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
A16 J A18 J

USE AND MAINTENANCE MANUAL
- ENGLISH - ORIGINAL INSTRUCTIONS

AIRO is a division of TIGIEFFE SRL
Via Villa Superiore, 82 - 42045 Luzzara (RE) ITALY-
☏ +39-0522-977365 - 🖷 +39-0522-977015
WEB: www.airo.com

Revision date	Description of revision
2010-01	• Update due to new machine directive 2006/42/EC. • Model names updated.
2010-11	• Biodegradable oil instructions introduced • Temperatures and oil list updated.
2011-05	• Amended information on “Commissioning and first inspection, subsequent inspections and title transfer report”. • Inserted “Total quantity of battery electrolyte” in Technical Data (added optional batteries in ED). • Corrected "Max. power" diesel engine and inserted "Adjusted Power".
2011-08	• Changed the second part of the manual, with updated diagrams for 48V-12V converter change in systems JE to JED.
2012-09	• Removed parking brakes in electric and electro-diesel versions: changed descriptions and hydraulic diagram.
2013-10	• Specified instructions for harness anchoring points.
2014-09	• Inserted information on maximum limits of manual forces. • Changed Name and Surname of CEO.
2015-01	• CE Conformity Declaration Updated. • Hand Position Instructions Added.
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”. • Updated operating system on the charger and overload in platform.
2017-01	• Added description of new overload controller.
2019-06	• Added “AIRO SENTINEL” secondary safety system description.
2019-07	• Updated procedure description of commissioning declaration in Italy.
2020-01	• Updated normative references and certifying body.

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 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 new owner of the Aerial Platform 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 elevating work 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 motorized to allow the machine to move even when the platform is lifted (see "Use instructions"). The machines can be delivered with the following drive and steering features:

- two driving wheels and two steering idle wheels;
- Four driving wheels, of which two steering and two fixed.

Furthermore, to all the above combinations, it is possible to associate, optionally, a self-locking oscillating axle.
All wheels are equipped with hydraulic parking brakes, positive logic type (when drive controls are released brakes are automatically activated).
The turret rests on a turntable fixed to the chassis and can be oriented (rotated) by 360° 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 the terminal boom named "Jib".

Such lifting structures are driven by 4 double-acting hydraulic cylinders:

- One cylinder for the "pantograph" extension.
- One cylinder for the boom extension.
- One cylinder for the extension/retraction of the telescopic boom.
- One cylinder for the "jib" extension.

The hydraulic cylinders which move the articulated structure (except for the boom tilt sensor cylinder) are provided with over-centre 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 boom "jib", can be rotated by 140° totally (70° on the right and 70° on the left) by means of a rotary actuator fitted with over-centre valve. It is fitted with guardrails and toe boards of prescribed height (the guardrails height ≥ 1100 mm; the toe boards height ≥150 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 completely 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:

- An electric-hydraulic system composed of rechargeable accumulators and electric pump.
- A heat engine (Diesel engine models are identified by the abbreviation "D"; petrol engine models are identified by the abbreviation "B").
- a dual-powered electric/thermic system (dual-powered Electric/Diesel models are identified by the abbreviation "ED"; dual-powered Electric/Petrol models are identified by the abbreviation "EB").

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.

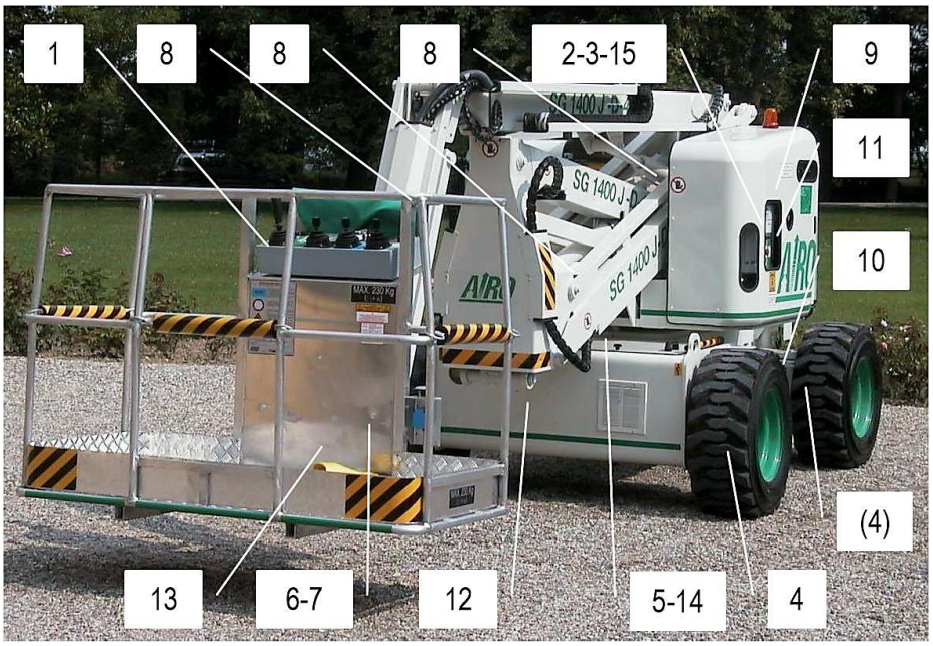


Fig. 2

1) Control panel
2) Electric control unit
3) Hydraulic control unit
4) Hydraulic drive motors
5) Turret rotation hydraulic motor
6) 230V plug (optional)
7) Spirit level (optional) for visual check of machine levelling
8) Lifting cylinders
9) Battery
10) Power assisted steering
11) Inclinometer
12) Heat engine fuel tank
13) Load limiter
14) Turntable
15) Control device for electric system isolation (electric machines "E" and electro/diesel "ED" only).

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 A16 JE

		A16 JE	
Dimensions:			
	Maximum working height	16	m
	Max. platform height	14	m
	Ground clearance	290	mm
	Max. outreach from turntable centre	8.1	m
	Turret rotation (not continuous)	360	°
	Platform rotation	140	°
	Platform height for safety speed activation	< 3	m
	Internal steering radius	1.15	m
	External steering radius	3.6	m
	Maximum capacity (m)	230	Kg
	Max. number of people on the platform (n) – indoors	2	
	Tool and material weight (me) (**) – indoors	70	Kg
	Max. number of people on the platform (n) – outdoors	2	
	Tool and material weight (me) ** – outdoors	70	Kg
	Maximum drive height	Max	
	Maximum dimensions of platform	0.8 x 1.7	m
	Max. hydraulic pressure	230	bar
	Max. pressure of lifting circuit	230	bar
	Min. pressure of braking circuit	50 ÷ 60	bar
	Tyre dimensions (****)	Ø 730 x 230	mm
	Tyre type (****)	250 - 15	
	Transport dimensions	5.5 x 1.765 x 1.985	m
	Transport dimensions with retracted jib	N.A.	m
	Machine weight (unloaded) (*)	7300	Kg
Stability limit:			
	Longitudinal slope	3	°
	Transversal slope	3	°
	Maximum wind speed (***)	12.5	m/s
	Maximum manual force:	400	N
	Max. load per wheel	3200	Kg
Performance:			
	Drive wheels	2	
	Max. drive speed	4	km/h
	Safety drive speed	0.7	km/h
	Oil tank capacity	104	Lt.
	Gradeability	25	%
	Max. operating temperature	+50	°C
	Min. operating temperature	-15	°C

Battery power:			
	Battery capacity and voltage	2 x 24 / 450	V/Ah
	Total electrolyte quantity	2 x 84	Lt.
	Battery weight	2 x 400	Kg
	Single-phase battery charger (HF)	48 / 45	V/A
	Max. current absorbed by the battery charger	15	A
	Max. installed power	9	kW
	Electric pump power 1	4.5	kW
	Max. absorbed current	160	A
	Electric pump power 2	4.5	kW
	Max. absorbed current	160	A
	Electric pump power 3	NA	kW
	Max. absorbed current	NA	A
Diesel drive power			
	Diesel engine type	NA	
	Motor power	NA	kW
	Starter battery	NA	V/Ah
	Diesel oil tank capacity	NA	Lt.
	Max. drive speed	NA	km/h
380V three-phase electrical pump (optional)			
	Motor power	NA	kW
	Max. absorbed current	NA	A
	Max. drive speed	NA	km/h
230V single-phase electric pump (optional)			
	Motor power	NA	kW
	Max. absorbed current	NA	A
	Max. drive speed	NA	km/h

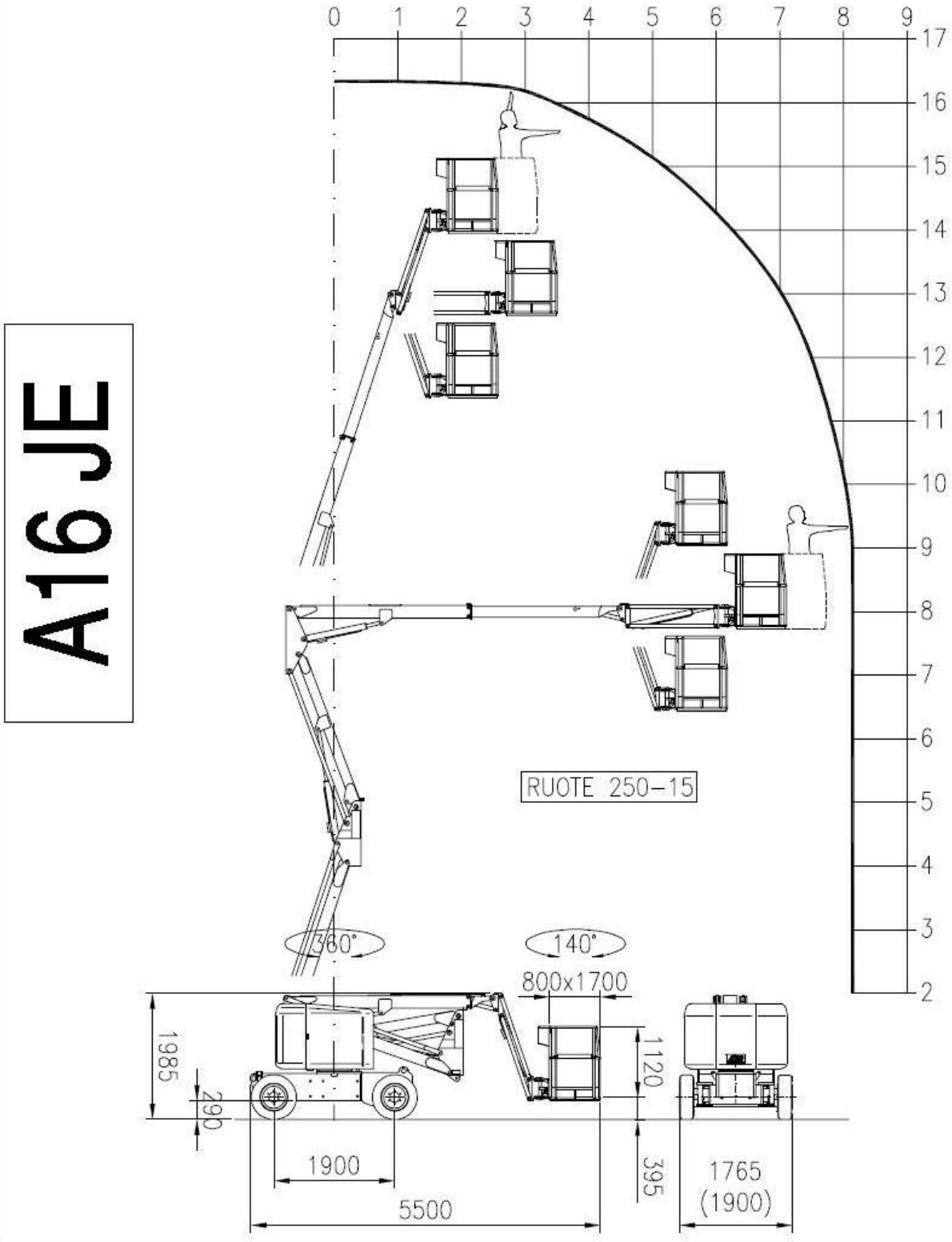
(*) In some cases different limits can be fixed. It is recommended to comply with the data shown on the machine plate.

(**) me = m – (n x 80)

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

(****) Standard Extra flexible tyres 250-15; Optional rough terrain tyres 10x16,5 filled with polyurethane foam; Optional rough terrain tyres 12x16,5 filled with polyurethane foam.

A16 JE


0 1 2 3 4 5 6 7 8 9
17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2
RUOTE 250–15
360°
140°
800x1700
1985
290
1900
5500
1120
395
1765
(1900)

2.2. Model A16 JED

		A16 JED	
Dimensions:			
	Maximum working height	16	m
	Max. platform height	14	m
	Ground clearance	290	mm
	Max. outreach from turntable centre	8.1	m
	Turret rotation (not continuous)	360	°
	Platform rotation	140	°
	Platform height for safety speed activation	< 3	m
	Internal steering radius	1.15	m
	External steering radius	3.6	m
	Maximum capacity (m)	230	Kg
	Max. number of people on the platform (n) – indoors	2	
	Tool and material weight (me) (**) – indoors	70	Kg
	Max. number of people on the platform (n) – outdoors	2	
	Tool and material weight (me) ** – outdoors	70	Kg
	Maximum drive height	Max	
	Maximum dimensions of platform	0.8 x 1.7	m
	Max. hydraulic pressure	230	bar
	Max. pressure of lifting circuit	230	bar
	Min. pressure of braking circuit	50 ÷ 60	bar
	Tyre dimensions (****)	Ø 730 x 230	mm
	Tyre type (****)	250 - 15	
	Transport dimensions	5.5 x 1.765 x 1.985	m
	Transport dimensions with retracted jib	N.A.	m
	Machine weight (unloaded) (*)	7600	Kg
Stability limit:			
	Longitudinal slope	3	°
	Transversal slope	3	°
	Maximum wind speed (***)	12.5	m/s
	Maximum manual force:	400	N
	Max. load per wheel	3200	Kg
Performance:			
	Drive wheels	2	
	Max. drive speed	4	km/h
	Safety drive speed	0.7	km/h
	Oil tank capacity	104	Lt.
	Gradeability	25	%
	Max. operating temperature	+50	°C
	Min. operating temperature	-15	°C
Battery power:			
	Standard battery capacity and voltage	2 x 24 / 350	V/Ah
	Total electrolyte quantity of standard battery	2 x 70	Lt.
	Standard battery weight	2 x 350	Kg
	Optional battery capacity and voltage	2 x 24 / 420	V/Ah
	Total electrolyte quantity of optional battery	2 x 95	Lt.
	Optional battery weight	2 x 355	Kg
	Single-phase battery charger (HF)	48 / 45	V/A
	Max. current absorbed by the battery charger	15	A
	Max. installed power	9	kW
	Electric pump power 1	4.5	kW
	Max. absorbed current	160	A
	Electric pump power 2	4.5	kW
	Max. absorbed current	160	A
	Electric pump power 3	NA	kW
	Max. absorbed current	NA	A

Diesel drive power			
	Diesel engine type	HATZ 1D81C	
	Max. motor power	9.6	kW
	Adjusted Power	9.6	kW
	Starter battery	12 / 132	V/Ah
	Total electrolyte quantity	7	Lt.
	Diesel oil tank capacity	20	Lt.
	Max. drive speed	4	km/h
380V three-phase electrical pump (optional)			
	Motor power	NA	kW
	Max. absorbed current	NA	A
	Max. drive speed	NA	km/h
230V single-phase electric pump (optional)			
	Motor power	NA	kW
	Max. absorbed current	NA	A
	Max. drive speed	NA	km/h

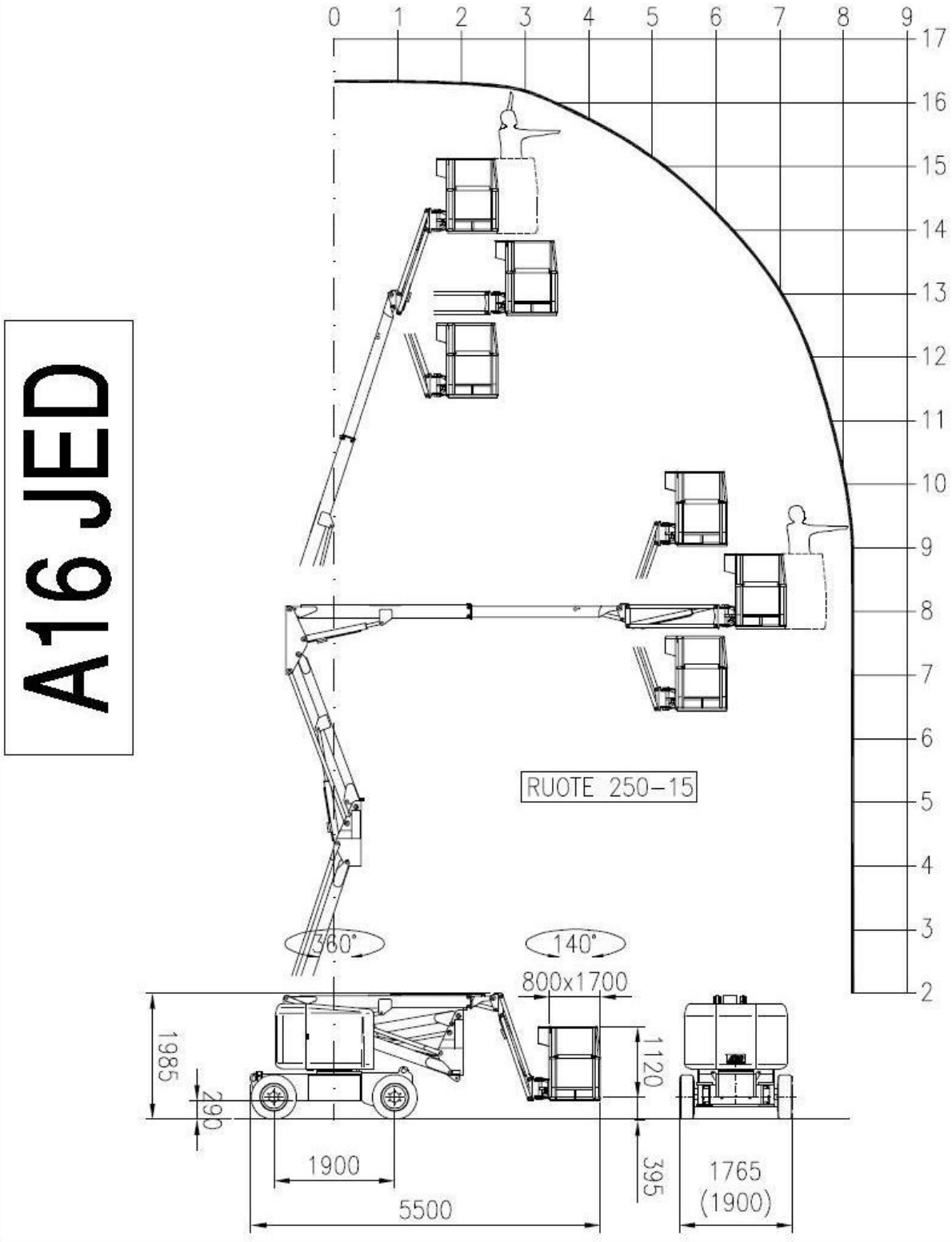
(*) In some cases different limits can be fixed. It is recommended to comply with the data shown on the machine plate.

(**) me = m – (n x 80)

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

(****) Standard Extra flexible tyres 250-15; Optional rough terrain tyres 10x16,5 filled with polyurethane foam; Optional rough terrain tyres 12x16,5 filled with polyurethane foam.

A16 JED


0 1 2 3 4 5 6 7 8 9
17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2
RUOTE 250–15
360°
140°
800x1700
1985
290
1900
5500
1120
395
1765
(1900)

2.3. Model A16 JRTD

		A16 JRTD	
Dimensions:			
	Maximum working height	16	m
	Max. platform height	14	m
	Ground clearance	350	mm
	Max. outreach from turntable centre	8.1	m
	Turret rotation (not continuous)	360	°
	Platform rotation	140	°
	Platform height for safety speed activation	< 3	m
	Internal steering radius	1.15	m
	External steering radius	3.6	m
	Maximum capacity (m)	230	Kg
	Max. number of people on the platform (n) – indoors	2	
	Tool and material weight (me) (**) – indoors	70	Kg
	Max. number of people on the platform (n) – outdoors	2	
	Tool and material weight (me) ** – outdoors	70	Kg
	Maximum drive height	Max	
	Maximum dimensions of platform	0.8 x 1.7	m
	Max. hydraulic pressure	230	bar
	Max. pressure of lifting circuit	230	bar
	Min. pressure of braking circuit	50 ÷ 60	bar
	Tyre dimensions	Ø 800 x 320	mm
	Type of tyres	12 x 16.5	
	Transport dimensions	5.5 x 2 x 2.05	m
	Transport dimensions with retracted jib	N.A.	m
	Machine weight (unloaded) (*)	7160	Kg
Stability limit:			
	Longitudinal slope	4	°
	Transversal slope	4	°
	Maximum wind speed (***)	12.5	m/s
	Maximum manual force:	400	N
	Max. load per wheel	3200	Kg
Performance:			
	Drive wheels	4	
	Max. drive speed	4.7	km/h
	Safety drive speed	0.7	km/h
	Oil tank capacity	104	Lt.
	Gradeability	40	%
	Max. operating temperature	+50	°C
	Min. operating temperature	-15	°C
Battery power:			
	Battery capacity and voltage	NA	V/Ah
	Battery weight	NA	Kg
	Single-phase battery charger (HF)	NA	V/A
	Max. current absorbed by the battery charger	NA	A
	Max. installed power	NA	kW
	Electric pump power 1	NA	kW
	Max. absorbed current	NA	A
	Electric pump power 2	NA	kW
	Max. absorbed current	NA	A
	Electric pump power 3	NA	kW
	Max. absorbed current	NA	A

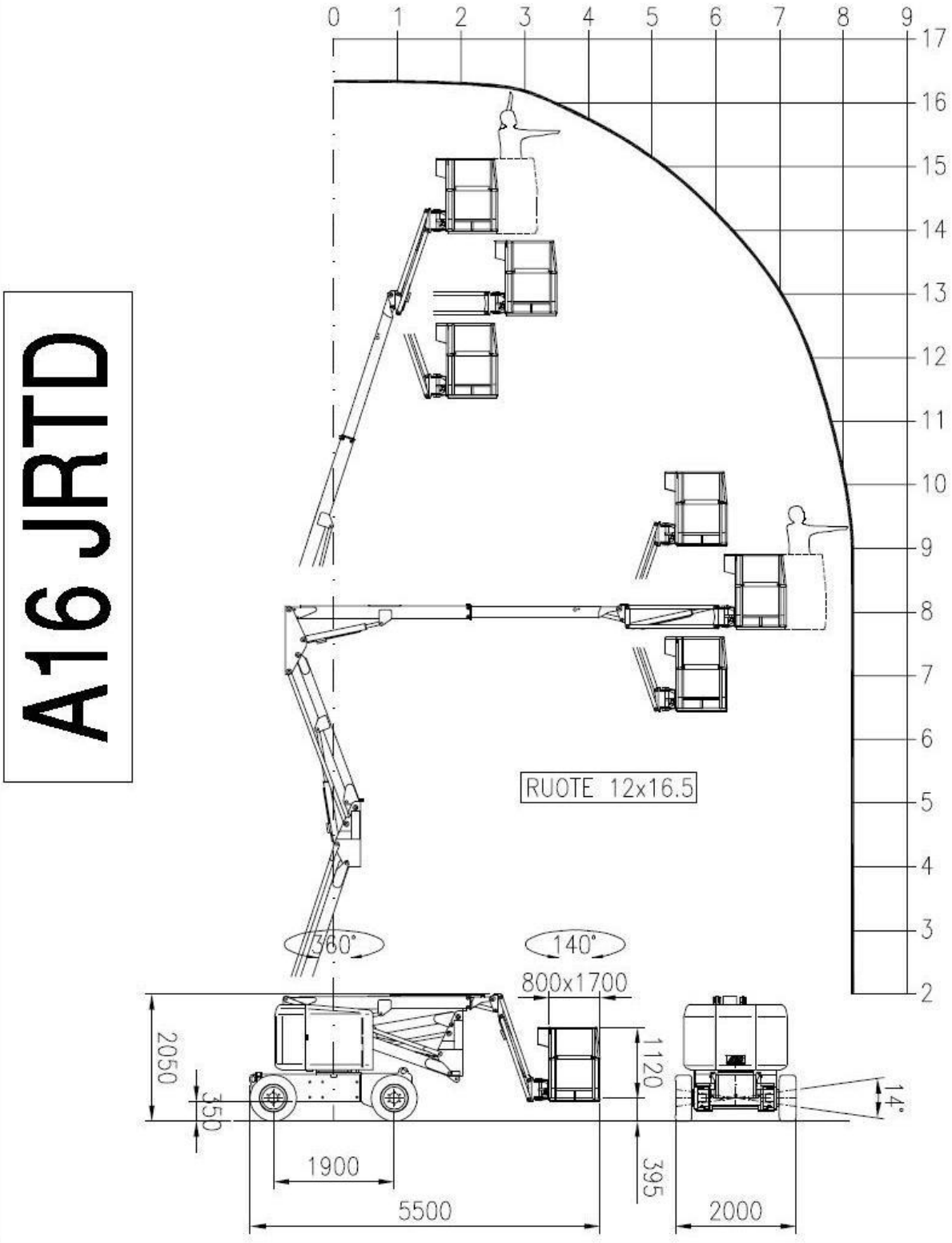
Diesel Power HATZ			
	Diesel engine type	HATZ 3L41C	
	Max. motor power	38.8	kW
	Adjusted Power	35.5	kW
	Starter battery	12 / 132	V/Ah
	Total electrolyte quantity	7	Lt.
	Diesel oil tank capacity	45	Lt.
Diesel Power ISUZU			
	Diesel engine type	ISUZU 4LE1	
	Max. motor power	39	kW
	Adjusted Power	35	kW
	Starter battery	12 / 132	V/Ah
	Total electrolyte quantity	7	Lt.
	Diesel oil tank capacity	45	Lt.
380V three-phase electrical pump (optional)			
	Motor power	NA	kW
	Max. absorbed current	NA	A
	Max. drive speed	NA	km/h
230V single-phase electric pump (optional)			
	Motor power	2.2	kW
	Max. absorbed current	13.9	A
	Max. drive speed	NA	km/h

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

(**) me = m – (n x 80)

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

A16 JRTD


0 1 2 3 4 5 6 7 8 9
17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2
RUOTE 12x16.5
360°
140°
800x1700
2050
350
1900
5500
1120
395
2000
14°

2.4. Model A18 JE

		A18 JE	
Dimensions:			
	Maximum working height	17.8	m
	Max. platform height	15.8	m
	Ground clearance	290	mm
	Max. outreach from turntable centre	9.9	m
	Turret rotation (not continuous)	360	°
	Platform rotation	140	°
	Platform height for safety speed activation	< 3	m
	Internal steering radius	1.15	m
	External steering radius	3.6	m
	Maximum capacity (m)	230	Kg
	Max. number of people on the platform (n) – indoors	2	
	Tool and material weight (me) (**) – indoors	70	Kg
	Max. number of people on the platform (n) – outdoors	2	
	Tool and material weight (me) ** – outdoors	70	Kg
	Maximum drive height	Max	
	Maximum dimensions of platform	0.8 x 1.7	m
	Max. hydraulic pressure	230	bar
	Max. pressure of lifting circuit	230	bar
	Min. pressure of braking circuit	50 ÷ 60	bar
	Tyre dimensions (****)	Ø 730 x 230	mm
	Tyre type (****)	250 - 15	
	Transport dimensions	6.47 x 1.765 x 1.985	m
	Transport dimensions with retracted jib	N.A.	m
	Machine weight (unloaded) (*)	8250	Kg
Stability limit:			
	Longitudinal slope	3	°
	Transversal slope	3	°
	Maximum wind speed (***)	12.5	m/s
	Maximum manual force:	400	N
	Max. load per wheel	3500	Kg
Performance:			
	Drive wheels	2	
	Max. drive speed	4	km/h
	Safety drive speed	0.7	km/h
	Oil tank capacity	104	Lt.
	Gradeability	25	%
	Max. operating temperature	+50	°C
	Min. operating temperature	-15	°C
Battery power:			
	Battery capacity and voltage	2 x 24 / 450	V/Ah
	Total electrolyte quantity	2 x 84	Lt.
	Battery weight	2 x 400	Kg
	Single-phase battery charger (HF)	48 / 45	V/A
	Max. current absorbed by the battery charger	15	A
	Max. installed power	9	kW
	Electric pump power 1	4.5	kW
	Max. absorbed current	160	A
	Electric pump power 2	4.5	kW
	Max. absorbed current	160	A
	Electric pump power 3	NA	kW
	Max. absorbed current	NA	A

Diesel drive power			
	Diesel engine type	NA	
	Motor power	NA	kW
	Starter battery	NA	V/Ah
	Diesel oil tank capacity	NA	Lt.
	Max. drive speed	NA	km/h
380V three-phase electrical pump (optional)			
	Motor power	NA	kW
	Max. absorbed current	NA	A
	Max. drive speed	NA	km/h
230V single-phase electric pump (optional)			
	Motor power	NA	kW
	Max. absorbed current	NA	A
	Max. drive speed	NA	km/h

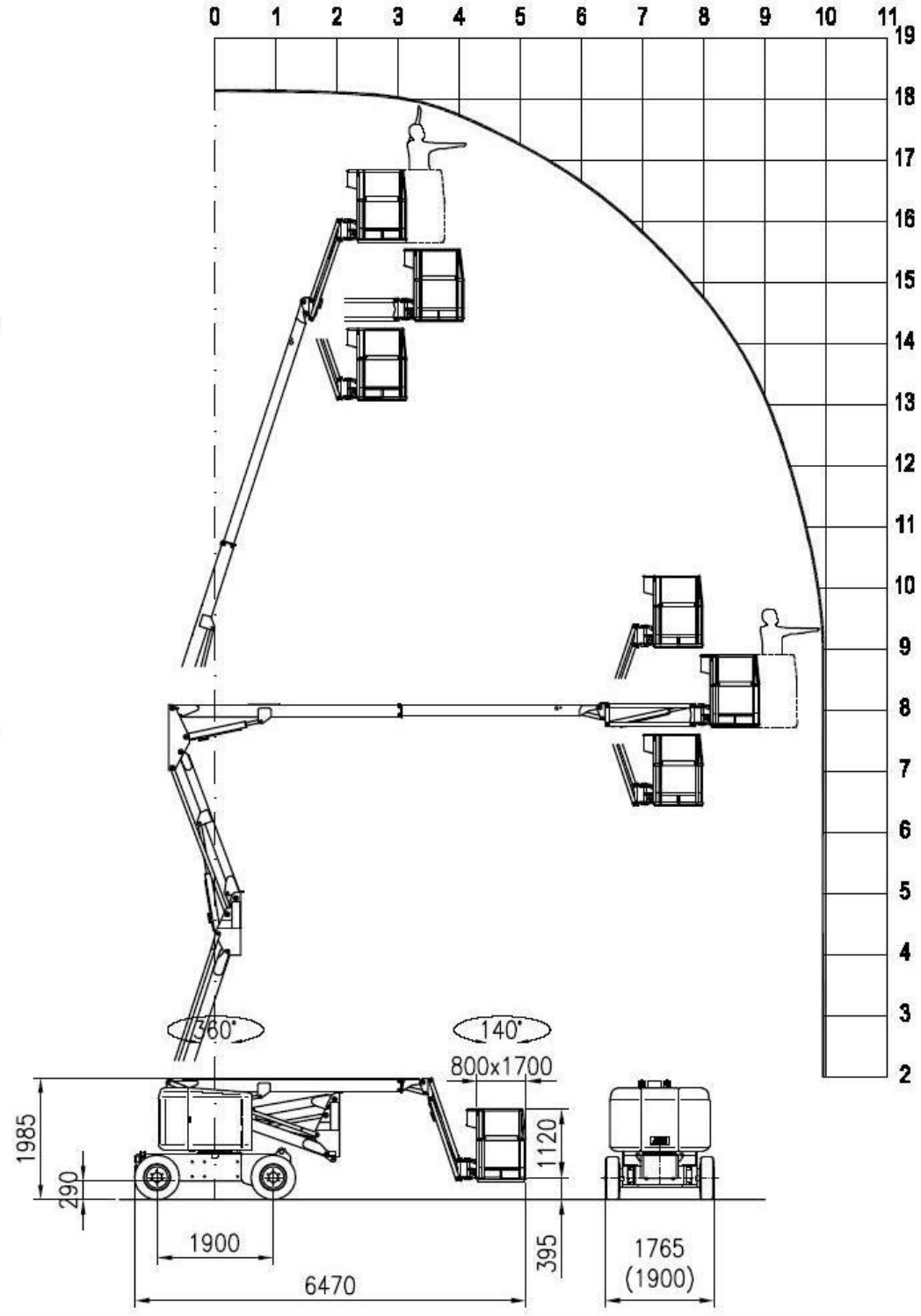
(*) In some cases different limits can be fixed. It is recommended to comply with the data shown on the machine plate.

(**) me = m – (n x 80)

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

(****) Standard Extra flexible tyres 250-15; Optional rough terrain tyres 10x16,5 filled with polyurethane foam; Optional rough terrain tyres 12x16,5 filled with polyurethane foam.

A18 JE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360°
140°
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290
1120
395
1900
6470
1765
(1900)

2.5. Model A18 JED

		A18 JED	
Dimensions:			
	Maximum working height	17.8	m
	Max. platform height	15.8	m
	Ground clearance	290	mm
	Max. outreach from turntable centre	9.9	m
	Turret rotation (not continuous)	360	°
	Platform rotation	140	°
	Platform height for safety speed activation	< 3	m
	Internal steering radius	1.15	m
	External steering radius	3.6	m
	Maximum capacity (m)	230	Kg
	Max. number of people on the platform (n) – indoors	2	
	Tool and material weight (me) (**) – indoors	70	Kg
	Max. number of people on the platform (n) – outdoors	2	
	Tool and material weight (me) ** – outdoors	70	Kg
	Maximum drive height	Max	
	Maximum dimensions of platform	0.8 x 1.7	m
	Max. hydraulic pressure	230	bar
	Max. pressure of lifting circuit	230	bar
	Min. pressure of braking circuit	50 ÷ 60	bar
	Tyre dimensions (****)	Ø 730 x 230	mm
	Tyre type (****)	250 - 15	
	Transport dimensions	6.47 x 1.765 x 1.985	m
	Transport dimensions with retracted jib	N.A.	m
	Machine weight (unloaded) (*)	8140	Kg
Stability limit:			
	Longitudinal slope	3	°
	Transversal slope	3	°
	Maximum wind speed (***)	12.5	m/s
	Maximum manual force:	400	N
	Max. load per wheel	3500	Kg
Performance:			
	Drive wheels	2	
	Max. drive speed	4	km/h
	Safety drive speed	0.7	km/h
	Oil tank capacity	104	Lt.
	Gradeability	25	%
	Max. operating temperature	+50	°C
	Min. operating temperature	-15	°C
Battery power:			
	Standard battery capacity and voltage	2 x 24 / 350	V/Ah
	Total electrolyte quantity of standard battery	2 x 70	Lt.
	Standard battery weight	2 x 350	Kg
	Optional battery capacity and voltage	2 x 24 / 420	V/Ah
	Total electrolyte quantity of optional battery	2 x 95	Lt.
	Optional battery weight	2 x 355	Kg
	Single-phase battery charger (HF)	48 / 45	V/A
	Max. current absorbed by the battery charger	15	A
	Max. installed power	9	kW
	Electric pump power 1	4.5	kW
	Max. absorbed current	160	A
	Electric pump power 2	4.5	kW
	Max. absorbed current	160	A
	Electric pump power 3	NA	kW
	Max. absorbed current	NA	A

Diesel drive power			
	Diesel engine type	HATZ 1D81C	
	Max. motor power	9.6	kW
	Adjusted Power	9.6	kW
	Starter battery	12 / 132	V/Ah
	Total electrolyte quantity	7	Lt.
	Diesel oil tank capacity	20	Lt.
	Max. drive speed	4	km/h
380V three-phase electrical pump (optional)			
	Motor power	NA	kW
	Max. absorbed current	NA	A
	Max. drive speed	NA	km/h
230V single-phase electric pump (optional)			
	Motor power	NA	kW
	Max. absorbed current	NA	A
	Max. drive speed	NA	km/h

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

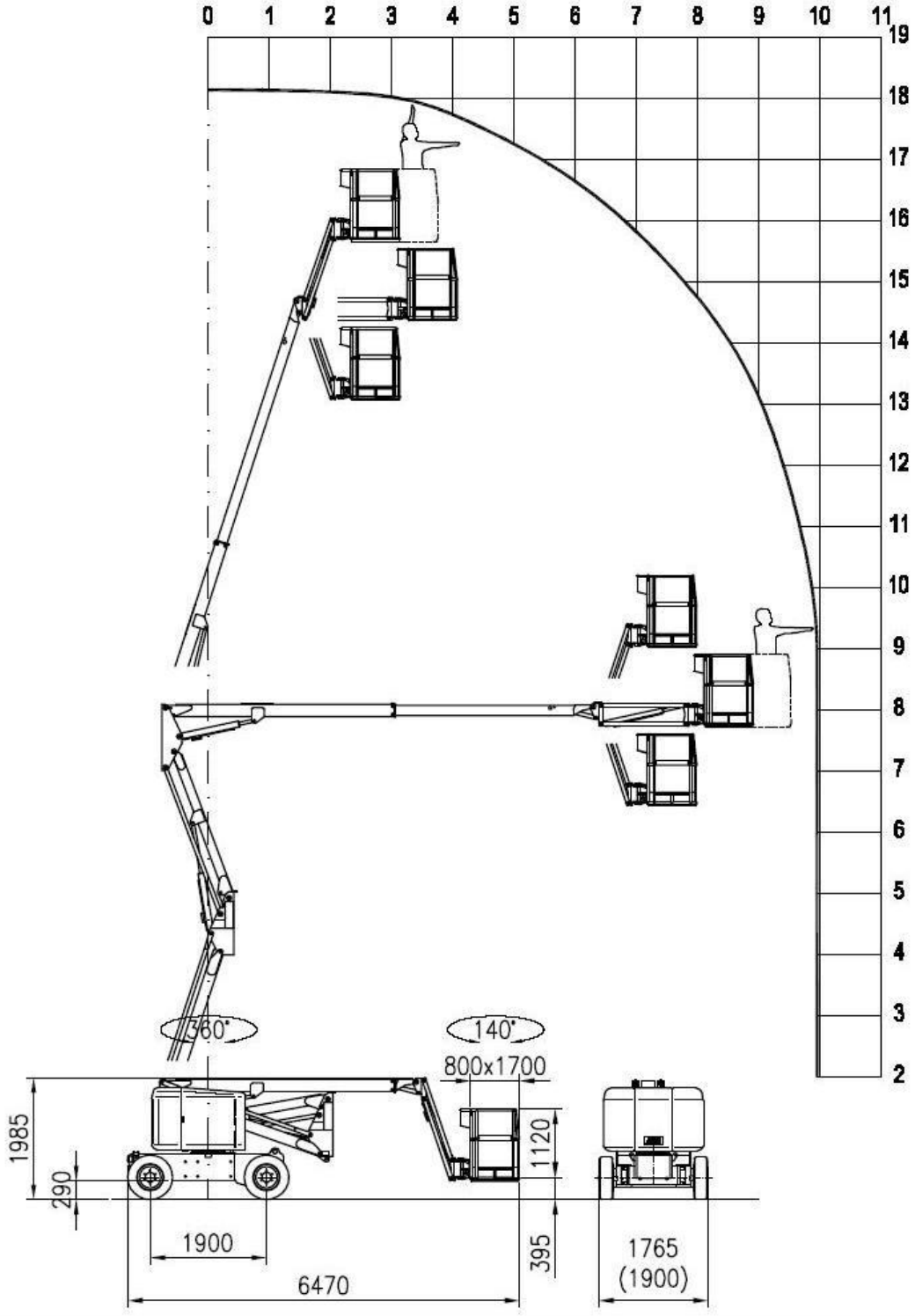
(**) me = m – (n x 80)

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

(****) Standard Extra flexible tyres 250-15; Optional rough terrain tyres 10x16,5 filled with polyurethane foam; Optional rough terrain tyres 12x16,5 filled with polyurethane foam.

(*****) Standard batteries 48V 350Ah; Optional batteries 48V 455Ah.

A18 JED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19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2
360°
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1985
290
1120
395
1900
6470
1765
(1900)

2.6. Model A18 JRTD

		A18 JRTD	
Dimensions:			
	Maximum working height	17.8	m
	Max. platform height	15.8	m
	Ground clearance	350	mm
	Max. outreach from turntable centre	9.9	m
	Turret rotation (not continuous)	360	°
	Platform rotation	140	°
	Platform height for safety speed activation	< 3	m
	Internal steering radius	1.15	m
	External steering radius	3.6	m
	Maximum capacity (m)	230	Kg
	Max. number of people on the platform (n) – indoors	2	
	Tool and material weight (me) (**) – indoors	70	Kg
	Max. number of people on the platform (n) – outdoors	2	
	Tool and material weight (me) ** – outdoors	70	Kg
	Maximum drive height	Max	
	Maximum dimensions of platform	0.8 x 1.7	m
	Max. hydraulic pressure	230	bar
	Max. pressure of lifting circuit	230	bar
	Min. pressure of braking circuit	50 ÷ 60	bar
	Tyre dimensions	Ø 800 x 320	mm
	Type of tyres	12 x 16.5	
	Transport dimensions	6.74 x 2 x 2.05	m
	Transport dimensions with retracted jib	N.A.	m
	Machine weight (unloaded) (*)	8100	Kg
Stability limit:			
	Longitudinal slope	4	°
	Transversal slope	4	°
	Maximum wind speed (***)	12.5	m/s
	Maximum manual force:	400	N
	Max. load per wheel	3500	Kg
Performance:			
	Drive wheels	4	
	Max. drive speed	4.7	km/h
	Safety drive speed	0.7	km/h
	Oil tank capacity	104	Lt.
	Gradeability	40	%
	Max. operating temperature	+50	°C
	Min. operating temperature	-15	°C
Battery power:			
	Battery capacity and voltage	NA	V/Ah
	Battery weight	NA	Kg
	Single-phase battery charger (HF)	NA	V/A
	Max. current absorbed by the battery charger	NA	A
	Max. installed power	NA	kW
	Electric pump power 1	NA	kW
	Max. absorbed current	NA	A
	Electric pump power 2	NA	kW
	Max. absorbed current	NA	A
	Electric pump power 3	NA	kW
	Max. absorbed current	NA	A

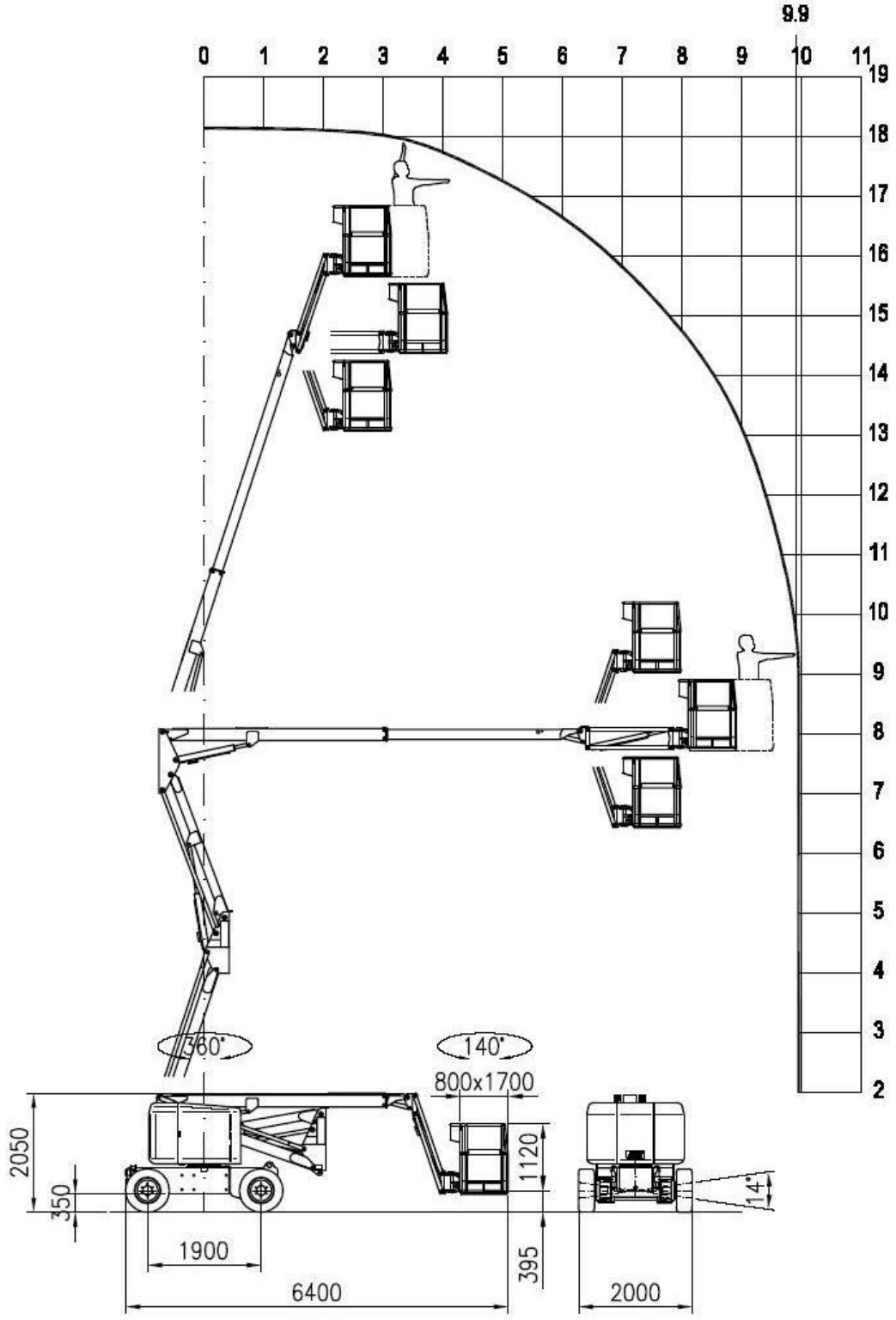
Diesel Power HATZ			
	Diesel engine type	HATZ 3L41C	
	Max. motor power	38.8	kW
	Adjusted Power	35.5	kW
	Starter battery	12 / 132	V/Ah
	Total electrolyte quantity	7	Lt.
	Diesel oil tank capacity	45	Lt.
Diesel Power ISUZU			
	Diesel engine type	ISUZU 4LE1	
	Max. motor power	39	kW
	Adjusted Power	35	kW
	Starter battery	12 / 132	V/Ah
	Total electrolyte quantity	7	Lt.
	Diesel oil tank capacity	45	Lt.
380V three-phase electrical pump (optional)			
	Motor power	NA	kW
	Max. absorbed current	NA	A
	Max. drive speed	NA	km/h
230V single-phase electric pump (optional)			
	Motor power	2.2	kW
	Max. absorbed current	13.9	A
	Max. drive speed	NA	km/h

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

(**) me = m – (n x 80)

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

A18 JRTD


9.9
0 1 2 3 4 5 6 7 8 9 10 11
19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2
360°
140°
800x1700
2050
350
1120
14°
1900
6400
395
2000

2.7. 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 Diesel engine models, 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 78dB(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. If the audible alarm and the red light on the platform control panel turn on, the machine is not correctly positioned (see paragraphs relevant to “Use instructions”). It is necessary to bring it to safety 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 are equipped with a device controlling the electric system isolation. In case of isolation loss or remote switch fault, such device (located on the chassis or on the turret – see paragraph "Location of main components") brings the machine to a complete halt and signals the fault by means of a continuous hissing sound.
- Electric-powered machines feature a device for checking the state of battery charge (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.
- Do not use the thermic drive power (Diesel or Petrol engine) indoors or in insufficiently ventilated areas.
- 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.

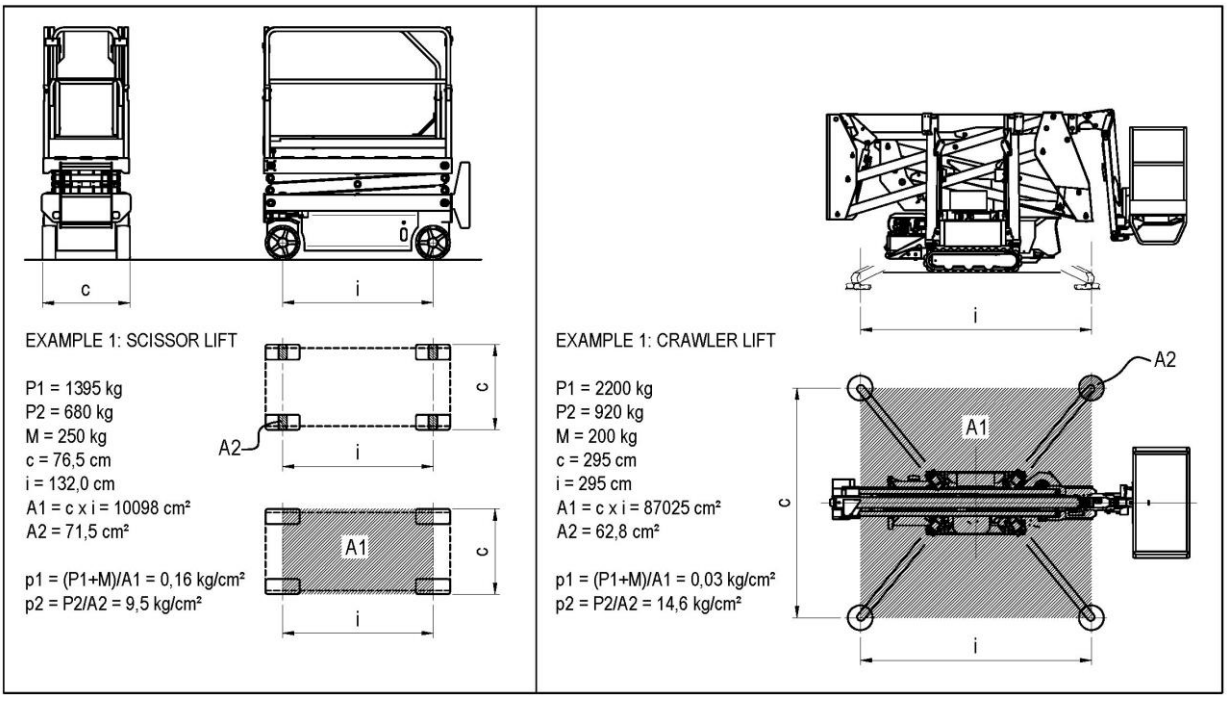
The machines for which the max. wind limit is 0 m/s must be used indoors only. These machines cannot be used outdoors even with no wind.

Beaufort scale	Wind speed (km/h)	Wind speed (m/s)	Wind Rating	Sea/ocean conditions	Land conditions
0	0	<0.28	Flat	Calm.	Smoke rises vertically.
1	1-6	0.28–1.7	Light air	Ripples without crests. No white crest generation.	Wind direction detected by smoke direction
2	7-11	1.7-3	Light breeze	Tiny, short but visible wavelets. No breaking water waves, crests foam with glassy appearance.	Wind perception on bare skin. The leaves rustle.
3	12-19	3-5.3	Gentle breeze	Water waves start to break: the crest foam looks glassy. "Whitecaps" of bubbles and streaks on breaking crests.	Leaves and small twigs constantly moving.
4	20-29	5.3-8	Moderate breeze	Small waves becoming longer. Numerous whitecaps.	Dust, leaves, and loose paper lifted. Small tree branches move.
5	30-39	8.3-10.8	Fresh breeze	Moderate waves taking longer form. many whitecaps, some spray.	Small trees in leaf begin to sway, small waves start to form on inland waters.
6	40-50	10.8-13.9	Strong breeze	Long waves begin to form. White foam crests are very frequent. Some sprays.	Whole trees in motion. Difficulties in keeping an umbrella.
7	51-62	13.9-17.2	High wind	Sea heaps up with moderately high waves of greater length. The edges of crests begin to break into spindrift, foam blown in streaks in the same wind direction.	Larger tree branches moving, whistling in wires Strong resistance felt walking against wind.
8	63-75	17.2-20.9	Gale	High waves, Sea begins to roll, dense streaks of foam, spray may reduce visibility	Twigs breaking off trees, generally impedes progress Walking against the wind is impossible.
9	76-87	20.9-24.2	Whole gale	Very high, heavy rolling waves. Foam blown into thicker streaks.	Slight structural damage occurs (slate blows off roofs).
10	88-102	24.2-28.4	Storm	Very high waves with overhanging crests, Sea white with densely blown foam, the water has a white appearance. Heavy rolling, and reduced visibility.	Trees broken or uprooted. Considerable structural damage.
11	103-117	28.4-32.5	Strong storm	Exceptionally high waves hiding average size vessels from the sight. Foam patches cover sea, Air filled with foam, completely white with driving spray, visibility greatly reduced.	Heavy structural damage.
12	>117	>32.5	Hurricane	Exceptionally high waves, sea completely white with driving spray.	Heavy structural damage.

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 WHEELS BASE.	A1 = c × i
c	cm	Track	Cross width of machine measured outside the wheels. or: Cross width of machine measured between levelling stabilizer centres.	-
i	cm	Wheel base	Longitudinal length of machine measured between wheel centres. or: Longitudinal length of machine measured between levelling stabilizer 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-tension 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, with injury 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 welding of lifting structure).
- 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

The control panel is located on the platform. The control panel is fixed to the front guard rail and is used to:

- Turn the machine ON/OFF.
- Move the platform during ordinary working procedures.
- Display some parameters (alarms, dead-man's working, etc…).

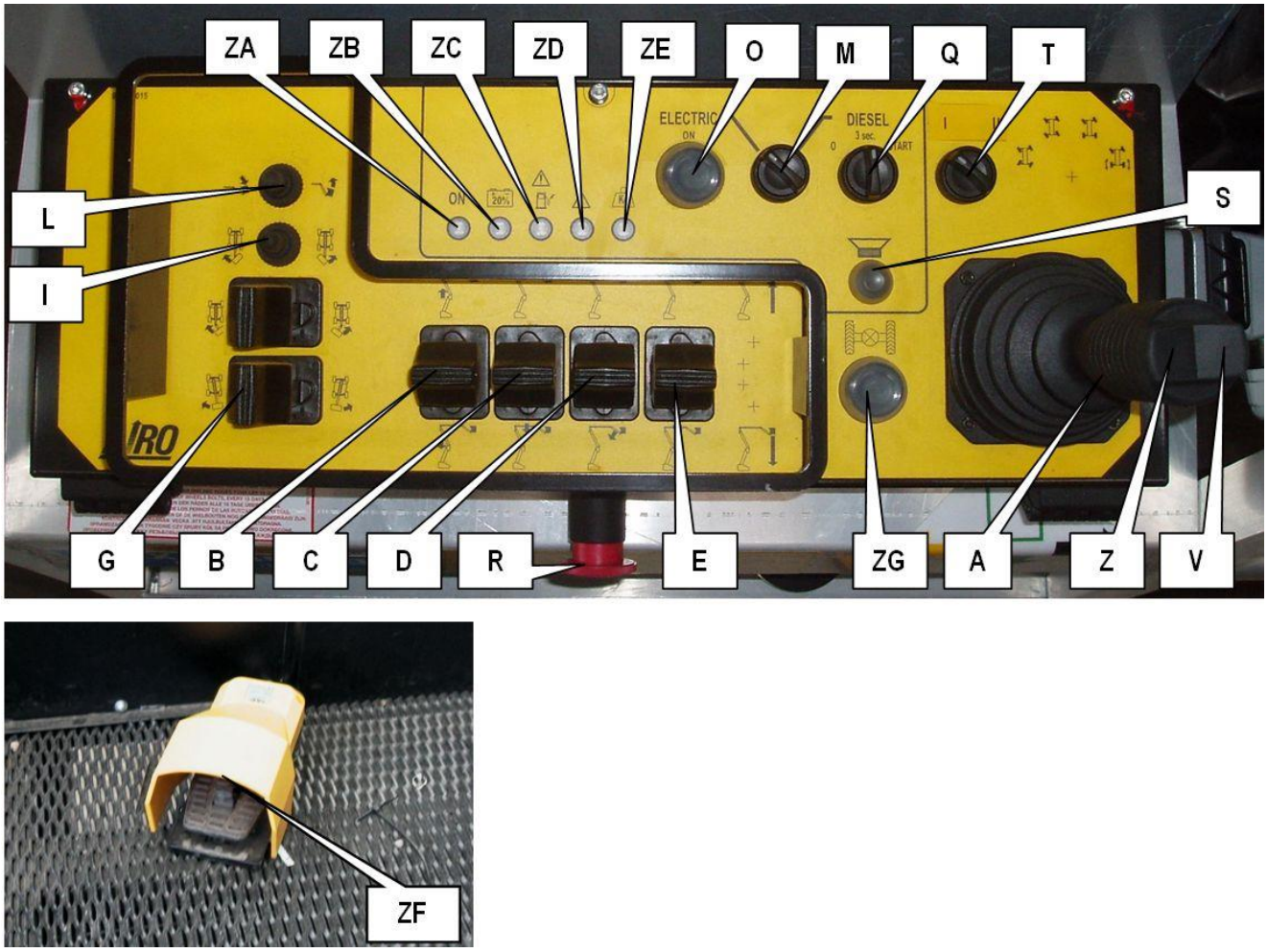


Fig.5

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
G) Proportional lever control turret rotation
I) Platform rotation switch
L) Platform level switch
M Diesel/electric drive power selector (OPTIONAL)

O) Starting button, electric pump 12V DC (Battery) or electric pump (220V or 380V AC) (OPTIONAL)
Q) Diesel engine start button
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 red warning light (models - E)
ZC) Diesel engine fault / low fuel level warning light (models -D)
ZD) Danger warning light
ZE) Overload warning light
ZF) Dead-man pedal
ZG) Differential locking button (OPTIONAL)

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!!
In standard machines the drive and steering controls can be executed simultaneously but they are interlocked with the platform movement controls (lifting/lowering/rotations) except four wheel drive Diesel machines (D-4WD) where with platform lowered (booms down, telescopic boom retracted, jib at height from +10° to –70°) only simultaneous drive-steering- turret orientation is allowed to help machine positioning in narrow places.

In machines with simultaneous controls (OPTIONAL) the drive and steering controls can be executed simultaneously but they are interlocked with the platform movement controls (lifting/lowering/rotations) as previously; on the other hand the simultaneous drive-steering-orientation with platform lowered (booms down, telescopic boom retracted, jib at a height from +10° and -70°) is allowed in all three versions (electric "E", electro-diesel "ED" and four wheel drive diesel RTD).

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** and/or the differential lock button **ZG**. Due to the rigid chassis of the machine, when driving on uneven grounds, one of the two driving wheels may be lifted thus absorbing all oil capacity and idling. In this condition the machine cannot move. To overcome this condition, press the differential locking button **ZG**.

NOTE: To achieve maximum drive speed, set the speed selector (T) to position (III), press down the proportional joystick (A) and hold down the differential locking button (ZG-OPTIONAL).
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 lifted platform, safety drive speed is automatically enabled, therefore neither speed selector **F** nor differential locking button **L** are active.

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, G** 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 **ZA** 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.

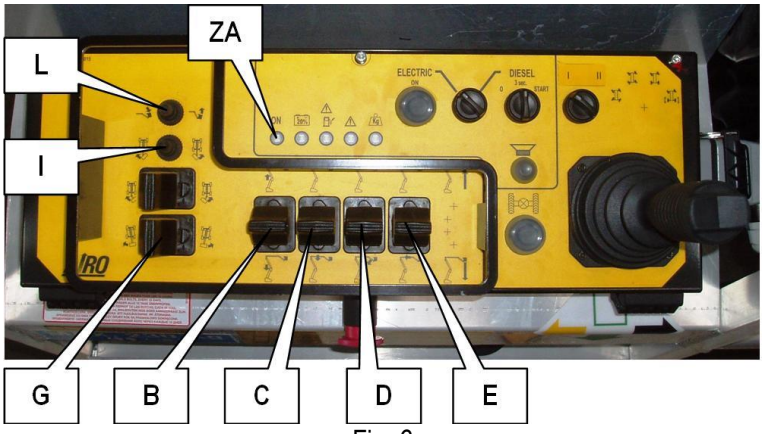


Fig. 6

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.

⚠

On standard machines, electric (E) and electro-diesel (ED) versions, all platform position controls can be executed only individually and are interlocked with drive and steering controls.

On standard machines, 4 wheel drive version (RTD), all platform position controls can be executed only individually whilst the turret orientation can be executed together with the drive and steering control with platform lowered (booms down, telescopic boom retracted, jib at a height from +10 and -70°).

On machines with simultaneous controls (OPTIONAL), in all three versions (electric E, electro-diesel E/D and 4 wheel drive diesel RTD) the platform position controls can be executed simultaneously (unless otherwise indicated), and the turret orientation can be executed together with the drive and steering controls with platform lowered (booms down, telescopic boom retracted, jib at a height from +10° to -70°).

5.1.2.1. Pantograph (lower boom) lifting/lowering

To lift/lower the pantograph (lower 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 upper 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.

On machines with simultaneous controls (OPTIONAL) this movement cannot be executed together with the turret orientation.

5.1.2.5. 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").

On machines with simultaneous movements (OPTIONAL) this movement cannot be executed together with the telescopic boom extraction/retraction.

In standard machines the drive and steering controls can be executed simultaneously but they are interlocked with the platform movement controls (lifting/lowering/rotations) except four wheel drive Diesel machines (D-4WD) where with platform lowered (booms down, telescopic boom retracted, jib at height from +10° to –70°) only simultaneous drive-steering- turret orientation is allowed to help machine positioning in narrow places.

In machines with simultaneous controls (OPTIONAL) the drive and steering controls can be executed simultaneously but they are interlocked with the platform movement controls (lifting/lowering/rotations) as previously; on the other hand the simultaneous drive-steering-orientation with platform lowered (booms down, telescopic boom retracted, jib at a height from +10° and -70°) is allowed in all three versions (electric "E", electro-diesel "ED" and four wheel drive diesel RTD).

5.1.2.6. 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.

5.1.2.7. 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 completely lowered. No result is achieved if these operations are carried out when the platform is lifted.

Both on standard machines and machines with simultaneous controls (OPTIONAL), this operation cannot be executed together with any other ones.

5.1.3. Other functions of the platform control panel

5.1.3.1. Selection of electric/thermic propulsion (OPTIONAL)

On some models it is possible to select the type of drive using the selector **M**. Set it to position **Electric** to use the electric propulsion (12V battery or 48V for E/D models, for emergency boom operations or 380V three-phase / 230V single-phase for boom work operations - OPTIONAL); set it to position **Diesel** to use the thermic drive power.

5.1.3.2. Electrical pump start button 12V (Battery) or 230V/380V three-phase mains (power mains) - (OPTIONAL)

The button **O** starts:

- the 12V electric pump for emergency operations (excluding drive and steering).
- The 230V single-phase electric pump for platform movement (excepting drive and steering) and the ground electric panel is connected to three-phase electric mains.
- The 380V three-phase electric pump for platform movement (excepting drive and steering) and the ground control panel is connected to three-phase electric mains.

See next paragraphs for operations modes of the start button of the electrical pump.

WARNING! The power by the 12V emergency electrical pump is only for platform lowering in case of faults in the main powers. Do not use it during normal work operations.

5.1.3.3. Heat engine start button (“ED”, “D” models)

It starts the heat engine (Diesel) on dual-powered models (“ED”) and on thermal-powered models (“D”).
With selector **O** in position **Diesel** operating the switch **Q**:

- In **START** position it enables starting.
- In position **3 sec** it pre-heats the plugs (motors with plugs only).
- In position **0** it stops the heat engine.

5.1.3.4. Manual horn

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

5.1.3.5. 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.

5.1.3.6. Warning lights

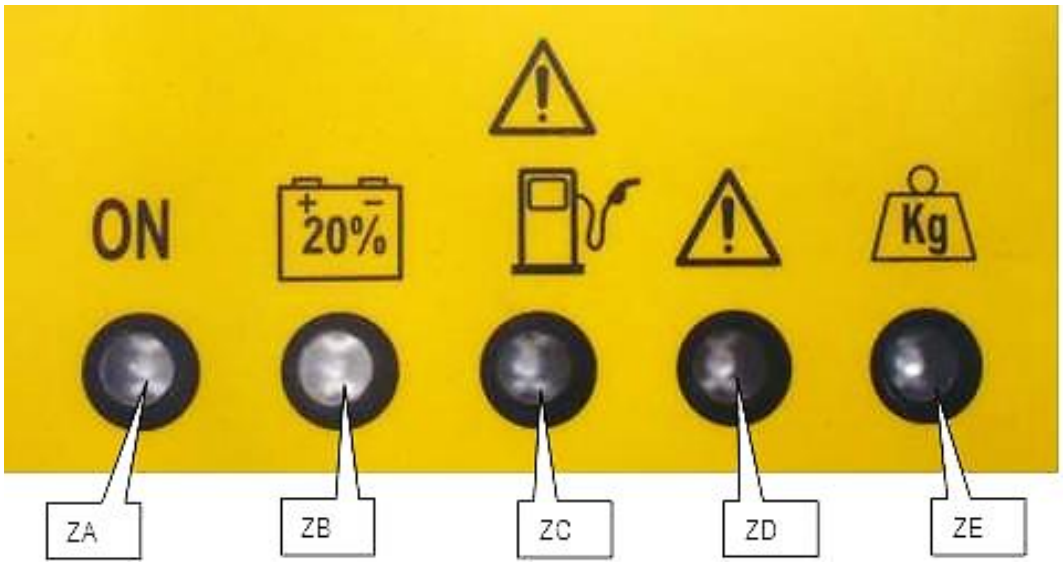


Fig. 7

5.1.3.6.1 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).

5.1.3.6.2 Flat battery red warning light (ZB) – electric models only

Flashing when the battery charge is at 20% (only models "E" or "ED" with current continuous electrical pump). In this condition lifting and telescopic boom extension are disabled. Batteries should be immediately recharged.

5.1.3.6.3 Diesel engine fault / low fuel red warning light (ZC)

This warning light indicates malfunctioning of diesel engine or low fuel.
On steady with machine on; platform control panel; Diesel drive power selected. Diesel Engine off ready for start-up. Insufficient motor oil pressure.
Slow flashing in the event of the engine head overheating. If on, it stops the Diesel engine; if off, it prevents the Diesel motor from starting.
Fast flashing in the event of low fuel (approx. 10 litres of fuel left). This warning is active only when the motor is running.
Double fast flashing when the fuse on the solenoid valve of the air/oil exchanger (if present) is burnt out. WARNING! Change the fuse. Danger of overheating of hydraulic oil.

5.1.3.6.4 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 together with the audible alarm when the chassis inclination exceeds the allowed value. All lifting operations and telescopic extension are disabled (except JIB lifting). If the machine is lifted, drive is also disabled. It is necessary to lower the booms completely and then place the machine onto a flat surface.

WARNING! The activation of this indicator warns of a dangerous situation since the machine has 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.

5.1.3.6.5 Overload red warning light (ZE)

Lit up flashing slowly with activation of audible alarm 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

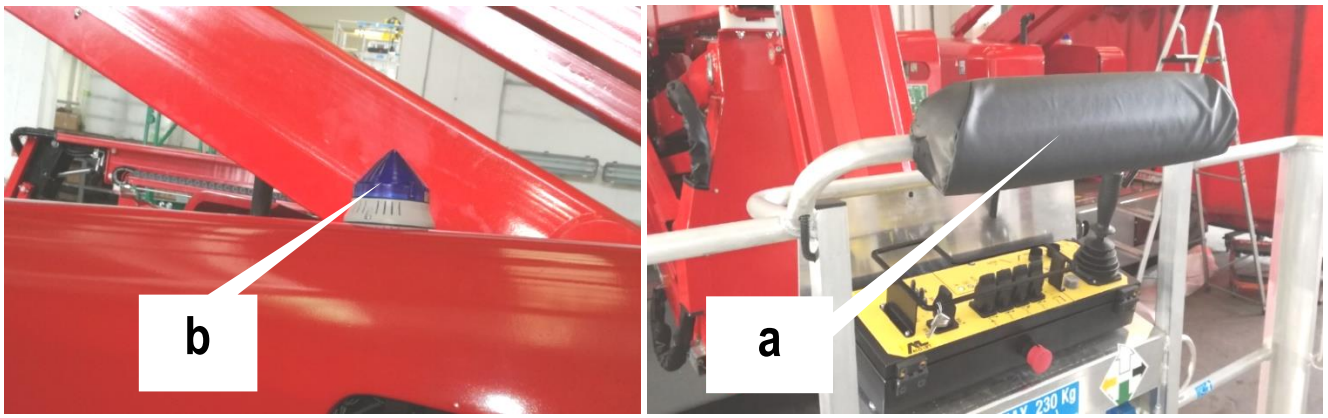


Fig. 8

The overall system with all functions is only available from the platform control panel.

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 "Dead Man" 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 "Dead Man" 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 "Dead Man" 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 (electric control unit)

The ground control panel (or electric control unit) contains the main electronic boards necessary to operate the machine and to carry out safety checks.

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; Diesel engine operational 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.

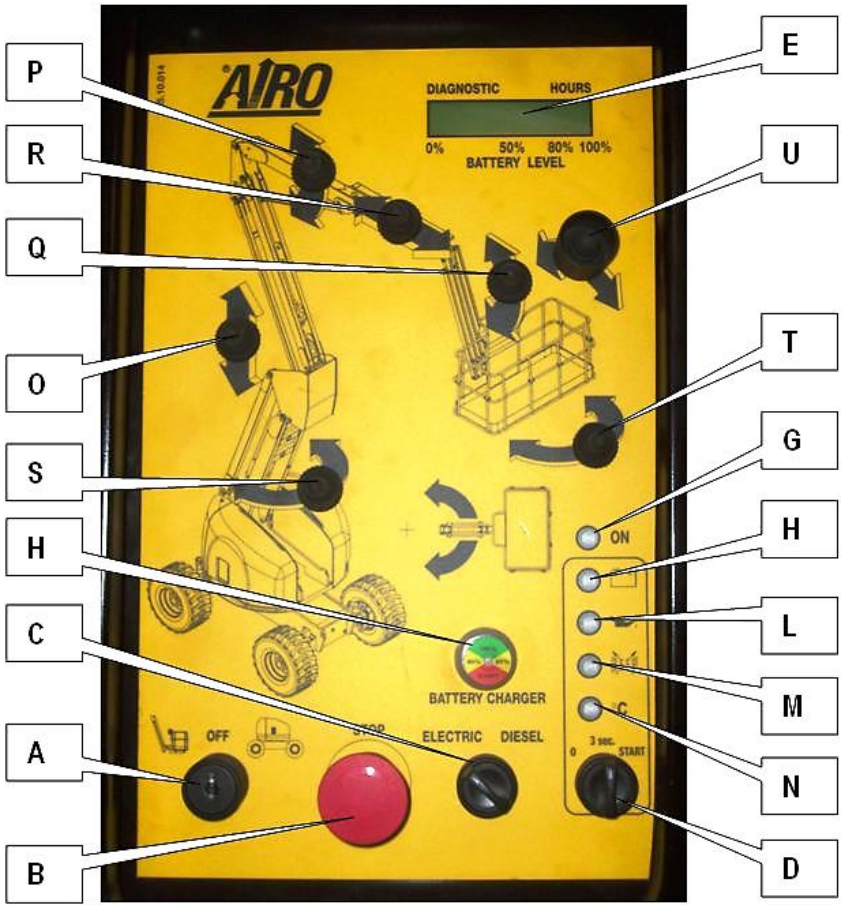


Fig. 8

A) ON-OFF key and ground/platform control panel selector
B) Emergency STOP button
C) Selector for Diesel power for work or electric power.
D) Heat engine start button (models “D” and “ED”)
E) User interface display
F) Battery charger warning light (models “E” and “ED”)
G) Powered-on machine warning light
H) Alternator warning light (models “D” and “ED”)
L) Oil warning light (models “D” and “ED”)
M Air filter warning light (models “D” and “ED”)
N) Motor head temperature warning light (models “D” and “ED”)
O) PANTOGRAPH LIFTING/LOWERING lever
P) BOOM LIFTING/LOWERING lever
Q) JIB LIFTING/LOWERING lever
R) TELESCOPIC BOOM OUT/IN lever
S) TURRET ROTATION lever
T) PLATFORM ROTATION lever
U) PLATFORM LEVEL compensation lever

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 on models "D", "ED" and "EB") 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/electric drive power selector (C)

Holding the ON-OFF key in position “ground control panel” it is possible to select the type of power for the ground controls:

- If ELECTRIC is selected and the on/off key is kept active in position “ground control panel” the 12V electric pump is started for the emergency controls or the 48V electric pump for “ED” models.
- If DIESEL is selected and the ON-OFF key is kept active in position “ground control panel” the Diesel engine can be started.

5.2.4. Heat engine start button (D)

Holding the ON-OFF key in position “ground control panel” after selecting the DIESEL power, the diesel engine can be started by means of the relevant switch.

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

5.2.5. User interface display (E)

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

- the operation parameters of the machine during normal functioning or in the event of a fault;
- Working hours of Diesel engine (when Diesel power is selected the working hours are displayed in the format HOURS: MINUTES and final letter D).
- Working hours of the emergency electric pump with continuous current (when 12V electrical power is selected the working hours are displayed in the format HOURS:MINUTES and final letter M) –OPTIONAL-;
- Working hours of the single-phase or three-phase work pump (when 220V or 380V electric power is selected –at platform- the working hours are displayed in the format HOURS:MINUTES and final letter E) –OPTIONAL-;
- 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.

5.2.6. Battery charger warning light (F)

Electric and dual-powered models (“E”, “ED” and “EB”), equipped with a built-in high frequency battery charger, are provided with this warning light indicating the operation of the battery charger (for more detailed information read the paragraph "Battery charge”).

5.2.7. Enabled control panel warning light (G)

The green light is ON when the machine is turned ON and the ground control panel is enabled (the on/off key (C) should be kept in “turret” position).

5.2.8. Diesel engine warning lights (H, L, M, N)

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

5.2.9. Levers of movement of the platform (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.

Use the ground controls only in emergency situations to allow the platform to be lowered.
IT IS FORBIDDEN to use the ground control panel as a workstation when personnel is on the platform.

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.

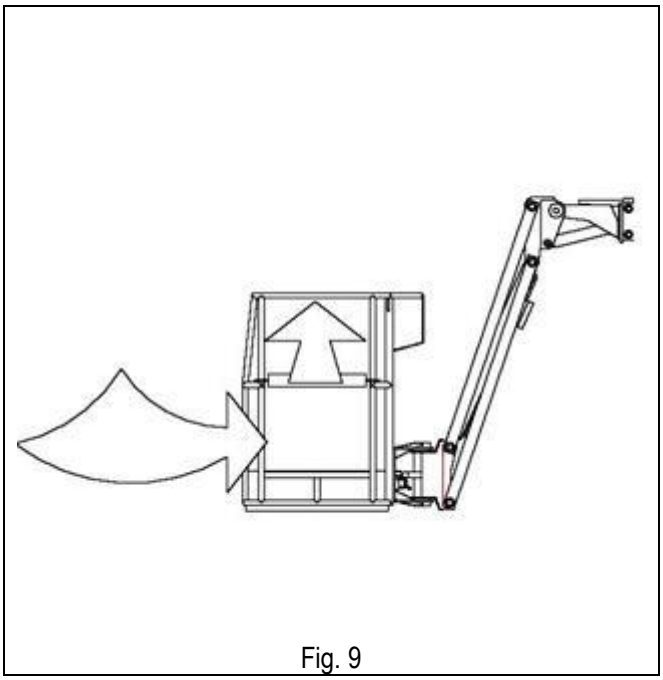


Fig. 9

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 (see previous paragraphs).

For electric-powered machines (models “E”), at this point 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.

On Electric/Diesel dual-powered models (models “ED” or “EB”), it is necessary to select the power supply type by means of the selector. To use the electric drive power once this option has been selected the operator can start performing the various functions by following the instructions given in the previous paragraphs. To use the thermic drive power read the next paragraphs to start the heat engine.

For Diesel-powered machines (models “D”):
- To use Diesel power select the power type “Diesel” with the selector and then read the next paragraphs to start the heat engine.
- To use the 230V or 380V electric power (optional) select the power type “Electric” with the selector and then (if available) the 230V or “380V” voltage (read the next paragraphs to start the three-phase electric motor).

- To use the 12V electric power (optional) (only for emergency controls) select the power type “Electric” with the selector and then (if available) the “12V” voltage and read the next paragraphs to start the 12V electric motor.

Before using the thermic drive power (Diesel or Petrol engine) check the fuel level in the tank.
For those machines that are not equipped with a level gauge on the platform control panel, this operation should be carried out by visually checking the fuel level after unscrewing the filler cap; for the other machines it is possible to check the level directly through the level gauge on the platform control panel.

- Before starting the working session, when the motor is off and sufficiently cool, visually check the fuel level.
- Keep the fuel tank and the motor clean.

For petrol motors (models “EB”) use only **Unleaded Petrol with Octane No. >87.**

5.4.1. Diesel engine start-up

By turning the starter key on the platform control panel:
- To “0” position the Diesel engine stops (models “D” and “ED”).
- To “3 sec” position the plugs pre-heating takes place (only engines with plugs) (models “D” and “ED”).
- In “Start” position the motor 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 engine 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.

5.4.2. Starting the 230V single-phase electric pump (OPTIONAL)

Diesel-powered models can be equipped, on request, with a 230V electric pump.

To start the electric pump:

1) Insert the 230 V plug of the power cable into the socket (**A**).
2) Set the switch (**B**) shown in figure to ON position.
3) To start the electric pump with the platform controls:
   - Select the on-platform control panel by means of the locking key switch located on the electric control unit on the chassis.
   - Unlock the push-button (**R**) turning by a ¼ of turn clockwise.
   - Set the power selector (**M**) at platform to "Electric" position.
   - Set the power selector at platform (if any) to "230V" position.
   - Operate the machine.

NOTE The operations carried out with 230V electric pump are slightly slower than those with diesel engine.

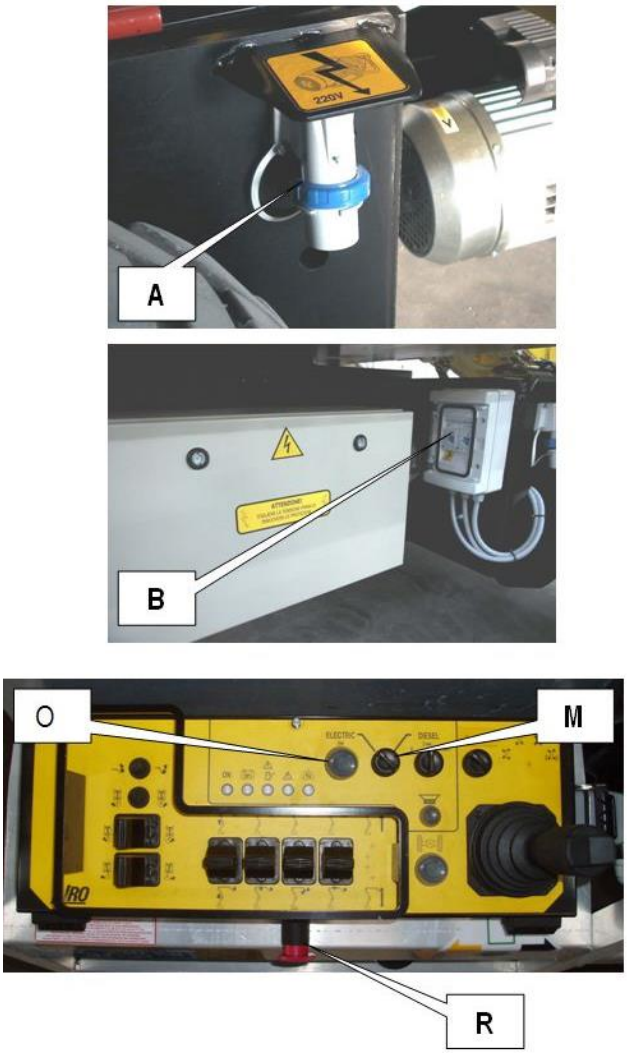


Fig. 10

WARNING!! Always check the position of the power cord during the movements.
The platform with 230V power can be operated only from the platform.
Disconnect all electric power supplies before opening the boxes.

5.4.3. Start-up of 380V three-phase work electrical pump (OPTIONAL)

Diesel-powered models can be equipped, on request, with a 380V three-phase electric pump.

To start the three-phase electrical pump:

- Insert the 380 V plug of the power cable into socket (**A**) on the chassis.
- Set the switches (**C**) shown in figure to ON position
- Set the angular red switch (**F**) to ON position turning it downwards or upwards. If the connection has been successfully carried out it is possible to start the electrical pump as indicated in next paragraphs. On the contrary, in the event of a phase fault in the electric power the audible alarm is automatically enabled, and the electrical pump cannot be started. In this case it is possible to compensate the power phases by turning the angular red switch (**F**) on the electric case by 90°.
- To start the electric pump with the platform controls:
  - Select the platform control panel with the locking key switch on the ground control unit.
  - Unlock the push-button (**R**) turning by a ¼ of turn clockwise.
  - Set the power selector (**M**) to "Electric" position.
  - Select the 380V power with selector.
  - Press the button (**O**); When on, the green warning light indicates that the three-phase electric pump is turned on.
  - Wait 5 seconds before moving the machine.
- To stop the electric pump press button (**O**) again.

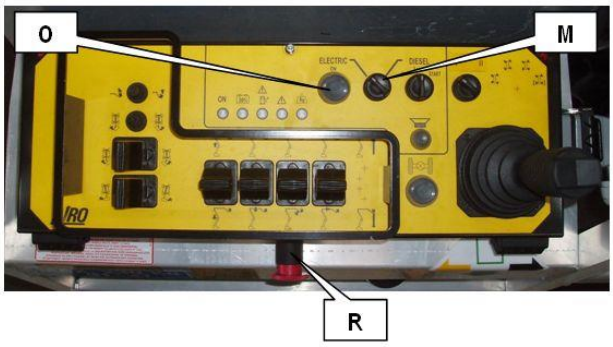


Fig. 11

NOTE The machine with 380V three-phase power can be operated only from the platform.
The operations carried out with 380V electrical pump are slightly slower than those with diesel engine.

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

WARNING!! Always check the position of the power cord during the movements.
Disconnect all electric power supplies before opening the boxes.

5.4.4. Start-up of 12V emergency electrical pump (OPTIONAL for models “D”)

Diesel-powered models may be equipped with a 12V electrical pump for the operation of the booms (lifting, lowering, rotation) in the event of an emergency.

To start the emergency electrical pump by means of the **platform control panel:**

- Select the platform control panel with the locking key switch on the ground control unit.
- Unlock the push-button (**R**) turning by a ¼ of turn clockwise.
- Set the power selector (**M**) to "Electric" position.
- Press and hold down the green button (**O**) as long as the desired operation has been carried out.
- Press and hold down the dead-man pedal as long as the desired operation has been carried out.
- Operate the controls of the machine as indicated in previous paragraphs.

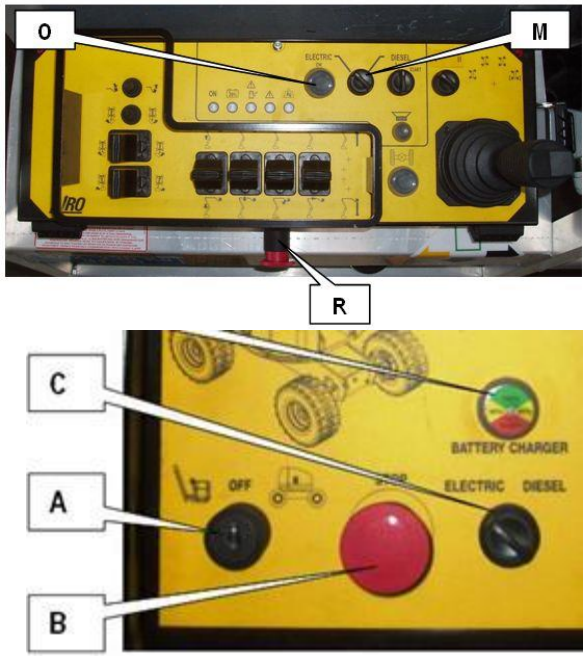


Fig. 12

WARNING!! To start the 12V emergency electrical pump it is necessary to follow the sequence of the above mentions operations.

To start the emergency electrical pump by means of the **ground control panel:**

- Select the ground control panel with the key switch (**A**) on the ground control unit keeping it active.
- Set the power selector (**C**) to "Electric" position.
- In this condition the 12V emergency electrical pump is started, and the machine controls can be operated as indicated in previous paragraphs.

WARNING! The power by the 12V emergency electrical pump is only for platform lowering in case of faults in the main powers. Do not use it during normal work operations.

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

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 and the machine (all models) and the heat engine (models “D”, “ED”, “EB”) are stopped.
- Press the power emergency stop button (if available – “E” models), and the machine power (power circuit cut-out) is 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 emergency stop button (if available) to the outside until it locks in position to power the machine again.

5.5.3. Diesel engine stop

In order to stop the Diesel engine:

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.

Do not stop the motor when the r.p.m. is high. Before stopping the motor wait until the r.p.m. is at the lowest.

5.5.4. Stopping the 380V three-phase or 230V single-phase electrical pump (optional)

To stop the electrical pump (optional):

On the platform control panel:

- Press the stop button.
- Otherwise, press the emergency stop button.

On the ground control panel:

- 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.

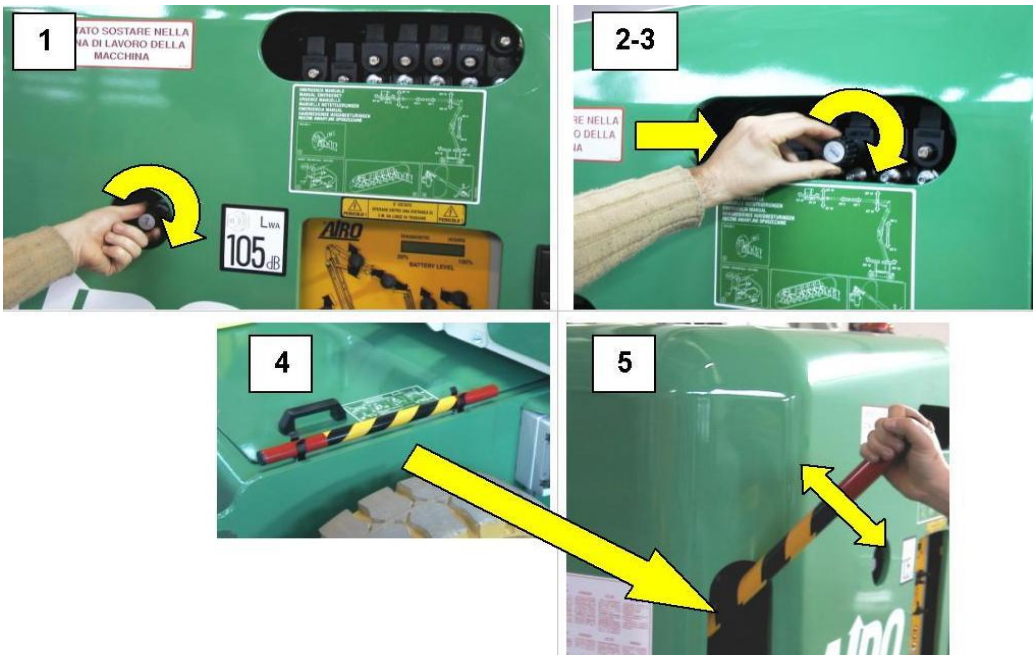


Fig.13

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

1. Screw the indicated tap completely (solenoid valve EV1);
2. Insert and screw the emergency actuator on the solenoid valve corresponding to the desired movement (see below correspondence between solenoid valves names and obtained movements);
3. Completely screw the knurled knob of the previously chosen actuator;
4. Remove the operating lever of the manual pump and insert it on the pump itself;
5. Activate the emergency pump.
6. Check the correct execution of this procedure.

NB: In case of machines with simultaneous movements (OPTIONAL) the procedures for platform recovery are the same but the operations are to be carried out from point 2.

Solenoid valves and relevant movements:

- EV4 = Pantograph lifting (lower boom)
- EV5 = Pantograph lowering (lower boom)
- EV6 = Telescopic boom out
- EV7 = Telescopic boom in
- EV12 = Turret right rotation;
- EV13 = Turret left rotation;
- EV14 = Lifting upper boom
- EV15 = Lowering upper boom
- EV18 = Jib up;
- EV19 = Jib down;
- EV21 = Platform right rotation
- EV22 = Platform left rotation

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

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

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.

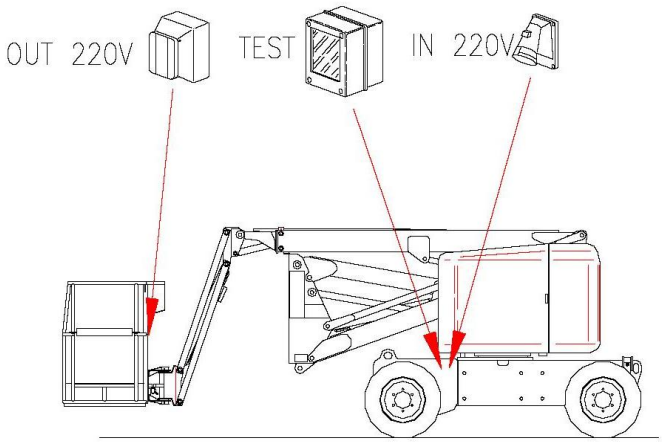


Fig. 14

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. Fuel level and re-fuelling (models “ED”, “D”)

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

This operation is to be carried out by visually checking the fuel level after unscrewing the filler cap.

- 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" (models “E” and “ED” only).
- 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 platform is completely lowered (or within a given height according to specific needs and further to checks) the machine can be handled (i.e. drive can be performed) at different speeds to be freely selected by the user.
With platform at a given height, the drive speed is automatically limited, and cannot be changed.
The section TECHNICAL FEATURES indicates the limits concerning drive for each model.

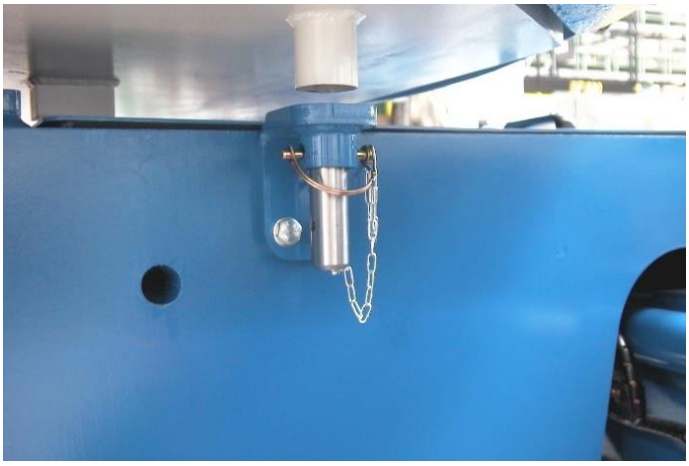


Fig.15

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.

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.).

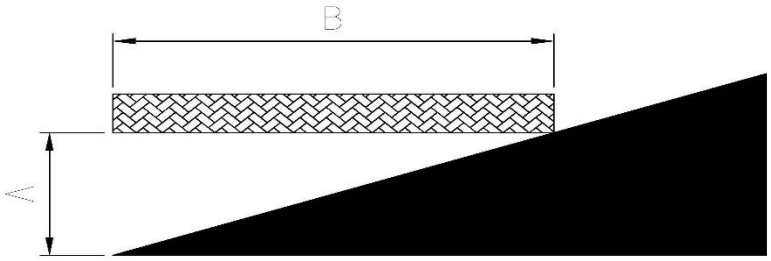
6.2. Transportation

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 advisable to lift the jib (if present- see picture aside) to prevent the machine from hitting 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. The determination of the gradient can be done using an electronic level or empirically as described below:
  - 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;

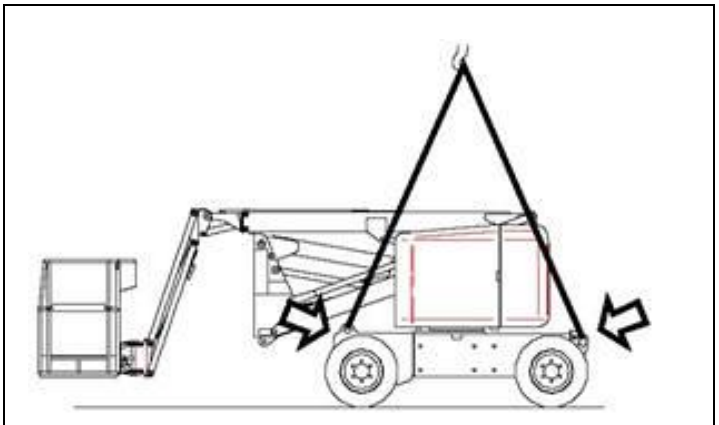


Fig.16

- **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:

- Hook the machine to the provided holes.
- Unscrew the two bolts (**A**) at the centre of the drive reduction gears by means of a 10 mm wrench for hexagonal head (the 2 wheel drive machines have 2 drive reduction gears; the 4 wheel drive machines have 4 drive reduction gears) and slide the cover (**B**) of the reduction gears along the slots; then, remove the pin (**C**) at the centre of the drive reduction gears.
- Reposition the pin into the seats of the reduction gears in the reverse order.
- Place the cover again and tighten the bolts.
- Tow at a very slow speed (remember that when the machine is being towed, brakes are out of order).

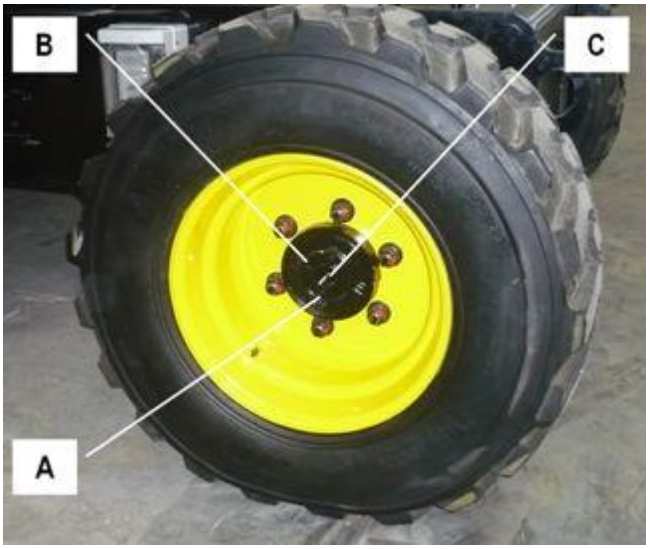


Fig. 17

WARNING! THIS OPERATION MAY CAUSE OIL LEAKAGE FROM THE DRIVE REDUCTION GEARS.

To resume the normal operation, set back the machine to initial conditions and, if necessary, top up the oil level inside the drive reduction gears.

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. Should the brakes be completely out of order 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

Below are listed the main maintenance jobs to be done and the relevant schedule (the machine features an 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
Oil level check in hydraulic tank	Every month
Check of heat engine fixing on elastic supports	Every month
Emergency devices efficiency check	Every year
Electric connections check	Every year
Hydraulic connections check	Every year
Periodic operation check and structure visual check	Every year
Screw tightening (see paragraph "Various adjustments")	Every year
Check of drive reduction gear oil change	Every year
Drive circuit pressure relief valve adjustment and operation check.	Every year
Operation check of movement circuit pressure relief valve	Every year
Operation check and adjustment of the braking system	Every year
Air purging from oscillating axe cylinders	Every year
Inclinometer operation check	Every year
Operation check of platform overload controller	Every year
Operation check of M1 microswitches	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
Drive reduction gear oil change	Every two years
Total oil change in hydraulic tank	Every two years

DIESEL (D) AND ELECTRIC-DIESEL (ED) MODELS: As it is possible to install different types of Diesel engines, refer to the instructions manual of the engine manufacturer for all maintenance operations.

BIODEGRADABLE OIL KIT
PANOLIN BIOMOT 10W40

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) Fixing screws of steering hub pins
5) Cage fixing screws
6) Hydraulic fittings
7) screws and safety dowels of boom pins;
8) Rotation reduction gear fixing screws
9) Elastic supports of heat engine

For torque wrench setting refer to the table below.

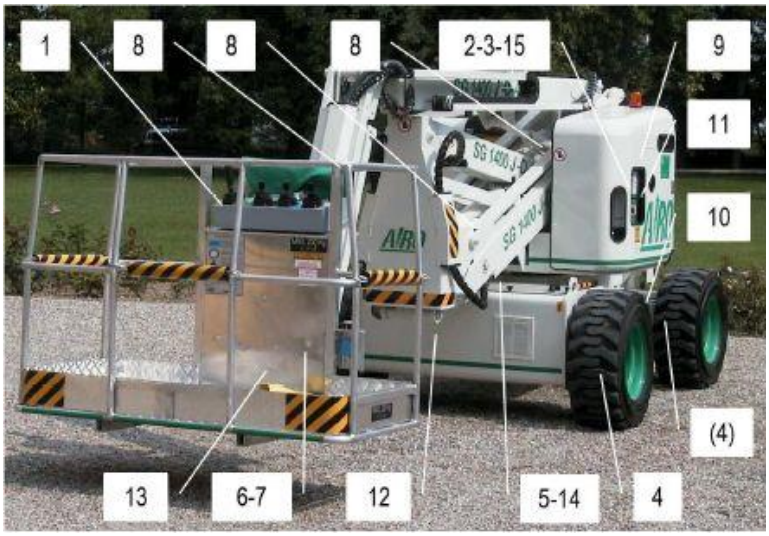


Fig. 18

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, remember to grease the articulated joints in the following cases:

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

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

ESSO BEACON-EP2 or similar.

(OPTIONAL BIODEGRADABLE OIL KIT)
PANOLIN BIOGREASE 2

Fig. 19

7.2.3. Hydraulic circuit oil level check and change

Check after the first 10 working hours and, afterwards, at least once a month the level by means of the provided cap (**A**) equipped with a dipstick; always make sure that the level lies between the max. and min. values. If necessary, top up until 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.

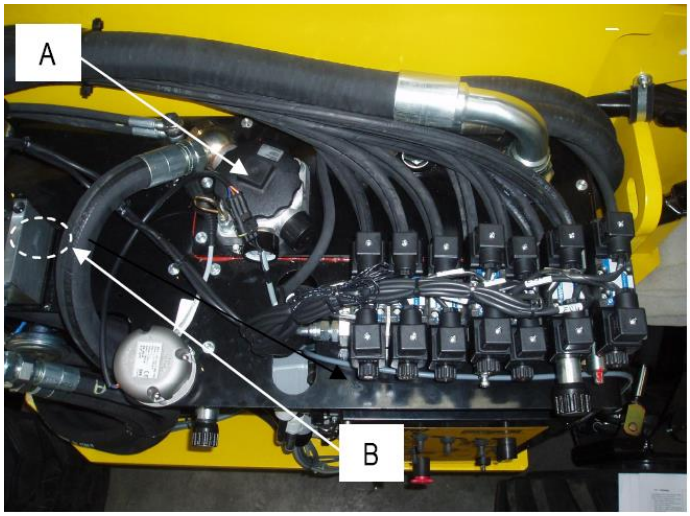


Fig. 20

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

HYDRAULIC SYSTEM OIL			
BRAND	**TYPE** -20°C +79°C	**TYPE** -30°C +48°C	**REQUIRED QUANTITY** **A16 JRTD A16 JED A16 JE A18 JRTD A18 JED A18 JE**
SYNTHETIC OILS			105 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%.

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

7.2.4. Hydraulic filter replacement

7.2.4.1. Suction filters

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.

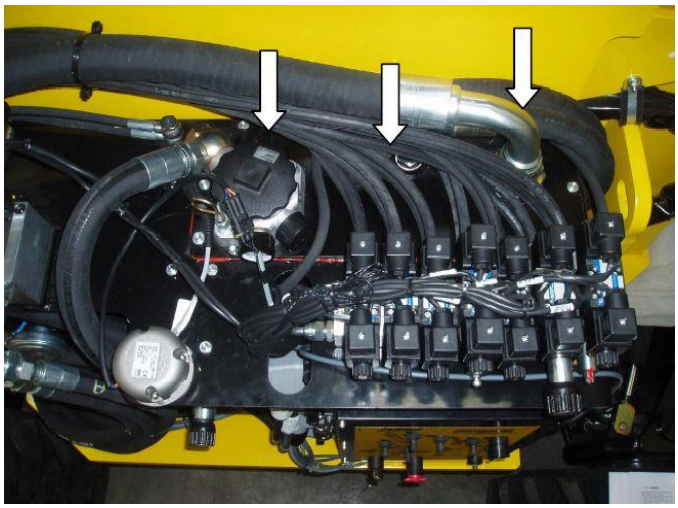


Fig. 21

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.

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.

Fig.22

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.

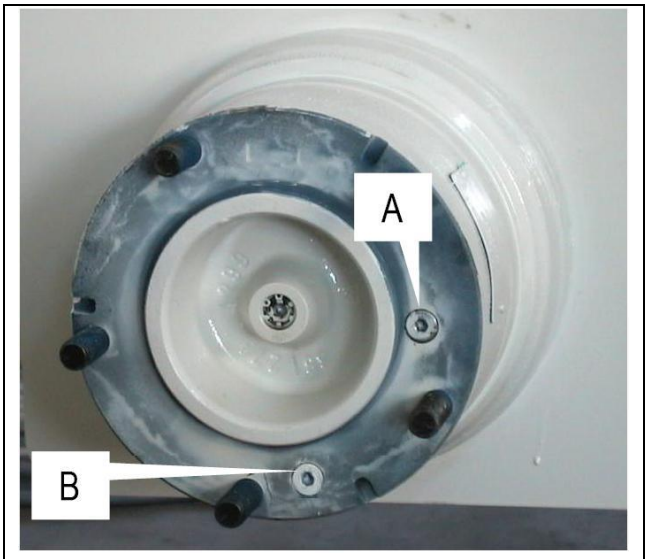


Fig. 23

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. 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).

SYNTHETIC OILS		0.5 litres for every motor
ESSO	Compressor Oil LG 150	
AGIP	Blasia S 220	
CASTROL	Alpha SN 6	
IP	Telesia Oil 150	
BIODEGRADABLE OILS - OPTIONAL		
PANOLIN	PANOLIN	

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

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. Air purging from oscillating axle locking cylinders

Once drive has been stopped and with raised platform, the axle locking cylinders are locked in position thus increasing the machine stability.
Check that no air is present inside the oscillating axial cylinders every year.
To check for proper operation, proceed as follows:

- Remove the protection cylinder crankcases (**A**) of the oscillating axle.
- Unscrew the cap (**B**) of one of the two cylinders of the oscillating axle.
- Let the machine perform some travelling until the cylinder of the floating axle cylinders reaches against end stop several times, and until you see oil flowing out of the plug of the check valve.
- Once purging has been completed, screw cap (**B**) and check the oil level in the tank.

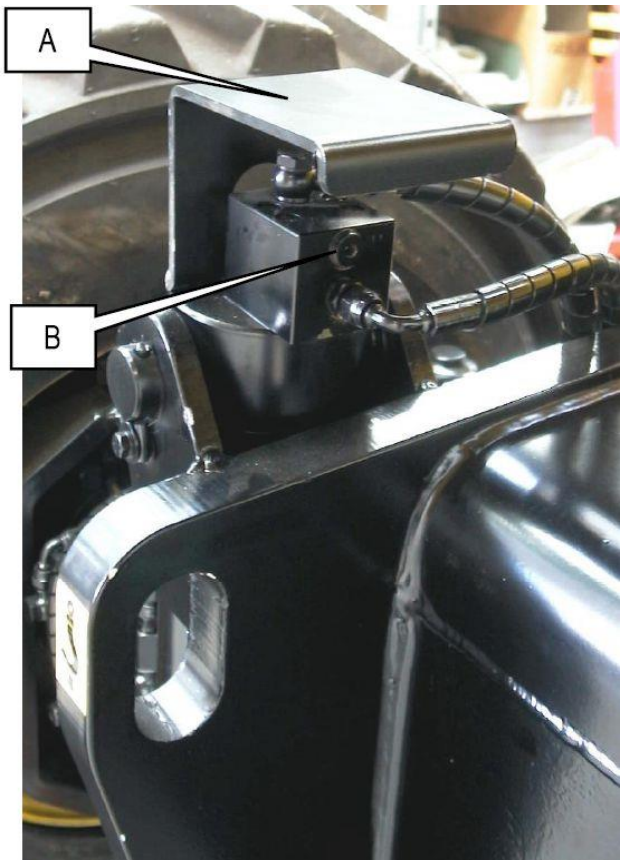


Fig.24

WARNING!

THIS OPERATION MUST BE CARRIED OUT BY TWO OPERATORS SIMULTANEOUSLY: ONE AT THE GUIDE OF THE MACHINE, THE OTHER THAT VERIFIES THE OPERATION AND COLLECT THE OIL THAT LEAKS.

THIS OPERATION SHOULD BE CARRIED OUT IN ROOMS THAT ALLOW THE OIL LEAKING FROM THE CYLINDERS TO BE RECOVERED.

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

7.2.7. Telescopic boom sliding blocks clearance adjustment

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

- Unscrew dowel **A**;
- Screw the sliding block **B** using a cap (seeger wrench until the above mentioned clearance is reached.
- Screw dowel **A** again.

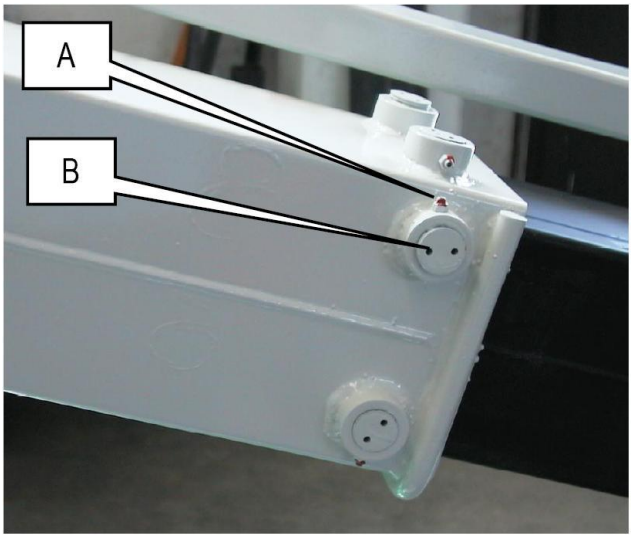


Fig. 25

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

7.2.8. Drive circuit pressure relief valve adjustment and operation check

The described pressure relief valve controls the maximum pressure of the hydraulic drive circuit. 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 main pressure relief valve (see figure aside):
- Disconnect the power cords of the solenoid valves **EV2** and **EV3 (H** and **I**).
- Introduce a pressure gauge with full scale of at least 250 bar in the special quick coupling (1/4" BSP) **D;**
- Using the platform control panel drive the machine forward and backward. Initially carry out the operation softly to check that the above mentioned solenoid valves have been disconnected properly (the machine should not move).
- Check the detected pressure value. The correct value is indicated in the chapter "**Technical features**".

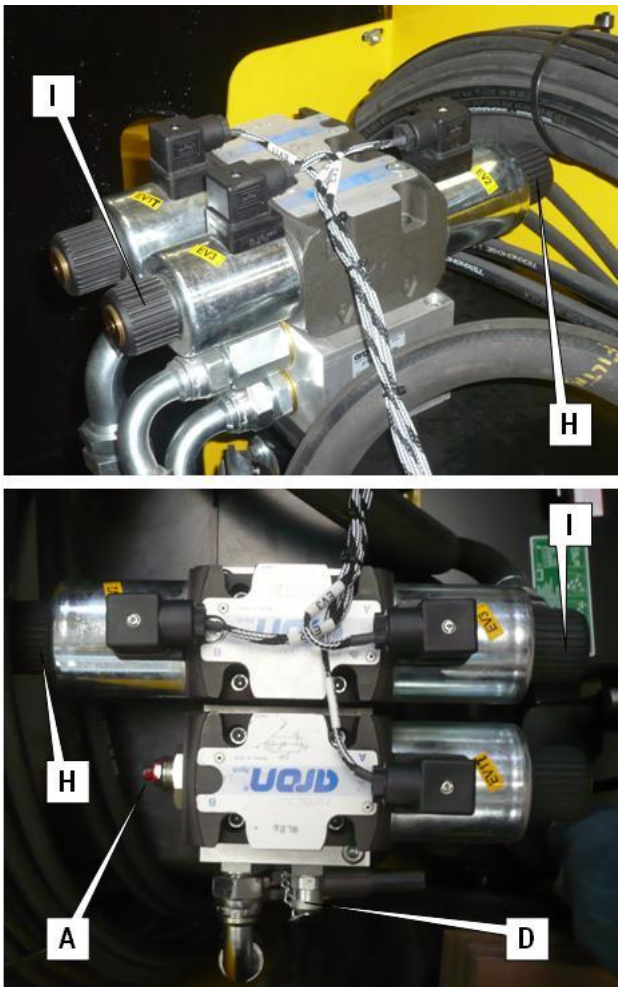


Fig. 26

To adjust the pressure relief valve:
- Disconnect the power cords of the solenoid valves **EV2** and **EV3 (H** and **I**).
- Introduce a pressure gauge with full scale of at least 250 bar in the special quick coupling (1/4" BSP) **D;**
- Locate the pressure relief valve **A.**
- Unscrew the adjusting dowel lock-nut;
- Using the platform control panel, drive the machine forward and backward and adjust the pressure relief valve by means of the adjusting dowel so as to reach the pressure value indicated in chapter "**Technical Features**". Initially carry out the operation softly to check that the above mentioned valves have been disconnected properly (the machine should not move).
- 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.

7.2.9. Circuit movements pressure relief valve operation check

The main pressure relief valve controls the maximum pressure of the circuit movements. (lifting operations/lowering/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.

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) **D;**
- Using the ground control panel, lift the machine up to the end stop.
- Check the detected pressure value. The correct value is indicated in the chapter "**Technical features".**

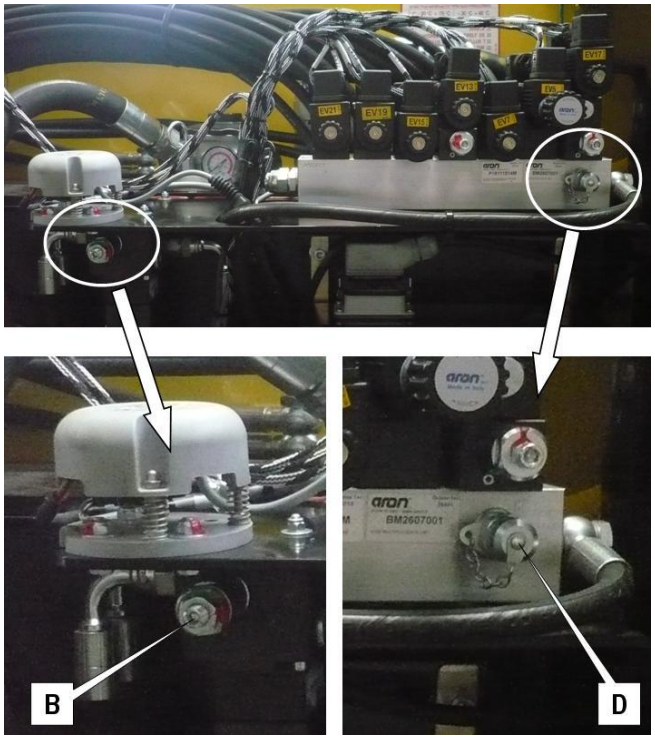


Fig. 27

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) **D;**
- Locate the pressure relief valve of lifting circuit **B;**
- Unscrew the adjusting dowel lock-nut;
- Using the ground control panel, lift the machine 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.

7.2.10. Operation check and adjustment of the braking valves

These valves check the minimum operating pressure during drive (in both running directions) and affect the dynamic braking and the drive speed. Normally, these valves do not require any adjustment, since they are calibrated at the factory before the machine is delivered.
The braking valves stop the machine when the drive controls are released. Once the machine has stopped, the parking brakes automatically come on, thus keeping the machine in position.

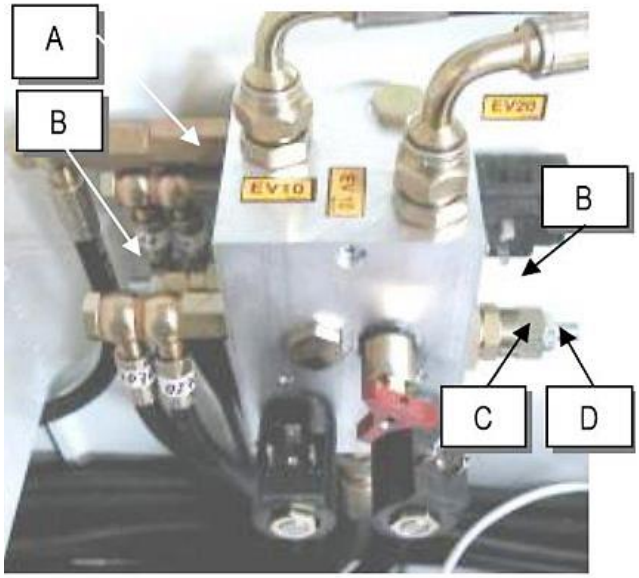


Fig. 28

Check operation at least once a year.

To check the operation of the braking system:

- With platform completely lowered place the machine on a flat ground, free of obstacles, operate the drive control and when the max. speed is reached, release the control immediately.
- The correct operation of the braking system allows the machine to stop within a distance lower than 70 cm.
- In any case the braking system can stop and keep the machine on slopes as indicated in **"Technical features"** (the braking distance on descents is longer; drive downwards at the min. drive speed).

Calibration of both braking valves is required:

- In case of replacement of the hydraulic unit **A**.
- In case of replacement of one or both braking valves **C** (in a few cases only one valve is fitted).

To calibrate the braking valves:

- Locate the hydraulic unit (or the units) **A** called "drive plate".
- Locate the braking valves B (one for each running direction).
- Introduce a pressure gauge with full scale of at least 250 bar in the special quick coupling of hydraulic control unit (1/4" BSP).
- On the platform control panel select the minimum drive speed.
- Unscrew the lock-nuts **C** of the adjusting dowels.
- Using the platform control panel drive the machine (in the direction controlled by the valve) on a flat ground in straightforward direction and adjust the braking valve (relevant to that running direction) by means of adjusting dowel **D** so as to achieve the required pressure value (call the nearest Service Centre to ask for the exact value).
- Once the required pressure value has been achieved, check that the valve controlling the braking in the opposite direction has maintained its adjustment (if present – in a few cases only one valve is fitted)
- Once adjustments are complete (pressure values in the two directions must not vary by more than ±5 bar), 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.

7.2.11. Inclinometer operation check

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 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:

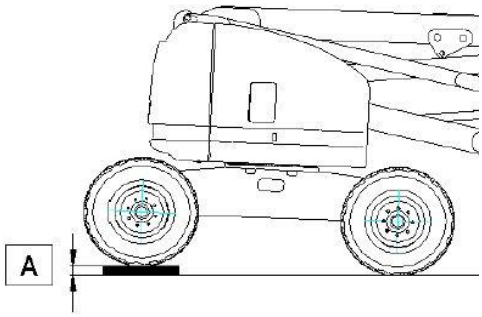
- It disables lifting.
- It disables drive when platform exceeds a given height (varying according to model).
- It warns of the instability condition by means of an audible alarm and a warning light located on the platform (see chapter "General use instructions").

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, and jib at a height between +10° and –70°) all manoeuvres 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.



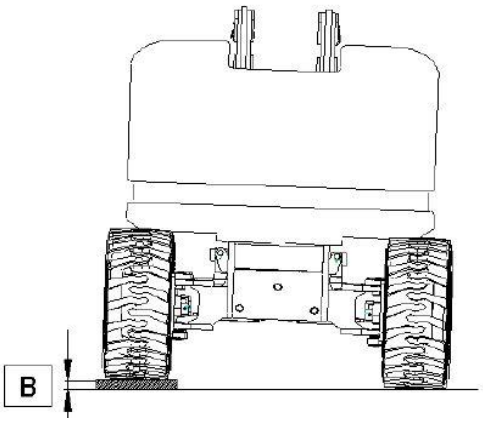


Fig.29

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, and jib at a height between +10° and –70°) all manoeuvres 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.

MODELS		
SHIMS	**A16 JRTD** **A18 JRTD**	**A16 JE A16 JED** **A18 JE A18 JED**
A [mm]	135	100
B [mm]	135	95

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.

7.2.12. Operation check and adjustment of platform overload controller

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**) (load cell).
- electronic board (**B**) for the system calibration located inside a tight case (**C**) in platform;

Operation check of the overload controller:

- When platform is completely lowered and with extension deck retracted, load a charge evenly distributed equal to the max. nominal load allowed by the platform (paragraph "Technical features"). In this condition all operations should be possible both from platform 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.

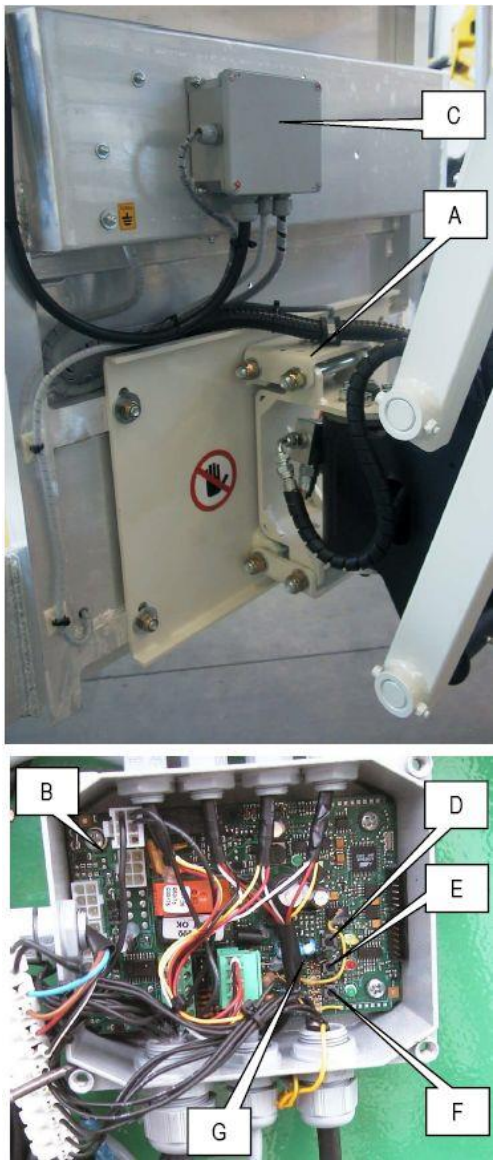


Fig.30a

- 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.

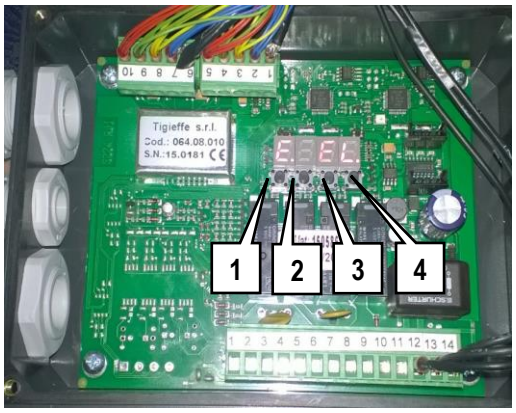


Fig.30b

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.

Calibration depends on the type of fitted device.
If the board is the one shown in **fig.30a**:

- switch off the machine;
- open the box **C** which contains electronic board**;**
- without any load on the platform, fit the bridge between the two pins of the connector **G**;
- switch on the machine;
- press button **D** (the yellow light and red light turn on);
- press button **E** (the luminosity of the red light increases a few seconds), and the overload controller will be reset;
- position a distributed load on the platform equal to nominal capacity plus 20% ;
- press button **F** (the green light turns on a few seconds) to store the overload condition;
- press button **D** again to exit the calibration procedure (the yellow light turns off and if the procedure has been carried out correctly, the red light stays on signalling the overload);
- switch off the machine;
- open the jumper on connector **G**;
- switch on the machine;
- check that after removing the 20% overload (only the rated load remains on the platform) the alarm condition does not occur in any of the platform positions (platform down, up, driving, rotated);
- Once the adjustment has been completed, close the box which contains the board.

If the board is the one shown in **fig.30b**:

- switch off the machine;
- Open the box which contains electronic board.
- switch on the machine;
- With no load on the platform, press and hold buttons **1** and **4** until the word **CONS** appears;
- Press **4** to enter the **CAP** and **4** again to display the parameter value;
- Enter the correct value = **1000** via the button **1**, **2** and **3**. Press button **4** to save and exit.
- Press **2** and **2** again to switch to **J01J**, press **4** to display the parameter value;
- Enter the correct value = **1** via the button **1**, and **2**. Press button **4** to save and exit.
- Press **3** and **2** again to switch to **CALB**. Press **4** to switch to **CAL**;
- After checking that there are no loads on platform, press **1** to perform the zero calibration;
- Load the weight equal to the nominal load and check out the value shown on the display. If it is correct, press **4** to save and exit, otherwise press **2** and then, via buttons **1**, **2** and **3** manually enter the correct value. Press **4** and **4** again to go back to **CALB**.
- Press **2** and **2** again to switch to **ALAR**, then press **4** and **2** again to switch to **BLOC**;
- Press **4** to enter and then, via buttons **1**, **2** and **3**, enter the alarm value equal to the nominal load + the overload of 20%. Press **4** to save;
- Press **2** to go to **DIFF** and **4** again to enter. Set the value = **0045**, via buttons **1**, **2** and **3**, then 4 again to store;
- Press **2** to switch to **TEST** and **4** again to do the test. When **PASS** appears, press **3** three times to exit calibration;
- Check out if the display shows the value of the current load on the platform;
- Check out if with a load >= the rated load + 20% overload, the system goes into overload alarm and that, by removing the 20% overload, the alarm condition disappears;
- Once the adjustment has been completed, close the box which contains the board.

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

7.2.13. 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.

WARNING!! IN THIS CONDITION THE MACHINE CAN CARRY OUT ANY OPERATION, THOUGH THE RED STEADY 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.

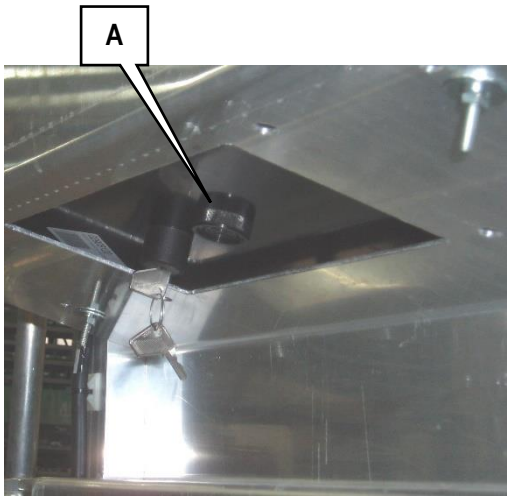


Fig.31

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.

7.2.14. Operation check of M1 microswitches

The lifting booms and the telescopic extension are controlled by microswitches:

- M1A on pantograph (lower boom)
- M1B on the upper boom.
- M1C on the Jib.
- M1E on the telescopic extension (OPTIONAL for A16J – STANDARD for A18 J).

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

The microswitch functions M1A-M1B-M1E are as follows: with platform outside the rest position (at least one of the microswitches M1A-M1B-M1E is driven):

- the safety drive speed is automatically activated;
- If the chassis is inclined over the max. allowed inclination, lifting, extension 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 functions of the microswitch M1C on the Jib have been designed to favour loading/unloading operations 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 first drive speed is automatically activated.
- if the chassis is inclined over the max. allowed inclination, Jib lifting and drive controls remain allowed;

7.2.15. Dead-man pedal safety system operation check

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. Starter 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. Starter battery models “D” “ED”

On machines with heat engine the starter battery is for:

- Powering the machine control circuits.
- Starting the heat engine.
- Powering the 12V electrical pump for emergency operations (if any).

7.3.2. Starter type battery for models “E”

On machines with batteries the starter battery is for:

- Powering the control circuits of the machine.

7.3.3. Starter battery maintenance

The starter battery does not require any special maintenance:

- Keep terminals clean by removing any oxidation residues.
- Check correct terminal tightening.

7.3.4. Starter battery recharge

Starter batteries do not require any recharge.
During normal operation of the Diesel engine an alternator recharges the battery (machines “D”, “ED”). On machines featuring single-phase 230 V or three-phase 380 V electrical pump, the control system of the electrical pump keeps the starter battery charged during operation in “electric mode”. On machines with battery a DC-DC converter keeps the starter battery charged.

WARNING!
Check the charge of the starter battery after carrying a lowering manoeuvre of the platform with the 12V emergency electrical pump (OPTIONAL).

7.4. "DRIVE" battery for models "E" and "ED"

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.

7.4.1. General instructions for DRIVE 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.

7.4.2. DRIVE 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.

7.4.3. DRIVE 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 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 charger with consequent damages 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 charging phase (refer to table below).

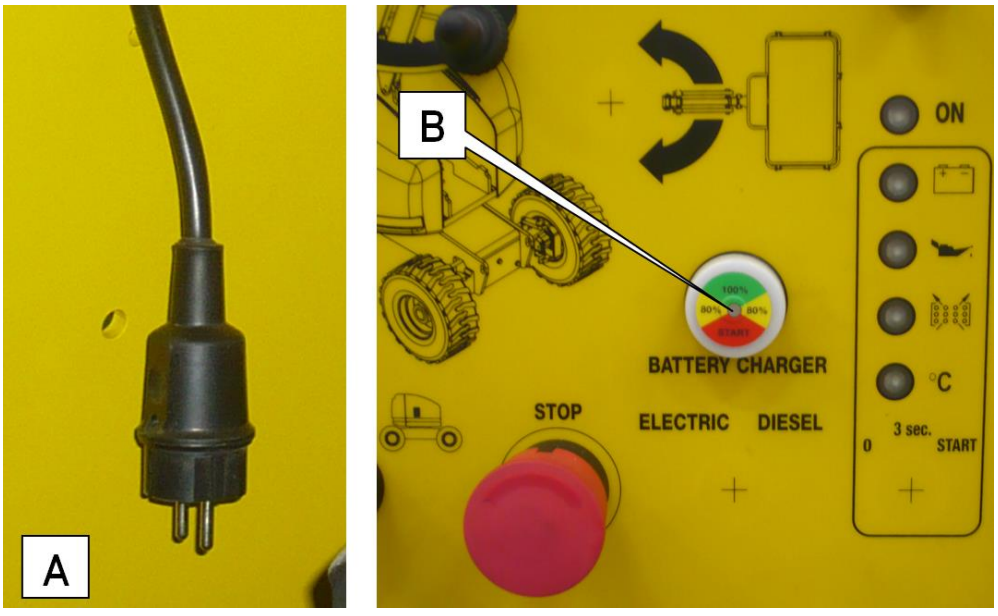


Fig. 32

WARNING	DESCRIPTION
RED led flashing for a few seconds	Battery charger self-diagnostic phase
RED led on	Indicates the first and second charging phase
YELLOW led on	Indicates the equalization of the charging phase
GREEN led on	Indicates that charging is over; buffer charge active

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.

7.4.4. Battery charger: fault report

An intermittent audible alarm and the flashing LED on the battery charger indicator described in the previous paragraph indicate that a warning situation has occurred:

Signalling	Alarm type	Problem description and troubleshooting
Alarm + flashing **RED**	Battery presence	Battery is disconnected or faulty (check connection and the rated voltage of the battery).
Alarm + flashing **YELLOW**	Thermal probe	Thermal probe is disconnected during charging or outside working range (check probe connection and measure battery temperature).
Alarm + flashing **GREEN**	Time-out	Phase 1 and/or Phase 2 of duration higher than the max. allowed value (check battery capacity).
Audible signalling + flashing **RED-YELLOW**	Battery Current	Loss of output current control (fault in control logic).
Audible signalling + flashing **RED-GREEN**	Battery Voltage	Loss of output voltage control (battery disconnected or fault in the control logic).
Audible signalling + flashing **RED-YELLOW-GREEN**	Thermal	Over temperature of semiconductors (check the fan operation).

WARNING!

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

7.4.5. 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

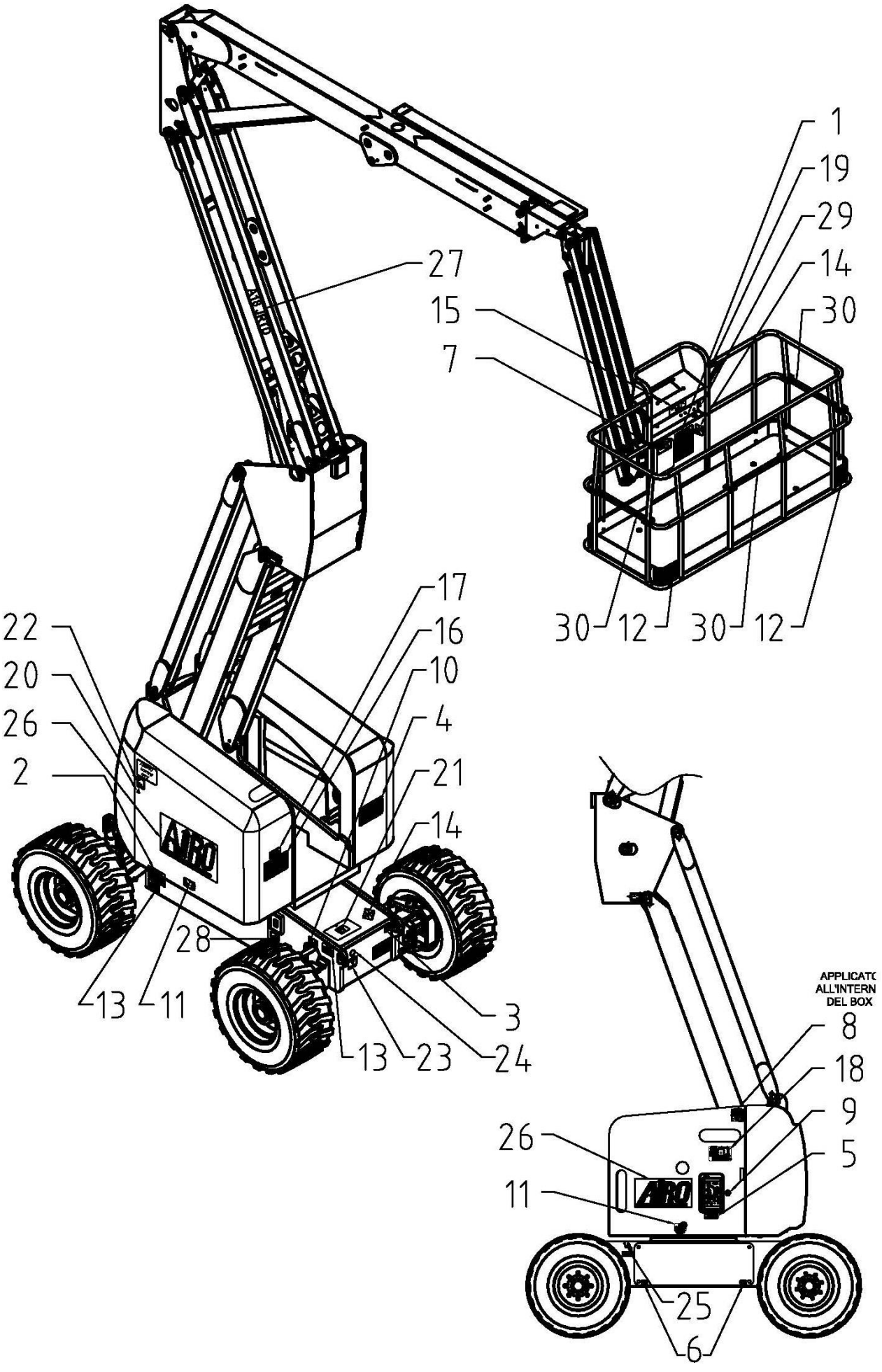
Test carrying out is shown by the above plate with CE mark applied on the machine and by the declaration of conformity enclosed in this user manual.

9. PLATES AND STICKERS

STANDARD STICKERS 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	001.10.088	Document holder sticker	1
8	001.10.150	"46" oil type sticker I-D-F-NL-B-G-PL	1
9	001.10.180	First check sticker	1
10	001.10.243	"Max. Load per wheel" sticker	4
11	001.10.260	Symbol articulated no stopping sticker	2
12	010.10.010	YELLOW-BLACK LINE STICKER <150x300>	4
13	021.10.017	Emergency towing sticker	4* - 2***
14	023.10.003	Directions sticker	3
15	029.10.006	230 KG capacity sticker	1
16	029.10.011	No fasten cage sticker	1
17	029.10.013	Turret lock device sticker	1
18	029.10.030	**STANDARD** MACHINES emergency manual lowering sticker	1
	029.10.022	**SIMULTANEOUS CONTROLS MACHINES** emergency manual lowering sticker	1
19	035.10.007	Safety belts coupling sticker	2
20****	008.10.020	Triangle hot parts sticker	1
21****	029.10.005	Fuel tank sticker	1
22*	029.10.016	Sound power level sticker 103 dB	1
22**	030.10.008	Sound power level sticker 105 dB	1
23***	001.10.098	STOP sticker I-D-F-NL-B-GB	1
24***	001.10.242	Emergency stop button yellow sticker	1
25***	045.10.011	Battery charger plug sticker	1
26	001.10.175	AIRO pre-spaced yellow sticker <530x265>	2
27	029.10.023	Pre-spaced sticker "A16 JE" BLACK	2
	029.10.025	Pre-spaced sticker "A16 JED" BLACK	2
	029.10.026	Pre-spaced sticker "A16 JRTD" BLACK	2
	040.10.010	Pre-spaced sticker "A18 JE" BLACK	2
	040.10.012	Pre-spaced sticker "A18 JED" BLACK	2
	040.10.013	Pre-spaced sticker "A18 JRTD" BLACK	2
28****	045.10.010	(Optional) electric line plug sticker	1
29****	001.10.021	(Optional) ground symbol sticker	1
30****	001.10.244	(Optional) entrance bar black-yellow line sticker	1

* Only DIESEL models
** Only Electric/Diesel models
*** Only Electric models or Electro/Diesel
**** Only DIESEL models or Electro/Diesel
***** Optional features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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.

	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 OIL LEVEL CHECK	See chapter 7.2.3. 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			

DRIVE REDUCTION GEARS OIL LEVEL CHECK	See chapter 7.2.5.

	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 DRIVE CIRCUIT RELIEF PRESSURE VALVE	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			

CALIBRATION CHECK OF MOVEMENT CIRCUIT RELIEF PRESSURE VALVE	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

CHECK	DESCRIPTION OF OPERATIONS TO BE PERFORMED
BATTERY STATE	See chapter 7.4 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 7.2.7.

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

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	DESCRIPTION OF OPERATIONS TO BE PERFORMED
TOTAL OIL CHANGE IN HYDRAULIC TANK AND DRIVE REDUCTION GEARS (EVERY TWO YEARS)	See chapter 7.2.3 and 7.2.5

	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**	
AIR PURGING FROM OSCILLATING AXLE CYLINDERS		**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

SAFETY SYSTEM CHECK	DESCRIPTION OF OPERATIONS TO BE PERFORMED
INCLINOMETER 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			

EFFICIENCY CHECK OF PLATFORM OVERLOAD CONTROLLER	See chapter 7.2.12.

	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	See chapter 7.2.10.

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

M1 MICROSWITCH OPERATION 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			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

SAFETY SYSTEM CHECK	DESCRIPTION OF OPERATIONS TO BE PERFORMED
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			

SAFETY SYSTEM CHECK	DESCRIPTION OF OPERATIONS TO BE PERFORMED
"DEAD-MAN" SYSTEM CHECK	See chapter 7.2.15.

	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**

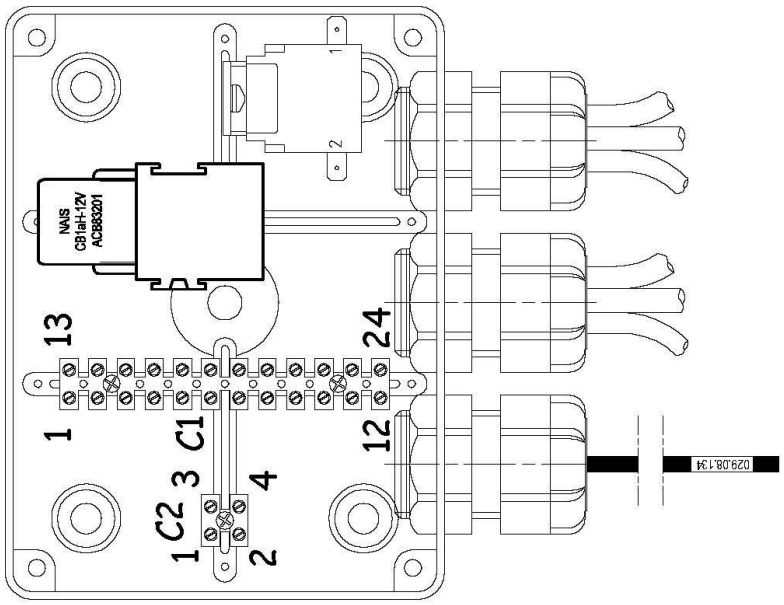
11. ELECTRIC DIAGRAMS

Machine name → Machine name		A16 JRTD	A16 JE	A16 JED	A18 JRTD	A18 JE	A18 JED
Kit code Kit description	**Kit description Kit description**						
029.08.144	Chassis shunt box Main fixed structure electric box	**X**			**X**		
029.08.149	CR sheath CR sheath		**X**			**X**	
029.08.161	CR sheath CR sheath			**X**			**X**
029.08.171	CNV sheath CNV sheath		**X**	**X**		**X**	**X**
029.08.128	Solenoid valve sheath – CA1 CA1 – electrovalves sheath	**X**	**X**	**X**	**X**	**X**	**X**
029.08.129	Sheath microswitches – CA2 CA2 – microswitches sheath	**X**			**X**		
029.08.150	Sheath microswitches – CA2 CA2 – microswitches sheath		**X**	**X**		**X**	**X**
029.08.132	Cassetta di derivazione motore HATZ Main HATZ engine electric box	**X**			**X**		
029.08.158	Heat engine junction box Main thermic engine electric box			**X**			**X**
029.08.148	Power sheath - MO MO – Supplying sheath		**X**			**X**	
029.08.147	Platform junction box Main platform electric box	**X**	**X**	**X**	**X**	**X**	**X**
029.08.170	Full Electric Diagram		**X**			**X**	

029.08.144

"C1" CONNECTOR			
N. PIN PIN #	N. FILO / GUAINA WIRE / SHEATH #	NOTE	NOTE
1	1 - 029.08.134	POSITIVO EV8	EV8 POSITIVE
2	2 - 029.08.134	POSITIVO EV9	EV9 POSITIVE
3	3 - 029.08.134	POSITIVO EV10A/B	EV10A/B POSITIVE
4	4 - 029.08.134	POSITIVO EV10C/D	EV10C/D POSITIVE
5	11 - 029.08.134	NEGATIVO EV8	EV8 NEGATIVE
6	12 - 029.08.134	NEGATIVO EV9	EV9 NEGATIVE
7	13 - 029.08.134	NEGATIVO EV10A/B	EV10A/B NEGATIVE
8	14 - 029.08.134	NEGATIVO EV10C/D	EV10C/D NEGATIVE
9	8 - 029.08.134	POSITIVO DA CHIAVE	POSITIVE FROM KEY
10	9 - 029.08.134	ALLARME FUSIBILE ELETTROVENTOLA	ALETTROFAN FUSE ALARM
11	10 - 029.08.134	ALLARME LIVELLO GASOLIO	DIESEL RESERVE ALARM
12		LIBERO	FREE

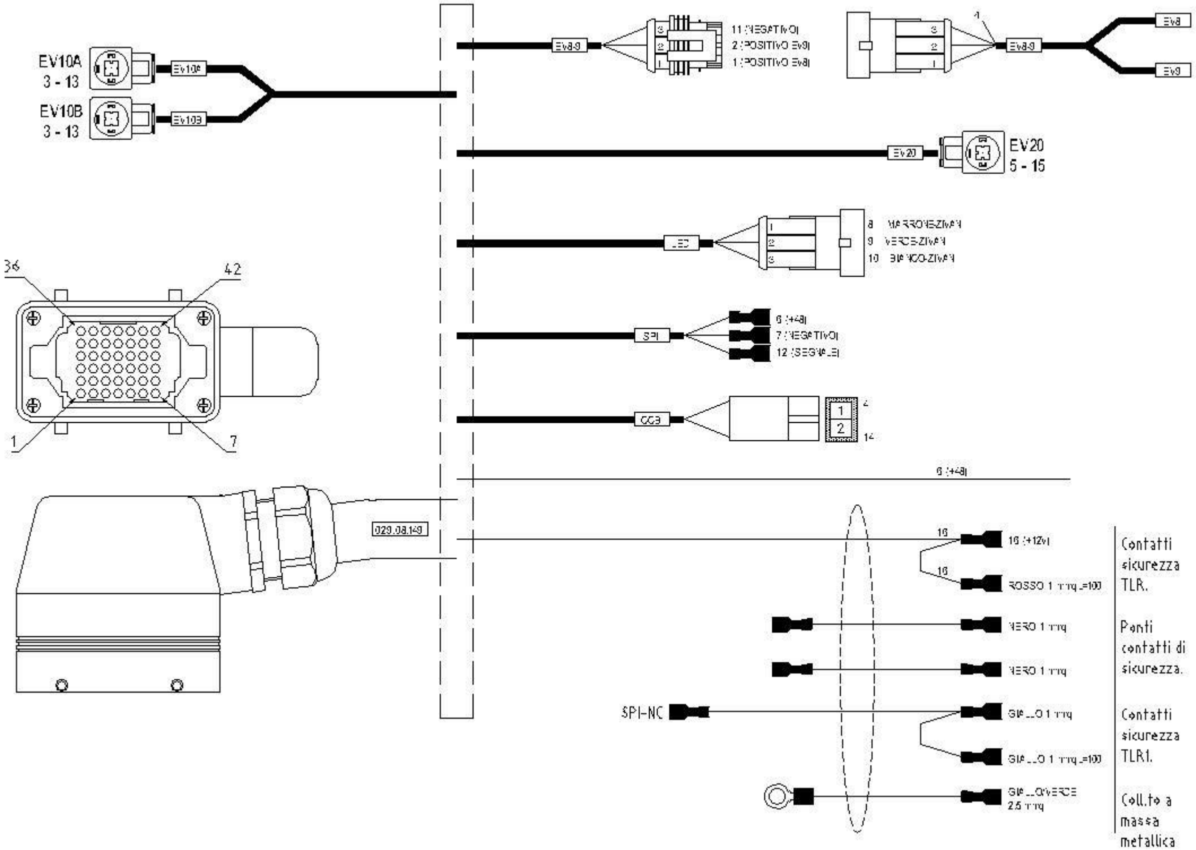
"C2" CONNECTOR			
N. PIN PIN #	N. FILO / GUAINA WIRE / SHEAT #	NOTE	NOTE
1	7 - 029.08.134	POSITIVO EV41 (SG1600-J)	EV41 POSITIVE (SG1600-J)
2	15 - 029.08.134	NEGATIVO EV41 (SG1600-J)	EV41 NEGATIVE (SG1600-J)



GUAINA CR - CR SHEATH 029.08.134			
N. FILO WIRE #	PIN / CONNETT.	NOTE	NOTE
1	1 - C1	POSITIVO EV8	EV8 POSITIVE
2	2 - C1	POSITIVO EV9	EV9 POSITIVE
3	3 - C1	POSITIVO EV10A-B	EV10A-B POSITIVE
4	4 - C1	POSITIVO EV10C-D	EV10C-D POSITIVE
5		LIBERO	FREE
6		LIBERO	FREE
7	1 - C2	POSITIVO EV41 (SG1600-J)	EV41 POSITIVE (SG1600-J)
8	9 - C1	POSITIVO DA CHIAVE	POSITIVE FROM KEY
9	10 - C1	ALLARME FUSE ELETTROVENTOLA	ELETTROFAN FUSE ALARM
10	11 - C1	ALLARME RISERVA GASOLIO	GASOLINE RESERVE ALARM
11	5 - C1	NEGATIVO EV8	EV8 NEGATIVE
12	6 - C1	NEGATIVO EV9	EV9 NEGATIVE
13	7 - C1	NEGATIVO EV10A-B	EV10A-B NEGATIVE
14	8 - C1	NEGATIVO EV10C-D	EV10C-D NEGATIVE
15	2 - C2	NEGATIVO EV41 (SG1600-J)	EV41 NEGATIVE (SG1600-J)
16		LIBERO	FREE

029.08.149

CABLAGGIO CONNETTORE GUAINA - CR					
PIN	FILO	NOTE	PIN	FILO	NOTE
1	1 - CR	EV4	22		FILO LIBERO SEGNALE M13
2	2 - CR	EV7	23		FILO LIBERO NEGATIVO M13
3	3 - CR	EV11A-B	24	Ponticello su ILME tra i pin 24 e 25	POSITIVO TERMOSTATO
4		FILO LIBERO EV11C-D	25		ALLARME FUSIBILE SCAMBIATORE
5	5 - CR	EV21A	26		ALLARME RISERVA CARBURANTE
6		FILO LIBERO EV21-B	27		FILO LIBERO ELETTROP. EMERG.
7		FILO LIBERO EV34	28		FILO LIBERO NEGATIVO EP EMERG.
8		FILO LIBERO EV39	29		FILO LIBERO EP MONOF/TRIF.
9		FILO LIBERO EV41	30		FILO LIBERO AUSIL. EP MONOF./TRIF.
10		FILO LIBERO EV41	31	8 - CR	LED SPIA CARICA BATTERIA
11	11 - CR	NEGATIVO EV4/7	32	9 - CR	LED SPIA CARICA BATTERIA
12		FILO LIBERO NEGATIVO EV7	33	10 - CR	LED SPIA CARICA BATTERIA
13	13 - CR	NEGATIVO EV11A-B	34	4 - CR	CCI CONTATTO MACC. OFF
14		FILO LIBERO NEGATIVO EV11C-D	35	14 - CR	CCI CONTATTO MACC. OFF
15	15 - CR	NEGATIVO EV21A	36	6 - CR	SPI POSITIVO FUORI ISOL.
16		FILO LIBERO EV21B	37	7 - CR	SPI NEGATIVO FUORI ISOL.
17		FILO LIBERO NEGATIVO EV34	38	12 - CR	SPI SEGNALE FUORI ISOL.
18		FILO LIBERO NEGATIVO EV39	39	16 - CR	+12V SIC
19		FILO LIBERO NEGATIVO EV41	40		FILO LIBERO
20		FILO LIBERO NEGATIVO EV41	41		FILO LIBERO
21		FILO LIBERO POSITIVO M13	42		FILO LIBERO



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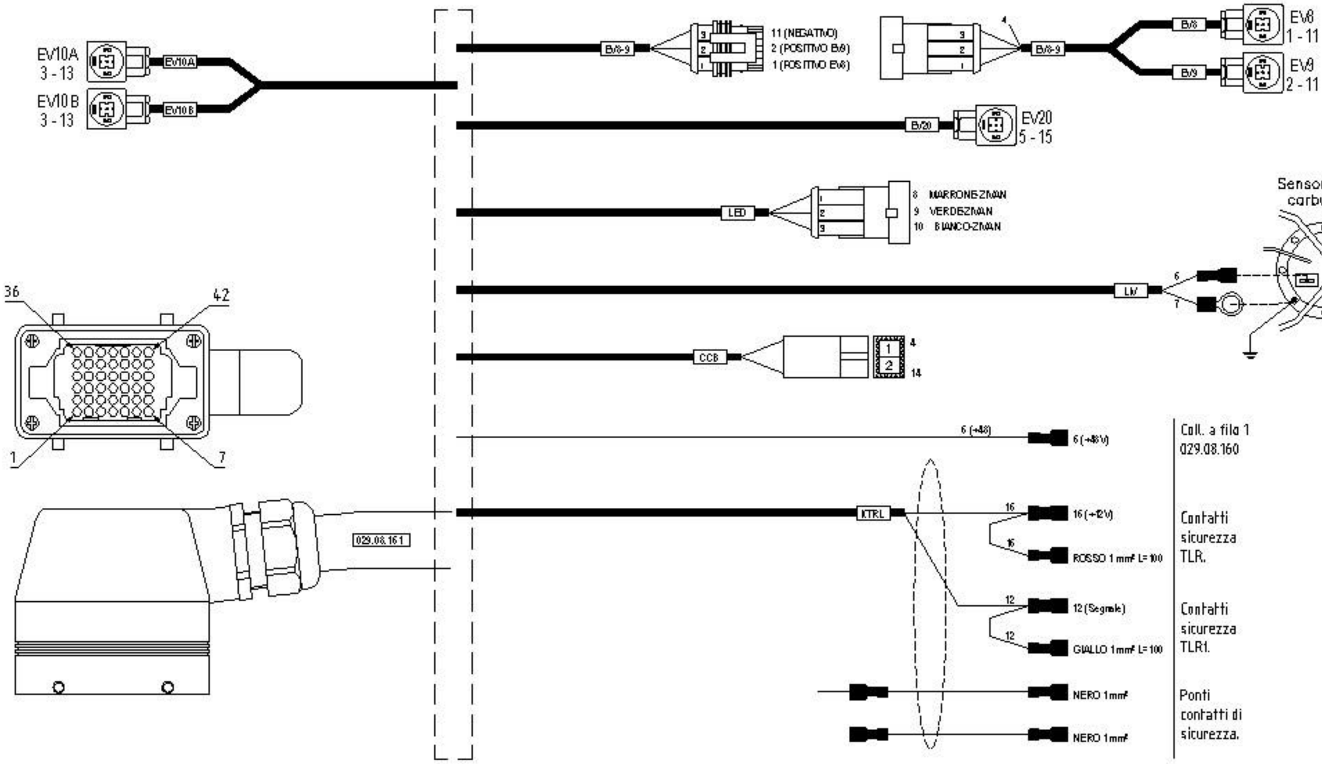

CABLAGGIO CONNETTORE GUAINA – CR					
PIN	FILO	NOTE	PIN	FILO	NOTE
1	1 - CR	EV8	22		FILO LIBERO SEGNALE M13
2	2 - CR	EV9	23		FILO LIBERO NEGATIVO M13
3	3 - CR	EV10A-B	24	Ponticello su ILME tra i pin 24 e 25	POSITIVO TERMOSTATO
4		FILO LIBERO EV10C-D	25		ALLARME FUSIBILE SCAMBIATORE
5	5 - CR	EV20A	26	6 - CR	ALLARME RISERVA CARBURANTE
6		FILO LIBERO EV20-B	27		FILO LIBERO ELETTROP. EMERG.
7		FILO LIBERO EV38	28		FILO LIBERO NEGATIVO EP EMERG.
8		FILO LIBERO EV39	29		FILO LIBERO EP MONOF/TRIF.
9		FILO LIBERO EV40	30		FILO LIBERO ABIL. EP MONOF./TRIF.
10		FILO LIBERO EV41	31	8 - CR	LED SPIA CARICABATTERIA
11	11 - CR	NEGATIVO EV8/9	32	9 - CR	LED SPIA CARICABATTERIA
12		FILO LIBERO NEGATIVO EV9	33	10 - CR	LED SPIA CARICABATTERIA
13	13 - CR	NEGATIVO EV10A-B	34	4 - CR	CCB CONTATTO MACC. OFF
14		FILO LIBERO NEGATIVO EV10C-D	35	14 - CR	CCB CONTATTO MACC. OFF
15	15 - CR	NEGATIVO EV20A	36	6 - CR	SP1 POSITIVO FUORI ISOL.
16		FILO LIBERO EV20B	37	7 - CR	SP1 NEGATIVO FUORI ISOL.
17		FILO LIBERO NEGATIVO EV38	38	12 - CR	TLR - SP1 SEGNALE SICUREZZA
18		FILO LIBERO NEGATIVO EV39	39	16 - CR	+12VSK
19		FILO LIBERO NEGATIVO EV40	40		FILO LIBERO
20		FILO LIBERO NEGATIVO EV41	41		FILO LIBERO
21		FILO LIBERO POSITIVO M13	42		FILO LIBERO

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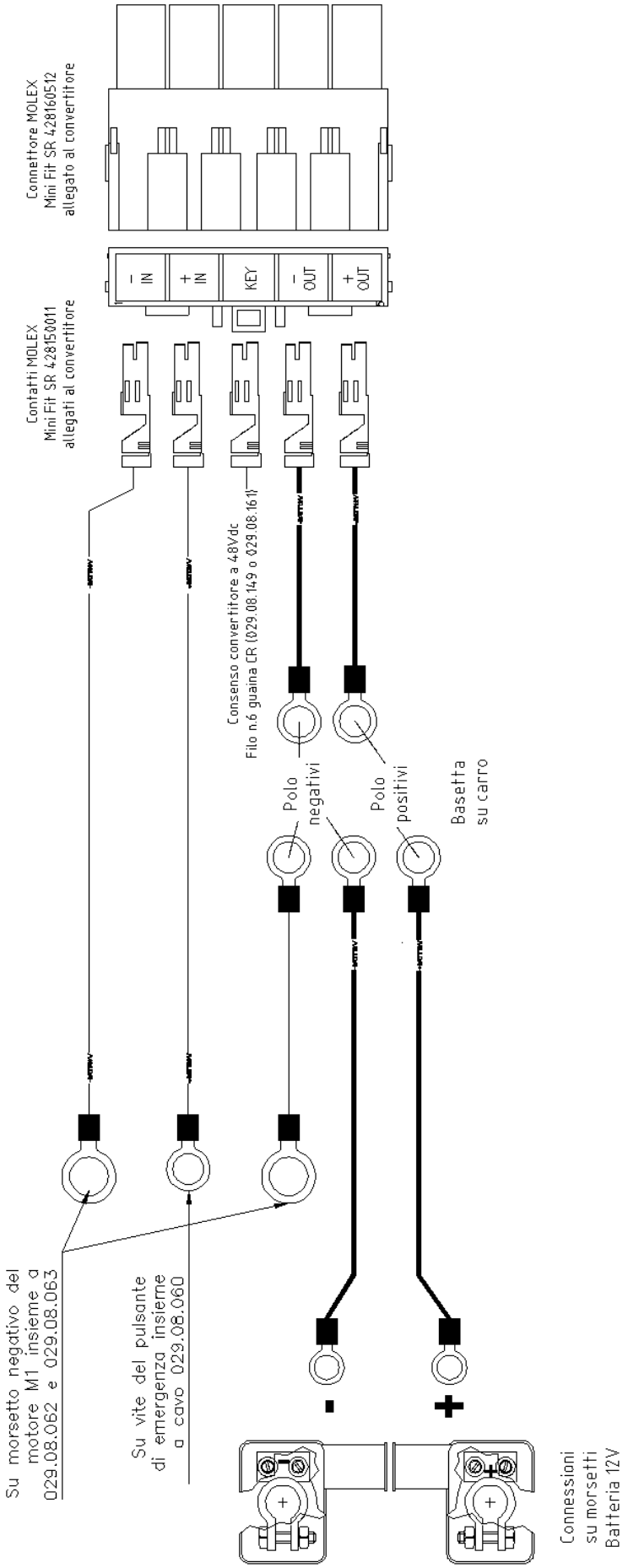
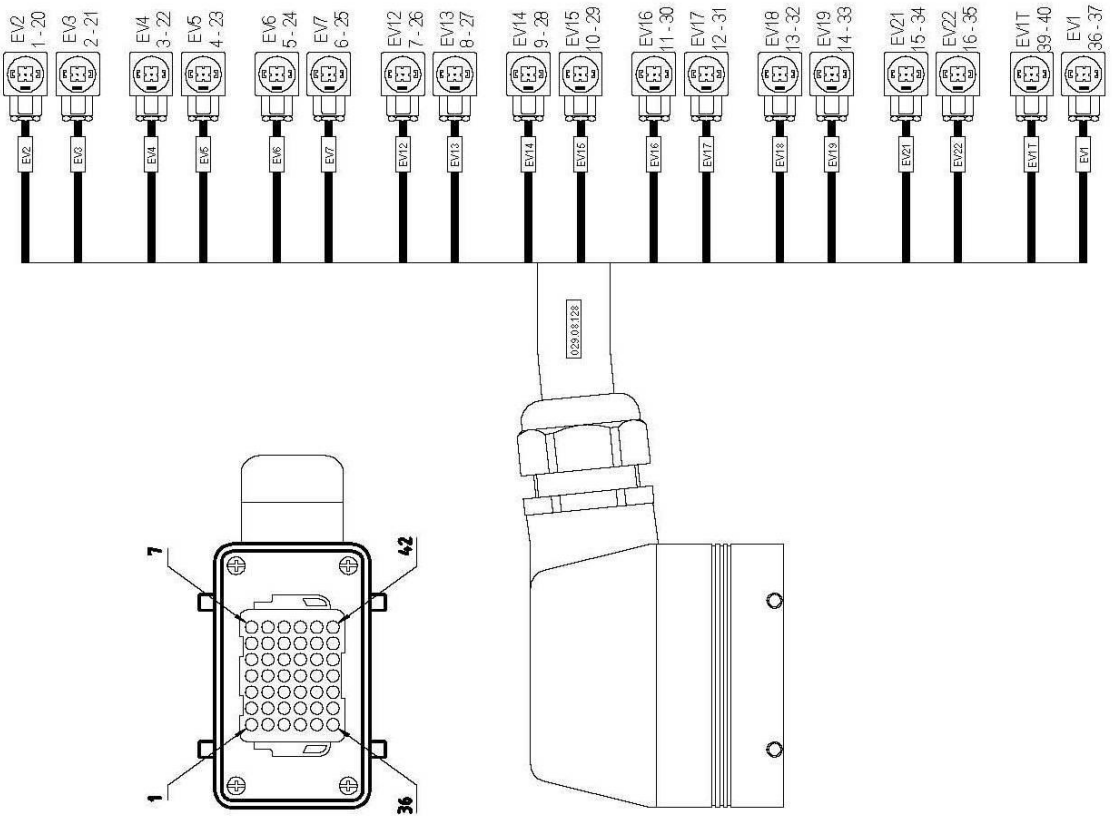

Connettore MOLEX
Mini Fit SR 428160512
allegato al convertitore
- IN
+ IN
KEY
- OUT
+ OUT
Contatti MOLEX
Mini Fit SR 428150011
allegati al convertitore
Consenso convertitore a 48Vdc
Filo n.6 guaina CR (029.08.149 o 029.08.161)
Polo negativi
Polo positivi
Basetta su carro
Su morsetto negativo del motore M1 insieme a 029.08.062 e 029.08.063
Su vite del pulsante di emergenza insieme a cavo 029.08.060
Connessioni su morsetti Batteria 12V

029.08.128

GUAINA – CA1			
PIN	FILO / GUAINA WIRE / SHEATH	NOTE	NOTE
1	1	POSITIVO EV2	EV2 POSITIVE
2	2	POSITIVO EV3	EV3 POSITIVE
3	3	POSITIVO EV4	EV4 POSITIVE
4	4	POSITIVO EV5	EV5 POSITIVE
5	5	POSITIVO EV6	EV6 POSITIVE
6	6	POSITIVO EV7	EV7 POSITIVE
7	7	POSITIVO EV12	EV12 POSITIVE
8	8	POSITIVO EV13	EV13 POSITIVE
9	9	POSITIVO EV14	EV14 POSITIVE
10	10	POSITIVO EV15	EV15 POSITIVE
11	11	POSITIVO EV16	EV16 POSITIVE
12	12	POSITIVO EV17	EV17 POSITIVE
13	13	POSITIVO EV18	EV18 POSITIVE
14	14	POSITIVO EV19	EV19 POSITIVE
15	15	POSITIVO EV21	EV21 POSITIVE
16	16	POSITIVO EV22	EV22 POSITIVE
17		FILO LIBERO	FREE WIRE
18		FILO LIBERO	FREE WIRE
19		FILO LIBERO	FREE WIRE
20	20	NEGATIVO EV2	EV2 NEGATIVE
21	21	NEGATIVO EV3	EV3 NEGATIVE
22	22	NEGATIVO EV4	EV4 NEGATIVE
23	23	NEGATIVO EV5	EV5 NEGATIVE
24	24	NEGATIVO EV6	EV6 NEGATIVE
25	25	NEGATIVO EV7	EV7 NEGATIVE
26	26	NEGATIVO EV12	EV12 NEGATIVE
27	27	NEGATIVO EV13	EV13 NEGATIVE
28	28	NEGATIVO EV14	EV14 NEGATIVE
29	29	NEGATIVO EV15	EV15 NEGATIVE
30	30	NEGATIVO EV16	EV16 NEGATIVE
31	31	NEGATIVO EV17	EV17 NEGATIVE
32	32	NEGATIVO EV18	EV18 NEGATIVE
33	33	NEGATIVO EV19	EV19 NEGATIVE
34	34	NEGATIVO EV21	EV21 NEGATIVE
35	35	NEGATIVO EV22	EV22 NEGATIVE
36		FILO LIBERO	FREE WIRE
37		FILO LIBERO	FREE WIRE
38		FILO LIBERO	FREE WIRE
39	39	EV1T	EV1T
40	40	EV1T	EV1T
41	36	EV1	EV1
42	37	EV1	EV1



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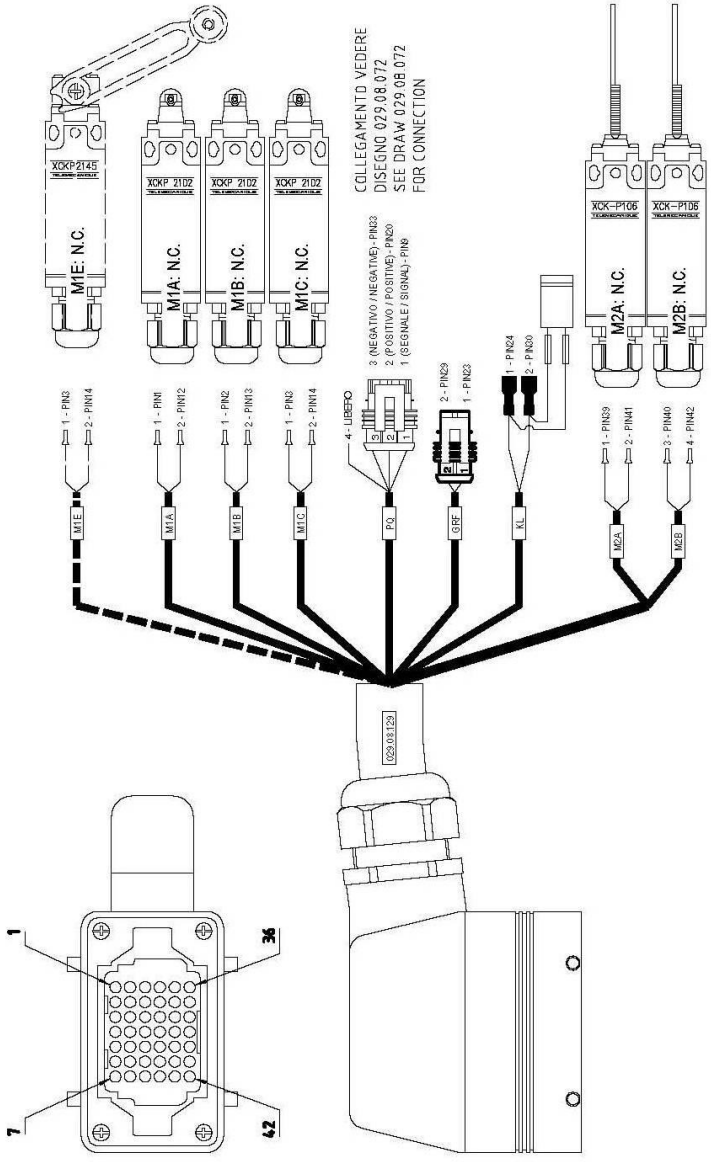
GUAINA CA2
CA2 SHEATH

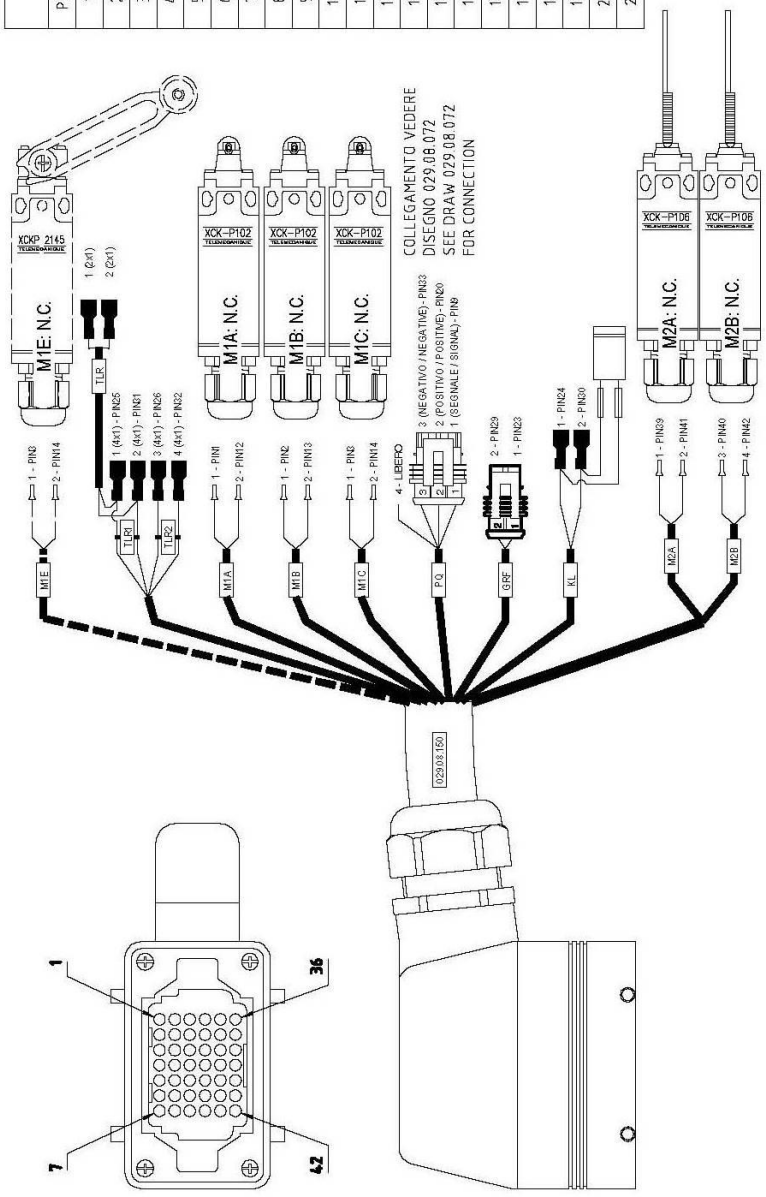
PIN	FILO / WIRE	NOTE	NOTE	PIN	FILO / WIRE	NOTE	NOTE
1	1 – M1A	RITORNO DA M1A	BACK FROM M1A	22		FILO LIBERO	FREE WIRE
2	1 – M1B	RITORNO DA M1B	BACK FROM M1B	23	1 – GRF	POSITIVO GRF	GRF POSITIVE
3	1 – M1C	RITORNO DA M1C	BACK FROM M1C	24	1 – KL	POSITIVO KL	KL POSITIVE
4		FILO LIBERO (OPZIONE RITORNO DA M15)	FREE WIRE OR BACK FROM M15	25		FILO LIBERO (OPZIONE POSITIVO TLR4)	FREE WIRE OR TLR1 POSITIVE
5		FILO LIBERO (OPZIONE RITORNO DA M16)	FREE WIRE OR BACK FROM M16	26		FILO LIBERO (OPZIONE POSITIVO TLR5)	FREE WIRE OR TLR2 POSITIVE
6	1 – M1E	RITORNO DA M1E (SG1640-J)	BACK FROM M1E (SG1640-J)	27		FILO LIBERO	FREE WIRE
7		FILO LIBERO (OPZIONE RITORNO DA M11)	FREE WIRE OR BACK FROM M11	28		FILO LIBERO	FREE WIRE
8		FILO LIBERO (OPZIONE RITORNO DA M12)	FREE WIRE OR BACK FROM M12	29	2 – GRF	NEGATIVO GRF	GRF NEGATIVE
9	1 – PQ	RITORNO DA INCLINOMETRO "PQA"	BACK FROM INCLINOMETER "PQA"	30	2 – KL	NEGATIVO KL	KL NEGATIVE
10		FILO LIBERO	FREE WIRE	31		FILO LIBERO (OPZIONE NEGATIVO TLR1)	FREE WIRE OR TLR1 NEGATIVE
11		FILO LIBERO	FREE WIRE	32		FILO LIBERO (OPZIONE NEGATIVO TLR2)	FREE WIRE OR TLR2 NEGATIVE
12	2 – M1A	POSITIVO M1A	M1A POSITIVE	33	3 – PQ	NEGATIVO INCLINOMETRO PQ	INCLINOMETER "PQ" NEGATIVE
13	2 – M1B	POSITIVO M1B	M1B POSITIVE	34		FILO LIBERO	FREE WIRE
14	2 – M1C	POSITIVO M1C	M1C POSITIVE	35		FILO LIBERO	FREE WIRE
15		FILO LIBERO (OPZIONE POSITIVO M15)	FREE WIRE OR M15 POSITIVE	36		FILO LIBERO	FREE WIRE
16		FILO LIBERO (OPZIONE POSITIVO M16)	FREE WIRE OR M16 POSITIVE	37		FILO LIBERO	FREE WIRE
17	2 – M1E	POSITIVO M1E (SG1640-J)	M1E POSITIVE (SG1640-J)	38		FILO LIBERO	FREE WIRE
18		FILO LIBERO (OPZIONE POSITIVO M11)	FREE WIRE OR M11 POSITIVE	39	1 – M2A/B	RITORNO DA M2A	M2A BACK FROM
19		FILO LIBERO (OPZIONE POSITIVO M12)	FREE WIRE OR M12 POSITIVE	40	3 – M2A/B	RITORNO DA M2B	M2B BACK FROM
20	2 – PQ	POSITIVO INCLINOMETRO PQ	INCLINOMETER "PQA" POSITIVE	41	2 – M2A/B	POSITIVO M2A	M2A POSITIVE
21		FILO LIBERO (OPZIONE POSITIVO M13)	FREE WIRE OR M13 POSITIVE	42	4 – M2A/B	POSITIVO M2B	M2B POSITIVE



029.08.150

GUAINA CA2
CA2 SHEATH

PIN	FILO / WIRE	NOTE	NOTE	PIN	FILO / WIRE	NOTE	NOTE
1	1 – M1A	RITORNO DA M1A	BACK FROM M1A	22		FILO LIBERO	FREE WIRE
2	1 – M1B	RITORNO DA M1B	BACK FROM M1B	23	1 – GRF	POSITIVO GRF	GRF POSITIVE
3	1 – M1C	RITORNO DA M1C	BACK FROM M1C	24	1 – KL	POSITIVO KL	KL POSITIVE
4		FILO LIBERO (OPZIONE RITORNO DA M15)	FREE WIRE OR BACK FROM M15	25	1 – TLR1	POSITIVO TLR1	TLR1 POSITIVE
5		FILO LIBERO (OPZIONE RITORNO DA M9)	FREE WIRE OR BACK FROM M9	26	3 – TLR2	POSITIVO TLR2	TLR2 POSITIVE
6	1 – M1E	RITORNO DA M1E (SOLENOID-J)	BACK FROM M1E (SOLENOID-J)	27		FILO LIBERO	FREE WIRE
7		FILO LIBERO (OPZIONE RITORNO DA M11)	FREE WIRE OR BACK FROM M11	28		FILO LIBERO	FREE WIRE
8		FILO LIBERO (OPZIONE RITORNO DA M12)	FREE WIRE OR BACK FROM M12	29	2 – GRF	NEGATIVO GRF	GRF NEGATIVE
9	1 – PQ	RITORNO DA INCLINOMETRO "PQ"	BACK FROM INCLINOMETER "PQ"	30	2 – KL	NEGATIVO KL	KL NEGATIVE
10		FILO LIBERO	FREE WIRE	31	2 – TLR1	NEGATIVO TLR1	TLR1 NEGATIVE
11		FILO LIBERO	FREE WIRE	32	4 – TLR2	NEGATIVO TLR2	TLR2 NEGATIVE
12	2 – M1A	POSITIVO M1A	M1A POSITIVE	33	3 – PQ	NEGATIVO INCLINOMETRO PQ	INCLINOMETER "PQ" NEGATIVE
13	2 – M1B	POSITIVO M1B	M1B POSITIVE	34		FILO LIBERO	FREE WIRE
14	2 – M1C	POSITIVO M1C	M1C POSITIVE	35		FILO LIBERO	FREE WIRE
15		FILO LIBERO (OPZIONE POSITIVO M15)	FREE WIRE OR M15 POSITIVE	36		FILO LIBERO	FREE WIRE
16		FILO LIBERO (OPZIONE POSITIVO M9)	FREE WIRE OR M9 POSITIVE	37		FILO LIBERO	FREE WIRE
17	2 – M1E	POSITIVO M1E (SOLENOID-J)	M1E POSITIVE (SOLENOID-J)	38		FILO LIBERO	FREE WIRE
18		FILO LIBERO (OPZIONE POSITIVO M11)	FREE WIRE OR M11 POSITIVE	39	1 – M2A/B	RITORNO DA M2A	BACK FROM M2A
19		FILO LIBERO (OPZIONE POSITIVO M12)	FREE WIRE OR M12 POSITIVE	40	3 – M2A/B	RITORNO DA M2B	BACK FROM M2B
20	2 – PQ	POSITIVO INCLINOMETRO PQ	INCLINOMETER "PQ" POSITIVE	41	2 – M2A/B	POSITIVO M2A	M2A POSITIVE
21		FILO LIBERO (OPZIONE POSITIVO M13)	FREE WIRE OR M13 POSITIVE	42	4 – M2A/B	POSITIVO M2B	M2B POSITIVE



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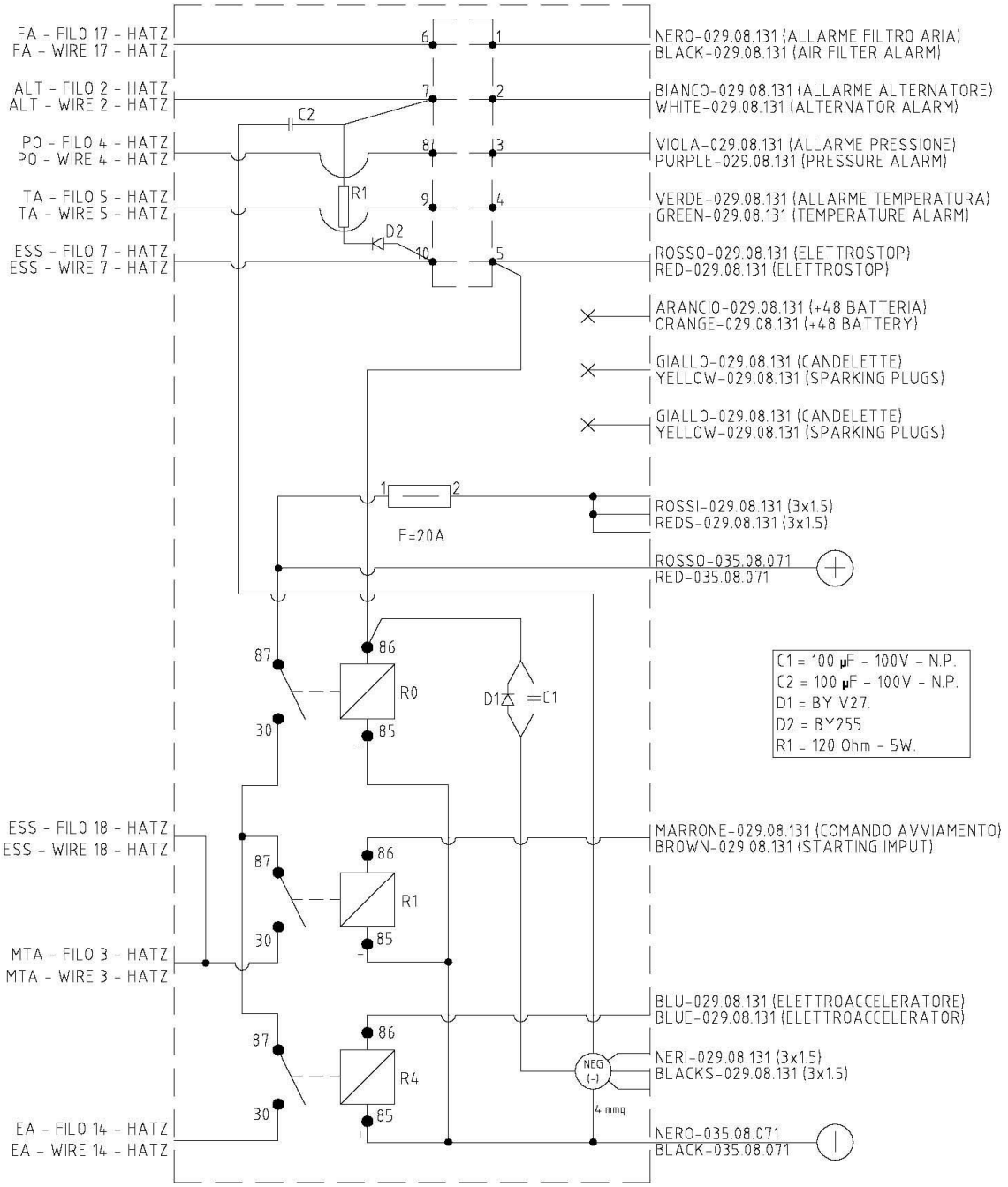
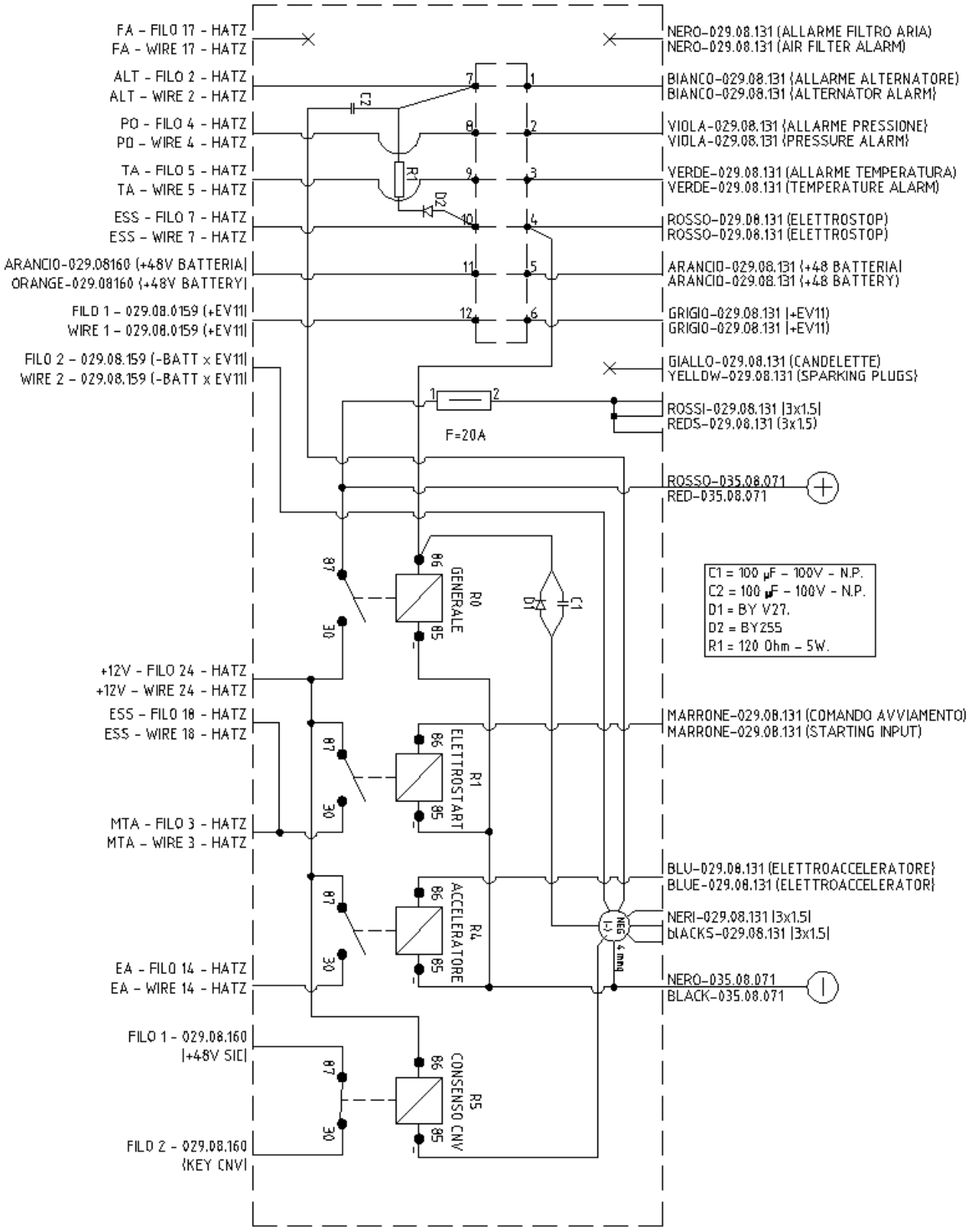
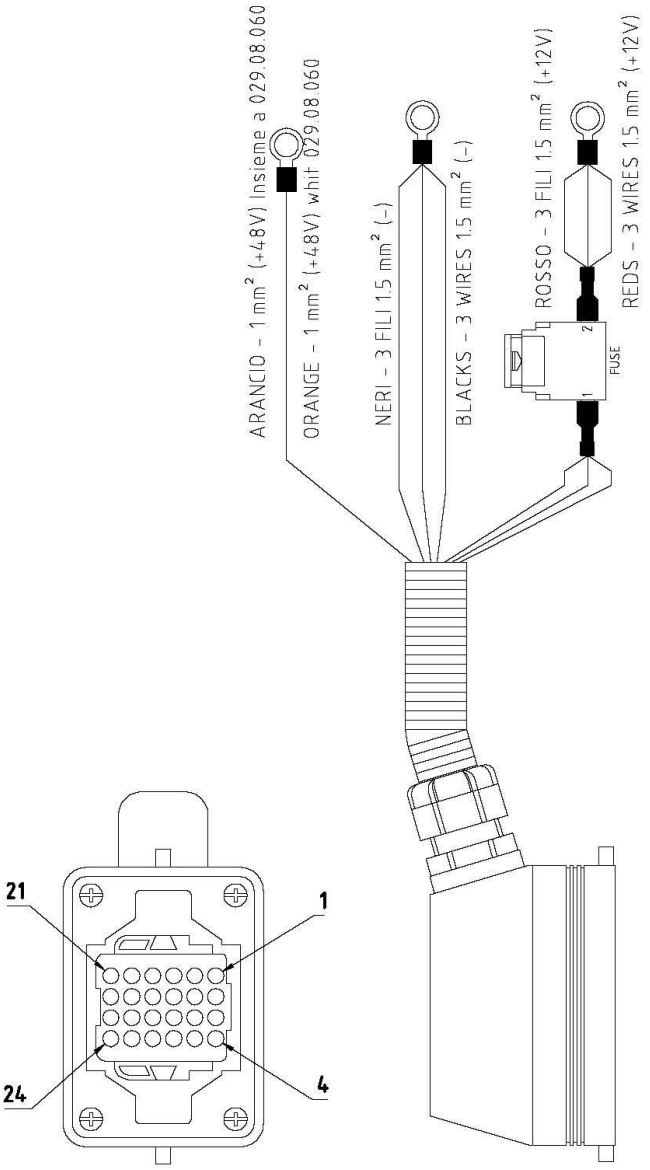

FA - FILO 17 - HATZ
FA - WIRE 17 - HATZ
NERO-029.08.131 (ALLARME FILTRO ARIA)
BLACK-029.08.131 (AIR FILTER ALARM)
ALT - FILO 2 - HATZ
ALT - WIRE 2 - HATZ
BIANCO-029.08.131 (ALLARME ALTERNATORE)
WHITE-029.08.131 (ALTERNATOR ALARM)
C2
PO - FILO 4 - HATZ
PO - WIRE 4 - HATZ
VIOLA-029.08.131 (ALLARME PRESSIONE)
PURPLE-029.08.131 (PRESSURE ALARM)
TA - FILO 5 - HATZ
TA - WIRE 5 - HATZ
R1
VERDE-029.08.131 (ALLARME TEMPERATURA)
GREEN-029.08.131 (TEMPERATURE ALARM)
D2
ESS - FILO 7 - HATZ
ESS - WIRE 7 - HATZ
ROSSO-029.08.131 (ELETTROSTOP)
RED-029.08.131 (ELETTROSTOP)
ARANCIO-029.08.131 (+48 BATTERIA)
ORANGE-029.08.131 (+48 BATTERY)
GIALLO-029.08.131 (CANDELETTE)
YELLOW-029.08.131 (SPARKING PLUGS)
GIALLO-029.08.131 (CANDELETTE)
YELLOW-029.08.131 (SPARKING PLUGS)
F=20A
ROSSI-029.08.131 (3x1.5)
REDS-029.08.131 (3x1.5)
ROSSO-035.08.071
RED-035.08.071
R0
D1
C1
C1 = 100 µF - 100V - N.P.
C2 = 100 µF - 100V - N.P.
D1 = BY V27.
D2 = BY255
R1 = 120 Ohm - 5W.
ESS - FILO 18 - HATZ
ESS - WIRE 18 - HATZ
MARRONE-029.08.131 (COMANDO AVVIAMENTO)
BROWN-029.08.131 (STARTING IMPUT)
R1
MTA - FILO 3 - HATZ
MTA - WIRE 3 - HATZ
BLU-029.08.131 (ELETTROACCELERATORE)
BLUE-029.08.131 (ELETTROACCELERATOR)
R4
NEG (-)
NERI-029.08.131 (3x1.5)
BLACKS-029.08.131 (3x1.5)
4 mmq
EA - FILO 14 - HATZ
EA - WIRE 14 - HATZ
NERO-035.08.071
BLACK-035.08.071

029.08.158


FA - FILO 17 - HATZ
FA - WIRE 17 - HATZ
NERO-029.08.131 (ALLARME FILTRO ARIA)
NERO-029.08.131 (AIR FILTER ALARM)
ALT - FILO 2 - HATZ
ALT - WIRE 2 - HATZ
BIANCO-029.08.131 (ALLARME ALTERNATORE)
BIANCO-029.08.131 (ALTERNATOR ALARM)
PO - FILO 4 - HATZ
PO - WIRE 4 - HATZ
VIOLA-029.08.131 (ALLARME PRESSIONE)
VIOLA-029.08.131 (PRESSURE ALARM)
TA - FILO 5 - HATZ
TA - WIRE 5 - HATZ
VERDE-029.08.131 (ALLARME TEMPERATURA)
VERDE-029.08.131 (TEMPERATURE ALARM)
ESS - FILO 7 - HATZ
ESS - WIRE 7 - HATZ
ROSSO-029.08.131 (ELETTROSTOP)
ROSSO-029.08.131 (ELETTROSTOP)
ARANCIO-029.08160 (+48V BATTERIA)
ORANGE-029.08160 (+48V BATTERY)
ARANCIO-029.08.131 (+48 BATTERIA)
ARANCIO-029.08.131 (+48 BATTERY)
FILO 1 - 029.08.0159 (+EV11)
WIRE 1 - 029.08.0159 (+EV11)
GRIGIO-029.08.131 (+EV11)
GRIGIO-029.08.131 (+EV11)
FILO 2 - 029.08.159 (-BATT x EV11)
WIRE 2 - 029.08.159 (-BATT x EV11)
GIALLO-029.08.131 (CANDELETTE)
YELLOW-029.08.131 (SPARKING PLUGS)
F=20A
ROSSI-029.08.131 (3x1.5)
REDS-029.08.131 (3x1.5)
ROSSO-035.08.071
RED-035.08.071
C1 = 100 µF - 100V - N.P.
C2 = 100 µF - 100V - N.P.
D1 = BY V27.
D2 = BY255
R1 = 120 Ohm - 5W.
R0 GENERALE
R1 ELETTROSTART
R4 ACCELERATORE
R5 CONSENSO CNV
+12V - FILO 24 - HATZ
+12V - WIRE 24 - HATZ
ESS - FILO 18 - HATZ
ESS - WIRE 18 - HATZ
MARRONE-029.08.131 (COMANDO AVVIAMENTO)
MARRONE-029.08.131 (STARTING INPUT)
MTA - FILO 3 - HATZ
MTA - WIRE 3 - HATZ
BLU-029.08.131 (ELETTROACCELERATORE)
BLUE-029.08.131 (ELETTROACCELERATOR)
NERI-029.08.131 (3x1.5)
blACKS-029.08.131 (3x1.5)
EA - FILO 14 - HATZ
EA - WIRE 14 - HATZ
NERO-035.08.071
BLACK-035.08.071
FILO 1 - 029.08.160 (+48V SIC)
FILO 2 - 029.08.160 (KEY CNV)

029.08.148



CONNETTORE "MO"
"MO" CONNECTOR

PIN	FILO WIRE	NOTE	NOTE	PIN	FILO WIRE	NOTE	NOTE	PIN	FILO WIRE	NOTE	NOTE
1		LIBERO	FREE	9		LIBERO	FREE	17		LIBERO	FREE
2		LIBERO	FREE	10		LIBERO	FREE	18		LIBERO	FREE
3		LIBERO	FREE	11		LIBERO	FREE	19	ROSSO/RED	POSITIVO (+12) DA BATTERIA	POSITIVE (+12) FROM BATTERY
4		LIBERO	FREE	12		LIBERO	FREE	20	ROSSO/RED	POSITIVO (+12) DA BATTERIA	POSITIVE (+12) FROM BATTERY
5		LIBERO	FREE	13		LIBERO	FREE	21	NERO/BLACK	NEGATIVO DA BATTERIA	NEGATIVE FROM BATTERY
6		LIBERO	FREE	14	ARANCIO/ORANGE	POSITIVO (+48) BATTERIA	POSITIVE BATTERY (+48)	22	NERO/BLACK	NEGATIVO DA BATTERIA	NEGATIVE FROM BATTERY
7		LIBERO	FREE	15		LIBERO	FREE	23	NERO/BLACK	NEGATIVO DA BATTERIA	NEGATIVE FROM BATTERY
8		LIBERO	FREE	16		LIBERO	FREE	24	ROSSO/RED	POSITIVO (+12) DA BATTERIA	POSITIVE (+12) FROM BATTERY

CAVO CELLA DI CARICO LOAD CELL CABLE			
N. FILO WIRE #	PIN / CONNETT. PIN / CONNECT.	NOTE	NOTE
ROSSO	R – J7		
BIANCO	B – J7	LIBERO	FREE
GIALLO	G – J7		
NERO	N – J7	LIBERO	FREE

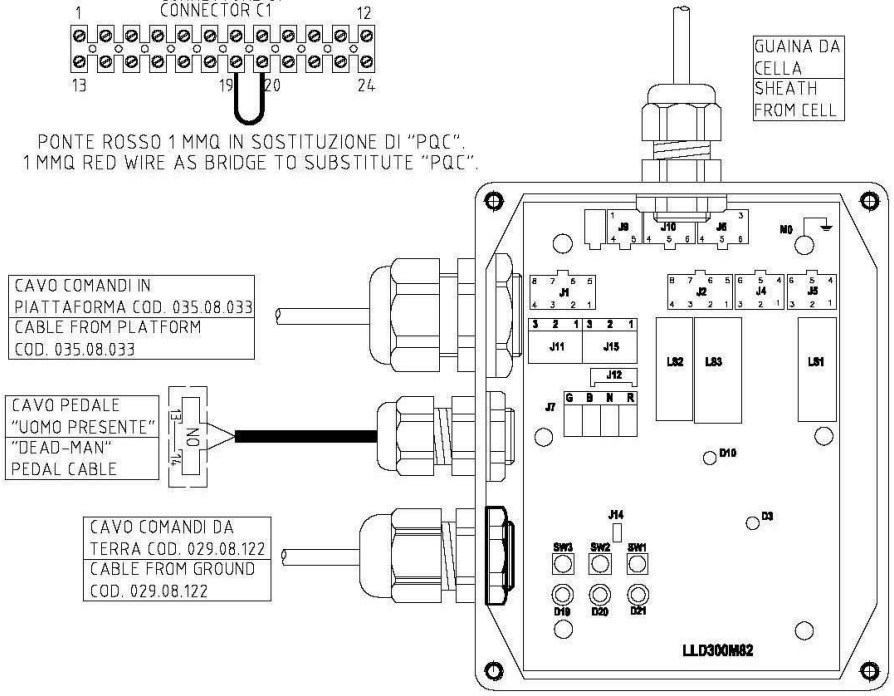
CONNETTORE "C1" "C1" CONNECTOR			
N. PIN PIN #	N. FILO / GUAINA WIRE/SHEATH #	NOTE	NOTE
1	1 – 035.08.033	TRASMISSIONE SERIALE (A)	SERIAL TRASMISSION (A)
2	2 – 035.08.033	TRASMISSIONE SERIALE (B)	SERIAL TRASMISSION (B)
3	3 – 035.08.033	TENSIONE BATTERIA DA FUSIBILE "F2"	BATTERY VOLTAGE FROM FUSE "F2"
4	4 – 035.08.033	NEGATIVO PRINCIPALE	MAIN NEGATIVE
5	5 – 035.08.033	PULSANTE A FUNGO	EMERGENCY BUTTON
6	6 – 035.08.033	PULSANTE A FUNGO	EMERGENCY BUTTON
7	7 – 035.08.033	USCITA POSITIVO PER "PQC"	POSITIVE OUTPUT FOR "PQC"
8	8 – 035.08.033	SEGNALE "PQC"	"PQC" SIGNAL
9	15 – 035.08.033	POSITIVO "PQC"	"PQC" POSITIVE
10	16 – 035.08.033	NEGATIVO "PQC"	"PQC" NEGATIVE
11	13 – 035.08.033	POSITIVO PEDALE "UOMO PRESENTE"	"DEAD MAN PEDAL" POSITIVE
12	14 – 035.08.033	SEGNALE PEDALE "UOMO PRESENTE"	"DEAD MAN PEDAL" SIGNAL
13	1 – 035.08.004	TRASMISSIONE SERIALE (A)	SERIAL TRASMISSION (A)
14	2 – 035.08.004	TRASMISSIONE SERIALE (B)	SERIAL TRASMISSION (B)
15	3 – 035.08.004	TENSIONE BATTERIA DA FUSIBILE "F2"	BATTERY VOLTAGE FROM FUSE "F2"
16	4 – 035.08.004	NEGATIVO PRINCIPALE	MAIN NEGATIVE
17	5 – 035.08.004	PULSANTE A FUNGO	EMERGENCY BUTTON
18	6 – 035.08.004	PULSANTE A FUNGO	EMERGENCY BUTTON
19	PONTE-ROSSO 1MMQ BRIDGE-RED 1MMS	POSITIVO	POSITIVE
20		SEGNALE "PQC"	SIGNAL "PQC"
21		POSITIVO "PQC" NON PRESENTE	"PQC" POSITIVE - ABSENT
22		NEGATIVO "PQC" NON PRESENTE	"PQC" NEGATIVE - ABSENT
23	2 - PEDALE / PEDAL	POSITIVO	POSITIVE
24	1 - PEDALE / PEDAL	SEGNALE PEDALE	PEDAL SIGNAL

CAVO COMANDI DA TERRA COMMAND CABLE FROM GROUND COD.035.08.004			
N. FILO WIRE #	PIN / CONNETT. PIN / CONNECT.	NOTE	NOTE
1	13 – C1	TRASMISSIONE SERIALE (A)	SERIAL TRASMISSION (A)
2	14 – C1	TRASMISSIONE SERIALE (B)	SERIAL TRASMISSION (B)
3	15 – C1	TENSIONE BATTERIA DA FUSIBILE "F2"	BATTERY VOLTAGE FROM "F2" FUSE
4	16 – C1	NEGATIVO PRINCIPALE	MAN NEGATIVE
5	17 – C1	PULSANTE A FUNGO	EMERGENCY BUTTON
6	18 – C1	PULSANTE A FUNGO	EMERGENCY BUTTON

CONNETTORE C1
CONNECTOR C1

PONTE ROSSO 1 MMQ IN SOSTITUZIONE DI "PQC".
1 MMQ RED WIRE AS BRIDGE TO SUBSTITUTE "PQC".

CONNETTORE "J5" SU SCHEDA COD. 021614 CONNECTOR "J5" ON CARD (021614)			
N. PIN PIN #	N. FILO / GUAINA WIRE/SHEATH #	NOTE	NOTE
1	9 – 035.08.033	ALIME. POSITIVO SCHEDA CELLE	POSITIVE SUPPLY CELL CARD
2	12 – 035.08.033	ALIME. NEGATIVO SCHEDA CELLE	NEGATIVE SUPPLY CELL CARD
3		LIBERO	FREE
4	10 – 035.08.033	SEGNALE CELLE	CELL SIGNAL
	11 – 035.08.033	SEGNALE CELLE	CELL SIGNAL
5		LIBERO	FREE
6		LIBERO	FREE

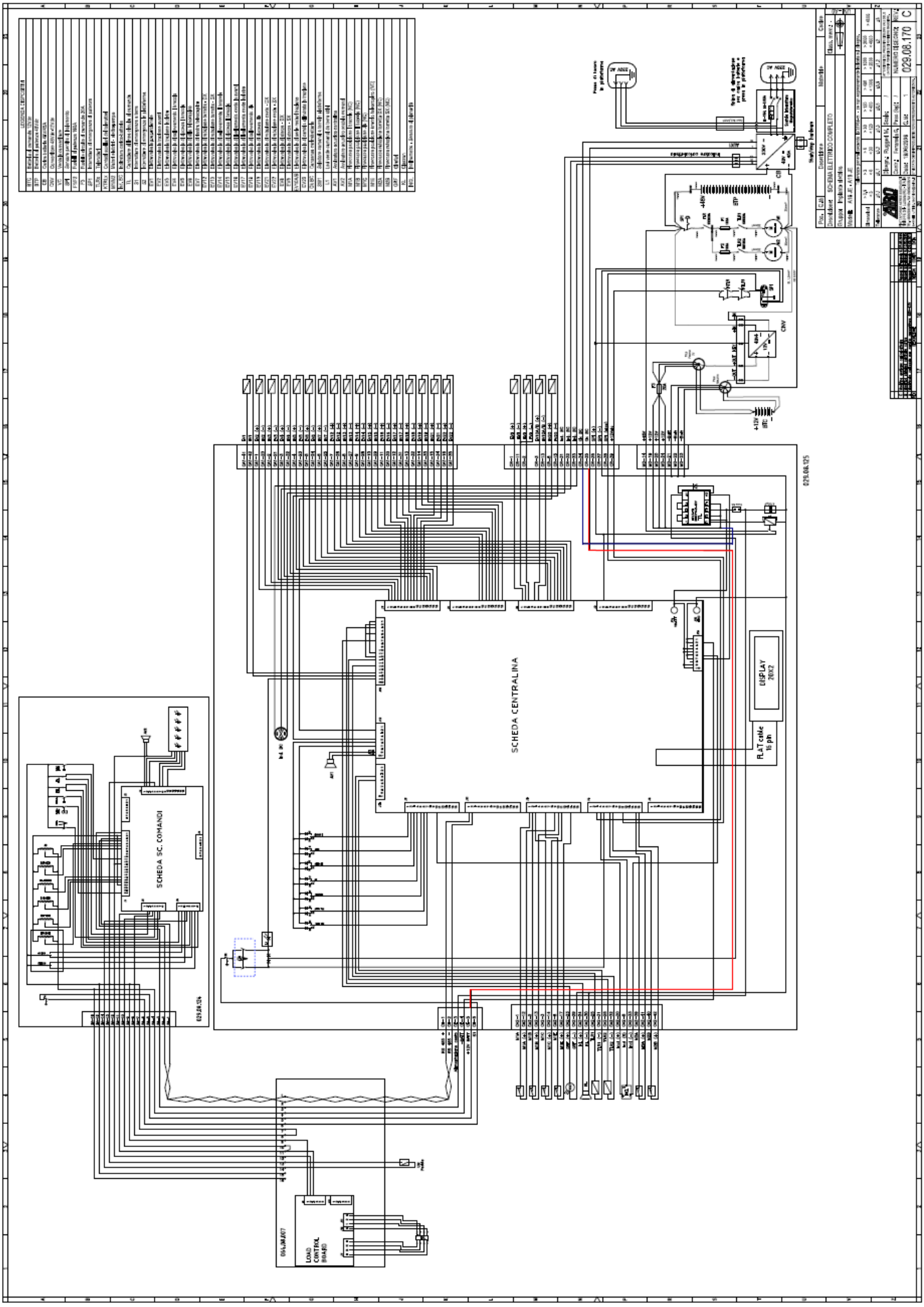


CAVO PEDALE "UOMO PRESENTE" "DEAD-MAN" PEDAL CABLE			
N. FILO WIRE #	PIN / CONNETT. PIN / CONNECT.	NOTE	NOTE
1	24 – C1	POSITIVO	POSITIVE
2	23 – C1	SEGNALE PEDALE	PEDAL SIGNAL

CONNETTORE "J7" SU SCHEDA COD. 021614 CONNECTOR "J7" ON CARD (021614)		
N. PIN PIN #	N. FILO / GUAINA WIRE / SHEATH #	NOTE
G	GIALLO-CELLA/YELLOW-CELL	
B	BIANCO-CELLA / WHITE-CELL	
N	NERO-CELLA / BLACK-CELL	
R	ROSSO-CELLA / RED-CELL	

CAVO COMANDI IN PIATTAFORMA PLATFORM COMMAND CABLE COD.035.08.033			
N. FILO WIRE #	PIN / CONNETT. PIN / CONNECT.	NOTE	NOTE
1	1 – C1	TRASMISSIONE SERIALE (A)	SERIAL TRASMISSION (A)
2	2 – C1	TRASMISSIONE SERIALE (B)	SERIAL TRASMISSION (B)
3	3 – C1	TENSIONE BATTERIA DA FUSIBILE "F2"	BATTERY VOLTAGE FROM "F2" FUSE
4	4 – C1	NEGATIVO PRINCIPALE	MAIN NEGATIVE
5	5 – C1	PULSANTE A FUNGO	EMERGENCY BUTTON
6	6 – C1	PULSANTE A FUNGO	EMERGENCY BUTTON
7	7 – C1	USCITA POSITIVO PER "PQC"	POSITIVE OUTPUT FOR "PQC"
8	8 – C1	SEGNALE "PQC"	"PQC" SIGNAL
9	1 – J5	ALIM. POSITIVO SCHEDA CELLE	POSITIVE SUPPLYING FOR LOAD-CELL CARD
10	4 – J5	SEGNALE CELLE	LOAD-CELLS SIGANL
11	4 – J5	SEGNALE CELLE	LOAD-CELLS SIGANL
12	2 – J5	ALIM. NEGATIVO SCHEDA CELLE	NEGATIVE SUPPLYING FOR LOAD-CELL CARD
13	11 – C1	POSITIVO PEDALE "UOMO PRESENTE"	"DEAD MAN" PEDAL POSITIVE
14	12 – C1	SEGNALE PEDALE "UOMO PRESENTE"	"DEAD MAN" PEDAL NEGATIVE
15	9 – C1	POSITIVO "PQC"	"PQC" POSITIVE
16	10 – C1	NEGATIVO "PQC"	"PQC" NEGATIVE

029.08.147

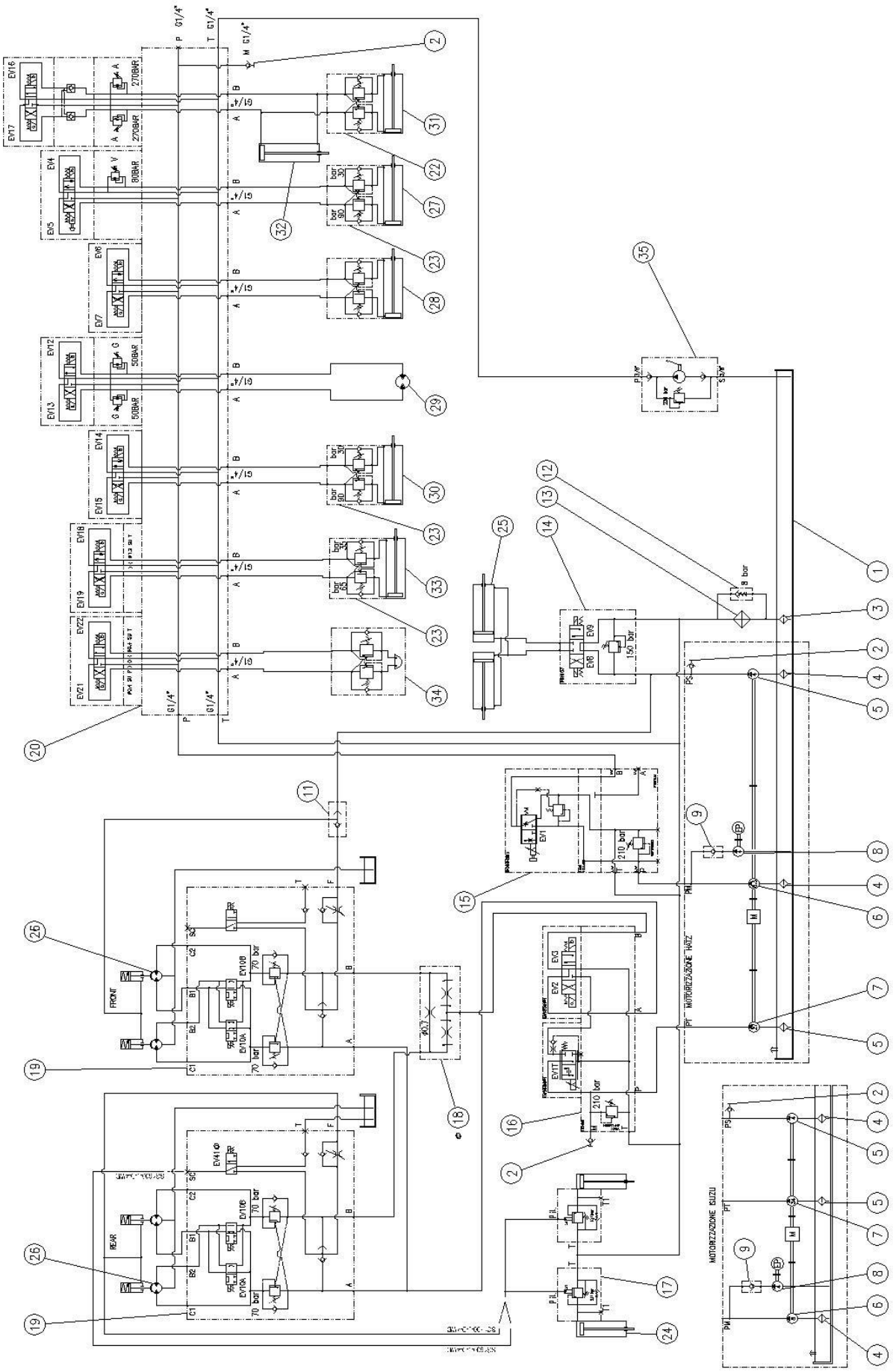

SCHEDA CENTRALINA
SCHEDA SC. COMANDI
DISPLAY 20X2
FLAT cable 16 pin
LOAD CONTROL BOARD

12. HYDRAULIC DIAGRAM

A16 JRTD A18 JRTD

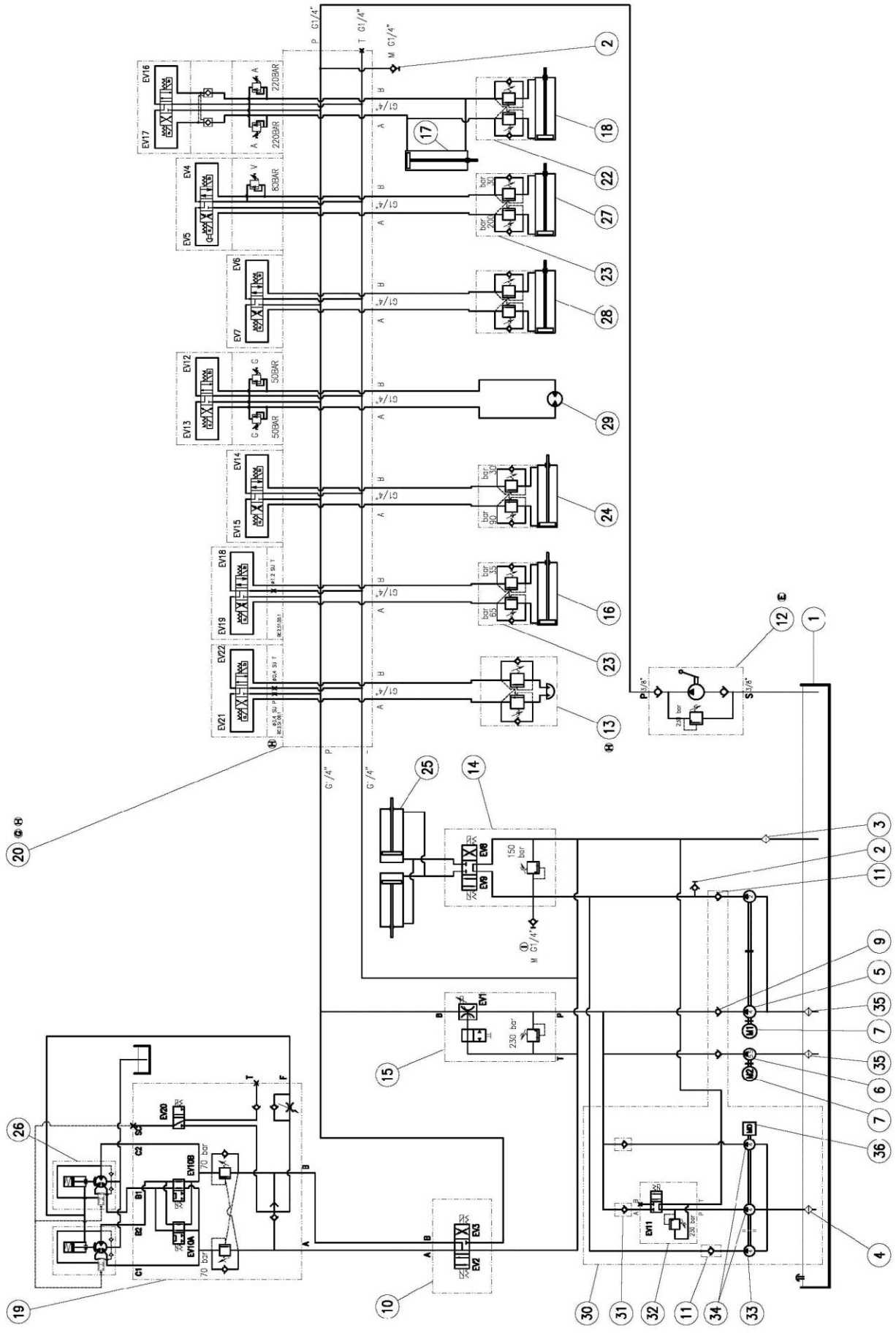
N°029.07.039

1	OIL TANK
2	QUICK COUPLING
3	RETURN FILTER
4	SUCTION FILTER
5	STEERING PUMP
6	MOVEMENT PUMP
7	DRIVE PUMP
8	EMERGENCY OPERATION PUMP
9-11	UNIDIRECTIONAL VALVE
12	BY-PASS VALVE
13	AIR/OIL EXCHANGER
14	STEERING HYDRAULIC BLOCK
15	MOVEMENT PROPORTIONAL JOYSTICK CONTROL BLOCK
16	DRIVE PROPORTIONAL JOYSTICK CONTROL BLOCK
17	BLOCK VALVE
18	FLOW DIVIDER
19	DRIVE PLATE
20	MOVEMENT SOLENOID VALVE BLOCK
22-23	OVER-CENTER VALVE
24	OSCILLATING AXLE CYLINDER
25	STEERING CYLINDER
26	DRIVE GEARED MOTOR
27	PANTOGRAPH CYLINDER
28	TELESCOPIC BOOM EXTENSION CYLINDER
29	TURRET ROTATION GEARED MOTOR
30	BOOM CYLINDER
31	PLATFORM LEVELLING OUTRIGGERS
32	SENSOR CYLINDER
33	JIB CYLINDER
34	PLATFORM ROTATION ACTUATOR
35	MANUAL PUMP
36	UNIDIRECTIONAL AND PRESSURE RELIEF VALVE
M	DIESEL ENGINE
EP	EMERGENCY ELECTRIC PUMP
EV1	MOVEMENT PROPORTIONAL JOYSTICK CONTROL
EV1T	DRIVE PROPORTIONAL JOYSTICK CONTROL
EV2	FORWARD DRIVE SOLENOID VALVE
EV3	BACKWARD DRIVE SOLENOID VALVE
EV4	PANTOGRAPH LIFTING SOLENOID VALVE
EV5	FIRST PANTOGRAPH LOWERING SOLENOID VALVE
EV6	BOOM EXTENSION SOLENOID VALVE
EV7	BOOM RETRACTION SOLENOID VALVE
EV8	RIGHT STEERING SOLENOID VALVE
EV9	LEFT STEERING SOLENOID VALVE
EV10	SOLENOID VALVE, SERIES-PARALLEL TRACTION
EV12	CLOCKWISE TURRET ROTATION SOLENOID VALVE
EV13	ANTICLOCKWISE TURRET ROTATION SOLENOID VALVE
EV14	BOOM LIFTING SOLENOID VALVE
EV15	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	RIGHT CAGE ROTATION SOLENOID VALVE
EV22	LEFT CAGE ROTATION SOLENOID VALVE
EV41	OSCILLATING AXLE UNLOCK SOLENOID VALVE (ONLY A18 JRTD)

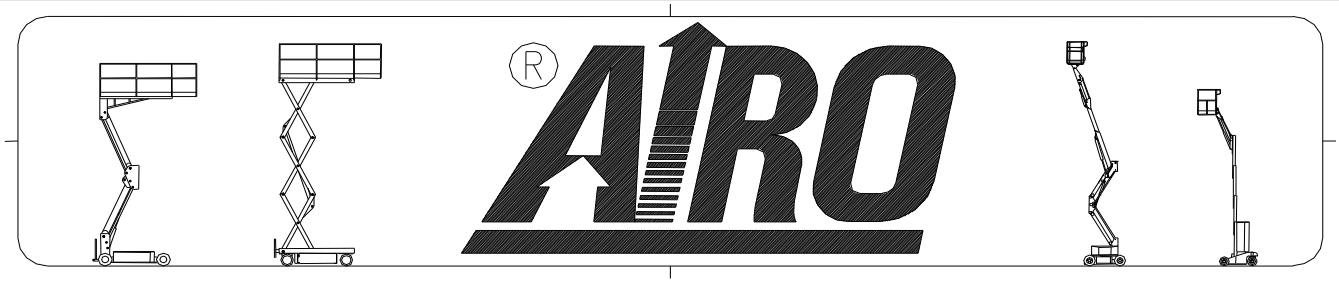

FRONT
REAR
MOTORIZZAZIONE ISUZU

A16 JE A16 JED A18 JE A18 JED
N°029.07.045

1	OIL TANK
2	QUICK COUPLING
3	RETURN FILTER
4-35	SUCTION FILTER
5	DOUBLE PUMP
6-33-34	MOVEMENT PUMP
7	ELECTRIC MOTOR 48.4500
9-11-31	UNIDIRECTIONAL VALVE
10	DRIVE SOLENOID VALVE
12	MANUAL PUMP
13	PLATFORM ROTATION ACTUATOR
14	STEERING HYDRAULIC BLOCK
15	PROPORTIONAL JOYSTICK CONTROL BLOCK
16	JIB CYLINDER
17	SENSOR CYLINDER
18	PLATFORM LEVELLING OUTRIGGERS
19	DRIVE PLATE
20	MOVEMENT SOLENOID VALVE BLOCK
22-23	OVER-CENTER VALVE
24	SECOND BOOM CYLINDER
25	STEERING CYLINDER
26	DRIVE GEARED MOTOR
27	PANTOGRAPH CYLINDER
28	TELESCOPIC BOOM EXTENSION CYLINDER
29	TURRET ROTATION GEARED MOTOR
30	ELECTRO-DIESEL APPLICATION
32	BY-PASS SOLENOID VALVE
36	DIESEL ENGINE
EV1	PROPORTIONAL JOYSTICK CONTROL
EV2	FORWARD DRIVE SOLENOID VALVE
EV3	BACKWARD DRIVE SOLENOID VALVE
EV4	PANTOGRAPH LIFTING SOLENOID VALVE
EV5	FIRST PANTOGRAPH LOWERING SOLENOID VALVE
EV6	TELESCOPIC EXTENSION SOLENOID VALVE
EV7	TELESCOPIC RETRACTION SOLENOID VALVE
EV8	LEFT STEERING SOLENOID VALVE
EV9	RIGHT STEERING SOLENOID VALVE
EV10	SOLENOID VALVE, SERIES-PARALLEL TRACTION
EV12	ANTICLOCKWISE TURRET ROTATION SOLENOID VALVE
EV13	CLOCKWISE TURRET ROTATION SOLENOID VALVE
EV14	BOOM LIFTING SOLENOID VALVE
EV15	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
EV20	DISPLACEMENT EXCHANGE SOLENOID VALVE
EV21	LEFT CAGE ROTATION SOLENOID VALVE
EV22	RIGHT CAGE ROTATION SOLENOID VALVE



13. CE CERTIFICATES



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

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Piattaforma di Lavoro Elevabile - Mobile Elevating Work Platform
Plates-formes Elévatrice Mobiles de Personnel - Fahrbare Hubarbeitsbühnen
Plataforma Elevadora Móvil de Personal
Платформа для высотного работ

Modello - Model - Modèle Typ – Modelo-МОДЕЛЬ	N° Chassis - Chassis No. N° Chassis - Fahrgestellnr - N° Chassis - Номер Рама	Anno - Year - Année Baujahr – Ano -Год
A16 JE	***XXXXXXXXXX***	***XXXXXXXXXX***

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Identification No. 0477

con il seguente numero di certificazione:	with the following certification number:	avec le numèro de certification suivant :	Zertifizierten Modell mit folgender Zertifizierungsnummer:	con el siguiente número de certificación:	со следующим сертифицированным номером:

N.Certificato - Certificate No. - N° du certificat - Bestätigungnummer - N° de certificado – Номер Сертификата
XYZ

e alle norme seguenti:	and with the following standards:	et aux normes suivantes :	die Erklärung entspricht den folgenden Normen:	y a las siguentes normas:	и со следующими нормами:

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

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Luzzara (RE), data-date-date-Datum-fecha-Дата

.....
Pignatti Simone
(Il legale rappresentante - The legal representative)

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Plates-forme Elévatrice Mobiles de Personnel
Fahrbare Hubarbeitsbühnen
Plataforma Elevadora Móvil de Personal
Платформа для высотного работ

Modello - Model - Modèle Typ – Modelo-МОДЕЛЬ	N° Chassis - Chassis No. N° Chassis - Fahrgestellnr - N° Chassis - Номер Рама	Anno - Year - Année Baujahr – Ano -Год
A18 JE	***XXXXXXXXXX***	***XXXXXXXXXX***

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

con il seguente numero di certificazione:	with the following certification number:	avec le numèro de certification suivant :	Zertifizierten Modell mit folgender Zertifizierungsnummer:	con el siguiente número de certificación:	со следующим сертифицированным номером:

N.Certificato - Certificate No. - N° du certificat - Bestätigungnummer - N° de certificado – Номер Сертификата

XYZ

e alle norme seguenti:	and with the following standards:	et aux normes suivantes :	die Erklärung entspricht den folgenden Normen:	y a las siguentes normas:	и со следующими нормами:

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

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Luzzara (RE), data-date-date-Datum-fecha-Дата

.....
Pignatti Simone
(Il legale rappresentante - The legal representative)

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

DICHIARAZIONE *CE* DI CONFORMITÀ - *CE* DECLARATION OF CONFORMITY - DECLARATION *CE* DE CONFORMITE' - *EG* KONFORMITÄTSERKLÄRUNG - DECLARACION *CE* DE CONFORMIDAD- ЗАЯВЛЕНИЕ О КОНФОРМНОСТИ *ЕС* 2006/42/CE

Dichiarazione originale	Original Declaration	Déclaration Originale	Originalerklärung	Declaración Original	Оригинальная декларация

Noi - We - Nous - Wir – Nosotros- мы

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TIGIEFFE S.r.l. a socio unico
Via Villa superiore, 82 - 42045 Luzzara (RE) ITALY-
☏ +39-0522-977365 - 🖷 +39-0522-977015
WEB: www.airo.com – e-mail: info@airo.com