



TECHNICAL COURSE

GoldLift 14.70

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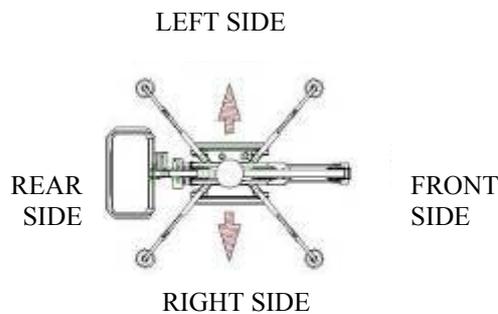
1. INTRODUCTION

The aim of this booklet is to describe the Hinowa Gold Lift 1470 aerial platform at a technical level, dealing with the safety devices of the machine, the electric and the hydraulic systems. The description of the use of the machine is not treated in this text, but will be found in its use and maintenance manual.

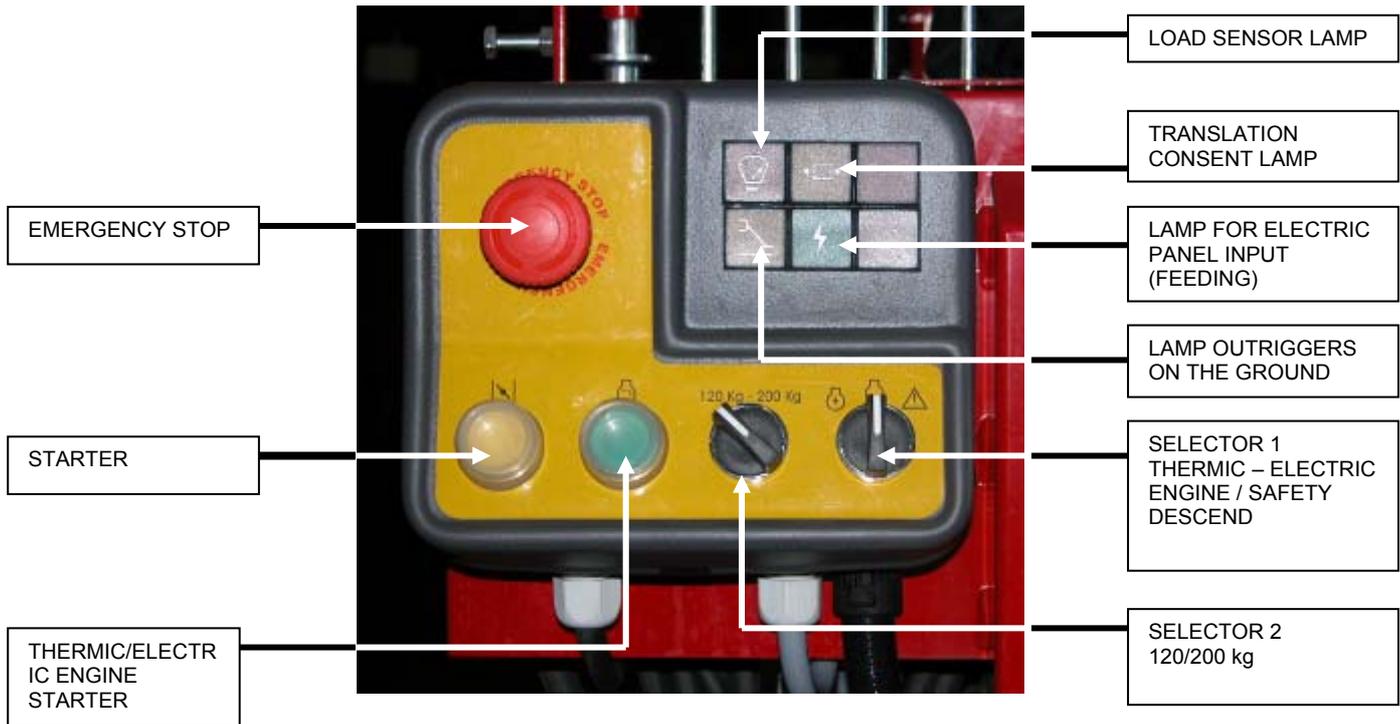
The numerical part of the name Gold Lift 1470 identifies, with the first two numbers the max. working height of the machine in metres, with the second two numbers the max. working outreach in decimetres.

The aerial platform is equipped with a hydraulic and electric system that interact to ensure the safety of the machine in any situations. Below we are presenting the two systems, in particular paying attention to their interactions.

We remind you that the correct position of the operator during the translation is inside the basket, in the rear part. We have then the following scheme.



In the basket there is a control panel containing the lamps and the selectors to be used when operating the machine.



1.2 DATA SHEET OF LIGHTLIFT 19.65

	CAPACITY: 200 kg	CAPACITY: 120 kg
PLATFORM HEIGHT (walkway surface)	10.58 m	11.94 m
MAX. WORKING HEIGHT	12.63 m	14.00 m
STANDARD BASKET DIMENSIONS	1330 x 694 mm	H 1100 mm
HORIZONTAL RANGE	5.16 m	6.24 m
MAX. HORIZONTAL WORK RANGE	5.61 m	7.00 m
ROTATION (non continuous)	300°	300°
PLATFORM CAPACITY	200 kg	120 kg
MAX. REACTION AGAINST GROUND FOR EACH OUTRIGGER	1330 daN	
MAX. PRESSURE AGAINST GROUND FOR EACH OUTRIGGER	1.9 daN/cm ²	
No. OF OPERATORS	2	1
No. OF OPERATORS WITH OPTIONAL 1-MAN BASKET	1	1
JIB – TYPE OF ARTICULATED JOINT	/	80° (+0° / -80.°)
MAX. WORKING INCLINATION	1° / 2.2 %	
MAX. STABILIZATION INCLINATION	10°	
OVERALL WEIGHT IN TRANSPORT CONFIGURATION	1700 kg	
ENGINE	HONDA GX270 - 9CV - 3000rpm - PETROL	
	HONDA GX390 - 13CV - 3000rpm - PETROL	
	HATZ1B30 - 7CV - 3000rpm - DIESEL	
ELECTRIC MOTOR	P _n =1.5 KW - 220V - 50Hz - 1500rpm	
	P _n =1.5 KW - 110V - 50Hz - 1500rpm	
ELECTRICAL SYSTEM VOLTAGE	12 V	
PUMPS	2 x 3.15 cc (for each motor)	
MAX. TRANSLATION SPEED (engine)	1.8 / 2.2 km/h	
PRESSURE OF TRANSLATION/STABILIZATION SYSTEM	175 bar	
PRESSURE OF THE AERIAL PART SYSTEM	180 bar	
MAX. SLOPE THAT CAN BE OVERCOME WHEN DRIVING	24° / 53%%	
MAX. ADMISSIBLE WIND SPEED	12.5 m/s	
MAX. ADMISSIBLE MANUAL FORCE	400 N	
RUBBER CRAWLER WIDTH – OPEN/CLOSED	780/1080 mm	

2. FUNCTIONING AND SAFETY DEVICES OF THE MACHINE

The Gold Lift 1470 aerial platform is divided into two main parts:

1. Undercarriage part
2. Aerial part
- 3.

If you use the machine during the translation or while it is stabilized, you operate the undercarriage part; if you are working in altitude (height), then you operate the aerial part. The operation of the two parts and their functioning is controlled by an electric panel consisting of the assembly PLC + relay control; the relays are inside the electric components housing, on the left side of the machine.



2.1 FUNCTIONING DURING THE TRANSLATION AND WHEN THE MACHINE IS STABILIZED.

The translation and stabilization operations are controlled by the two valve-blocks located on the undercarriage part



Both the translation and the stabilization are possible only if the machine is closed and aligned.

This condition is ensured by the two photoelectric cells on the rear part of the machine.



The first photoelectric cell is the type “sender-receiver”. The sender, located on the arm, sends a signal. If the machine is closed and aligned, the signal is perceived by the receiver that is fixed to the valve-block support and that sends a positive signal to the electric panel. The second photoelectric cell is the “reflection” type. The component fixed on the arm sends a signal that, if the machine is closed and aligned, is reflected by the retroreflector located on the valve-block support. Then the signal comes back to the photoelectric cell on the arm, that sends a positive impulse to the electric panel.

In order to be able to drive or stabilize the machine BOTH THE PHOTOELECTRIC CELLS MUST SEND A POSITIVE SIGNAL TO THE ELECTRIC PANEL.

This condition is signalled by a lamp on the control panel (translation consent lamp).
The alignment of the machine is indicated by the two arrows on the valve-block support.



2.2 FUNCTIONING DURING THE AERIAL WORKS

The aerial operations are usually controlled by the valve-block in the basket.



There is also the possibility IN EMERGENCY SITUATIONS, to control the aerial part from the ground through the valve-block located on the turret.



It is possible to move the aerial part only if the machine is stabilized and levelled (max 1°). This condition is signalled by the 4 flashing lamps that are on, when the outriggers lay on the ground and the machine is lifted.

The pressure of the discs on the ground is signalled by the 4 microswitches located on the 4 outriggers, that are released by the cylinder rod when the disc touches the ground.



When all 4 outriggers send the signal to the electric panel, the machine is stabilized and a lamp lights on the electric panel (lamp outriggers on the ground).

The levelling of the machine needs to be checked by the operator on the water level located near the valve-block of the undercarriage part.



Before lifting the machines, the operator has to choose the working load through the 120/200kg selector, located on the control panel.

The Gold Lift 1470 aerial platform can work in two ways:

200kg: on the basket two people are allowed, for a max. weight of 200kg. All the functions of the machines are activated, but the JIB movements. To work in this way, it is necessary that the JIB ARM IS COMPLETELY CLOSED. This condition is controlled by a microswitch located in the lower part of the JIB arm. When the arm is closed, the microswitch sends a signal to the electric panel allowing the 200kg load only up to max. 12 working metres. In case you chose the 200kg. way and the Jib arm was not completely closed, the red flashing lamp on the control panel “load sensor lamp” would light, emitting an intermittent acoustic signal.



120kg: only 1 person is allowed in the basket, for a max. weight of 120kg. All the functions of the machine are activated, up to a working height of 14m.

NOTE: the selection of the working way must be done only when the machine is closed.

One more device controlling the movements of the aerial part of the machine is the electronic load sensor. A sensor located under the basket controls the load and checks that it is lower than the max. one foreseen for the machine and selected by the operator. In case the max. allowed weight was overcome (120kg o 200 kg), the load sensor under the basket sends a signal to the circuit board located near the basket, and the machine immediately stops. On the control panel the red flashing lamp “load sensor lamp” lights, emitting an intermittent acoustic signal.



2.3 EMERGENCY STOP

The Gold Lift aerial platform is equipped with 2 emergency stop buttons: one is on the control panel and the other one is on the undercarriage part, near the valve-block that controls the aerial part.

If you use the emergency buttons to stop the machine when the arm is closed, an intermittent acoustic signal warns that the engine key is in the ON position.

2.4 EMERGENCY DESCEND

The machine has been designed taking into account possible emergency situations such as mechanic failures, electric failures, illness of the operator, etc. In all these cases it is possible to act/intervene on the machine both from the basket and from the ground in order to bring the machine back in the transport configuration, or to be able to assist the operator/s inside the basket. Below are indicated the intervention procedures.

NOTE: We remind you that while the machine is working, the presence of people of the staff on the ground is compulsory.

2.4.1 ELECTRIC EMERGENCY DESCEND

The emergency descend procedure can be done from the basket only if the electric system of the machine is in good order; do the following operations:

- keep the manual “selector 1” on the control panel pushed
- operate the usual arm descend controls until you reach the desired height;
- leave the manual “selector 1” on the control panel pushed

Since the descend is due to the force of gravity, it is of course not possible to obtain the swing movement of the platform and the movements of the telescopic arm; then the basket sinks vertically at a distance from the rotation centre, that depends on the configuration the machine had when the emergency situation happened.

The basket rotation can be operated by the operator who is on the ground through the slew ring screw, opposite to the hydraulic motor. Anyway, in order to move the machine, you need to move the rotation lever on the valve-block either in the basket or on the ground.



In the model 1470 when you are using the emergency descend, the jib cylinder cannot be activated; this means that when the arm is completely down, the basket is at about 1,8 m height. In this case, in order to help the person in the basket, it is necessary to use an external tool (for example a ladder).

2.4.2 EMERGENCY DESCEND OPERATED FROM THE GROUND WHEN THE MACHINE IS PERFECTLY WORKING.

This emergency descend is to be used only in case of:

- illness of the operator inside the basket.

The only reason to allow the use of the emergency descend from the ground is to help the operator/s bringing the basket down, near the ground level; any other use is forbidden.

To operate the emergency descend in the above mentioned conditions, do as follows:

- a) Move the deviator for the valve-block selection, from the valve-block in the basket to the valve-block on the undercarriage.
- b) On the valve-block on the undercarriage, singularly move the levers that control the arms, until the operator is on the ground.



NOTE: in the model 1470, when you are using the emergency descend, the jib cylinder cannot be activated, then when the arm is completely down, the basket is at about 1,8 m height. In this case, in order to help the operator, you have to use an external tool (for example a ladder).

2.4.3 EMERGENCY DESCEND OPERATED FROM THE GROUND THROUGH THE MANUAL PUMP IN CASE OF FAILURE OF ALL THE SYSTEMS CONVEYING ENERGY

This emergency descend is to be used only in case of:

- failure of the electric system of the machine, when it is not possible to make any emergency manoeuvres from the basket;

The only reason to allow the use of the emergency descend from the ground is to compensate a failure in the system and bring back the basket on the ground; any other use is forbidden.

The emergency descend from the ground can be made using the hydraulic manual pump.



In order to move the basket, you need to pump the oil manually and at the same time to use the controls for the arms movements located on the undercarriage.

It is absolutely forbidden to make manoeuvres that are different from the above mentioned ones, such as to open the telescopic arm, to move the jib (only for the model 1470), the outriggers, and in general all the manoeuvres that could cause a loss of stability of the machine.

In order to operate the emergency descend in the above mentioned conditions, do as follows:

- **Case 1:** there is tension when you turn the ignition key to the ON position and when the emergency descend buttons are not on:
 1. move the deviator towards the manual pump, in the position corresponding to the arms movement;
 2. move the selection deviator from the valve-block in the basket to the valve-block on the undercarriage;
 3. move the manual pump and at the same time move the levers of the arms movements singularly, until the operator is on the ground.

- **Case 2:** There is no tension or the emergency stop buttons are on:
remove the protection cap from the blue safety electrovalve near the electric motor



1. energize the mechanical activation of the electrovalve, pushing and turning the golden knob near the electrovalve coil.



3. put the deviator on the manual pump in the position that corresponds to the arms movements.
4. move the selection deviator from the valve-block in the basket to the valve-block on the undercarriage;
5. move the manual pump and at the same time move the levers of the arms movements singularly, until the operator is on the ground.

2.5 MANUAL PUMP

The manual pump conveys the pressured oil, to make manoeuvres in case of emergency due to failures of the main hydraulic system.

The manual pump is equipped with a manual deviator that allows choosing to move either the two right outriggers (Position 1) or the two left outriggers and the aerial part of the structure (Position 2).

The outrigger operations are allowed only if the electric system hasn't got failures and the ignition key is in the ON position.

In case of failure of the electric system, if you need to move the outriggers you have to move the deviator aerial part-undercarriage part manually, using the mechanical commutator that is delivered together with the machine in the electric components' housing (see picture).



As soon as the emergency operations have been completed, don't forget to remove the mechanical commutator of the deviator and to restore the standard configuration of the deviator. The presence of the mechanical commutator of the deviator during the work jeopardizes the safety of the machine, causing possible dangerous situations.

It is allowed to manoeuvre the outriggers in emergency situations, only in case of failure of the machine and in case you needed to close the outriggers to transport the machine.

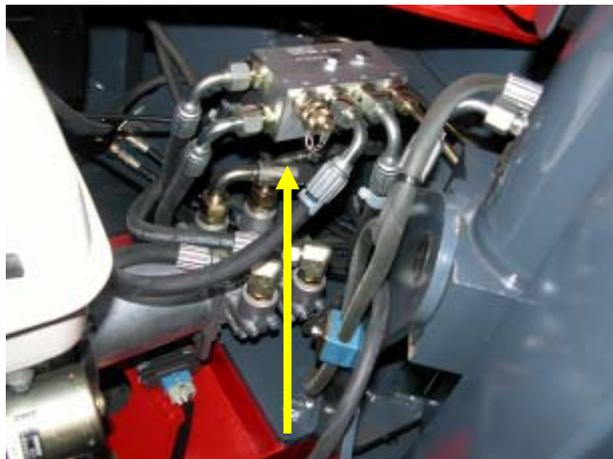
4. HYDRAULIC SYSTEM

For the description of the Gold Lift hydraulic system we refer to the attachment 1. The numbers in brackets indicate the components of the hydraulic circuit.

The circuit of the Gold Lift is fed through three pumps groups:

1. Group (4) connected with the thermic engine (2) - 2 3cc/rev pumps set at 3000rpm-.
2. Group (4) connected with the electric engine (3) - 2 3cc/rev pumps set at 1500rpm-.
3. Emergency manual pump (1). Since this pump is unique, a deviator has been put on the delivery line (1) to select in which of the two deliveries to convey the flow.

The deliveries of the three pumps groups are conveyed through a collector (5) to two main delivery hoses A and B. Six unidirectional valves prevent the pressured oil of one group from coming back to the tank, through one of the other two groups.



The two main delivery hoses A and B go into the black electric deviator (6) located near the slew ring, on the side of the electric engine.



With the deviator you choose to convey the oil to the valveblock either of the undercarriage part or of the aerial part. If the coil is not energized, the delivery A is conveyed to the aerial part, the delivery B is conveyed to the tank. The aerial part uses only one pump. This condition happens when the machine IS NOT ALIGNED. On the contrary, if the machine is ALIGNED, the deviator is excited and the oil is conveyed to the undercarriage part.

3.1 FUNCTIONING OF THE UNDERCARRIAGE PART.

The oil of the deliveries A and B is conveyed to the two valve-blocks 9 and 10, through which the two hydraulic drive motors are controlled (14), to the 4 outriggers (12) and to the undercarriage's widening cylinders (11). On each of the 4 outriggers are mounted two piloted block valves in series, on the piston side, flanged near the pin that fixes the cylinder to the structure.



From the right valve-block (10) comes a hose (carry over connection) that goes together with the delivery of the valve-blocks in the aerial part. The function of this connection is to allow the first movement of the aerial part, that disaligns or open the machine and commutes the deviator 6, directly feeding the aerial part. A unidirectional valve located on a compact curve at the exit of the valve-block, prevents the pressured oil from coming back to the tank through the valve-block 10, when using the aerial part.



3.2 FUNCTIONING OF THE AERIAL PART

The delivery B that goes to the valve-blocks of the aerial part (17 and 32) is connected in parallel with a two-ways / two positions electrovalve connected with the tank and usually open. (8). See 2.4.3



If this electrovalve is NOT POWERED, the oil is conveyed to the tank, preventing the movement of the aerial part. This condition happens when:

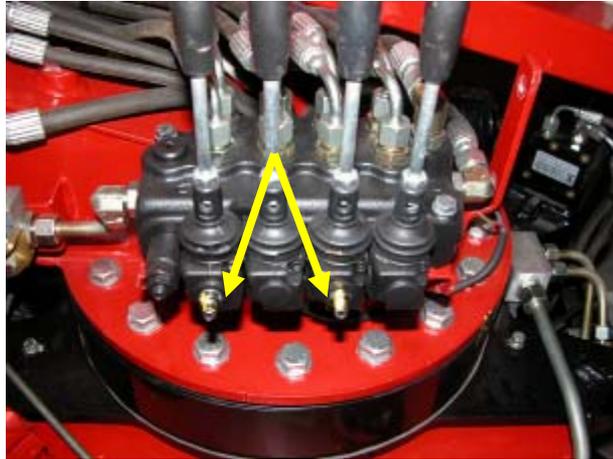
1. The machine is not stabilized
2. The load sensor is alarmed
3. You select the 200kg way and the Jib is not completely closed.

On the contrary, when the machine is stabilized, with a load which is lower than its limit and in the proper functioning way, you can go up. To excite the electrovalve 8, you need to close the connection to the tank.

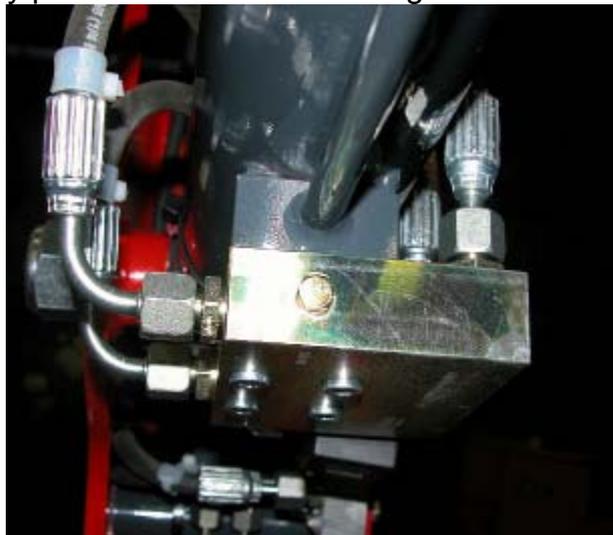
The delivery hose goes then into a deviator (16) that sends the oil to the valve-block in the basket or to the valve-block on the undercarriage part.



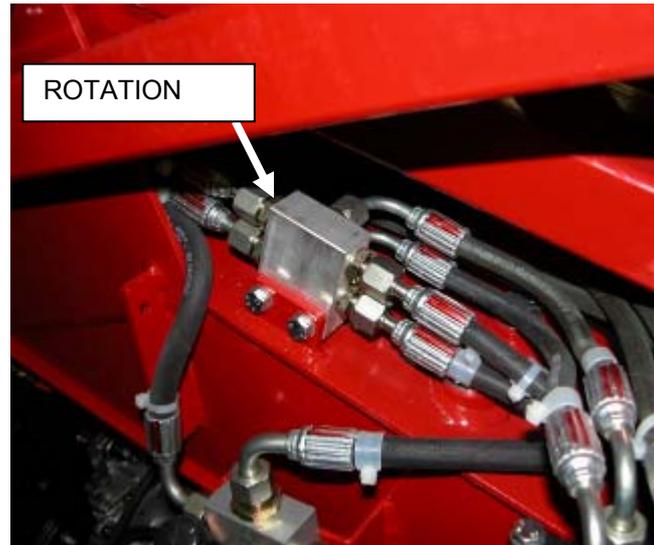
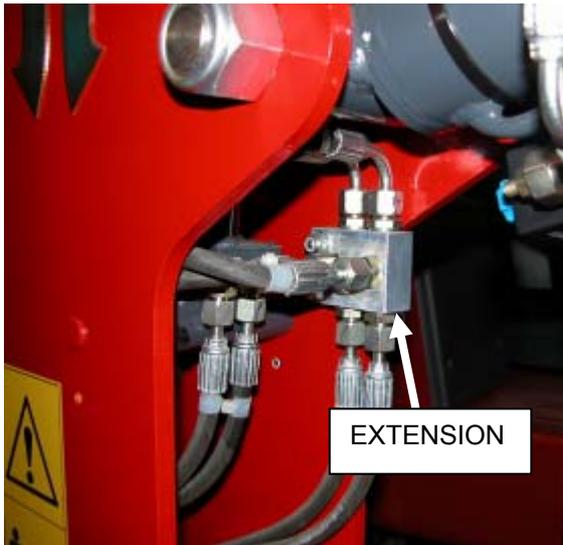
The valveblocks convey the oil to the cylinders that move the machine. The setting of the machine speeds is made by registers at the sides of the valveblock, that limit the spools' run bypassing some of the oil to the tank. Such settings cannot be altered, since the speed of the machine is set by law.



The connections of the hoses coming from the valveblocks both on the undercarriage and in the basket, are usually positioned on the balancing valves.



The extension and the rotation are exceptions; in this case the aluminium blocks make the connection.



Balancing valves are flanged on all cylinders; these work both as block valves, limiting the descending speed and as anti-shock valves (20; 21; 23; 27; 24; 31). Some of these valves also include the electrovalve for the emergency descend (see 2.4.1) (20; 21; 23). On the contrary, the valve of the basket levelling cylinder is double (31).

The manufacturer sets these valves and they must not be altered (tampered with). An action on these valves for example releasing the setting screw, can increase the descend speed and decrease the setting of the anti-shock valve, with a consequent big danger for the operator.

3.3 FUNCTIONING OF THE FIRST AND SECOND ARM.

On the Gold Lift 1470 aerial platform there are three arms. The first arm allows reaching the last two metres working height.

The first and second arm (20 and 21) are connected in parallel. This means that the less loaded cylinder moves first.

The movement sequence is as follows: raise: second arm → first arm; descend: first arm → second arm.

Then there's one single trajectory both raising and descending.

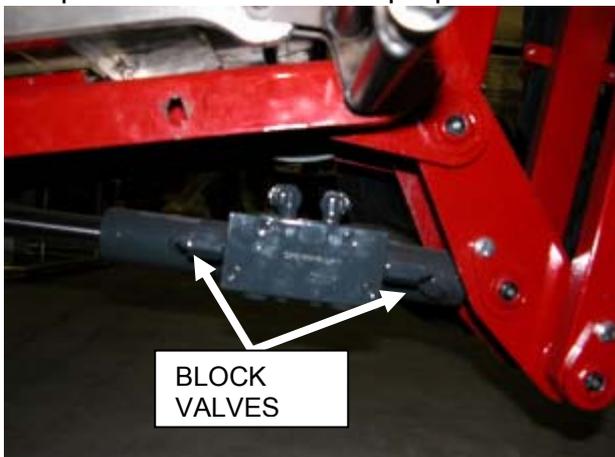
3.4 FUNCTIONING OF THE BASKET LEVELLING.

The basket levelling during the movement of the first arm, the second arm and the jib is mechanic and follows a parallelogram system.

On the contrary, when moving the third arm, the basket levelling is hydraulic and is made by two cylinders. The first cylinder is located near the second extension and is moved by the third arm.



The oil pushed by the first cylinder is sent to the second cylinder located under the basket. This is equipped with a double block valve and two anti-shock valves, to get rid of the overpressures due to an improper basket levelling.



3.5 FUNCTIONING OF THE JIB

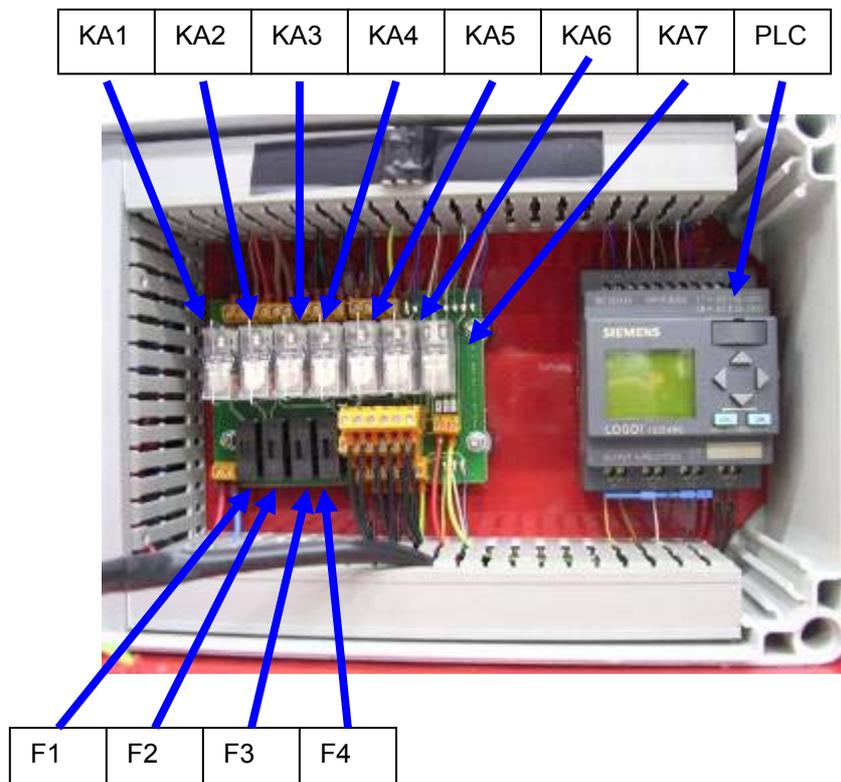
A balancing and anti-shock valve is flanged on the jib cylinder (27). Inside this valve there is an electrovalve controlling the jib operation, according to the load that has been selected. When 200kg are selected, the electrovalve is not powered, and the oil delivered to the piston is conveyed directly to the tank. The oil delivered to the rod is conveyed to the tank through a hole ($\varnothing=0.3\text{mm}$) that is necessary to avoid couterstokes when you stop the machine and at the same time not to leave the rod side completely free.

A non-returning valve (34) prevents any pressure peaks inside the valveblock from coming back to the valve, which would cause a slight opening of the jib arm.



4. ELECTRIC SYSTEM

The following description makes reference to the attachments n° 2, 3, 4, 5 and to the pictures of the electric component housing in this chapter.



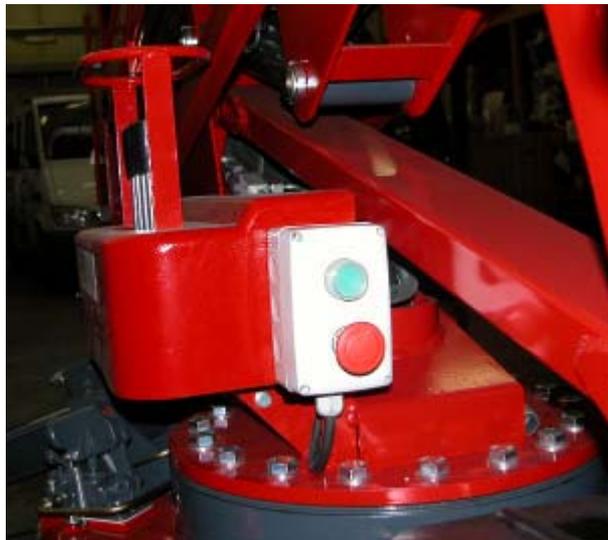
4.1 MAIN LINE F1 FEEDING

The main line feeding the circuit starts from the battery (see attachment n° 2: +12 and 0). The main PLC feeding line (F1) branches out from cable +12 and is controlled by the engine key SC1 and by the main fuse F1. Two emergency stop buttons (one on the control panel of the ground position and one on the control panel of the cage position: see attachment 3) are connected in series to F1: if not powered, they feed cable n° 1 and as a consequence the hour-counter (it functions every time the 2 emergency stop are not powered, regardless of whether the engines are working or not). The indicator KL2 is connected to line F1: when lit, it indicates that the electronic system of the platform is fed.

4.2 THERMIC ENGINE STARTING

4.2.1 THERMIC ENGINE STARTING FROM GROUND POSITION

The main line F1 enters the control panel on the carriage base where the emergency stop and start buttons (in series) are located (see attachment n° 3).



In order to start the thermic engine, the SC-EL DIS-EM selector on the control panel of the cage position must be switched to thermic motor (connection normally closed and as a result cable 4 fed at the I4 input to the PLC and to the relay KA7). The relay KA7 is powered and causes commutation of the connections KA7 (see attachment n° 4). When the stop button is not powered and the start button is pushed, cable 2 is powered and the I2 input to the PLC is energized. The connection KA7 is thus closed at the relay KA5 and, as a consequence, the connection KA5 to the engine starting line controlled by the fuse F4 (n.o.) is closed and the engine is started.

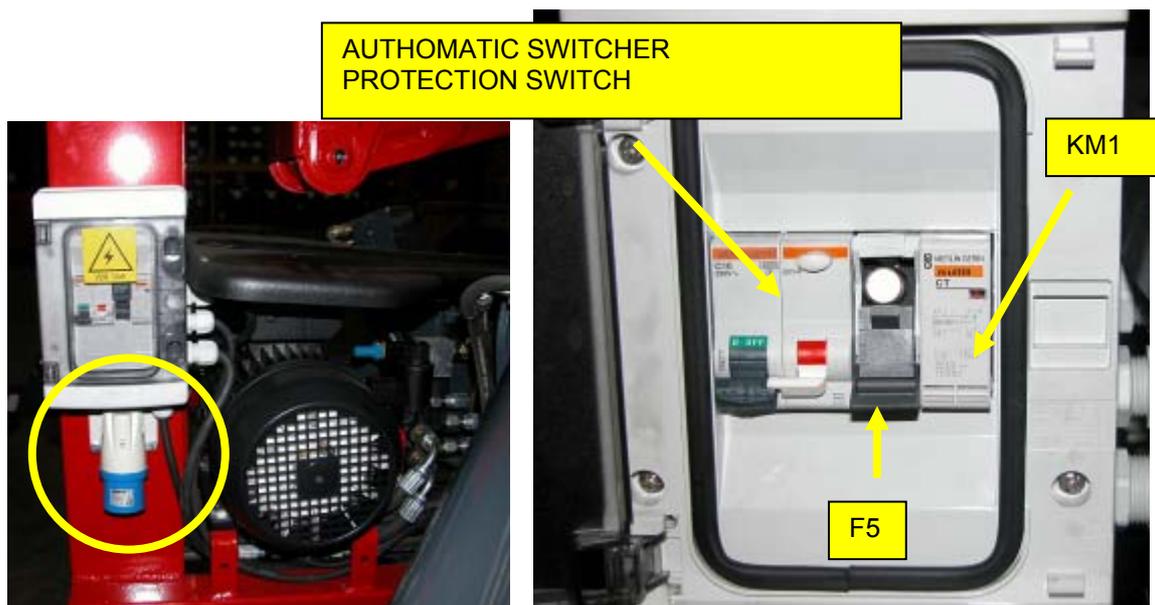
4.2.2 THERMIC ENGINE STARTING FROM CAGE POSITION

The main line F1 enters the control panel on the carriage base where the emergency stop and start buttons (in series) are located. From here, the 15 – 16 cable reaches the control panel on the cage and links to the STOP button (of the cage). Cable 1 links the STOP button to the I1 input of the PLC (line fed) conveying the information that the 2 emergency STOP are not powered.

In order to start the thermic engine the selector n° 1 on the control panel (SC –EL DIS-EM, attachment n° 3) must be switched to thermic engine (connection normally closed). When the stop button is not powered and the start button is pushed, cable 2 and 4 are powered (see attachment n° 5) and the same process described above is triggered.

4.3 ELECTRIC ENGINE STARTING

Starting the electric engine is possible only if the platform is fed through the electric system by means of the plug located under the board containing the switches, the fuse and the contactor.



It is of course highly recommended to make sure the automatic switcher and the fuse F5 are in good conditions.

The procedure for starting the electric engine is quite similar to the one for starting the thermic engine described above. In this case however, the selector 1 on the control panel (SC – EL DIS – EM attachment n° 3) must be switched to electric engine. By doing so, the connection that in the case of the thermic motor being used would be closed will be open, cable 4 will no longer be fed and the I3 input to the PLC and to the relay KA7 will no longer be energized (see attachment n° 5). The n.o. connection to the relay KA5 on the feeding line will remain open and starting of the thermic engine will be prevented.

When the PLC receives from the operator the input to start the electric engine (I3 input with no signal and I2 input receiving signal from the start button), it causes the outgoing

connection Q4 of the feeding circuit to the relay KM1 to be closed: as a result the connections on the line KM1 are closed and the electric engine is started. The feeding line to the electric engine is controlled by the fuse F5.



4.4 STARTER FROM THE CAGE (GASOLINE ENGINE ONLY)

Pushing the start button on the control panel of the cage position causes cable 6, which is connected to the coil located on the thermic engine, to be fed.

4.5 PLATFORM OPERATIONS.

4.5.1 TRASLATION AND STABILIZATION

In order for the traslation movement to be allowed, the machine must be perfectly aligned. Alignment of the sender/receiver photocell 1 (attachment n° 4) causes the relay KA1 to be energized and a signal to be sent to the input I4 to the PLC. The alignment of the reflection photocell energizes the relay KA6 instead. As a result the relevant connections in series close the circuit on cable 10 (which feeds the electric valve of the aerial part/undercarriage deviator). The same signal reaches the control panel on the cage position where cable 10 causes the ALIGNED MACHINE indicator KL4 to light (see attachment n° 3).

4.5.2 AERIAL WORK

In order for the aerial work to be enabled, the machine must be stabilized. Each stabilizer is equipped with an NC double connection micro switch (ST1; ST2; ST3; ST4: see attachment n° 2). When the micro switches are released, the indicators located on each of the stabilizers will start flashing. At the same time, the 4 NC connections in series will close, and the relay KA2 will be energized (the status of the relay KA2 is revealed by the input I6 to the PLC). Alimentation to these connections is conveyed by cable 14 from the control panel on the cage position. Cable 14 in its turn is fed by the load cell board which controls whether it is possible to operate the aerial part of the machine or not (see attachment n° 4). The n.o. connection to the relay KA2 changes and closes circuit 8 feeding the electric valve of the aerial part and the *machine stabilized* indicator KL1 on the control panel of the cage position. (see attachment n° 3).

4.5.3 JIB

Switching the selector 2 (selector 120-200, see attachment n° 3) to 120 Kg causes circuit, 13 feeding the relay KA4, to close; the n.o. connection to KA4 will then close the connection to the JIB electric valve energizing it (see attachment n° 4). When the selector 2 is switched to 200 Kg, the connection is closed and cable 14 is fed. This is interrupted by the JIB micro switch. In case the JIB arm is not completely closed, the connection opens and alimentation to the KA2 relay is prevented.

4.6 EMERGENCY DESCENT MANOEUVRE

Switching the selector 1 (SC-EL DIS-EM, see attachment n°3) to the emergency position causes circuit 11 to be closed and as a consequence the KA3 relay to be energized (see attachment n° 4). The connection KA3 is then changed and feeds the 3 electric valves for the emergency descent.

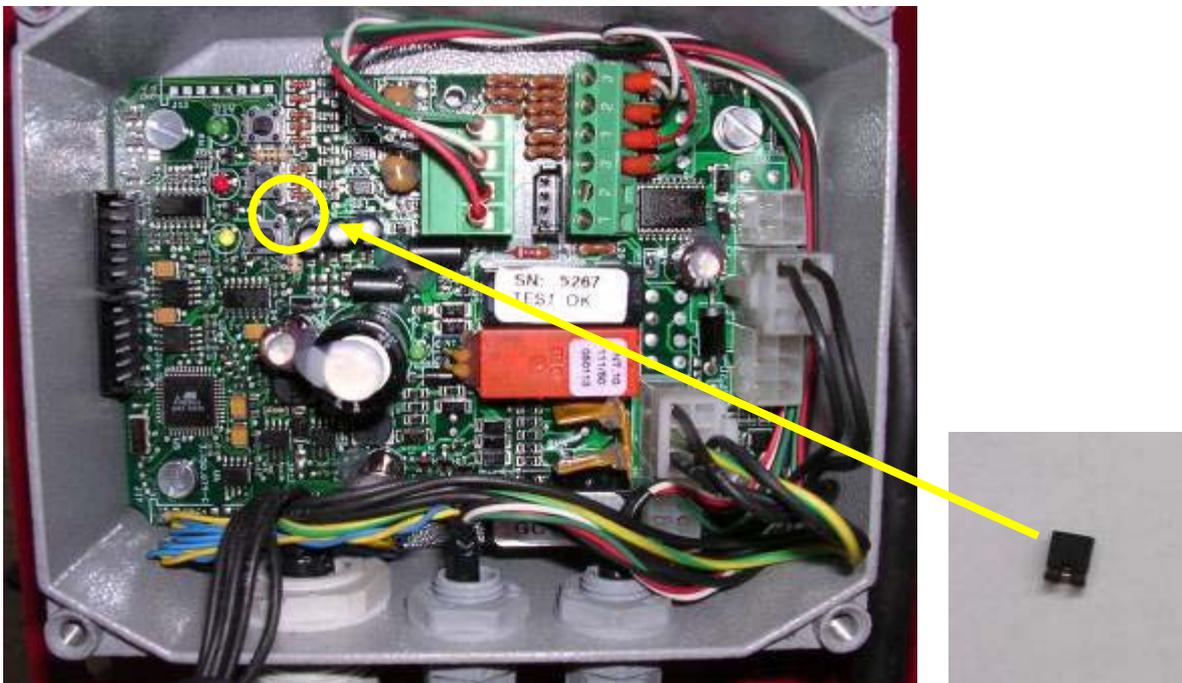
NOTE: Line 11 is directly connected to F1, which makes it possible to use the emergency descent manoeuvre even if the emergency STOP is activated, unless the key is switched to OFF or the F1/F3 fuses are burned.

4.7 LOAD SENSOR SETTING

This procedure is required when the loading cell has lost reference of the maximum load. This can be due to an over voltage damaging the loading cell or it may indicate that the weight sensor located under the cage needs to be changed. However, these eventualities are unlikely to happen.

4.7.1 HOW TO PROCEED:

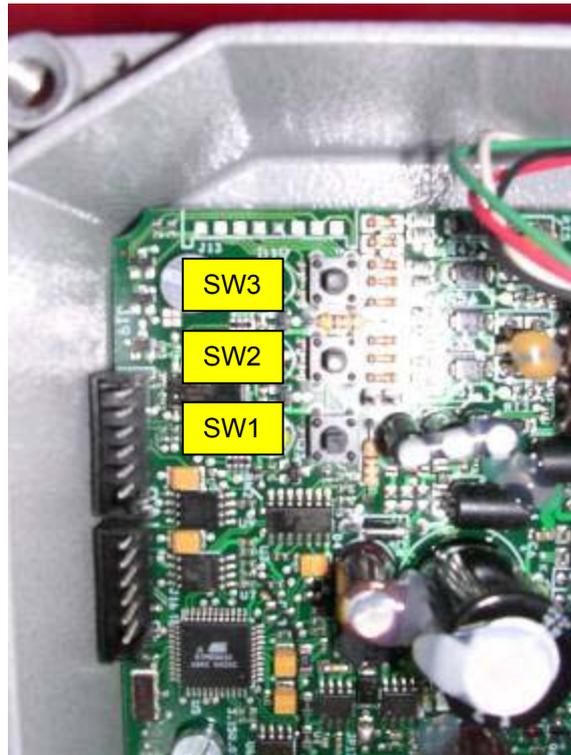
1. Turn off the board by turning to «O» (OFF) the key located on the engine block
2. Insert the bridge on the J14 jumper (see picture below);



3. Feed the board (turning the key on the engine block to the “I” position: the green led will light (the red one also may be lit: proceed with the setting anyway).

SETTING:

4. Push SW1; the yellow led (D21) will light and the red one (D20) will start flashing;
5. **TRANSDUCER ZERO:** bring the system to rest conditions (minimum weight on the sensor). Push SW2: while pushing it, the red led will turn brighter.



6. *SETTING 200 kg MAXIMUM WEIGHT* : switch the max. weight selector on the control panel of the cage position to 210kg (maximum weight). Push SW3, the green led will light for a while (D19);
7. push SW1;
8. *SETTING 120 Kg MAXIMUM WEIGHT*: set the max. weight selector on the control panel of the cage position to 120kg (maximum weight). Push SW3, the green led will light for a while (D19).
9. *END OF SETTING*. Push SW1 to exit the setting procedure: the yellow led will shade (D21). Red led lit (D20): re-establish normal conditions (no over weight) and verify whether it shades (D20).
10. Turn off the board by turning the key on the engine block;
11. Remove the bridge from the J14 jumper;
12. Restart the system and verify whether it functions correctly: overload the cage and check whether the red led lights (D20).

4.7.2 ZERO SETTING PROCEDURE

It is possible to automatically re-set the system without having to use the setting load that has been used to for the zero setting.

Automatic set is always possible, except in case of defected sensor, which would be indicated by flashing of the green led (D19).

Proceed as follows::

1. Turn off the board by turning to «**O**» (OFF) the key located on the engine block.
 2. Insert the bridge on the J14 jumper (see previous picture).
 3. Turn on the board turning the key on the engine block to the “I” position: the green led will light (D3)
 4. AUTHOMATIC SET: bring the system to the same conditions (minimum load on the sensor) as described for the 0 setting procedure.
 5. Push SW2: while pushing it the red led (D20) will turn brighter.
 6. Turn off the board.
 7. Remove the bridge from the J14 jumper.
 8. Restart the system and verify whether if functions correctly: overweight the platform and check whether the red led (D20) lights.
- The 0 setting procedure must be carried out correctly since the security of the system depends on it.
After the 0 setting procedure has been performed, verify whether system functions correctly and whether it blocks under alarm conditions.

4.8 ELECTRIC SYSTEM CONTROLS (SUMMERY)

F1: general fuse controlling the main line F1.

It is to be checked in case the PLC or the load cell board (with emergency stop not activated) do not receive alimentation .

F2: fuse controlling the undercarriage electric valves, aerial part and JIB .

F3: fuse controlling the electric valves for the emergency descent manoeuvre.

F4: fuse controlling the line for starting the thermic engine.

F5: fuse controlling the transformer

KA1: relay controlled by the receiver of the alignment photocell controlling the electric valves of the undercarriage

KA2: relay controlled by the connections in series of micro switches on the stabilizers. It controls the electric valve of the aerial part. It is to be checked in case the aerial part do not work when the machine is stabilized.

KA3: relay controlled by the selector for the emergency descent manoeuvre. It controls the electric valves for the emergency descent manoeuvre. It is to be checked in case the emergency descent manoeuvre do not work.

KA4: relay controlled by the position of the 120-200kg deviator.
When 120 is selected, it controls the electric valve for the movement of the JIB arm. It is to be checked in case the JIB cylinder do not work.

KA5: relay controlled by the status of the relay KA7 (which in its turn is controlled by the position of the engine selector). When thermic engine is selected and the START button is pushed, the connection KA5 feeds the line for starting the thermic engine. It is to be checked in case the thermic engine do not start by pushing START.

KA6: relay activated by the reflection alignment photocell; it controls the undercarriage electric valve. It is to be checked in case the undercarriage do not work when the machine closed and aligned.

KA7: relay controlled by the position of the engine selector. When the electric engine is selected, is causes stopping of the thermic engine (if it is working) and prevents starting it. It is to be checked in case the thermic motor cannot be started or stopped.

KA8: relay controlled by the 2°V button (optional). It activates the electric valve for changing the speed during the rotation phase.

KM1: relay controlling the electric engine. It is to check in case the electric engine do not work.

5. POSSIBLE INCONVENIENCES: CAUSES AND SOLUTIONS

- 1) The undercarriage jerks or the translation is not straight
 - The machine is not centred: centre it
 - The non-return valves of the deliveries collector are dirty: clean or replace them
 - The pump is faulty: replace it
 - The valves on the reduction gear drive controlling the translation are dirty or damaged: clean or replace them.
- 2) The outriggers' lamp does not work
 - The lamp is burned out (the machine works): replace it
 - The outrigger's micron doesn't work: check the setting or replace it
 - Fuse F1 is faulty (the machine does not work): replace it
 - A cable is cut: check it
- 3) One outrigger sinks
 - The block is faulty: replace it
 - The cylinder is leaking: replace it
- 4) The basket doesn't self-level
 - There is air in the basket levelling circuit: breathe the levelling cylinder on the second transmission
 - Anti-shockvalve on the the basket levelling cylinder is dirty or faulty: clean or replace it
 - The self-levelling cylinders are faulty: replace them
- 5) The machine doesn't start from the basket
 - The relay KA5 is faulty: replace it
 - The battery is flat: charge ore replace it
 - One cable is cut: check and repair it
 - One switch is faulty: replace it
- 6) The aerial part doesn't move
 - The outriggers are not on the ground: check the lamp "outriggers on the ground" on the control panel, and stabilize
 - The non-return valves of the deliveries collector are dirty: clean or replace them
 - The microswitches of the outriggers are not well set or faulty (see point 2): set or replace them
 - The safety deviator (see page16) is faulty or not fed: check the electric system or replace the deviator
 - Overload: check the load sensor lamp on the control panel
 - The Jib arm is not closed and the selector 2 is on 200kg.: load less than 120kg, position the selector 2 on 120kg and close the Jib arm.
 - Friction of the pins or wrong setting of the load sensor: (see point 4.5)
- 7) The outriggers don't go up
 - The aerial part is not completely closed or centred: check the centering and the lamp to allow the translation on the control panel

8) The electric engine doesn't work

- Oxidation of the rotating parts, caused by non-use: clean or replace
- The condenser is faulty: replace it
- The relay KM1 is faulty: replace it
- The fuse F4 is burned out: replace it

9) The electric engine runs but the pump doesn't send oil

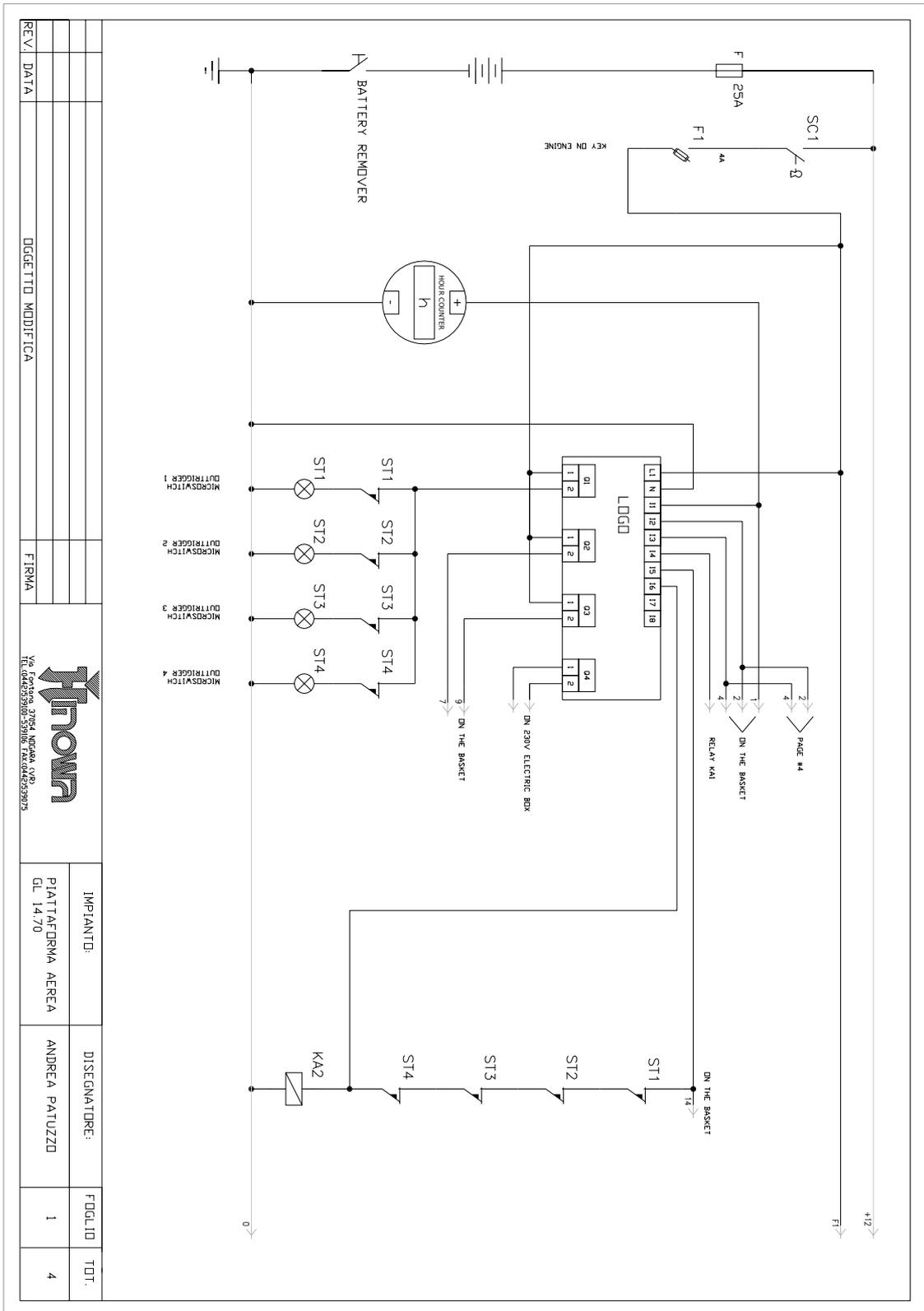
- The pump is faulty
- The non-return valves of the deliveries collector are dirty: clean or replace them

10) The emergency descend doesn't work:

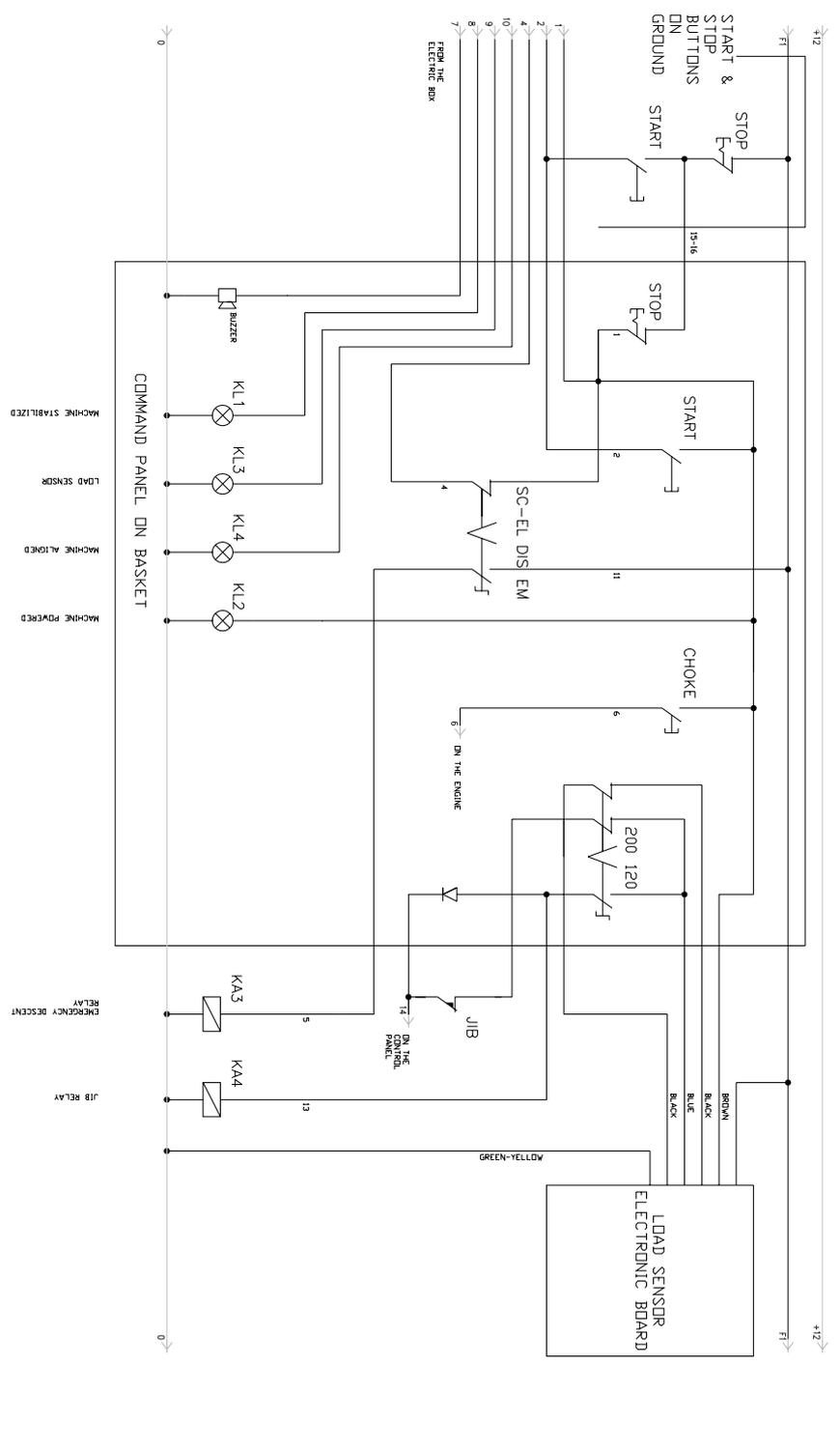
- The ignition key is in the OFF position: turn it to ON
- The relay KA3 is burned out: replace it
- The battery is flat: charge or replace it
- One cable is cut: check it
- One switch is damaged: check or replace it

NOTE: the emergency descend works in any conditions, unless the ignition key is on the OFF position.

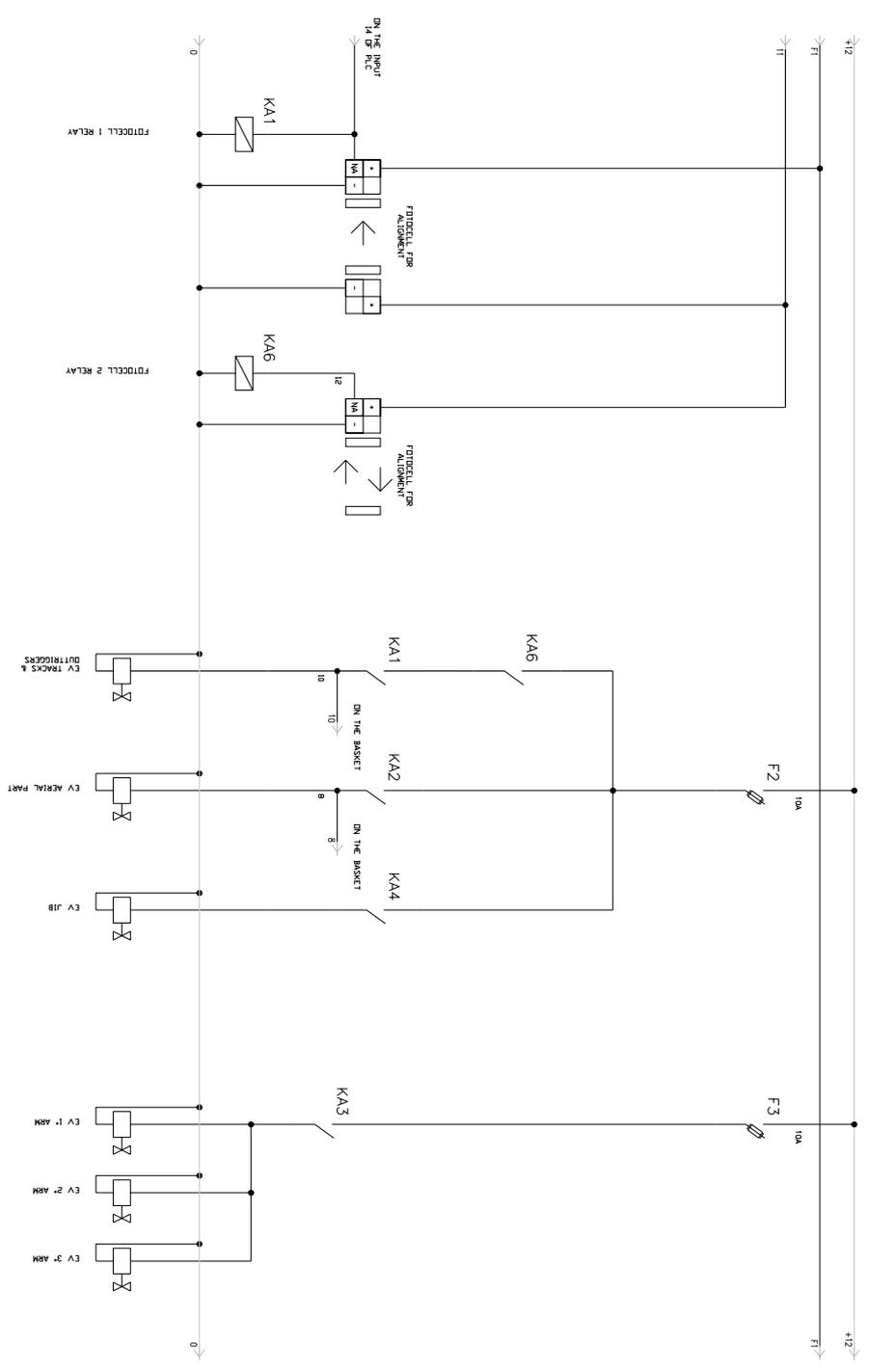
ATTACHMENTS 2. 3. 4. 5. **ELECTRIC CIRCUIT**



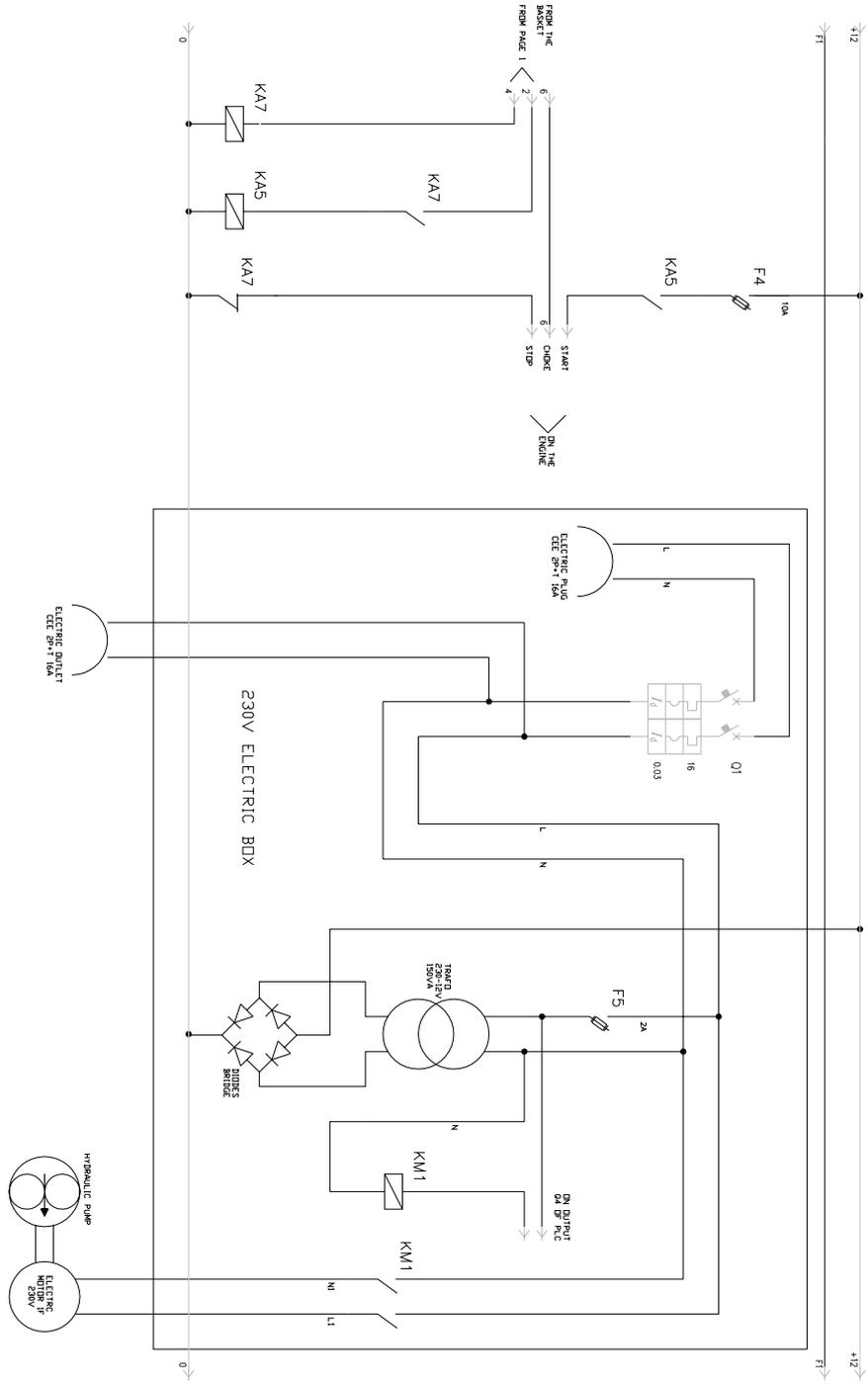
REV.	DATA	OGGETTO MODIFICA	FIRMA	 VIA F.lli. VENTURA 4/10 TEL. 0445/351001-351002 FAX 0445/351075	IMPIANTO:	DISSEGNAZIONE:	FUOGLIO	TOT.
					PIATTAFORMA AEREA	ANDREA PATUZZO	1	4
					GL 14.70			



REV.	DATA	DOGGETTO MODIFICA	FIRMA	 Via Bolognese, 37054, NORDA, VR Tel. 0445390159/016 Fax 0445393975	IMPIANTO: PIATTAFORMA AEREA GL 14.70/200	DISSEGNAZIONE: ANDREA PATUZZO	FOGLIO 2	TOT. 4
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REV. DATA	DGGETTIO MODIFICA	FIRMA	 <p>Via F. Testi, 37/39A - 20136 MILANO, ITALY Tel. 02.44633910-33916-33918-33919-33920-33921-33922-33923-33924-33925-33926-33927-33928-33929-33930-33931-33932-33933-33934-33935-33936-33937-33938-33939-33940-33941-33942-33943-33944-33945-33946-33947-33948-33949-33950-33951-33952-33953-33954-33955-33956-33957-33958-33959-33960-33961-33962-33963-33964-33965-33966-33967-33968-33969-33970-33971-33972-33973-33974-33975-33976-33977-33978-33979-33980-33981-33982-33983-33984-33985-33986-33987-33988-33989-33990-33991-33992-33993-33994-33995-33996-33997-33998-33999-34000</p>	IMPIANTO:	DISSEGNAZIONE:	FOGLIO	TOT.
				Piattaforma Aerea	ANDREA PATUZZO	3	4
				GL 17.70/200			



REV.	DATA	DGGETTIO	MODIFICA	FIRMA	 Via F. Petrucci 37/64 Ancona, V.P. Tel. 0542/39100-39105 Fax 0542/393075	IMPIANTO: PIATTAFORMA AEREA GL 14.70/200	DISSEGNAZIONE: ANDREA PATUZZO	FOGLIO 4	TOT. 4
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