PIATTAFORME AEREE SEMOVENTI
SELF-PROPELLED WORK-PLATFORMS
PLATES-FORMES DE TRAVAIL AUTOMOTRICES
SELBSTFAHRENDE HUBARBEITSBÜHNEN
PLATAFORMAS ELEVADORAS AUTOPROPULSADAS
ZELFRIJDENDE HOOGWERKERS
SJÄLVGÅENDE ARBETSPLATTFORMAR
SAMOKRETNE RADNE PLATFORME

"SC" SERIES

SC1000 S SC1000 DL SC1000 DC

USE AND MAINTENANCE MANUAL
- ENGLISH -

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Tigieffe thanks you for purchasing a product of its range, and invites you to read this manual. Here you can find all the necessary information for a correct use of the purchased machine; therefore, you are advised to follow the instructions carefully and to read the manual thoroughly. The manual should be kept in a suitable place where no damage can occur to it. The content of this manual may be modified without prior notice and further obligations in order to add changes and improvements to the units already delivered. No reproduction or translation may take place without the written permission of the owner.

Contents:

1. INTRODUCTION

This Use and Maintenance Manual provides general instructions concerning the complete range of units indicated on the cover. Therefore the description of their components, as well as control and safety systems, may include parts not present on your unit since supplied on request or not available. In order to keep pace with the technical development *AIRO-Tigieffe s.r.l.* reserves the right to modify the product and/or the use and maintenance manual at any time without updating the units already delivered.

1.1 Legal aspects

1.1.1 Delivery of the unit

Within EU (European Union) member countries the machine is delivered complete with:
- Use and Maintenance manual in your language;
- CE mark applied on the unit;
- CE conformity declaration.

It is to be noted that the Use and Maintenance Manual is an integral part of the machine and a copy of this, together with copies of the documents certifying that the periodical checks have been carried out, must be kept on board in its suitable container. In the event of a transfer of property the machine must always be provided with its use and maintenance manual.

1.1.2 Declaration of commissioning, periodical checks and transfers of ownership

The legal obligations of the owner of the machine vary according to the country of commissioning. It is therefore recommended to inquiry about the procedures in force in your country from the boards responsible for industrial safety. This manual contains a final section called "Check register" for a better filing of documents and recording of any modifications.

1.1.2.1 Declaration of commissioning

In ITALY the owner of the Aerial Platform must notify the use of the unit to the local competent ISPESL (National Institute for the prevention of accidents at the workplace). To declare the commissioning of the unit in Italy, send the form that is supplied together with other documents upon machine delivery, by registered letter with advice of receipt.
ISPESL will assign a Serial Number and depending on their staff availability will issue a "Check booklet" indicating only the detectable data of the machine already in use or inferable from the relative User Manual. Afterwards ISPESL sends a copy of the same booklet to the territorial inspection boards (ASL/USL or ARPA) which carry out the periodical mandatory checks (every year).

1.1.2.2 Periodical checks

The annual checks are compulsory and must be carried out also when the "Check booklet" is not available. In Italy the owner of the Aerial Platform must apply for a periodical check by sending a registered letter to the local competent inspection board (ASL/USL or ARPA) at least twenty days before the expiry of the year from the purchase date or the last periodical check.

NB: If a machine without a valid control document should be moved in an area outside the competence of the usual inspection board, the owner of the machine must ask the inspection board, competent for the new territory where the machine is to be used, for the annual check.

1.1.2.3 Transfers of Ownership

In case of transfer of ownership (in Italy) the new owner of the Aerial Platform must notify the ownership of the unit to the local competent inspection board (ASL/USL or ARPA) by enclosing a copy of:

- Conformity declaration issued by the manufacturer;
- Declaration of commissioning carried out by the first owner.

1.2 Intended use

The machine described in this use and maintenance manual is a self-propelled aerial platform intended for lifting persons and materials (equipment and building materials) in order to carry out maintenance, installation, cleaning, painting, de-painting, sand-blasting, welding operations, etc.
The max. capacity allowed (which varies according to the model – see paragraph “Technical features”) is divided as follows:

- 80 Kg for each person on board;
- 40 Kg for equipment;
- the remaining load is represented by the material being worked.

In any case NEVER exceed the maximum capacity allowed as indicated in paragraph "Technical features”.
All loads must be positioned inside the cage. Do not lift loads (even if complying with the maximum capacity allowed) hanging from the platform or lifting structure.
Do not carry large-sized panels since they increase the resistance to wind force thus causing the machine to overturn.
The operator on the cage is not allowed to carry out drive and stabilizing operations. For these operations the operator is to get on the ground and control the machine at a safety distance.
A load limiter interrupts the operation of the unit if the load on the platform exceeds by 25% the rated load (see chapter "general use instructions”).
The unit cannot be used in areas where road vehicles operate. Always surround the working area by means of suitable signs when the unit is used in public areas.
Do not use the machine to tow trucks or other vehicles.

1.3 Description of the unit

The machine described in this use and maintenance manual is a self-propelled aerial platform equipped with:

- motorized chassis equipped with rubber tracks and outriggers;
- hydraulically driven rotating turret;
- articulated boom operated by hydraulic cylinders;
- operator platform (the max. capacity varies according to the model - see chapter "Technical features”).

The chassis consists of sheeting, box-type structures and electrically welded structural forms of different thickness. It is motorised to allow the machine to move (see "General use instructions"). The 2 tracks are controlled by independent motors and equipped with hydraulic parking brake, positive logic type (when drive controls are released brakes are automatically activated). On the chassis there are four outriggers operated by hydraulic double acting cylinders that are controlled by solenoid valves directly flanged on the same. The outriggers are held in position by non-return valves directly piloted and flanged on the same.
The turret consists of electrically welded sheets and is connected to the chassis by means of a turntable allowing its rotation around the central axle.
The articulated structure consists of booms made of electrically welded quality steel box-type structures and/or tubes. The hydraulic cylinders which move the articulated structure are provided with over-center valves directly flanged on the same. These devices allow the booms to remain in position even if one of the supply tubes accidentally breaks.
The platform is equipped with guard-rails and toe-boards of a prescribed height (the height of the guard-rails is $\geq$ 1100 mm; the height of the toe-boards is $\geq$ 150 mm).

1.4 Control stations

The machine is equipped with two control stations:
- at platform for normal use of the unit;
- on the chassis where you can find the emergency controls for platform recovery and emergency stop. The on-ground control post is also equipped with a key-selector to select the control post and to start the unit.

The operator on the cage is not allowed to carry out drive and stabilizing operations. For these operations the operator is to get on the ground and control the machine at a safety distance.

1.5 Power supply

The machines are powered by a bi-fuel system:
- heat engine (standard petrol engine; optional diesel engine);
- electric pump (standard 230V single-phase; optional 380 three-phase).

In any case both the hydraulic and the electric systems are equipped with all necessary protections (see electric and hydraulic circuit diagrams annexed to this manual).

Do not use the machine for purposes different from those it was intended for.
If disposal of the unit is necessary, comply with current local regulations.

1.6 Identification

In order to identify the machine, when spare parts and service are required, always mention the information given in the serial number plate. Should this plate (as well as the various stickers applied on the unit) be lost or illegible, it is to be replaced as soon as possible. In order to identify the machine when no plate is available the serial number is also stamped on the chassis. To locate the plate and the stamp of the serial number, see the following picture. The main data of the machine to which this book refers are indicated in the following boxes:

Model.....……..	Chassis:.....……..	Year:.....……..

Fig. 1

1.7 Location of main components

Below is a diagram showing the machine and its components.

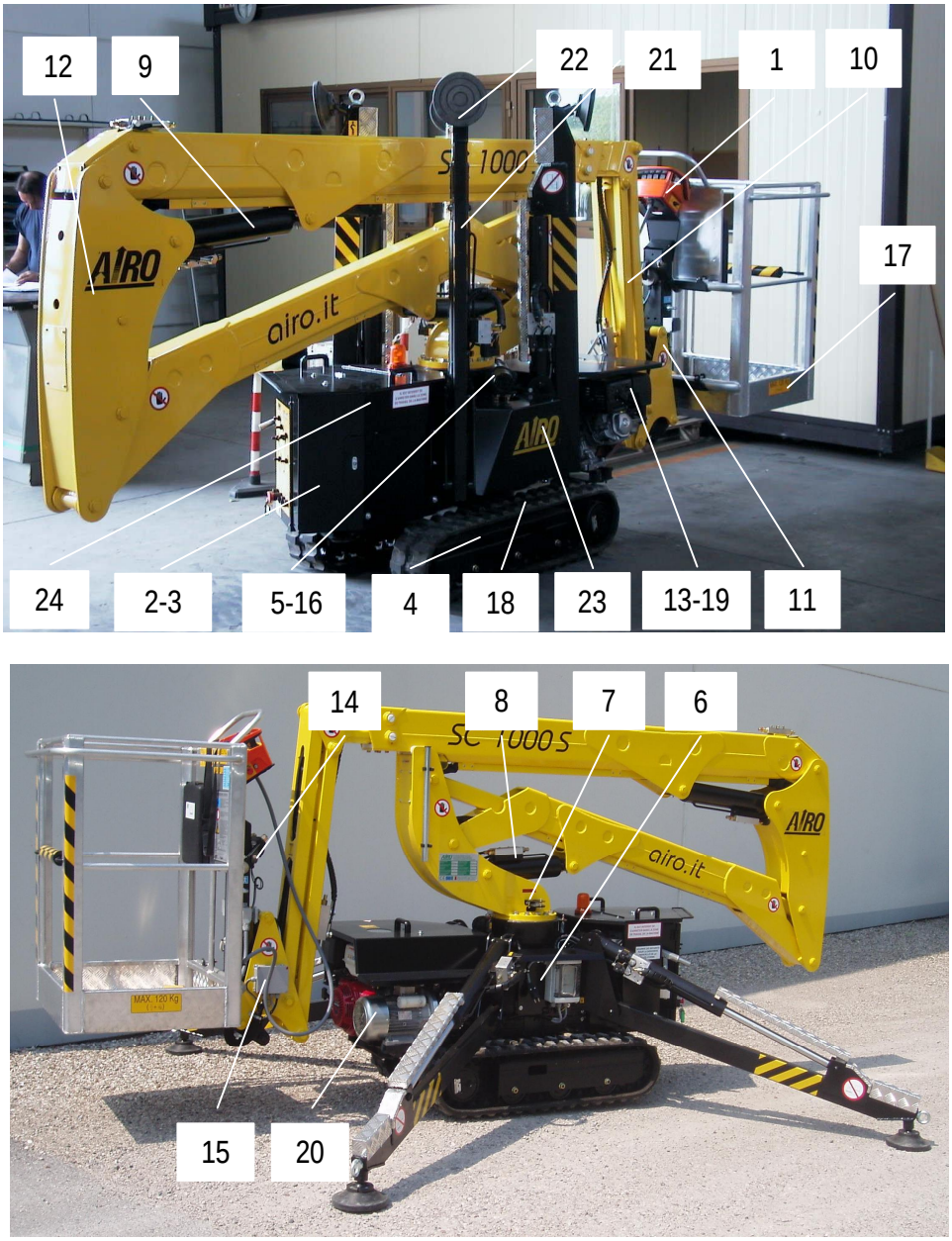


Fig.2

1) Control panel;
2) Electric control unit;
3) Hydraulic control unit;
4) Drive gear motors;
5) Turret rotation hydraulic motor;
6) 230V single-phase power plug;
7) Bubble level for visual check of machine levelling;
8) First boom lifting cylinder;
9) Second boom lifting cylinder;
10) Jib lifting cylinder;
11) Cage lifting cylinder;
12) Sensor cylinder;
13) Heat engine fuel tank;
14) Load cell;
15) Electronic control unit for overload controller;
16) Turntable;
17) Cage;
18) Tracks;
19) Heat engine;
20) Electric pump;
21) Outriggers;
22) Outriggers articulated feet;
23) Battery;
24) Inclinometer.

2 TECHNICAL FEATURES OF STANDARD MACHINES

DESCRIPTION	SC1000-S	SC1000-DC	SC1000-DL
Max. working height – m -	12	12	12
Max. walking surface height – m -	10	10	10
Max. outreach from turntable centre - m -	6.5	6.5	6.5
Turret rotation (not continuous) - degrees -	320	320	320
Max. platform dimensions - mm -	850x700 h=1100	1300x700 h=1100	1300x700 h=1100
Max. capacity - Kg -	120	200	200
Max. No. of people on platform	1	2	2
Machine weight (unloaded) - Kg -	1520	1950	1580
Max. load on each outrigger - kg -	630	820	680
Max. hydraulic pressure - bar -	170	170	170
Tracks dimension - mm -	Ø 300 x 200	Ø 300 x 200	Ø 300 x 200
Max. operating temperature - °C -	+50	+50	+50
Min. operating temperature - °C -	-10	-10	-10
Stability limits:			
Max. slope compensated by outriggers - degrees -	5°	5°	5°
Stabilization area (between the support centres) - mm	2595x2595	2595x2595	3225x3225
Longitudinal inclination - degrees -	1°	1°	1°
Transversal inclination - degrees -	1°	1°	1°
Max. wind force (**) - m/s -	12,5	12,5	12,5
220 V electric pump power			
Max. capacity - KW -	2,2	2,2	2,2
Max. absorbed current - A -	14,5	14,5	14,5
Max. drive speed - m/s -	0,1	0,1	0,1
Max. gradeability - % -	28	28	28
Petrol engine power			
Engine type	Honda GX390	Honda GX390	Honda GX390
Max. engine power - Hp/kW -	13/9,5	13/9,5	13/9,5
Starter battery –V/Ah-	12/80	12/80	12/80
Max. drive speed - m/s -	0,18	0,18	0,18
Hydraulic oil tank capacity - L -	30	30	30
Petrol tank capacity - L -	6	6	6
Fuel consumption - g/kWh -	313	313	313
Max. gradeability - % -	28	28	28
Diesel engine power			
Engine type	-	-	-
Max. engine power - Hp/kW -	-	-	-
Starter battery –V/Ah-	-	-	-
Max. drive speed - m/s -	-	-	-
Hydraulic oil tank capacity - L -	-	-	-
Diesel tank capacity - L -	-	-	-
Fuel consumption - g/kWh -	-	-	-
Max. gradeability - % -	-	-	-

Noise tests have been carried out under the most unfavourable conditions to study the effects on the operator. The level of acoustic pressure weighed (A) at work places does not exceed 105 dB(A).
As to vibrations in ordinary working conditions:

- the rms. value weighed according to acceleration frequency relevant to the upper limbs is lower than 2.5 m/sec^2 ;
- the rms. value weighed according to acceleration frequency relevant to the body is lower than 0.5 m/sec^2 .

3 SAFETY PRECAUTIONS

3.1 Power supply

The electric and hydraulic circuits are provided with safety devices, calibrated and sealed by the manufacturer.

⚠ Do not tamper with and modify the calibration of any component of the electric and hydraulic system.

3.2 Work and maintenance rules

- Always wear personal protective clothes according to current regulations concerning industrial health and safety (in particular, helmet and safety harness are COMPULSORY. See picture below).
- The machine must be used only in areas well lit up, checking that the ground is flat and firm. The machine may not be used if the lighting conditions are not sufficient.
- Do not use the thermic power (Diesel or Petrol engine) indoors or in insufficiently ventilated areas.
- Before using the machine check its integrity and conservation state.
- During maintenance operations do not dispose of any waste materials in the environment, but comply with current regulations.
- Do not carry out any service or maintenance operations when the machine is connected to the power supply. Follow the instructions given in the following paragraphs.
- For the maintenance of the heat engine (Diesel or Petrol engine) supplement the instructions given in this manual with those given in the heat engine manual.
- Do not approach the electric and hydraulic system components with sources of heat or flames.
- The platform is intended for people carriage; therefore, it is necessary to comply with the current local regulations relevant to this class of machines.
- Do not increase the max. allowed height by means of scaffolds, ladders or other.
- Do not use the machine as a crane.
- Do not use the machine as a hoist and/or lift.
- Protect the unit (in particular the platform control panel) and the operator when working in adverse environmental conditions (painting, de-painting, sand-blasting, washing, etc.).
- It is forbidden to the unit in case of severe weather conditions (rainstorms with wind exceeding the limit speed indicated in chapter "Technical features").
- In the event of rain or in parking condition always protect the on-platform control panel by means of the specially provided cap.
- Do not use the machine in areas where risks of fire or explosion exist.
- Do not use pressurized water jets (high-pressure cleaners) to wash the machine.

Fig.3

3.3 Safety rules

3.3.1 General

Only adults, after carefully reading this manual, are allowed to use the machine.

Use the machine at a distance of at least 5 metres from high-tension lines (in any case not in proximity to live elements).

Use the machine according to the capacity values indicated in the technical features section. The max. No. of people allowed on the platform and the capacity are specified on the identification plate.

It is absolutely forbidden to load persons, tools and building materials on the platform when it is not in access position.

Do NOT use the framework of the platform or any of its elements for grounding connection while welding on platform.

It is the machine owner and/or safety manager's responsibility to check that the operators have been thoroughly trained in the use of the machine.

It is the machine owner and/or safety manager's responsibility to check that the maintenance and repair operations are carried out by skilled personnel.

3.3.2 Handling

Before any movement make sure that the machine plugs are disconnected from the power source. Always check the cable position during handling if the machine is powered with a 220V electric pump.

In order to avoid any instability, use the machine on regular and firm grounds. Before lifting the platform check the platform level through the spirit level which is located on the turret. To prevent the machine from overturning, comply with the max. gradeability values indicated in the Technical features section under paragraph "Stability limits". However, movements on inclined grounds are to be carried out with the utmost caution.

In order to avoid any instability, use the machine on regular and firm grounds. Before lifting the platform check the platform level through the spirit level which is located on the turret.

The operator on the cage is not allowed to carry out drive and stabilizing operations. For these operations the operator is to get on the ground and control the machine at a safety distance.

The machine must not be used directly for road transport. Do not use it for material transport (see paragraph 1.2 "Intended use").

Check that in the operating area there are not obstacles or other dangerous elements.

Pay particular attention to the area above the machine during lifting to avoid any crushing and collisions.

3.3.3 Operating procedures

Before starting to work , when the engine is not running and sufficiently cool, visually check the fuel level in the tank. If necessary, add fuel (lead-free Petrol O.N.>87 for petrol models; Diesel oil for Diesel models) avoiding to fill the tank completely and to dirty the unit. Should small quantities of fuel leak out, clean immediately using a clean cloth.

In case of Thermic engine fault, refer to the User Manual provided by the manufacturer of the engine.

The machine is equipped with a load-on-platform control system stopping the platform in case of overloading. Platform operation can be resumed only after removing the exceeding load. Should the audible warning device and the red light located on the platform control panel turn on, then the machine is overloaded (see paragraph relevant to general use instructions). Remove the exceeding load before starting operations again.

The machine is equipped with a chassis inclination control system disabling lifting operations in case of unstable positioning. Work is possible only after placing the machine in a steady position. Should the audible device and the red light on the platform control panel turn on, the machine is not correctly positioned (see paragraphs relevant to general use instructions). Bring it to safety rest position before starting operations again.

The machine is equipped with a control system of the outriggers feet resting on the ground. When all feet are resting on the ground, the warning lights are lit and, unless other alarms, all movements are allowed except for tracks control. When the platform is lifted if one of the feet loses contact with the ground, the relevant warning light turns off and all lifting movements are inhibited. Cage lowering on the ground is still possible (lowering and turret rotation in both directions) at an automatically reduced speed.

The machine is equipped with a control system of the rotating turret position. When the turret is in central position, the green light is lit. If the boom is completely lowered, drive and stabilization controls are possible while the turret rotation is inhibited.

To avoid improper use, a special microswitch checks the platform position; when the second boom is not completely lowered, the outriggers cannot be operated.

Do not lean over the platform guard-rails. Avoid severe weather conditions and, in particular, windy days.

During operations in public areas surround the working area by means of barriers or other suitable signs.

Do not use the thermic power indoors or in insufficiently ventilated areas.

Make sure that no people, apart from the operator, are in the area where the machine is operating.

Lift the platform only if the machine is resting on solid ground and is levelled. If you operate on grounds which are not solid enough, place some boards of tough and resistant material under the pads of the outriggers so as to increase the support surface and reduce the specific ground pressure.

After each work session, always take the keys out of the control panels and keep them in a safe place to prevent unauthorized people from using the machine.

Always place working tools in a steady position to prevent them from falling and hurting the operators on the ground.

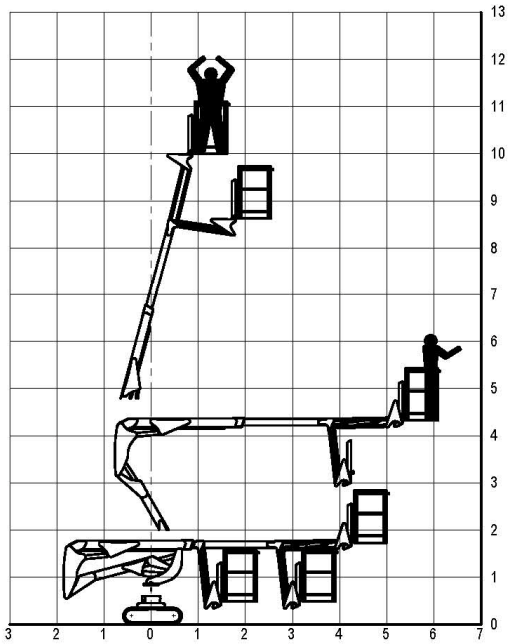
3.3.4 Wind speed according to Beaufort table.

You can use the table below for a simple assessment of the wind speed. We remember that the max. limit for each machine model is indicated in the table TECHNICAL FEATURES OF STANDARD MACHINES.

The machines for which the max. wind limit is 0 m/s must be used indoors only. These machines cannot be used outdoors even with no wind.

Beaufort Number	Wind speed (km/h)	Wind speed (m/s)	Description	Sea conditions	Land conditions
0	0	<0.28	Calm	Flat	Calm. Smoke rises vertically.
1	1-6	0.28–1.7	Light air	Ripples without crests.	Wind motion visible in smoke.
2	7-11	1.7–3	Light Breeze	Small wavelets. Crests of glassy appearance, not breaking.	Wind felt on exposed skin. Leaves rustle.
3	12-19	3–5.3	Gentle breeze	Large wavelets. Crests begin to break; scattered whitecaps.	Leaves and smaller twigs in constant motion.
4	20-29	5.3–8	Moderate breeze	Small waves.	Dust and loose paper raised. Small branches begin to move.
5	30-39	8.3-10.8	Fresh breeze	Moderate (1.2 m) longer waves. Some foam and spray.	Smaller trees sway.
6	40-50	10.8-13.9	Strong breeze	Large waves with foam crests and some spray.	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult.
7	51-62	13.9-17.2	Near gale / moderate gale	Sea heaps up and foam begins to streak.	Whole trees in motion. Effort needed to walk against the wind.
8	63-75	17.2-20.9	Fresh gale	Moderately high waves with breaking crests forming spindrift. Streaks of foam.	Twigs broken from trees. Cars veer on road.
9	76-87	20.9-24.2	Strong gale	High waves (6-7 m) with dense foam. Wave crests start to roll over. Considerable spray.	Larger branches break off trees, construction/temporary signs and barricades blown over, damage to circus tents and canopies.
10	88-102	24.2-28.4	Whole gale / Storm	Very high waves. The sea surface is white and there is considerable tumbling. Visibility is reduced.	Trees broken off or uprooted, saplings bent and/or deformed, poorly attached asphalt shingles and shingles in poor condition peel off roofs.
11	103-117	28.4-32.5	Violent storm	Exceptionally high waves.	Widespread vegetation damage, minor damage to most roof shingles/surfaces, gravel may be blown from flat roofs.
12	>117	>32.5	Hurricane	Huge waves. Air filled with foam and spray. Sea completely white with driving spray. Visibility greatly reduced.	Considerable and widespread damage to vegetation, a few windows broken, structural damage to mobile homes and poorly constructed sheds and barns.

- From the following pictures you can locate the action range of the platform while the chassis is kept in a fixed position. Watch these pictures carefully in order to position the chassis so as to avoid any contacts with obstacles present in the action range.



DIM. / MOD.	A	B	C	D
SC1000 S	2000	160	850	2595
SC1000 DC	2000	160	1300	2595
SC1000 DL	2415	160	1300	3225

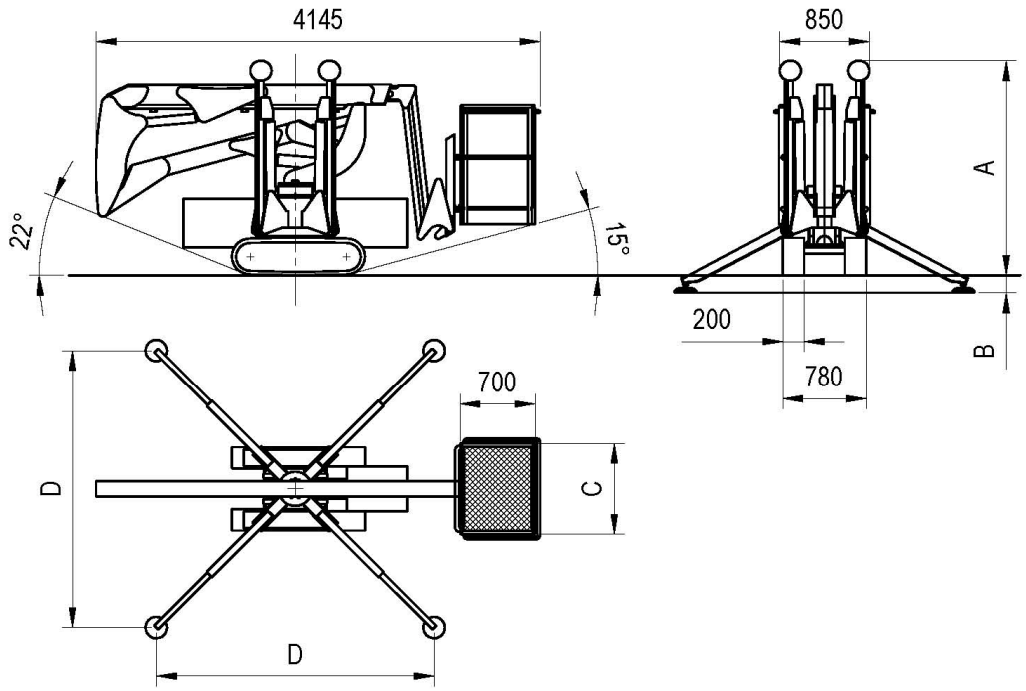


Fig. 4

4 INSTALLATION AND PRELIMINARY CHECKS

The machine is supplied completely assembled, therefore it can perform all functions in full safety as provided for by the manufacturer. No preliminary operation is required. To unload the machine, follow the instructions in paragraph "Handling and carrying".
Place the machine onto a firm ground and with a gradeability lower than the max. allowed (see "Stability limits"). The machine is equipped with on-chassis spirit levels for visual check and an inclinometer to always check machine levelling, both transversal and longitudinal.
Before using the machine read the instructions given in this manual and the concise instructions indicated on the platform plate.
Before starting any operations verify the integrity of the unit (by means of a visual check) and read the plates indicating the operating limits.

4.1 Before using the machine

Before using the machine the operator must <u>always</u> check visually that:
- the fuel tank is full;
- the hydraulic oil level ranges between the min. and max. value (with platform lowered and outriggers lifted);
- the ground is sufficiently horizontal and solid;
- the machine carries out all operations in safety;
- the outriggers and articulated pads are in good condition;
- the tracks are in good condition;
- the guardrails are fixed to the platform and the self-closing gates are present;
- the structure does not show clear faults (check welding of lifting structure);
- the instructions plates are perfectly readable;
- the controls are perfectly efficient both at platform and at emergency ground control station, including the "dead-man" system.

5 GENERAL USE INSTRUCTIONS

Before using the machine read this chapter thoroughly.

5.1 Platform control panel/wire control

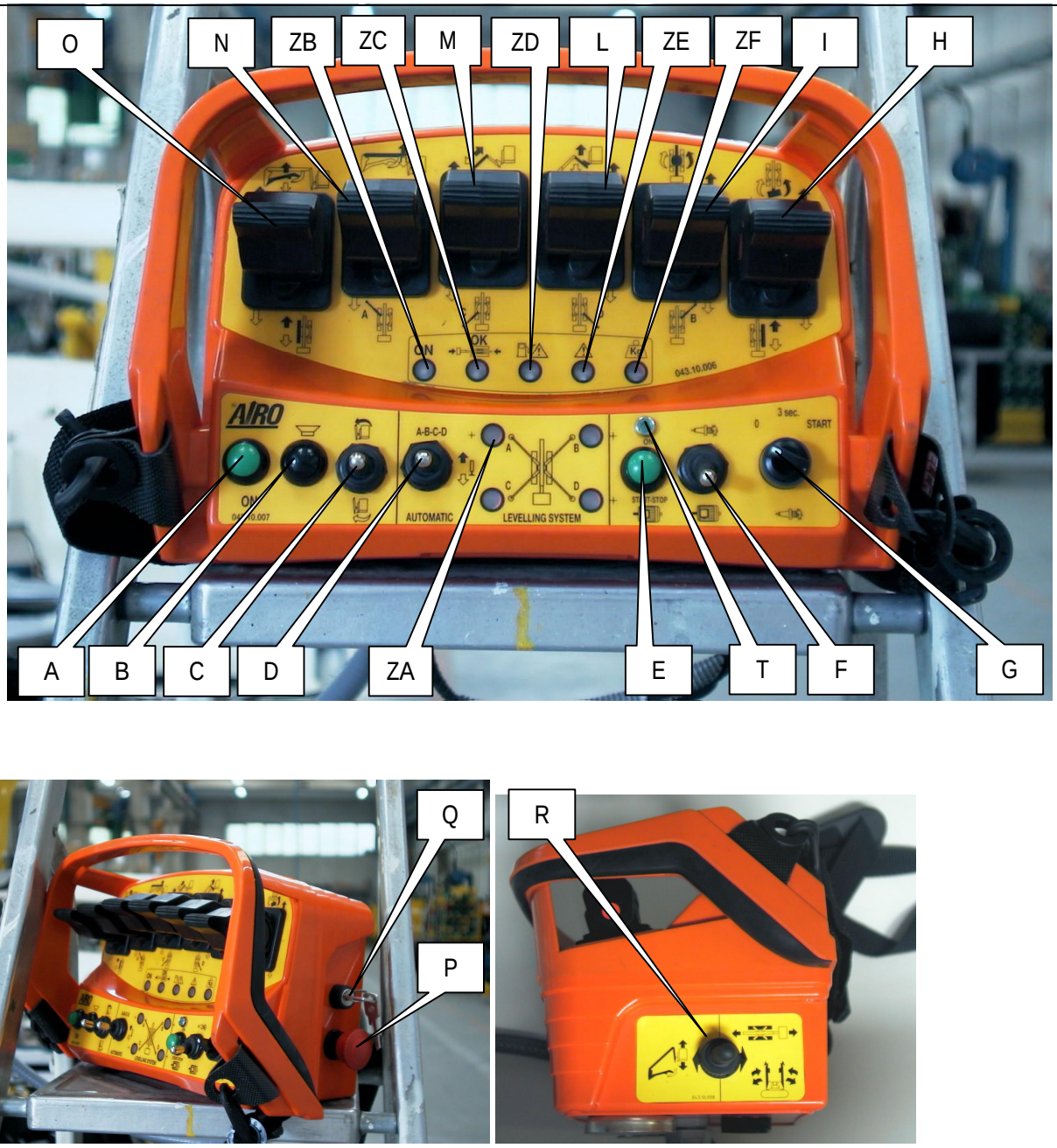


Fig. 5

A) Dead-man button
B) Horn button
C) Platform level compensation switch
D) Automatic stabilization control switch (optional)
E) Electric engine start / stop button (optional)
F) Electric / thermic power selector (petrol engine)
G) Heat engine starting switch
H) Platform rotation control proportional lever (optional) / RIGHT track drive
I) Turret rotation control proportional lever / front RIGHT outrigger (B)
L) JIB up-down control proportional lever / back RIGHT outrigger (D)
M Telescopic boom in-out control proportional lever / back LEFT outrigger (C)
N) Boom up-down control proportional lever / front LEFT outrigger (A)
O) Scissors up/down control proportional lever / LEFT track drive
P) Emergency stop button
Q) Load control by-pass emergency key switch
R) Controls mode selector: platform movement / wire control (drive and stabilization)
S) Dead-man pedal
T) Enabled electric pump warning light (optional)
ZA) Outriggers position warning lights
ZB) Enabled station warning light
ZC) In-centre turret warning light
ZD) Low fuel / Diesel engine anomaly warning light – Not active for machines with petrol engine
ZE) Danger warning light (unsteady position and faults indicator)
ZF) Overload alarm warning light

All controls – except for platform level reset and stabilization – are of proportional type; it is therefore possible to adjust movement speed by means of the relative proportional levers. To avoid sudden shakes during movements, it is advisable to operate the proportional levers gradually.

For safety reasons, to operate the machine, it is necessary to press “dead-man” pedal S or “dead-man” button A at platform before operating the controls. If the dead-man pedal is accidentally released while the machine is operating, the movement is immediately stopped.
During platform positioning with operator on board, the controls can be enabled using the “dead-man” pedal; during drive and stabilization movements with operator on the ground, controls must be enabled using the “dead-man” button.

CAUTION! Holding down the dead-man pedal for over 10 seconds without carrying out any operation will disable the control station. Once the “dead-man” button is pressed, you have 2 seconds to activate the controls. If no operation is performed after 2 seconds, the control station is disabled.
The condition of disabled control station is reported by the green flashing led (see paragraph “Warning lights”). To operate the machine again, it is necessary to release the “dead-man” pedal and press it again or press the “dead-man” button.

Follow exclusively the instructions given in the next paragraphs and the safety rules described both hereafter and in the previous paragraphs. Read the next paragraphs carefully in order to properly understand the on/off procedures as well as all operations and their correct use.

Before any movement, verify the presence of people in close proximity to the machine and, in any case, proceed with the utmost caution.

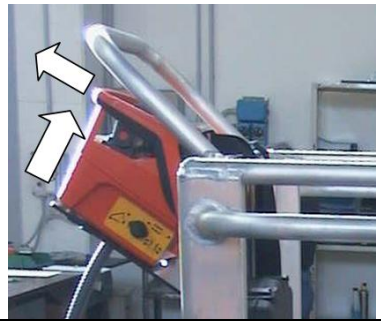
5.1.1 "Wire control" mode: Drive and Stabilization

To use the controls of the operating mode "Wire control" (Drive and Stabilization) carry out the following preliminary operations in the sequence below:

1. Remove the control box from the magnetic support on the platform and remove the cable from the supports;
2. Get off the platform and carry the control box on your shoulder;
3. Select the operating mode "Wire control" by setting selector R to 1;
4. Place yourself at safety distance from the machine in lateral position compared to platform and control the desired movement following the instructions in the next paragraphs.

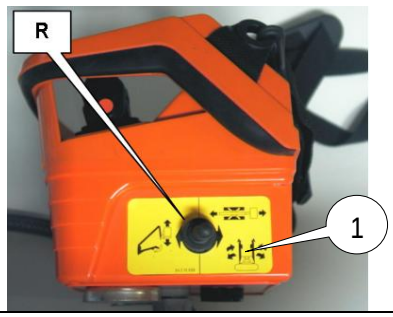
In "Wire control" mode, the proportional control levers have the following functions:
H) RIGHT track Drive proportional lever control
I) RIGHT front outrigger proportional lever control (B)
L) RIGHT rear outrigger proportional lever control (D)
M) LEFT rear outrigger proportional lever control (C)
N) LEFT front outrigger proportional lever control (A)
O) LEFT track Drive proportional lever control.

1)



2)

3)



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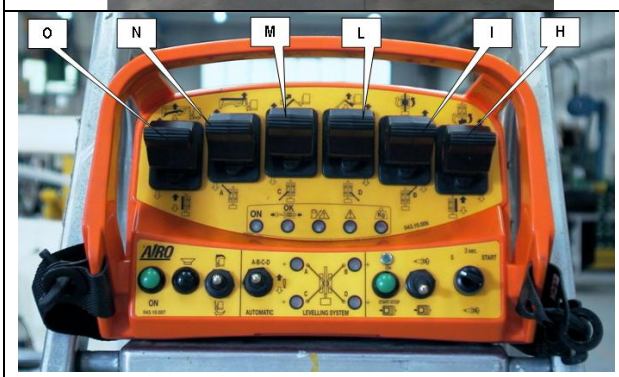


Fig.6

WARNING!!

The operator on the cage is not allowed to carry out drive and stabilizing operations. For these operations the operator has to get on the ground and control the machine at a safety distance.

Drive and stabilization functions are active only if green warning light ZC is lit (turret is in central position).

5.1.1.1 Drive

Once the operations in paragraph 5.1.1 have been carried out, to achieve the drive movement (tracks control), perform the following operations in sequence:

1. Press “dead-man” button A on the control box. Green led ZB will light up steady;
2. Within 2 seconds, operate the proportional levers H and O simultaneously in the same direction and with the same intensity to get the straightforward direction or with different intensity to steer the machine as shown in figure.

Fig.7

Drive controls are of proportional type; it is therefore possible to adjust movement speed by means of the relative proportional levers. To avoid sudden shakes during movements, it is advisable to operate the proportional levers gradually.

WARNING!!

The operator on the cage is not allowed to carry out drive and stabilizing operations. For these operations the operator has to get on the ground and control the machine at a safety distance.

The drive operation is active only if green warning light ZC is lit (turret is in central position) and green warning lights ZA are OFF (no outriggers resting on the ground).

WARNING!!

Due to the limited width of the machine, to go up and down the steps, KEEP the machine perpendicular compared to the obstacle. RISK OF OVERTURN.

DO NOT overcome steps higher than 10 cm. Reduce the obstacle height by using strong wooden boards and pieces.

5.1.1.2 Stabilization

Once the operations in paragraph 5.1.1 have been carried out, to achieve the stabilization movement, perform the following operations in sequence:

1. Press “dead-man” button A on the control box. Green led ZB will light up steady;
2. Within 2 seconds operate proportional levers I, L, M, N to control the outriggers individually or use switch D (optional) for automatic stabilization.

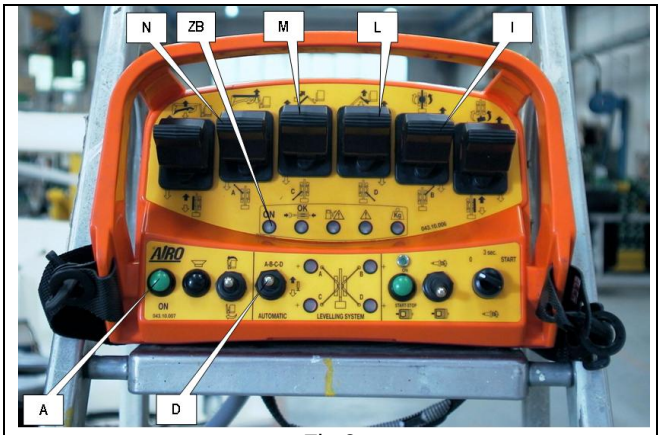


Fig.8

Stabilization controls are not proportional. The movement speed is fixed, it is set at factory and does not depend on the control levers.

WARNING!!
The operator on the cage is not allowed to carry out drive and stabilizing operations. For these operations the operator has to get on the ground and control the machine at a safety distance.

Always check the firmness of the ground before lifting the platform. Place strong wooden boards under the outriggers pads so as to spread the load on a wider surface.

A spirit level on the turret allows the operator to control the machine levelling while stabilizing. However, the machine is equipped with a chassis inclination control system disabling lifting operations in case of unstable positioning. Work is possible only after placing the machine in a steady position. Should the audible alarm and red warning light ZE on the control box turn on, the machine is not correctly positioned; stabilization is necessary to operate the machine again.

While using the outriggers, an automatic system inhibits platform lifting in the event that one of the pads does not rest perfectly on the ground. The outriggers pads are resting on the ground when all warning lights ZA are ON.

When the platform is lifted if one of the feet looses contact with the ground, the relevant warning light ZA turns off, danger light ZE turns on and all lifting movements are inhibited. Cage lowering on the ground is still possible (lowering and rotation in both directions) at automatically reduced speed.

Specially provided micro-switches located on the levelling cylinders control their position. With one or more pads resting on the ground (one or more ZA warning lights are ON) drive is inhibited. To carry out drive movement, lift the pads from the ground. When warning lights ZA turn off, pads are lifted.

To avoid improper use, a special microswitch checks the position of the lifting boom. With a second boom not completely resting on the fixed structure, the outriggers control is inhibited.

An automatic system checks the position of the rotating turret. When green warning light ZC is lit steady, the turret is correctly positioned and stabilization control is allowed. If the green light ZC turns off, the turret position is not correct and stabilization is inhibited.

The following table indicates the approximate values of the bearing capacity of various types of ground. All values are merely indicative and do not provide any binding information concerning the actual bearing capacity of the various types of ground in different composition and conditions. The real bearing capacity of each single ground can be achieved only through penetration tests carried out by experienced professionals.

INDICATIVE TABLE OF BEARING CAPACITY VALUES OF A FEW GROUNDS	
TYPE OF GROUND	BEARING CAPACITY IN Kg/ cm²
Non compact filling earth	0 – 1
Mud, peat, etc.	0
Sand	1,5
Gravel	2
Friable earth	0
Soft earth	0,4
Rigid earth	1
Semi-solid earth	2
Solid earth	4
Rock	15 - 30

To correctly dimension a support plate to be placed under the levelling pad – once the real bearing capacity of the ground is known – follow the expression:

MAX LOAD OF OUTRIGGER [kg] / GROUND BEARING CAPACITY [Kg/cm²]= PLATE SURFACE [cm²]

Example:
Max. load applied by one outrigger (see paragraph "Technical features") = 820 kg;
Ground bearing capacity = 4 Kg/cm²

Minimum necessary surface for the support plate = 820 / 4 = 205 cm².

5.1.1.2.1 Manual stabilization control

To lift/lower the levelling cylinders it is necessary to operate one or more of the four control levers I, L, M, N.
If you set levers I, L, M, N down, the levelling pads extend; vice versa, if you set the levers up, they retract.
The location of the control levers I, L, M, N and relevant warning lights ZA corresponds to the arrangement of the levelling cylinders:

- Lever N / Warning light A = Front left levelling cylinder;
- Lever I /Warning light B = Front right levelling cylinder;
- Lever M / Warning light C = Rear left levelling cylinder;
- Lever L / Warning light D = Rear right levelling cylinder;

For a correct manual stabilization:

a) control all the outriggers simultaneously until the support pads are close to the ground;
b) set the support pads near the ground by controlling a pair of outriggers at a time until the tracks raise slightly from the ground;
c) correct stabilization by controlling one or two outriggers at a time until the machine is levelled and displayed by the spirit level.

5.1.1.2.2 Automatic stabilization control (OPTIONAL)

The machine can be supplied with an optional automatic stabilization system. The system has two operating modes:
- manual mode (see previous paragraph)
- automatic mode.

For AUTOMATIC STABILIZATION set control lever D down. The control system will independently control the levelling cylinders until the machine is levelled.
Levelling is correct when:
- all four warning lights ZA are on;
- inclination alarm warning light ZE is off (if an alarm condition due to instability before the levelling control is present);
- enabled control station green warning light ZB from steady to flashing.

For a quick manual stabilization:
a) control all outriggers simultaneously with the manual controls (levers I, L, M, N) until support pads are close to the ground;
b) activate automatic stabilization control lever D.

For AUTOMATIC RETRACTION of all pads, set control lever D up. The control system will retract all pads up to the upper stop.

During automatic levelling, the system aims to level the machine within an allowance of 0.4° both longitudinally and transversally. The system continues the pad control until levelling within this tolerance is reached. If the automatic system is unable to obtain levelling within the expected allowance, yet the four pads are firmly resting on the ground and the machine is within the stability limits controlled by the inclinometer, lifting can be still carried out.
Excessive longitudinal and/or transversal inclinations may prevent the automatic levelling from being reached.

5.1.2 Mode “Platform movement”: lifting/lowering/rotation

To use the controls of the operating mode “Platform movement” (Lifting/Lowering/Rotation) carry out the following preliminary operations in the sequence below:

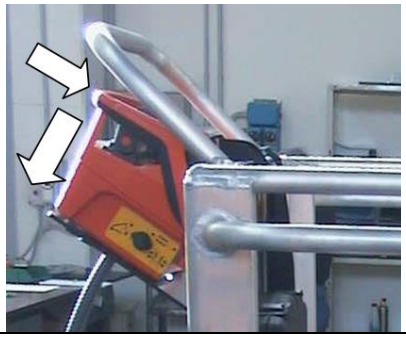
1. Once the machine has been correctly positioned according to the previous paragraphs, reposition the control box on the magnetic support at platform and lock the cable on the supports.
2. Step onto platform;
3. Select the operating mode “Platform Movement” by setting selector R to position 2; control the desired movement following the instructions in the next paragraphs.

In “Platform movement” mode, the proportional control levers have the following functions:

H) Platform Rotation proportional control lever (Optional)
I) Turret Rotation proportional control lever
L) Jib up/down proportional control lever
M) Telescopic boom out/in proportional control lever
N) Second boom up/down proportional control lever
O) First boom up/down proportional control lever.

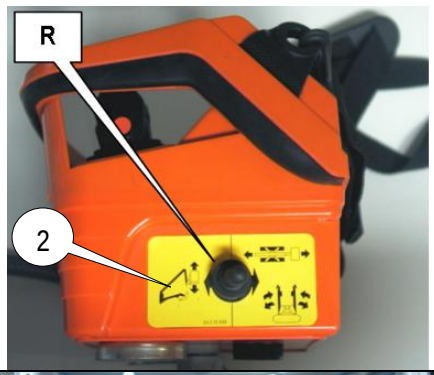
When the second boom is resting on the turret (low platform), platform level compensation control C is active.

1)



2)

3)



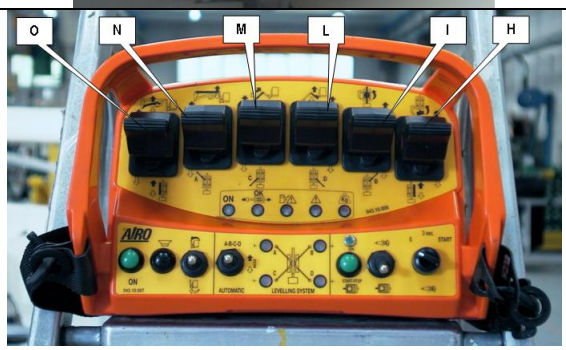


Fig.9

WARNING!!

Should the audible alarm and red warning light ZE on the control box activate, the machine is not correctly positioned; stabilization is necessary to operate the machine again.

When platform is lifted if one of the feet looses contact with the ground, the relevant warning light ZA turns off, danger light ZE turns on and all lifting movements are inhibited. Cage lowering on the ground is still possible (lowering and rotation in both directions) at automatically reduced speed.

To avoid improper use, a special microswitch checks the position of the lifting boom. When the second boom is not completely resting on the fixed structure, the control for platform level compensation is inhibited.

To avoid any collision risks between the lifting structure and the outriggers, platform can be completely lowered only if turret is in central position (green warning light ZC is ON).

5.1.2.1 First boom lifting/lowering

Once the operations in paragraph 5.1.2 have been carried out, to achieve the lifting/lowering movement of the first boom, perform the following operations in sequence:

1. Press “dead-man” pedal S on the platform; The green led ZB will light up steady;
2. Within 10 seconds gradually set the proportional lever O up to lift or down to lower.

5.1.2.2 Second boom lifting/lowering

Once the operations in paragraph 5.1.2 have been carried out, to achieve the lifting/lowering movement of the second boom, perform the following operations in sequence:

1. Press “dead-man” pedal S on the platform; green led ZB will light up steady;
2. Within 10 seconds gradually set the proportional lever N up to lift or down to lower.

5.1.2.3 Telescopic boom extension/retraction

Once the operations in paragraph 5.1.2 have been carried out, to extend/retract the telescopic boom, perform the following operations in sequence:

1. Press “dead-man” pedal S on the platform; green led ZB will light up steady;
2. Within 10 seconds gradually set the proportional lever M up to lift or down to lower.

5.1.2.4 Jib lifting/lowering

Once the operations in paragraph 5.1.2 have been carried out, to lift/lower the Jib, perform the following operations in sequence:

1. Press “dead-man” pedal S on the platform; green led ZB will light up steady;
2. Within 10 seconds gradually set the proportional lever L up to lift or down to lower.

5.1.2.5 Turret orientation (rotation)

Once the operations in paragraph 5.1.2 have been carried out, to orientate the turret, perform the following operations in sequence:

1. Press “dead-man” pedal S on the platform; green led ZB will light up steady;
2. Within 10 seconds gradually set the proportional lever I up for anticlockwise rotation or down for clockwise rotation.

5.1.2.6 Platform rotation (OPTIONAL)

Once the operations in paragraph 5.1.2 have been carried out, to rotate the platform (OPTIONAL), perform the following operations in sequence:

1. Press “dead-man” pedal S on the platform; green led ZB will light up steady;
2. Within 10 seconds gradually set the proportional lever H up for anticlockwise rotation or down for clockwise rotation.

5.1.2.7 Platform level compensation

The platform is automatically levelled. Should it be necessary to reset the correct level, use switch C.
Set switch C up for forward levelling or downward for backward levelling.

Warning!! This operation can be carried out only when booms are completely lowered. No result is achieved if these operations are carried out when platform is lifted.

5.1.3 Other functions of the platform control panel

5.1.3.1 Electric / thermic power selector (F) (OPTIONAL)

The propulsion type can be selected using the selector F.
Setting the selector forward (sparking plug symbol) the thermic propulsion is selected (Petrol or Diesel motor); setting the selector backward (electric engine symbol) the electric propulsion is selected (230V single-phase pump or 380V three-phase pump).

5.1.3.2 Electric engine start / stop button (E) (OPTIONAL)

Once the electric power has been selected by means of selector F, if the ground control panel is connected to the mains, press button E to turn the pump on (if off) or off (if on), to press the electric pump press button E.

See next paragraphs for operating modes of the electric pump starting button.

5.1.3.3 Enabled electric pump warning light (T) (OPTIONAL)

When green warning light T is on, the electric pump is enabled, if selector F is in “Electric” position and ground control connected to the mains.

5.1.3.4 Heat engine starting switch (G)

After selecting the thermic power by means of selector F, use switch G to start/stop the heat engine (Petrol or Diesel):
- In START position it enables starting;
- In position 3 sec it pre-heats the plugs (Diesel motors with plugs only);
- In position 0 it stops the heat engine.

5.1.3.5 Horn (B)

It warns that the machine is moving. It is operated by means of button B.

5.1.3.6 Emergency STOP button (P)

By pressing button P all machine control functions are stopped. Normal functions are enabled by rotating the button of 1/4 turn clockwise.

5.1.3.7 Warning lights

Fig.10

5.1.3.7.1 Enabled control station warning light (ZB)

On with blinking light. If platform control station has been selected and this light is blinking, controls are not enabled because:

- Dead-man pedal is not pressed or it was pressed for more than 10 seconds and no operation was performed.
- Or dead-man button was not pressed or more than 2 seconds went by since it was pressed for the last movement.

On steady. If platform control station has been selected, controls are enabled because:

- Dead-man pedal has been pressed for less than 10 seconds;
- Or dead-man button was pressed for less than 2 seconds.

5.1.3.7.2 In-centre turret warning light (ZC)

This light is on when turret is in central position. When light is off and boom lifted, all boom movements are possible. When light is off and boom completely lowered, turret orientation controls are active to allow the turret to be set to central position, but stabilization and drive are disabled. When light is on and boom lifted, turret orientation control is inhibited but stabilization and drive controls are active.

⚠

WARNING!!

To avoid any collision risks between the lifting structure and the outriggers, platform can be lowered completely only if turret is in central position (green warning light ZC is ON).

5.1.3.7.3 Diesel engine fault / Low fuel level warning light (ZD) (DIESEL engine only)

This warning light indicates malfunctioning of diesel engine or low fuel.
On steady with: machine on; platform controls; heat engine power selected. Diesel engine off, ready for start-up. Insufficient engine oil pressure.
Slow flashing in the event of the engine head overheating. If on, it stops the Diesel engine; if off, it prevents the Diesel motor from starting.
Fast flashing in the event of low fuel. This warning is active only with the engine on.

5.1.3.7.4 Danger warning light (unsteady position and faults indicator) (ZE)

It blinks quickly for 4 seconds together with the audible alarm at the machine start-up in case of fault during safety test on controls (levers, joystick controls, buttons, etc.).
It is lit up steady together with the audible alarm when the chassis inclination exceeds the allowed value. All types of lifting and telescopic extension are blocked. Retraction movements (lowering and rotations) are possible at reduced speed. It is necessary to lower the booms completely and then place the machine onto a horizontal surface.
On steady and activation of audible alarm when one of the outriggers looses contact with the ground with lifted platform. All types of lifting and telescopic extension are blocked. Retraction movements (lowering and rotations) are possible at reduced speed. Booms must be lowered completely and outriggers positioned on a firm ground.

CAUTION!
The activation of this indicator warns of a dangerous situation since the machine has reached a dangerous condition for its stability.
In case of alarm condition, to prevent increasing the overturn risk, the operator on the platform is recommended to retract the telescopic boom first and to lower it as the last operation.

5.1.3.7.5 Overload alarm warning light (ZF)

On steady and activation of audible alarm with a platform overload exceeding 25% the rated load. If the platform is lifted, the machine is completely locked. Remove the overload before using the machine again.
On with blinking light and activation of audible alarm in case of emergency by-pass of the platform load controller. All movements are possible until the machine is turned off.

CAUTION!
The activation of this indicator is a synonym of danger since the load at platform is exceeding or no load control is active upon signalling.

For adjustment or activation in emergency situations read the MAINTENANCE chapter.

5.1.3.7.6 Outriggers position warning lights (ZA)

When all warning lights are ON steady, all the outriggers pads are resting on the ground.
When all warning lights are off, none of the outriggers pads is in contact with the ground.
Platform can be lifted only when all warning lights are on with no other alarms (see description Other warning lights).

CAUTION!

When the platform is lifted if one of the feet looses contact with the ground, the relevant warning light ZA turns off, danger red light ZE turns on and all lifting movements are inhibited. Cage lowering on the ground is still possible (lowering and rotation in both directions) at automatically reduced speed.

With one or more pads resting on the ground (one or more ZA warning lights are ON) drive is inhibited. To carry out drive movement, lift the pads from the ground.

5.2 Ground control station and electric control unit

The ground control station (or electric central unit) contains the main electronic boards necessary to operate the machine and to carry out safety checks.
The ground control station is to be used to:

- turn the machine ON/OFF;
- select the control station (ground or platform/wire control);
- operate the platform in emergency cases;
- display a few working parameters (work hours; diagnostics, etc.);

⚠ Access to the electric control unit is allowed to specialized personnel only for maintenance and/or repair purposes. Access the electric power unit only after the machine has been disconnected from any 220V power sources.

5.2.1 Ground control station

The ground control station is located on the chassis (see paragraph "Location of main components").
The ground control station corresponds with the electric control unit.

⚠ Use the ground controls only in emergency situations to allow the platform to be recovered or to help its carriage.
IT IS FORBIDDEN to use the ground control station as a workstation when personnel is on the platform.

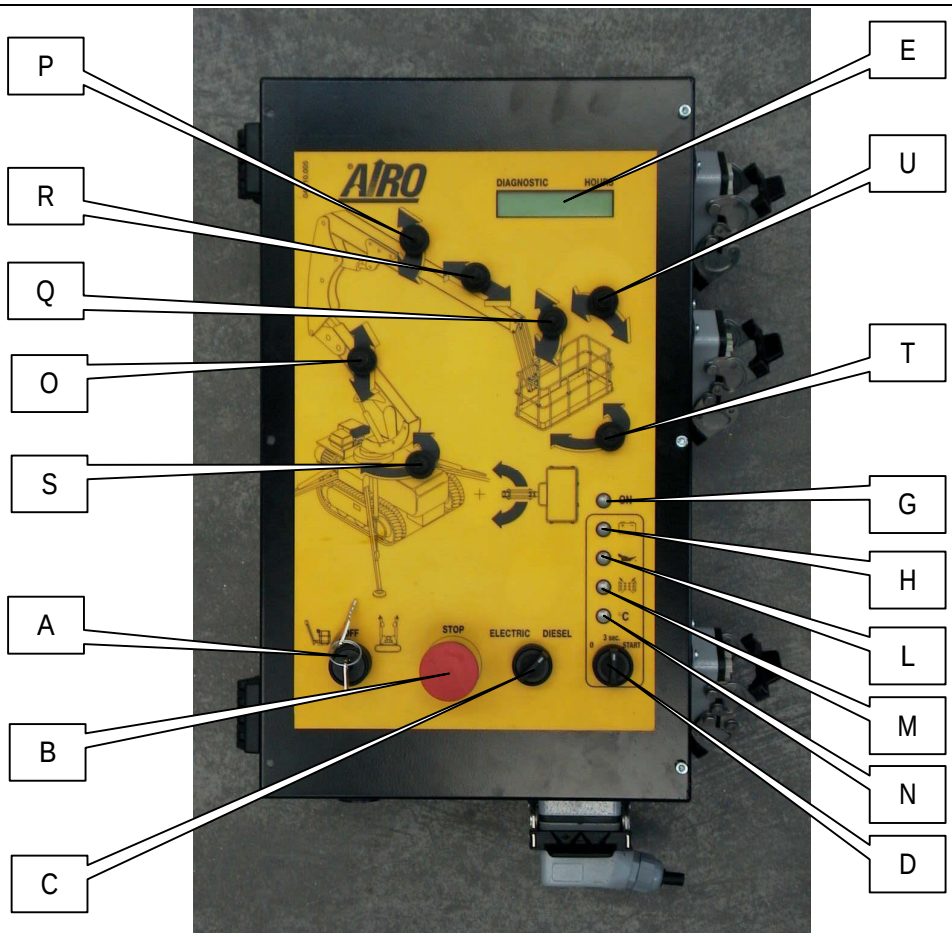


Fig.11

A) ON-OFF key and ground/platform control station selector
B) Emergency stop button
C) Electric / thermic power selector (OPTIONAL)
D) Heat engine starting switch
E) User interface display
G) Warning light: machine on
H) Alternator warning light (Diesel models only)
L) Oil warning light (Diesel models only)
M Air filter warning light (Diesel models only)
N) Motor head temperature warning light (Diesel models only)
O) FIRST BOOM UP/DOWN lever
P) SECOND BOOM UP/DOWN lever
Q) JIB LIFTING/LOWERING lever.
R) TELESCOPIC BOOM OUT/IN lever.
S) TURRET ORIENTATION lever
T) PLATFORM ROTATION lever (OPTIONAL)
U) PLATFORM LEVEL compensation lever.

The key must be given only to authorized personnel. A duplicate key should be kept in a safe place.

The ground controls for operating the structure, except for Jib lifting/lowering, are active only if machine is levelled and resting on outriggers.

The Jib lifting/lowering control from the ground is always active to enable Jib lifting before loading/unloading operations of the machine by means of ramps.

5.2.1.1 On-off key and control station selector (A)

The on-off key located on the ground control station is used to:
- turn ON the machine by selecting one of the two control stations:
  - platform/wire controls enabled with key switch set to platform symbol. Stable key position with possibility to extract the key;
  - ground controls enabled (for emergency operations) with key switch set to CHASSIS symbol. Position with action to be kept. When the key is released the machine is turned off.
- turn OFF the control circuits by turning it to OFF;

5.2.1.2 Emergency STOP button (B)

By pressing this button the machine is completely stopped; by rotating it of 1/4 turn (clockwise) the machine can be turned ON by means of the ON-OFF key (see 5.2.1.1).

5.2.1.3 Thermic / electric work power selector (C) (OPTIONAL)

Holding the ON-OFF key in position “ground controls” it is possible to select the type of power for the ground controls:
- If ELECTRIC is selected and the ON-OFF key is kept active in position “ground controls” the 220V single-phase pump is started;
- If THERMIC is selected and the ON-OFF key is kept active in position “ground controls” the heat engine can be started.

5.2.1.4 Heat engine starting switch (D)

Holding the ON-OFF key in position “ground controls” after selecting the THERMIC power, the heat engine can be started by means of the relevant switch.

- In “0” position the heat engine is off;
- In “3 sec” position the plugs pre-heating takes place (only for Diesel engine);
- In “Start” position the engine starts.

5.2.1.5 User interface display (E)

The multifunction display for machine/user interface is used to:

- Display the operation parameters of the machine during normal functioning or in the event of a fault;
- Working hours of heat engine (when thermic power is selected the working hours are displayed in the format HOURS:MINUTES and final letter D);
- Working hours of electric pump (the working hours are displayed in the format HOURS:MINUTES and final letter E).

The user interface display is also used during any interventions by specialized personnel to calibrate/adjust the working parameters of the machine. This function is not available to the user.

5.2.1.6 Enabled machine warning light (G)

The green light is on with machine on with ground controls only.

5.2.1.7 Heat engine warning lights (H,L,M and N) (DIESEL engine only)

These warning lights warn the user about heat engine operational faults. One of these warning lights turns ON when the engine is stopped. A “fault” message is sent to the operator on the platform (see paragraph “Platform control panel”).
Once the Diesel engine has stopped due to a problem signalled by one of these warning lights, the engine can no longer be re-started until such problem has been solved.

5.2.1.8 Platform control levers (O,P,Q,R,S,T,U)

The various levers shown in the figure allow the platform to be operated. According to the various signs the corresponding movements are activated. These controls can be operated only if the on-off key is set to ON down (ground control station selected). We shall also remind you that the ground controls - except for JIB UP/DOWN - are to be used to operate the platform only in emergency situations and must not be used for any other purposes.

5.3 Platform access

⚠	To get on the platform use only the access equipment the platform is provided with.

To get on the platform, lift the bar and get on board. Check that, once you are on the platform, the bar falls down closing the access.

⚠	Do NOT block the closing bar so as to keep the platform access door open.

With the ground controls (see paragraph “Ground control station..”) it is possible, operating the boom, to lower the height of access to the platform for a better access to the platform itself.

Fig.12

5.4 Start-up

To start the machine the operator shall:

- release stop button B located on the ground control post by rotating it of 1/4 turn clockwise;
- turn on-off key A on the ground control station to Platform position;
- remove the starting key and keep it in a safe place or hand it over to a person in charge on ground, properly informed of the use of the emergency controls;
- get on the platform;
- release stop button P on the platform control panel by rotating it by 1/4 clockwise (see previous paragraphs).

If you wish to use the thermic propulsion, select the thermic power by means of selector F on the control box and start the heat engine using switch G (see instructions in next paragraph).

If you wish to use the electric propulsion, select the electric power by means of selector F on the control box and start the engine using button E (see instructions in next paragraphs).

Fig.13

5.4.1 Heat engine start-up

Preliminary operations to start the petrol engine:

a) Open the fuel cock;
b) In case of cold start-up, turn the starter lever to the position shown in the figure (petrol engine only).
c) Make sure that the manual accelerator lever is in the indicated position.

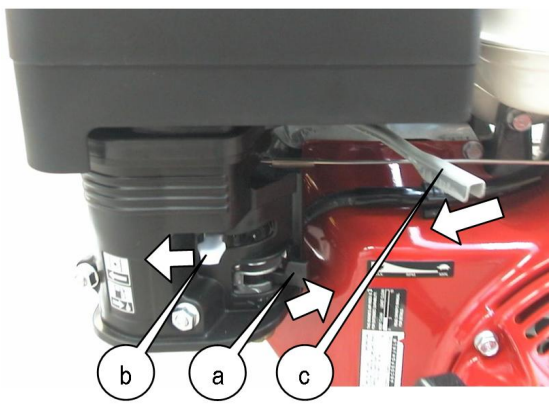


Fig.14

By turning starting switch G on the platform control panel:

- In “0” position the heat engine is off;
- In “3 sec” position the plugs pre-heating takes place (only for Diesel engine);
- In “Start” position the engine starts.

After starting set the starter lever to its original position (petrol engine only).

⚠ Do not insist on the starting position for longer than 3 seconds. In the event of failed start, check the fuel level and read the use and maintenance manual of the engine.
Do not try to start the engine if it is already running. This operation may cause the pinion of the starter to break.
In the event of operational faults, check the engine warning lights (DIESEL engine only) and read the Use and Maintenance manual of the engine.
Before using the thermic propulsion check the fuel level in the tank. This operation is to be carried out by visually checking the fuel level after unscrewing the filling cap.
NOTE: The heat engine can be started only if the dead-man pedal or dead-man button are not pressed. This means that the engine can be started only if the platform green warning light ON is flashing.

5.4.2 Starting the 230V electric pump (OPTIONAL)

To start the electric pump:

1) Insert plug X into the 230V socket of a power cord connected to a mains socket complying with all standards in force;
2) Set switch Y shown in figure to ON position;
3) To start the electric pump using the platform controls, start the engine by pressing green button E. The engine is started when green warning light T is on.

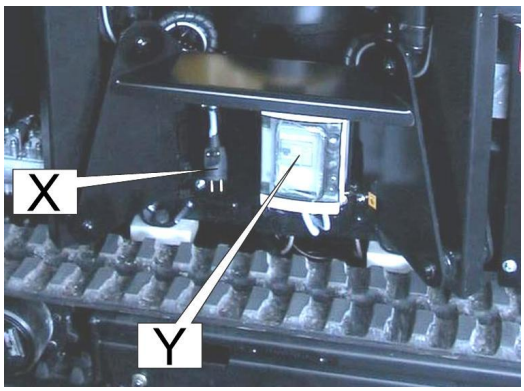


Fig.15

When the electric pump is on, a battery charger starts automatically to keep the battery charge level.

N.B: the operations carried out with 220V electric pump may be slightly slower than those with heat engine.

⚠ WARNING!!
Always check the position of the power cord during the movements.
Disconnect all electric power supplies before opening the cases.
Use 3x2.5 power cords with a length not exceeding 15 m.
Do not use rolled-up cables.

5.5 Machine stop

5.5.1 Normal stop

In normal operating conditions:
- By releasing the controls the operation is stopped. Stop occurs within a time limit set at the factory, which guarantees smooth braking.
- By releasing the “dead-man” pedal located on the platform, the operation is stopped.

5.5.2 Emergency stop

Should it be necessary, the operator may immediately stop all machine functions from both platform and ground control station.
From the platform control station/wire control:
- press the mushroom button on the control panel and the machine is turned off;

From the ground control station:
- press the ground control station stop button and the machine is turned off;

To resume the operations:

From the platform control station/wire control:
- Turn the stop button of 1/4 turn clockwise.

From the ground control station:
- Turn the stop button of 1/4 turn clockwise.

5.5.3 Heat engine stop

In order to stop the heat engine:

1) From the platform control station/wire control:
- Turn the starting key anticlockwise to position “0”.
- Otherwise, press the mushroom button.

2) From the ground control station:
- Turn the starting key anticlockwise to position “0”.
- Otherwise, press the mushroom button.

5.5.4 Stopping the 230V single-phase electric pump (OPTIONAL)

To stop the electric pump:

1) From the platform control station/wire control:
- Press the green start/stop button
- Otherwise, press the mushroom button.

2) From the ground control station:
- Turn the starting key anticlockwise to position “0”.
- Otherwise, press the mushroom button.

5.6 Emergency manual controls

⚠ This function is to be used only in emergency situations when no motive power is available.

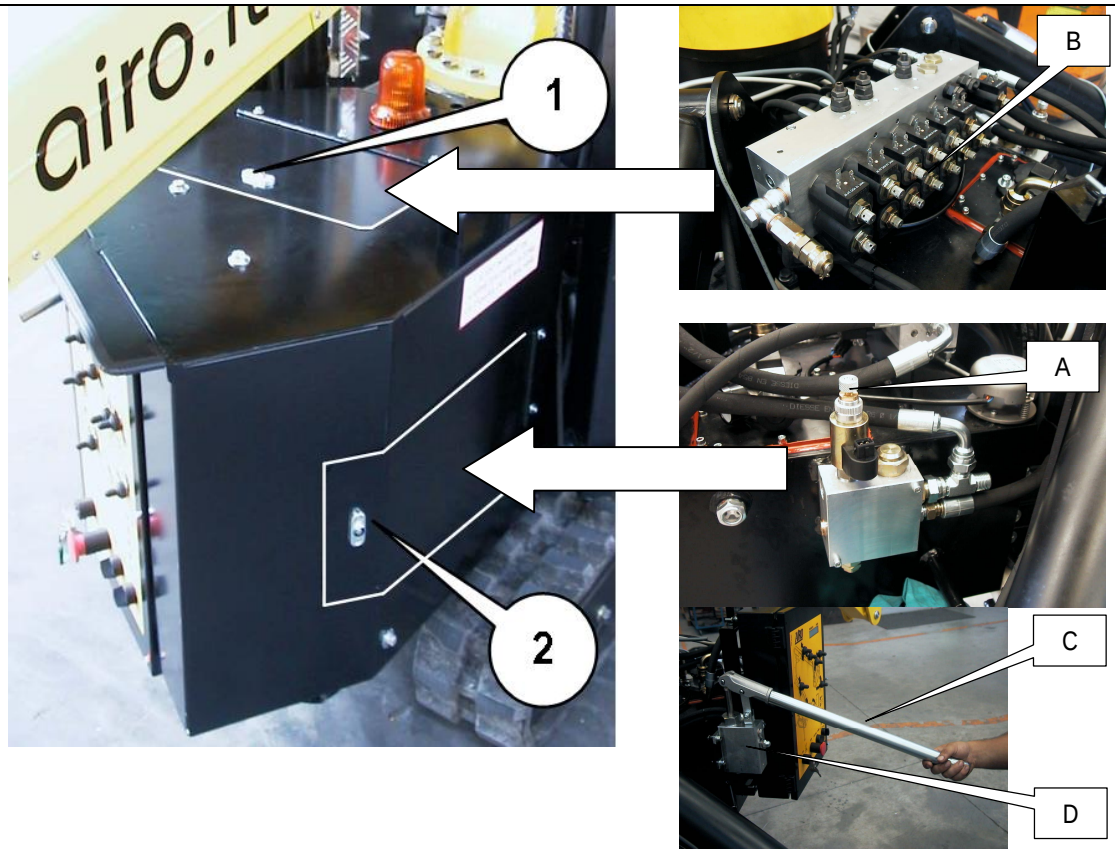


Fig.16

In case of fault in the electric or hydraulic system, carry out the following emergency procedures:

1) Open doors 1 and 2 using the special key;
2) Screw knurled knob A completely;
3) Completely unscrew knurled knob of the solenoid valve (example B) relevant to the movement you wish to achieve (see below correspondence between name of solenoid valves and achieved movements);
4) Remove lever C from its housing on the structure and insert it on manual pump D;
5) Activate the emergency pump;
6) Check the correct execution of this procedure;

Electric valves and relevant movements:

EV4 = First boom up
EV5 = First boom down
EV6 = Telescopic boom extension
EV7 = Telescopic boom retraction
EV12 = Turret right rotation
EV13 = Turret left rotation
EV14 = Second boom up
EV15 = Second boom down
EV16 = Cage forward levelling
EV17 = Cage backward levelling
EV18 = Jib lifting

EV19 = Jib lowering
EV21 = Platform right rotation
EV22 = Platform left rotation
EV23/25/27/29 = Outriggers up
EV24/26/28/30 = Outriggers down

WARNING: THE EMERGENCY CONTROL CAN BE STOPPED AT ANY MOMENT BY STOPPING THE PUMP.

Once the emergency manoeuvre has been carried out, the knurled knobs must be set to their initial position again in order to resume the operations (in normal position the knobs, except "A," are completely unscrewed).

The knurled knobs operating the outriggers are sealed; to carry out the emergency movement of the outriggers, remove the seal.

CAUTION!

It is absolutely forbidden to operate the outriggers by means of emergency controls if any operators are on the platform. The emergency control of the outriggers is allowed only with platform at ground and nobody and nothing on the platform. Risk of overturn.

5.7 Socket for electric tool connection and single-phase electric pump powering (OPTIONAL)

The platform is equipped with a socket (A) (220-230V AC) enabling the operator to connect the electric tools necessary to carry out his operations and to power the (OPTIONAL) single-phase electric pump.
To activate the electric line (see picture aside) introduce a cable into the plug (A) connected to the 220-230V Ac. 50 Hz mains and set the earth-leakage circuit breaker switch (B), close to the socket, to ON position. It is advisable to check the earth-leakage circuit breaker by means of the specially provided TEST button. Now socket (C) is powered and can be used.

The plugs and sockets equipped on standard machines comply with EEC standards and can therefore be used in EU member countries.
On request the machine can be equipped with plugs and sockets in compliance with local standards or with particular needs.

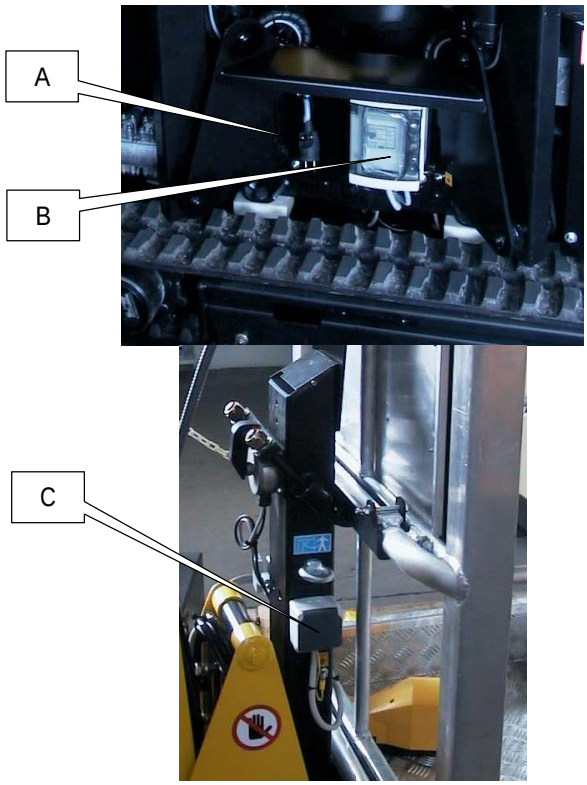


Fig.17

5.8 End of work

After stopping the machine according to the instructions given in the previous paragraphs, you are advised to:

- Always set the machine to rest position.
- Press the Stop button on the ground control station;
- Remove the keys from the control panel to prevent unauthorized people from using the machine.

6 HANDLING AND CARRYING

6.1 Handling

To handle the machine in normal operating conditions follow the instructions given in chapter "GENERAL USE INSTRUCTIONS" under paragraph "Drive".

When platform is completely lowered (regardless of JIB position, even raised) you con operate the machine (carry out drive) using the drive controls.
With one or more outriggers resting on the ground, drive is inhibited.

CAUTION!

Check that there are no holes or steps on the floor and bear in mind machine overall dimensions.

Before any movement, verify the presence of people in close proximity to the machine and, in any case, proceed with the utmost caution.

Before any movement make sure that the machine plugs are disconnected from the power source. On machines with AC electric pump (optional) always check the position of the power cord during the movements.

6.2 Carrying

In order to carry the machine to the various working sites, follow the instructions given below.
Considering the large dimensions of some models, before carrying, it is recommended to inquire about the overall dimension limits for road transport in force in your country.

Before carrying the machine, turn it off and remove the keys from the control panels. No people are allowed in proximity to or on the machine to avoid any risks deriving from sudden movements.

For safety reasons never lift or tow the machine by means of its booms or platform.

Loading operations are to be carried out on a flat surface with a suitable capacity, after setting the platform to rest position.

To carry the machine the operator shall load it onto a vehicle either:

1) By means of loading ramps and translation controls to load it directly onto the vehicle- if ramp slope is within the gradeability described in paragraph "TECHNICAL FEATURES" and capacity is adequate to machine weight- according to the instructions given in paragraph "GENERAL USE INSTRUCTION" under paragraph "DRIVE" for correct operation of drive controls.
Block the vehicle using the parking brake. Make sure there are no people nearby.
Position the pair of ramps of suitable dimensions and set them in line with the machine tracks (check capacity).

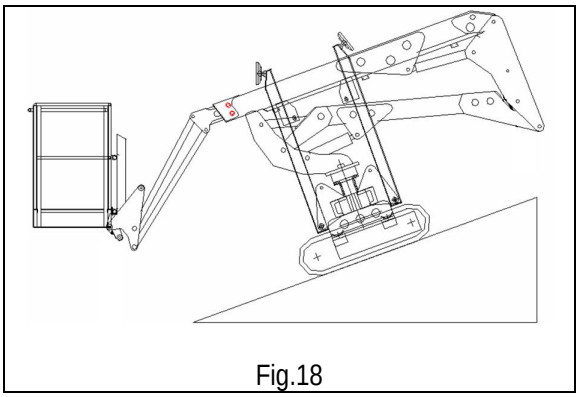
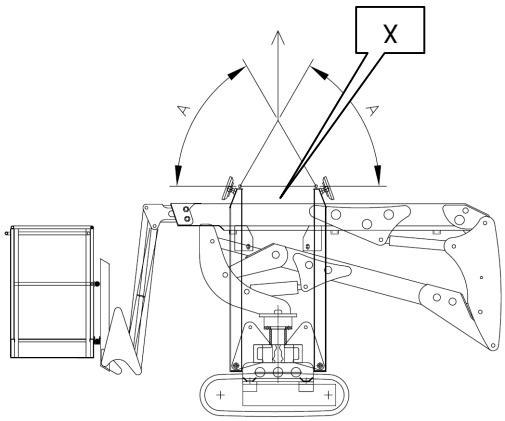


Fig.18

Make sure the ramps slope is not exceeding the machine gradeability and ramps are perfectly free from grease, mud, snow or ice.
Using the ground controls lift the Jib so as to avoid any accidental collisions with the ground (see paragraph "GROUND CONTROL STATION").
Control the drive movements slowly and only with the cage in the opposite direction compared to drive direction as shown in figure.

We recommend you to secure the machine parts indicated by arrow X using suitably dimensioned bands after loading the machine on vehicles for transport.

2) By means of crane:
Make sure the lifting capacity of the device is suitable to lift the machine weight.
Use intact bands, ropes or chains able to lift the machine, considering the opening angle “A” which must be HIGHER or EQUAL to 60° (angle included between the diagonal rope and horizontal line of the machine).
Lift the outriggers completely and hook the ropes to them near the pads using the four eyebolts (G).



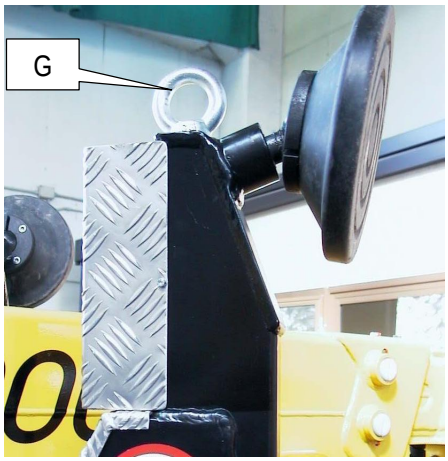


Fig.19

⚠

IT IS FORBIDDEN to lift the machine using different systems from those indicated in the previous paragraphs.

Once the machine has been placed on the vehicle platform, secure it with bands over the second boom as indicated in X, and protect painting by inserting a protection element between the band and the boom.

To avoid breaking the platform overload controller, thus causing the machine to stop, DO NOT fix the machine to the vehicle base by tying the platform.

Before carrying the unit check the stability grade.

Do not use the machine to tow other vehicles.

7 MAINTENANCE

Always carry out maintenance operations when the machine is still, after having removed the key from the control panel, and with the platform in rest position.

Carry out only the maintenance and adjustment operations described in this user manual. In emergency situations (e.g. breakdown, tracks replacement) contact Our Technical Support.

Repairs and maintenance operations are to be carried out by trained personnel only.

During interventions, check that the machine is completely blocked. Before carrying out maintenance operations inside the lifting equipment, check that this is immobilized in order to avoid accidental lowering of the booms.

Remove the battery cables and provide batteries with a suitable protection during welding operations.

Carry out maintenance operations on the heat engine only when it is not running and sufficiently cool (except for those operations, such as oil change, which must be performed when the engine is hot). Risk of burns in contact with hot parts.

Do not use petrol or other flammable materials to clean the heat engine.

For maintenance operations on the heat engine, read the manufacturer's manual of the heat engine supplied on machine purchase.

In case of replacement, use original spare parts only.

Disconnect the 220V AC sockets, if any.

CAUTION! NEVER MODIFY OR TAMPER WITH MACHINE PARTS TO IMPROVE THE MACHINE PERFORMANCE AS THIS MAY AFFECT ITS SAFE OPERATION.

7.1 Machine cleaning

To clean the machine use non-pressurized water jets after properly protecting the following parts:
- the control stations (both platform and ground);
- the electric control unit and all electric boxes in general;
- the electric motors.

Do not use pressurized water jets (high-pressure cleaners) to clean the machine.

After washing the machine, always:
- dry the machine;
- check integrity of plates and stickers;
- lubricate the articulated joints equipped with greaser.

7.2 General maintenance

The table below indicates the main maintenance operations and their frequency. The machine is equipped with a service hour-meter.

Operation	Frequency
Screw tightening as indicated in paragraph "Various adjustments"	After the first 10 working hours
Oil level check in hydraulic tank	After the first 10 working hours
Deformation of tubes and cables	Every week
Oil leakage check	Every week
Engine oil level check	Every month
Tracks condition and tension check	Every month
Heat engine fixing on elastic supports	Every month
Oil level check in hydraulic tank	Every month
Articulated joints and sliding blocks greasing	Every month
Stickers and code plates	Every month
Operation check of “dead-man” pedal and button safety system	Every six months
Screw tightening as indicated in paragraph "Various adjustments"	Every year
Telescopic boom sliding blocks adjustments	Every year
Periodic operation check and structure visual check	Every year
Inclinometer operation check and adjustment	Every year
Platform overload controller operation check and adjustment	Every year
M1 Microswitches operation check	Every year
MRT Microswitch operation check	Every year
M2A-M2B Microswitches operation check	Every year
STP1÷STP4 Microswitches operation check	Every year
Brake system operation check	Every year
Hydraulic filter replacement	Every two years
Drive reduction gear oil change	Every two years
Total oil change in hydraulic tank	Every two years

As it is possible to install different types of heat engines, refer to the instructions manual of the engine manufacturer for all maintenance operations.

7.2.1 Various adjustments

Check the conditions of the following components and, if necessary, tighten:

1) Securing rings of the structure pins;
2) Drive geared motor fixing screws;
3) Securing nuts for rolls and tracks pinions;
4) Cage fixing screws;
5) Hydraulic fittings;
6) Elastic supports of heat engine.

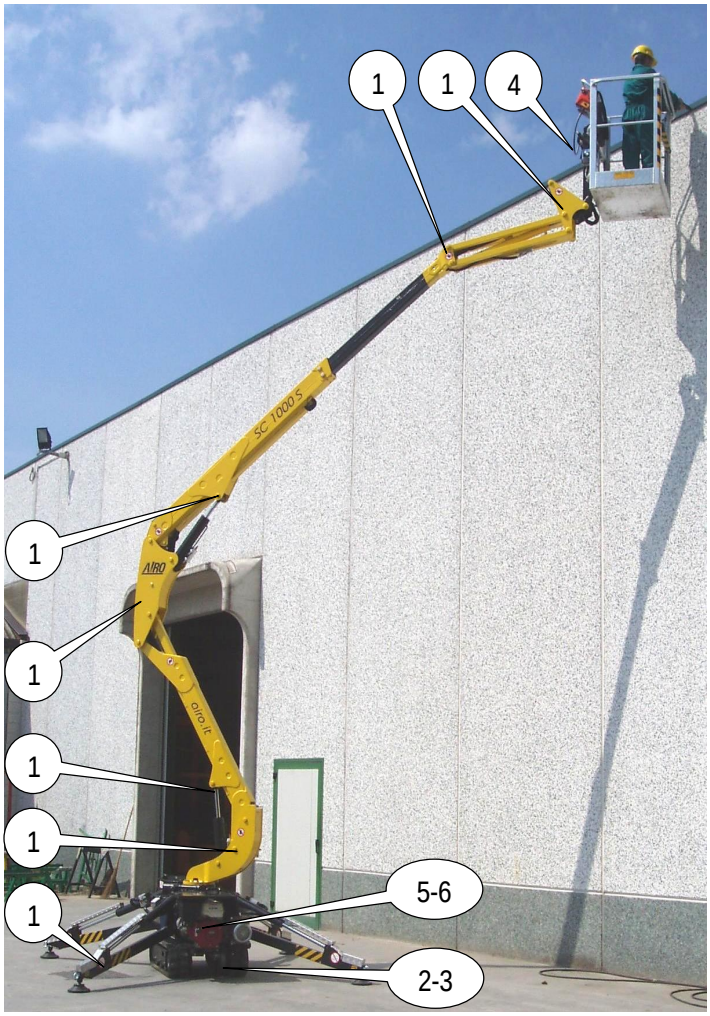


Fig.20

TORQUE WRENCH SETTING (S.I. thread, normal pitch)						
Class	8.8 (8G)		10.9 (10K)		12.9 (12K)	
Diameter	kgm	Nm	kgm	Nm	kgm	Nm
M4	0.28	2.8	0.39	3.9	0.49	4.9
M5	0.55	5.5	0.78	7.8	0.93	9.3
M6	0.96	9.6	1.30	13.0	1.60	16.0
M8	2.30	23.0	3.30	33.0	3.90	39.0
M10	4.60	46.0	6.50	65.0	7.80	78.0
M12	8.0	80.0	11.0	110	14.0	140
M14	13.0	130	18.0	180	22.0	220
M16	19.0	190	27.0	270	33.0	330
M18	27.0	270	38.0	380	45.0	450
M20	38.0	380	53.0	530	64.0	640
M22	51.0	510	72.0	720	86.0	860
M24	65.0	650	92.0	920	110	1100

7.2.2 Greasing

Grease all articulated joints at least every month.
Moreover, remember to grease the articulated joint in the following cases:

- after washing the machine;
- before using the machine again after a long time-interval;
- after using the machine in adverse environmental conditions (high humidity levels; presence of dust; coastal areas, etc).

Grease all points indicated in the picture aside (and all articulated joints equipped with greaser) with grease type:

ESSO BEACON-EP2

or similar.

Fig.21

7.2.3 Hydraulic circuit oil level check and change

Check the tank level periodically by means of transparent cap A and make sure the level is visible. To access the transparent cap, open door B.
Check when boom is completely lowered and outriggers completely lifted.
If necessary top up until max. level is reached.

To empty the oil tank, place a container under cap C (under the tank) and unscrew it.

The oil tank capacity, which varies according to the models, is indicated in the table at page 48.

Do not dispose of used oil in the environment. Comply with the current local standards.

Use only the types of oil indicated in the table at page 48.

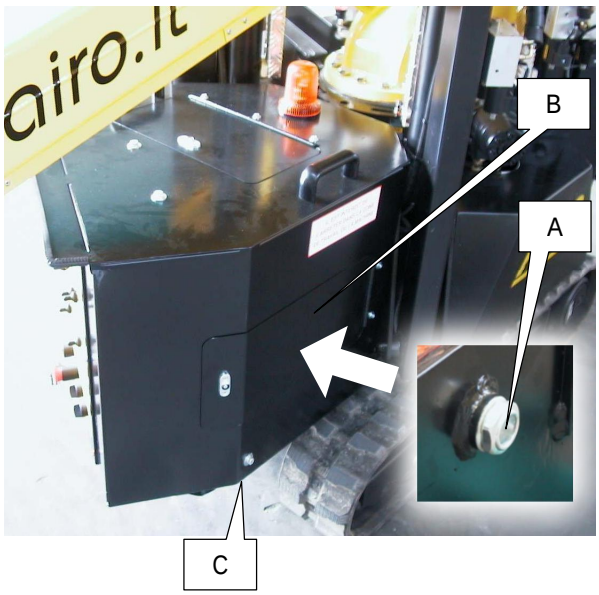


Fig. 22

7.2.4 Hydraulic filters cleaning / replacing

7.2.4.1 Suction filters

All models are equipped with a suction filters (see picture aside) installed inside the tank at the base of the suction tubes, which have to be cleaned (or replaced) at least every two years.

To replace the suction filters installed inside the tank (see figure):
1) Stop the machine by pressing the push-button of the ground central unit;
2) Empty the hydraulic tank;
3) Unscrew the cover from the tank;
4) Extract the cover from the tank;
5) Unscrew the filter from the suction tube and clean it with a detergent and a compressed air jet by blowing from the connection or replace the filtering element;
6) To restore the initial condition, carry out the above-mentioned operation in reverse order.


Fig.23

During these operations a quantity of oil may leak out. In this case remove the oil by means of cloths or let the oil flow by placing a suitable container under it.

7.2.4.2 Return filter

The return filter is directly flanged to the tank cover.
The return filter is equipped with a clogging indicator to indicate when the filtering cartridge is to be cleaned or replaced.
During normal operation, the visual indicator is in the green zone. When the indicator is in the red zone, the filtering cartridge is to be replaced.

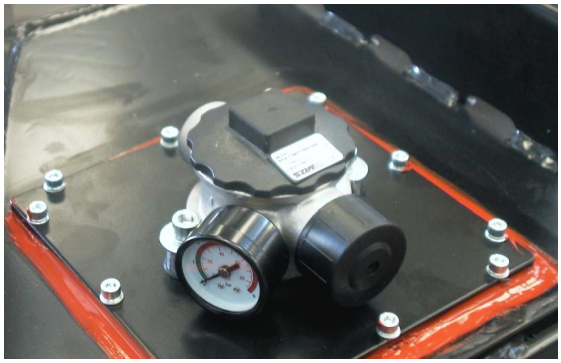


Fig.24

To replace the filtering cartridge:

- Stop the machine by pressing the push-button on the ground central unit;
- Remove the filter cover by unscrewing it;
- Remove the cartridge;

Fit the new cartridge paying attention to the correct position of the retaining spring and place the cover again. During these operations a quantity of oil may leak out. In this case remove the oil by means of cloths or let the oil flow by placing a suitable container under it.

⚠ IT IS FORBIDDEN to start the machine when the filter cover is missing or not properly tightened.

Replace the filters using only original accessories available at our Technical Support.
Do not re-use used oil and do not leave it in the environment, but dispose of in compliance with local standards in force.
Once the filters have been replaced (or cleaned), check the hydraulic oil level in the tank.

7.2.5 Traction reduction gear oil level check and change

The oil level should be checked every two years. Position the machine until the two caps (A and B) reach the position indicated in the picture aside. Check the level visually through cap (B). Oil check must be carried out when the oil is hot. The level is correct when the reduction gear body is full of oil up to the cap limit (B). Should a lubricant volume higher than 10% be topped up, check that there is no oil leakage in the system. Do not mix different types of oil, of the same or of different brands. Do not mix mineral oils and synthetic oils. The oil must be changed the first time after 50-100 working hours, and afterwards after every 2500 working hours or at least every two years. Depending on the actual operating conditions, these intervals may be varied for each single case. While changing the oil it is advisable to wash the internal part of the crankcase with a fluid recommended by the lubricant producer. To avoid sludge deposits, the oil must be changed when the reduction gear is hot. To change the oil unscrew cap (A), and place a container of a 2-litre capacity under it. Empty the reduction gear body completely, clean it as described above and then fill it up to the limit level of cap B.

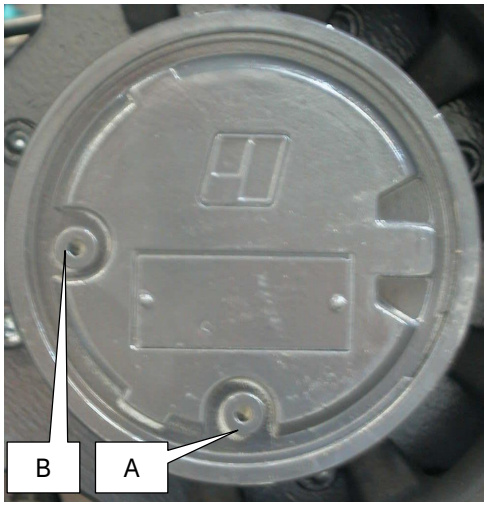


Fig. 25

HYDRAULIC SYSTEM OIL		
BRAND	TYPE	REQUIRED QUANTITY
ESSO	Invarol EP46	30 LITRES
AGIP	Arnica 45	
ELF	Hydrelf DS46	
SHELL	Tellus SX46	
BP	Energol SHF46	
TEXACO	Rando NDZ46	

OIL FOR DRIVE REDUCTION GEARS		
BRAND	TYPE	REQUIRED QUANTITY
ESSO	Compressor Oil LG 150	0,4 X 2 LITRES
AGIP	Blasia S 220	
CASTROL	Alpha SN 6	
IP	Telesia Oil 150	

7.2.6 Telescopic boom sliding blocks clearance adjustment

Check the wear of the telescopic boom sliding blocks every year.
The correct clearance between the blocks of the boom is 0,5-1 mm; in case of higher clearance tighten the sliding blocks as follows:

- Unscrew the dowel A;
- Screw the sliding block B with a screwdriver for single-slot screws until the above mentioned clearance is reached.

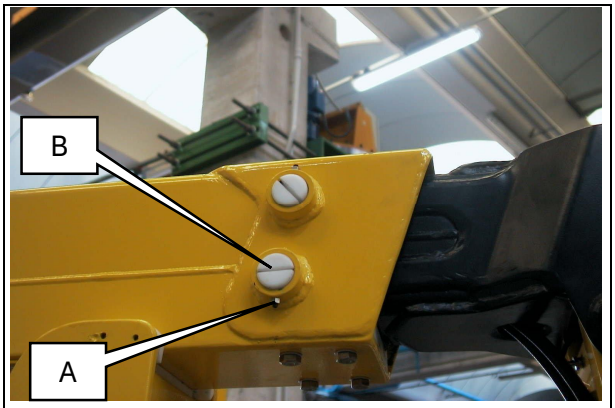


Fig. 26

AS THIS OPERATION IS VERY IMPORTANT IT IS TO BE CARRIED OUT BY SPECIALIZED TECHNICIANS ONLY.

CALL THE TECHNICAL SUPPORT

7.2.7 Inclinometer adjustment

The inclinometer (see figure aside) does not require any adjustment since it is calibrated in the factory before the machine is delivered.
This device controls the chassis inclination and when inclined over the allowed value:

- it inhibits lifting and telescopic extension;
- it warns of the instability condition by means of an audible warning device and a warning light located on the platform (see "General use instructions").
- lowering, telescopic retraction, turret rotations are possible. All at an automatically reduced speed.

Fig.27

Adjustment is required only if the device is to be replaced.
The inclinometer checks the inclination with respect to the two axes (X; Y). On machine models with the same transversal and longitudinal inclination limits, control is carried out with reference to one axis only (X-axis).

To check the inclinometer operation according to the longitudinal axis (generally X-axis):

- place 2 shims (A+10mm, see following table) under the 2 front or rear outriggers.
- Wait three seconds (intervention delay set at factory) until the danger red light and the audible platform device turn on;
- make sure the lifting and telescopic boom controls are inhibited;
- if platform is lifted make sure the lowering and cage rotation controls are available; all at an automatically reduced speed.

To adjust the inclinometer according to the transversal axis (normally Y-axis):

- place 2 shims (B+10mm, see following table) under the 2 right or left outriggers.
- Wait three seconds (intervention delay set at factory) until the danger red light and the audible platform device turn on;
- make sure the lifting and telescopic boom controls are inhibited;

- if platform is lifted make sure the lowering and cage rotation controls are available; all at an automatically reduced speed.

CAUTION! Usually the inclinometer does need to be adjusted. The equipment necessary for the replacement and adjustment of this component is such that these operations should be carried out by skilled personnel.

CALL THE TECHNICAL SUPPORT

MODELS		
SHIMS	SC1000-S SC1000-DC	SC1000 DL
A [mm]	45	55
B [mm]	45	55

CAUTION! The dimensions of shims A and B refer to max. allowed inclination as indicated in table "TECHNICAL FEATURES". To be used during the inclinometer calibration.

7.2.8 Adjustment of the overload controller (load cell)

The AIRO self-propelled articulated boom aerial platforms are equipped with a sophisticated system controlling the platform overload.
Normally the overload controller does not require any adjustment, since it is calibrated in the factory before the machine is delivered.

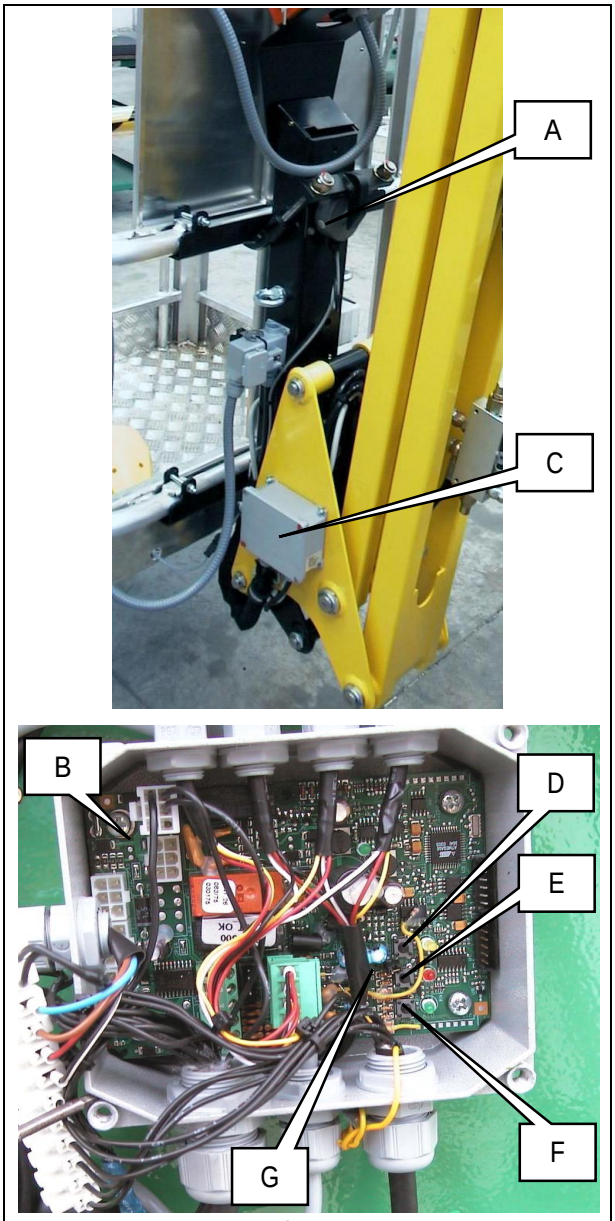


Fig. 28

<u>This device checks the load on the platform and:</u>
- It disables all movements if the platform is overloaded by 30% approx. compared to the rated load;
- It warns the user of the overload condition by means of the audible warning device and the platform warning light (see “General use instructions”).
- By removing the exceeding load, the machine can be operated again.

<u>The overload controller consists of:</u>
- Deformation transducer (A);
- Electronic board (B) for the system calibration located inside a tight case (C);

<u>Device operation check:</u>
- When platform is completely lowered load a charge evenly distributed equal to the normal load allowed by the platform (see paragraph “Technical features”). In this condition all manoeuvres should be possible both from platform and ground control station;
- When platform is completely lowered add to the rated load an overload of 35% of the rated load. In this condition the red light and the audible device turn on (see “General use rules”) but all manoeuvres are still possible;
- the alarm condition inhibits all platform movement controls. To operate the machine again, remove the excessive load.

<u>The calibration of the system is necessary:</u>
- in case of replacement of one of the items composing the system;
- when, following an excessive overload or a collision, without the excessive load the danger condition is signalled anyway.

To calibrate the device:

- turn off the machine;
- open the box which contains electronic board C;
- with no load on the platform, introduce the jumper to connector G;
- power electronic board B (by switching on the machine);
- press button D (the yellow light and red light turn on);
- press button E (the luminosity of the red light increases a few seconds), and the load system will be reset;
- on the furthermost part of the platform overhang place a load equal to the rated load plus 30%;
- press button F (the green light turns on a few seconds);
- press button D again to exit the calibration procedure (the yellow light turns off and if the procedure has been carried out correctly, the red light stays on signalling the overload);
- switch off the electronic board (by switching off the machine);
- open the jumper on connector G;
- power electronic board B (by switching on the machine);
- check that after removing the 30% overload (only the rated load remains on the platform) the alarm condition does not occur in any of the platform positions (platform down, up, driving, rotated);
- once the adjustment has been completed, close the box which contains the board.

In case of fault and impossibility to calibrate the device, a by-pass of the system is possible by turning the key (Q) clockwise and keeping it active for approx. 2 seconds.
WARNING!! IN THIS CONDITION THE MACHINE CAN CARRY OUT ANY OPERATION, THOUGH THE RED FLASHING LED AND THE INTERMITTENT AUDIBLE DEVICE SIGNAL THE DANGER CONDITION. TURNING OFF THE MACHINE WILL RESET THE SYSTEM, AND UPON STARTING THE LOAD DETECTING SYSTEM OPERATES AGAIN SIGNALLING THE PREVIOUS OVERLOAD CONDITION.

CAUTION!
THIS OPERATION IS ALLOWED ONLY FOR EMERGENCY HANDLING OF THE UNIT. DO NOT USE THE MACHINE IF THE OVERLOAD CONTROLLER IS NOT EFFICIENT.

Fig.29

CAUTION!
Calibration is to be carried out by skilled personnel. This operation may not be performed by the operator.

7.2.9 M1 Microswitches operation check

The lifting booms are controlled by microswitches:
- M1A-M1B on the support of the second boom to the turret;
- M1C on the extension.

The functions of the microswitches M1A- M1B- M1C are the following:

with platform not in rest position (at least one of the microswitches M1A-M1B-M1C is activated):
- If the chassis is inclined over the max. allowed inclination, lifting/extension and drive controls are inhibited;
- the compensation control for platform levelling is inhibited;
- the outriggers and drive controls are inhibited.

In case of contact loss of one of the outriggers pads (microswitches STP…) with at least one of the microswitches M1A-M1B-M1C activated:
- the stability danger alarm on the control box at platform/wire control lights up;
- lifting/extensions are inhibited;
- only retraction is possible but at an automatically reduced speed;

With lowered booms (all microswitches M1…are closed) and turret in central position (microswitch MRT closed):
- the in-centre turret green warning light is on;
- turret rotation is inhibited;
- controls of wire control mode (drive and stabilization) are available.

7.2.10 MRT microswitch operation check

The rotating turret position is controlled by microswitch MRT.

With turret outside position “0” microswitch MRT is open and:
- the in-centre turret green warning light is off;
- if the boom is lifted all movements are possible;
- if the boom is lowered, the controls of wire control mode (drive and stabilization) are inhibited.

With turret in “0” (MRT closed):
- the in-centre turret green warning light is on;
- if the boom is lifted all movements are possible;
- if the boom is lowered, turret rotation is inhibited;
- if the boom is lowered, the controls of wire control mode (drive and stabilization) are available.

7.2.11 M2A-M2B microswitches operation check

Turret rotation is also controlled by M2A and M2B microswitches.

M2A and M2B are the turret rotation microswitches in both directions. When activated, they allow the turret to rotate only in the opposite direction to which the microswitch has been activated.

7.2.12 STP1-STP2-STP3-STP4 microswitches operation check

The outriggers pads are controlled by microswitches STP1-STP2-

When all pads are resting on the ground:
- all the outriggers position green warning lights are on;
- controls of “wire control” mode (drive and stabilization) are inhibited;
- if no other alarms are on, the boom can be lifted.

When no pads are resting on the ground:
- all the outriggers position green warning lights are off;
- the controls of “Platform movement” mode (lifting/lowering/rotation) are inhibited;
- the controls of wire control mode are available.

With one or more pads not resting on the ground:
- the outriggers position green warning lights relevant to lifted pads are off;
- controls of “wire control” mode (drive and stabilization) are inhibited;
- if the boom is lifted, lifting and telescopic boom extension are inhibited; lowering and turret rotation at an automatically reduced speed are available.

7.2.13 “Dead-man” safety system operation check

7.2.13.1 “Dead-man” pedal

The platform dead-man pedal is for enabling the operation controls of the machine from the platform control station.
If the control panel is selected but the dead-man pedal is not pressed the green light on the platform is flashing and the machine cannot be operated.
Pressing the dead-man pedal the controls are activated and the condition is signalled by a steady green led.
Once the pedal has been pressed, the controls are to be activated within 10 seconds, after which they are deactivated and the green light will flash again.

7.2.13.2 ”Dead-man” button

The platform dead-man button is for enabling the operation controls of the machine from the platform control station. It is an alternative to pedal for “Platform movement” mode; it is the only system for the “Wire control” mode.
If the control panel is selected but the dead-man button is not pressed the green light on the platform is flashing and the machine cannot be operated.
Pressing the dead-man button the controls are activated and the condition is signalled by a steady green led.
Once the pedal has been pressed (it is not necessary to hold it down), the controls are to be activated within 2 seconds approx., after which they are deactivated and the green light will blink again.

7.2.14 Tracks condition and tension check

The life of the rubber tracks depends on the ground on which the machine is used. The tracks must be replaced when the tread ribs reach a height lower or equal to 10-12 mm, or if evident cuts and/or tears are visible.

For a longer life of the tracks, check their tensioning at least once a month. To check the tracks tensioning:

a) lift the chassis from the ground using the stabilization control;
b) visually check the clearance of the tracks;
c) in case of greater clearance compared to the one indicated, tension the tracks by pumping lubricating grease (type ESSO BEACON EP2 or equivalent) in the special valve which can be accessed through slot (A) using a pneumatic pumping system.

CAUTION! Any tracks replacement is to be carried out by skilled personnel.

CALL THE TECHNICAL SUPPORT

7.2.15 Battery

The starter battery is for:
- Powering the machine control circuits;
- Starting the heat engine.

CAUTION!
Do not approach the battery with flames. Risk of explosion due to the formation of explosive gases.
Do not carry out temporary or irregular electric connections.
The terminals must be tightened and without deposits. The cables must be provided with a good insulation.
Keep the battery cleaned, dry and free of oxidation products by using antistatic cloths.
Do not place tools or any other metal object on the battery.

7.2.15.1 Battery maintenance

The starter battery does not require any special maintenance:
- Keep terminals clean by removing any oxidation residues;
- Check correct terminal tightening.

In case of faulty operations due to the battery, avoid any direct intervention and call the Customer Service.
To limit automatic battery discharge during periods of inactivity store the machine in environments with temperatures lower than a 30°C.

7.2.15.2 Battery recharge

Starter batteries do not require any recharge. Battery is charged by:
- the heat engine alternator during its normal working;
- an automatic battery charger which is activated along with the activation of the 230V single-phase pump (Optional).

CAUTION!
Properly check the charge level of the starting battery.
The battery recharges automatically only if the heat engine or electric pump are activated. Leaving the control panels active for a long time with the engine off may cause the battery to discharge.

7.2.16 Battery charger: fault report

The automatic battery charger (A) is located on the chassis close to the battery (B) and protected by a cover.
On the battery charger a LED indicator (C) provides information concerning its working. During the normal working of the battery charger, the led is on steady and can be:

- RED: initial charging process;
- YELLOW: the charge of the battery is at 80%;
- GREEN: the charge of the battery is at 100%.

To access the battery charger and indicator it is necessary to remove the cover.

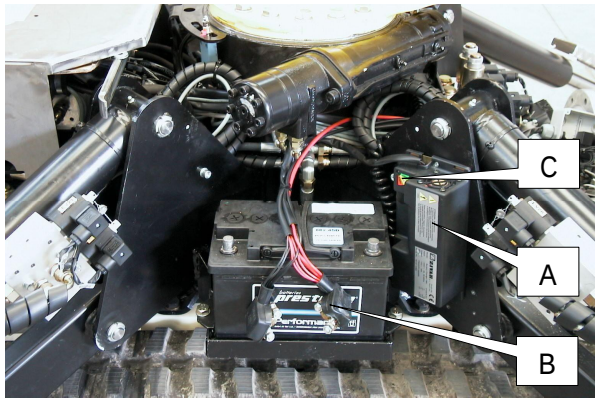


Fig.30

The flashing LED on the battery charger indicator described in the previous paragraph indicates that an alarm situation has occurred:

Signalling	Alarm type	Problem description and troubleshooting
flashing GREEN	Timeout	Phase 1 of duration higher than the max. allowed value (check battery capacity).
flashing RED-YELLOW	Battery Current	Loss of output current control (fault in control logic).
flashing RED-GREEN	Battery Voltage	Not compliant battery (check nominal voltage) or loss of output voltage control (battery disconnected or fault in the control logic).
flashing RED-YELLOW-GREEN	Thermal	Overtemperature of semiconductors (check the fan operation).

⚠ CAUTION!
In presence of alarm the battery charger stops the current delivery.

7.2.17 Battery replacement

⚠ Replace the old batteries only with models of the same voltage, capacity, dimensions and mass.
Batteries must be approved by the manufacturer.

AS THIS OPERATION IS VERY IMPORTANT IT IS TO BE CARRIED OUT BY SPECIALIZED TECHNICIANS ONLY.

CALL THE TECHNICAL SUPPORT

8 MARKS AND CERTIFICATIONS

The models of self-propelled aerial platform described in this manual were subject to the CE type test according to the EEC Directive 98/37/EC.
The certification was issued by:

I.C.E.P.I Srl Via P. Belizzi, 29/31/33 29100 Piacenza ITALIA	

Test carrying out is shown by the above plate with CE mark applied on the machine and by the declaration of conformity enclosed in this user manual.

9 CHECK REGISTER

The check register is released to the user of the platform in conformance with Attachment 1 of Directive 89/392/EEC, according to the integration required by Directive 91/368/EEC.
This register is to be considered an integral part of the equipment and must accompany the machine for its entire life until its final disposal.

The register is provided for the notation, according to the proposed format, of the following events that regard the life of the machine:

- Periodic obligatory inspections (copy of documents to be filed) under the care of the agency responsible for checking it (in Italy, the ASL / USL / ARPA).
- Obligatory periodic inspections to verify the structure, proper machine functioning and the protection and safety systems. Such inspections are the responsibility of the safety manager of the company that owns the machine and must occur with ANNUAL frequency.
- Transfers of Ownership. In Italy, the purchaser must notify the ISPESL department responsible that the installation of the machine has occurred.
- Extraordinary maintenance work and replacement of important elements of the machine.

REQUIRED PERIODIC INSPECTIONS BY THE REGULATORY AGENCY		
Date	Observations	Signature + Stamp

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Visual check	Check the integrity of the guardrails, of any access stairs, rust, oil leaks, securing rings of the structure pins.

	Date	Observations	Signature + Stamp
1st Year			
2nd Year			
3rd Year			
4th Year			
5th Year			
6th Year			
7th Year			
8th Year			
9th Year			
10th Year			

♦ Various adjustments	See chapter 7.2.1

	Date	Observations	Signature + Stamp
1st Year			
2nd Year			
3rd Year			
4th Year			
5th Year			
6th Year			
7th Year			
8th Year			
9th Year			
10th Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Deformation of tubes and cables	Most of all, check at junction points that tubes and cables do not show any evident defects.

	Date	Observations	Signature + Stamp
1st Year			
2nd Year			
3rd Year			
4th Year			
5th Year			
6th Year			
7th Year			
8th Year			
9th Year			
10th Year			

♦ Greasing (monthly operation; confirm that it was carried out at least once a year).	♦ See chapter 7.2.2

	Date	Observations	Signature + Stamp
1st Year			
2nd Year			
3rd Year			
4th Year			
5th Year			
6th Year			
7th Year			
8th Year			
9th Year			
10th Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Stickers and plates check (monthly operation; confirm that it was carried out at least once a year).	Check the legibility of the aluminium plate on the platform where the main instructions are summarised; that the capacity stickers are on the platform and that they are legible; that the stickers on the ground and platform control stations are legible.

	Date	Observations	Signature + Stamp
1st Year			
2nd Year			
3rd Year			
4th Year			
5th Year			
6th Year			
7th Year			
8th Year			
9th Year			
10th Year			

Total oil change in hydraulic tank and drive reduction gears. (EVERY TWO YEARS)	See chapters 7.2.3, 7.2.5.

	Date	Observations	Signature + Stamp
2nd Year			
4th Year			
6th Year			
8th Year			
10th Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Hydraulic filters cleaning / replacing (EVERY TWO YEARS)	See chapter 7.2.4

	Date	Observations	Signature + Stamp
2nd Year			
4th Year			
6th Year			
8th Year			
10th Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Telescopic boom sliding blocks clearance adjustment	♦ See chapter 7.2.6

	Date	Observations	Signature + Stamp
1st Year			
2nd Year			
3rd Year			
4th Year			
5th Year			
6th Year			
7th Year			
8th Year			
9th Year			
10th Year			

♦ Inclinometer operation check	♦ See chapter 7.2.7

	Date	Observations	Signature + Stamp
1st Year			
2nd Year			
3rd Year			
4th Year			
5th Year			
6th Year			
7th Year			
8th Year			
9th Year			
10th Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Platform overload controller check	♦ See chapter 7.2.8

	Date	Observations	Signature + Stamp
1st Year			
2nd Year			
3rd Year			
4th Year			
5th Year			
6th Year			
7th Year			
8th Year			
9th Year			
10th Year			

♦ M1/MRT/M2 microswitches operation check	♦ See chapter 7.2.9, 7.2.10, 7.2.11, 7.2.12

	Date	Observations	Signature + Stamp
1st Year			
2nd Year			
3rd Year			
4th Year			
5th Year			
6th Year			
7th Year			
8th Year			
9th Year			
10th Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ "Dead-man" safety system operation check	See charter 7.2.13

	Date	Observations	Signature + Stamp
1st Year			
2nd Year			
3rd Year			
4th Year			
5th Year			
6th Year			
7th Year			
8th Year			
9th Year			
10th Year			

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Tracks condition and tension check	See charter 7.2.14

	Date	Observations	Signature + Stamp
1st Year			
2nd Year			
3rd Year			
4th Year			
5th Year			
6th Year			
7th Year			
8th Year			
9th Year			
10th Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Braking system efficiency check	Going down a ramp with max. slope indicated in chapter "Technical features", at the lowest speed, the machine should be able to stop, upon release of the joystick, in a space of less than 0.3 meters.

	Date	Observations	Signature + Stamp
1st Year			
2nd Year			
3rd Year			
4th Year			
5th Year			
6th Year			
7th Year			
8th Year			
9th Year			
10th Year			

♦ Emergency manual controls check	♦ See chapter 5.6

	Date	Observations	Signature + Stamp
1st Year			
2nd Year			
3rd Year			
4th Year			
5th Year			
6th Year			
7th Year			
8th Year			
9th Year			
10th Year			

TRANSFERS OF OWNERSHIP

FIRST OWNER

Company	Date	Model	Serial Number	Date of Delivery

AIRO – Tigieffe S.r.l.

SUBSEQUENT TRANSFERS OF OWNERSHIP

Company	Date

We affirm that, as of the date quoted above, the technical, dimensional and functional characteristics of this machine were in conformance with what was originally required and that any changes have been recorded in this register.

The Seller	The Purchaser

SUBSEQUENT TRANSFERS OF OWNERSHIP

Company	Date

We affirm that, as of the date quoted above, the technical, dimensional and functional characteristics of this machine were in conformance with what was originally required and that any changes have been recorded in this register.

The Seller	The Purchaser

SUBSEQUENT TRANSFERS OF OWNERSHIP

Company	Date

We affirm that, as of the date quoted above, the technical, dimensional and functional characteristics of this machine were in conformance with what was originally required and that any changes have been recorded in this register.

The Seller	The Purchaser

IMPORTANT BREAKDOWNS

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

IMPORTANT BREAKDOWNS

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

IMPORTANT BREAKDOWNS

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

IMPORTANT BREAKDOWNS

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

IMPORTANT BREAKDOWNS

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager