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

"A" SERIES

A12 JE A15 JE A12 JED A15 JED A17 JE

USE AND MAINTENANCE MANUAL

- ENGLISH - ORIGINAL INSTRUCTIONS

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Revision date	Description of revision
2011-01	• Manual issue.
2011-05	• Corrected “Total quantity of battery electrolyte” in Technical Data. • Inserted motor generator: data "Max power." and "Adjusted Power" diesel engine, generator current data.
2013-04	• Edit to insert second battery charge indicator.
2013-10	• Specified instructions for harness anchoring points.
2014-01	• Deleted timer circuit, second battery charger.
2014-07	• Updated technical data of batteries and battery charger. • Inserted information on maximum limits of manual forces. • CE Conformity Declaration Updated.
2015-00	• CE Conformity Declaration Updated. • Added position of hands instruction.
2015-10	• Type of usable hydraulic oil updated. • Added indication for spare parts. They must be original or approved by the manufacturer of the machine in any way. • Added "Leaving at height”.
2018-05	• Data sheets were added with units of measurement of the international system and US unit of measurement. • Changed Name and Surname of CEO. • Unified First and Second Part.
2018-12	• Added “AIRO SENTINEL” secondary safety system description. • “Tilt alarm” description updated. • “ZC” warning light description (drive controller alarm) updated. • Edit to insert a “Battery indicator” and “Battery compartment access”. • EC Declaration of Conformity updated in 8 languages. • Updated “Electric diagram”.
2019-05	• New model A17 JE added. • Updated procedure description of commissioning declaration in Italy.
2020-01	• Updated normative references and certifying body.
2020-10	• Corrected the technical data converted to the US measuring system. • Updated paragraph 5.6 "Manual emergency controls": inserted emergency control procedure with the new hydraulic block. • Updated paragraphs 7.2.7.1 and 7.2.7.2 with pictures of the new hydraulic blocks. • Hydraulic scheme updated due to installation of new hydraulic blocks. • Updated wiring diagram for Trackunit preparation. • Updated facsimiles of EC declarations of conformity: monolingual text.

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 machines indicated on the cover. Therefore the description of their components, as well as control and safety systems, may include parts not present on Your machine 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 machine

Within EU (European Union) member countries the machine is delivered complete with:
- Use and Maintenance manual in your language.
- CE mark applied on the machine.
- CE conformity declaration.
- Guarantee certificate.
- Declaration of internal testing.

Only for Italy:
- Instructions on commissioning declaration with INAIL and on the application for the first periodic check on the INAIL portal.

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 ownership the machine must always be provided with its use and maintenance manual.

1.1.2. Declaration of commissioning, first check, further 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 and first check

In ITALY the owner of the Aerial Platform must notify the use of the machine to the local competent INAIL and submit it to periodical compulsory checks. The first of such checks is performed by the INAIL within sixty days from a request being made. In the event of such time passing without the inspection being made, the employer can call in the ASL (Local Health Unit) or qualified public or private services. Subsequent checks are made by the already-mentioned parties within thirty days from a request being made. In the event of such time passing without these checks being made, the employer can call in qualified public or private services. The checks are on a payment basis and the employer (machine owner) will be charged for them. For these checks, the territorial inspection boards (ASL/USL or ARPA) and INAIL can be supported by qualified public or private services. The qualified private institutes acquire the qualification of responsible for the public service and refer directly to the public structure that controls this function.

For the commissioning declaration in Italy, it is necessary to login to the INAIL portal. Follow the instructions delivered together with other documents during the machine delivery, as well as the information about the portal.

The INAIL will assign a serial number and when the First Check is performed the “technical identification sheet” will be completed indicating only the details obtained from the already-operating machine or from the instruction manual. Such document shall form an integral part of the machine documentation.

1.1.2.2. Further periodical checks

Yearly checks are compulsory. In Italy the Aerial Platform owner must apply for a periodical check - by registered letter - to the local competent inspection board (ASL/USL or ARPA or other qualified public or private services) at least twenty days before the expiry of the year from the last 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 Aerial Platform new owner must notify the ownership of the machine to the local competent inspection board (ASL/USL or ARPA or other qualified public or private services) by enclosing a copy of:

- Declaration of conformity issued by the manufacturer.
- Declaration of commissioning carried out by the first owner.

1.1.3. Operator training and information

The employer must ensure that the workers appointed to use the equipment are adequately and specifically trained so they are able to use the Mobile Elevating Work Platform in a proper and safe way and also avoid the risks caused by other people.

1.2. Tests performed before delivery

Before being placed on the market, each MEWP undergoes the following tests:

- Braking test.
- Overload test.
- Operating test.

1.3. 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 work 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”. Persons, tools and work materials can be loaded on the platform only from the access position (platform lowered). It is absolutely forbidden to load persons, tools and work materials on the platform when it is not in access position.
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 from the lifting structure.
Do not carry large-sized panels since they increase the resistance to wind force thus causing the machine to overturn.
While the machine is being displaced with lifted platform, no horizontal loads can be loaded onto the platform (operators on board are not allowed to pull wires or ropes, etc.).
An overload controller stops the operation of the machine if the load on the platform exceeds by 20% approx. the nominal load (see chapter "General use rules”) and platform is lifted.
The machine cannot be used in areas where road vehicles operate. Always surround the working area by means of suitable signs when the machine is used in public areas.
Do not use the machine to tow trucks or other vehicles.
All types of machine use other than those for which it was designed must be approved in writing by the machine manufacturer following a specific request on the part of the user.

Do not use the machine for purposes other than those for which it was designed, except after making a request and having obtained written permission in this sense from the manufacturer

1.3.1. Leaving at height

The mobile elevating work platforms are not designed by taking into account the risks of the "leaving at height" because the only access position considered is when the platform is completely lowered. **For this reason, this activity is formally forbidden.** However, there are exceptional conditions in which the operator needs to access or leave the work platform not in the access position. This activity is normally defined as "leaving at height".

The risks connected to the "leaving at height" do not depend exclusively on the PLE (work elevating platform) characteristics; a specific risk analysis carried out by the employer can authorize this specific use by taking into account:

- The working environment characteristics.
- The absolute prohibition to consider the work platform as a fixing point for people working outdoors.
- The use of the machine at xx% of its performances to avoid that additional forces created by a specific operation or bending of the structure move away the access zone from the unloading zone. Provide for some tests in order to define these limitations.
- Provide for a specific evacuation procedure in case of emergency (for example: an operator always on the work platform, one at the ground control panel while a third operator leaves the lifted platform).
- Provide for a specific training of the staff both as operator and transported staff.
- Equip the unloading zone with all the devices that are necessary to avoid the risk of fall of the staff that accesses/leaves the platform.

What said above is not a formal authorization of the manufacturer for the "leaving at height", but it wants to supply information to the employer - who is fully responsible for that - which can be useful for the planning of this exceptional activity.

1.4. Description of the machine

The machine described in this use and maintenance manual is a mobile elevating work platform equipped with:

- Motorized chassis equipped with wheels.
- Hydraulically driven rotating turret.
- Articulated boom operated by hydraulic cylinders (the number of articulations and cylinders varies according to machine model).
- operator platform (the max. capacity varies according to the model - see chapter "Technical features").

The chassis is motorised to allow the machine to move even with lifted platform (see "Use instructions") and has two rear driving wheels and two front idle steering wheels. The rear wheels are equipped with parking brakes, positive logic type (when drive controls are released brakes are automatically activated). On the chassis there are two pot-hole guards automatically activated by the platform control panel (depending on the rotating turret position) when the platform is raised.
The turret rests on a turntable fixed to the chassis and can be oriented (rotated) by 370° non-continuous around the central axle of the machine by means of irreversible endless screw.
The lifting system, with articulated boom, can be divided into three main structures:

- The first, with vertical extension, consists of a "double parallelogram" system named "pantograph".
- The second, consists of a lifting boom with telescopic extension.
- The third, consists of a terminal boom called "Jib" (the Jib is fixed as a standard, as an option it is rotating of about 130° totally).

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, hinged to the end of the "jib", can be rotated by 180° totally (90° on the right and 90° on the left) by means of a rotary actuator fitted with over-centre valve. It is fitted with rails and toe boards of prescribed height (the rails height $\geq$ 1100 mm; the toe boards height $\geq$150 mm; in the access area the toe board height is $\geq$100 mm). The platform levelling is automatic and is ensured by mechanical ties and two cylinders in closed circuit. The manual level compensation is possible by acting on the relevant control only with lowered booms (and with "Jib" inclination ranging between +10° and –70° with respect to the horizontal axis).

1.5. Control panels

The machine is equipped with two control panels:

- On the platform for normal use of the machine.
- On the turret (or on the ground) you can find the emergency controls to lower or stop the machine in emergency situations, a key-selector to select the control panel and to start the machine.

1.6. Power supply

The machines can be powered by:

- Electro-hydraulic system composed of rechargeable batteries, electric pump and electric drive motors equipped with automatic parking brake.
- Hybrid system composed of rechargeable batteries, electric pump and electric drive motors equipped with automatic parking brake and additional Diesel motor generator. Hybrid machines are identified by the initials "ED".

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

1.7. Machine life, demolition and decommissioning

The machine has been designed to last for 10 years in normal operating environments, if properly used and serviced. Within this period, the manufacturer must carry out a complete inspection/overhaul.
If disposal of the unit is necessary, comply with current local regulations.
In Italy, the demolition/decommissioning must be notified to the local ASL / USL or ARPA.
The machine consists mainly of metal parts which are easy to be identified (steel for the most parts, and aluminium for the hydraulic blocks); thus, we can state that the machine can be recycled at 90%.

⚠ **European standards and those transposed by the member countries relating to respect for the environment and the disposal of wastes envisage heavy administrative and penal fines in case of infringement.**
In case of demolition/decommissioning, carefully keep to the provisions of applicable regulations, especially as regards materials such as hydraulic oil and batteries.

1.8. 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 machine) 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. It is recommended to copy such data in the following boxes.

MODEL: _____	**CHASSIS: _____**	**YEAR: _____**

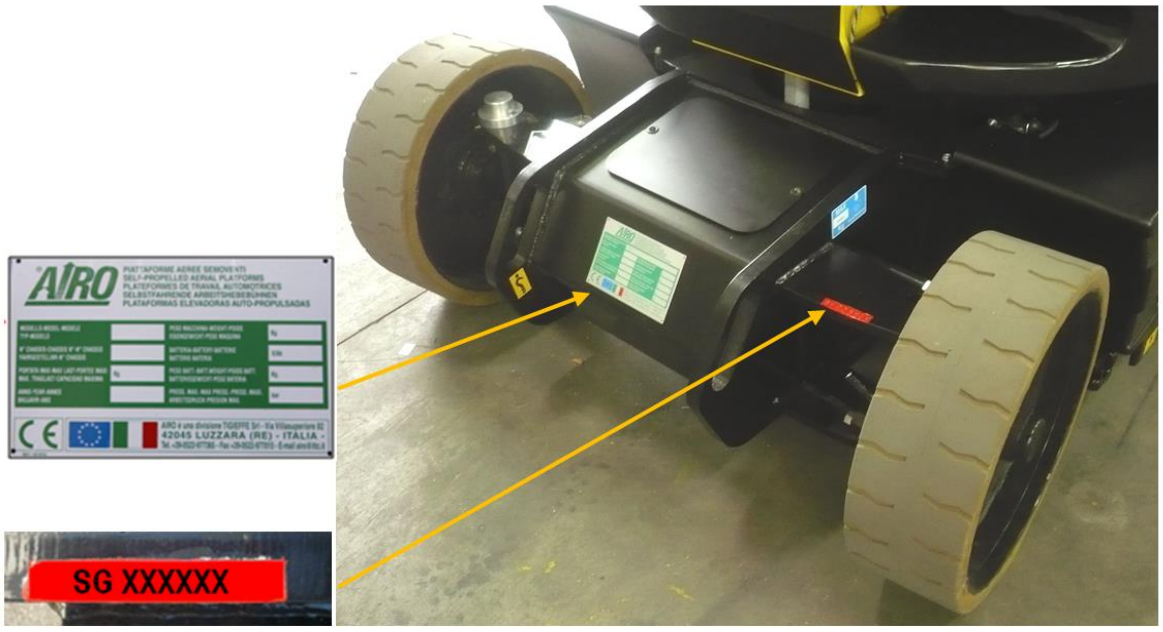


Fig.1

1.9. Location of main components

The picture shows the machine and its own components.

1) Control panel.
2) Ground emergency controls.
3) Electric control unit.
4) Hydraulic oil tank.
5) Diesel tank (models ED).
6) Diesel motor generator (models ED).
7) Pot-hole guards.
8) Electric pump.
9) Electric drive motors with brake.
10) Turret rotation hydraulic motor.
11) 230V plug (optional).
12) Spirit level (optional) for visual check of machine levelling.
13) Lifting cylinders.
14) Battery.
15) (Optional) electric line plug.
16) Inclinometer.
17) Limiting sensor of platform load (load cell).
18) Turntable coupling and proximity sensors PS1A-PS1B (only for A17 JE).
19) Drive motors AC controllers and electric pump.
20) Battery charger power supply plug.
21) Microswitch M1A.
22) Microswitch M1B.
23) Microswitch M1C.
24) Microswitch M1E and microswitch M1S (only for A17 JE with ROTATING JIB).
25) Microswitches MPT1-MPT2.
26) Microswitches M2A-M2B.
27) "AIRO SENTINEL" anti-trapping system - OPTIONAL.

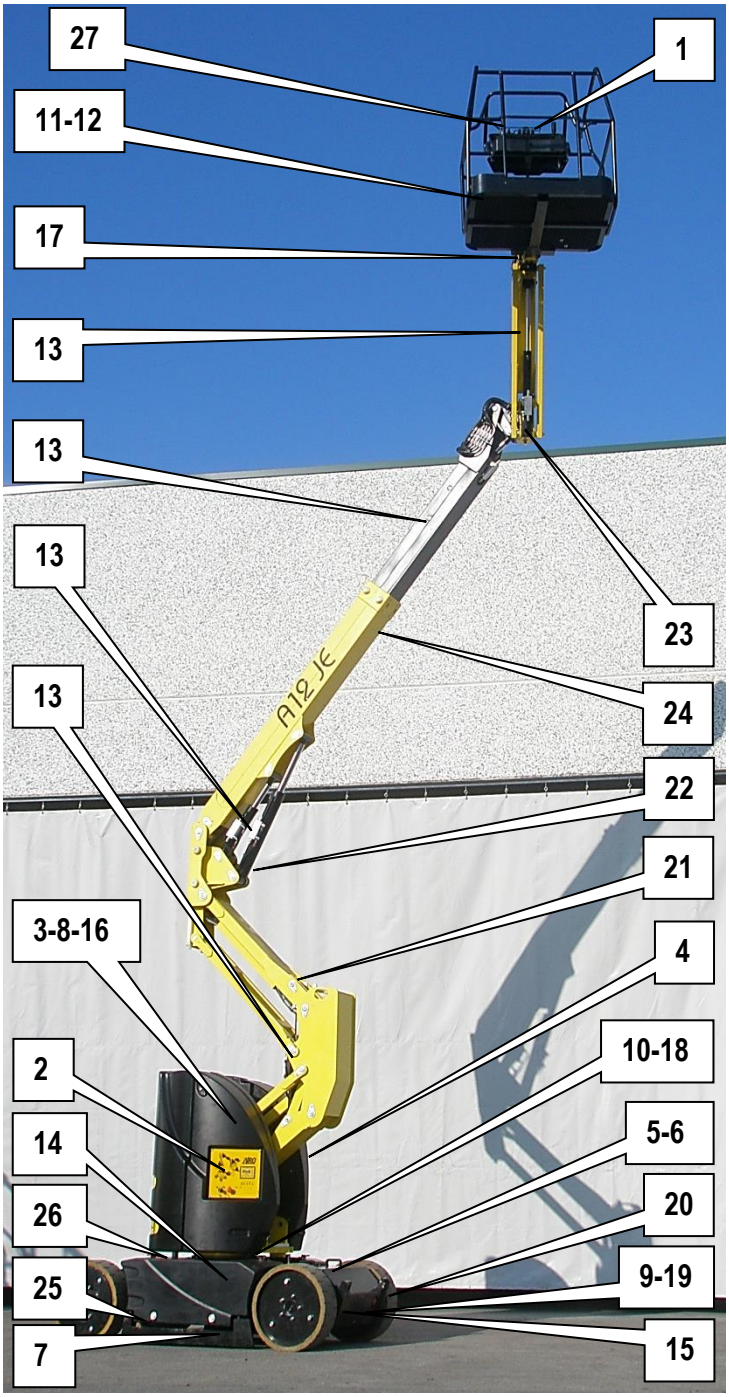


Fig. 2

2. TECHNICAL FEATURES OF STANDARD MACHINES

THE TECHNICAL FEATURES OF THE PRODUCTS IN THE FOLLOWING PAGES CAN BE MODIFIED WITHOUT PRIOR NOTICE

2.1. Model A12 JE

	A12 JE			
Dimensions:				
Maximum working height	12.1	m	*39' 8"*	*ft*
Max. platform height	10.1	m	*33' 1"*	*ft*
Ground clearance (with pot-hole guards lifted)	125	mm	*4.9"*	*in*
Ground clearance (with pot-hole guards lowered)	25	mm	*1"*	*in*
Max. outreach from turntable centre	7.5	m	*24' 7"*	*ft*
Max. tailswing	0	mm	*0*	*in*
Turret rotation (not continuous)	370	°	*370*	°
Platform rotation	180	°	*180*	°
Jib rotation (optional)	130	°	*130*	°
Platform height for safety speed activation	< 3.5	m	*< 11' 5"*	*ft*
Internal steering radius	2.1	m	*6' 10 "*	*ft*
External steering radius	3.6	m	*11' 10"*	*ft*
Maximum capacity (m)	230	Kg	*507*	*lbs*
Max. number of people on the platform (n) – indoors	2		*2*	
Tool and material weight (me) (2) – indoors	70	Kg	*154*	*lbs*
Max. number of people on the platform (n) – outdoors	1		*1*	
Tool and material weight (me) (2) – outdoors	150	Kg	*331*	*lbs*
Maximum drive height	Max		*Max*	
Maximum platform dimensions (5)	0.8 x 1.15	m	*2' 7" x 3' 9"*	*ft*
Max. hydraulic pressure	250	bar	*3626*	*psi*
Tyre dimensions (4)	Ø 600 x 190	mm	*Ø 23.6" x 7.5"*	*in*
Tire type (4)	Cushion soft		*Cushion soft*	
Transport dimensions	5,8 x 1,2 H=1,99	m	*19' 1" x 3' 11" x 6' 6"*	*ft*
Transport dimensions with rotated platform	5,4 x 1,2 H=1,99	m	*17' 9" x 3' 11" x 6' 6"*	*ft*
Transport dimensions with retracted jib	4,6 x 1,2 H=2,6	m	*15' 1" x 3' 11" x 8' 6"*	*ft*
Transport dimensions with retracted jib and rotated platform	4,4 x 1,2 H=2,1	m	*14' 5" x 3' 11" x 6' 11"*	*ft*
Machine weight (unloaded) (1)	7510	Kg	*16557*	*lbs*
Stability limit:				
Longitudinal slope	2.3	°	*2.3*	°
Transversal slope	2.3	°	*2.3*	°
Maximum manual force - indoors	400	N	*90*	*lbf*
Maximum manual force - outdoors	200	N	*45*	*lbf*
Maximum wind speed (3)	12.5	m/s	*27.96*	*mph*
Max. load per wheel	3400	Kg	*7496*	*lbs*
Performance:				
Drive wheels	2		*2*	
Max. drive speed	6	km/h	*3.7*	*mph*
Safety drive speed	0.6	km/h	*0.37*	*mph*
Oil tank capacity	60	Lt.	*15.85*	*gal*
Gradeability	25	%	*25*	*%*
Max. operating temperature	+50	°C	*122*	*°F*
Min. operating temperature	-15	°C	*5*	*°F*

Battery power					
	Voltage and standard battery capacity - Deep Cycle	48 / 320	V/Ah	*48 / 320*	*V/Ah*
	Total electrolyte quantity of standard battery	8 x 11.4	Lt.	*8 x 3*	*gal*
	Standard battery weight	8 x 52	Kg	*8 x 115*	*lb*
	Voltage and optional battery capacity 1 - Drive Battery	48 / 330	V/Ah	*48 / 330*	*V/Ah*
	Total electrolyte quantity of optional battery 1	24 x 4.4	Lt.	*24 x 1.1*	*gal*
	Optional battery weight 1	410	Kg	*904*	*lbs*
	Voltage and optional battery capacity 2 - Drive Battery	48 / 385	V/Ah	*48 / 385*	*V/Ah*
	Total electrolyte quantity of optional battery 2	24 x 6.1	Lt.	*24 x 1.6*	*gal*
	Optional battery weight 2	564	Kg	*1243*	*lbs*
	Single-phase battery charger (HF)	48 / 45	V/A	*48 / 45*	*V/A*
	Battery charger power supply mains voltage - single phase	230 - 50	V - Hz	*230 – 50*	*V – Hz*
	Max. current absorbed by battery charger	15	A	*15*	*A*
	Max. installed power	15	kW	*20*	*hp*
	AC electric pump power	9	kW	*12*	*hp*
	Max. absorbed current	210	A	*210*	*A*
	AC drive motors power	2 x 3	kW	*2 x 4*	*hp*
	Max. current absorbed by each motor	2 x 60	A	*2 x 60*	*A*
380V three-phase electrical pump (optional)					
	Motor power	NA	kW	*NA*	*hp*
	Max. absorbed current	NA	A	*NA*	*A*
	Max. drive speed	NA	km/h	*NA*	*mph*
230V single-phase electric pump (optional)					
	Motor power	NA	kW	*NA*	*hp*
	Max. absorbed current	NA	A	*NA*	*A*
	Max. drive speed	NA	km/h	*NA*	*mph*

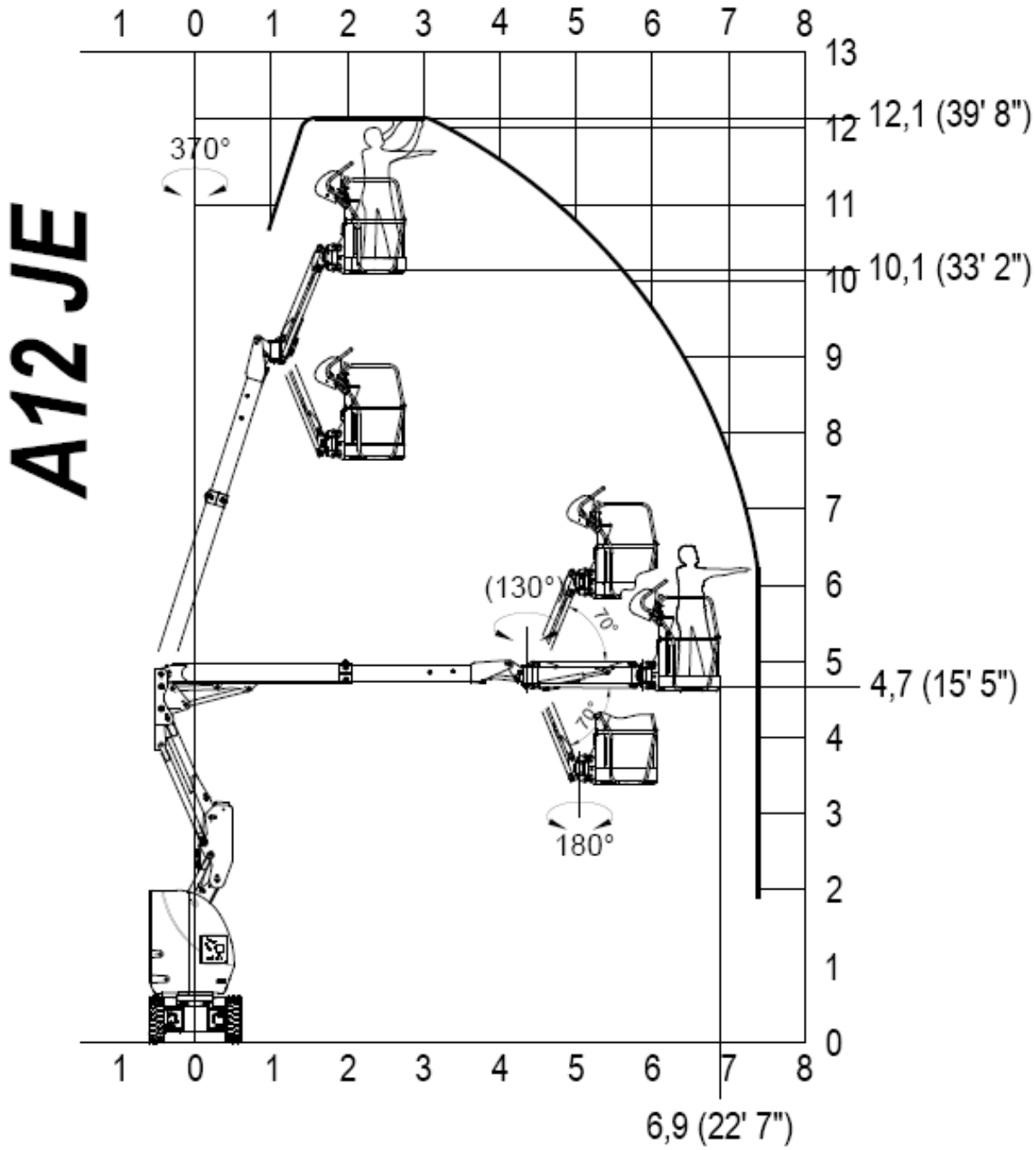
(1) In some cases, different limits can be fixed. It is recommended to comply with the data shown on the machine plate.

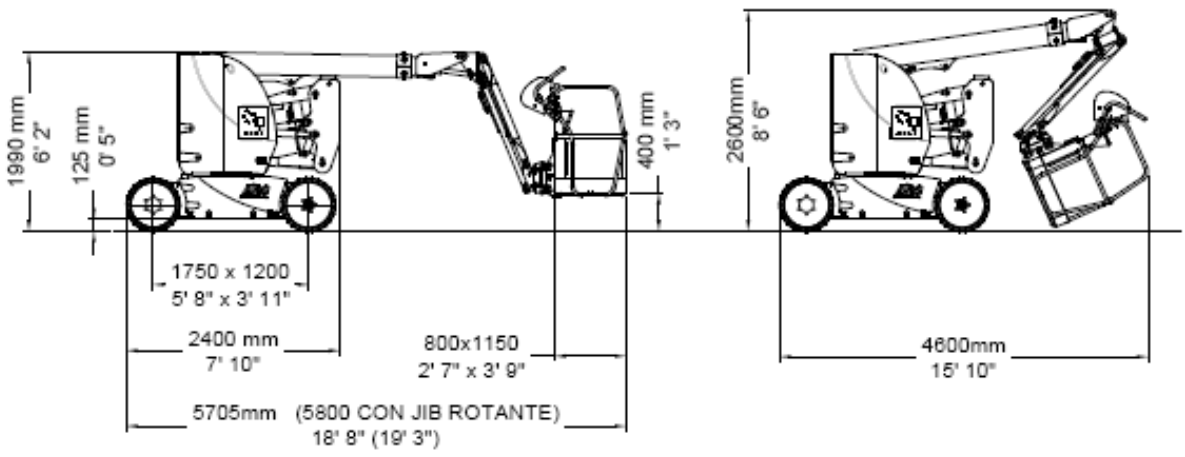
(2) me = m – (n x 80).

(3) Wind speeds higher or equal to 12.5 m/s indicate that the machines can be also used outdoors; Wind speeds equal to 0 m/s indicate that the machines can be used INDOORS ONLY. The A12 JE can be used outdoors with only one person on the platform.

(4) Cushion Soft no-marking standard tyres.

(5) Standard steel platform.


A12 JE
1 0 1 2 3 4 5 6 7 8
13
12
11
10
9
8
7
6
5
4
3
2
1
0
12,1 (39' 8")
10,1 (33' 2")
4,7 (15' 5")
370°
(130°)
70°
70°
180°
6,9 (22' 7")


1990 mm
6' 2"
125 mm
0' 5"
400 mm
1' 3"
1750 x 1200
5' 8" x 3' 11"
2400 mm
7' 10"
800x1150
2' 7" x 3' 9"
5705mm (5800 CON JIB ROTANTE)
18' 8" (19' 3")
2600mm
8' 6"
4600mm
15' 10"

2.2. Model A15 JE

	A15 JE			
Dimensions:				
Maximum working height	15.0	m	*49' 2"*	*ft*
Max. platform height	13.0	m	*42' 8"*	*ft*
Ground clearance (with pot-hole guards lifted)	135	mm	*5.3"*	*in*
Ground clearance (with pot-hole guards lowered)	25	mm	*1"*	*in*
Max. outreach from turntable centre	8.95	m	*29' 4"*	*ft*
Max. tailswing	0	mm	*0*	*in*
Turret rotation (not continuous)	370	°	370	°
Platform rotation	180	°	180	°
Jib rotation (optional)	130	°	130	°
Platform height for safety speed activation	< 3.5	m	*< 11' 5"*	*ft*
Internal steering radius	0.9	m	*2' 11"*	*ft*
External steering radius	3.0	m	*9' 10"*	*ft*
Maximum capacity (m)	230	Kg	*507*	*lbs*
Max. number of people on the platform (n) – indoors	2		*2*	
Tool and material weight (me) (2) – indoors	70	Kg	*154*	*lbs*
Max. number of people on the platform (n) – outdoors	2		*2*	
Tool and material weight (me) (2) – outdoors	70	Kg	*154*	*lbs*
Maximum drive height	Max		*Max*	
Maximum platform dimensions (5)	0.8 x 1.4	m	*2' 7" x 4' 7"*	*ft*
Max. hydraulic pressure	250	bar	*3626*	*psi*
Tyre dimensions (4)	Ø 600 x 190	mm	*Ø 23.6" x 7.5"*	*in*
Tire type (4)	Cushion soft		Cushion soft	
Transport dimensions	6,5 x 1,5 H=1,99	m	*21' 4" x 4' 11" x 6' 6"*	*ft*
Transport dimensions with rotated platform	6,2 x 1,5 H=1,99	m	*20' 4" x 4' 11" x 6' 6"*	*ft*
Transport dimensions with retracted jib	4,9 x 1,5 H=2,6	m	*16' 1" x 4' 11" x 8' 6"*	*ft*
Transport dimensions with retracted jib and rotated platform	4,9 x 1,5 H=2,2	m	*16' 1" x 4' 11" x 7' 3"*	*ft*
Machine weight (unloaded) (1)	7490	Kg	*16513*	*lbs*
Stability limit:				
Longitudinal slope	3	°	*3*	°
Transversal slope	3	°	*3*	°
Maximum manual force - indoors	400	N	*90*	*lbf*
Maximum manual force - outdoors	400	N	*90*	*lbf*
Maximum wind speed (3)	12.5	m/s	*27.96*	*mph*
Max. load per wheel	3400	Kg	*7496*	*lbs*
Performance:				
Drive wheels	2		*2*	
Max. drive speed	6	km/h	*3.7*	*mph*
Safety drive speed	0.6	km/h	*0.37*	*mph*
Oil tank capacity	60	Lt.	*15.85*	*gal*
Gradeability	25	%	*25*	*%*
Max. operating temperature	+50	°C	*122*	*°F*
Min. operating temperature	-15	°C	*5*	*°F*

Battery power					
	Voltage and standard battery capacity - Deep Cycle	48 / 320	V/Ah	*48 / 320*	*V/Ah*
	Total electrolyte quantity of standard battery	8 x 11.4	Lt.	*8 x 3*	*gal*
	Standard battery weight	8 x 52	Kg	*8 x 115*	*lbs*
	Voltage and optional battery capacity 1 - Drive Battery	48 / 330	V/Ah	*48 / 330*	*V/Ah*
	Total electrolyte quantity of optional battery 1	24 x 4.4	Lt.	*24 x 1.1*	*gal*
	Optional battery weight 1	410	Kg	*904*	*lbs*
	Voltage and optional battery capacity 2 - Drive Battery	48 / 385	V/Ah	*48 / 385*	*V/Ah*
	Total electrolyte quantity of optional battery 2	24 x 6.1	Lt.	*24 x 1.6*	*gal*
	Optional battery weight 2	564	Kg	*1243*	*lbs*
	Single-phase battery charger (HF)	48 / 45	V/A	*48 / 45*	*V/A*
	Battery charger power supply mains voltage - single phase	230 - 50	V - Hz	*230 – 50*	*V – Hz*
	Max. current absorbed by battery charger	15	A	*15*	*A*
	Max. installed power	15	kW	*20*	*hp*
	AC electric pump power	9	kW	*12*	*hp*
	Max. absorbed current	210	A	*210*	*A*
	AC drive motors power	2 x 3	kW	*2 x 4*	*hp*
	Max. current absorbed by each motor	2 x 60	A	*2 x 60*	*A*
380V three-phase electrical pump (optional)					
	Motor power	NA	kW	*NA*	*hp*
	Max. absorbed current	NA	A	*NA*	*A*
	Max. drive speed	NA	km/h	*NA*	*mph*
230V single-phase electric pump (optional)					
	Motor power	NA	kW	*NA*	*hp*
	Max. absorbed current	NA	A	*NA*	*A*
	Max. drive speed	NA	km/h	*NA*	*mph*

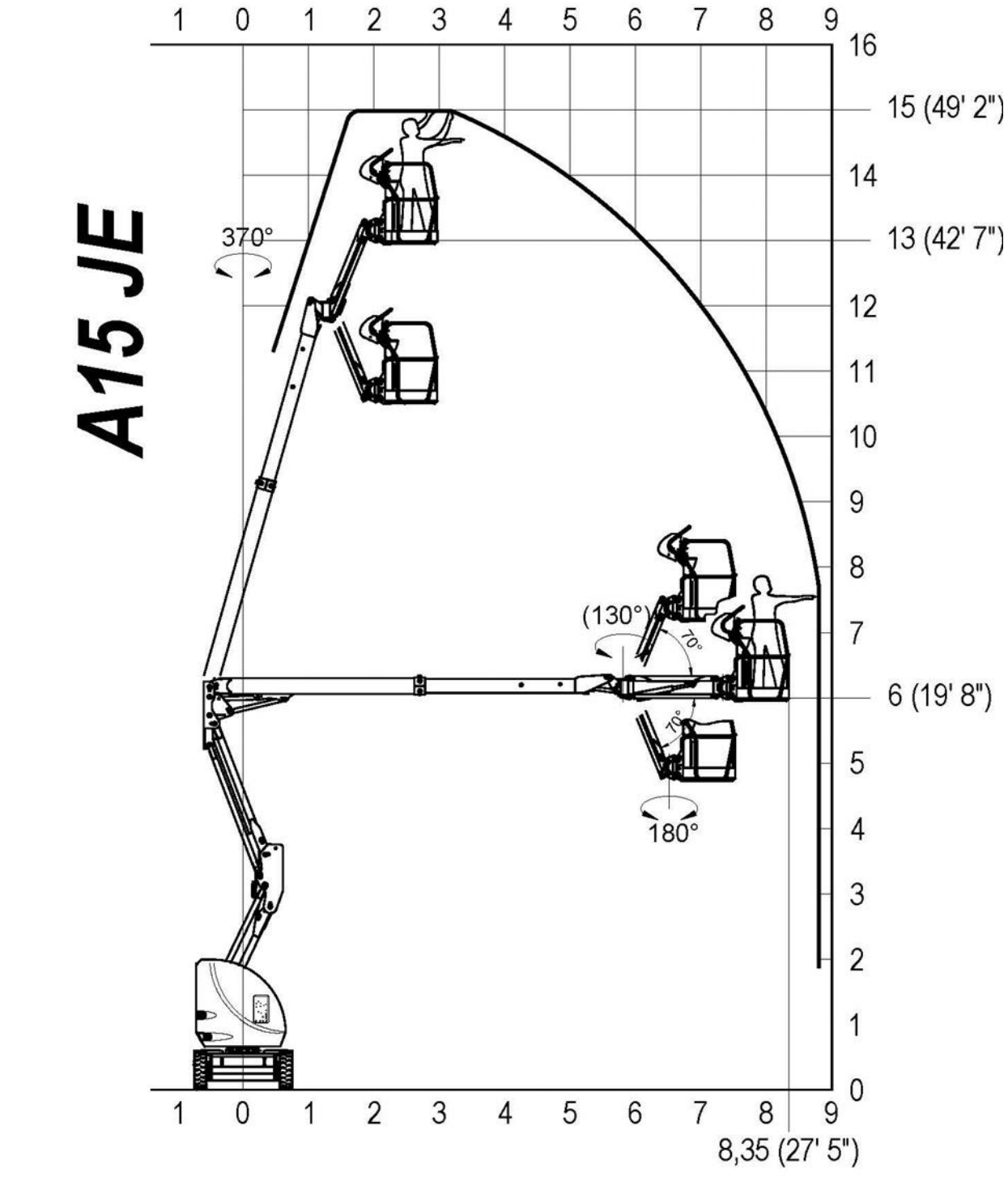
(1) In some cases, different limits can be fixed. It is recommended to comply with the data shown on the machine plate.

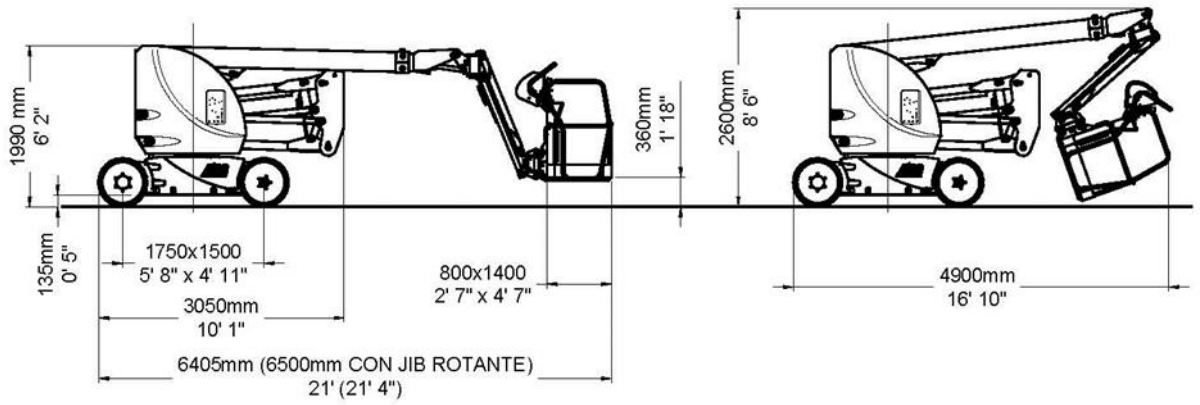
(2) me = m – (n x 80).

(3) Wind speeds higher or equal to 12.5 m/s indicate that the machines can be also used outdoors; Wind speeds equal to 0 m/s indicate that the machines can be used INDOORS ONLY.

(4) Cushion Soft no-marking standard tyres.

(5) Standard steel platform 800x1400 mm; Optional steel platform 800x1150 mm.


A15 JE
1 0 1 2 3 4 5 6 7 8 9
16
15 (49' 2")
14
13 (42' 7")
12
11
10
9
8
7
6 (19' 8")
5
4
3
2
1
0
370°
(130°)
70°
70°
180°
8,35 (27' 5")


1990 mm
6' 2"
135mm
0' 5"
1750x1500
5' 8" x 4' 11"
3050mm
10' 1"
6405mm (6500mm CON JIB ROTANTE)
21' (21' 4")
800x1400
2' 7" x 4' 7"
360mm
1' 18"
2600mm
8' 6"
4900mm
16' 10"

2.3. Model A17 JE.

	A17 JE			
Dimensions:				
Maximum working height	17.1	m	*56‘ 1”*	*ft*
Max. platform height	15.1	m	*49‘ 6”*	*ft*
Ground clearance (with pot-hole guards lifted)	135	mm	*5.3”*	*in*
Ground clearance - with pot-hole guards down - machine with fixed jib	50	mm	*2”*	*in*
Ground clearance - with pot-hole guards down - machine with rotating jib	25	mm	*1”*	*in*
Max. outreach from turntable centre	8.9	m	*29‘ 2”*	*ft*
Max. tailswing	35	mm	*1.4”*	*in*
Turret rotation (not continuous)	370	°	370	°
Platform rotation	180	°	180	°
Jib rotation (optional)	130	°	130	°
Platform height for safety speed activation	< 3.5	m	*< 11‘ 5”*	*ft*
Internal steering radius	0.9	m	*2‘ 11”*	*ft*
External steering radius	3.0	m	*9‘ 10”*	*ft*
Maximum load - machine with fixed jib (m)	230	Kg	*507*	*lbs*
Max. number of people on the platform (n) – indoors	2		*2*	
Tool and material weight (me) (2) – indoors	70	Kg	*154*	*lbs*
Max. number of people on the platform (n) – outdoors	2		*2*	
Tool and material weight (me) (2) – outdoors	70	Kg	*154*	*lbs*
Maximum load - machine with rotating jib optional (m)	230	Kg	*507*	*lbs*
Max. number of people on the platform (n) – indoors	2		*2*	
Tool and material weight (me) (2) – indoors	70	Kg	*154*	*lbs*
Max. number of people on the platform (n) – outdoors	1		*1*	
Tool and material weight (me) (2) – outdoors	150	Kg	*331*	*lbs*
Max. height / outreach drive - machine with fixed jib	Max / Max		*Max / Max*	
Max. height / outreach traction - machine with rotating jib	16.8 / 8.6	m	*55’ 1” / 28’ 2”*	*ft*
Maximum platform dimensions (5)	0.8 x 1.4	m	*2‘ 7” x 4’ 7”*	*ft*
Max. hydraulic pressure	250	bar	*3626*	*psi*
Tyre dimensions (4)	Ø 600 x 190	mm	*Ø 23.6” x 7.5”*	*in*
Tire type (4)	Cushion soft		Cushion soft	
Transport dimensions	6.4 x 1.5 H=1,99	m	*21’ x 4‘ 11”* *h= 6’ 6”*	*ft*
Transport dimensions with retracted jib	6.0 x 1.5 h = 2,4	m	*19’ 8” x 4’ 11”* *h =7’ 11”*	*ft*
Machine weight (unloaded) - machine with fixed jib (1)	8305	Kg	*18310*	*lbs*
Machine weight (unloaded) - machine with rotating jib (1)	8375	Kg	*18464*	*lbs*
Stability limit:				
Longitudinal inclination (compared to the extensible structure)	2	°	*2*	°
Transversal inclination (compared to the extensible structure)	3	°	*3*	°
Maximum manual force - indoors	400	N	*90*	*lbf*
Maximum manual force - outdoors - machine with fixed jib	400	N	*90*	*lbf*
Maximum manual force - outdoors - machine with rotating jib	200	N	*45*	*lbf*
Maximum wind speed (3)	12.5	m/s	*27.96*	*mph*
Max. load per wheel	3800	Kg	*8377*	*lbs*

Performance:					
	Drive wheels	2		*2*	
	Max. drive speed	6	km/h	*3.7*	*mph*
	Safety drive speed	0.6	km/h	*0.37*	*mph*
	Oil tank capacity	60	Lt.	*15.85*	*gal*
	Gradeability	25	%	*25*	*%*
	Max. operating temperature	+50	°C	*122*	*°F*
	Min. operating temperature	-15	°C	*5*	*°F*
Battery power					
	Standard battery voltage and capacity - drive battery	48 / 385	V/Ah	*48 / 385*	*V/Ah*
	Total electrolyte quantity of standard battery	24 x 6.1	Lt.	*24 x 1.6*	*gal*
	Standard battery weight	564	Kg	*1243*	*lbs*
	Single-phase battery charger (HF)	48 / 45	V/A	*48 / 45*	*V/A*
	Battery charger power supply mains voltage - single phase	230 - 50	V - Hz	*230 – 50*	*V – Hz*
	Max. current absorbed by battery charger	15	A	*15*	*A*
	Max. installed power	15	kW	*20*	*hp*
	AC electric pump power	9	kW	*12*	*hp*
	Max. absorbed current	210	A	*210*	*A*
	AC drive motors power	2 x 3	kW	*2 x 4*	*hp*
	Max. current absorbed by each motor	2 x 60	A	*2 x 60*	*A*
380V three-phase electrical pump (optional)					
	Motor power	NA	kW	*NA*	*hp*
	Max. absorbed current	NA	A	*NA*	*A*
	Max. drive speed	NA	km/h	*NA*	*mph*
230V single-phase electric pump (optional)					
	Motor power	NA	kW	*NA*	*hp*
	Max. absorbed current	NA	A	*NA*	*A*
	Max. drive speed	NA	km/h	*NA*	*mph*

(1) In some cases, different limits can be fixed. It is recommended to comply with the data shown on the machine plate.

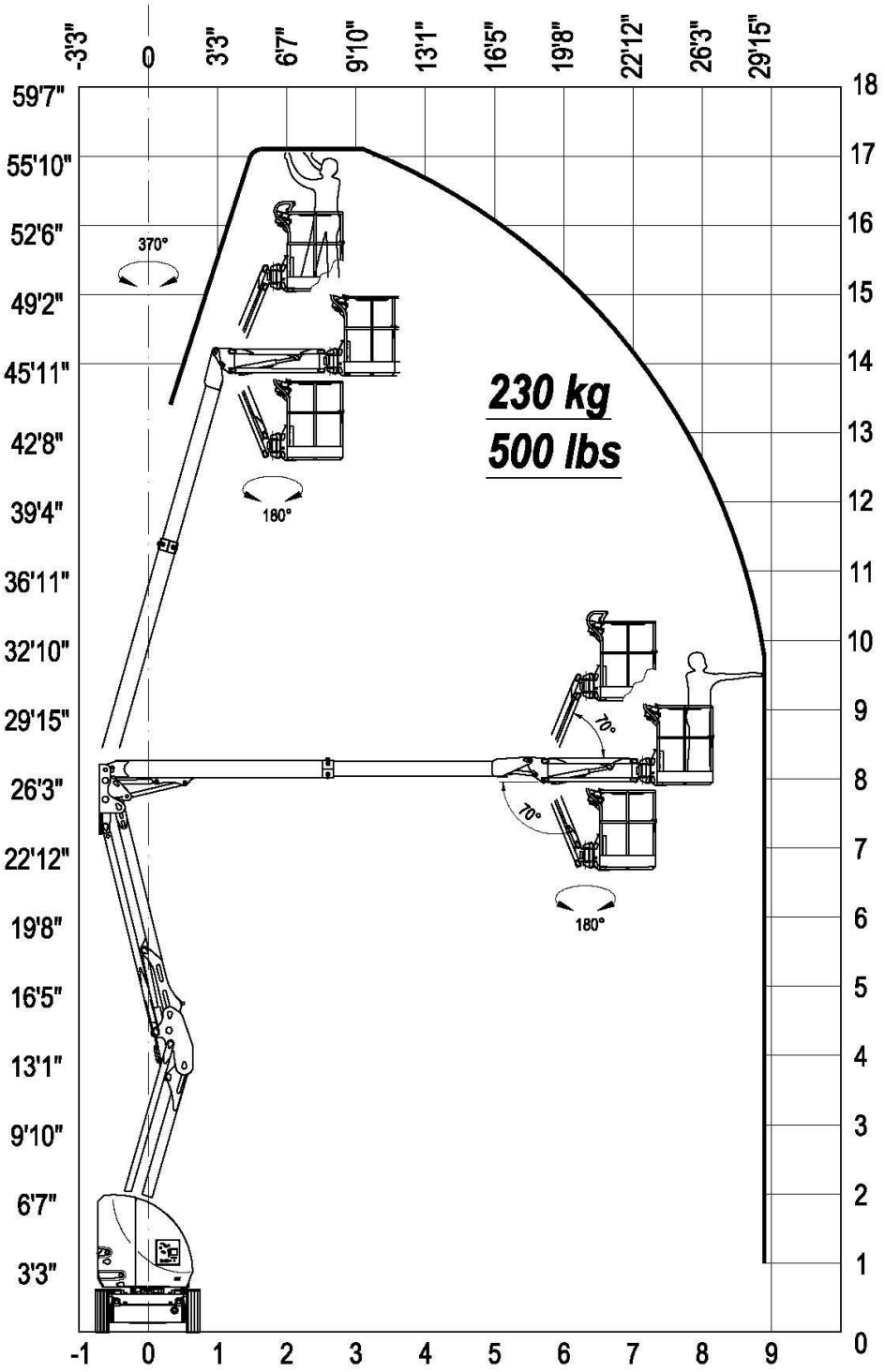
(2) me = m – (n x 80).

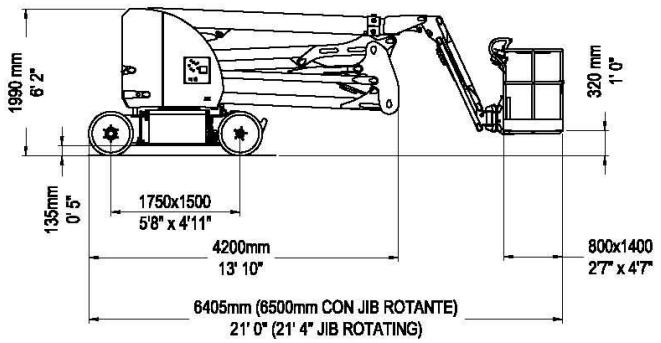
(3) Wind speeds higher or equal to 12.5 m/s indicate that the machines can be also used outdoors; Wind speeds equal to 0 m/s indicate that the machines can be used INDOORS ONLY.

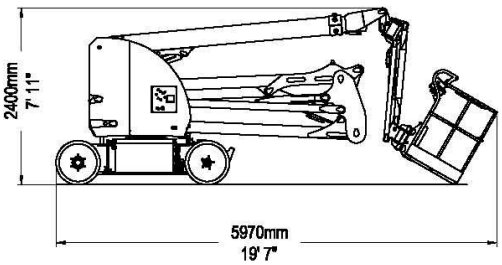
(4) Cushion Soft no-marking standard tyres.

(5) Standard steel platform 800x1400 mm; Optional steel platform 800x1150 mm.

A17 JE


-3'3"
0
3'3"
6'7"
9'10"
13'1"
16'5"
19'8"
22'12"
26'3"
29'15"
59'7"
55'10"
52'6"
49'2"
45'11"
42'8"
39'4"
36'11"
32'10"
29'15"
26'3"
22'12"
19'8"
16'5"
13'1"
9'10"
6'7"
3'3"
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
-1
0
1
2
3
4
5
6
7
8
9
370°
180°
70°
70°
180°
230 kg
500 lbs


1990 mm
6' 2"
320 mm
1' 0"
135mm
0' 5"
1750x1500
5'8" x 4'11"
4200mm
13' 10"
800x1400
2'7" x 4'7"
6405mm (6500mm CON JIB ROTANTE)
21' 0" (21' 4" JIB ROTATING)


2400mm
7' 11"
5970mm
19' 7"

2.4. Model A12 JED

	A12 JED			
Dimensions:				
Maximum working height	12.1	m	*39' 8"*	*ft*
Max. platform height	10.1	m	*33' 2"*	*ft*
Ground clearance (with pot-hole guards lifted)	135	mm	*5.3"*	*in*
Ground clearance (with pot-hole guards lowered)	25	mm	*1"*	*in*
Max. outreach from turntable centre	7.3	m	*23' 11"*	*ft*
Max. tailswing	0	mm	*0*	*in*
Turret rotation (not continuous)	370	°	*370*	°
Platform rotation	180	°	*180*	°
Jib rotation (optional)	130	°	*130*	°
Platform height for safety speed activation	< 3.5	m	*< 11' 5"*	*ft*
Internal steering radius	0.9	m	*2' 11"*	*ft*
External steering radius	3.0	m	*9' 10"*	*ft*
Maximum capacity (m)	230	Kg	*507*	*lbs*
Max. number of people on the platform (n) – indoors	2		*2*	
Tool and material weight (me) (2) – indoors	70	Kg	*154*	*lbs*
Max. number of people on the platform (n) – outdoors	2		*2*	
Tool and material weight (me) (2) – outdoors	70	Kg	*154*	*lbs*
Maximum drive height	Max		*Max*	
Maximum platform dimensions (5)	0.8 x 1.4	m	*2' 7" x 4' 7"*	*ft*
Max. hydraulic pressure	250	bar	*3626*	*psi*
Tyre dimensions (4)	Ø 600 x 190	mm	*Ø 23.6" x 7.5"*	*in*
Tire type (4)	Cushion soft		*Cushion soft*	
Transport dimensions	---	m	---	*ft*
Transport dimensions with rotated platform	---	m	---	*ft*
Transport dimensions with retracted jib	---	m	---	*ft*
Transport dimensions with retracted jib and rotated platform	---	m	---	*ft*
Machine weight (unloaded) (1)	---	Kg	---	*lbs*
Stability limit:				
Longitudinal slope	3	°	*3*	°
Transversal slope	3	°	*3*	°
Maximum manual force - indoors	400	N	*90*	*lbf*
Maximum manual force - outdoors	400	N	*90*	*lbf*
Maximum wind speed (3)	12.5	m/s	*27.96*	*mph*
Max. load per wheel	---	Kg	---	*lbs*
Performance:				
Drive wheels	2		*2*	
Max. drive speed	6	km/h	*3.7*	*mph*
Safety drive speed	0.6	km/h	*0.37*	*mph*
Oil tank capacity	60	Lt.	*15.85*	*gal*
Gradeability	25	%	*25*	*%*
Max. operating temperature	+50	°C	*122*	*°F*
Min. operating temperature	-15	°C	*5*	*°F*

Battery power					
	Voltage and standard battery capacity - Deep Cycle	48 / 320	V/Ah	*48 / 320*	*V/Ah*
	Total electrolyte quantity of standard battery	8 x 11.4	Lt.	*8 x 3*	*gal*
	Standard battery weight	8 x 52	Kg	*8 x 115*	*lbs*
	Voltage and optional battery capacity 1 - Drive Battery	48 / 330	V/Ah	*48 / 330*	*V/Ah*
	Total electrolyte quantity of optional battery 1	24 x 4.4	Lt.	*24 x 1.1*	*gal*
	Optional battery weight 1	410	Kg	*904*	*lbs*
	Voltage and optional battery capacity 2 - Drive Battery	48 / 385	V/Ah	*48 / 385*	*V/Ah*
	Total electrolyte quantity of optional battery 2	24 x 6.1	Lt.	*24 x 1.6*	*gal*
	Optional battery weight 2	564	Kg	*1243*	*lbs*
	Single-phase battery charger (HF)	48 / 45	V/A	*48 / 45*	*V/A*
	Battery charger power supply mains voltage - single phase	230 - 50	V - Hz	*230 - 50*	*V - Hz*
	Max. current absorbed by battery charger	15	A	*15*	*A*
	Max. installed power	15	kW	*20*	*hp*
	AC electric pump power	9	kW	*12*	*hp*
	Max. absorbed current	210	A	*210*	*A*
	AC drive motors power	2 x 3	kW	*2 x 4*	*hp*
	Max. current absorbed by each motor	2 x 60	A	*2 x 60*	*A*
Motor generator					
	Diesel engine type	HATZ 1B30/6		*HATZ 1B30/6*	
	Max. motor power	5	kW	*6.7*	*hp*
	Adjusted Power	4.6	kW	*6.1*	*hp*
	Generator power	2.4	kW	*3.2*	*hp*
	Supplied voltage	48	VDC	*48*	*VDC*
	Supplied current	50	A	*50*	*A*
380V three-phase electrical pump (optional)					
	Motor power	NA	kW	*NA*	*hp*
	Max. absorbed current	NA	A	*NA*	*A*
	Max. drive speed	NA	km/h	*NA*	*mph*
230V single-phase electric pump (optional)					
	Motor power	NA	kW	*NA*	*hp*
	Max. absorbed current	NA	A	*NA*	*A*
	Max. drive speed	NA	km/h	*NA*	*mph*

(1) In some cases, different limits can be fixed. It is recommended to comply with the data shown on the machine plate.

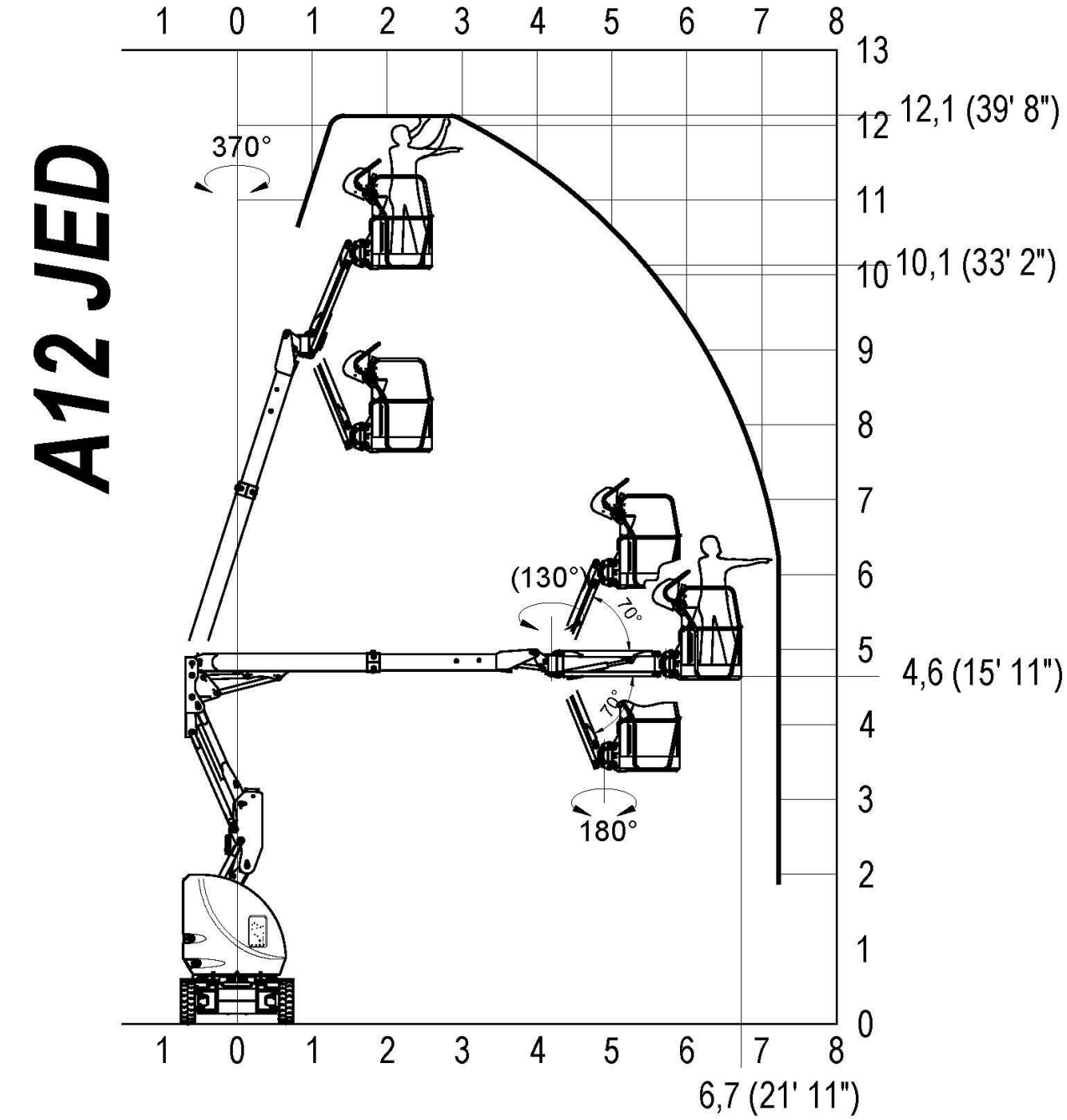
(2) me = m – (n x 80).

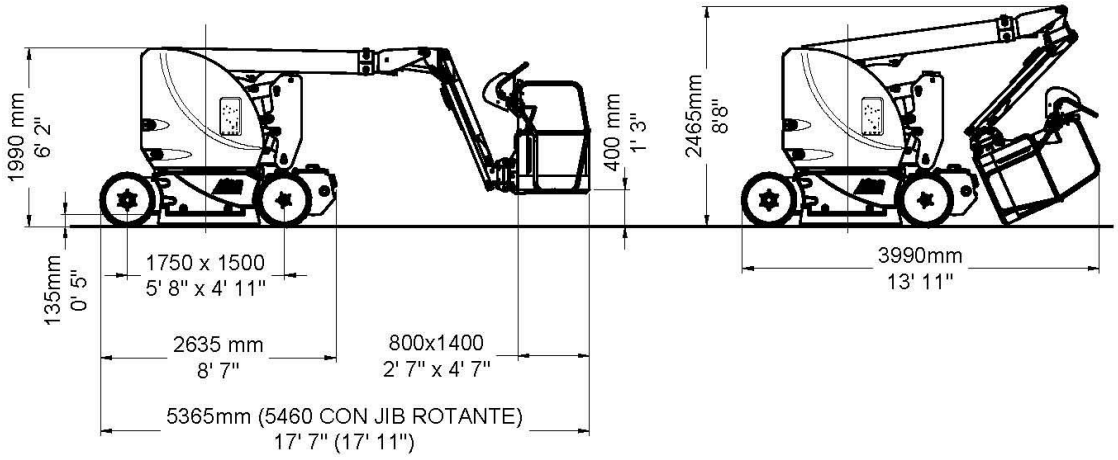
(3) Wind speeds higher or equal to 12.5 m/s indicate that the machines can be also used outdoors; Wind speeds equal to 0 m/s indicate that the machines can be used INDOORS ONLY.

(4) Standard tyres: cushion soft no-marking.

(5) Standard steel platform 800x1400 mm; Optional steel platform 800x1150 mm.

A12 JED


1 0 1 2 3 4 5 6 7 8
13
12
11
10
9
8
7
6
5
4
3
2
1
0
12,1 (39' 8")
10,1 (33' 2")
4,6 (15' 11")
370°
(130°)
70°
70°
180°
1 0 1 2 3 4 5 6 7 8
6,7 (21' 11")


1990 mm
6' 2"
400 mm
1' 3"
135mm
0' 5"
1750 x 1500
5' 8" x 4' 11"
2635 mm
8' 7"
800x1400
2' 7" x 4' 7"
5365mm (5460 CON JIB ROTANTE)
17' 7" (17' 11")
2465mm
8'8"
3990mm
13' 11"

2.5. Model A15 JED

	A15 JED			
Dimensions:				
Maximum working height	15.0	m	*49' 2"*	*ft*
Max. platform height	13.0	m	*42' 8"*	*ft*
Ground clearance (with pot-hole guards lifted)	135	mm	*5.3"*	*in*
Ground clearance (with pot-hole guards lowered)	25	mm	*1"*	*in*
Max. outreach from turntable centre	8.95	m	*29' 4"*	*ft*
Max. tailswing	0	mm	*0*	*in*
Turret rotation (not continuous)	370	°	*370*	°
Platform rotation	180	°	*180*	°
Jib rotation (optional)	130	°	*130*	°
Platform height for safety speed activation	< 3.5	m	*< 11' 5"*	*ft*
Internal steering radius	0.9	m	*2' 11"*	*ft*
External steering radius	3.0	m	*9' 10"*	*ft*
Maximum capacity (m)	230	Kg	*507*	*lbs*
Max. number of people on the platform (n) – indoors	2		*2*	
Tool and material weight (me) (2) – indoors	70	Kg	*154*	*lbs*
Max. number of people on the platform (n) – outdoors	2		*2*	
Tool and material weight (me) (2) – outdoors	70	Kg	*154*	*lbs*
Maximum drive height	Max		*Max*	
Maximum platform dimensions (5)	0.8 x 1.4	m	*2' 7" x 4' 7"*	*ft*
Max. hydraulic pressure	250	bar	*3626*	*psi*
Tyre dimensions (4)	Ø 600 x 190	mm	*Ø 23.6" x 7.5"*	*in*
Tire type (4)	Cushion soft		*Cushion soft*	
Transport dimensions	---	m	---	*ft*
Transport dimensions with rotated platform	---	m	---	*ft*
Transport dimensions with retracted jib	---	m	---	*ft*
Transport dimensions with retracted jib and rotated platform	---	m	---	*ft*
Machine weight (unloaded) (1)	---	Kg	---	*lbs*
Stability limit:				
Longitudinal slope	3	°	*3*	°
Transversal slope	3	°	*3*	°
Maximum manual force - indoors	400	N	*90*	*lbf*
Maximum manual force - outdoors	200	N	*45*	*lbf*
Maximum wind speed (3)	12.5	m/s	*27.96*	*mph*
Max. load per wheel	---	Kg	---	*lbs*
Performance:				
Drive wheels	2		*2*	
Max. drive speed	6	km/h	*3.7*	*mph*
Safety drive speed	0.6	km/h	*0.37*	*mph*
Oil tank capacity	60	Lt.	*15.85*	*gal*
Gradeability	25	%	*25*	*%*
Max. operating temperature	+50	°C	*122*	*°F*
Min. operating temperature	-15	°C	*5*	*°F*

Battery power					
	Voltage and standard battery capacity - Deep Cycle	48 / 320	V/Ah	*48 / 320*	*V/Ah*
	Total electrolyte quantity of standard battery	8 x 11.4	Lt.	*8 x 3*	*gal*
	Standard battery weight	8 x 52	Kg	*8 x 115*	*lbs*
	Voltage and optional battery capacity 1 - Drive Battery	48 / 330	V/Ah	*48 / 330*	*V/Ah*
	Total electrolyte quantity of optional battery 1	24 x 4.4	Lt.	*24 x 1.1*	*gal*
	Optional battery weight 1	410	Kg	*904*	*lbs*
	Voltage and optional battery capacity 2 - Drive Battery	48 / 385	V/Ah	*48 / 385*	*V/Ah*
	Total electrolyte quantity of optional battery 2	24 x 6.1	Lt.	*24 x 1.6*	*gal*
	Optional battery weight 2	564	Kg	*1243*	*lbs*
	Single-phase battery charger (HF)	48 / 45	V/A	*48 / 45*	*V/A*
	Battery charger power supply mains voltage - single phase	230 - 50	V - Hz	*230 – 50*	*V - Hz*
	Max. current absorbed by battery charger	15	A	*15*	*A*
	Max. installed power	15	kW	*20*	*hp*
	AC electric pump power	9	kW	*12*	*hp*
	Max. absorbed current	210	A	*210*	*A*
	AC drive motors power	2 x 3	kW	*2 x 4*	*hp*
	Max. current absorbed by each motor	2 x 60	A	*2 x 60*	*A*
Motor generator					
	Diesel engine type	HATZ 1B30/6		HATZ 1B30/6	
	Max. motor power	5	kW	*6.7*	*hp*
	Adjusted Power	4.6	kW	*6.1*	*hp*
	Generator power	2.4	kW	*3.2*	*hp*
	Supplied voltage	48	VDC	*48*	*VDC*
	Supplied current	50	A	*50*	*A*
380V three-phase electrical pump (optional)					
	Motor power	NA	kW	*NA*	*hp*
	Max. absorbed current	NA	A	*NA*	*A*
	Max. drive speed	NA	km/h	*NA*	*mph*
230V single-phase electric pump (optional)					
	Motor power	NA	kW	*NA*	*hp*
	Max. absorbed current	NA	A	*NA*	*A*
	Max. drive speed	NA	km/h	*NA*	*mph*

(1) In some cases, different limits can be fixed. It is recommended to comply with the data shown on the machine plate.

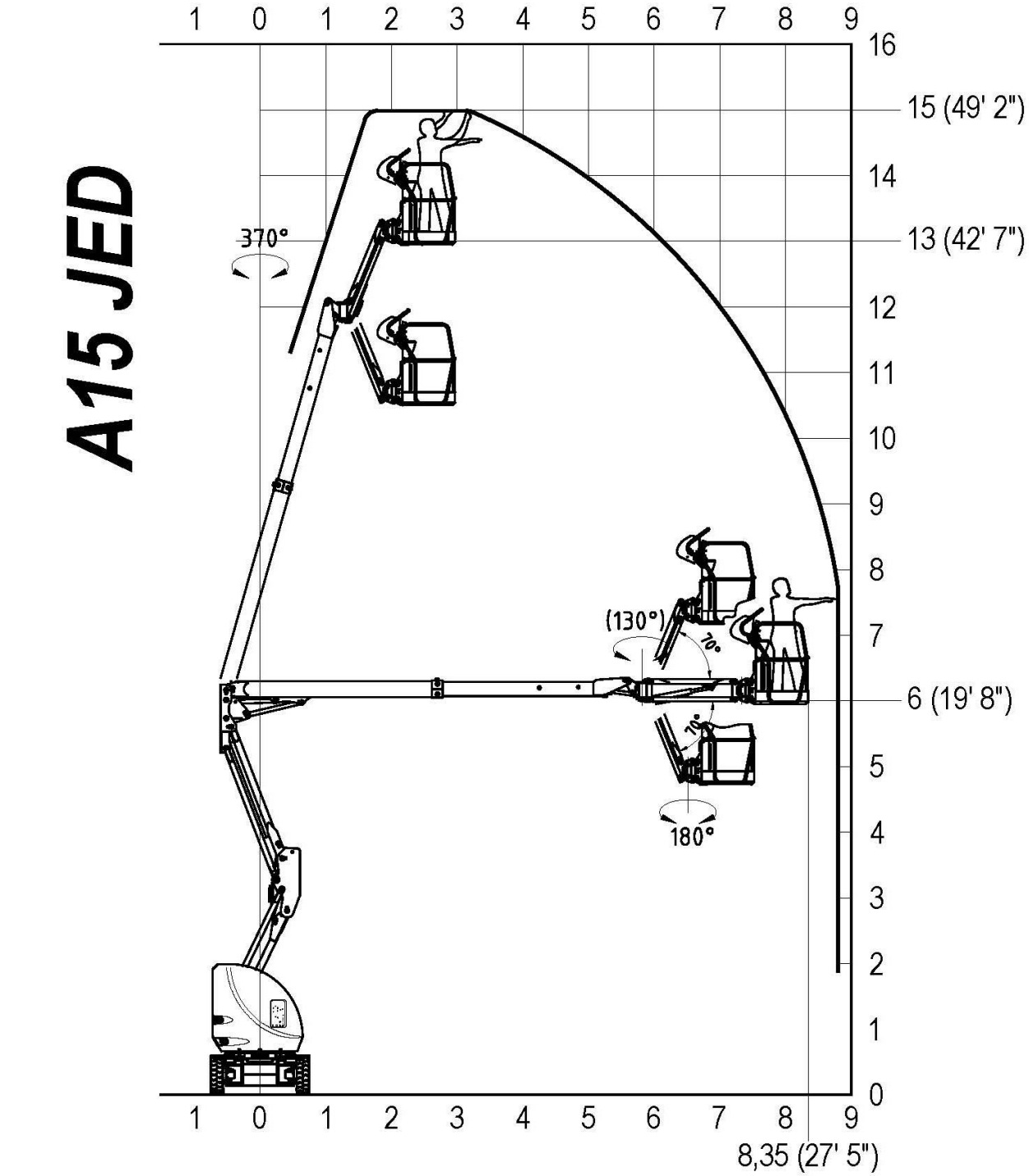
(2) me = m – (n x 80).

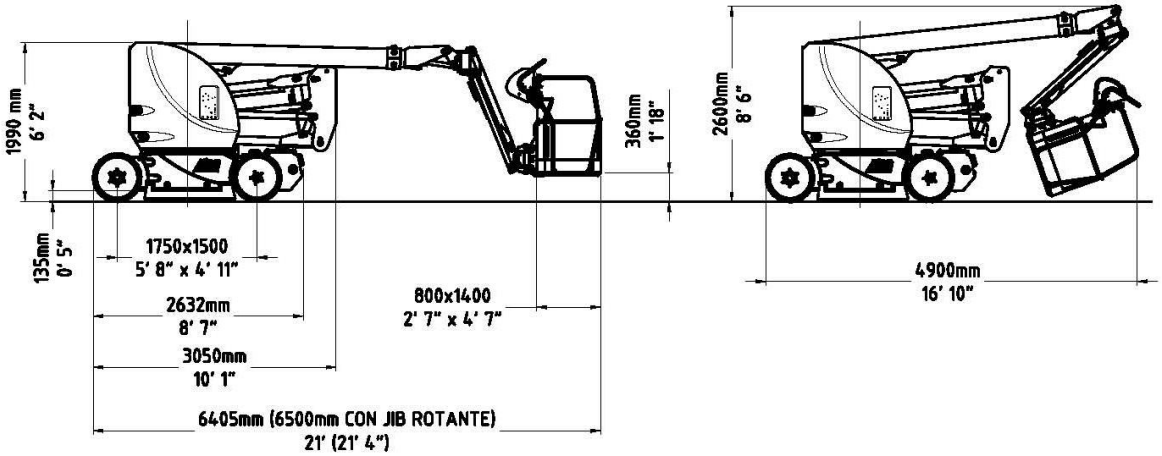
(3) Wind speeds higher or equal to 12.5 m/s indicate that the machines can be also used outdoors; Wind speeds equal to 0 m/s indicate that the machines can be used INDOORS ONLY.

(4) Standard tyres: cushion soft no-marking.

(5) Standard steel platform 800x1400 mm; Optional steel platform 800x1150 mm.

A15 JED


1 0 1 2 3 4 5 6 7 8 9
16
15 (49' 2")
14
13 (42' 7")
12
11
10
9
8
7
6 (19' 8")
5
4
3
2
1
0
370°
(130°)
70°
70°
180°
8,35 (27' 5")


1990 mm
6' 2"
135mm
0' 5"
1750x1500
5' 8" x 4' 11"
2632mm
8' 7"
3050mm
10' 1"
6405mm (6500mm CON JIB ROTANTE)
21' (21' 4")
800x1400
2' 7" x 4' 7"
360mm
1' 18"
2600mm
8' 6"
4900mm
16' 10"

2.6. Vibrations and noise

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 70dB(A) for each electrical model.

For the models equipped with diesel motor generator, the level of acoustic pressure weighed (A) at work places does not exceed 106dB(A), the level of acoustic pressure at ground control panel does not exceed 85dB(A), the level of acoustic pressure at platform control panel does not exceed 78bD(A).

As to vibrations in ordinary working conditions:

- The average weighted quadratic value in frequency of the acceleration which the upper members have to withstand is below **2.5 m/sec²** for each of the models to which this Use and Maintenance manual refers.
- The average weighted quadratic value in frequency of the acceleration which the body has to withstand is below **0.5 m/sec²** for each of the models to which this Use and Maintenance manual refers.

3. SAFETY PRECAUTIONS.

3.1. Personal protective equipment (PPE)

Always wear personal protective equipment according to current regulations concerning industrial health and safety (in particular, hard hat and safety shoes are **COMPULSORY**).
It is the operator or safety manager's responsibility to choose the personal protective equipment (PPE) depending on the activity to be carried out. For their correct use and maintenance, refer to the equipment manuals themselves.
The use of safety harness is not compulsory except in certain countries with specific regulations. In Italy, the consolidation act on safety, **Law Decree 81/08,** has made the use of a safety harness mandatory.
The harness is attached to one of the anchorages reported by labels, as in the following picture.

Fig. 3

3.2. General safety norms

- Only adults (18 years old), after carefully reading this manual, are allowed to use the machine. The employer is responsible for training.
- The platform is intended for people carriage; therefore, it is necessary to comply with the current local regulations relevant to this class of machines (see paragraphs 1).
- At least two users must operate the machine, one of them on the ground, able to carry out the emergency operations described in this handbook.
- Always keep the machine at a safety distance from power lines as indicated in the next chapters.
- Use the machine according to the capacity values indicated in the technical features section. The identification plate shows the maximum number of people allowed on the platform at any one time, the maximum capacity and the tool and material weight. Never exceed the indicated figures.
- Do NOT use the framework of the platform or any of its elements for grounding connections while welding on the platform.
- It is absolutely forbidden to load and/or unload persons and/or material with platform not in the access position.
- 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. Use instructions

3.3.1. General

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 SYSTEMS.

- 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. The machine is not equipped with any lightening system.
- 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 mains supply. Follow the instructions given in the following paragraphs.
- Do not approach the electric and hydraulic system components with sources of heat or flames.
- Do not increase the max. allowed height by means of scaffolds, ladders or other.
- With the machine lifted, do not fasten the platform to any structure (beams, pillars or wall).
- Do not use the machine as a crane, hoist or lift.
- Protect the machine (in particular the platform control panel by means of the specially provided cover- if any - or a waterproof tarpaulin) and the operator when working in adverse environmental conditions (painting, de-painting, sand-blasting, washing, etc.).
- Using the machine in bad weather conditions is forbidden; in particular, wind speeds must not exceed the limits indicated in the Technical specifications (to measure speeds, see the following chapters).
- Machines with a wind speed limit of 0 m/s are to be used indoors only.
- In the event of rain or in parking condition always protect the platform control panel (with the specially provided cap - if any - or a waterproof tarpaulin).
- 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.
- Overloading the work platform is forbidden.
- Avoid knocks and/or contacts with other vehicles and fixed structures.
- Leaving or accessing the work platform is forbidden unless this is in the position required for access or leaving (see the “Accessing the platform” chapter).

3.3.2. Handling

- Before handling the machine check that the connection plugs are disconnected from the power supply source. Always check the cable position during handling if the machine is powered with a 230V electrical pump.
- In order to avoid any instability, use the machine on regular and firm grounds. To prevent the machine from overturning, comply with the max. gradeability values indicated in the Technical data section under paragraph "Stability limits". However, movements on inclined grounds are to be carried out with the utmost caution.
- As soon as the platform is lifted (the tolerance varies from model to model) the safety drive speed is automatically activated (all models of this handbook have passed the stability Tests in compliance with standard EN280).
- Drive the machine with lifted platform only on flat grounds, verifying the absence of holes or steps on the floor and bearing in mind the overall dimensions of the machine.
- While driving the machine with lifted platform the operators are not allowed to place horizontal loads onto the platform (operators on board must not pull ropes, wires, etc.).
- The machine must not be used directly for road transport. Do not use it for material transport (see paragraph “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.

- During operation keep your hands in safety position, the driver has to place them as shown in picture A or B while the transported operator has to keep them as shown in picture C.

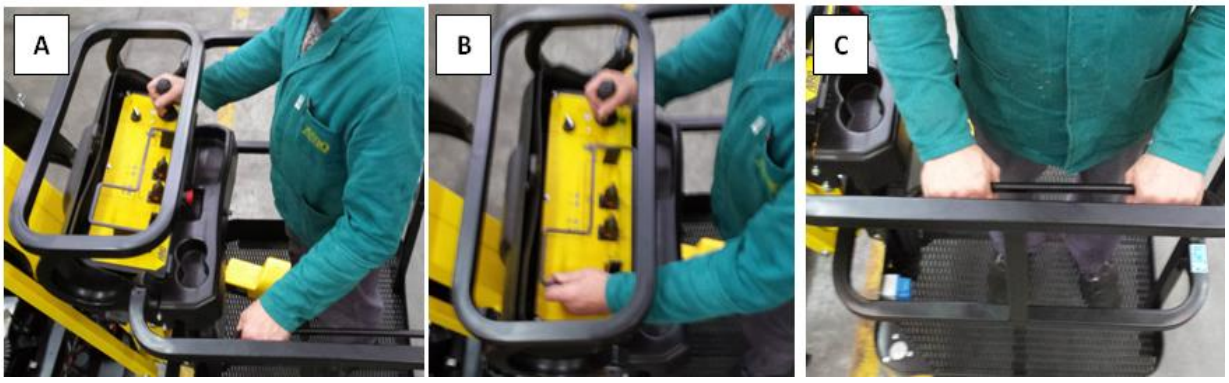


Fig. 4

3.3.3. Operating procedures

- The machine is equipped with a chassis inclination control system disabling lifting operations in case of unstable positioning. Working operations can be resumed only after placing the machine in a steady position. Should the audible alarm (activated only if the platform is lifted) and the red warning light on the platform control panel turn on, the machine is not correctly positioned (see paragraphs about “Use instructions”) and it is necessary to bring it to rest position before starting operations again. If the tilt alarm trips with the platform elevated, the only possible operations are those that allow lowering the platform.
- The machine is equipped with an overload controller stopping the platform in case of overloading. In case of platform overloading when lifted, also drive is disabled. Platform operation can be resumed only after removing the exceeding load. Should the audible alarm and the red light located on the platform control panel turn on, then the platform is overloaded (see chapter "Red warning light overload"). Remove the exceeding load before starting operations again.
- Electric-powered machines feature a device for checking the state of battery discharge (battery protection): when battery charge is at 20% the operator on the platform is informed of this condition through a flashing red light. In this condition lifting is disabled. Battery should be immediately charged.
- Do not lean over the platform guard rails.
- Make sure that no people, apart from the operator, are in the area where the machine is operating. While moving the platform, the operator on board should pay particular attention to avoid any contact with the personnel on the ground.
- During operations in public areas, in order to prevent people other than the personnel from approaching the machine and being endangered, surround the working area by means of barriers or other suitable signs.
- Avoid severe weather conditions and, in particular, windy days.
- Lift the platform only if the machine is resting on firm and horizontal surfaces (following chapters).
- Drive the machine with lifted platform only if the ground is solid and horizontal.
- 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.

When choosing the positioning point of the chassis, to prevent unexpected possible contacts with obstacles, always observe the figures carefully as these make it possible to identify the range of action of the platform (chap. 2).

3.3.4. Wind speed according to Beaufort scale

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.

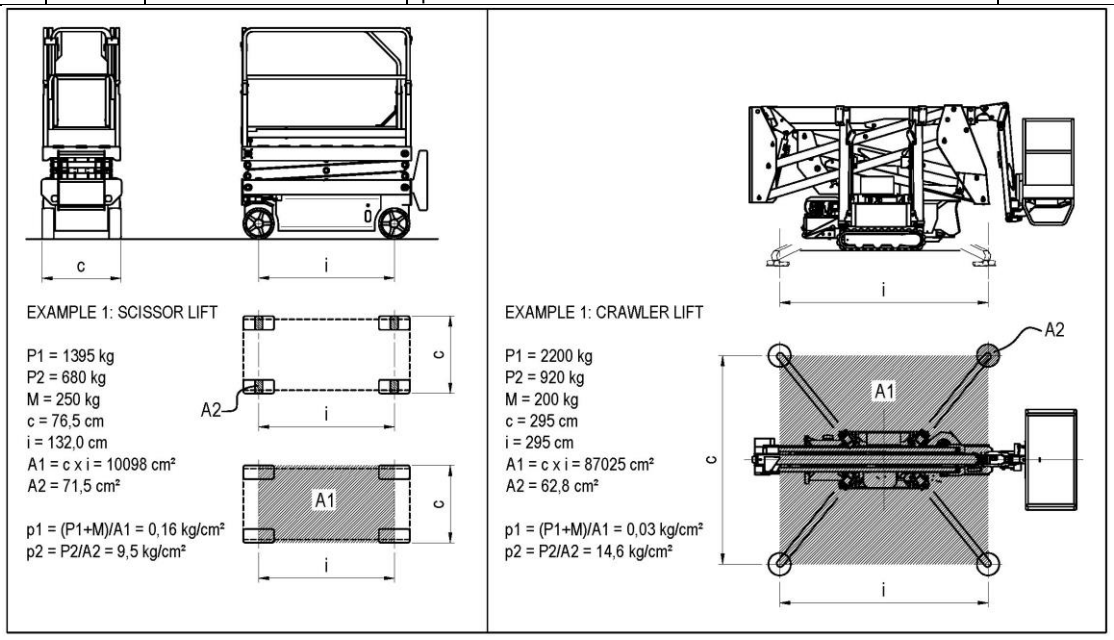
The machines for which the max. wind limit is 0 m/s must be used indoors only. These machines cannot be used outdoors even with no wind.

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.

3.3.5. Pressure of the machine on ground and load-bearing capacity of ground

Before using the machine, the operator must make sure the floor is suitable for withstanding the specific loads and pressures on the ground with a certain safety margin.
The following chart provides the parameters in play and two examples of calculation of the average pressure on the ground below the machine and max pressure underneath the wheels or stabilizers (p1 and p2).

SYMBOL	U.M.	DESCRIPTION	EXPLANATION	FORMULA
P1	Kg	Total machine weight	It represents the machine weight, nominal load excluded. Note: always refer to the details indicated on the plates affixed to the machine.	-
M	Kg	Nominal Load	The max. load allowed for the work platform.	-
A1	cm²	Area occupied on the ground	Machine supporting area on the ground determined by the result of TRACK x WHEEL BASE.	A1 = c × i
c	cm	Track	Cross width of machine measured outside the wheels. or: Cross width of machine measured between levelling outrigger centres.	-
i	cm	Wheel base	Longitudinal length of machine measured between wheel centres. or: Longitudinal length of machine measured between levelling outrigger centres.	-
A2	cm²	Wheel or levelling stabilizer area	Wheel or levelling stabilizer ground support area. The wheel support area on the ground must be verified empirically by the operator; the levelling stabilizer support area depends on the shape of the support foot.	-
P2	Kg	Max. load on wheel or levelling stabilizer	This represents the max. load that can be discharged onto the ground by a wheel or by a levelling stabilizer when the machine is in the worst position and load conditions. Note: always refer to the details indicated on the plates affixed to the machine.	-
p1	Kg/cm²	Pressure on ground	Average pressure placed on the ground in idle conditions and supporting the nominal load.	p1 = (P1 + M) / A1
p2	Kg/cm²	Max specific pressure	Max. pressure which a wheel or a levelling stabilizer can place on the ground when the machine is in the worst position and load conditions.	p2 = P2 / A2



The table below shows the load-bearing capacity of the ground split up by ground type.
Refer to the data contained in the specific tables of each model (chapter 2, TECHNICAL FEATURES OF STANDARD MACHINES) to obtain the figure relating to the max pressure on the ground caused by the single wheel.

Using the machine is forbidden if the max ground pressure per wheel is higher than the bearing capacity of the specific type of ground on which the machine is to be used.

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

Should you have any doubts, verify the load-bearing capacity with specific tests.
In case of constructed surfaces (concrete floors, bridges, etc.) the load-bearing capacity must be provided by the builder.

3.3.6. High-voltage power lines

The machine is not electrically insulated and is not protected in case of contact with or vicinity to power lines.
According to the applicable laws and the following table a minimum distance from the power lines must be kept.

Type of power lines	Voltage (KV)	Minimum distance (m)
Light poles	<1	3
	1 -10	3.5
	10 - 15	3.5
	15 - 132	5
	132 - 220	7
	220 - 380	7
High-voltage pylons	>380	15

3.4. Dangerous situations and/or accidents

- If, during Preliminary Operation Checks or when using the machine, the operator discovers a defect that could produce a hazardous situation, the machine must be placed in **safety condition** (isolate it and affix a notice) and the employer must be notified about the fault.
- If, during use, an accident occurs, without injuries to the operators, caused by operating errors (e.g., collisions) or any structural yielding, the machine must be placed in **safety condition** (isolate it and affix a notice) and the employer must be notified about the fault.
- In case of an accident with injuries to one or more operators, the operator on the ground (or on a platform not involved in the accident) must:
  - **Seek help immediately.**
  - Perform the operation to return the platform to the ground **only if he is certain this will not make the situation worse.**
  - Place the machine in **safety condition** and notify the fault to the employer.

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 chapter “Handling and carrying”.
Place the machine on a sturdy enough surface (see paragraph **3.3.5**) and with a gradient below max. allowed gradient (see technical features “**Stability limits**”)

4.1. Becoming acquainted with the machine

Anyone wishing to use a machine with weight, height, width and length characteristics or which generally differs significantly from the training received must be updated in order to cover the differences.
The employer shall be responsible for ensuring all the operators who use work equipment are adequately trained and in compliance with applicable health and safety legislation.

4.2. Preliminary operation checks

Before using the machine read the instructions given in this manual and the concise instructions indicated on the platform plate.
Check the perfect integrity of the machine (by sight check) and read the plates showing machine operating limits.
Before using the machine, the operator must always check visually that:

- Make sure the battery is fully charged and the fuel tank is full.
- The oil level lies between the min. and max. value (with lowered platform).
- The ground is sufficiently horizontal and solid.
- The machine carries out all operations in safety.
- The wheels and drive motors are properly fixed.
- The wheels are in good conditions.
- Make sure the rails are fastened to the platform and the gate/s are in automatic reclosing mode.
- The structure does not show clear faults (visually check also the weldings of the lifting structure, chassis and turret) and make sure there are no deformations (e.g. platform rails, pot-hole guards).
- The instructions plates are perfectly readable.
- The platform control panel and the ground emergency control panel, dead-man system included, are perfectly efficient.
- The fixing points for the harness are in perfect state of conservation.

Do not use the machine for purposes different from those it was intended for.

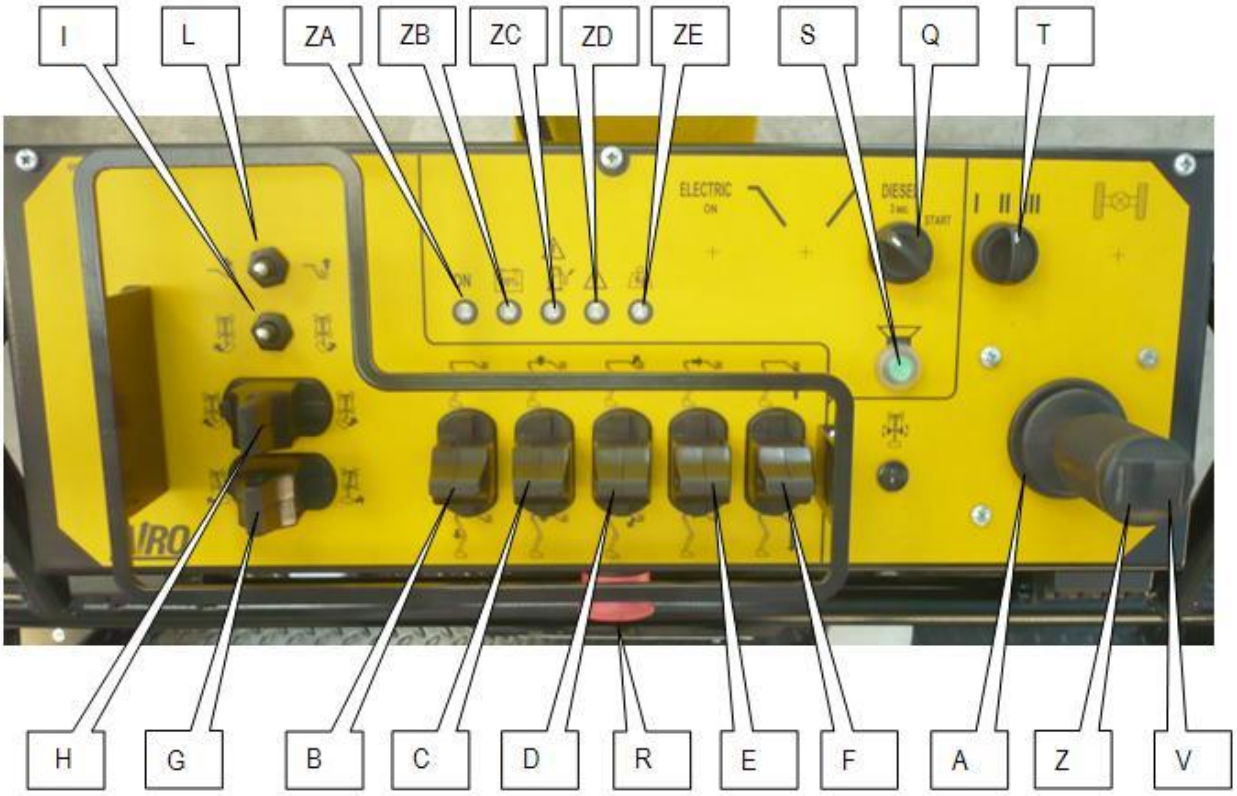
5. USE INSTRUCTIONS

Before using the machine read this chapter thoroughly.

WARNING!

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.

5.1. Platform control panel



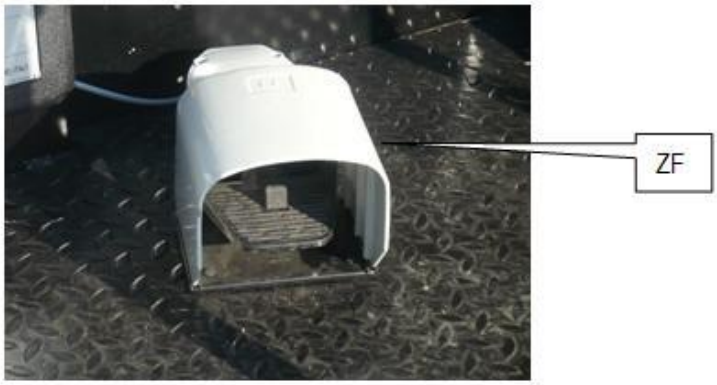


Fig.5

A) Drive proportional joystick control
B) Proportional lever control pantograph up/down
C) Proportional lever control boom up/down
D) Proportional lever control jib up/down
E) Proportional lever control telescopic boom out/in
F) Proportional lever control QUICK UP/QUICK DOWN (OPTIONAL)
G) Proportional lever control turret rotation
H) Proportional lever control jib rotation (OPTIONAL)
I) Platform rotation switch
L) Platform level switch
Q) Motor generator start/stop button (models A12 JED - A15 JED)
R) Emergency STOP button
S) Manual horn
T) Drive speed selector
V) Right steering switch
Z) Left steering switch
ZA) Enabled control panel warning light
ZB) Flat battery warning light
ZC) Drive controller fault warning light / Diesel motor generator fault / low fuel level warning light (OPTIONAL)
ZD) Danger warning light
ZE) Overload warning light
ZF) Dead-man pedal
ZG) Motor generator Automatic / Manual operation mode selector (models JED12 - A15 JED).

All movements (except for platform rotation and platform level compensation) are controlled by proportional joystick /levers; it is therefore possible to adjust movement speed by means of the relative controls. To avoid sudden shakes during movements, it is advisable to operate the proportional joystick controls gradually.

For safety reasons, to operate the machine, it is necessary to press the “dead-man” **ZF** pedal on the platform. If the “dead-man” pedal is accidentally released while the machine is operating, the movement is immediately stopped.

WARNING!

Holding down the “dead-man” pedal for over 10 seconds without carrying out any operation will disable the control panel.
The disabled control panel condition is indicated by the flashing green led (ZA). To operate the machine again it is necessary to release the “dead-man” pedal and press it again; the green led (ZA) will light up steady and for the next 10 seconds all controls will be enabled.

5.1.1. Drive and steering

Before carrying out any displacement operation, verify that no people are in proximity of the machine and in any case proceed with the utmost caution.

IT IS FORBIDDEN to drive the machine when the platform is lifted unless the chassis is flat and steady with no holes and steps.

To drive the machine, carry out the following operations in sequence:

a) Press dead-man pedal **ZF** located on the platform; the green led **ZA** will light up steady indicating its enabling.
b) Within 10 seconds from the green steady led lighting up, set the proportional joystick control **A** forward for forward drive or backward for reverse drive.

WARNING!!

Drive and steering controls can take place at the same time but they are interlocked with the platform movement controls (lifting/lowering/rotation). With platform lowered (booms down, telescopic boom in, jib at a height between +10° and –70°) simultaneous steering-drive-turret rotation is possible to facilitate the machine positioning in narrow spaces.

With platform lowered (booms down, telescopic boom in, jib at a height between +10° and –70°) it is possible to select different drive speeds by means of the speed selector **T**.

NOTES: To achieve maximum drive speed, set the speed selector (T) to position (III), and press down the proportional joystick (A).
To operate on high ascending slopes (e.g. while loading the machine onto a truck) set the speed selector (T) to position (II).
To operate on high descending slopes (e.g. while unloading the machine from a truck) and get the minimum speed with lowered platform, set the speed selector (T) to position (I).

With platform lifted the safety drive speed is automatically activated. Drive can be controlled with raised platform only if both pot-hole guards are fully lowered. Otherwise, drive with raised platform is disabled and the condition is reported to the operator by turning on the red led ZD (without triggering an audible alarm).

To steer, press the buttons **V / Z** located on the drive proportional joystick control (press the right button for right steering and vice versa). Also the steering control is enabled by the “dead-man” pedal and it is possible only if the green led **ZA** is lit up steady.

5.1.2. Platform positioning movements

To carry out all movements other than drive, use proportional levers **B**, **C**, **D, E, F, G, H** and switches **I** and **L.**
To achieve the movement, it is necessary to carry out the following operations in sequence:

a) Press the dead-man pedal located on the platform; the green led **Z** will light up steady indicating its enabling.
b) Within 10 seconds from the green steady led lighting up set the proportional joystick control or the desired switch in the direction shown by the serigraphy on the control panel.

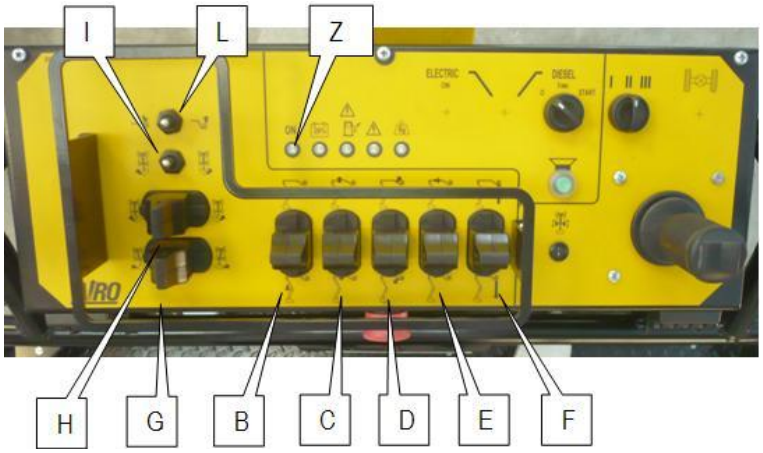


Fig. 6

NOTE: before activating the proportional joystick control or the desired switch the dead-man pedal must be pressed. Release the "dead-man" pedal and the manoeuvre will be immediately stopped.

⚠ **The platform positioning controls can be used simultaneously (unless otherwise indicated). Furthermore, the turret orientation can be operated at the same time as the drive and steering controls in lowered platform conditions (booms lowered, telescopic boom in, jib at a height between +10° and –70°).**

5.1.2.1. Pantograph (lower boom) lifting/lowering

To lift/lower the pantograph (first boom), use the proportional lever **B**.
Set the proportional lever **B** forward for lifting or backward for lowering.

5.1.2.2. Upper boom lifting/lowering

To lift / lower the second boom, use the proportional lever **C**.
Set the proportional lever **C** forward for lifting or backward for lowering.

5.1.2.3. Jib lifting/lowering

To lift/lower the JIB, use the proportional lever **D**.
Set the proportional lever **D** forward for lifting or backward for lowering.

5.1.2.4. Telescopic boom extension/retraction

To extend/retract the telescopic boom, use the proportional lever **E**.
Set the proportional lever **E** forward for extension or backward for retraction.

5.1.2.5. QUICK UP/QUICK DOWN (optional)

This lever controls the quick lifting/lowering of the platform, while simultaneously controlling the following manoeuvres:

- Pantograph lifting/lowering.
- Upper boom lifting/lowering.
- Jib lifting/lowering.
- Telescopic boom extension/retraction.

To carry out the QUICK UP/QUICK DOWN manoeuvre, use the proportional lever **F.**
Set the proportional lever **F** forward for quick lifting or backward for lowering.

5.1.2.6. Turret orientation (rotation)

To carry out the turret orientation (rotation), use the proportional lever **G.**
Set the proportional lever **G** to the right for right rotation or to the left for left rotation.

⚠ **Before carrying out this manoeuvre make sure that the mechanical lock device of the turret - if any - be deactivated (see chapter 6 "Handling and carrying").**

With platform lowered (booms down, telescopic boom in, jib at a height between +10° and –70°) simultaneous steering-drive-turret rotation is possible to facilitate the machine positioning in narrow spaces.

5.1.2.7. Jib rotation (optional)

To rotate the jib, use the proportional lever **H**.
Set the proportional lever **H** to the right for right rotation or to the left for left rotation.

5.1.2.8. Platform rotation

To rotate the platform, use the switch **I**.
Set the switch **I** to the right for right rotation, or to the left for left rotation.

5.1.2.9. Platform levelling

The platform is automatically levelled. Should it be necessary to reset the correct level, use switch **L**.
Set switch **L** to the left for backward levelling, or to the right for forward levelling.

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

This manoeuvre cannot be carried out when other operations are taking place.

5.1.3. Other functions of the platform control panel.

5.1.3.1. Manual horn.

The horn warns that the machine is moving. It is operated by means of button **S**.

5.1.3.2. Emergency stop

By pressing the red emergency STOP **R** button all control functions are stopped. Normal functions are enabled by rotating the button of 1/4 turn clockwise.

5.1.3.3. Motor generator operation mode selector

On hybrid models, you can select the operation mode of the motor generator by means of selector **ZG**. In **AUTO** position the motor generator turns on and off independently according to the level of charge and discharge of the battery. In **MANUAL** position the motor generator can be turned on and off by the operator with the switch **Q**.

5.1.3.4. Warning lights

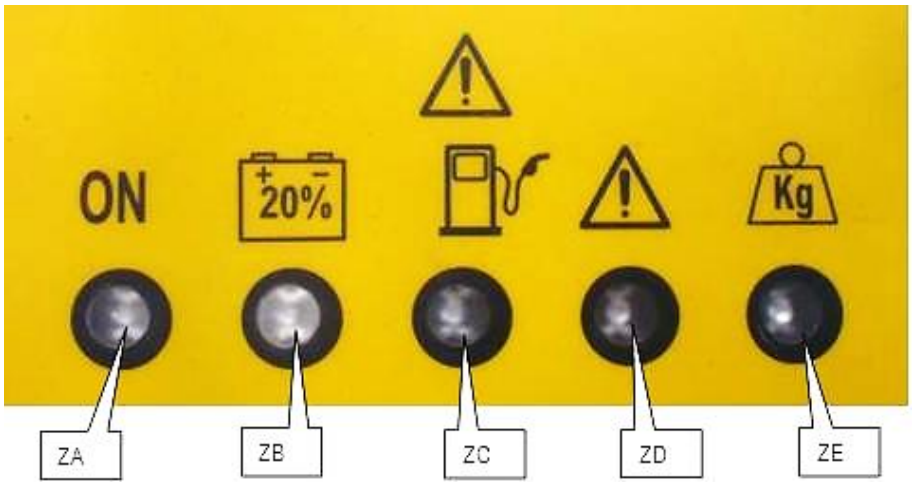


Fig. 7

5.1.3.4.1. Enabled control panel green warning light (ZA)

Lit up flashing when the machine is turned on. If you enabled the control panel on the basket, and this pilot flashes it means that the controls are not active because the dead-man pedal has not been pressed, or it was pressed for over 10 seconds without performing any operation.
On steady with machine on and dead-man pedal pressed for less than 10 seconds. With platform control panel all controls are enabled (unless other types of warning show up – see next paragraphs).

5.1.3.4.2. Red warning light: flat battery (ZB)

Flashing when battery is charged at 20% only. In this condition lifting and telescopic boom extension are disabled. Batteries should be immediately recharged.

5.1.3.4.3. Drive controller fault warning light / Diesel motor generator fault / low fuel red warning light - OPTIONAL (ZC)

This warning light indicates a malfunctioning of traction controllers (electric models), generator diesel motor or low fuel.
On steady indicating a traction controller fault (electric traction machines), with "CTR" alarm on the ground controls display.
OPTION: On steady with machine on; platform control panel; Diesel power selected. Diesel motor generator off, ready for start-up. Insufficient motor oil pressure.
OPTION: Slow flashing in the event of the engine head overheating (optional function) If on, it stops the Diesel motor generator; if off, it prevents the Diesel motor generator from starting.
OPTION: Fast flashing in the event of low fuel (optional function). This warning is active only when the motor is running.

5.1.3.4.4. Danger red warning light (ZD)

It flashes quickly for 4 seconds together with the audible alarm at the machine start-up in case of fault during safety test on controls (pedal, joystick control, switches, etc).
It is lit up steady without audible alarm activation when the chassis inclination exceeds the allowed value and lowered platform. All lifting operations and telescopic extension are disabled (except JIB lifting). If platform is lifted, the audible alarm is activated and drive is also disabled. It is necessary to lower the booms and then place the platform onto a flat surface.
It is lit up without the audible alarm with booms raised and one or both of the pot-hole guards not perfectly lowered. All platform movement controls are possible but drive with raised platform is automatically disabled.

WARNING! The activation of this indicator together with the audible alarm warns of a dangerous situation since the machine or the platform have reached a dangerous inclination level for the machine stability.
When the chassis inclination exceeds the allowed value, 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.

5.1.3.4.5. Overload red warning light (ZE)

Lit up steady with audible alarm activation with a platform overload exceeding 20% the nominal load. If platform is lifted, the machine is completely locked. If the platform is lowered all drive/steering operations are still possible but lifting/rotation are disabled. Remove the overload before using the machine again.
Fast flashing in case of fault in the platform overload controller. With lifted platform the machine is completely locked. After reading the manual instructions, trained staff can carry out an emergency manoeuvre for platform lowering.

WARNING! The activation of this indicator is a synonym of danger since the load at platform is exceeding or no overload controller is active upon signalling.
For adjustment or activation in emergency situations read the MAINTENANCE chapter.

5.1.4. "AIRO SENTINEL" Anti-Trapping System - OPTIONAL

AIRO SENTINEL secondary safety system (OPTIONAL) is used to reduce the risk for the operator of being crushed against obstacles and external structures during the operations on the platform control panel.

The system is equipped with:

a. Bumper.
b. Blue flashing light with integrated audible alarm.

Fig. 8

<u>The overall system with all functions is only available from the platform control panel.</u>

If the operator is accidentally crushed between the BUMPER (**a**) and an external obstacle, a safety procedure will start. It lasts at least 3 seconds, and:

- The movement alarm integrated in the standard control system and the platform audible alarm are automatically activated for 3 seconds or the whole time the operator remains trapped and/or the deadman pedal is pressed.
- The danger red light on the platform control panel is activated for 3 seconds or for the whole time the operator remains trapped and/or the deadman pedal is pressed.
- From the platform, the operation (or the simultaneous operations) generating the operator crushing is immediately stopped and/or automatically reversed according to the next paragraph "SENTINEL logic movements" description.
- The word "**BMP**" is displayed on the ground control panel screen for 3 seconds or for the whole time the operator remains trapped and/or the deadman pedal is pressed.
- If the operator remains trapped over 3 seconds, the additional blue flashing light and the integrated audible alarm (**b**) are activated until the operator is released.

5.1.4.1. SENTINEL control logic

When the operator is crushed against the BUMPER (**a**), in addition to what described in the previous paragraph, all the current operations automatically react as follow:

- **Drive with lifted platform (safety speed):** the current operation is immediately stopped and reversed.
- **Drive with lowered platform (at any speed)**: the current operation stops slowly.
- **All the extensible structure operations (lifting, lowering, rotation) individually or simultaneously activated except for the pantograph lowering and the telescopic retraction:** the current operation is immediately stopped and reversed.
- **Pantograph lowering, Telescopic retraction and Cage Levelling Correction:** the current operation is immediately stopped.

3 seconds after the operator hits against BUMPER (**a**) the control foot pedal is automatically deactivated regardless of the joystick control, the green pilot on the platform control panel starts flashing, and you must first release and reactivate the foot pedal in order to enable the other controls on the platform control panel.

The ground control panel is always available for the emergency recovery of the operator possibly trapped, in any condition of the SENTINEL system.

5.2. Ground control panel and electric control unit

The ground control station contains some electronic boards necessary to operate the machine and to carry out safety checks.

The electric control unit (or electronic control board) is inside the cowling (near the electric pump).

The ground control panel is located on the rotating turret (see paragraph "Location of main components") and is used to:

- Turn the machine ON/OFF.
- Select the control panel (ground or platform).
- Operate the platform in emergency cases.
- Display some operation parameters (working hours; various faults; battery charger operation; etc.).

IT IS FORBIDDEN
To use the ground control panel as a workstation when personnel is on the platform.

Use the ground control panel only to start/stop the machine, to select the control panel or in emergency situations to allow the platform to be recovered.

Give the key to authorized persons and keep a duplicate in a safe place.
Always remove the on/off key at the end of work shifts.

Access to the electric control unit is allowed to specialized personnel only for maintenance and/or repair purposes. Access the electric control unit only after the machine has been disconnected from any 230V or 380V power sources.

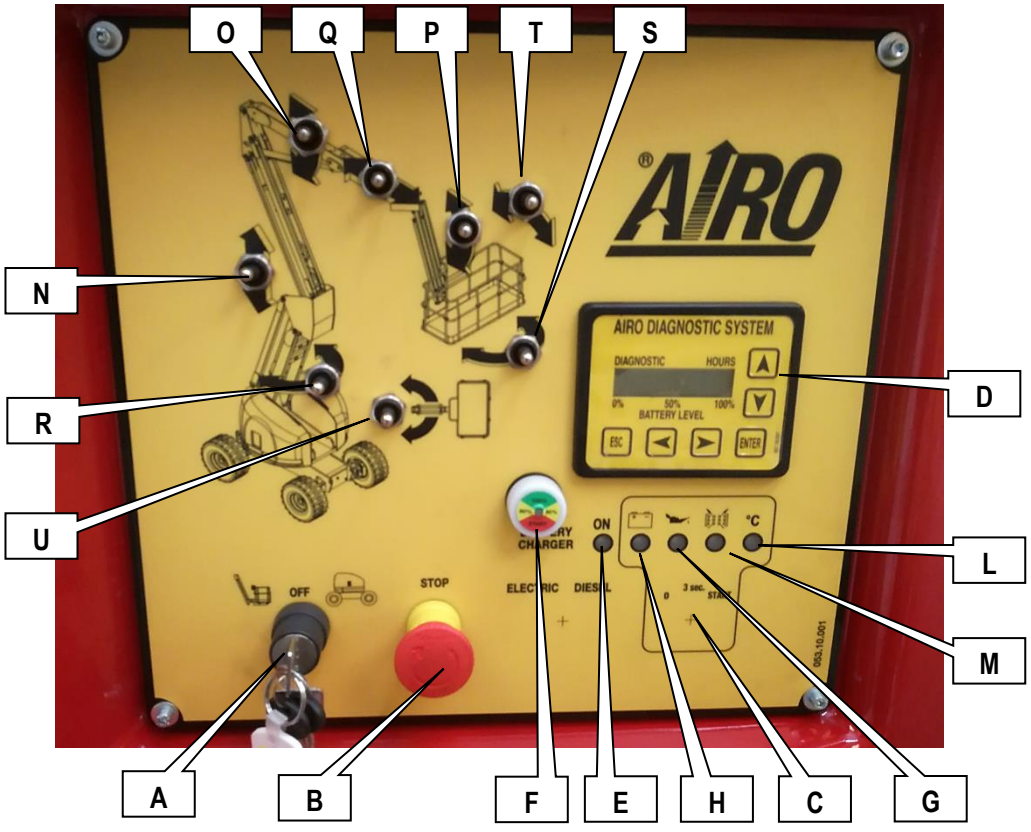


Fig. 9

A) ON-OFF key and ground/platform control panel selector
B) Emergency STOP button
C) Diesel motor generator start button (models A12 JED - A15 JED)
D) User interface display
E) Powered-on machine warning light
F) Battery recharge indicator
G) Oil warning light
H) Alternator warning light
L) Motor head temperature warning light
M Air filter warning light
N) PANTOGRAPH LIFTING/LOWERING lever
O) BOOM LIFTING/LOWERING lever
P) JIB LIFTING/LOWERING lever
Q) TELESCOPIC BOOM OUT/IN lever
R) TURRET ROTATION lever
S) PLATFORM ROTATION lever
T) PLATFORM LEVEL compensation lever
U) JIB ROTATION lever (OPTIONAL).

5.2.1. On-off key and control panel selector (A)

The on-off key located on the ground control panel is used to:

- Turn ON the machine by selecting one of the two control panels:
  - Platform controls enabled with locking key switch set to “platform” symbol. Stable key position with possibility to extract the key.
  - Ground control panel enabled (for emergency operations) with locking key switch set to "turret" 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.

5.2.2. Emergency stop button (B)

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

5.2.3. Diesel motor generator start button (C) (models A12 JED - A15 JED)

Holding the ON-OFF key in position “ground control panel”, the Diesel motor generator can be started by means of the relevant switch.

- In “0” position the Diesel motor generator is off.
- In “3 sec” position the plugs pre-heating takes place (only for engines with plugs).
- In “Start” position the motor starts.

5.2.4. User interface display (D)

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 the electric pump and electric drive motors (the working hours are displayed in the format HOURS: MINUTES and the finale E).
- Working hours of Diesel generator (the working hours are displayed in the format HOURS: MINUTES and the finale D).
- Working hours of the optional emergency CC electric pump (when 12V electric power is selected the working hours are displayed in the format HOURS: MINUTES and the finale M).
- Battery charge level (only electrical models 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.

5.2.5. Powered-on machine warning light (E)

The green light lit up indicates that the machine is powered-on (both with platform control panel and ground control panel).

5.2.6. Battery recharge indicator (F)

They allow to check the correct operation of the battery charger and the state of charging of the battery.
After plugging into the mains, the indicator starts flashing for a few seconds with red light, checking phase of the battery. Then the phases of battery charge are started and displayed in sequence from fixed light first red, then yellow and finally green, which indicates the end of charging.
No light or long flashing during battery charger feeding indicates malfunctioning.

5.2.7. Diesel motor generator warning lights (G, H, L, M) - OPTIONAL

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

5.2.8. Levers of movement of the platform (N, 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 panel selected). We shall also remind you that the ground controls 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

The “access position” is the only one from which loading or unloading of persons and materials is allowed. The “access position” to the work platform is the **completely lowered** configuration.

To get on the platform:
- Get on the platform hanging on to the entry side rails.
- Raise the bar and get on board.

Check that, once you are on the platform, the bar falls down closing the access. Fasten the safety harness to the provided hooks.

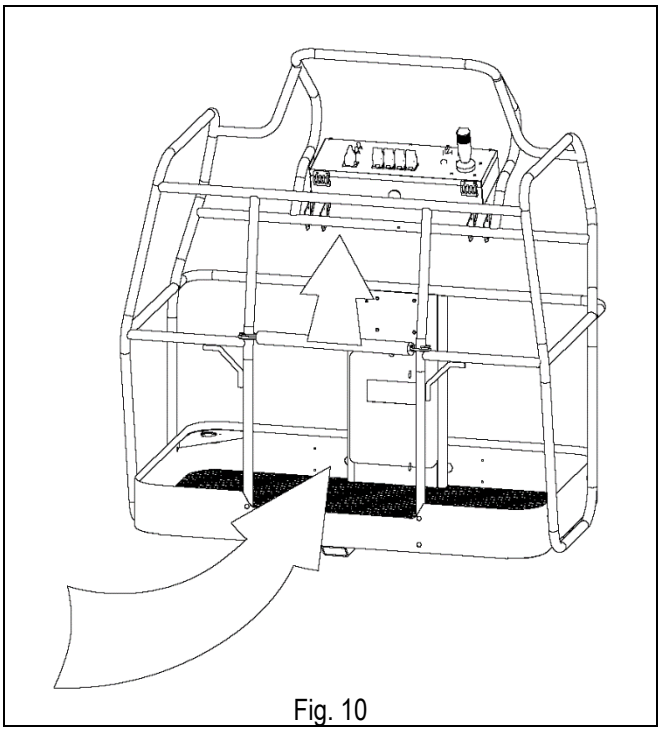


Fig. 10

To get on the platform use only the access equipment the platform is provided with.
When moving up or down, always keep your eyes on the machine and hold onto the entry stringers.

IT IS FORBIDDEN
Lock the closing bar so as to keep the platform access door open.

IT IS FORBIDDEN
To leave or access the work platform if it is not in the position required for accessing or leaving.

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

5.4. Machine start-up

To start the machine the operator shall:
- Release the emergency stop button on the ground control panel by rotating it of 1/4 turn clockwise.
- Turn the on-off key on the ground control panel to "Platform" position.
- Remove the starting key and hand it over to a person in charge on ground, properly informed of the use of the emergency controls.
- Get onto the platform.
- Release the emergency stop button on the platform control panel by rotating it by 1/4 clockwise (see previous paragraphs).

As the machine is electric-powered (models “E”), now the various functions can be performed by thoroughly following the instructions given in the previous paragraphs. To turn on the machine, the battery charger must be disconnected from the mains. If the battery charger is working, the machine is off and cannot be turned on.

Before using the thermic drive power (Diesel motor generator) check the fuel level in the tank through the visual level on the tank.

Keep the fuel tank and the motor clean.

5.4.1. Diesel motor generator start-up

It is possible to select between two operation modes:

- Auto.
- Manual.

In "Auto" mode the motor generator turns on and off independently according to the discharge level of the battery. During the operation of the motor generator some movements take place at a reduced speed than usual one.
In "Manual" mode the motor-generator can be turned on and off following the instructions below.

Do not enable the "Auto" mode when you work in closed environments and/or not adequately ventilated.

By turning the starter key on the platform control panel:

- In “0” position the Diesel motor generator is off.
- In “3 sec” position the plugs pre-heating takes place (only for engines with plugs).
- In “Start” position the motor generator starts.

Do not insist on the starting position for longer than 3 seconds. In the event of failed start, check the fuel level by means of the relevant indicator and read the Use and maintenance manual of the Engine.

Do not try to start the motor if it is already running. This operation may cause the pinion of the starter to break (under normal conditions the control system blocks this operation).
In the event of operational faults, check the motor warning lights and read the Use and Maintenance manual of the motor.

NOTE: The Diesel motor generator can be started only if the dead-man pedal is neither pressed nor enabled. This means that the motor can be started only if the platform green warning light ON is flashing.

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 in the factory, which guarantees smooth braking.
- By releasing the dead-man pedal located on the platform, the operation is immediately stopped. In the event of an immediate stop, braking is sudden.

5.5.2. Emergency stop button

Should it be necessary, the operator may immediately stop all machine functions on both platform and ground control panel.

On the platform control panel:

- Press the emergency stop button on the control panel and the machine is turned off.
- By releasing the dead-man pedal, the operation is immediately stopped. In the event of an immediate stop, braking is sudden.

On the ground control panel:

- Press the emergency stop button on the ground control panel (if any) and the machine will be turned off.
- By pressing the power emergency stop button, thus cutting out machine power (power circuit cut-out).

To resume the operations is necessary:

On the platform control panel:

- Turn the emergency stop button of 1/4 turn clockwise.

On the ground control panel:

- Turn the emergency stop button of 1/4 turn clockwise.
- Pull the power circuit red emergency STOP button to the outside - until it locks in position - to power the unit again.

5.5.3. Diesel motor generator stop

In order to stop the Diesel motor generator:

On the platform control panel:

- Turn the starter key anticlockwise to position “0”.
- Otherwise, press the emergency stop button.

On the ground control panel:

- Turn the starter key anticlockwise to position “0”.
- Otherwise, press the emergency stop button.

5.6. Emergency manual controls

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

5.6.1. Hydraulic block of type A

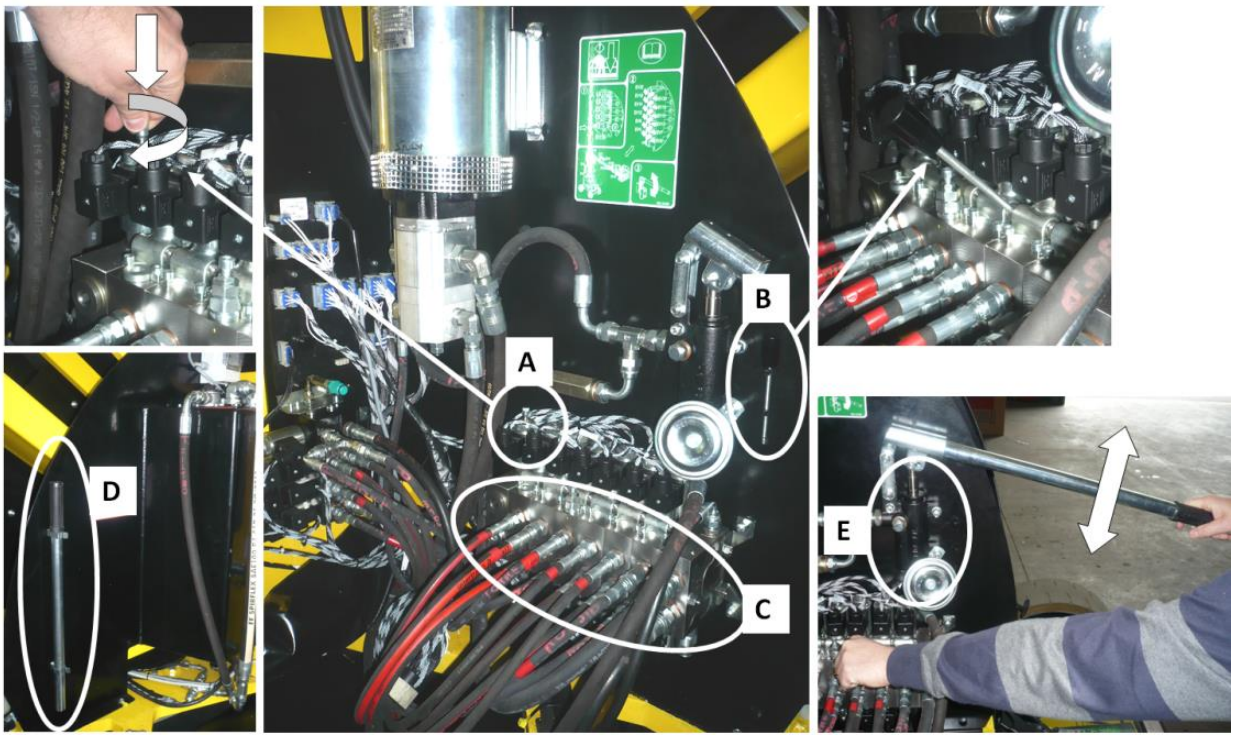


Fig.11-B

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

1) Push and turn the actuator on the solenoid valve EV11B (**A**).
2) Remove the lever (**B**) from its housing by removing the seal and screw it into the distributor that you intend to operate (**C**).
3) Remove the operating lever of the manual pump (**D**) and insert it on the pump.
4) Operate the emergency pump (**E**) by operating at the same time the distributor lever previously inserted in the desired direction, considering the manoeuvre you want to achieve.
5) Check the correct execution of this procedure.

Solenoid valves and relevant movements:

- EV4 = Pantograph up
- EV5 = Pantograph down
- EV6 = Telescopic boom out
- EV7 = Telescopic boom in
- EV12 = Turret right rotation
- EV13 = Turret left rotation
- EV14 = Boom up
- EV15 = Boom down
- EV18 = Jib up
- EV19 = Jib down
- EV32 = Jib right rotation
- EV33 = Jib left rotation.

WARNING: The emergency control can be stopped at any moment by releasing the lever or by stopping the pump.

Once you have completed the manual emergency manoeuvre it is necessary to return everything to the initial conditions and have the lever sealed by an authorized service center.

5.6.2. Hydraulic block of type B

Fig.11-A

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

1) Screw tight the actuator on the EV11B (**A**).
2) Remove the operating lever of the manual pump (**B**) and insert it on the pump.
3) Operate the emergency pump (**D**) by simultaneously operating the joystick of the control valve in the desired direction, considering the manoeuvre you wish to perform (**C**).
4) Check the correct execution of this procedure. A sticker explaining the operation of the solenoid valves (**E**) is affixed to the wall of the compartment.

Correspondence of the solenoids and manual operations.		
Electric valve name	**Movement**	**Operate the manual operator**
EV4	Pantograph lifting	Pull
EV5	Pantograph lowering	Push
EV6	Telescopic boom extension	Pull
EV7	Telescopic boom retraction	Push
EV12	Turret anticlockwise rotation	Pull
EV13	Turret clockwise rotation	Push
EV14	Upper boom lifting	Pull
EV15	Upper boom lowering	Push
EV18	Jib lifting	Pull
EV19	Jib lowering	Push
EV32	Jib anticlockwise rotation (optional)	Pull
EV33	Jib clockwise rotation (optional)	Push

WARNING: The emergency control can be stopped at any moment by releasing the lever or by stopping the pump.

Once you have completed the manual emergency manoeuvre, return everything to the initial conditions and have the lever sealed by an authorized service centre.

5.7. Socket for electric tool connection (Optional)

The work platform can be equipped with a socket (230V Ac) enabling the operator to connect the electric tools necessary to carry out his operations.

To activate the electric line (see pictures above) introduce a cable into the plug connected to the 230V AC 50 Hz mains, with all protections according to the current standards in force. If there is the circuit breaker switch (optional), to activate the electric line set the switch to ON position. It is advisable to check the earth-leakage circuit breaker by means of the specially provided TEST button.

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. 12

Connect to the power mains having the following features:

- **Power voltage 230V ± 10%**
- **Frequency 50÷60 Hz**
- **Activated grounding line.**
- **Working protection devices according to current standards in force.**
- **Do not use extension leads exceeding 5 metres to connect to the mains.**
- **Use a cable of suitable section (min 3x2.5 mm^2).**
- **Do not use rolled-up cables.**

5.8. Level and refuelling (models A12 JED - A15 JED)

Before using the thermic drive power (Diesel motor generator) check the fuel level in the tank.

This operation is to be carried out by visually checking the fuel level via the indicator on the tank visible next to the ground control panel.

- Visually check the fuel level before starting to work.
- Keep the fuel tank and the motor clean.

5.9. End of work

After stopping the machine according to the instructions given in the previous paragraphs:

- Always set the machine to rest position (platform completely lowered).
- Press the emergency Stop button on the ground control panel.
- Remove the keys from the control panel to prevent unauthorized people from using the machine.
- Recharge the battery according to the instructions given in section "Maintenance".
- To fill the tank (if it applies).

6. HANDLING AND CARRYING

6.1. Handling

Before using the machine, make sure that the mechanical lock device of the turret is disabled (see figure aside).

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

When the platform is lowered (booms down, telescopic boom completely in and jib at a height between +10° and –70° with respect to horizontal axis) the machine can be handled (i.e. drive can be performed) at different speeds to be freely selected by the user.

When the platform is lifted and exceeds a given height, the enabled machines (see chapter “Technical Features) can be driven at a reduced speed (automatically) up to the height specified in chapter “Technical Features”.

Fig.13

WARNING!
Drive with lifted platform may be subject to different restrictions according to the country where the machine is used. Find out about the legislative limits concerning this operation from the bodies of Health and Safety at work.

It is absolutely forbidden to drive the machine when platform is lifted unless the ground is horizontal, flat and steady.

Before carrying out any displacement operation, verify that no people are in proximity of the machine and in any case proceed with the utmost caution.

Before handling the machine check that the connection plugs are disconnected from the power supply source.

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

If the machine, while driving with platform lifted, hits a hump or a hole (pot-hole guards lowered and safety speed enabled), the machine will rest on one or both guards with no danger to the operator.
Now, if you lower the platform completely, and both drive wheels are lifted from the ground, the machine might not be able to quit the lock condition with its own means. Emergency towing is necessary (see par. "Emergency towing").

Do not use the machine to tow other vehicles.

Before steering and driving the machine, check the actual position of the rotating turret through the relevant stickers on the chassis to achieve the correct movement direction.

While the machine is being displaced with lifted platform, no horizontal loads can be loaded onto the platform (operators on board are not allowed to pull wires or ropes, etc.).

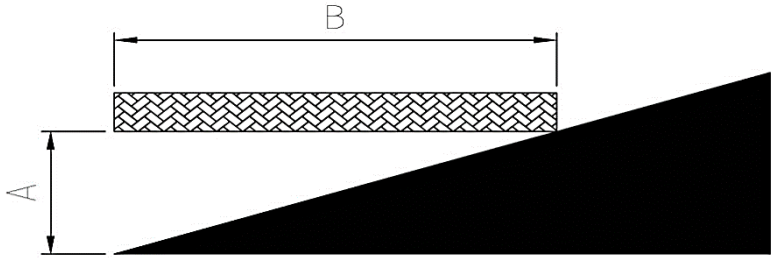
6.2. Transportation

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:

- **By means of loading ramps and translation controls** located on the platform to load it directly onto the machine (if ramp slope is within the gradeability described in paragraph "TECHNICAL FEATURES" and ramp capacity is adequate to weight) according to the instructions given in paragraph "USE INSTRUCTION" under paragraph "Drive and steering" for correct operation of drive controls. During the loading operation following this system, it is best to raise the Jib (not over +10° with respect to the horizontal to prevent engaging the safety speed) to prevent the platform knocking against the ground. Pay attention not to load other booms during this operation to prevent the emergency microswitches from being activated, which in case of inclined machine disable all the manoeuvres except the lowering ones. If the slope exceeds the gradeability, the machine is to be towed by means of a windlass only if the operator on the platform simultaneously activates the drive control to release the parking brakes. Position a spirit level on the wood board and lift the downstream extremity of the latter until it is level.
    - Position a wood board of known length on the gradient to be measured.
    - Position a spirit level on the wood board and lift the downstream extremity of the latter until it is level.
    - Now measure the distance between the board and the ground (**A**), divide this by the length of the board (**B**) and multiply by 100. The following image sums up the method.



- **By means of hooks and steel ropes** (with safety factor = 5, see machine weight in Technical features) connected to the provided holes as indicated in the picture aside.

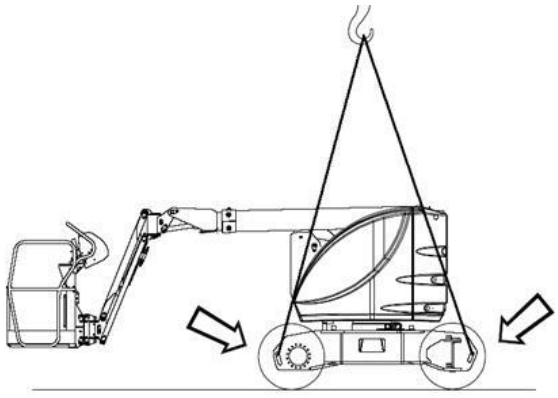


Fig. 14

- **Through a lift truck** of a suitable capacity (see machine weight in table "Technical features" at the beginning of this manual) equipped with forks having at least the same length as the machine width. Insert the forks as indicated by the stickers on the machine. Should these stickers be not available, DO NOT lift the machine by means of a lift truck. Lifting the machine by means of a lift truck is a dangerous operation, which must be carried out by qualified operators only.

⚠ **After placing the machine onto the carrying vehicle, fasten it by means of the same holes used for lifting. 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 (any model) or the last lifting boom.**

⚠ **Lock the turret by means of the mechanical safety lock device as specified in the previous chapters.**

⚠ **Before carrying the machine check the stability grade. The platform must be fully lowered and the platform extension must be in retracted position to ensure adequate stability during the entire operation.**

6.3. Emergency towing of the machine

In the event of a fault, carry out the following operations to tow the machine:

1. Hook the machine to the provided holes.
2. Completely screw the threaded dowels at the centre of the reduction gears by means of an 8 mm hexagonal wrench.
3. Tow at a very slow speed (remember that when the machine is being towed, brakes are out of order).

To restart normal operation, set the machine back to the initial conditions.

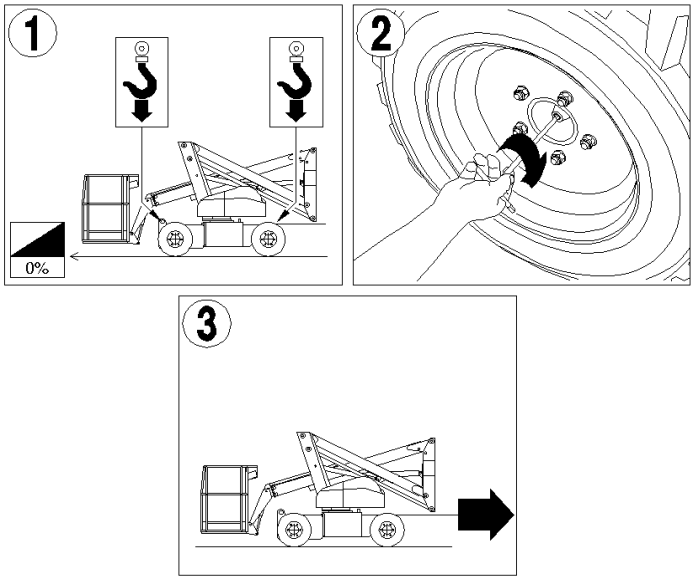


Fig.15

⚠ **Tow at a very slow speed (remember that when the machine is being towed, brakes are out of order).**

Tow only on a flat ground.

Do not park the machine without brakes on.

With the brakes off, put wedges under the wheels to prevent the machine from moving accidentally.

7. MAINTENANCE

- **Always carry out maintenance operations with machine at a standstill position and after having removed the key from the control panel with the platform in rest position.**
- **The maintenance operations described below refer to a machine with ordinary working use. In case of difficult conditions of use (extreme temperatures, corrosive environments, etc.) or following long machine inactivity, it will be necessary to contact the AIRO assistance service to change the intervention schedule.**
- **Repairs and maintenance operations are to be carried out by trained and authorised personnel only. All maintenance operations should be carried out in compliance with the current work safety regulations (work places, personal protection equipment, etc...).**
- **Carry out only the maintenance and adjustment operations described in this user manual. In emergency situations (e.g. breakdown, wheels replacement) contact Our Technical Support.**
- **During interventions, check that the machine is completely locked. Before carrying out maintenance operations inside the lifting structure, check that this is off-line 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 motor 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 motor supplied on machine purchase.**
- **In case of replacement, use original spare parts only or spare parts approved by the manufacturer.**
- **Disconnect the 230V AC and/or 380V AC sockets, if any.**
- **The lubricants, hydraulic oils, electrolytes and all detergent products should be handled with care and disposed of in safety according to the current regulations. A prolonged contact with the skin may cause irritations and dermatosis; wash with water and soap and rinse thoroughly. Contact with eyes, especially with electrolytes, is also dangerous; rinse with water thoroughly and call the doctor.**

WARNING!
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 panel (both platform and ground).
- The electric ground 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 (see paragraph "Various adjustments")	After the first 10 working hours
Oil level check in hydraulic tank	After the first 10 working hours
Check of the battery state (charge and liquid level)	Every day
Check of deformation of tubes and cables	Every week
Check of stickers and code plates	Every month
Articulated joints and sliding blocks greasing	Every month
Diesel motor generator fixing on elastic supports	Every month
Emergency devices efficiency check	Every year
Electric connections check	Every year
Oil level check in hydraulic tank	Every year
Hydraulic connections check	Every year
Periodic operation check and structure visual check	Every year
Screw tightening (see paragraph "Various adjustments")	Every year
Operation check of movement circuit pressure relief valve	Every year
Brake system operation check	Every year
Operation check of the turret inclinometer	Every year
Operation check of platform overload controller	Every year
Operation check of M1 microswitches	Every year
Operation check of PS1A-PS1B proximity sensors	Every year
MPT1 and MPT2 microswitches operation check	Every year
Operation check of dead-man pedal safety system	Every year
Telescopic boom sliding blocks clearance adjustment	Every year
Hydraulic filter replacement	Every two years
Total oil change in hydraulic tank	Every two years
Check of the pot-hole structure in case either wheel rides over a pothole	Immediately in case of ride over a pot-hole.

ELECTRIC-DIESEL MODELS (E/D): Refer to the manufacturer's manual of the engine for any maintenance operation.

TO SEND THE MACHINE TO THE MANUFACTURER WITHIN 10 YEARS OF WORK FOR A COMPLETE CHECK

7.2.1. Various adjustments

Check the conditions of the following components and, if necessary, tighten after the first 10 working hours and, afterwards, at least once a year:

1) Wheel screws.
2) Drive motor fixing screws.
3) Steering cylinder fixing screws.
4) Steering hub pin fixing screws.
5) Cage fixing screws.
6) Hydraulic fittings.
7) screws and safety dowels of boom pins.
8) Turntable fixing screws.
9) Elastic supports of Diesel motor generator.

For torque wrench setting refer to the table below.

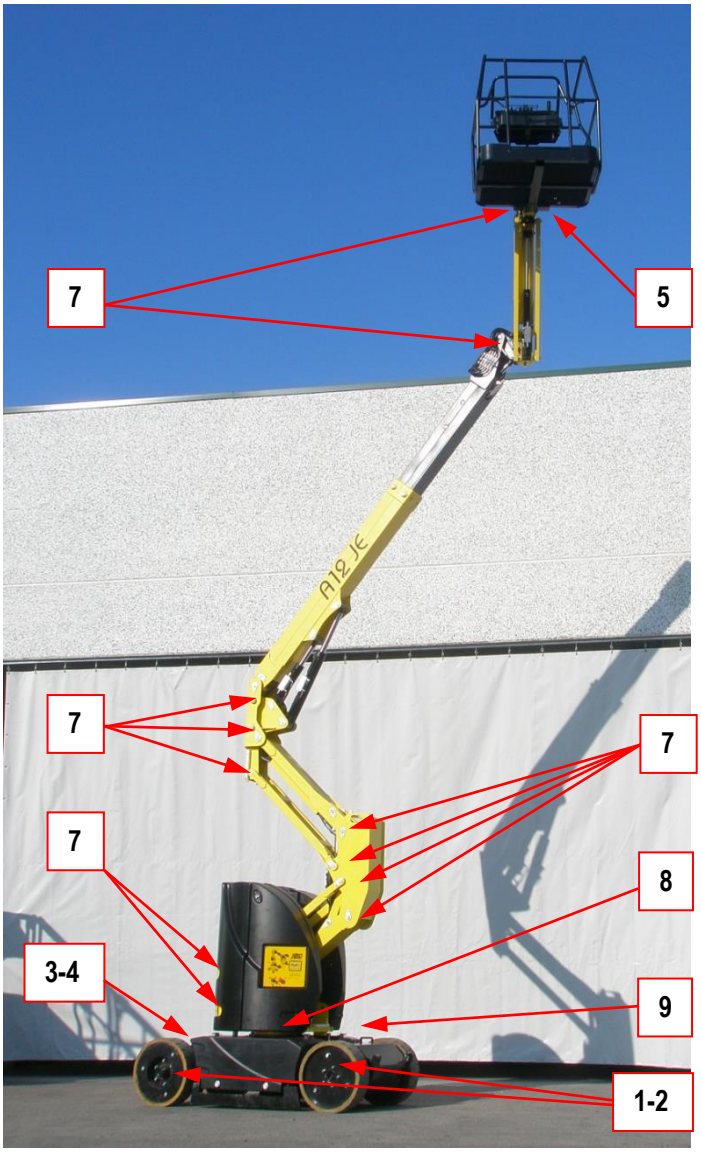


Fig.16

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 equipped with greaser (or predisposition for greaser) at least every month.

At least once a month, using a spatula or a brush, lubricate the telescopic extension.

Moreover, always remember to grease the articulated joints:

- 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 equivalent.

(OPTIONAL BIODEGRADABLE OIL KIT)
PANOLIN BIOGREASE 2

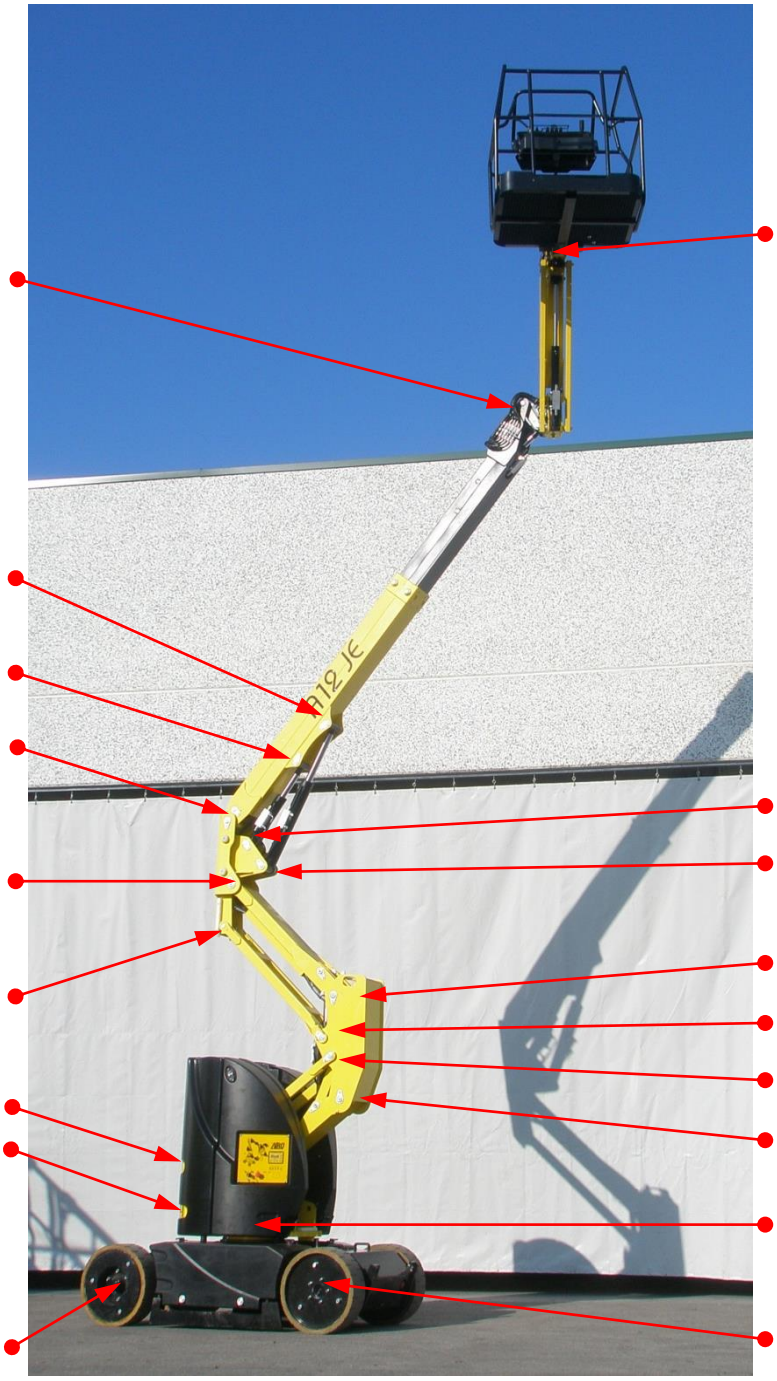


Fig. 17

7.2.3. Hydraulic circuit oil level check and change

After the first 10 working hours and, afterwards, once a month check the oil level in the tank by means of the provided indicator **A** in the picture aside) and make sure that it always lies between the max. and min. values. If necessary, top up until the max. level is reached. The oil check should be carried out when platform is completely lowered and telescopic boom in.

Completely change the hydraulic oil at least every two years.

To empty the tank:

- Lower the platform completely and retract the telescopic boom extension.
- Stop the machine by pressing the emergency stop button of the ground control panel.
- Place a container under cap (**B**), under the tank, and unscrew it.

Use only the types of oil and quantity indicated in the table below.

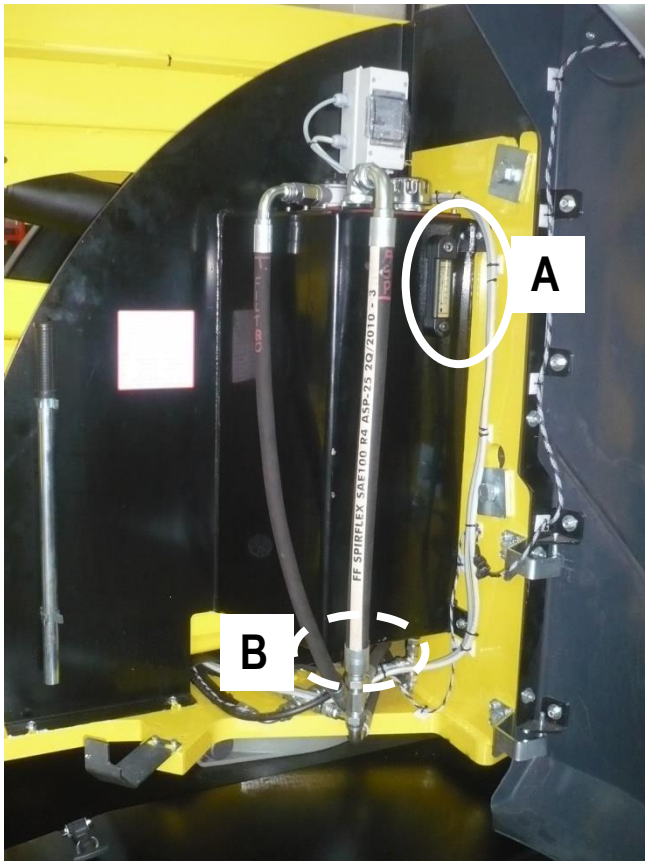


Fig. 18

HYDRAULIC SYSTEM OIL			
BRAND	**TYPE** -20°C +79°C	**TYPE** -30°C +48°C	**REQUIRED QUANTITY**
SYNTHETIC OILS			60 Litres
ESSO	Invarol EP46	Invarol EP22	
AGIP	Arnica 46	Arnica 22	
ELF	Hydrelf DS46	Hydrelf DS22	
SHELL	Tellus SX46	Tellus SX22	
BP	Energol SHF46	Energol SHF22	
TEXACO	Rando NDZ46	Rando NDZ22	
Q8	LI HVI 46	LI HVI 22	
PETRONAS	HIDROBAK 46 HV	HIDROBAK 22 HV	
BIODEGRADABLE OILS - OPTIONAL			
PANOLIN	HLP SINTH E46	HLP SINTH E22	

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

The lubricants, hydraulic oils, electrolytes and all detergent products should be handled with care and disposed of in safety according to the current regulations. A prolonged contact with the skin may cause irritations and dermatosis; wash with water and soap and rinse thoroughly. Contact with eyes, especially with electrolytes, is also dangerous; rinse with water thoroughly and call the doctor.

7.2.3.1 Biodegradable hydraulic oil (Optional)

At the request of the customer, the machines can be supplied with biodegradable hydraulic oil compatible with the environment. Biodegradable hydraulic oil is completely synthetic, without zinc, non-polluting and highly efficient with saturated ester base, combined with special additives. The machines with biodegradable oil use the same component parts as standard machines, but the use of such type of oil is best taken into account from machine construction.
In case of wanting to change from mineral-oil based hydraulic oil to "bio" oil, the following procedure must be followed.

7.2.3.2 Emptying

Empty the hot hydraulic oil for entire system operation (oil tank, cylinders, large-volume pipes).

7.2.3.3 Filters

Change the filtering inserts. Use standard filters as indicated by the manufacturer.

7.2.3.4 Washing

After completely emptying the machine, fill the recommended type and quantity of "bio" oil.
Start the machine and perform all work movements at low revs for at least 30 minutes.
Drain the liquid from the system as indicated at 7.2.3.2.
Warning: During the entire washing procedure, avoid air entering the system.

7.2.3.5 Filling

After washing, fill the hydraulic circuit, bleed and check the level.
Bear in mind that contact of fluid with the hydraulic pipes can cause swelling.
Also remember that contact of fluid with the skin can cause reddening or irritation.
Also use suitable PPE during these operations (e.g., protective eyewear and gloves).

7.2.3.6 Commissioning / check

"Bio" oil behaves regularly, but it must be checked by taking a sample at set intervals according to the indications provided below:

CHECK FREQUENCY	NORMAL DUTY	HEAVY DUTY
1st CHECK AFTER	50 OPERATION HOURS	50 OPERATION HOURS
2nd CHECK AFTER	500 OPERATION HOURS	250 OPERATION HOURS
3rd CHECK AFTER	1000 OPERATION HOURS	500 OPERATION HOURS
FOLLOWING CHECKS	1000 HOURS OR 1 OPERATION YEAR	500 HOURS OR 1 OPERATION YEAR

The fluid state is therefore constantly monitored, thus allowing its use until its features decay. Normally, in the absence of contaminating agents, the oil is never completely changed, but only occasionally topped-up.
The oil samples (at least 500ml) must be taken with the system at operating temperature.
It is recommended to use new and clean containers.
The samples must be sent to the "bio" oil supplier.
For more dispatch details, contact Your nearest distributor.

Copies of the analysis report must be kept in the check register. This is mandatory.

7.2.3.7 Mix

Mixtures with other biodegradable oils are not allowed.
The remaining amount of mineral oil must not exceed 5% of total filling quantity as long as the mineral oil is suitable for the same use.

7.2.3.8 Micro-filtration

When making the conversion on second-hand machines, always take into account the high dirt dissolution power of biodegradable oil.
After conversion, the dissolution of fault-causing deposits in the hydraulic system could occur. In extreme cases, washing the seal housings can cause greater leaks.
To prevent faults as well as avoid any negative effect on oil quality, after the conversion, it is best to filter the hydraulic system using a micro-filtration system.

7.2.3.9 Disposal

The biodegradable oil, inasmuch as saturated ester, is suitable for both thermal and material re-use.
It therefore provides the same disposal / re-use options as mineral based old oil.
Such oil can be incinerated whenever local laws allow.
Recycling the oil is preferable to disposal on dumps or incineration.

7.2.3.10 Topping up

The oil must **ONLY EVER** be topped up with the same product.

Note: Max water contamination is 0.1%.

7.2.4. Hydraulic filter replacement

7.2.4.1. Suction filter

All models are equipped with a suction filter installed inside the tank at the base of the suction tube, which has to be replaced at least every two years.

To replace the suction filters installed inside the tank (see figure):

- Stop the machine by pressing the emergency stop button of the ground control unit.
- Unscrew the tank cover where the metal suction tubes are installed;
- Extract the cover from the tank.
- Unscrew filter from the suction tube and replace.
- To restore the initial condition, carry out the above-mentioned operation in reverse order.

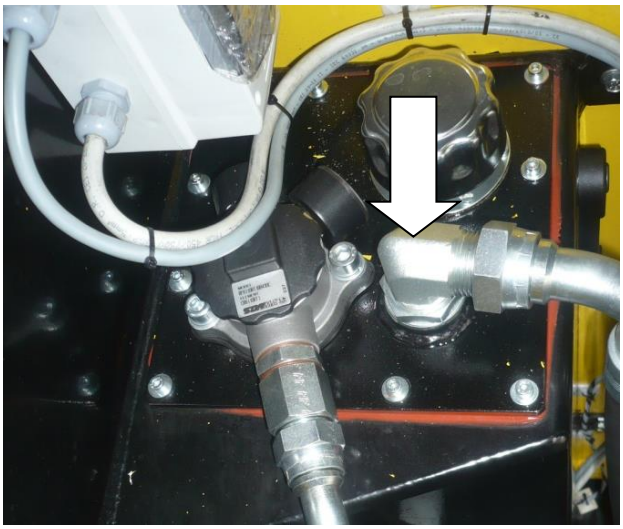


Fig. 19

During these operations a quantity of oil may leak out. In this case remove the oil by means of cloths and by pouring it into a specific container.

7.2.4.2 Return filter

The return filter directly flanged on the tank is equipped with a visual clogging indicator. 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. However, the filtering cartridge should be replaced at least every two years.
To replace the filtering cartridge:

- Stop the machine by pressing the emergency stop button on the ground control unit.
- Remove the filter cover.
- Remove the cartridge.
- Fit the new cartridge paying attention to the correct position of the retaining spring and place the cover again.

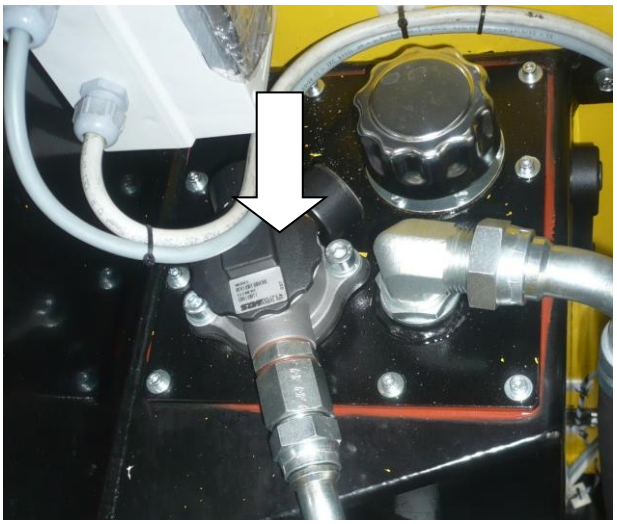


Fig. 20

During these operations a quantity of oil may leak out. In this case remove the oil by means of cloths and by pouring it into a specific container.

⚠ **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, check the hydraulic oil level in the tank.

7.2.5. Drive reduction gear oil level check and change

The oil level should be checked at least once a year. Place the machine so as to have the two caps (**A** and **B**) in the position shown in the picture aside (in a few cases it is necessary to remove the drive wheels to access the a.m. caps). Check the level by means of cap (**A**). 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 (**A**). 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 two years. Depending on the actual operating conditions, these intervals may be varied for each single case.

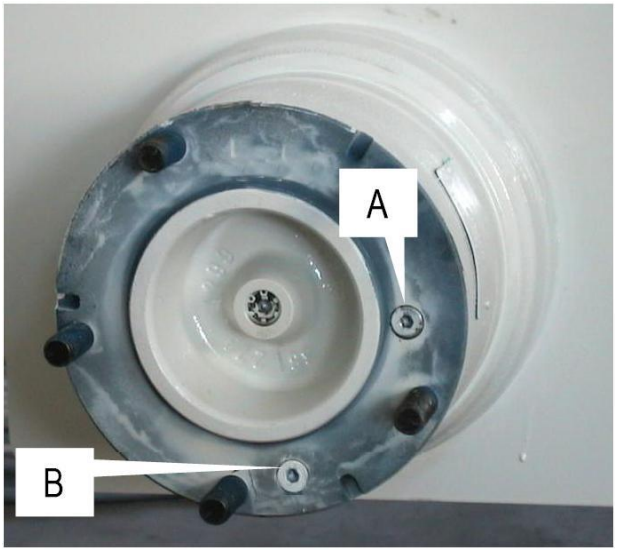


Fig. 21

While changing the oil it is advisable to wash the internal part of the cover 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 **B** and place a container of a 2-litre capacity under it. Drain the reduction gear completely, clean it as described above and then fill it up to the limit level of plug **A** through the same hole (for max. capacity see following table).

HYDRAULIC SYSTEM OIL		
BRAND	**TYPE**	**REQUIRED QUANTITY**
		Drive
SYNTHETIC OILS		0,8 litres
ESSO	Compressor Oil LG 150	
AGIP	Blasia S 220	
CASTROL	Alpha SN 6	
IP	Telesia Oil 150	
BIODEGRADABLE OILS - OPTIONAL		
PANOLIN	Biogear 80W90	

7.2.5.1 Checks in the use of synthetic biodegradable oil in drive reduction gears (Optional)

Quarterly or every 500 hours check the oil level. In case of need top up. If you notice that more than 10% of oil lacks in the reduction gear, check if there are any leaks.
Change the oil in the rotation reduction gear after the first 100 hours of operation and then every 6000 hours or every 3 years. Depending on the actual operating conditions, these intervals may change.
When changing the oil, it is recommended that you run a wash cycle inside the cover.
Change the oil when the reduction gear is hot. Mixtures of different oils (either biodegradable or mineral) even of the same brand are not allowed.

⚠ **During oil change or topping up, do not discard the hydraulic oil in the environment.**

7.2.6. Telescopic boom sliding block 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:

- Remove locking ring **A**.
- Screw the sliding block **B** until the above mentioned clearance is reached.
- Remove locking ring **A**.

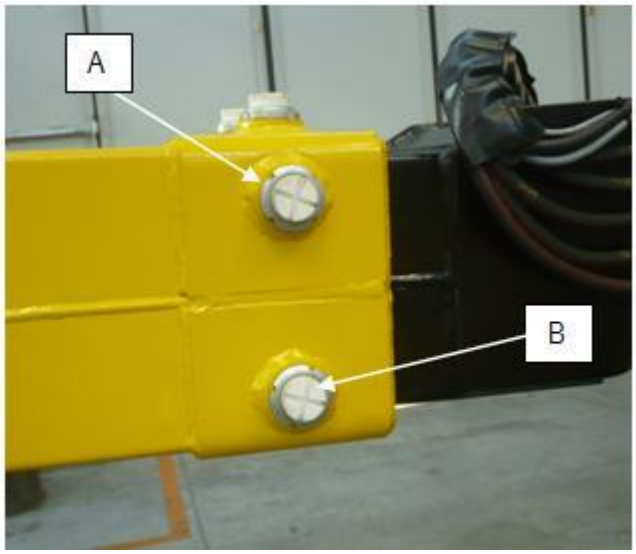


Fig.22

WARNING!
AS THIS OPERATION IS VERY IMPORTANT IT IS TO BE CARRIED OUT BY SKILLED TECHNICIANS ONLY.

7.2.7. Circuit movements pressure relief valve operation check

7.2.7.1. Pressure relief valve of proportional movement circuit

The pressure relief valve described controls the maximum pressure on the circuit of proportional movements (pantograph, upper boom, telescopic boom, jib, turret rotation, jib rotation). Normally, this valve does not require any adjustment, since it is calibrated at the factory before the machine is delivered.

Calibration is required:

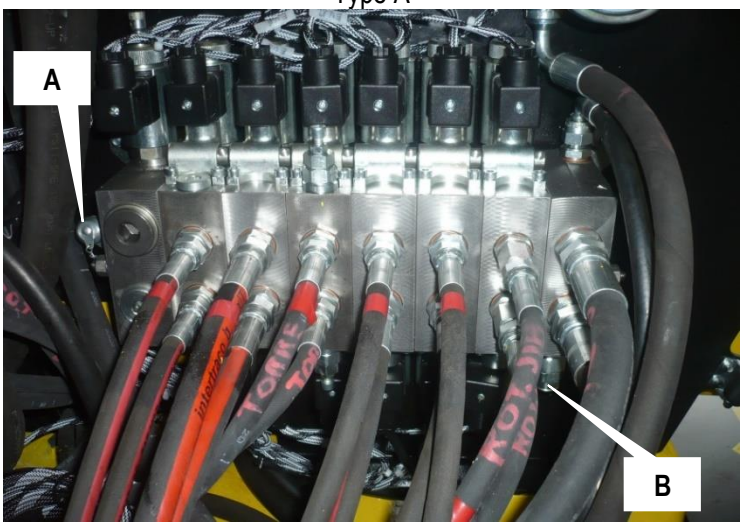
- In case of replacement of the hydraulic block.
- in case of replacement of the pressure relief valve only.

<u>Check operation at least once a year</u>

To check the operation of the pressure relief valve:

- Introduce a pressure gauge with full scale of at least 250 bar in the special quick coupling (1/4" BSP) **A.**
- Using the ground control panel lift the crank arm (lower boom) up to the end stop.
- Check the detected pressure value. The correct value is indicated in the chapter "**Technical features**".

Type A



Type B

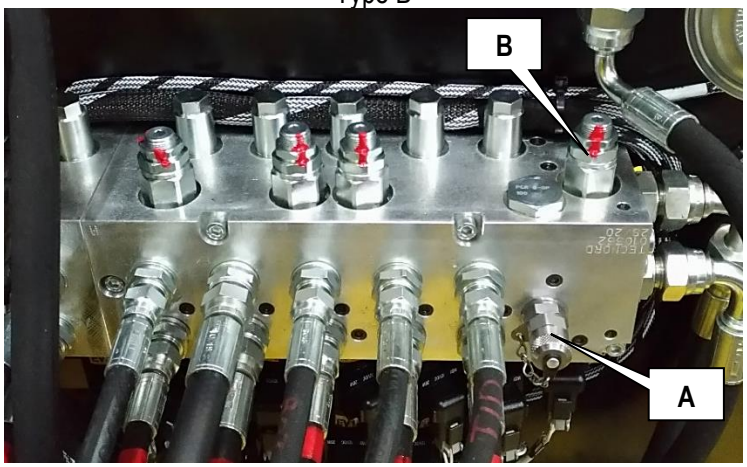


Fig. 23

To calibrate the pressure relief valve:

- Introduce a pressure gauge with full scale of at least 250 bar in the special quick coupling (1/4" BSP) **A.**
- Locate the pressure relief valve of lifting circuit **B.**
- Unscrew the adjusting dowel lock-nut.
- Using the ground control panel lift the crank arm (lower boom) up to the end stop.
- Adjust the pressure relief valve by means of the adjusting dowel so as to reach the pressure value indicated in chapter "**Technical Features**".
- Once calibration has been carried out, lock the adjusting dowel by means of the lock-nut.

⚠ **WARNING!**
AS THIS OPERATION IS VERY IMPORTANT IT IS TO BE CARRIED OUT BY SKILLED TECHNICIANS ONLY

7.2.7.2. Pressure relief valve of ON-OFF movement circuit

The described pressure relief valve controls the maximum pressure of the ON-OFF movement circuit (steering, cage rotation, cage levelling). Normally, this valve does not require any adjustment, since it is calibrated at the factory before the machine is delivered.

Calibration is required:

- In case of replacement of the hydraulic block.
- in case of replacement of the pressure relief valve only.

Check operation at least once a year

To check the operation of the pressure relief valve:

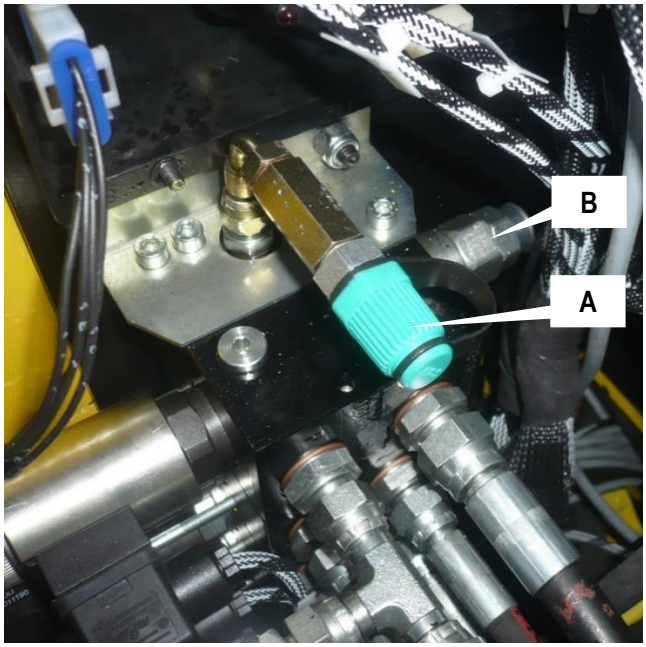
- Introduce a pressure gauge with full scale of at least 250 bar in the special quick coupling (1/4" BSP) **A.**
- Using the on-ground control panel, rotate the cage up to the end stop.
- Check the detected pressure value. The correct value is indicated in the chapter "**Technical features".**

To calibrate the pressure relief valve:

- Introduce a pressure gauge with full scale of at least 250 bar in the special quick coupling (1/4" BSP) **A.**
- Locate the pressure relief valve of lifting circuit **B.**
- Unscrew the adjusting dowel lock-nut.
- Using the on-ground control panel, rotate the cage up to the end stop.
- Adjust the pressure relief valve by means of the adjusting dowel so as to reach the pressure value indicated in chapter "**Technical Features".**

Once calibration has been carried out, lock the adjusting dowel by means of the lock-nut.

Type A



Type B

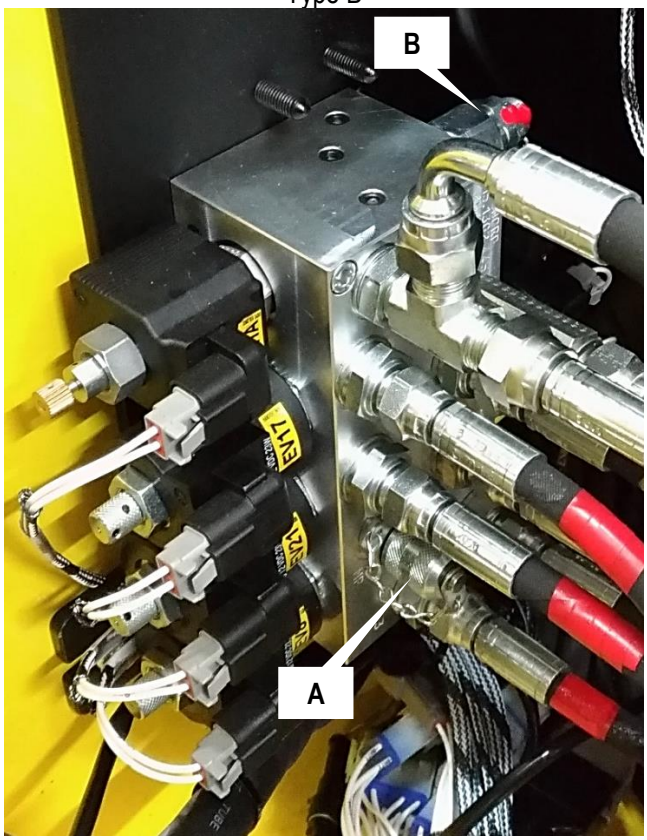


Fig.24

WARNING!
AS THIS OPERATION IS VERY IMPORTANT IT IS TO BE CARRIED OUT BY SKILLED TECHNICIANS ONLY

7.2.8. Operation check of the turret inclinometer

WARNING!

Usually the inclinometer does not need to be adjusted unless the electronic control unit is replaced. The equipment necessary for the replacement and adjustment of this component is such that these operations should be carried out by skilled personnel.

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

The inclinometer built-in the control board does not require any adjustment since it is calibrated in the factory before the machine is delivered.
This device controls the chassis slope and when inclined over the allowed value:

- It disables lifting.
- It disables drive when platform exceeds a given height (varying according to model).
- It warns of the instability condition by means of an audible alarm and a warning light located on the platform (see "General use instructions").

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

Check operation at least once a year.

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

- Using the platform control panel set the machine so as to place a shim of dimension (**A+10 mm**) under the two rear or front wheels (see following table).
- Wait three seconds (operation delay set at factory) until the danger red light and the platform audible alarm turn on. With platform lowered (booms down, telescopic boom in and jib at a height between +10° and –70°) all operations are still possible. By lifting one of the booms (excepting the Jib) and/or extending the telescopic boom with respect to the horizontal, the control system of the machine disables the lifting and drive controls.
- If the alarm does not go off CALL THE TECHNICAL ASSISTANCE.

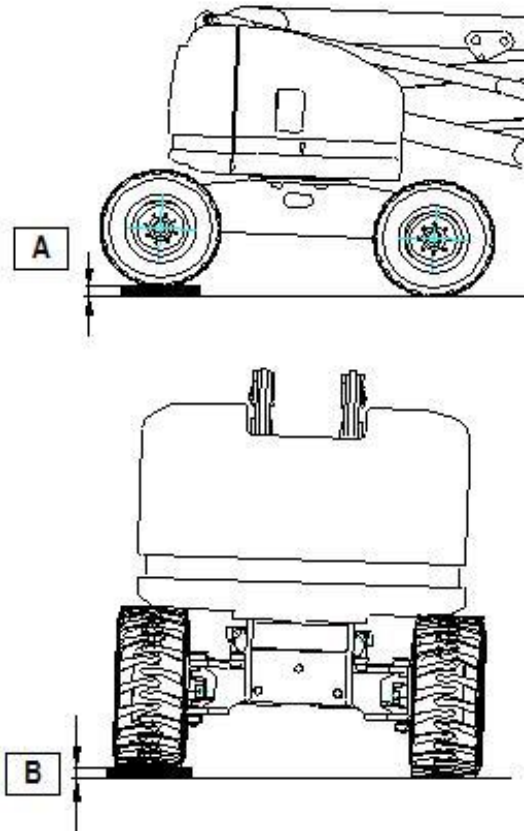


Fig. 25

To check the inclinometer according to the **transversal axis** (normally **Y-Axis**):

- Using the platform control panel set the machine so as to place a shim of dimension (**B+10 mm**) under the two side right or left wheels (see following table).
- Wait three seconds (operation delay set at factory) until the danger red light and the platform audible alarm turn on. With platform lowered (booms down, telescopic boom in and jib at a height between +10° and –70°) all operations are still possible. By lifting one of the booms (excepting the Jib) and/or extending the telescopic boom with respect to the horizontal, the control system of the machine disables the lifting and drive controls.
- If the alarm does not go off CALL THE TECHNICAL ASSISTANCE.

SHIMS	A12 JE	A12 JED – A15 JE – A15 JED	A17 JE
A [mm]	75	95	60
B [mm]	45	75	75

WARNING! 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.

7.2.9. Adjustment of the overload controller (load cell)

WARNING!

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

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

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

This device checks the load on the platform and:

- Disables all movements if platform is overloaded by 20% compared to the nominal load (drive and steering disabled with platform lifted).
- With platform in transport position and overloaded by 20% compared to the nominal load, it disables telescopic boom lifting and extension.
- It warns the user of the overload condition by means of the platform audible alarm and warning light.
- By removing the overload, the machine can be operated again.

<u>Check operation at least once a year</u>

The overload controller consists of:

- Deformation transducer (**A**).
- Display (**B**) for system calibration placed on the ground control panel.

Fig. 26

Operation check of the overload controller:

- When the platform is completely lowered and with slide-out extension deck retracted, load a charge evenly distributed equal to the nominal load allowed by the platform (see paragraph “Technical features”). In this condition all operations should be possible both on platform control panel and ground control panel.
- When platform is completely lowered add to the rated load an overload of 25% of the nominal load. In this condition the red alarm light and the audible alarm turn on.
- If the platform is at a height from the ground higher than that indicated in chapter “Technical features”, the alarm condition locks the machine completely (the jib activates its microswitch after exceeding a height of 10° according to the horizontal axis) the alarm condition blocks the machine completely. To operate the machine again, remove the overload.

The system needs calibration:

- 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.

7.2.10. Overload controller by-pass – ONLY FOR EMERGENCY OPERATIONS

In case of fault and impossibility to calibrate the device, a by-pass of the system is possible by means of locking key switch (**A**) under the control panel. Keep the locking key switch active for 5 seconds and release to get the BY-PASS condition.

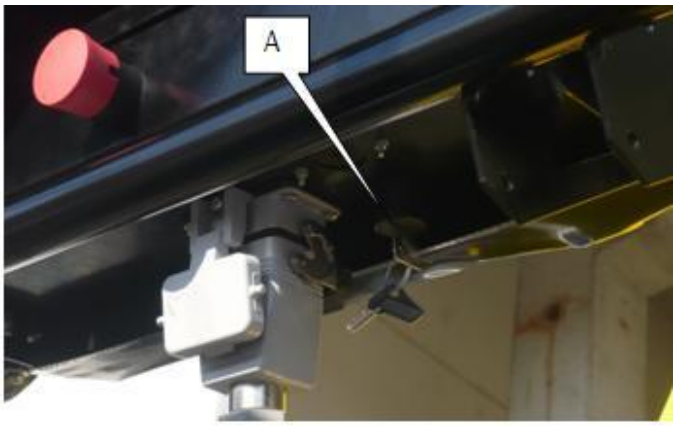


Fig. 27

WARNING!! IN THIS CONDITION THE MACHINE CAN CARRY OUT ANY OPERATION, THOUGH THE RED FLASHING LED AND THE AUDIBLE ALARM SIGNAL THE DANGER CONDITION. TURNING OFF THE MACHINE WILL RESET THE SYSTEM, AND UPON STARTING, THE OVERLOAD CONTROLLER OPERATES AGAIN SIGNALLING THE PREVIOUS OVERLOAD CONDITION.
THIS OPERATION IS ALLOWED ONLY FOR EMERGENCY HANDLING OF THE MACHINE. DO NOT USE THE MACHINE IF THE OVERLOAD CONTROLLER IS NOT EFFICIENT.

⚠

WARNING!
THIS OPERATION IS ALLOWED ONLY FOR EMERGENCY HANDLING OF THE MACHINE OR IN THE EVENT OF A FAULT OR IMPOSSIBILITY TO CALIBRATE THE SYSTEM.
DO NOT USE THE MACHINE IF THE OVERLOAD CONTROLLER IS NOT EFFICIENT.

7.2.11. Operation check of M1 microswitches

The lifting booms are controlled by microswitches:
- M1A on the pantograph.
- M1B on the boom.
- M1C on the Jib.
- M1E on the telescopic extension;
- M1S on the telescopic extension (only A17 JE with rotating jib).

Once a year check the working conditions of the microswitches M1.

The functions of the microswitches M1A- M1B- M1E are the following:

With platform not in rest position (at least one of the microswitches M1A-M1B-M1E is activated):
- The safety drive speed is automatically activated.
- The pot-hole guards are activated.
- If the chassis is inclined over the max. allowed inclination the lifting and drive controls are disabled.
- The compensation control for platform levelling is disabled.
- When the platform is overloaded ALL operations until removal of overload are disabled.

The function of the M1S microswitch (only on A17 JE with rotating jib) is the following:
- When the telescopic extension reaches the last 250 mm extension the drive control is inhibited.

The following functions of the microswitch M1C on the Jib were designed to support loading/unloading from the ramps of a vehicle:
- With booms in rest position (microswitches M1A-M1B-M1E not activated), and Jib with inclination higher than +10° according to the horizontal axis (M1C activated):
- The third drive speed is automatically disabled.
- If the chassis is inclined over the max. allowed inclination, Jib lifting and drive controls remain allowed.

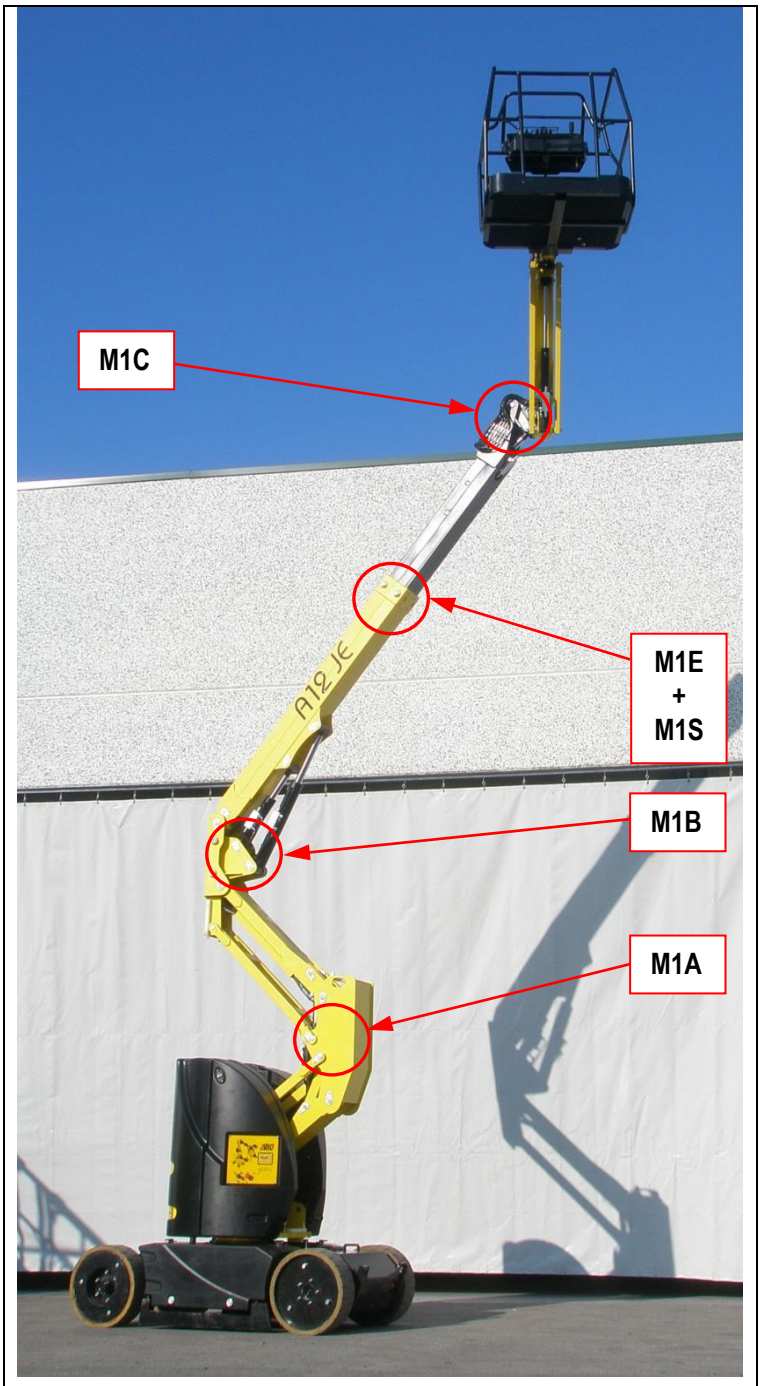


Fig. 28

7.2.12. Operation check of microswitches MPT1-MPT2 for A12 JE - A12 JED - A15 JE - A15 JED

When one of the following booms is lifted/extended:

- Pantograph.
- Upper boom.
- Telescopic boom.

One or more M1A, M1B, M1E microswitches are activated and consequently an automatic control activates the pot-hole guards, whose fully lowered position is checked by MPT1 and MPT2 microswitches.

Once a year check the working conditions of the microswitches MPT1-MPT2.

The functions of the microswitches MPT1-MPT2 are the following:

- With platform not in rest position (at least one of the microswitches M1A-M1B-M1E is activated) if both pot-hole guards are fully lowered the microswitches MPT1-MPT2 are "free" and drive at safety speed is allowed. Conversely, if one or both microswitches MPT1-MPT2 remained activated it means that one or both pot-hole guards are not in the correct position and drive (with raised platform) is disabled; the alarm condition is reported to the operator by the danger red light on the platform.
- With platform in a rest position (all the microswitches M1A-M1B-M1E are "free") the status of the microswitches MPT1-MPT2 is not considered.

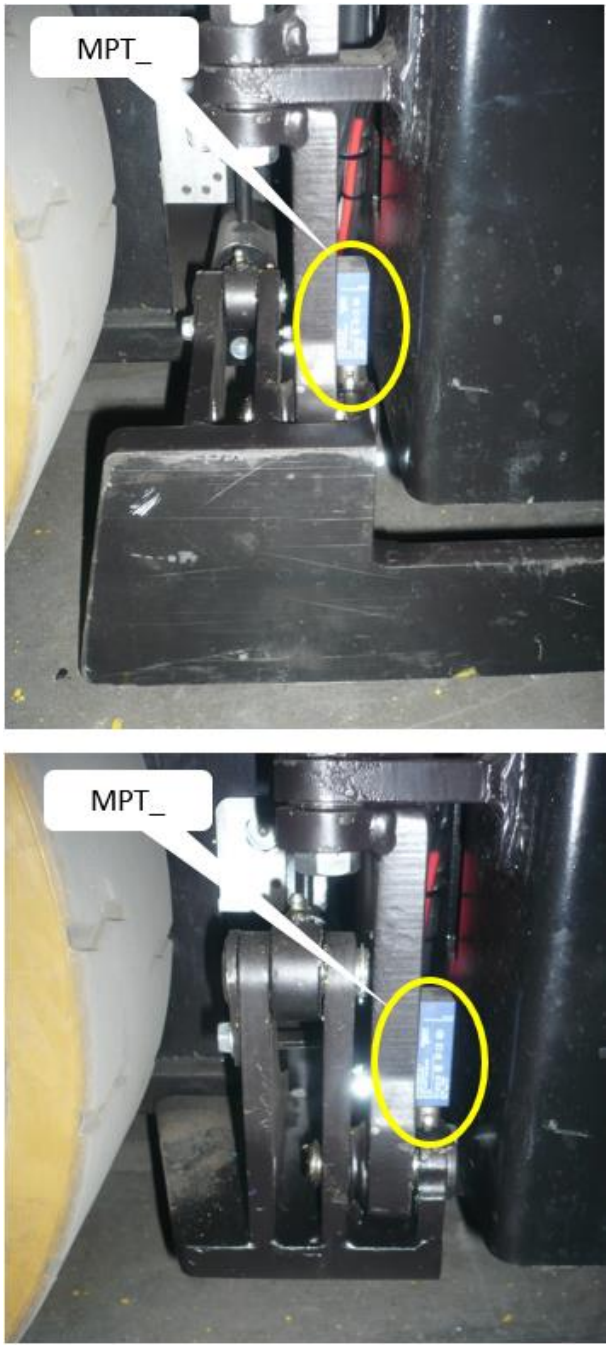


Fig.29

7.2.13. Operation check of MPT1-MPT2 microswitches and PS1A-PS1B proximity sensors for A17 JE

When one of the following booms is lifted/extended:

- Pantograph.
- Upper boom.
- Telescopic boom.

One or more M1A, M1B, M1E microswitches are activated and consequently an automatic control activates the pot-hole guards, whose fully lowered position is checked by MPT1 and MPT2 microswitches. Pot-hole guards activation depends on the position of the rotating turret monitored by the PS1A-PS1B sensors. According to the picture above:

- In the POT-HOLE AREA the pot-hole guards are activated;
- In the NO POT-HOLE AREA the pot-hole guards are not activated.

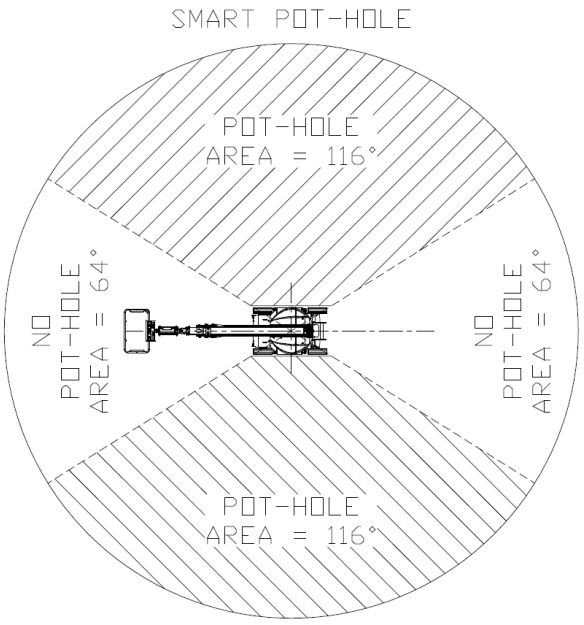
<u>Annually check the operation of the MPT1-MPT2 microswitches and of the PS1A-PS1B sensors.</u>

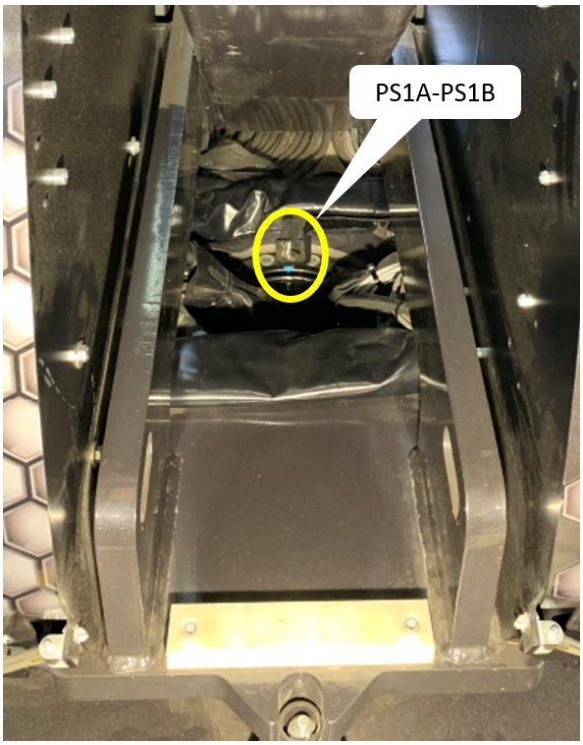
The functions of the MPT1-MPT2 microswitches are the following:

- PS1A-PS1B sensors monitor the position of the rotating turret defining the "POT-HOLE AREA" and "NO POT-HOLE AREA" as shown in the picture above.

- With platform not in rest position (at least one of the M1A-M1B-M1E microswitches is activated) if the turret is in the POT-HOLE AREA if both pot-hole guards are fully lowered the MPT1-MPT2 microswitches are "free" and drive is allowed at safety speed. Conversely, if one or both microswitches MPT1-MPT2 remained activated it means that one or both pot-hole guards are not in the correct position and drive (with raised platform) is disabled; the alarm condition is reported to the operator by the danger red light on the platform.

- With platform not in rest position (at least one of the M1A-M1B-M1E microswitches is activated) if the turret is in the NO POT-HOLE AREA if both pot-hole guards are fully lifted the MPT1-MPT2 microswitches are "not free" and the drive is allowed at safety speed. Conversely, if one or both microswitches MPT1-MPT2 remained activated it means that one or both pot-hole guards are not in the correct position and drive (with raised platform) is disabled; the alarm condition is reported to the operator by the danger red light on the platform.





- With platform in rest position (all the M1A-M1B-M1E microswitches are "free") the status of the MPT1-MPT2 microswitches and sensors PS1A-PS1B is not considered.

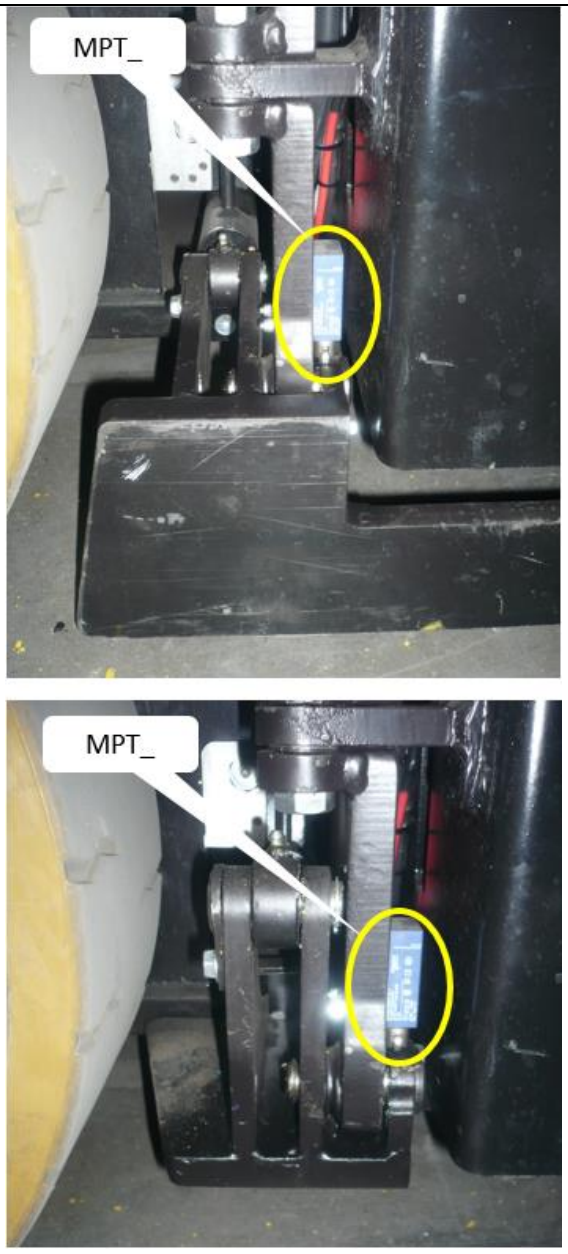


Fig. 30

7.2.14. Operation check of dead-man pedal safety system

The platform dead-man pedal is for enabling the operation controls of the machine on the platform control panel.

Check operation at least once a year.

To check the dead-man PEDAL:
- Move the drive joystick forward and backward in sequence, WITHOUT PRESSING THE DEAD-MAN PEDAL.
- Check that the machine does not perform any movement.

- Hold down the dead-man pedal for more than 10 seconds.
- With the pedal pressed, move the joystick forward and backward in sequence.
- Check that the machine does not perform any movement.

If the device works properly, no machine movement is possible on the platform control panel unless you press the dead-man pedal beforehand. If this is pressed for more than 10 seconds and no operation is performed, all movements are disabled; to operate the machine again, release the dead-man pedal and press it again.
The condition of the switch is indicated by the green led in the platform:

- Steady green led lit up enabled control panel
- Flashing green led lit up disabled control panel

7.3. Battery

The battery is one of the most important elements of the machine. It is recommended to keep it in an efficient condition to increase its useful life, to avoid faults and to reduce the management costs of the machine.

7.3.1. General instructions for battery

- In case of new batteries do not wait for the flat battery warning before recharging; recharge batteries after 3 or 4 working hours for the first 4/5 times.
- In case of new batteries full performance is achieved after approx. ten cycles of discharge and charge.
- Charge the battery in airy rooms and open the caps to allow the outflow of gas.
- Do not use extension leads exceeding 5 metres to connect the battery charger to the mains.
- Use a cable of suitable section (min 3x2.5 mm^2).
- Do not use rolled-up cables.
- Do not approach the battery with flames. Risk of deflagration 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.
- Check that the electrolyte level is 5-7 mm higher than the splash guard level.
- During charging operations check that the electrolyte temperature is not higher than 45°C max.
- If the machine is equipped with an automatic topping up device, follow the instructions described in the battery user manual carefully.

7.3.2. Battery maintenance

7.3.2.1. Accessing the battery compartment

The battery compartments are located under the cowlings on the sides of the machine chassis. To access the compartments and carry out maintenance operations, remove the cowlings (**A**), by performing the following steps:

Fig.31

- Open the hook (**D**).
- Laterally remove the cowling (**A**) by pulling out the hook lever (**D**).
- Unscrew the plastic lobe knobs (**B**), located on both sides of the cowling.
- Remove the cover (**C**).

Fig. 32

7.3.2.2. Closing the battery compartment

To close the compartment after maintenance, perform the following operations:
- Insert the cover (**C**) on the battery compartment and secure it with the lobe knobs (**B**).
- Bring laterally the cowling (**A**) near the chassis.
- Hook the battery compartment to the chassis by the hook (**D**).

7.3.2.3. Battery maintenance

- For normal water operating conditions, water topping up is to be carried out every week.
- Top up using distilled or demineralized water.
- Top up after battery charging. The electrolyte level must be 5-7 mm higher than the splash guard level.
- For machines equipped with automatic topping up device, follow the instructions given in the battery user manual.
- Battery discharge must be stopped when 80% of the battery rated capacity has been used. An excessive and prolonged discharge irreversibly damages the battery. The machine is equipped with a device that, when the battery is discharged by 80%, lifting operations are disabled. The battery needs to be recharged. This condition is signalled by a flashing light of the relevant led on the platform control panel.
- Battery charge is to be carried out according to the instructions given in the next paragraphs.
- Keep caps and connections covered and dry. A careful cleaning allows electric insulation protection, good operation and useful life of the battery.
- In case of faulty operations due to the battery, avoid any direct intervention and call the Customer Service.
- When the machine is not being used the batteries will run down automatically (automatic discharge). To avoid the battery operation from being compromised, charge it at least once a month. This has to be done even if the density values of the electrolyte are high.
- To limit the discharge of the battery during periods of inactivity, store the machine in environments where the temperature is below 30°C and press all the emergency buttons, including the main power button.

7.3.3. Battery recharge

WARNING!
EXPLOSIVE gas is originated during battery charging process. Therefore, charging must take place in airy rooms where no risks of fire and explosion exist and in the presence of fire extinguishers.

Connect the battery charger to the power mains having all protections according to the current standards in force and with the following features:
- Power voltage 100 230V ± 10%.
- Frequency 50÷60 Hz.
- Activated grounding line.
- Magneto-thermic switch and residual current device (“circuit breaker”)

Moreover:
- Do not use extension leads exceeding 5 metres to connect the battery charger to the mains.
- Use a cable of suitable section (min 3x2.5 mm^2).
- Do not use rolled-up cables.

IT IS FORBIDDEN
Connection to mains that do not comply with the above mentioned features.
Failure to comply with the a.m. instructions may cause incorrect functioning of the battery chargers with consequent damage not covered by the warranty.

WARNING!
After charging, when the battery charger is still connected, the electrolyte density values should range from 1.260 g/l to 1.270 g/l (at 25thC).

To use the battery charger, follow these procedures:

- Connect the battery charger by means of plug **A** to a current socket with the a.m. features.
- Check the connection state of the battery charger through led **B.** If it is on, connection has taken place and charging has started. The colour and enable mode of the led indicate the battery charging phase (refer to table below).

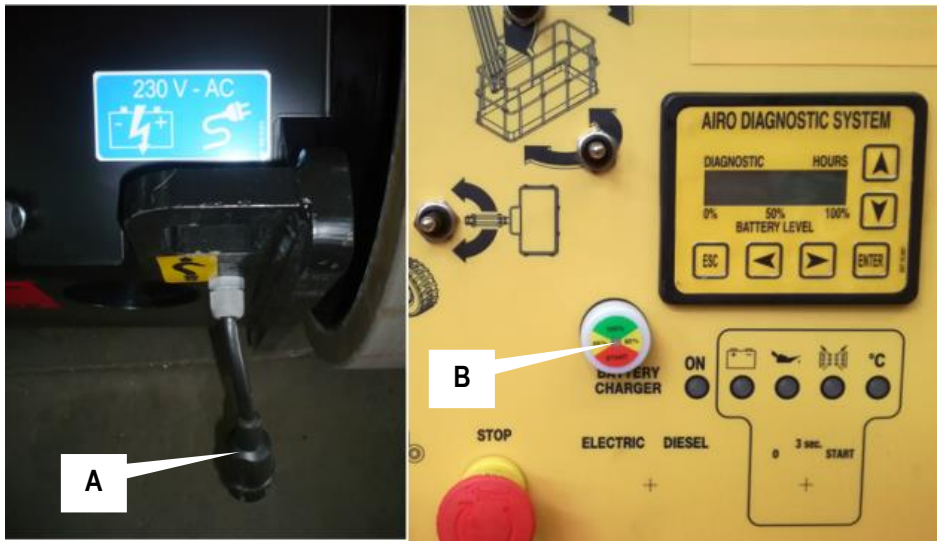


Fig.33

WARNING	DESCRIPTION
RED led flashing for a few seconds	Battery charger self-diagnostic phase
RED led on	Indicates that the battery charging has started
YELLOW led on	Indicates that the battery charging has reached 80%
GREEN led on	Indicates that the battery charging has reached 100%

With the battery charger ON, the machine is automatically off.

To disconnect the battery charger from the power source, disconnect the machine from the electric line.

WARNING!

Before using the machine check that the power cord of the battery charger is disconnected.

7.3.4. Battery charger: fault report

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

WARNING	PROBLEM	SOLUTION
Flashing **RED** led	Disconnected or not compliant battery	Check the connection with the batteries and the nominal voltage
Flashing **GREEN** led	Phase 1 and/or Phase 2 of higher duration than the max. allowed value	Check battery capacity
Flashing **RED-YELLOW** led	Loss of output current control	Control logic fault
Flashing **RED-GREEN** led	Loss of output voltage control	Batteries disconnected or fault in the control logic
Flashing **RED-YELLOW-GREEN** led	Semiconductor over temperature	Check the fan operation

⚠ **WARNING!**

In presence of alarm the battery charger stops the current delivery.

7.3.5. Battery replacement

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

⚠ **Do not dispose of batteries in the environment after replacement. Comply with the current local standards.**

⚠ **AS THIS OPERATION IS VERY IMPORTANT IT IS TO BE CARRIED OUT BY SKILLED 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 Directive 2006/42/EC. The certification was issued by:

Eurofins Product Testing Italy Srl - 0477 **Via Cuorgné, 21** **10156 – Torino – TO (Italy)**	CE

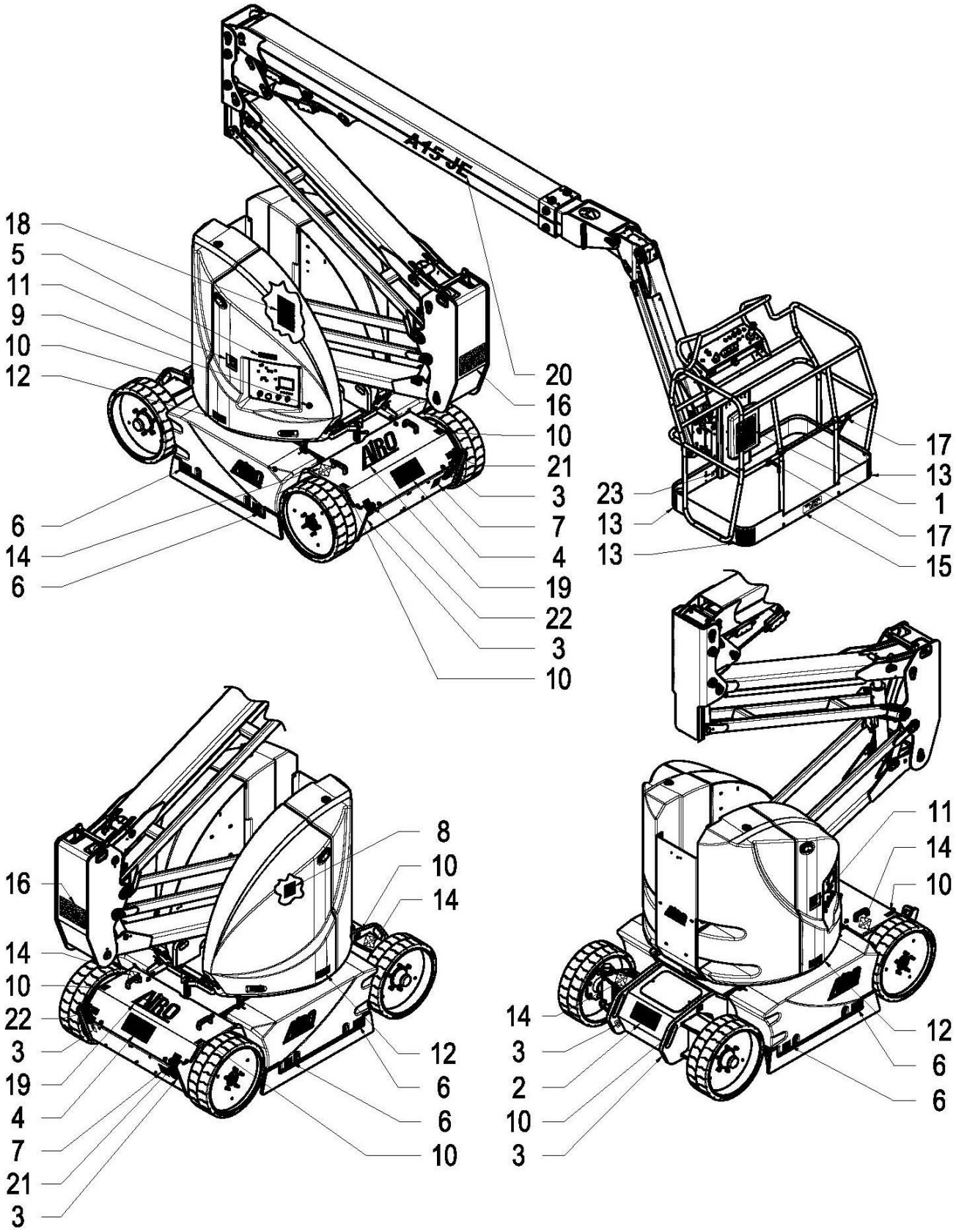
Test carrying out is shown by the above plate with CE mark applied on the machine and by the declaration of conformity enclosed in this user manual.

9. PLATES AND STICKERS

STANDARD STICKER CODES

	CODE	DESCRIPTION	QUANTITY
1	001.10.001	AIRO warnings plate	1
2	001.10.024	AIRO serial number plate	1
3	001.10.031	Towing hook sticker	4
4	001.10.057	General warnings sticker	1
5	001.10.059	Wheels tightening sticker	1
6	001.10.060	Lifting point sticker	4
7	001.10.098	STOP sticker	1
8	001.10.150	Oil type adhesive "46" I-D-F-NL-B-G-PL – under the cowling	1
9	001.10.180	First check sticker	1
10	001.10.243	“Max. Load per wheel” sticker	4
11	001.10.259	IPAF emergency sticker	1
12	001.10.260	Symbol articulated no stopping sticker	2
13	010.10.010	Yellow-black line sticker <150x300>	4
14	023.10.003	Directions sticker	2
15	029.10.006	Load sticker 230 KG – A12 JED – A15 JE – A15 JED - A17 JE STANDARD	1
	053.10.008	Load sticker 230 KG – A12 JE – A17E WITH ROTATING JIB	1
16	029.10.011	No fasten cage sticker	1
17	035.10.007	Safety belts coupling sticker	2
18	078.10.012	Manual emergency sticker Series “A PLUS” - under the cowling	1
19	001.10.175	AIRO pre-spaced yellow sticker <530x265>	1
	001.10.173	AIRO pre-spaced yellow sticker <300X140>	2
20	053.10.006	Pre-spaced sticker A12 JE black	1
	055.10.001	Pre-spaced sticker A15 JE black	1
	054.10.001	Pre-spaced sticker A12 JED black	1
	056.10.001	Pre-spaced sticker A12 JED black	1
	078.10.001	Pre-spaced sticker A17 JE black	1
21	045.10.011	Battery charger plug sticker	1
22*	045.10.010	(Optional) electric line plug sticker	1
23*	001.10.021	(Optional) ground symbol sticker	1

* optional features


A15 JE
18
5
11
9
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12
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14
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10
21
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14
3
2
10
3
12
6
6

10. CHECK REGISTER

The check register is released to the user of the platform in conformance with Attachment 1 of Directive 2006/42/EC.
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 under the care of the agency responsible for checking it (in Italy, ASL or 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 **frequency indicated.**
- Transfers of ownership. In Italy, the purchaser must notify the INAIL 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

STRUCTURAL CHECK	DESCRIPTION OF OPERATIONS TO BE PERFORMED
VISUAL CHECK	Check the integrity of the guardrails; the harness anchoring points; state of the lifting structure; any access ladders; rust; state of the tyres; oil leaks; locking pins on the structure; state of the pot-hole guard structure.

	DATE	REMARKS	SIGNATURE + STAMP
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			

DEFORMATION OF TUBES AND CABLES	Most of all, check at junction points that tubes and cables do not show any evident defects. Monthly operation. It is not necessary to indicate its execution every month, but at least every year when the other operations are carried out.

	DATE	REMARKS	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

STRUCTURAL CHECK	DESCRIPTION OF OPERATIONS TO BE PERFORMED
VARIOUS ADJUSTMENTS	See chapter 7.2.1

	DATE	REMARKS	SIGNATURE + STAMP
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			

GREASING	See chapter 7.2.2 Monthly operation. It is not necessary to indicate its execution every month, but at least every year when the other operations are carried out.

	DATE	REMARKS	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
HYDRAULIC TANK AND DRIVE REDUCTION GEARS OIL LEVEL CHECK	See chapter 7.2.3 and 7.2.5 Daily operation. It is not necessary to indicate its execution every day, but at least every year when the other operations are carried out.

	DATE	REMARKS	SIGNATURE + STAMP
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			

TELESCOPIC BOOM SLIDING BLOCKS CLEARANCE ADJUSTMENT	See chapter 7.2.6.

	DATE	REMARKS	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
CALIBRATION CHECK OF MOVEMENT CIRCUIT RELIEF PRESSURE VALVE	See chapter 7.2.7.

	DATE	REMARKS	SIGNATURE + STAMP
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			

BATTERY STATE	See chapter 7.3 Daily operation. It is not necessary to indicate its execution every day, but at least every year when the other operations are carried out.

	DATE	REMARKS	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
TOTAL OIL CHANGE IN HYDRAULIC TANK (EVERY TWO YEARS)	See chapter 7.2.3.

	DATE	REMARKS	SIGNATURE + STAMP
2nd YEAR			
4th YEAR			
6th YEAR			
8th YEAR			
10th YEAR			

HYDRAULIC FILTER REPLACING (EVERY TWO YEARS)	See chapter 7.2.4.

	DATE	REMARKS	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
TOTAL OIL CHANGE IN DRIVE REDUCTION GEARS (EVERY TWO YEARS)	See chapter 7.2.5.

	DATE	REMARKS	SIGNATURE + STAMP
2nd YEAR			
4th YEAR			
6th YEAR			
8th YEAR			
10th YEAR			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

SAFETY SYSTEM CHECK	DESCRIPTION OF OPERATIONS TO BE PERFORMED
OPERATION CHECK OF THE TURRET INCLINOMETER	See chapter 7.2.8.

	DATE	REMARKS	SIGNATURE + STAMP
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			

EFFICIENCY CHECK OF PLATFORM OVERLOAD CONTROLLER	See chapter 7.2.9.

	DATE	REMARKS	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

SAFETY SYSTEM CHECK	DESCRIPTION OF OPERATIONS TO BE PERFORMED
M1 MICROSWITCH OPERATION CHECK	See chapter 7.2.11

	DATE	REMARKS	SIGNATURE + STAMP
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			

OPERATION CHECK OF MPT1-MPT2 MICROSWITCHES AND PS1A-PS1B SENSORS	See chapter 7.2.12. and 7.2.13.

	DATE	REMARKS	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

SAFETY SYSTEM CHECK	DESCRIPTION OF OPERATIONS TO BE PERFORMED
DEAD-MAN SYSTEM CHECK	See chapter 7.2.14.

	DATE	REMARKS	SIGNATURE + STAMP
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			

STICKERS AND PLATES CHECK	See Chapter 9. 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 controls are legible.

	DATE	REMARKS	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

SAFETY SYSTEM 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 1.5 METERS

	DATE	REMARKS	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 OF EMERGENCY DEVICES		**DESCRIPTION OF OPERATIONS TO BE PERFORMED**	
MANUAL EMERGENCY LOWERING CHECK		**See chapter 5.6**	
	DATE	**REMARKS**	**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	DELIVERY DATE

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 features 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 features 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 features 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 features 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 features 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

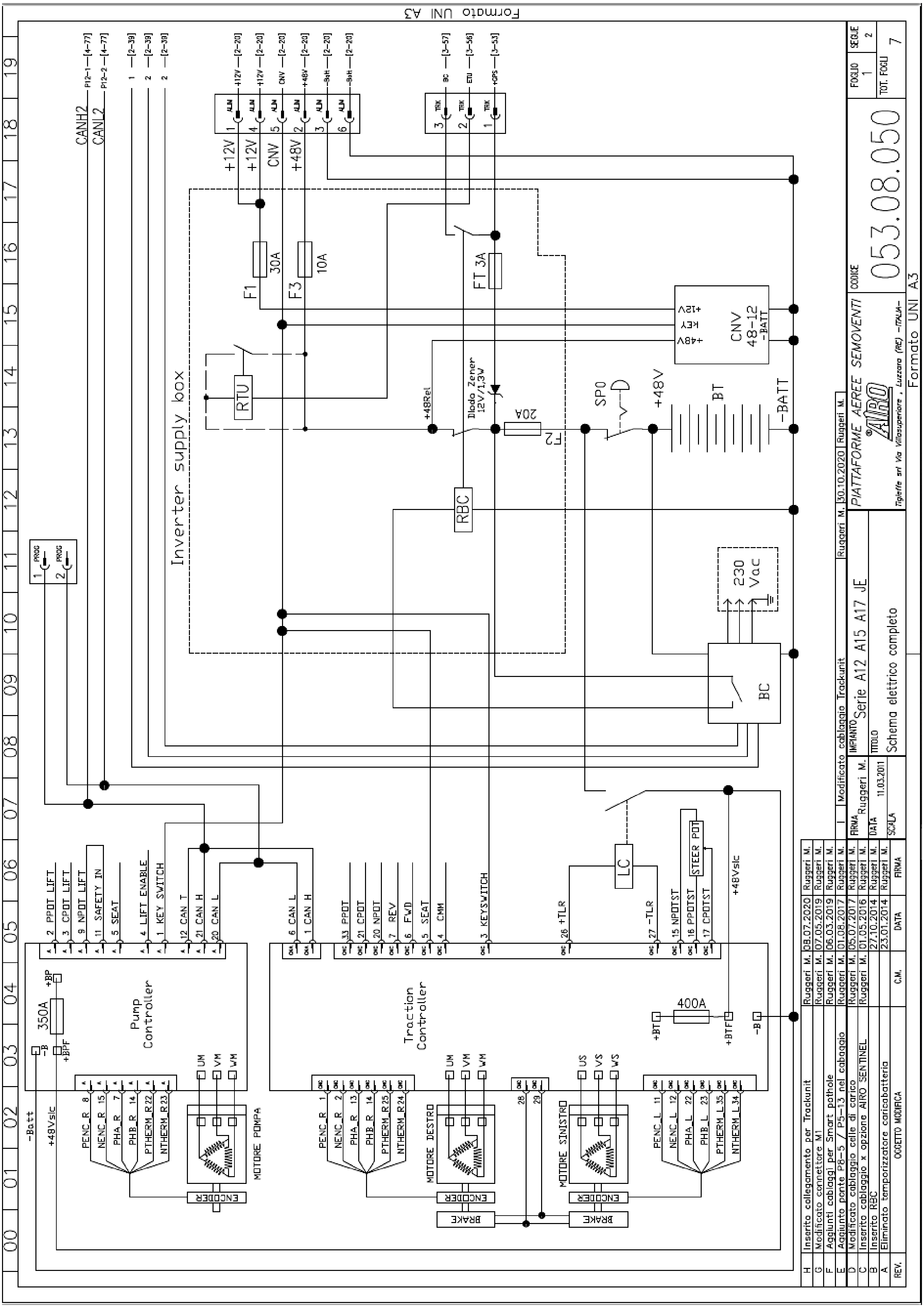
SPARE PARTS USED		DESCRIPTION
CODE	QUANTITY	

SERVICE **SAFETY MANAGER**

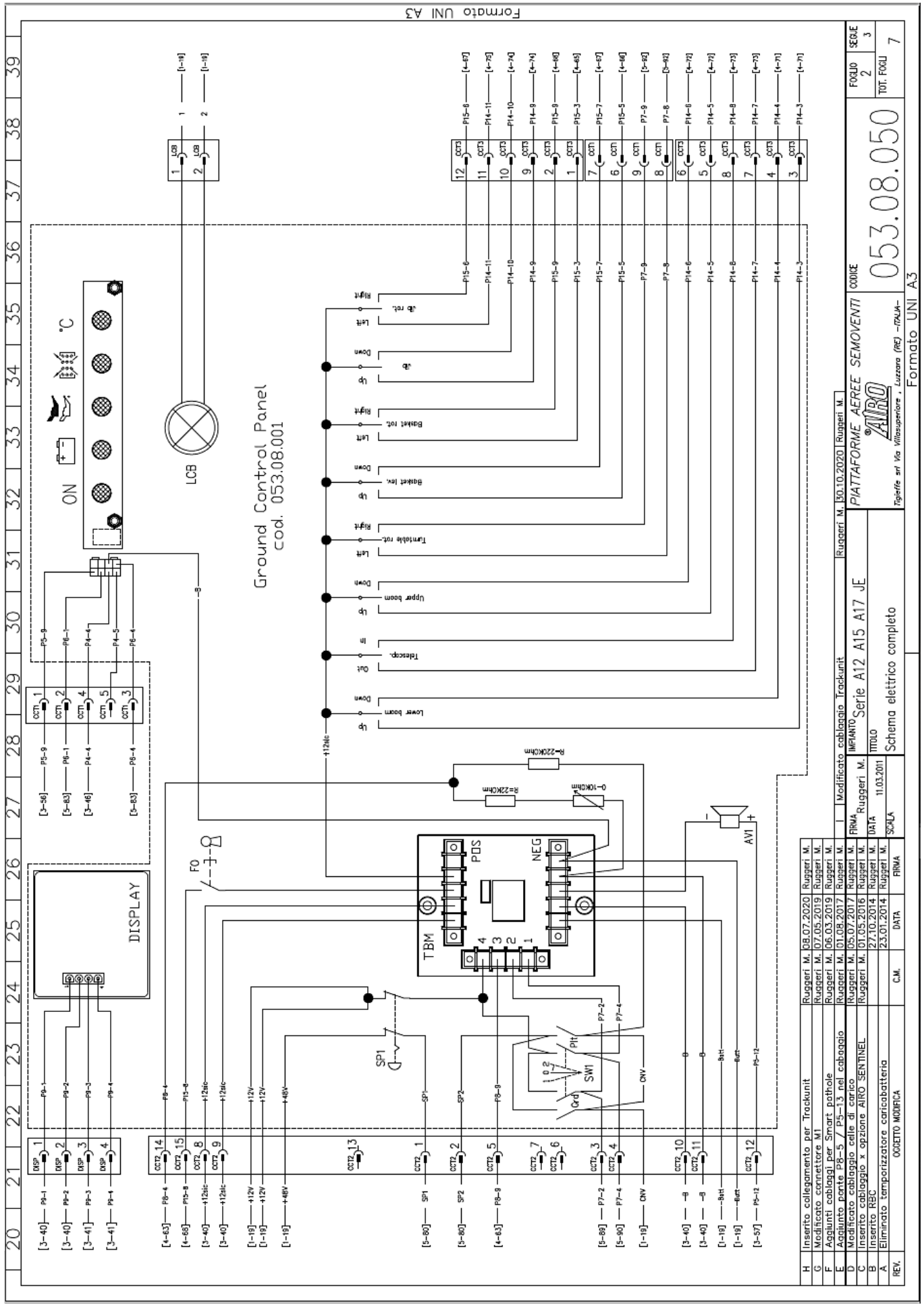
11. WIRING DIAGRAM

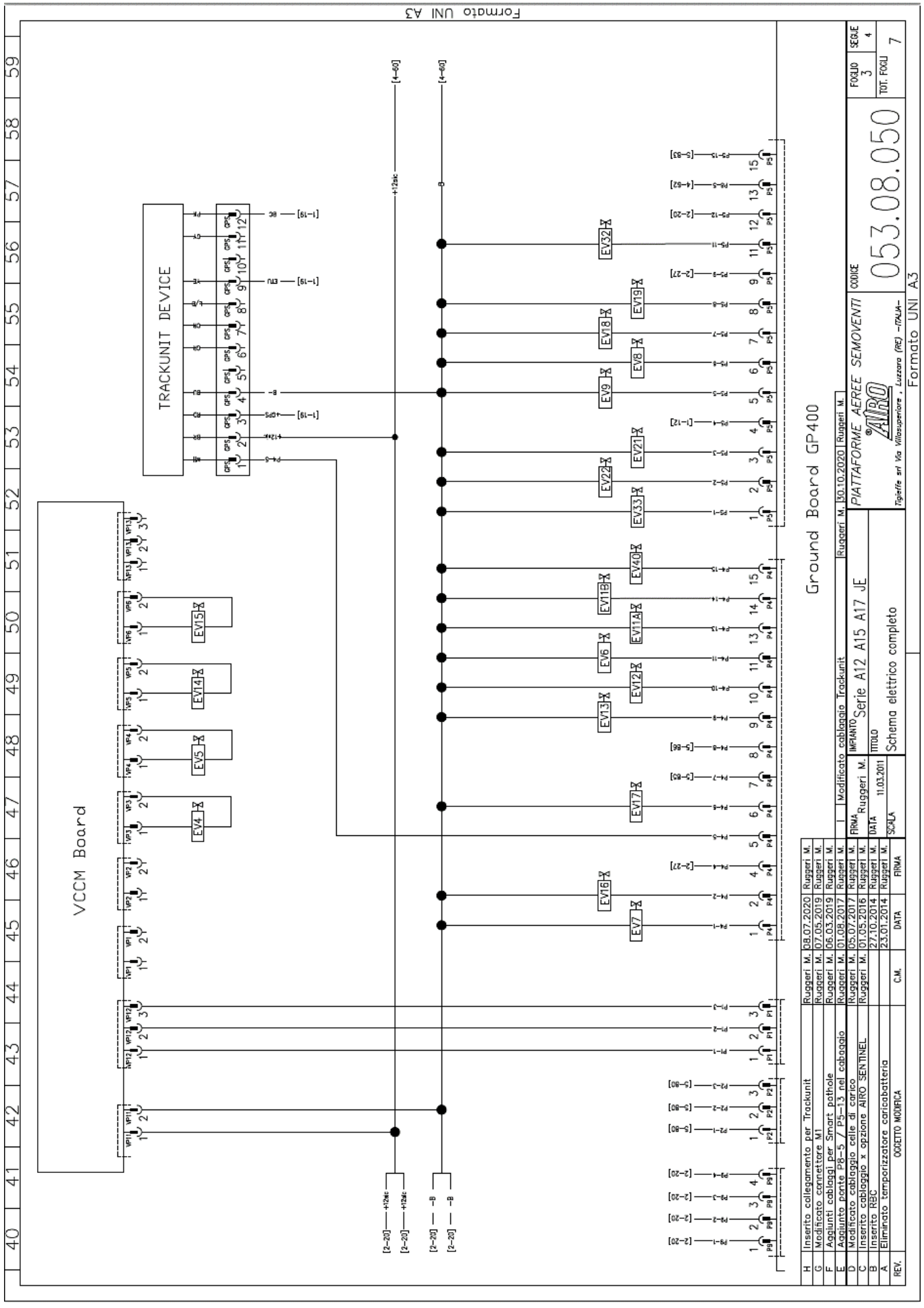
SYMB.	DESCRIPTION	Pag-Col.
AV1	GROUND AUDIBLE ALARM	2-26
AV2	PLATFORM AUDIBLE ALARM	6-105
AVS	BEEPER + BEACON FOR AIRO SENTINEL	5-80/82
BC1	BATTERY CHARGER 1	1-10
BC2	BATTERY CHARGER 2	1-12
BMP	BUMPER FOR AIRO SENTINEL	5-94/96
BT	BATTERY	1-15
BY	OVERLOAD CONTROLLER BY-PASS SELECTOR	6-113
CNV	CONVERTER 48VDC-12VDC	1-15
EV4	LOWER BOOM LIFTING SOLENOID VALVE	3-47
EV5	LOWER BOOM LOWERING SOLENOID VALVE	3-48
EV6	TELESCOPIC BOOM EXTENSION SOLENOID VALVE	3-49
EV7	TELESCOPIC BOOM RETRACTION SOLENOID VALVE	3-45
EV8	RIGHT STEERING SOLENOID VALVE	3-54
EV9	LEFT STEERING SOLENOID VALVE	3-54
EV11A	ON-OFF CIRCUIT ENABLE SOLENOID VALVE	3-50
EV11B	PROPORTIONAL CIRCUIT ENABLE SOLENOID VALVE	3-50
EV12	CLOCKWISE TURRET ROTATION SOLENOID VALVE	3-49
EV13	ANTICLOCKWISE TURRET ROTATION SOLENOID VALVE	3-48
EV14	UPPER BOOM LIFTING SOLENOID VALVE	3-50
EV15	UPPER BOOM LOWERING SOLENOID VALVE	3-51
EV16	HIGH CAGE LEVELLING SOLENOID VALVE	3-45
EV17	LOW CAGE LEVELLING SOLENOID VALVE	3-47
EV18	JIB LIFTING SOLENOID VALVE	3-55
EV19	JIB LOWERING SOLENOID VALVE	3-55
EV21	CLOCKWISE CAGE ROTATION SOLENOID VALVE	3-53
EV22	LEFT CAGE ROTATION SOLENOID VALVE	3-52
EV29	POT-HOLE GUARD LOWERING SOLENOID VALVE	5-83
EV30	POT-HOLE GUARD LIFTING SOLENOID VALVE	5-84
EV32	CLOCKWISE JIB ROTATION SOLENOID VALVE (OPTIONAL)	3-56
EV33	ANTICLOCKWISE JIB ROTATION SOLENOID VALVE (OPTIONAL)	3-53
EV40	BRAKE RELEASE SOLENOID VALVE	3-51
EV41A	OSCILLATING AXLE UNLOCK SOLENOID VALVE (OPTIONAL)	5-85
EV41B	OSCILLATING AXLE UNLOCK SOLENOID VALVE (OPTIONAL)	5-86
F1	CONTROL CIRCUIT FUSE	1-16
F2	CONVERTER CIRCUIT FUSE	1-13
F3	INVERTER AUXILIARY SYSTEM FUSE	1-16
F4	INTERFACE BOARD FUSE	1-16
FO	FACTORY OVERRIDE	2-25
GRF1	ROTATING BEACON 1	5-86
GRF2	ROTATING BEACON 2	5-86
GRF3	ROTATING BEACON 3	5-87
KL	CLAXON 48VDC	5-81
LC	LINE CONTACTOR	1-06
LCBL	LEFT BATTERY CHARGER LED	2-33
LCBR	RIGHT BATTERY CHARGER LED	2-33
M1A	I BOOM POSITION END STOP	5-89/90
M1B	II BOOM POSITION END STOP	5-90/91
M1C	JIB POSITION END STOP	5-91/92
M1E	TELESCOPIC BOOM POSITION END STOP	5-92/93
M1S	DRIVE LIMIT SWITCH (OPTIONAL)	5-93
M2A	CLOCKWISE TURRET ROTATION STOP LIMIT SWITCH	4-64
M2B	ANTICLOCKWISE TURRET ROTATION STOP LIMIT SWITCH	4-65

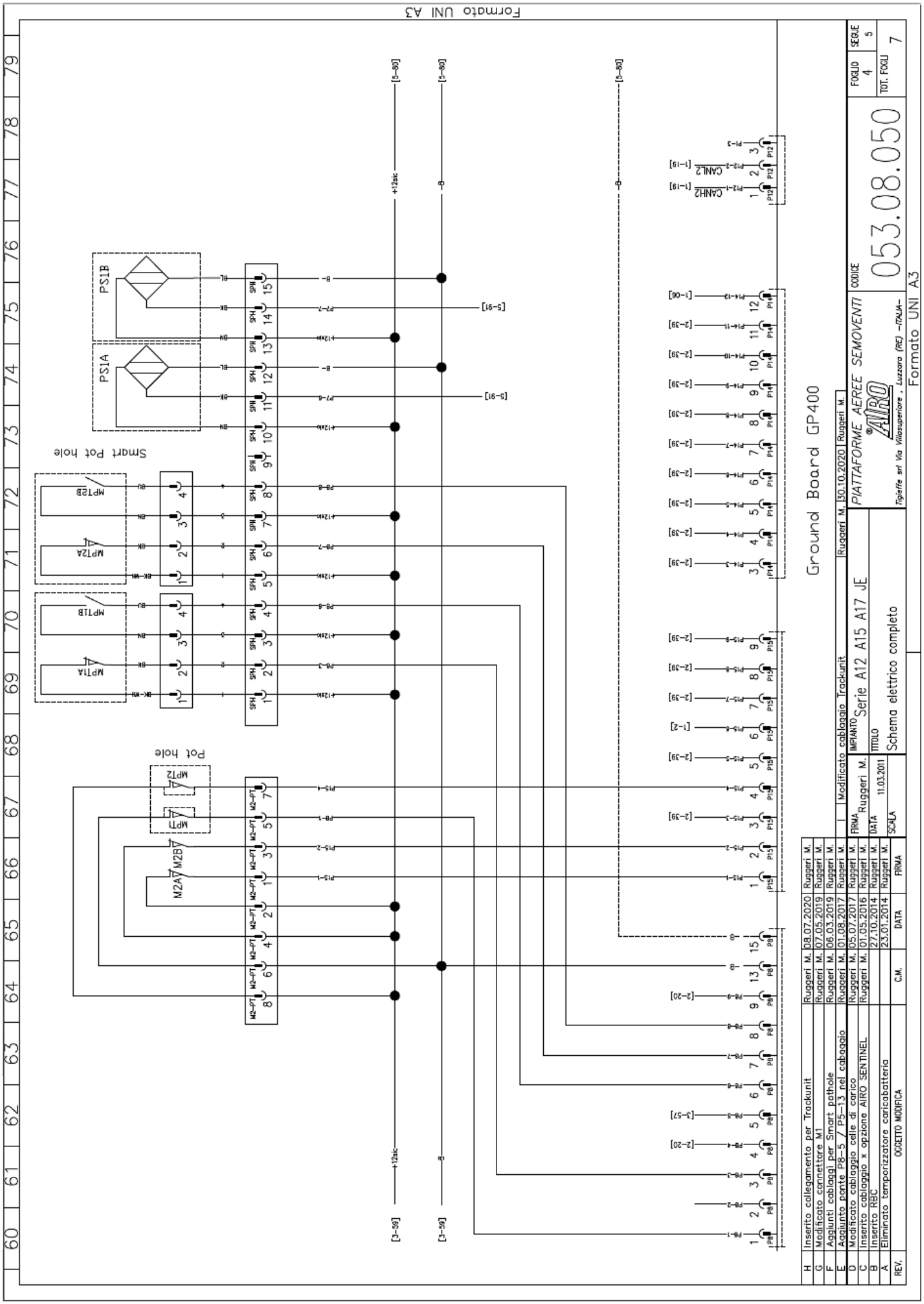
MPT1	RIGHT POT-HOLE GUARD LIMIT SWITCH	4-65
MPT2	LEFT POT-HOLE GUARD LIMIT SWITCH	4-66
MPT1A	RIGHT LIMIT SWITCH A, SMART POT-HOLE GUARDS	4-69
MPT1B	RIGHT LIMIT SWITCH B, SMART POT-HOLE GUARDS	4-70
MPT2A	LEFT LIMIT SWITCH A, SMART POT-HOLE GUARDS	4-71
MPT2B	LEFT LIMIT SWITCH B, SMART POT-HOLE GUARDS	4-72
PS1A	PROXIMITY SENSOR A, TURRET POSITION	4-74/75
PS1B	PROXIMITY SENSOR B, TURRET POSITION	4-75/76
RBC	BATTERY CHARGER RELAY	1-11/13
RTU	TRACKUNIT ENABLING RELAY	1-13/14
SP0	POWER CIRCUIT EMERGENCY SWITCH	1-15
SP1	EMERGENCY SWITCH – ON THE GROUND	2-23/24
SP2	EMERGENCY SWITCH – ON THE PLATFORM	6-103
SP3	HORN BUTTON	6-102
SW1	CONTROL SELECTORS	2-22/23
TBM	POWER SUPPLY MODULE	2-24/26
UM	DEAD-MAN PEDAL CONTACT	5-92

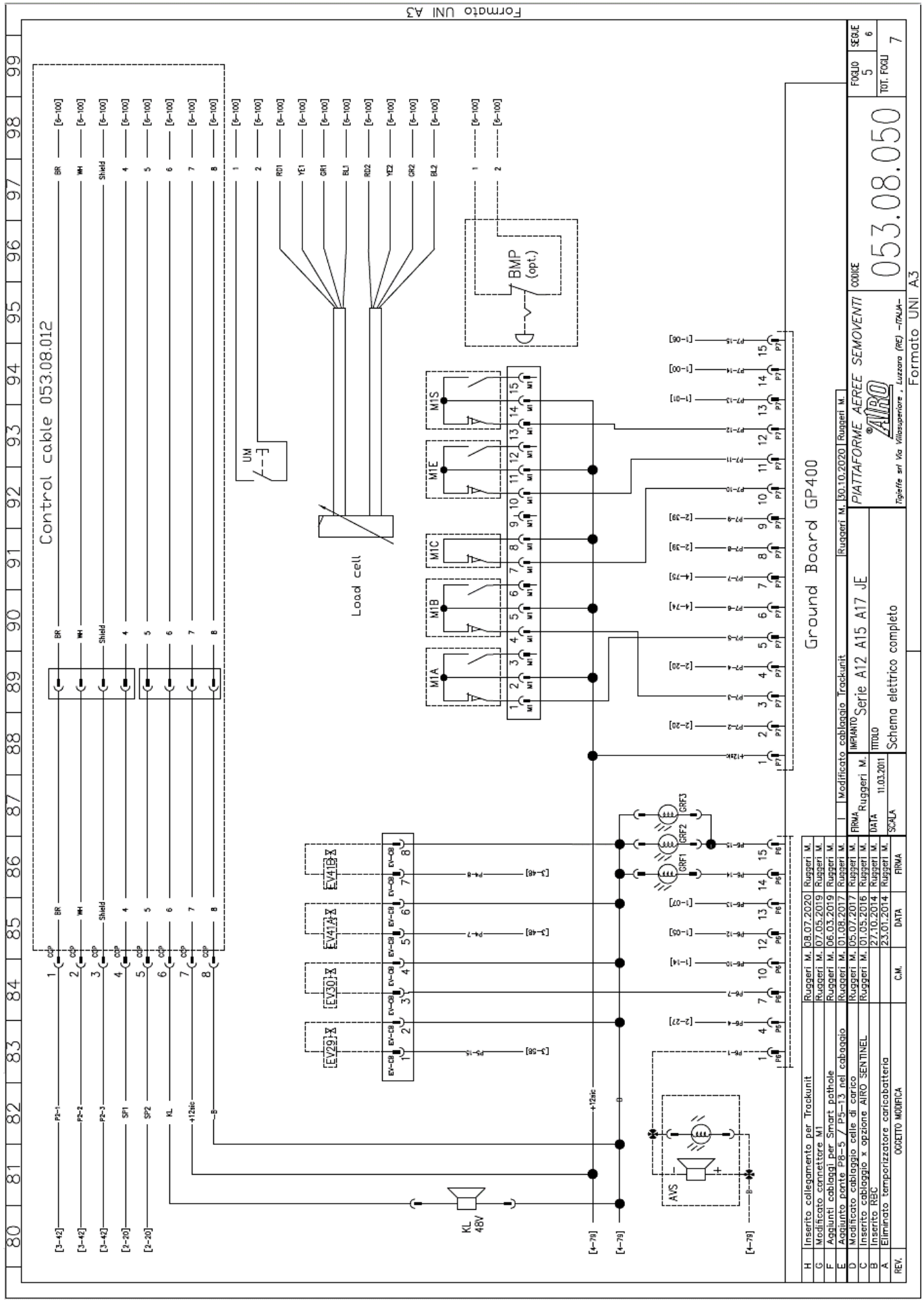


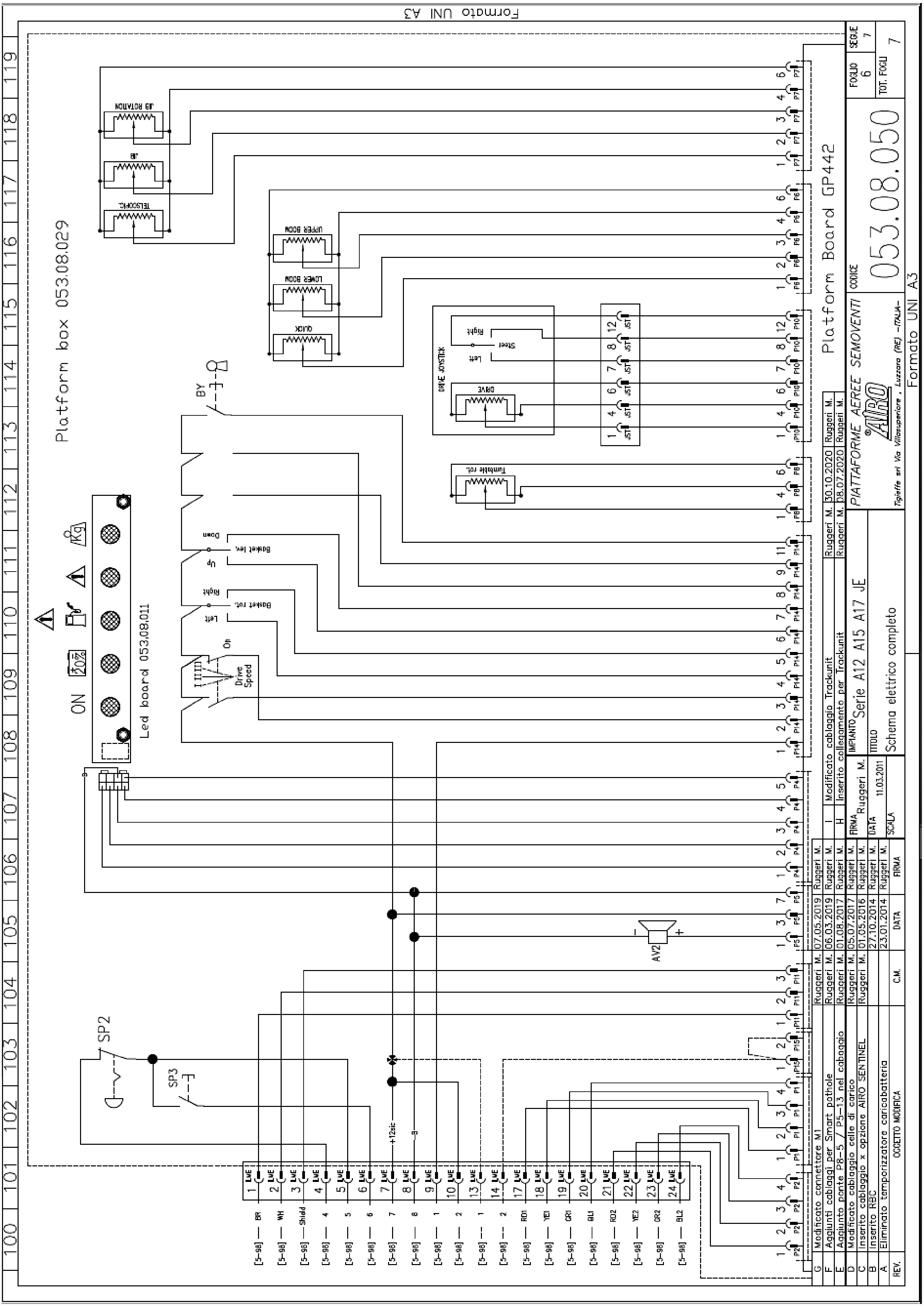
Formato UNI A3
Inverter supply box
Pump Controller
Traction Controller
MOTORE POMPA
MOTORE DESTRO
MOTORE SINISTRO
ENCODER
BRAKE
CANH2
CANL2
RTU
RBC
CNV 48-12
BT
BC
LC
STEER POT
230 Vac
Diodo Zener 12V/1,3W
F1 30A
F3 10A
FT 3A
F2 20A
350A
400A
SP0
+48V
-BATT
PIATTAFORME AEREE SEMOVENTI
Serie A12 A15 A17 JE
Schema elettrico completo
053.08.050
Inserito collegamento per Trackunit
Modificato connettore M1
Aggiunti cablaggi per Smart pothole
Aggiunto ponte P6-5 / P5-13 nel cablaggio
Modificato cablaggio celle di carico
Inserito cablaggio x opzione AIRO SENTINEL
Inserito RBC
Eliminato temporizzatore caricabatteria
Modificato cablaggio Trackunit


Formato UNI A3
Ground Control Panel
cod. 053.08.001
LCB
ON
°C
DISPLAY
TBM
POS
NEG
SP1
SW1
F0
AV1
R=22KOhm
0-10KOhm
Lower boom
Telescop.
Upper boom
Turntable rot.
Basket tilt
Jib
Jib rot.
PIATTAFORME AEREE SEMOVENTI
AIRO
Tigieffe srl Via Villasuperiore - Luzzara (RE) -ITALIA-
CODICE
053.08.050
FOGLIO 2
TOT. FOGLI 7
SCALE 3
IMPIANTO Serie A12 A15 A17 JE
TITOLO Schema elettrico completo
DATA 11.03.2011
SCALA
FIRMA Ruggeri M.
Ruggeri M. 30.10.2020
Formato UNI A3
H Inserito collegamento per Trackunit Ruggeri M. 08.07.2020 Ruggeri M.
G Modificato connettore M1 Ruggeri M. 07.05.2019 Ruggeri M.
F Aggiunti cablaggi per Smart pathole Ruggeri M. 06.03.2019 Ruggeri M.
E Aggiunto ponte P8-5 / P5-13 nel cablaggio Ruggeri M. 01.08.2017 Ruggeri M.
D Modificato cablaggio celle di carico Ruggeri M. 05.07.2017 Ruggeri M.
C Inserito cablaggio x opzione AIRO SENTINEL Ruggeri M. 01.05.2016 Ruggeri M.
B Inserito RBC 27.10.2014 Ruggeri M.
A Eliminato temporizzatore caricabatteria 23.01.2014 Ruggeri M.
REV. OGGETTO MODIFICA C.M. DATA FIRMA


Formato UNI A3
VCCM Board
TRACKUNIT DEVICE
Ground Board GP400
EV4
EV5
EV14
EV15
EV7
EV16
EV13
EV6
EV11
EV12
EV17
EV9
EV18
EV19
EV8
EV32
EV22
EV21
EV33
EV40
PIATTAFORME AEREE SEMOVENTI
Serie A12 A15 A17 JE
Schema elettrico completo
053.08.050
Formato UNI A3


Formato UNI A3
Ground Board GP400
PIATTAFORME AEREE SEMOVENTI
Serie A12 A15 A17 JE
Schema elettrico completo
053.08.050
Formato UNI A3
Smart Pot hole
Pot hole
PS1B
PS1A
MPT2B
MPT2A
MPT1B
MPT1A
MPT2
MPT1
M2A
M2B
CANH2
CANL2


Control cable 053.08.012
Ground Board GP400
Load cell
BMP (opt.)
UIM
KL 48V
AVS
M1A
M1B
M1C
M1E
M1S
EV29
EV30
EV41A
EV41B
GRF1
GRF2
GRF3
PIATTAFORME AEREE SEMOVENTI
Serie A12 A15 A17 JE
Schema elettrico completo
053.08.050
Formato UNI A3


Platform box 053.08.029
Led board 053.08.011
Platform Board GP442
PIATTAFORME AEREE SEMOVENTI
Serie A12 A15 A17 JE
Schema elettrico completo
053.08.050
Formato UNI A3

SIMB.	DESCRIPTION	Pag.–Col.
AV1	Beeper at ground	2–26
AV2	Platform Beeper	6–105
AVS	Beeper + beacon for AIRO SENTINEL	5–80/82
BC1	Battery Charger 1	1–10
BC2	Battery Charger 2	1–12
BMP	Bumper for AIRO SENTINEL	5–94/96
BT	Battery	1–15
BY	Load control by–pass switch	6–113
CNV	DC–DC Converter 48V–12V	1–15
EV4	Lower Boom UP valve	3–47
EV5	Lower Boom DOWN valve	3–48
EV6	Telescopic Boom extension valve	3–49
EV7	Telescopic Boom retraction valve	3–45
EV8	Steer right valve	3–54
EV9	Steer left valve	3–54
EV11A	Safe dump ON–OFF circuit valve	3–50
EV11B	Safe dump proportional circuit valve	3–50
EV12	Turntable right rotation valve	3–49
EV13	Turrntable left rotation valve	3–48
EV14	Upper Boom UP valve	3–50
EV15	Upper Boom DOWN valve	3–51
EV16	Platform levelling UP valve	3–45
EV17	Platform levellling DOWN valve	3–47
EV18	JIB UP valve	3–55
EV19	JIB DOWN valve	3–55
EV21	Platform right rotation valve	3–53
EV22	Platform left rotation valve	3–52
EV32	JIB right rotation valve	3–56
EV33	JIB left rotation valve	3–53
EV29	Pot–hole valve	5–83
EV30	Pot–hole valve	5–84
EV40	Brake dump valve	3–51
EV41A	Swing axle valve (opt.)	5–85
EV41B	Swing axle valve (opt.)	5–86
F1	Control circuit fuse	1–16
F2	Converter circuit fuse	1–13
F3	Inverter devices fuse	1–16
F4	CAN–BUS board Fuse	1–16
FO	Factory OVERRIDE key switch	2–25
GRF1	Light 1	5–86
GRF2	Light 2	5–86
GRF3	Light 3	5–87
KL	Clacson	5–81

SIMB.	DESCRIPTION	Pag.–Col.
LC	Line Contactor	1–06
LCBL	Left Battery charger Status Led	2–33
LCBR	Right Battery charger Status Led	2–33
M1A	Lower boom status switch	5–89/90
M1B	Upper boom status switch	5–90/91
M1C	JIB status switch	5–91/92
M1E	Telescopic boom status switch	5–92/93
M1S	Stop driving switch (opt.)	5–93
M2A	Turntable stop right rotation switch	4–64
M2B	Turntable stop left rotation switch	4–65
MPT1	Right pot–hole status switch	4–65
MPT2	Left pot–hole status switch	4–66
MPT1A	Right switch A, Smart pot–hole	4–69
MPT1B	Right switch B, Smart pot–hole	4–70
MPT2A	Left switch A, Smart pot–hole	4–71
MPT2B	Left switch B, Smart pot–hole	4–72
PS1A	Proximity sensor A, turret position	4–74/75
PS1B	Proximity sensor B, turret position	4–75/76
RBC	Battery Charger Relè	1–11/13
RTU	Trackunit enable Relay	1–13/14
SP0	Power circuit Emergency Switch	1–15
SP1	Ground Emergency Switch	2–23/24
SP2	Platform emergency switch	6–103
SP3	Clacson switch	6–102
SW1	Control Key Switch	2–22/23
TBM	Supply module	2–24/26
UM	"Dead man" switch	5–92

REV.	OGGETTO MODIFICA	C.M.	DATA	FIRMA
I	Modificato cablaggio Trackunit	Ruggeri M.	30.10.2020	Ruggeri M.
H	Inserito collegamento per Trackunit	Ruggeri M.	08.07.2020	Ruggeri M.
G	Modificato connettore M1	Ruggeri M.	07.05.2019	Ruggeri M.
F	Aggiunti cablaggi per Smart pothole	Ruggeri M.	06.03.2019	Ruggeri M.
E	Aggiunto ponte P8–5 / P5–13 nel cabaggio	Ruggeri M.	01.08.2017	Ruggeri M.
D	Modificato cablaggio celle di carico	Ruggeri M.	05.07.2017	Ruggeri M.
C	Inserito cablaggio x opzione AIRO SENTINEL	Ruggeri M.	01.05.2016	Ruggeri M.
B	Inserito RBC		27.10.2014	Ruggeri M.
A	Eliminato temporizzatore caricabatteria		23.01.2014	Ruggeri M.

FIRMA Ruggeri M.
DATA 11.03.2011
SCALA

IMPIANTO Serie A12 A15 A17 JE
TITOLO Schema elettrico completo

PIATTAFORME AEREE SEMOVENTI
AIRO
Tigieffe srl Via Villasuperiore , Luzzara (RE) –ITALIA–

CODICE 053.08.050

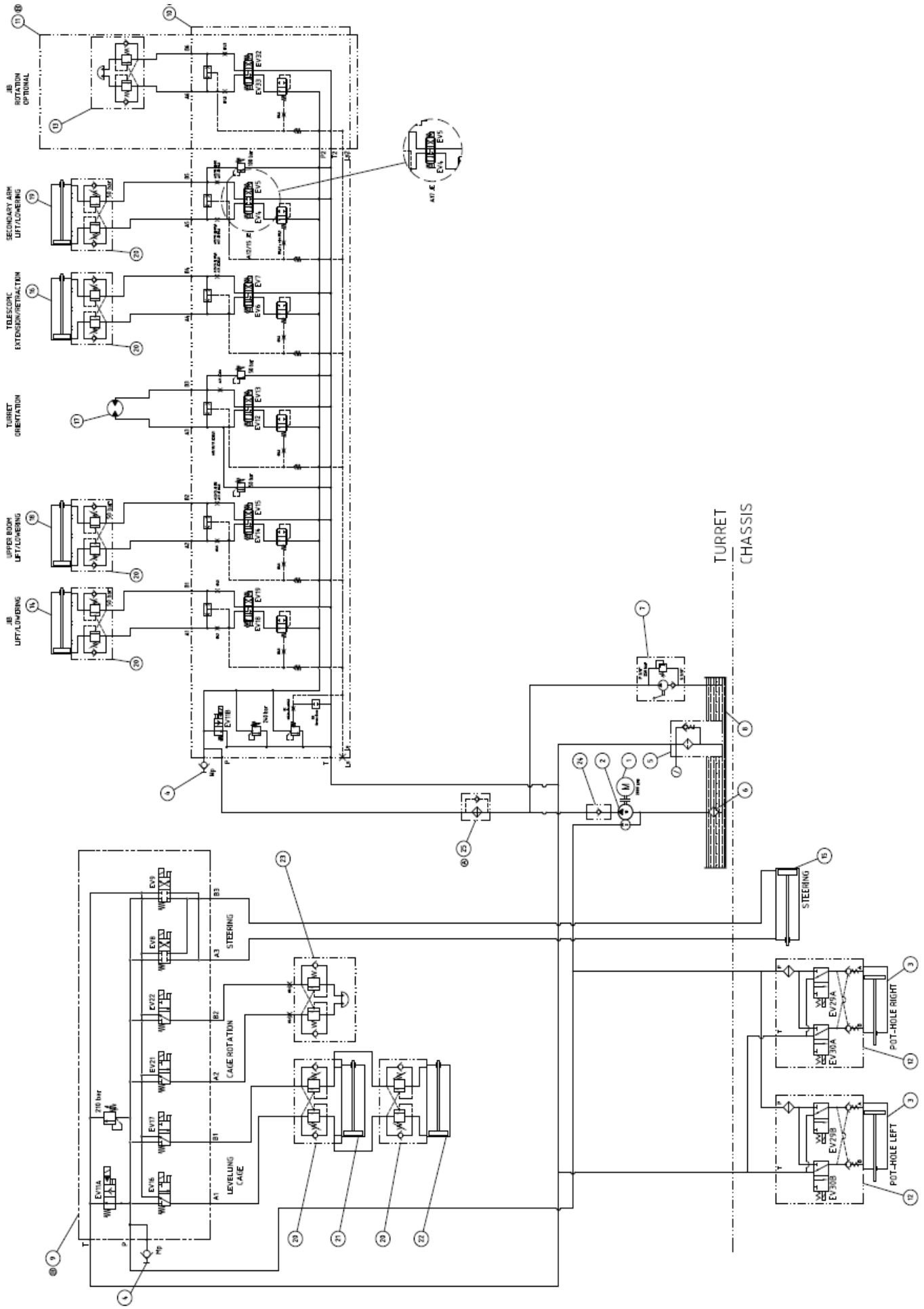
FOGLIO 7 | SEGUE –
TOT. FOGLI 7

Formato UNI A3

12. HYDRAULIC DIAGRAM

053.07.001

1	ELECTRIC MOTOR - AC
2	GEAR PUMP (MOVEMENTS)
3	POT-HOLE GUARD CYLINDERS
4	QUICK COUPLING (PRESSURE GAUGE CONNECTION)
5	RETURN FILTER
6	SUCTION FILTER
7	EMERGENCY OPERATION HAND PUMP
8	OIL TANK
9	ON-OFF MOVEMENTS HYDRAULIC LOCK
10	PROPORTIONAL MOVEMENTS HYDRAULIC LOCK
11	JIB ROTATION CONTROL ASSEMBLY - OPTIONAL
12	INTEGRATED ASSEMBLY
13	JIB ROTATION ACTUATOR (OPTIONAL)
14	JIB CYLINDER
15	STEERING CYLINDER
16	TELESCOPIC BOOM EXTENSION CYLINDER
17	TURRET ROTATION ROTATING TABLE
18	UPPER BOOM CYLINDER
19	PANTOGRAPH CYLINDER (LOWER BOOM)
20	OVER-CENTER VALVE
21	SENSOR CYLINDER (MASTER)
22	CAGE LEVELLING CYLINDER (SLAVE)
23	PLATFORM ROTATION ACTUATOR
24	UNIDIRECTIONAL VALVE
25	PRESSURE FILTER WITH VISUAL INDICATOR
EV4	PANTOGRAPH LIFTING SOLENOID VALVE (LOWER BOOM)
EV5	PANTOGRAPH LOWERING SOLENOID VALVE (LOWER BOOM)
EV6	BOOM EXTENSION SOLENOID VALVE
EV7	BOOM RETRACTION SOLENOID VALVE
EV8	LEFT STEERING SOLENOID VALVE
EV9	RIGHT STEERING SOLENOID VALVE
EV11A	BY-PASS SOLENOID VALVE
EV11B	BY-PASS SOLENOID VALVE
EV12	CLOCKWISE TURRET ROTATION SOLENOID VALVE
EV13	ANTICLOCKWISE TURRET ROTATION SOLENOID VALVE
EV14	UPPER BOOM LIFTING SOLENOID VALVE
EV15	UPPER BOOM LOWERING SOLENOID VALVE
EV16	FORWARD CAGE LEVELLING SOLENOID VALVE
EV17	REVERSE CAGE LEVELLING SOLENOID VALVE
EV18	JIB LIFTING SOLENOID VALVE
EV19	JIB LOWERING SOLENOID VALVE
EV21	CLOCKWISE CAGE ROTATION SOLENOID VALVE
EV22	ANTICLOCKWISE CAGE ROTATION SOLENOID VALVE
EV29A	RIGHT POT-HOLE GUARD LOWERING SOLENOID VALVE
EV29B	LEFT POT-HOLE GUARD LOWERING SOLENOID VALVE
EV30A	RIGHT POT-HOLE GUARD LIFTING SOLENOID VALVE
EV30B	LEFT POT-HOLE GUARD LIFTING SOLENOID VALVE
EV32	CLOCKWISE JIB ROTATION SOLENOID VALVE (OPTIONAL)
EV33	ANTICLOCKWISE JIB ROTATION SOLENOID VALVE (OPTIONAL)


JIB ROTATION OPTIONAL
SECONDARY ARM LIFT/LOWERING
TELESCOPIC EXTENSION/RETRACTION
TURRET ORIENTATION
UPPER BOOM LIFT/LOWERING
JIB LIFT/LOWERING
TURRET
CHASSIS
STEERING
CAGE ROTATION
LEVELLING CAGE
POT-HOLE RIGHT
POT-HOLE LEFT
210 bar

13. CE DECLARATION OF CONFORMITY

AIRO È UNA DIVISIONE TIGIEFFE SRL - VIA VILLA SUPERIORE, 82 - 42045 LUZZARA (RE) - ITALIA
TEL. +39 0522 977365 FAX +39 0522 977015

ORIGINAL EC DECLARATION OF CONFORMITY
2006/42/CE

We

Tigieffe s.r.l. - Via Villa Superiore N.° 82 - Luzzara (Reggio Emilia) - ITALIA

declare under our sole responsibility that the product:

Mobile Elevating Work Platform

Model	Chassis No.	Year
A12 JE	***XXXXXXXXXX***	***XXXXXXXXXX***

To which this declaration refers is in conformity with Directives 2006/42/EC, 2014/30/EC, 2005/88/EC and the model certified by:

Eurofins Product Testing Italy Srl - Via Cuorgné, 21 10156 – Torino – TO (Italia)
Identification No. 0477

with the following certification number:

Certificate No.
XYZ

and with the following standards:

EN 280:2013+A1:2015 EN ISO 12100:2010 EN ISO 60204-1:2018

The signatory of this declaration of conformity is authorised to compile the Technical File.

Luzzara (RE), date

.....
Pignatti Simone
(General Manager)
C/O TIGIEFFE SRL - VIA VILLA SUPERIORE,82 - 42045 LUZZARA (RE) - ITALY

AIRO È UNA DIVISIONE TIGIEFFE SRL - VIA VILLA SUPERIORE, 82 - 42045 LUZZARA (RE) - ITALIA
TEL. +39 0522 977365 FAX +39 0522 977015

ORIGINAL EC DECLARATION OF CONFORMITY 2006/42/CE

We

Tigieffe s.r.l. - Via Villa Superiore N.° 82 - Luzzara (Reggio Emilia) - ITALIA

declare under our sole responsibility that the product:

Mobile Elevating Work Platform

Model	Chassis No.	Year
A15 JE	***XXXXXXXXXX***	***XXXXXXXXXX***

To which this declaration refers is in conformity with Directives 2006/42/EC, 2014/30/EC, 2005/88/EC and the model certified by:

Eurofins Product Testing Italy Srl - Via Cuorgné, 21 10156 – Torino – TO (Italia)
Identification No. 0477

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Certificate No.
XYZ

and with the following standards:

EN 280:2013+A1:2015 EN ISO 12100:2010 EN ISO 60204-1:2018

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Luzzara (RE), date

.....
Pignatti Simone
(General Manager)
C/O TIGIEFFE SRL - VIA VILLA SUPERIORE,82 - 42045 LUZZARA (RE) - ITALY

AIRO È UNA DIVISIONE TIGIEFFE SRL - VIA VILLA SUPERIORE, 82 - 42045 LUZZARA (RE) - ITALIA
TEL. +39 0522 977365 FAX +39 0522 977015

ORIGINAL EC DECLARATION OF CONFORMITY 2006/42/CE

We

Tigieffe s.r.l. - Via Villa Superiore N.° 82 - Luzzara (Reggio Emilia) - ITALIA

declare under our sole responsibility that the product:

Mobile Elevating Work Platform

Model	Chassis No.	Year
A12 JED	***XXXXXXXXXX***	***XXXXXXXXXX***

To which this declaration refers is in conformity with Directives 2006/42/EC, 2014/30/EC, 2005/88/EC and the model certified by:

Eurofins Product Testing Italy Srl - Via Cuorgné, 21 10156 – Torino – TO (Italia)
Identification No. 0477

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Luzzara (RE), date

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Pignatti Simone
(General Manager)
C/O TIGIEFFE SRL - VIA VILLA SUPERIORE,82 - 42045 LUZZARA (RE) - ITALY

AIRO È UNA DIVISIONE TIGIEFFE SRL - VIA VILLA SUPERIORE, 82 - 42045 LUZZARA (RE) - ITALIA
TEL. +39 0522 977365 FAX +39 0522 977015

ORIGINAL EC DECLARATION OF CONFORMITY 2006/42/CE

We

Tigieffe s.r.l. - Via Villa Superiore N.° 82 - Luzzara (Reggio Emilia) - ITALIA

declare under our sole responsibility that the product:

Mobile Elevating Work Platform

Model	Chassis No.	Year
A15 JED	***XXXXXXXXXX***	***XXXXXXXXXX***

To which this declaration refers is in conformity with Directives 2006/42/EC, 2014/30/EC, 2005/88/EC and the model certified by:

Eurofins Product Testing Italy Srl - Via Cuorgné, 21 10156 – Torino – TO (Italia)
Identification No. 0477

with the following certification number:

Certificate No.
XYZ

and with the following standards:

EN 280:2013+A1:2015 EN ISO 12100:2010 EN ISO 60204-1:2018

The signatory of this declaration of conformity is authorised to compile the Technical File.

Luzzara (RE), date

.....
Pignatti Simone
(General Manager)
C/O TIGIEFFE SRL - VIA VILLA SUPERIORE,82 - 42045 LUZZARA (RE) - ITALY

AIRO È UNA DIVISIONE TIGIEFFE SRL - VIA VILLA SUPERIORE, 82 - 42045 LUZZARA (RE) - ITALIA
TEL. +39 0522 977365 FAX +39 0522 977015

ORIGINAL EC DECLARATION OF CONFORMITY 2006/42/CE

We

Tigieffe s.r.l. - Via Villa Superiore N.° 82 - Luzzara (Reggio Emilia) - ITALIA

we declare under our sole responsibility that the product:

Mobile Elevating Work Platform

Model	Chassis No.	Year
A17 JE	***XXXXXXXXXX***	***XXXXXXXXXX***

To which this declaration refers is in conformity with Directives 2006/42/EC, 2014/30/EC, 2005/88/EC and the model certified by:

Eurofins Product Testing Italy Srl - Via Cuorgné, 21 10156 – Torino – TO (Italia)
Identification No. 0477

with the following certification number:

Certificate No.
XYZ

and with the following standards:

EN 280:2013+A1:2015 EN ISO 12100:2010 EN ISO 60204-1:2018

The signatory of this declaration of conformity is authorised to compile the Technical File.

Luzzara (RE), date

.....
Pignatti Simone
(General Manager)
C/O TIGIEFFE SRL - VIA VILLA SUPERIORE,82 - 42045 LUZZARA (RE) - ITALY

TIGIEFFE S.r.l. a socio unico
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WEB: www.airo.com – e-mail: info@airo.com