
1,000 ft (305 m)	178,450 lb (81 100 kg)	239,150 lb (10 8700 kg)	183,950 lb (83 610 kg)	250,150 lb (113 700 kg)	191,750 lb (87 150 kg)	264,150 lb (120 050 kg)
1,300 ft (396 m)	220,100 lb (100 050 kg)	288,050 lb (130 920 kg)	225,600 lb (10 2550 kg)	299,050 lb (135 920 kg)	233,750 lb (106 240 kg)	313,300 lb (142 410 kg)

ATTENTION!

Always refer to the engineering package for specific tie loads to the structure.
The point loads calculus include a safety factor of 1.5 and a dynamic factor on all moving parts.

5.4 Electrical connection (on site)



* Mobile cable must be type ***DRAKA INDUSTRITE, 4 strands*** (Strands dimension depend on model). **Any other type of cable must be approved by Fraco to be used.**
** No special requirement for cable type.

6 Transport

Have the hoist transported by experienced and competent personel.

6.1 Inspection on reception of the hoist shipping

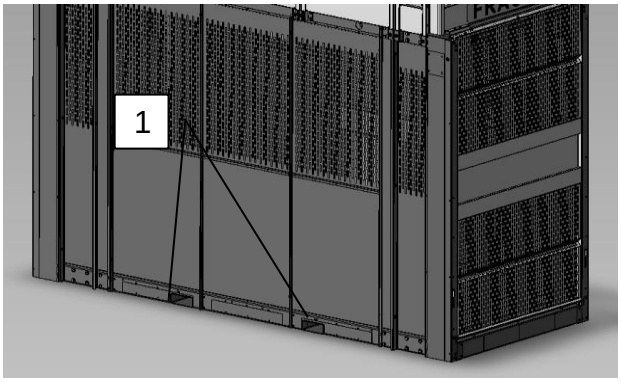
- Check the shipment for transport damage and for completeness according to your order.
- Immediately notify the carrier (Haulage Company) and dealer if there is any transport damage or missing component.

6.2 Loading and unloading the machine

The machine sections/components are loaded and unloaded using a forklift truck or a crane.

6.2.1 Lifting with a forklift truck

- Forklift take-up points *(1)* are on the base frame section of the car.

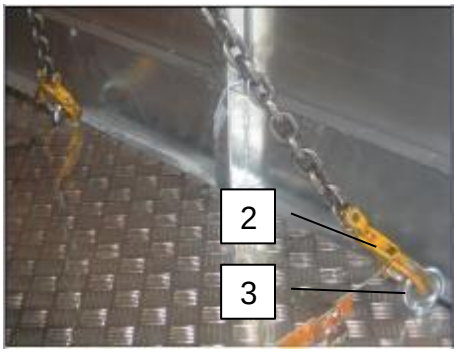


ATTENTION

Forklift tines must be the right length and width or corresponding base supports must be provided.

6.2.2 Lifting with a crane

- Guide crane hook with chain suspension.
- Hang chain suspension *(2)* to the four (4) crane lugs *(3)*. (Crane lugs are located at all four (4) corners of the car's base assembly on the roof)
- Raise car.



7 Operation

7.1 Safety notes

The hoist may only be operated by a competent person appointed by the contractor. This person must be familiar with the operating instructions, have sufficient experience, and must be instructed in the hazards involved in working with the hoist.

- There **must never be** anyone standing under the hoist.
- There **must never be** objects stored in the delimited off area or under the hoist.
- The hoist must be operated from outside the danger zone.
- Secure the machine thoroughly against unauthorized access! After working hours or during breaks, turn the control panel (AS3) operation key to OFF position, remove it. If required, secure with padlock (see local regulation).
- ***ATTENTION Never turn the main switches (480V) off unless it is required!*** Heating elements are present to keep electrical parts warm at all time, turning off the main switches will drain the backup battery.
- If the loaded car stops during operation due to a malfunction, operating personnel must empty the car. Never leave a loaded car unattended!
- Operation of the hoist must be stopped if:
  - Wind speeds exceed 45 mi/h (72 km/h, 20 m/sec)
  - Temperatures fall below –20°C.
  - There is damage or any other faults.
  - Recurring inspections have been missed (see section 2.3.1).
- Always respect the data sign indicating the maximum number of passengers and the maximum load allowed in the car. The weight of all passenger's present must be deducted from the maximum allowed load.

7.1.1 Rule for accompanying persons

- Comply with the instructions of the operating personnel.
- Do not step over material that is being transported as well.

7.1.2 Rules for personnel working at ground level

- **No persons may** stand under the machine.
- Store material at a safety distance of min. 20 in (50 cm) from moving parts of the car.
- No objects may be stored in the delimited off area or under the car.

7.1.3 Rules for loading and unloading the car

- Fall protection must be provided at loading points from a fall height of 10 ft (3.0 m) (confirm with local regulation) to prevent persons from falling. (Assemble landing level safety gate.)
- Double doors on landing level safety gates can only be opened if the car is stationary at a landing level.
- The car must always be loaded in such a way that the access points for loading and unloading and the control unit are kept clear.
- The loads must be evenly distributed in the car.
- Position the loads securely. Any material that could slip or fall must be secured.

7.2 Safety inspection

Before start of work:

- Carry out a test run with an empty car.
- Check if there are any obstacles along the path of the car, over the entire mast travel length.

The car will stop immediately if:

- An EMERGENCY STOP button is pressed.
  ∞REFER TO SECTION 7.6 SHUTTING DOWN IN AN EMERGENCY, ON PAGE 36
- A landing gate is open.
- The extreme HI or extreme LOW limit switch is actuated.
- The car has reached the mast end.
- The buffer limit switches are actuated.
- The safety brake is engaged.
- The roof hatch is opened.
- The ground fault protection is activated.

The car will not start if:

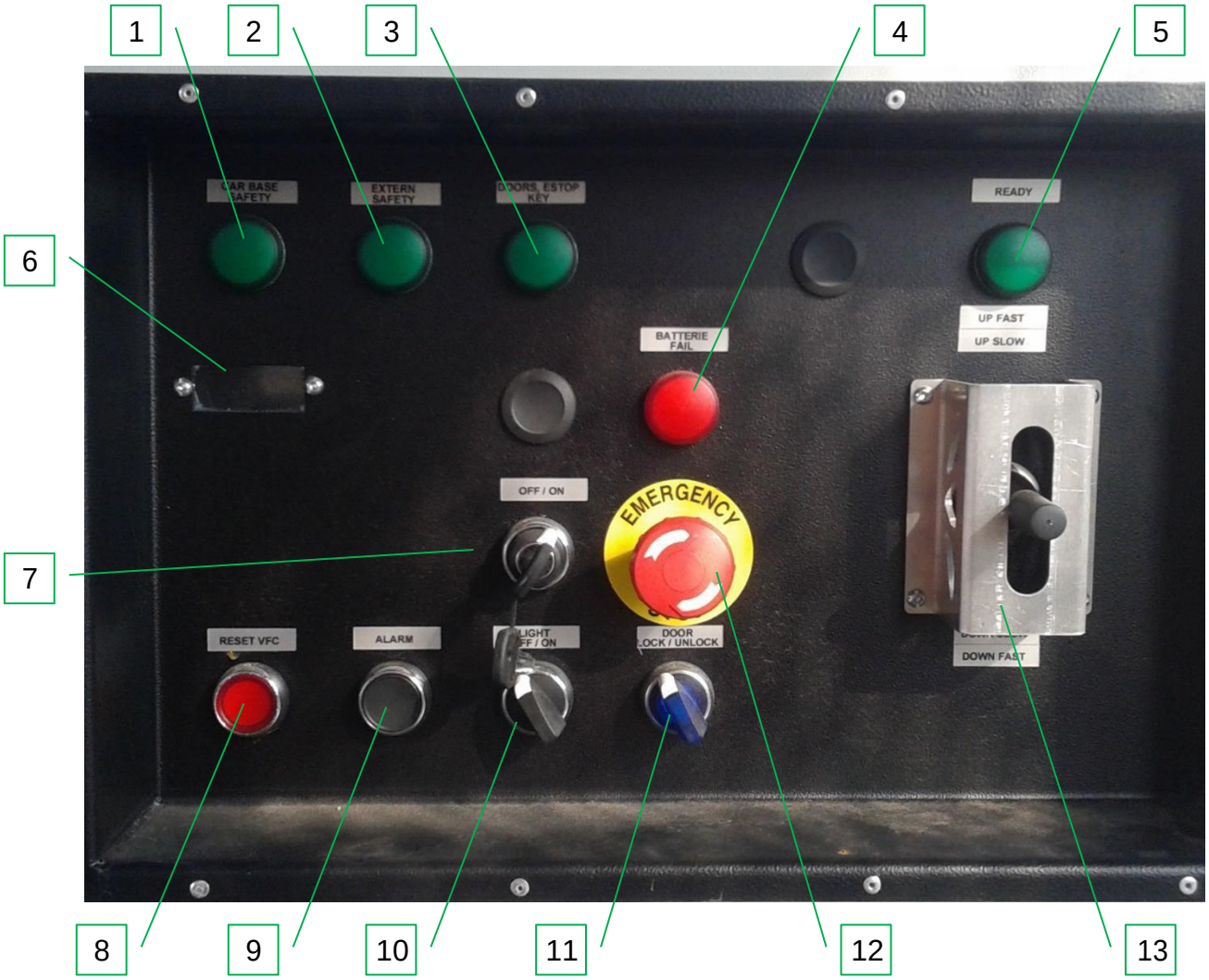
- It is overloaded (warning light on car control is flashing). (Optional)
- A sliding gate or door is open, or closed but not locked.
- The over speed limit switch of the safety brake has triggered.
- An EMERGENCY STOP button is pressed.
- A landing gate is open.
- The extreme HI or extreme LOW limit switch is actuated.
- The car has reached the mast end.
- The buffer limit switches are actuated.
- The safety brake is engaged.
- The roof hatch is opened.
- The ground fault protection is activated.
- There is a drive fault (Button Reset AC drive is lighted).

A sliding door may only be opened if:

- The car is on the ground or stationary at a landing level.

7.3 Controls

7.3.1 Operator's control panel (AS3)



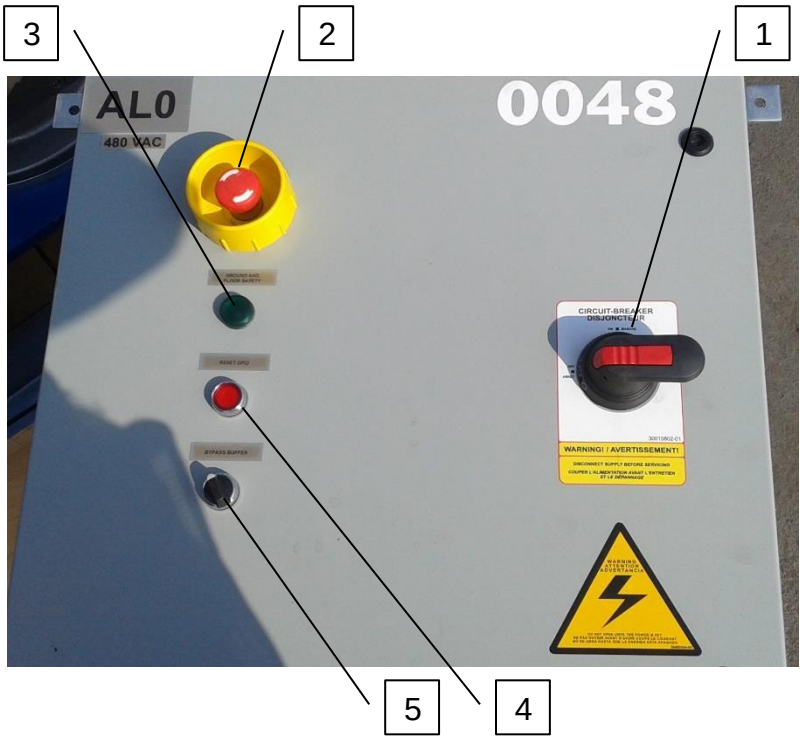
1 = Car base safety lights
2 = Extern safety light
3 = Door E-Stop key light
4 = Emergency Battery fail light
5 = READY light
6 = Weight overload (Optional)
7 = Operation key switch ON/OFF
8 = Reset VFC
9 = Sound Alarm
10 = Light switch
11 = Door lock release
12 = Emergency Stop
13 = Manual operator control (Joystick)*

*The joystick has five positions

1.UP Fast **2.**UP Slow
3.Center (Neutral)
4.DOWN Fast **5.**DOWN Slow

7.3.2 Ground control box (AL0) (Front view)

1 = 480V main breaker.
2 = Emergency stop.
3 = Ground and floor safety light.
4 = Reset ground fault protection.
5 = Buffer bypass switch.



7.4 Ascending / Descending

Before moving the car

- Verify that the main breakers are set to ON position (480V).
- Enter the car.
- Close and lock the doors. Lock the door using the door control selector switch.
- Wait until the green ready light on the car control panel is lighted up.
- The car is ready to ascend et descend.

Ascent

- Push the joystick upwards to " UP FAST" position.
- The car moves at full speed for as long as the joystick is pressed in " UP FAST" position.
- To stop at the next landing, the joystick must be relocated to "UP SLOW" position. Then the car will decrease in speed to slow down. At the landing level, the joystick must be relocated to the center "NEUTRAL" position. Then the car stops.

Descent

- Push the joystick downwards to "DOWN FAST" position.
- The car moves at full speed for as long as the joystick is pressed in "DOWN FAST" position.
- To stop at the next landing, the joystick must be relocated to "DOWN SLOW" location. Then the car will decrease in speed to slow down. At the landing level the joystick must be relocated to the centre "NEUTRAL" position. Then the car stops.

NOTE
The car will automatically slow down when arriving at the ground or top landing gates.

NOTE
When at ground or top landing, the unit can start traveling at "FAST" speed only when it is at the gate level. **If the unit is started at "SLOW" speed, it will not be able to go at "FAST" speed until it has cleared the BOTTOM or TOP limit switch cam!**

7.5 Opening the doors

The gates may only be opened if the car is stationary at a landing floor and if the door lock blue release switch has lighten up. i.e. when the car is in front of the sliding gate or the base enclosure barrier or in front of a landing level safety gate.

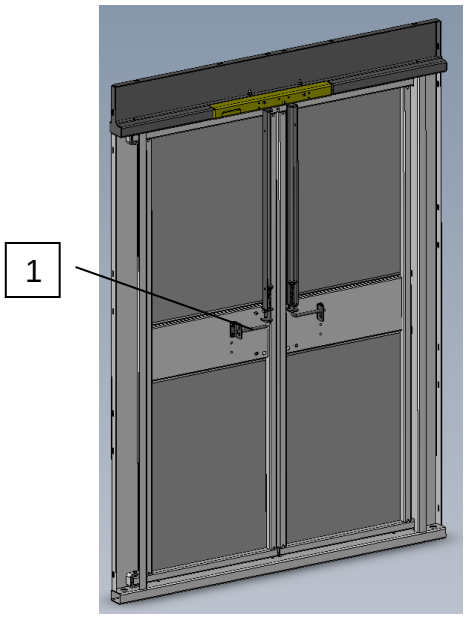
7.5.1 Base enclosure doors

From the inside:

- Pull down both door handles ***(1)***.
- Push the doors to open.

From the outside:

- Use the universal T-tool to unlock the base enclosure. (Only available to authorised personnel for maintenance purpose)

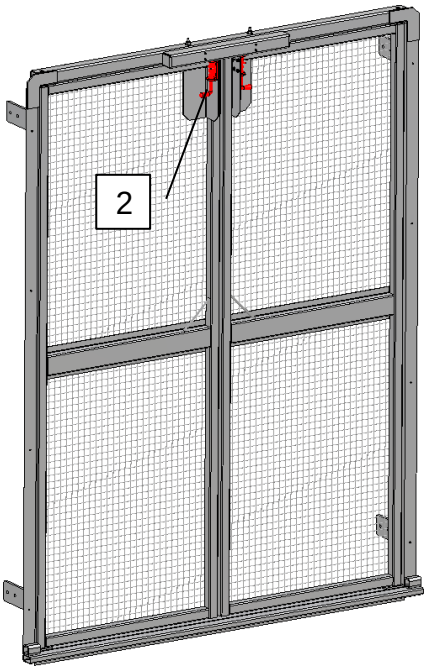


7.5.2 Landing gates

From the car:

- Pull down both door handles ***(2)***.
- Push the doors to open.

The landing gates cannot be opened from the building side.



7.5.3 Sliding gate

In normal operation, the sliding door can be unlocked from the inside only:

- Check that the blue door control selector ***(1)*** on the car control panel has lighten up.
- Turn the blue door control selector ***(1)*** to "UNLOCKED" position.
- Using the central handle grip ***(2)*** push the sliding gate up until it stops.

After closing the door again, you must turn the blue door control selector ***(1)*** to "LOCKED" positon again. **The car will not move if the door is not locked!**

ATTENTION!

Never if leaving the car with the blue door control selector ***(1)*** set to “locked” position! The door will lock itself when it closes. Be careful not to lock yourself out of the unit!

NOTE

In case of power failure, the door can still be unlocked with the door lock release switch at a landing level, if the battery is still active. It can also be manually opened trough the interlock keyway using the T-tool.

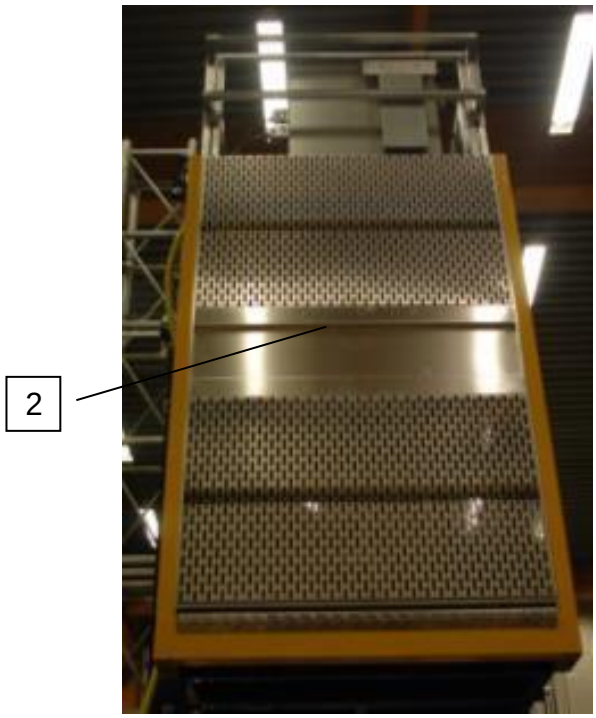
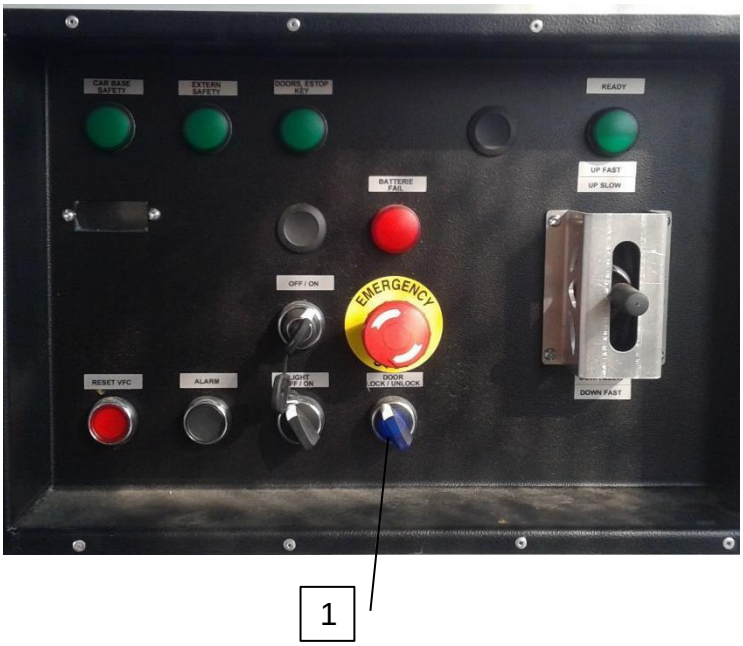


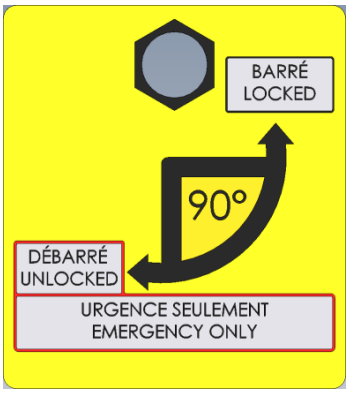
FIG. 2 - SIDES SLIDDING DOORS (A & B)

FIG. 1 - OPERATION PANEL (INSIDE THE CAGE)

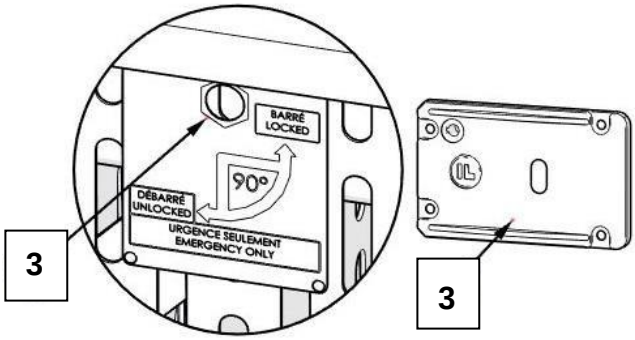


7.5.4 Manual opening

The sliding gate can be manually opened from outside the car, using the universal T-tool on the door interlock as indicated on the door instruction panel ***(3)***



ATTENTION!
After opening the door, you must turn the door interlock back to locked position.

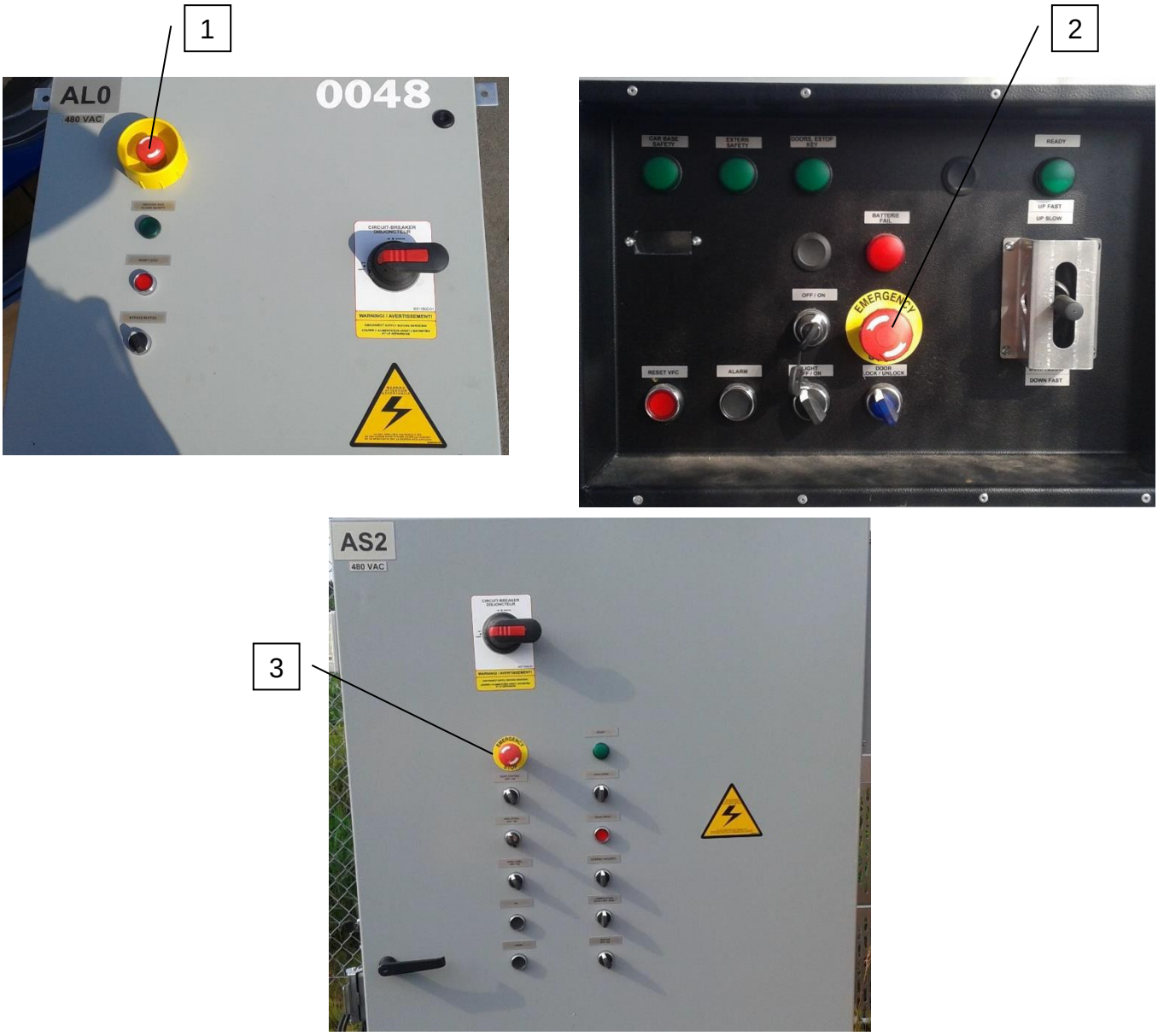


7.5.5 Arriving at a level with the car

- Unlock the car sliding gate and open it
- Unlock and open the landing gates. Turn the blue door control selector to "UNLOCKED" position.
- Load car with tools and/or materials and/or passengers.
- Close the landing gate and lock it.
- Close the car sliding door and lock it. Turn the blue door control selector to "LOCKED" positon.
- Now the car is ready to travel.

7.6 Shutting down in an emergency

- In situations that present a risk for the operating personnel or the hoist stop the car by pressing the EMERGENCY STOP button.
- An EMERGENCY STOP button is located on:
  - the ground control box (AL0) ***(1)***
  - the car control panel (AS3) ***(2)***
  - the roof power panel (AS2) ***(3)***



NOTE
EMERGENCY STOP buttons are equipped with a latching mechanism and remain active until they are manually unlocked again (turn red button to the right and pull it back).

7.7 Work interruption - end of work

- Lower the car to the ground using the joystick and unload.
- Turn the key switch on the car control to OFF *(1)*.
  Important! The operator must remove the key from its socket.
- If required, secure with padlock (see local regulation).

NOTE
Never turn the main switches (480V) off unless it is required! Heating elements are present to keep electrical parts warm at all time, turning off the main switches will drain the back up battery.

If the main switch must be turned off (during maintenance, emergencies, etc), you must also turn off the UPS inside the roof control panel (AS2). **If the UPS is kept activated, some electrical components will still be activated (live current)!** This is also true during a power outage.

8 Fault – cause and remedy

Faults may only be remedied by qualified personel! Before each troubleshooting session, move the car down and unload if possible!

Shut off the main switch and pull out the mains plug before working on the hoist's electrical system. Cease operation immediately if faults occur that endanger operational safety!

Check the following if there are faults:

- Mains supply plugged in?
- Is the main switch on the base enclosure turned ON?
- Is the key switch on the ground control turned ON?
- Fuses in building site ground box?
- Correct state of the extension cable?
- Are the EMERGENCY STOP buttons set in the unlocked position at the control points?
- Are the cars sliding gates closed?
- Is the emergency limit switch activated?
- Run too low or too high along the mast length?
- Are the up and down limit switches functioning properly?
- Has the over speed safety brake engaged (SEE SECTION 8.2 FOR RELEASE)?
- Check automatic circuit breaker in the switch box on the base enclosure.
- Is the key switch on the car control system set correctly for the desired operation mode?
- Is the red indicator light lit on the car control (car overloaded)?

NOTE:
If the brake resistance temperature become to high, the car may no longer ascend or descend.

Pull out the mains plug first before opening the switch box!

Motor is not giving full output:

- Drop in voltage of more than 10 % of the nominal voltage.
- Supply cable with a larger wire cross section may be needed.
- When overloaded, the integrated thermo-switch turns off the control current. A fast flashing indicator light on the car control warns against excess temperature on the drive motors. Work can continue after a cooling period (suggested to reduce load). Only if the optional overload device is on the elevator.

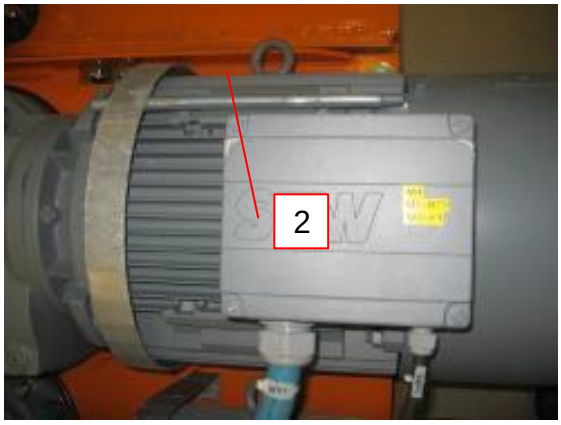
ATTENTION!
Repeated overheating/overloading must be avoided as otherwise the service life of the drive motor and motor brake are drastically reduced.

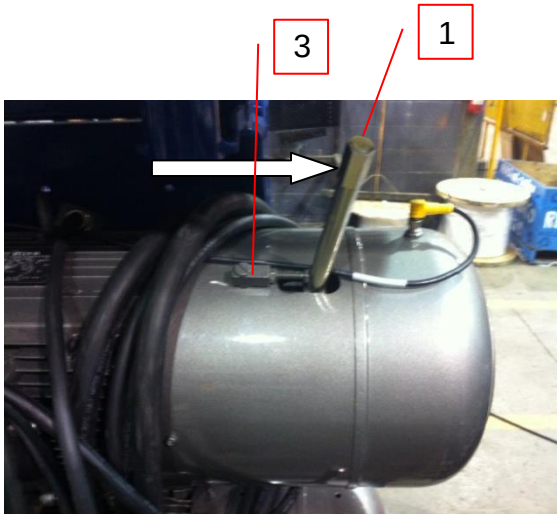
8.1 Possible faults during operation

8.1.1 Control system failure (Emergency Descent Procedure)

In this case, the car must be lowered to the next landing by using the emergency lowering system.

- Climb up on the roof and connect every emergency lowering levers ***(1)*** in to the threaded holes ***(2)*** of the drive unit brakes.
- Push one (1) lever in the maximum position and lock it in place ***(3)***, but make sure to keep one (1) lever lowered.
    - If you have three (3) motors, you can place two (2) levers in maximum position and lock them in place.
- Push the remaining lever **gently**, to allow the car to decent slowly to the nearest landing.
- Use the universal T-Tool to open the door locks on the car and the landing gates.
- Leave the car and call the authorized service personnel.
- For two (2) or three (3) motors applications it is necessary to release the locking pin ***(3)*** and use the brake release handle to disengage the motor brake.





ATTENTION

The brake release lever must never be used to lower the car during operation. It is intended for **<u>emergency use in only</u>**.

8.1.2 Car has ascended too high

The emergency limit switch of the car may reach the "UPPER EMERGENCY " limit switch cam if:

- The "UP" limit cam or switch is adjusted incorrectly.
- There is a fault in the electrical system.

Measures:

- Activate the "EXTREME" bypass switch on the operator's panel (AS3).
- Push the manual operator control (joystick) down on the car control (AS3).
- Now the car moves out of the "UPPER EMERGENCY" position.

8.1.3 Car has descended too low

The emergency limit switch of the car may reach the "LOWER EMERGENCY" limit switch cam if:

- The brakes' air gap is too large.
- The "DOWN" proximity switch is defective.
- There is a fault in the electrical system.
- The car is overloaded.

Measures:

- Activate the "EXTREME" bypass switch on the operator's panel (AS3).
- Push the manual operator control (joystick) up on the car control.
- Now the car moves out of the "LOWER EMERGENCY" position.

8.1.4 Overload warning device has been triggered (Optional only)

The hoist is equipped with an overload warning device which prevents the car from starting off when it is overloaded. If the car is overloaded, a red indicator light lights up on the car control (AS3).

IMPORTANT

If the indicator light is lit, reduce the load in the car until the indicator light goes out. Only then, will it be possible to start and move the car.

NOTE

For more information's about the overload protection see the overload protection device manual.

8.2 Over speed safety brake has been triggered

The hoist is equipped with an over speed safety brake that brakes the car downward travel if it is travelling too fast. Once the over speed safety brake has been triggered the machine will stop completely and movement will be render impossible!

Firstly, all persons must leave the car. Determine why the over speed safety brake has engaged, secure the car and repair damage before releasing the over speed safety brake!

NOTE

For more information about the over speed safety brake see the over speed safety brake manual.

ATTENTION!

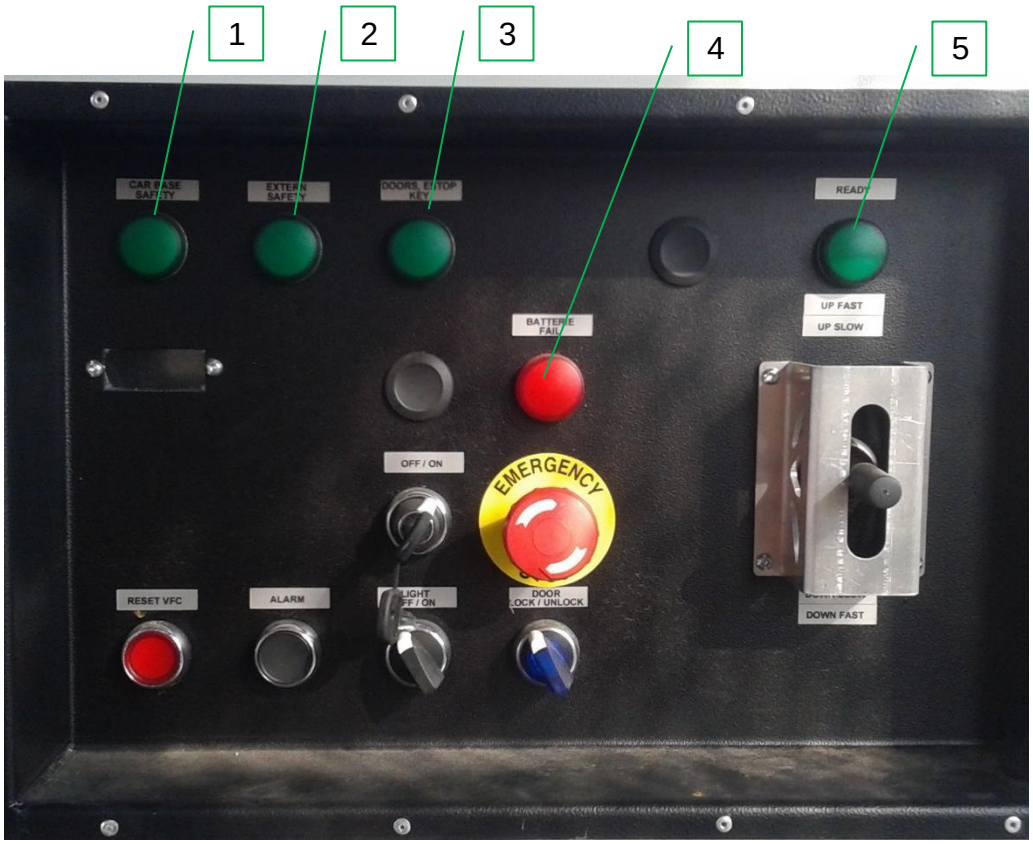
Check the over speed safety brake for damage, establish cause of over speed braking and remedy. The over speed safety brake must be checked by a qualified person.

Downwards movement is mechanically blocked by the over speed safety brake and may only be conducted again after a brief ascent!

8.3 Status light troubleshooting guide

If one of the status light lights up, follow the corresponding procedure.

1 = Car base safety
2 = Extern safety
3 = Door, E-Stop and key light
4 = Emergency Battery fail light
5 = READY light

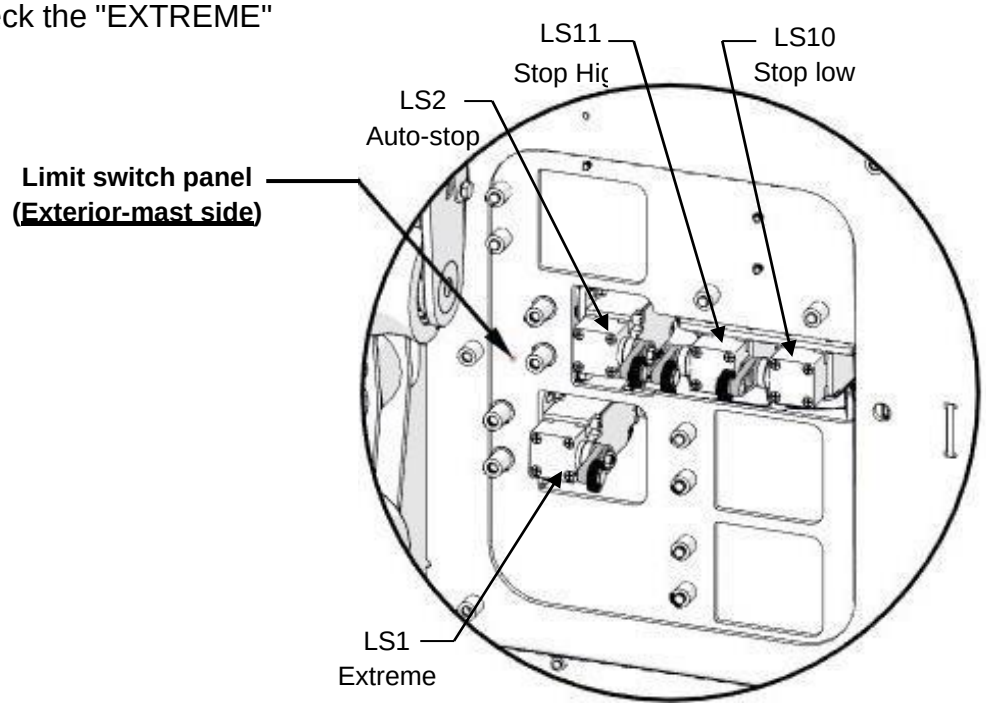


8.3.1 Base safety

- Check main alimentation "F1" and "F3" in ground panel.
- Check all door lock enclosure for each floor.
- Check hydraulic buffer switch.
- Check ground panel "bypass key" if hydraulic is not engaged.
- Check the following points in the frequency inverter control panel:
  - Circuit breaker "F5".
  - Main breaker "QS1".
  - Circuit breaker "F4".
  - If two LED are light up on phase monitor.
  - E-Stop on frequency inverter panel.
  - Overload relay release button.
  - "Bypass plug" or maintenance remote control connection.

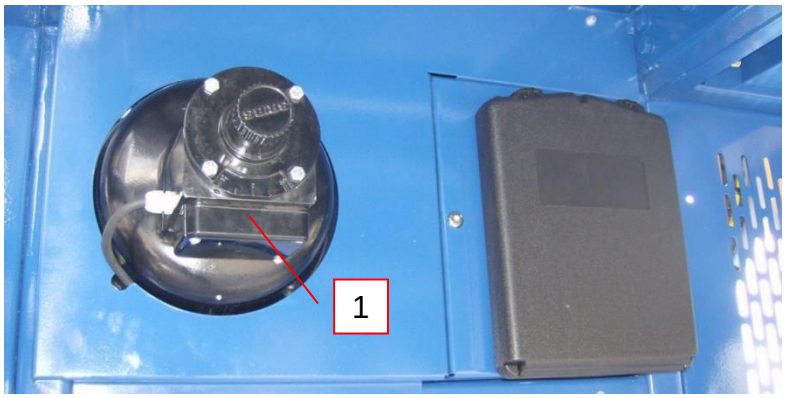
8.3.2 "TOP" and "BOTTOM" safety limit switch

- Open the limit switch panel in the cabin and check the "EXTREME" limit switch.



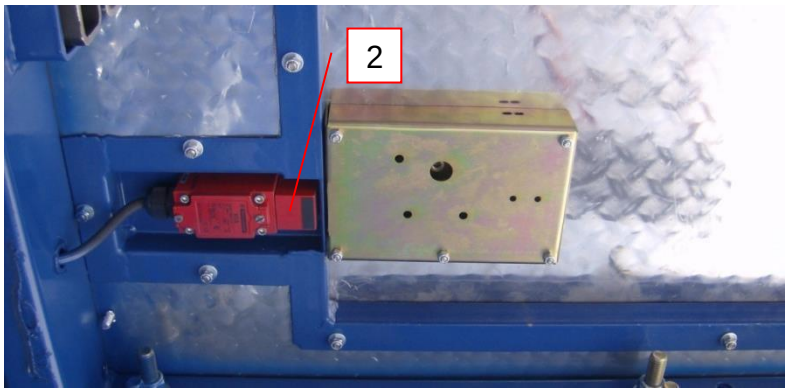
8.3.3 Safety brake device and roof switch

- Check the safety device limit switch *(1)* under the protection cap.



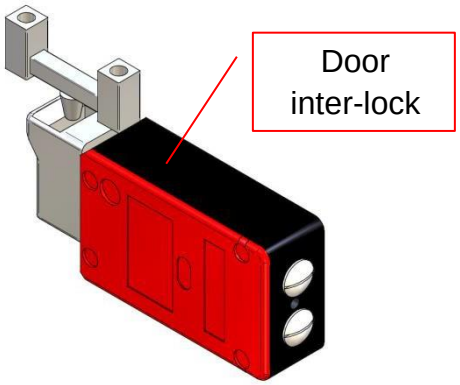
ATTENTION!
Only a certified technician should adjust the safety device limit switch.

- Check the roof switch *(2)*. Make sure the access panel is properly closed and locked.



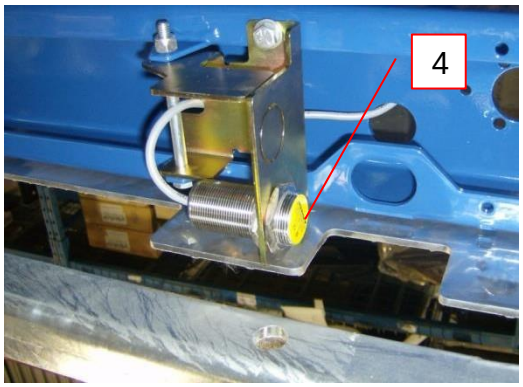
8.3.4 Door lock sides "A" & "B"

- On control panel (AS3) if the door selector light is not turned ON, make sure those two doors are closed and that the door selector is in the proper position.



8.3.5 Cabin E-Stop and proximity switch

- Check the cabin E-Stop button *(3)*
- Check the proximity switch's *(4)* adjustment



9 Maintenance

Maintenance work may only be carried out by qualified personnel. Dispose of lubricants and replacement parts in an environmentally friendly way.

Report immediately any resolved changes or faults to the manufacturer or its authorized representative. If necessary, shutdown and secure the hoist immediately.

9.1 Working under the cage

It is possible to work under the cage only if the cage is secured against spontaneous movement and falling. Use a "Maintenance Safety Bracket" *(6)* fitted to the rack to ensure this. Minimum clearance under the cage (under its lowest point) must be at least 6.6ft (2 m).
Important! Never enter the space under the cage if it is not secured!

Ground control box (AL0)

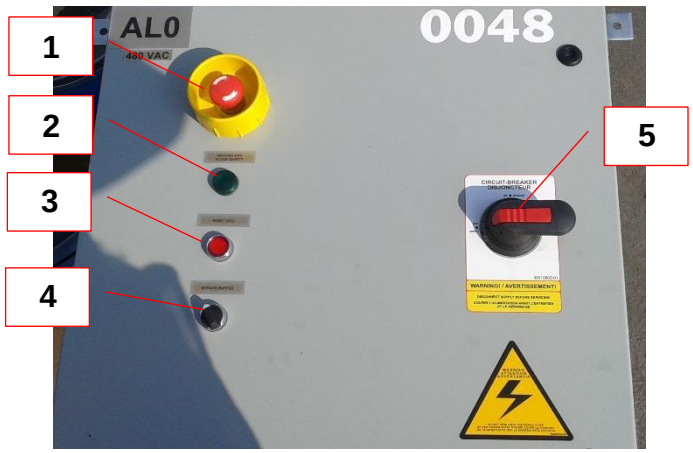
1 = Emergency Stop button

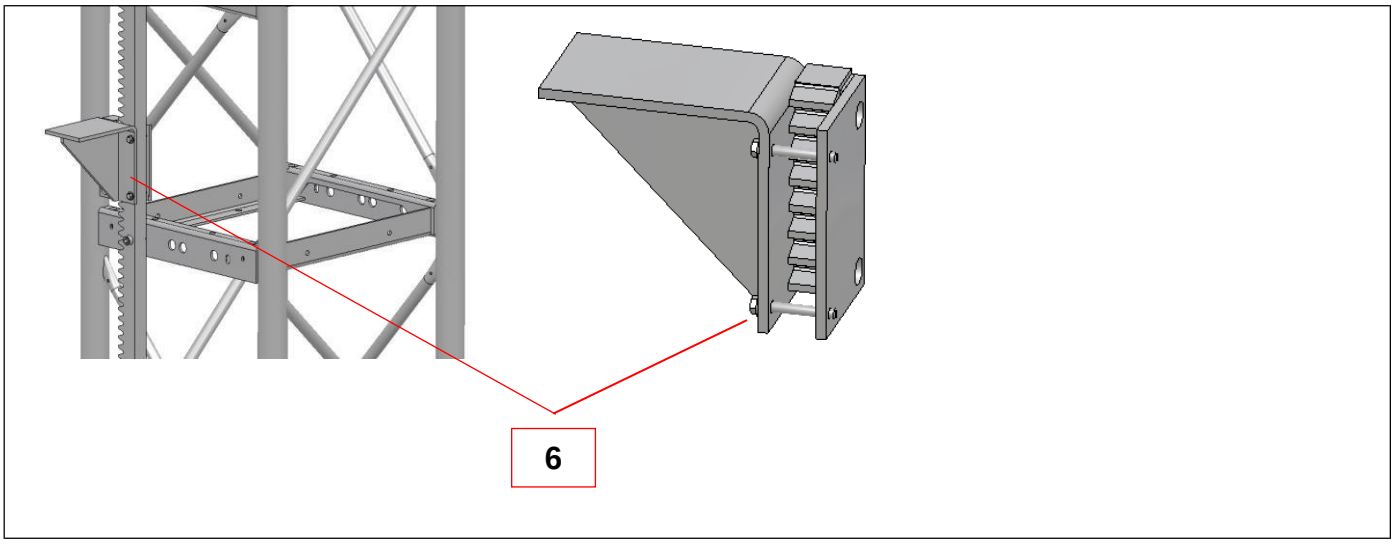
2 = Ground and floor protection light

3 = Reset ground fault protection button

4 = Bypass buffer switch

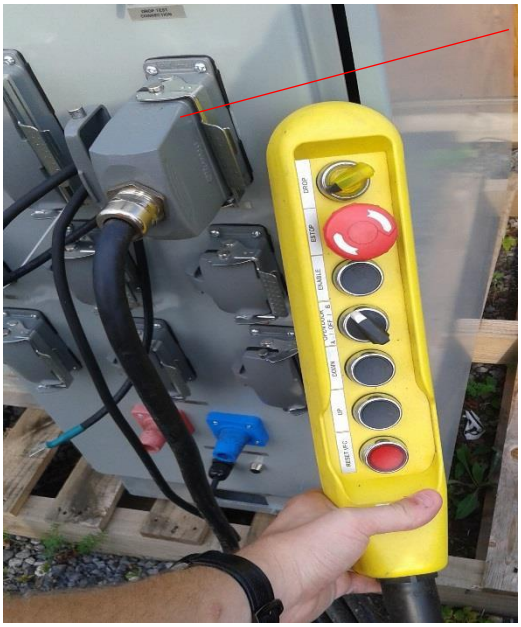
5 = Main switch (480V)





9.1.1 Procedure (for SEH single hoist)

1) Connect the *"Universal* remote control*"* in the power panel (AS2) drop test bypass port ***(1)***.
2) Turn ON the "SERVICE" key switch on the power panel (AS2).
3) Raise the car with the *"Universal* remote control*"* until the cage floor is 7'-5" (2.25 m) above the foundation slab, and respects the minimal clearance for the "Maintenance Safety Bracket". ***REFER TO SECTION 10 DROP TEST PROCEDURE, ON PAGE 51*** for universal remote control instruction.
4) Secure the hoist by turning OFF the main switch on the ground box (AL0). Perform a lock out procedure to prevent anyone from turning the main switch ON, install warning signs if necessary.
5) Install the "**Maintenance Safety Bracket**" (***SEE PREVIOUS PAGE***). The bracket must be installed above the mast horizontal member right under the car. The gap between the car and the bracket must be less than 1" (25 mm).
6) Perform maintenance work.
7) Remove the "**Maintenance Safety Bracket**" (***SEE PREVIOUS PAGE***) and leave the space under the car.
8) Unlock the main switch and turn it back ON.
9) Lower the car to the ground, remove warning sign if necessary.
10) Disconnect the *"Universal* remote control*"* and turn the "SERVICE" key switch to OFF position.



Universal remote

Do not forget to remove the "Maintenance Safety Bracket" after completion of the work under the cage!

NOTE

When working under the cage of the Fraco SEH, the personnel safety must be ensured in the same way specified above.

9.1.2 Procedure (for SEH twin hoist)

1) Connect the *"Universal* remote control*"* in the power panel (AS2) drop test bypass port ***(1)*** on the first hoist.

2) Turn ON the "SERVICE" key switch on the power panel (AS2).

3) Raise the first car with the *"Universal* remote control*"* until the cage floor is 7'-5" (2.25 m) above the foundation slab, and respects the minimal clearance for the "Maintenance Safety Bracket". ***REFER TO SECTION 10 DROP TEST PROCEDURE, ON PAGE 51*** for universal remote control instruction.

4) Secure the first hoist by turning OFF the main switch on the ground box (AL0). Perform a lock out procedure to prevent anyone from turning the main switch ON, install warning signs if necessary.

5) Repeat step 1 to 4 for the second car.

6) Install the "**Maintenance Safety Bracket**" (***SEE PREVIOUS PAGE***) on both cars. The bracket must be installed above the mast horizontal member. The gap between the car and the bracket must be less than 1" (25 mm)

7) Perform maintenance work.

8) Remove both **"Maintenance safety bracket"** (***SEE PREVIOUS PAGE***) and leave the space under the cars.

9) Unlock the main switch of the first car and turn it back ON.

10) Lower the first car to the ground, remove warning sign if necessary.

11) Disconnect the *"Universal* remote control*"* and turn the "SERVICE" key switch to OFF position.

12) Repeat step 8 to 11 for the second car.

! WARNING !

During installation of the "Maintenance Safety Bracket" both cages must be secured against undesirable movement by turning OFF the main switch.

9.2 Daily cleaning

- Clean dirt off the hoist.
- Clean proximity switches (on the gear wheel cases of both drives) of grease and chips/shavings.
- Keep working area around the hoist clear and clean.

9.3 Daily checks

- Check visually to ensure that the full travel path of the car is clear along the mast.
- Complete and fill the daily inspection sheet.
- Carry out a test run with an empty car and check if;
    - The level and ground operating limit switches are functioning properly.
    - The sliding gate latching devices are functioning; it should not be possible to execute a lift movement with the sliding gate open.
    - The EMERGENCY STOP button works; if it is pressed, it should not be possible for the hoist to travel up or down.
    - The car stops when every landing door is opened.

NOTE
The gear rack must be greased more often in case of increased uses or multi-shift operations.

9.4 Monthly inspection/maintenance

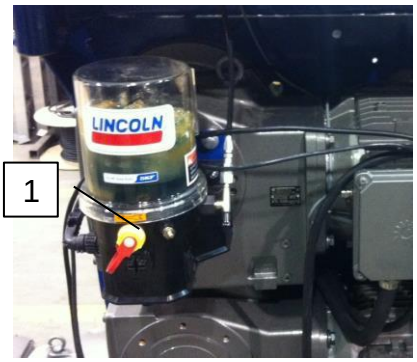
- Complete monthly inspection sheet.

9.5 Quarterly inspection/maintenance

- Are the notices/plates/stickers present and easily legible?
- Check auto-lubrication device (Optional):
  - The grease quantity in the container is enough for approx. 120 hours of normal operation. (The green indicator light on the car control flashes slowly if there is not enough grease.)
  - The grease container must be refilled before it becomes empty.
  - Filling quantity: 1.2 L

Filling the grease container

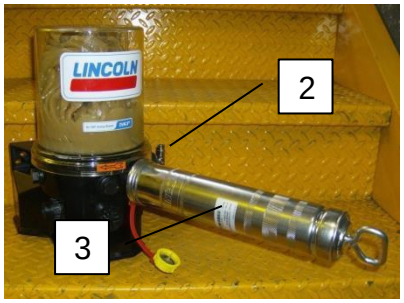
- Attach manual lever grease gun to the filling nipple ***(1)*** (on the underneath of the grease container) and pump grease into the container.
- Fill container up to the "MAX" mark.



ATTENTION!
Greases with solid lubricants are not suited to this pump.

Quick-filling with filling gun

- Unscrew the dust cap from the filling connection ***(2)*** to fill up and insert the neck of the filling gun ***(3)*** to the stop point in the filling connection ***(2)***.
- Fill container up to the "MAX" mark.



Venting the system

If the grease level switch is defective and the pump has run completely dry, it may be necessary to vent the system.

- Fill up pump via filling nipple until the grease is approx. 1.5“ (4 cm) over the "min. grease level" mark.
- Unscrew lubrication hose from the pump housing.
- Remove pump component or locking screw (M20 x 1.5) and keep open until the grease exits free of bubbles.
- Unscrew pump component or locking screw again.
- Trigger the lubricating impulse until bubble-free lubricant exits at the pump outlet.
- Connect lubrication hose again.

9.6 Annual servicing

- Check gear oil, fill up if necessary. Consult gear box manufacturer’s specifications for recommended oil type and application.
- Check that the gear rack is secures with a 197 Nm tightening torque.

9.7 Servicing every 3 years

The Fraco over speed safety brake may only be repaired or adjusted by the manufacturer's service technicians or his trained and authorized representatives.

The over speed safety brake has been type-tested and **must be replaced every 3 years** or checked by the manufacturer or an authorized representative of the manufacturer.

Change gear box SYNTHETIC OIL every three/four years.

9.8 Hoist lubrication

Lubrication diagram

Lubricating spots (callout-bubbles)	*Number of spots/unit*	*Lubricant type*	*Method*
Monthly (40 hours)			
1. Rack	-	grease	Coating/gun
2. Safety device bearings	1	grease	grease gun
3. Pinion bearings	2	grease	grease gun
Every 3 months (120 hours) – in addition to the above mentioned			
4. Output shaft bearings	2-3	grease	grease gun
5. Power unit guide rollers	8	grease	Needle tip MEC-2700
6. Mast guide rollers	16	*penetrating oil	*spray
Every year (480 hours) – in addition to the above mentioned			
7. Gearboxes	2-3	gear oil – see notice	refill

* - The rollers bearings are sealed and need no grease refilling. Clean shaft surface with a penetrative oil such as WD 40 (see red arrows) and test that the bearings move easily along their shaft. Replace rollers if bearings seals are broken, or if they don't meet the required mobility specified above. (See ***Figure 7***)

Gear oil recommendation and manufacturer:

- Mobil_____Glygoyle 200
- Aral_____Degol GS 220
- Shell_____Omala S4 WE 220
- BP_____Enersyn SG-XP 220

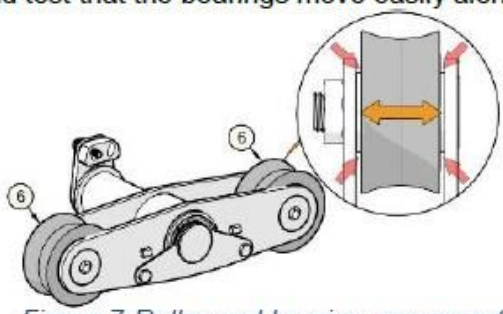


Figure 7-Roller and bearing movement

Note

Lubrication diagram can be found inside the car on Maintenance & inspection stickers.
* . . . grease specification – see Safety device technical data 98030763.

Maintenance work may only be carried out by trained and qualified personnel because they need special expert knowledge and special abilities. Neither are communicated in this operation manual.

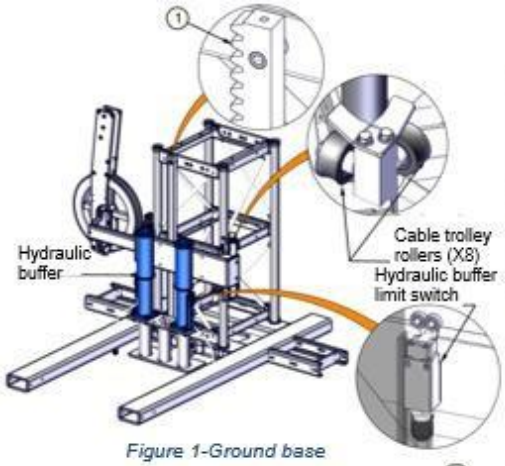


Figure 1-Ground base

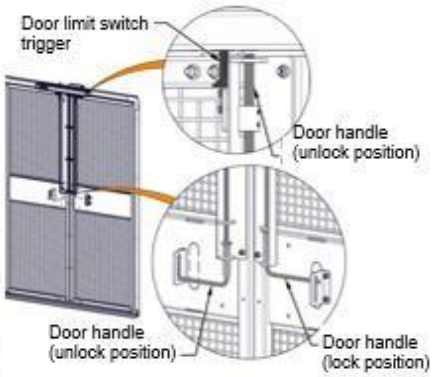


Figure 2-Landing gate

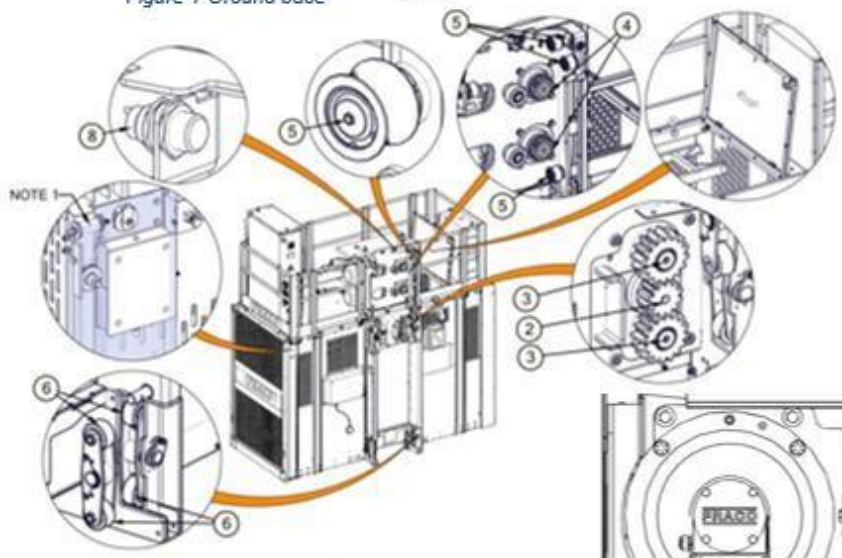


Figure 3-Hoist

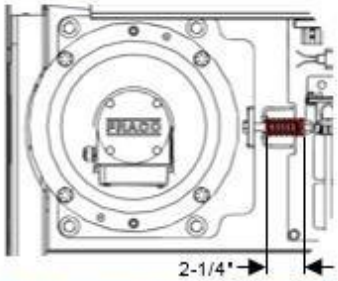


Figure 4-Safety device preload spring

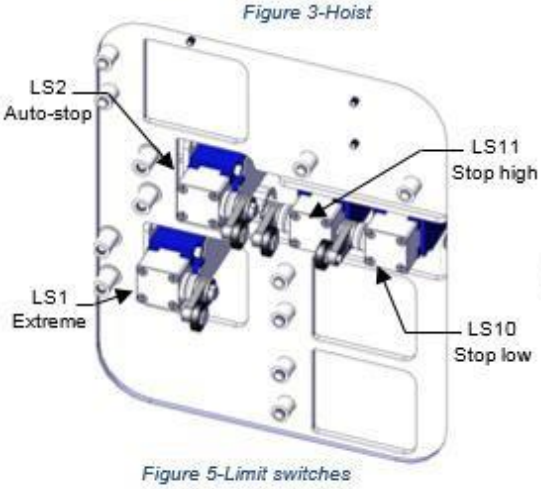


Figure 5-Limit switches

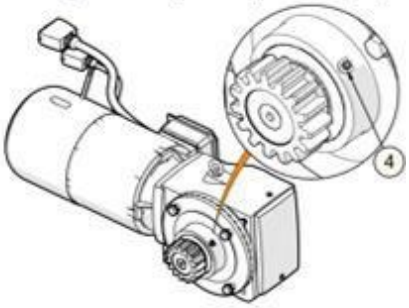


Figure 6-Gearbox detail

10 Drop test procedure

Before the drop test, lower the unit to the ground and make sure that control panel (AS3) "READY" light has lights up before proceeding to test.

Note: To activate any active command of the universal remote control, you need to simultaneously press the "ENABLE" button and press/switch the desired button/switch command. Remote control active commands are:

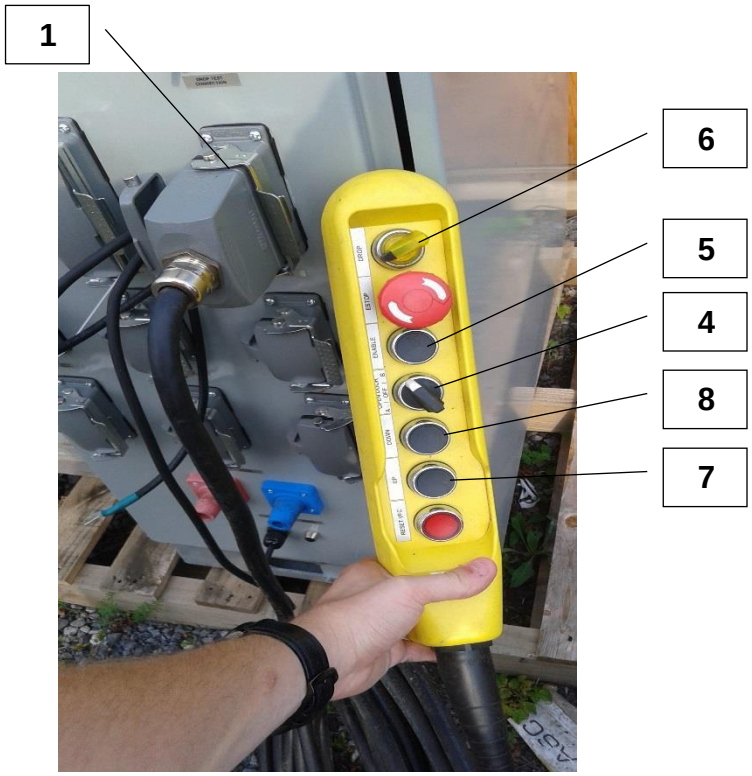
- "UP"
- "DOWN"
- "DROP"

Steps:

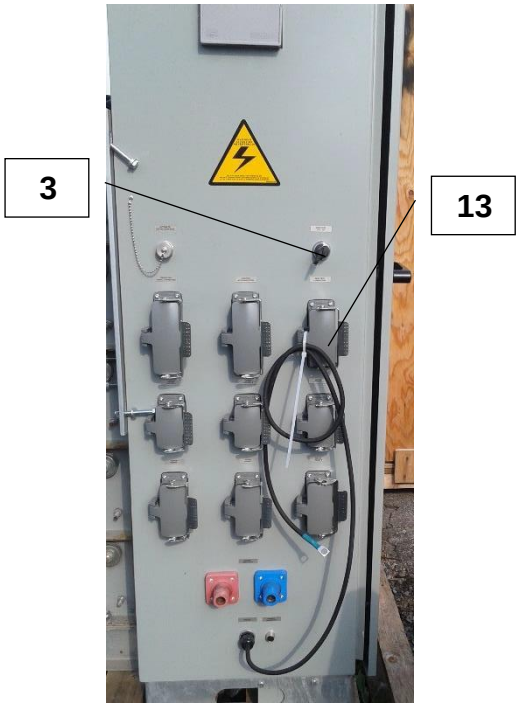
1. On car control panel (AS3) turn blue key selector ***(2)*** up to "UNLOCK" position. Open roof access trap door to reach power panel (AS2).
2. Remove drop test bypass ***(13) next page*** and connect the 10 pins connector of the "Universal remote control" to the roof power panel (AS2) ***(1) next page***.
3. Turn ON the “Drop test” key switch ***(3) next page*** on power panel (AS2) and confirm that the remote yellow "DROP" selector ***(6) next page*** lights-up.
4. Lower the remote to the ground. Close roof access trap door and check that "READY" light has lights up on control panel (AS3). Leave the car and close the door behind you.
5. **Important!** Establish a security perimeter following local regulation. Make sure that all surrounding people are informed and aware of the test.
6. Turn the “Door” selector of the controller ***(4) next page*** to "OFF" position.
7. Raise the unit of approximately 4 mast sections 20'-0" (6 m) by pressing simultaneously the "ENABLE" ***(5) next page*** and "UP" buttons ***(7) next page*** on the remote.
8. To initiate the drop, press the "ENABLE" button ***(5) next page*** and simultaneously turn the "DROP" switch ***(6) next page*** on the remote.

IMPORTANT:
If the safety device does not engage within the first 5 ft (1.5 m) of the drop, release the "DROP" and/or "ENABLE" to stop the drop!

8 – After the drop, lift the unit slightly, approximately 1'-0" (0.3 m) to disengage the safety device by simultaneously pressing "UP"***(7)*** and "ENABLE"***(5)*** buttons.
9 – Then, lower the car using the "DOWN"***(8)*** and "ENABLE"***(5)*** buttons. Maintain both until the unit as reached ground level and has stopped by itself.
10 – Reset the safety device following the “Procedure for resetting SD2” of the safety device manual.
11 – Fill the "Records of the safety device Fraco SD2 usage" of the safety device manual.
12 – Reach up to the power panel (AS2) and turn the "Drop test" key switch ***(3)*** to OFF position. Disconnect the universal remote.
12 – Put the "Bypass device" ***(13)*** back in place.



Universal remote control and connection



Power panel connection (Side)

11 Daily inspection sheet

FRACO Fraco Hoist SH 650 Premium Range - Daily inspection sheet

Serial number:

Site location

Month / Year

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
The operator is trained																															
The operator as read the operating manual																															
Weather conditions are ok for operation																															
Check for any damaged or broken parts																															
Basement shoring, post and fencing are in place																															
Check that base enclosure is firm and solid																															
Stairways, walks & locks are in good working condition																															
All loading dock gates are in good working order																															
Cage gates & locks are in good working condition																															
Landing gates, guards extension/hoarding and locks are in good working condition																															
Landing call boxes and lights are undamaged and in good working condition																															
In-car emergency stop button is in working condition																															
Cage/car is in good working condition and free from debris & trip hazards																															
Landing base/enclosure is clear from debris & trip hazards DO NOT ENTER																															
Loading dock/platform and landing gates are clear from debris & trip hazards																															
Ties-in, anchor bolts are in place																															
All warning panel and signalisation are visible/readable on platform, in the car and hoistway																															
In-car ladder is available																															
Up/down lower and final limits are in place																															
Power cable, travelling wheel & guides																															
There are no unusual sounds, noises or vibrations during operation																															
Please add additionnal information and comments on the reverse side of this page																															

Operator's or mechanic's name _____ Initial _____

SH650 Daily inspection sheet rev 28/11/2014

Called for service	Time	Operator's Name	Reason for service call	Repaired

All other issues	Time	Operator's Name	Additionnal information	Resolved

12 Monthly inspection sheet

FRACO	Fraco Hoist SEH 650 - Monthly inspection sheet	
Site location:	Serial number:	Year

	1	2	3	4	5	6	7	8	9	10	11	12
MAST, RACK, FOUNDATION, TIE-INS												
Tower Mast Sections												
Tie-ins (bolts, pins, screws are secure)												
Rack												
Shoring												
Rack Wear												
HOISTWAY ENCLOSURE & PROTECTION												
Ground Enclosure												
LandingGates & Locks												
CAR / CAGE / PLATFORM												
Car Gates and Locks												
Rollers & Roller Guides												
Car / Car Enclosure & Assembly												
TRAVELLING CABLE, GUIDES, BRACKETS												
Travelling Cable												
Travelling Cable Guidance System												
COUNTERWEIGHTS												
Counterweight												
Rollers & Roller guides												
CLEARANCES AND RUNBYS FOR CAR & COUNTERWEIGHTS												
Car & Counterweight Clearance												
OPERATION OF CONTROL DEVICES, ELECTRICAL DEVICES, TERMINAL STOPPING DEVICES												
Car Emergency Stop Button												
Up / Down Normal Limits												
Up / Down Final Limits												
Top Emergency Exit Switch												
Slack Rope Switch (if applicable)												
Car Top Emergency Stop Button												
Ground Fault Detector												
DRIVE MACHINES, BRAKES, SHEAVES, DRUMS, VALVES												
Brakes (check each for adjustment)												
Pinion wear												
Gear Box (oil level & condition)												
HOISTING & COUNTERWEIGHT CONNECTION												
Wire Ropes (Check for breaks, wear damage or defects, connections points)												
COMMUNICATION & SIGNAGE												
Speakers (test & inspect cable)												
Signage (in place and legible)												

Operator's or mechanic's name	Initial

SH650 Monthly inspection sheet rev 18/12/2014

13 Spare parts

When ordering spare parts please state the following:

- Type of elevator
- Year of construction
- Serial No. (FSUA…)
- Operating voltage
- Desired piece number

The type plate is located on the base unit of the machine.

NOTE
Spare parts must meet the manufacturer's technical requirements. Only use original spare parts from Fraco Products.

Place an order with our customer service for servicing or maintenance work:

Sales and customer service addresses depending of your location:

Fraco Products Ltd
91, chemin des Patriotes
St-Mathias-sur-Richelieu, Quebec
J3L 6B6 Canada
Telephone: (450) 658-0094

Fraco Products Ltd
57 Atomic Avenue
Toronto , Ontario
M8Z 5K8 Canada
(416) 255-9300

Fraco USA
4312 Old Milford Mill Road
Baltimore, Maryland
USA 21208
Telephone: (410) 580-9140

Fraco USA
21750 Schmeman Avenue
Warren , Michigan
USA 48089
Telephone: (248) 667-9260

14 Disposing of the machine

Dismantle the equipment properly at the end of its service life and dispose of according to local rules and regulations.

- Observe the following when disposing of equipment components:
  - Discharge oil/grease and dispose of in an environmentally friendly way
  - Recycle metal parts
  - Recycle plastic parts
  - Take electrical components to hazardous waste recycling facilities.

Recommendation: Get in touch with the manufacturer or commission a disposal specialist company in accordance with local regulations.

15 Warranty

Please find the warranty conditions in the general business conditions (see invoice or delivery note). Not included in the warranty are, damages or defects that occur as a result of non-prescribed electrical connection, improper handling, non-compliance with the installation and operation manuals. Electrical cables and parts that are subject to normal wear and tear are also excluded. The manufacturer reserve the right to determine how and through whom the defects are to be remedied.

16 EC Declaration of conformity

According to Appendix II of the Machinery Directive 98/37/EC

We, the following,

Les Produits Fraco Ltd
91 Chemin des Patriotes
St-Mathias-sur-Richelieu
J3L 6B6 Canada

declare that the construction hoist designated in the following is suitable for transporting material and for conveying a max. of 40 persons on construction sites. The model we have issued corresponds to the pertinent, fundamental safety and health requirements of the EC directive.

This declaration becomes null and void if any change is made to the machine that has not been agreed with by us.

Description of the equipment: Fraco SEH-series

Serial No. ..... -.....

Applicable EC directives:
EC Machinery Directive (98/37/EC)
EC Machinery Directive 2006/42/EC
EMC Directive (2004/108/EC)
Noise Emission Directive 2000/14/EC

Test site:
LIFTINSTITUUT
Buikslotermeerplein 381
1020 MA Amsterdam

European notified site No.

EC type-testing certificate No.

Applied and harmonized norms:
EN ISO 12100-1 and EN ISO 12100-2; EN 60 204-1
EN 12159 Builders Hoist for persons and materials with vertically guided cages
EN 81 Safety Rules for design and installation of elevators

Date/Manufacturer signature:

Signatory details:

17 Appendix for entering recurring inspections

Inspection findings

Date and signature of the tester

Inspection findings

Date and signature of the tester

Inspection findings

Date and signature of the tester

Inspection findings

Date and signature of the tester

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