



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

„XL“ SERIES
XL11 XL14 XL16 XL19



USE AND MAINTENANCE MANUAL

- ENGLISH – ORIGINAL INSTRUCTIONS

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

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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. 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
- § Original EC declaration of conformity
- § Guarantee certificate

Only for Italy:

- § Declaration of commissioning to ISPESL
- § List of local ISPESL departments
- § Declaration of internal testing

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

1.1.2 Declaration of commissioning, 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 ISPESL (National Institute for the prevention of accidents at the workplace) and submit it to periodical compulsory checks. The first one of these checks is carried out by ISPESL, while the following ones by the territorial inspection boards (ASL/USL or ARPA). The checks are on a payment basis and the machine owner will be charged for them. For these checks, the territorial inspection boards (ASL/USL or ARPA) and ISPESL can be supported by authorized public or private subjects. The authorized private subjects acquire the qualification of responsables of the public service and refer directly to the public structure that controls this function.

To declare the commissioning of the machine in Italy, send the form that is supplied together with other documents upon machine delivery, by registered letter with advice of receipt.

ISPESL will assign a Serial Number and during the First Check will issue a "Check booklet" indicating only the detectable data of the machine already in use or inferable from the relative User Manual. Afterwards ISPESL will send a copy of the same booklet to the territorial inspection boards (ASL/USL or ARPA) which will carry out the further periodical mandatory checks (every year).

1.1.2.2 Further periodical checks

Yearly checks are compulsory. In Italy the owner of the Aerial Platform must apply for a periodical check by sending a registered letter to the local competent inspection board (ASL/USL or ARPA) at least twenty days before the expiry of the year from the last check.

Note: 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 yearly 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) 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 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 EWP undergoes the following tests:

- § Braking test
- § Overload test
- § Operating test

1.3 Intended use

The machine described in this use and maintenance manual is a self-propelled aerial platform intended for lifting persons and materials (equipment and building materials) in order to carry out maintenance, installation, cleaning, painting, de-painting, sand-blasting, welding operations, etc.

The max. capacity allowed (which varies according to the model – see paragraph “Technical features”) is divided as follows:

- § 80 Kg for each person on board
- § 40 Kg for equipment
- § any 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 building materials can be loaded on the platform only from the access position (platform lowered). It is absolutely forbidden to load persons, tools and building materials on the platform when it is not in access position.

All loads must be positioned inside the platform. Do not lift loads (even if complying with the maximum capacity allowed) hanging from the platform or lifting structure.

Do not carry large-sized panels since they increase the resistance to wind force thus causing the machine to overturn.

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 30% approx. the rated 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.

1.4 Description of the machine

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

- § motorised chassis equipped with wheels and, on request, with levelling outriggers (optional);
- § vertical scissor lift structure operated by one or more hydraulic cylinders (the number of cylinders varies according to machine model)
- § operator platform which can be of two types (the max. capacity varies according to the model - see chapter "Technical features").
 - o Manual extension in both directions.
 - o Hydraulic extension in both directions.

The chassis is motorised to allow the machine to move (see "General use instructions"). On 2 wheel drive models the chassis is equipped with two rear driving wheels and two front idle steering wheels. On 4 wheel drive models the chassis is equipped with two rear driving wheels and two front driving and steering wheels. All driving wheels are equipped with hydraulic parking brakes, positive logic type (when drive controls are released brakes are automatically activated). On request the machine may be equipped with levelling outriggers to operate on inclined grounds (but sufficiently firm). Even in this case the machine is enough steady to operate on horizontal and sufficiently firm grounds and the platform can be lifted with the chassis resting on the four puncture-proof tires without using the levelling outriggers. These must be used when operating on uneven but sufficiently firm grounds. The levelling outriggers are controlled from the platform control panel, where machine levelling and operations in progress can be checked by means of a spirit level. The machine is also equipped with an inclinometer, a device that stops lifting in the event that the platform is lifted at a height from the ground which varies from model to model (the stability limits of each model are indicated in paragraph "Technical Features").

The hydraulic cylinders which move the articulated structure and the levelling outriggers are provided with solenoid valves or safety valves directly flanged on the same. This enables the machine to be held in position also in the event of an accidental breaking of the supply pipe.

The platform can be of two types:

- § The fixed platform is fitted with two manual slide-out extension decks which extend the operator's work surface.
- § The fixed platform is fitted with two hydraulic slide-out extension decks which extend the operator's work surface.

In any case, the platform is equipped with guard-rails and toe-boards of a prescribed height (the height of the guard-rails is ≥ 1100 mm; the height of the toe-boards is ≥ 150 mm).

When no motive power is available, the manual emergency lowering can be controlled by means of the manual pump and knob indicated by the instructions plates.

1.5 Control panels

The machine is equipped with two control panels:

- § On the platform for normal use of the machine.
- § On the chassis you can find: the emergency controls to lower or stop the platform and the emergency stop button, a key-selector to select the control panel and to start the machine.

1.6 Drive power

The machines can be powered by:

- § an electric-hydraulic system composed of rechargeable accumulators and electrical pump;
- § a heat engine (Diesel engine models are identified by the abbreviation "D"; petrol engine models are identified by the abbreviation "B");
- § a dual propulsion electric/thermic system (dual propulsion Electric/Diesel models are identified by the abbreviation "ED"; dual propulsion 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 electric and hydraulic circuit diagrams annexed 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 machine 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 fluids 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: _____
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Fig. 1

1.9 Location of main components



The picture shows the machine and its own components.

- 1) Control panel
- 2) Electric control unit (ground controls)
- 3) Hydraulic control unit
- 4) Hydraulic drive motors
- 5) Drive control hydraulic assembly (drive plate)
- 6) 230V plug (optional)
- 7) Spirit level (standard for models with levelling outriggers; optional for the other models) for visual check of machine levelling
- 8) Lifting cylinders
- 9) Battery
- 10) Power steering
- 11) Inclinometer
- 12) Control device for electric system isolation (electric machines E)
- 13) Emergency manual pump
- 14) Levelling outriggers (optional)
- 15) Heat engine (models "ED", "D", "EB")
- 16) Pump 230V/380V (option only on models "D" and "ED")
- 17) 230V/ 380V socket and switches (optional only on models D and E/D)
- 18) 230V/380V electric control unit for pump control (optional on models D and ED)

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 XL11 E

		XL11 E	
Dimensions:			
	Maximum working height	11.2	m
	Maximum platform height	9.2	m
	Ground clearance	255	mm
	Platform height for safety speed activation	2	m
	Internal steering radius	3.3	m
	External steering radius	5.8	m
	Maximum capacity (m)	700	Kg
	Max. number of people on the platform (n) – indoors	3	
	Tool and material weight (me) (**) – indoors	460	Kg
	Max. number of people on the platform (n) – outdoors	3	
	Tool and material weight (me) (**) – outdoors	460	Kg
	Maximum deck extension	1.17 + 1.17	m
	Maximum capacity with platform extended	700	Kg
	Max. No. of people with platform extended	3	
	Maximum drive height	Max	
	Maximum dimensions with platform extended	1.74 x 5.835	m
	Max. hydraulic pressure	210	Bar
	Max. pressure of lifting circuit	140	Bar
	Min. pressure of braking circuit	50 ÷ 60	Bar
	Tyre dimensions (****)	Ø 730 x 265	mm
	Tyre type (****)	10 x 16.5	
	Transport dimensions with removable rails installed	3.75 x 1.8 x 2.53	m
	Transport dimensions with removable rails not installed	N.A.	m
	Transport dimensions with rails folded down	3.75 x 1.8 x 1.81	m
	Machine weight (unloaded) (*)	4850	Kg
Stability limit:			
	Longitudinal inclination	3	°
	Transversal inclination	2	°
	Maximum wind speed (***)	12.5	m/s
	Max. load per wheel	1940	Kg
Performance:			
	Driving wheels	2	N
	Max. drive speed	4	km/h
	Safety drive speed	0.36	km/h
	Lowering/lifting time (unloaded)	85 / 80	Sec.
	Tank oil capacity	40	Lt.
	Gradeability	25	%
	Max. operating temperature	+50	C
	Min. operating temperature	-15	C
Battery power:			
	Voltage and capacity of battery	2 x 24 / 325	V/Ah
	Battery weight	2 x 220	Kg
	Single-phase battery charger (HF)	48 / 45	V/A
	Max. current absorbed by battery charger	15	A
	Max. installed power	4.5	kW
	Power electrical pump 1	4.5	kW
	Max. absorbed current	160	A
	Power electrical pump 2	NA	kW
	Max. absorbed current	NA	A
	Power electrical pump 3	NA	kW
	Max. absorbed current	NA	A

2.2 Model XL14 E

		XL14 E	
Dimensions:			
	Maximum working height	13.8	m
	Maximum platform height	11.8	m
	Ground clearance	255	mm
	Platform height for safety speed activation	2.3	m
	Internal steering radius	3.3	m
	External steering radius	5.8	m
	Maximum capacity (m)	500	kg
	Max. number of people on the platform (n) – indoors	3	
	Tool and material weight (me) (**) – indoors	260	kg
	Max. number of people on the platform (n) – outdoors	3	
	Tool and material weight (me) (**) – outdoors	260	kg
	Maximum deck extension	1.17 + 1.17	m
	Maximum capacity with platform extended	500	kg
	Max. No. of people with platform extended	3	
	Maximum drive height	8	m
	Maximum dimensions with platform extended	1.74 x 5.835	m
	Max. hydraulic pressure	210	bar
	Max. pressure of lifting circuit	180	bar
	Min. pressure of braking circuit	50 ÷ 60	bar
	Tyre dimensions (****)	Ø 730 x 265	mm
	Tyre type (****)	10 x 16.5	
	Transport dimensions with removable rails installed	3.75 x 1.8 x 2.73	m
	Transport dimensions with removable rails not installed	N.A.	m
	Transport dimensions with rails folded down	3.75 x 1.8 x 2.01	m
	Machine weight (unloaded) (*)	5150	kg
Stability limit:			
	Longitudinal inclination	3	°
	Transversal inclination	2	°
	Maximum wind speed (***)	12.5	m/s
	Max. load per wheel	2060	Kg
Performance:			
	Driving wheels	2	n
	Max. drive speed	4	km/h
	Safety drive speed	0.36	km/h
	Lowering/lifting time (unloaded)	85 / 80	Sec.
	Tank oil capacity	40	Lt.
	Gradeability	22	%
	Max. operating temperature	+50	C
	Min. operating temperature	-15	C
Battery power:			
	Voltage and capacity of battery	2 x 24 / 325	V/Ah
	Battery weight	2 x 220	kg
	Single-phase battery charger (HF)	48 / 45	V/A
	Max. current absorbed by battery charger	15	A
	Max. installed power	4.5	kW
	Power electrical pump 1	4.5	kW
	Max. absorbed current	160	A
	Power electrical pump 2	NA	kW
	Max. absorbed current	NA	A
	Power electrical pump 3	NA	kW
	Max. absorbed current	NA	A

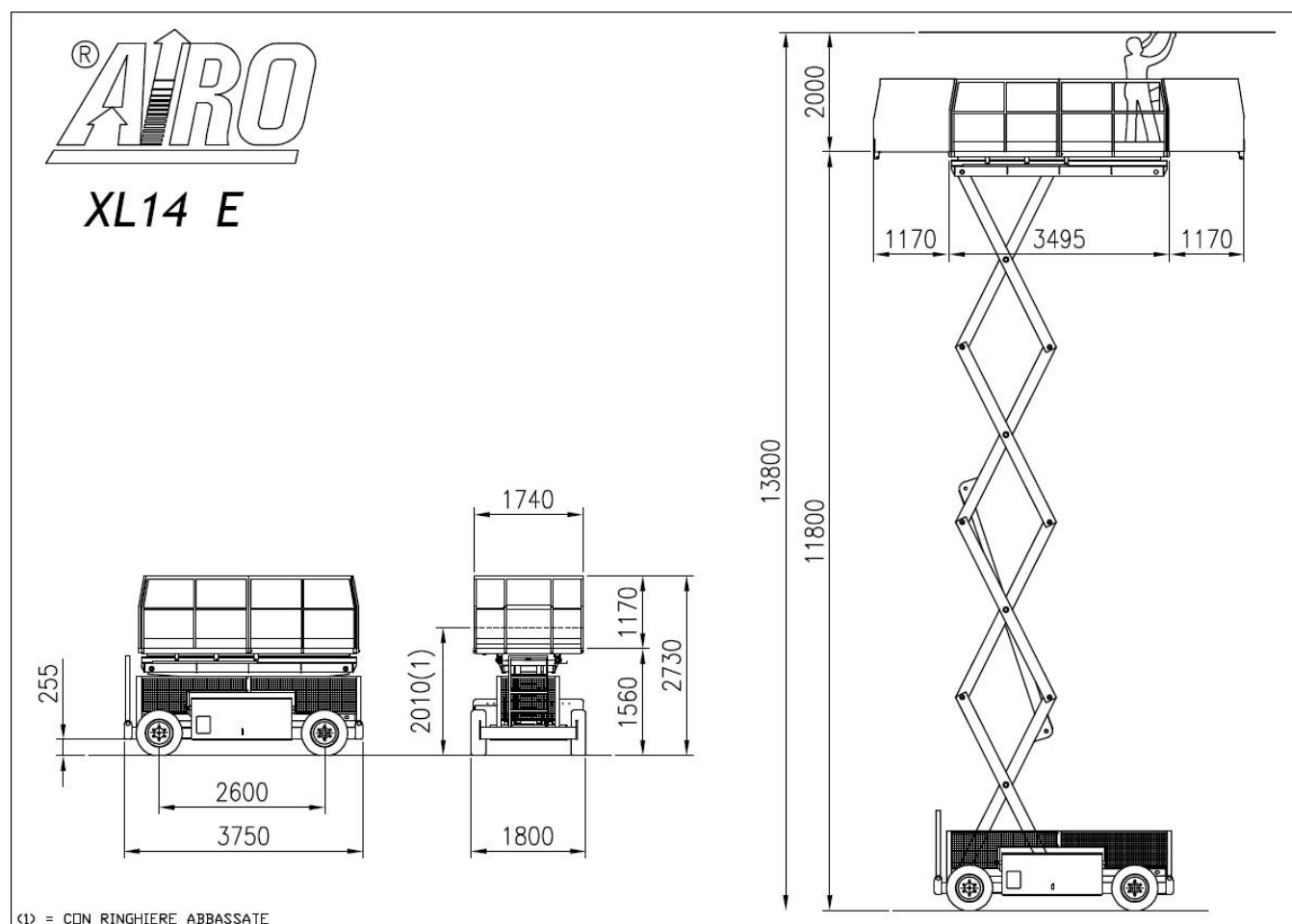
Diesel Power			
	Diesel engine type	NA	
	Engine power	NA	kW
	Starter battery	NA	V/Ah
	Diesel oil tank capacity	NA	Lt.
380V three-phase electrical pump (optional)			
	Engine power	NA	kW
	Max. absorbed current	NA	A
	Max. drive speed	NA	km/h

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

(**) $me = m - (n \times 80)$

(***) 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: tyres filled with puncture-proof polyurethane foam; Optional: extra flexible black tyres 250-15; Optional: extra flexible no-marking tyres 250-15.



2.3 Model XXL14 E

		XXL14 E	
Dimensions:			
	Maximum working height	13.8	m
	Maximum platform height	11.8	m
	Ground clearance	255	mm
	Platform height for safety speed activation	2.3	m
	Internal steering radius	3.3	m
	External steering radius	5.8	m
	Maximum capacity (m)	500	kg
	Max. number of people on the platform (n) – indoors	3	
	Tool and material weight (me) (**) – indoors	260	kg
	Max. number of people on the platform (n) – outdoors	3	
	Tool and material weight (me) (**) – outdoors	260	kg
	Maximum deck extension	1.17 + 1.17	m
	Maximum capacity with platform extended	500	kg
	Max. No. of people with platform extended	3	
	Maximum drive height	8	m
	Maximum dimensions with platform extended	1.74 x 5.835	m
	Max. hydraulic pressure	210	bar
	Max. pressure of lifting circuit	180	bar
	Min. pressure of braking circuit	50 ÷ 60	bar
	Tyre dimensions (****)	Ø 730 x 265	mm
	Tyre type (****)	10 x 16.5	
	Transport dimensions with removable rails installed	3.84 x 1.8 x 2.73	m
	Transport dimensions with removable rails not installed	N.A.	m
	Transport dimensions with rails folded down	3.84 x 1.8 x 2.01	m
	Machine weight (unloaded) (*)	5400	kg
Stability limit:			
	Longitudinal inclination	3	°
	Transversal inclination	2	°
	Maximum wind speed (***)	12.5	m/s
	Max. load per wheel	2160	Kg
Performance:			
	Driving wheels	2	n
	Max. drive speed	4	km/h
	Safety drive speed	0.36	km/h
	Lowering/lifting time (unloaded)	85 / 80	Sec.
	Tank oil capacity	40	Lt.
	Gradeability	22	%
	Max. operating temperature	+50	C
	Min. operating temperature	-15	C
Battery power:			
	Voltage and capacity of battery	2 x 24 / 325	V/Ah
	Battery weight	2 x 220	kg
	Single-phase battery charger (HF)	48 / 45	V/A
	Max. current absorbed by battery charger	15	A
	Max. installed power	4.5	kW
	Power electrical pump 1	4.5	kW
	Max. absorbed current	160	A
	Power electrical pump 2	NA	kW
	Max. absorbed current	NA	A
	Power electrical pump 3	NA	kW
	Max. absorbed current	NA	A

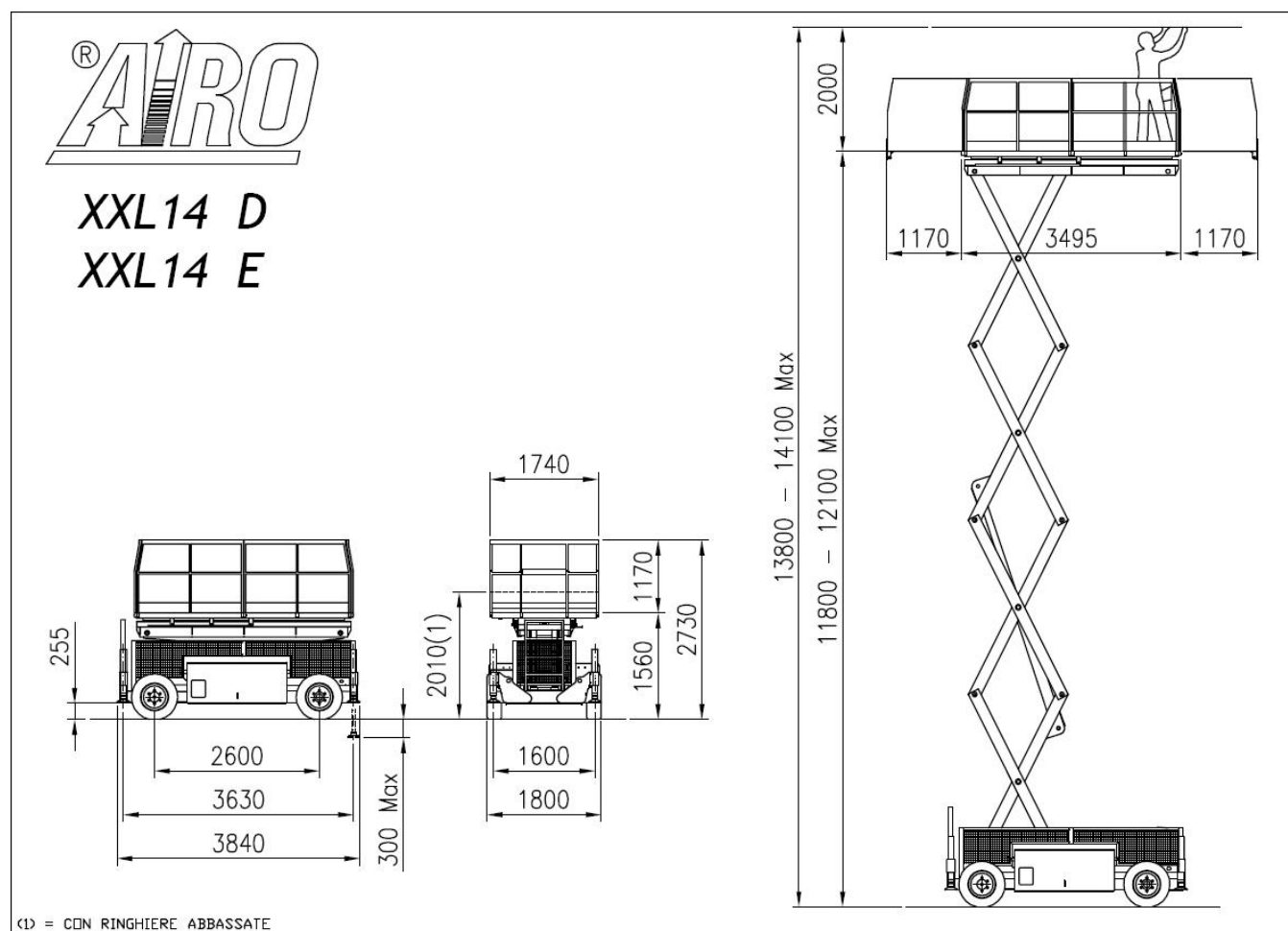
Diesel Power			
	Diesel engine type	NA	
	Engine power	NA	kW
	Starter battery	NA	V/Ah
	Diesel oil tank capacity	NA	Lt.
380V three-phase electrical pump (optional)			
	Engine power	NA	kW
	Max. absorbed current	NA	A
	Max. drive speed	NA	km/h

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

(**) $me = m - (n \times 80)$

(***) 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: tyres filled with puncture-proof polyurethane foam; Optional: extra flexible black tyres 250-15; Optional: extra flexible no-marking tyres 250-15.



2.4 Model XL14 RTD

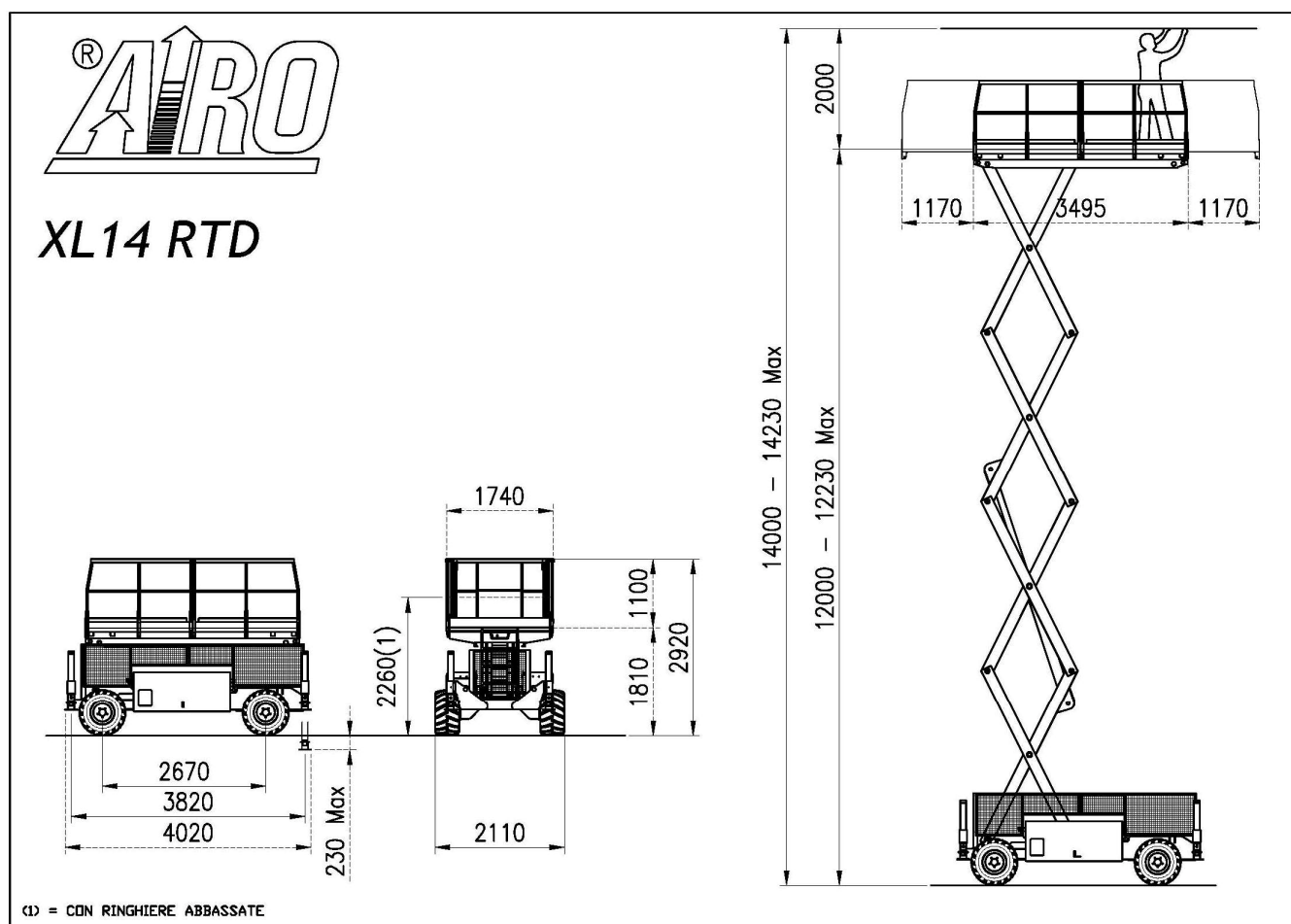
		XL14 RTD	
Dimensions:			
	Maximum working height	14	m
	Maximum platform height	12	m
	Ground clearance	370	mm
	Platform height for safety speed activation	2.6	m
	Internal steering radius	4.2	m
	External steering radius	7.2	m
	Maximum capacity (m)	700	kg
	Max. number of people on the platform (n) – indoors	3	
	Tool and material weight (me) (**) – indoors	460	kg
	Max. number of people on the platform (n) – outdoors	3	
	Tool and material weight (me) (**) – outdoors	460	kg
	Maximum deck extension	1.17 + 1.17	m
	Maximum capacity with platform extended	500	kg
	Max. No. of people with platform extended	3	
	Maximum drive height	8	m
	Maximum dimensions with platform extended	1.74 x 5.835	m
	Max. hydraulic pressure	190	bar
	Max. pressure of lifting circuit	190	bar
	Min. pressure of braking circuit	45 ÷ 60	bar
	Tyre dimensions	Ø 760 x 390	mm
	Type of tyres	31 x 15.50 x 15	
	Transport dimensions with removable rails installed	4.02 x 2.11 x 2.92	m
	Transport dimensions with removable rails not installed	N.A.	m
	Transport dimensions with rails folded down	4.02 x 2.11 x 2.26	m
	Machine weight (unloaded) (*)	5870	kg
Stability limit:			
	Longitudinal inclination	3	°
	Transversal inclination	2	°
	Maximum wind speed (***)	12.5	m/s
	Max. load per wheel	2350	Kg
Performance:			
	Driving wheels	4	n
	Max. drive speed	4.7	km/h
	Safety drive speed	0.36	km/h
	Lowering/lifting time (unloaded)	40 / 50	Sec.
	Tank oil capacity	145	Lt.
	Gradeability	35	%
	Max. operating temperature	+50	C
	Min. operating temperature	-15	C
Battery power:			
	Voltage and capacity of battery	NA	V/Ah
	Battery weight	NA	kg
	Single-phase battery charger (HF)	NA	V/A
	Max. current absorbed by battery charger	NA	A
	Max. installed power	NA	kW
	Power electrical pump 1	NA	kW
	Max. absorbed current	NA	A
	Power electrical pump 2	NA	kW
	Max. absorbed current	NA	A
	Power electrical pump 3	NA	kW
	Max. absorbed current	NA	A

Diesel Power			
	Diesel engine type	ISUZU 3LD1	
	Engine power	24.8	kW
	Starter battery	12/135	V/Ah
	Diesel oil tank capacity	45	Lt.
380V three-phase electrical pump (optional)			
	Engine 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.

(**) $me = m - (n \times 80)$

(***) 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.



2.5 Model XL16 E

		XL16 E	
Dimensions:			
	Maximum working height	15.8	m
	Maximum platform height	13.8	m
	Ground clearance	255	mm
	Platform height for safety speed activation	2.5	m
	Internal steering radius	4	m
	External steering radius	6.9	m
	Maximum capacity (m)	500	kg
	Max. number of people on the platform (n) – indoors	3	
	Tool and material weight (me) (**) – indoors	260	kg
	Max. number of people on the platform (n) – outdoors	3	
	Tool and material weight (me) (**) – outdoors	260	kg
	Maximum deck extension	1.17 + 1.17	m
	Maximum capacity with platform extended	500	kg
	Max. No. of people with platform extended	3	
	Maximum drive height	Max	
	Maximum dimensions with platform extended	1.87 x 6.38	m
	Max. hydraulic pressure	190	bar
	Max. pressure of lifting circuit	180	bar
	Min. pressure of braking circuit	50 ÷ 60	bar
	Tyre dimensions (****)	Ø 730 x 265	mm
	Tyre type (****)	10 x 16.5	
	Transport dimensions with removable rails installed	4.32 x 2.12 x 2.83	m
	Transport dimensions with removable rails not installed	N.A.	m
	Transport dimensions with rails folded down	4.32 x 2.12 x 2.12	m
	Machine weight (unloaded) (*)	7050	kg
Stability limit:			
	Longitudinal inclination	2	°
	Transversal inclination	2	°
	Maximum wind speed (***)	12.5	m/s
	Max. load per wheel	2820	Kg
Performance:			
	Driving wheels	2	n
	Max. drive speed	4	km/h
	Safety drive speed	0.36	km/h
	Lowering/lifting time (unloaded)	85 / 80	Sec.
	Tank oil capacity	110	Lt.
	Gradeability	22	%
	Max. operating temperature	+50	C
	Min. operating temperature	-15	C
Battery power:			
	Voltage and capacity of battery	2 x 24 / 450	V/Ah
	Battery weight	2 x 400	kg
	Single-phase battery charger (HF)	48 / 45	V/A
	Max. current absorbed by battery charger	15	A
	Max. installed power	9	kW
	Power electrical pump 1	4.5	kW
	Max. absorbed current	160	A
	Power electrical pump 2	4.5	kW
	Max. absorbed current	160	A
	Power electrical pump 3	NA	kW
	Max. absorbed current	NA	A

2.6 Model XXL16 E

		XXL16 E	
Dimensions:			
	Maximum working height	15.8	m
	Maximum platform height	13.8	m
	Ground clearance	255	mm
	Platform height for safety speed activation	2.5	m
	Internal steering radius	4	m
	External steering radius	6.9	m
	Maximum capacity (m)	500	kg
	Max. number of people on the platform (n) – indoors	3	
	Tool and material weight (me) (**) – indoors	260	kg
	Max. number of people on the platform (n) – outdoors	3	
	The tool and material weight (me) (**) – outdoors	260	kg
	Maximum deck extension	1.17 + 1.17	m
	Maximum capacity with platform extended	500	kg
	Max. No. of people with platform extended	3	
	Maximum drive height	Max	
	Maximum dimensions with platform extended	1.87 x 6.38	m
	Max. hydraulic pressure	190	bar
	Max. pressure of lifting circuit	180	bar
	Min. pressure of braking circuit	50 ÷ 60	bar
	Tyre dimensions (****)	Ø 730 x 265	mm
	Tyre type (****)	10 x 16.5	
	Transport dimensions with removable rails installed	4.4 x 2.12 x 2.83	m
	Transport dimensions with removable rails not installed	N.A.	m
	Transport dimensions with rails folded down	4.4 x 2.12 x 2.12	m
	Machine weight (unloaded) (*)	7125	kg
Stability limit:			
	Longitudinal inclination	2	°
	Transversal inclination	2	°
	Maximum wind speed (***)	12.5	m/s
	Max. load per wheel	2850	Kg
Performance:			
	Driving wheels	2	n
	Max. drive speed	4	km/h
	Safety drive speed	0.36	km/h
	Lowering/lifting time (unloaded)	85 / 80	Sec.
	Diesel oil tank capacity	110	Lt.
	Gradeability	22	%
	Max. operating temperature	+50	C
	Min. operating temperature	-15	C
Battery power:			
	Voltage and capacity of battery	2 x 24 / 450	V/Ah
	Battery weight	2 x 400	kg
	Single-phase battery charger (HF)	48 / 45	V/A
	Max. current absorbed by battery charger	15	A
	Max. installed power	9	kW
	Power electrical pump 1	4.5	kW
	Max. absorbed current	160	A
	Power electrical pump 2	4.5	kW
	Max. absorbed current	160	A
	Power electrical pump 3	NA	kW
	Max. absorbed current	NA	A

2.7 Model XL16 RTD

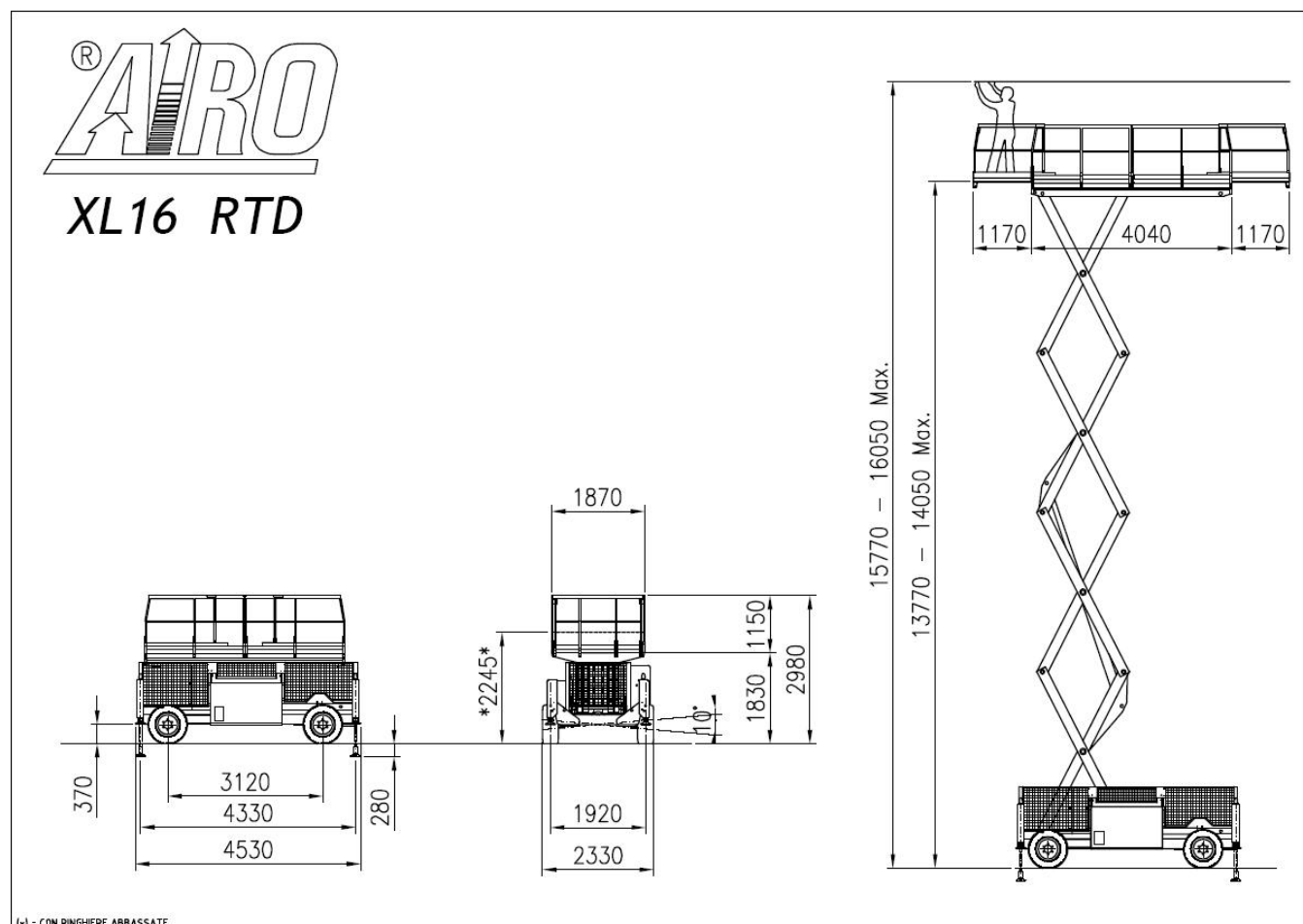
		XL16 RTD	
Dimensions:			
	Maximum working height	16	m
	Maximum platform height	14	m
	Ground clearance	370	mm
	Platform height for safety speed activation	2.7	m
	Internal steering radius	4	m
	External steering radius	6.9	m
	Maximum capacity (m)	700	kg
	Max. number of people on the platform (n) – indoors	3	
	The tool and material weight (me) (**) – indoors	460	kg
	Max. number of people on the platform (n) – outdoors	3	
	The tool and material weight (me) (**) – outdoors	460	kg
	Maximum deck extension	1.17 + 1.17	m
	Maximum capacity with platform extended	700	kg
	Max. No. of people with platform extended	3	
	Maximum drive height	Max	
	Maximum dimensions with platform extended	1.87 x 6.38	m
	Max. hydraulic pressure	190	bar
	Max. pressure of lifting circuit	190	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 with removable rails installed	4.53 x 2.33 x 2.98	m
	Transport dimensions with removable rails not installed	N.A.	m
	Transport dimensions with rails folded down	4.53 x 2.33 x 2.245	m
	Machine weight (unloaded) (*)	8000	kg
Stability limit:			
	Longitudinal inclination	4	°
	Transversal inclination	3	°
	Maximum wind speed (***)	12.5	m/s
	Max. load per wheel	3200	Kg
Performance:			
	Driving wheels	4	n
	Max. drive speed	5	km/h
	Safety drive speed	0.36	km/h
	Lowering/lifting time (unloaded)	65 / 75	Sec.
	Tank oil capacity	150	Lt.
	Gradeability	40	%
	Max. operating temperature	+50	C
	Min. operating temperature	-15	C
Battery power:			
	Voltage and capacity of battery	NA	V/Ah
	Battery weight	NA	kg
	Single-phase battery charger (HF)	NA	V/A
	Max. current absorbed by battery charger	NA	A
	Max. installed power	NA	kW
	Power electrical pump 1	NA	kW
	Max. absorbed current	NA	A
	Power electrical pump 2	NA	kW
	Max. absorbed current	NA	A
	Power electrical pump 3	NA	kW
	Max. absorbed current	NA	A

Diesel Power			
	Diesel engine type	Hatz 3L41C - ISUZU 4LE1	
	Engine power	36 - 40.5	kW
	Starter battery	12/135	V/Ah
	Diesel oil tank capacity	45	Lt.
380V three-phase electrical pump (optional)			
	Engine power	7.5	kW
	Max. absorbed current	15.6	A
	Max. drive speed	2.2	km/h

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

(**) $me = m - (n \times 80)$

(***) 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.



2.8 Model XL19 E

		XL19 E	
Dimensions:			
	Maximum working height	19.3	m
	Maximum platform height	17.3	m
	Ground clearance	290	mm
	Platform height for safety speed activation	3.3	m
	Internal steering radius	4	m
	External steering radius	6.9	m
	Maximum capacity (m)	500	kg
	Max. number of people on the platform (n) – indoors	3	
	The tool and material weight (me) (**) – indoors	260	kg
	Max. number of people on the platform (n) – outdoors	3	
	The tool and material weight (me) (**) – outdoors	260	kg
	Maximum deck extension	1.17 + 1.17	m
	Maximum capacity with platform extended	500	kg
	Max. No. of people with platform extended	3	
	Maximum drive height	14	M
	Maximum dimensions with platform extended	1.87 x 6.38	m
	Max. hydraulic pressure	190	bar
	Max. pressure of lifting circuit	150	bar
	Min. pressure of braking circuit	50 ÷ 60	bar
	Tyre dimensions (****)	Ø 710 x 230	mm
	Tyre type (****)	300-15	
	Transport dimensions with removable rails installed	4.53 x 2.21 x 3.21	m
	Transport dimensions with removable rails not installed	N.A.	m
	Transport dimensions with rails folded down	4.53 x 2.21 x 2.5	m
	Machine weight (unloaded) (*)	9645	kg
Stability limit:			
	Longitudinal inclination	1.5	°
	Transversal inclination	1.5	°
	Maximum wind speed (***)	12.5	m/s
	Max. load per wheel	3860	Kg
Performance:			
	Driving wheels	2	n
	Max. drive speed	4.3	km/h
	Safety drive speed	0.36	km/h
	Lowering/lifting time (unloaded)	105 / 80	Sec.
	Tank oil capacity	150	Lt.
	Gradeability	20	%
	Max. operating temperature	+50	C
	Min. operating temperature	-15	C
Battery power:			
	Voltage and capacity of battery	48/750	V/Ah
	Battery weight	1275	kg
	Three-phase battery charger (HF)	48 / 80	V/A
	Max. current absorbed by battery charger	16 (380 V)	A
	Max. installed power	13.5	kW
	Power electrical pump 1	4.5	kW
	Max. absorbed current	160	A
	Power electrical pump 2	4.5	kW
	Max. absorbed current	160	A
	Power electrical pump 3	4.5	kW
	Max. absorbed current	160	A

2.9 Model XL19 RTD

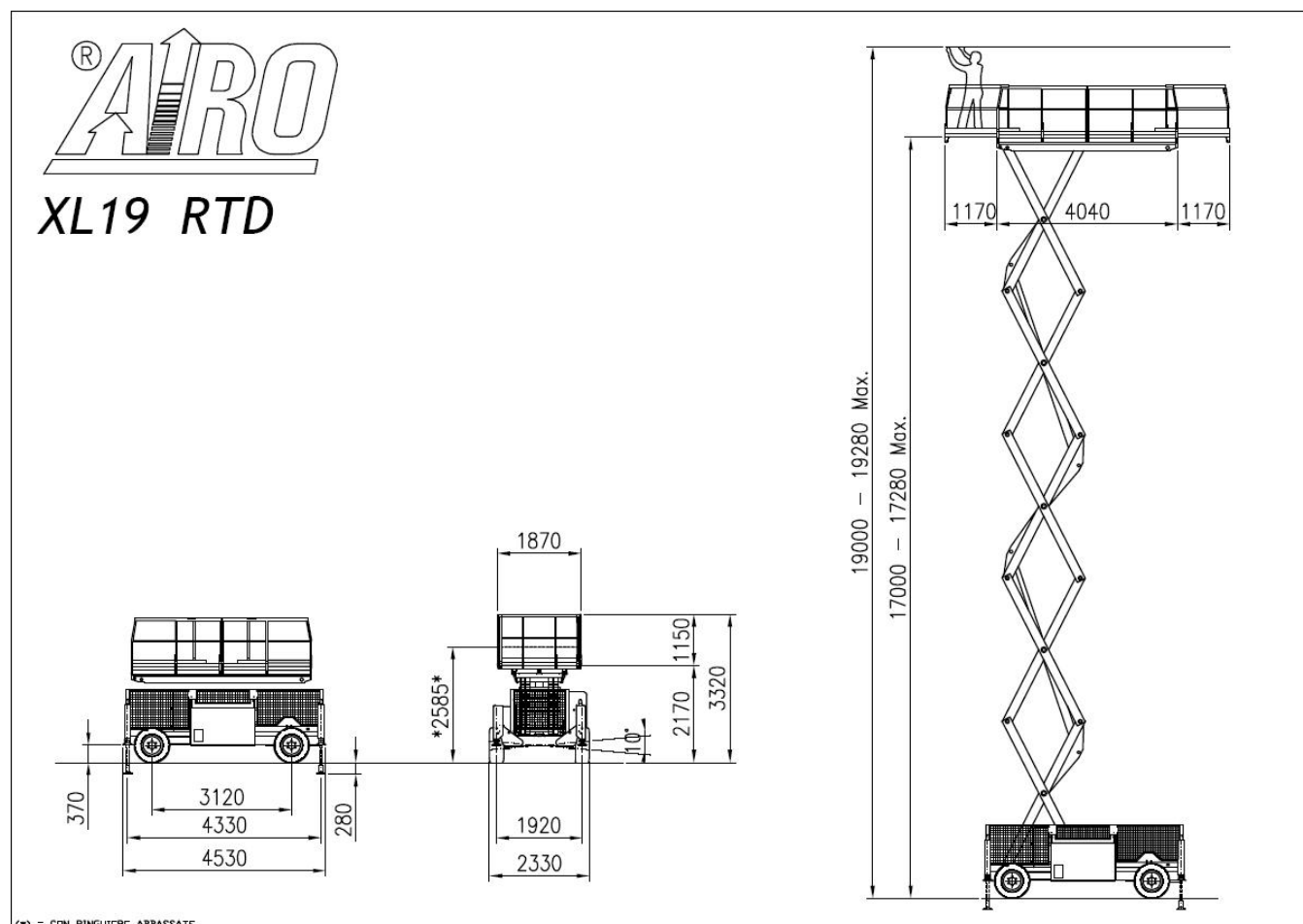
		XL19 RTD	
Dimensions:			
	Maximum working height	19.3	m
	Maximum platform height	17.3	m
	Ground clearance	370	mm
	Platform height for safety speed activation	3.3	m
	Internal steering radius	4	m
	External steering radius	6.9	m
	Maximum capacity (m)	500	kg
	Max. number of people on the platform (n) – indoors	3	
	Tool and material weight (me) (**) – indoors	260	kg
	Max. number of people on the platform (n) – outdoors	3	
	Tool and material weight (me) (**) – outdoors	260	kg
	Maximum deck extension	1.17 + 1.17	m
	Maximum capacity with platform extended	500	kg
	Max. No. of people with platform extended	3	
	Maximum drive height	10	M
	Maximum dimensions with platform extended	1.87 x 6.38	m
	Max. hydraulic pressure	190	bar
	Max. pressure of lifting circuit	160	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 with removable rails installed	4.53 x 2.33 x 3.32	m
	Transport dimensions with removable rails not installed	N.A.	m
	Transport dimensions with rails folded down	4.53 x 2.33 x 2.585	m
	Machine weight (unloaded) (*)	9520	kg
Stability limit:			
	Longitudinal inclination	1.5	°
	Transversal inclination	1.5	°
	Maximum wind speed (***)	12.5	m/s
	Max. load per wheel	3810	Kg
Performance:			
	Driving wheels	4	n
	Max. drive speed	5	km/h
	Safety drive speed	0.36	km/h
	Lowering/lifting time (unloaded)	65 / 75	Sec.
	Tank oil capacity	150	Lt.
	Gradeability	40	%
	Max. operating temperature	+50	C
	Min. operating temperature	-15	C
Battery power:			
	Voltage and capacity of battery	NA	V/Ah
	Battery weight	NA	kg
	Three-phase battery charger (HF)	NA	V/A
	Max. current absorbed by battery charger	NA	A
	Max. installed power	NA	kW
	Power electrical pump 1	NA	kW
	Max. absorbed current	NA	A
	Power electrical pump 2	NA	kW
	Max. absorbed current	NA	A
	Power electrical pump 3	NA	kW
	Max. absorbed current	NA	A

Diesel Power			
	Diesel engine type	Hatz 3L41C - ISUZU 4LE1	
	Engine Power	36 - 40.5	kW
	Starter battery	12/135	V/Ah
	Diesel oil tank capacity	45	Lt.
380V three-phase electrical pump (optional)			
	Engine Power	7.5	kW
	Max. absorbed current	15.6	A
	Max. drive speed	2.2	km/h

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

(**) $me = m - (n \times 80)$

(***) 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.



2.10 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 82dB(A) for each electrical models.

For all diesel engine models, the level of acoustic pressure weighed (A) at work places does not exceed 110dB(A).

As to vibrations in ordinary working conditions:

- The average weighted quadratic value in frequency of the acceleration which the upper and lower members have to withstand is below 2.5 m/sec^2 for each of the models to which this Operator's and Maintenance manual refers.
- The average weighted quadratic value in frequency of the acceleration which the upper and lower members have to withstand is below 0.5 m/sec^2 for each of the models to which this Operator's and Maintenance manual refers.

3. SAFETY PRECAUTIONS

3.1 Individual protection devices (IPD).

- § Always wear personal protective clothes 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 protection devices 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.

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 connection while welding on 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 Intended use

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 ADJUSTMENT OF ANY COMPONENT OF THE ELECTRIC AND HYDRAULIC SYSTEM.

- § 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 elevated, do not fasten the platform to any structure (beams, pillars or wall).
- § Do not use the machine as a crane, elevator or lift.
- § Protect the machine (in particular the platform control panel by means of the specially provided cover - optional) 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 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 by means of the specially provided cap (optional).
- § 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 any movement make sure that the machine plugs are disconnected from the power source.
- § 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 EN280:2001).
- § 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.
- § Backward drive (in the direction of the fixed wheels) does not allow the operator a complete visibility from the control position. This operation shall be carried out with the utmost care.
- § 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 chapter "Intended use").
- § Do not operate the machine if components boxes are not properly closed.
- § Check that in the operating area there are not obstacles or other dangerous elements.
- § Pay particular attention to the area above the machine during lifting to avoid any crushing and collisions.



3.3.3 Operating procedures



- § The machine is equipped with an inclination control system disabling lifting in case of unstable positioning. Working operations can be resumed only after placing the machine in a steady position. Should the alarm and the red light on the platform control panel turn on, the machine is not correctly positioned (see paragraphs relevant to "Use instructions"). Bring it to safety rest position before starting operations again. If the platform inclination is activated with platform raised the only possible platform operation is lowering
- § The machine is equipped with a platform overload controller stopping the platform lifting and lowering in case of overloading. In case of platform overloading when lifted, also drive is stopped. Platform operation can be resumed only after removing the exceeding load. Should the alarm and the red light located on the platform control panel turn on, then the machine is overloaded (see chapter "Red warning light overload"). Remove the exceeding load before starting operations again.
- § The machine can be equipped with a device to avoid the risk of shearing and crushing in the lifting structure in compliance with PrEN280:2009: the lowering movement is automatically stopped in a position where the vertical distance between the scissor ends is over 50 mm. In this condition the alarm warns about the danger condition by increasing its frequency. The operator on the platform must release the lowering control and wait until the alarm stops (about 3 sec.), then he can resume the lowering control (see chapter "Lifting and lowering").
- § Electrically-powered machines feature a device for checking the state of battery charge ("battery-saving" device): 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 stopped, battery should be immediately charged.
- § Electrically-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.
- § Do not lean over the platform guard-rails.
- § During operations in public areas surround the working area by means of barriers or other suitable signs.
- § Do not use the thermic power (Diesel or Petrol engine) indoors or in insufficiently ventilated areas.
- § Make sure that no people, apart from the operator, are in the area where the machine is operating. While moving the platform or operating the outriggers, the operator should pay particular attention to avoid any contact with the personnel on the ground.
- § Specially provided micro-switches located on the (optional) levelling outriggers control their position. When the cylinders are lowered, drive is disabled. In order to carry out the drive, lift the pads completely.
- § To avoid any improper use, machines with (optional) levelling outriggers are equipped with a suitable microswitch that checks the position of the platform. When the platform is at a height above 3 meters from the ground the levelling outriggers cannot be operated.
- § Lift the platform only if the machine is resting on solid and horizontal surfaces.
- § Drive the machine with lifted platform only if the ground is solid and horizontal.
- § Always place working tools in a steady position to prevent them from falling and hurting the operators on the ground.
- § 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.

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

3.3.4 Wind speed according to BEAUFORT SCALE

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



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

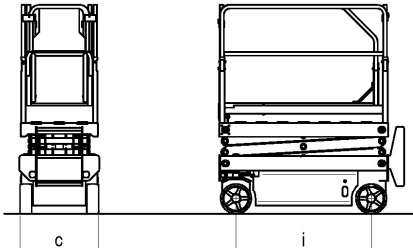
Beaufort Number	Wind speed (km/h)	Wind speed (km/h)	Description	Sea conditions	Land conditions
0	0	< 0.28	Calm	Flat	Calm. Smoke rises vertically.
1	1-6	0.28-1.7	Light air	Ripples without crests.	Wind motion visible in smoke.
2	7-11	1.7-3	Light breeze	Small wavelets. Crests of glassy appearance, not breaking.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

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

Before using the machine, the operator must make sure the floor is suitable for withstanding the specific loads and pressures on the ground with a certain safety margin.

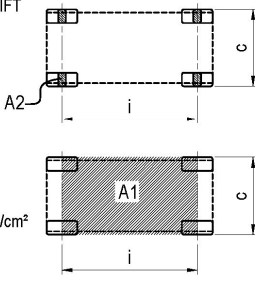
The following chart provides the parameters in play and two examples of calculation of the average pressure on the ground below the machine and max pressure underneath the wheels or stabiliser outriggers (p1 and p2).

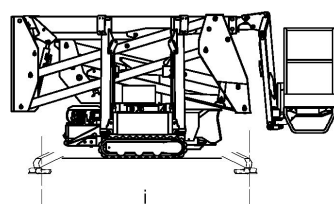
SYMBOL	U.M.	DESCRIPTION	EXPLANATION	FORMULA
P1	Kg	Total machine weight	Represents the weight of the machine, not including nominal load. Note: always refer to the details indicated on the plates affixed to the machine.	-
M	Kg	Nominal load	The max. load allowed for the work platform	-
A1	cm ²	Area occupied on the ground	Machine supporting area on the ground determined by the result of TRACK x WHEEL BASE.	$A1 = c \times i$
c	cm	Track	Cross width of machine measured outside the wheels. Or: Cross width of machine measured between levelling outrigger centres.	-
i	cm	Wheel base	Longitudinal length of machine measured between wheel centres. Or: Longitudinal length of machine measured between levelling outrigger centres.	-
A2	cm ²	Wheel or levelling outrigger area	Wheel or levelling outrigger ground support area. The wheel support area on the ground must be verified empirically by the operator; the levelling outrigger support area depends on the shape of the support foot.	-
P2	Kg	Max. load on wheel or levelling outrigger	This represents the max. load that can be discharged onto the ground by a wheel or by a levelling outrigger 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/cm ²	Pressure on ground	Average pressure placed on the ground in idle conditions and supporting the nominal load.	$p1 = (P1 + M) / A1$
p2	Kg/cm ²	Max. specific pressure	Max. pressure which a wheel or a levelling outrigger can place on the ground when the machine is in the worst position and load conditions.	$p2 = P2 / A2$



EXAMPLE 1: SCISSOR LIFT

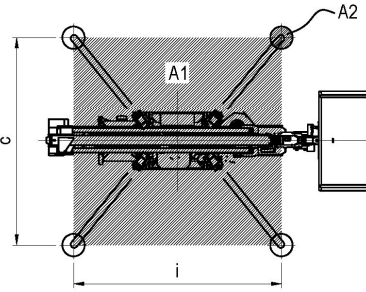
P1 = 1395 kg
 P2 = 680 kg
 M = 250 kg
 c = 76,5 cm
 i = 132,0 cm
 $A1 = c \times i = 10098 \text{ cm}^2$
 $A2 = 71,5 \text{ cm}^2$
 $p1 = (P1+M)/A1 = 0,16 \text{ kg/cm}^2$
 $p2 = P2/A2 = 9,5 \text{ kg/cm}^2$





EXAMPLE 1: CRAWLER LIFT

P1 = 2200 kg
 P2 = 920 kg
 M = 200 kg
 c = 295 cm
 i = 295 cm
 $A1 = c \times i = 87025 \text{ cm}^2$
 $A2 = 62,8 \text{ cm}^2$
 $p1 = (P1+M)/A1 = 0,03 \text{ kg/cm}^2$
 $p2 = P2/A2 = 14,6 \text{ kg/cm}^2$



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, STANDARD MACHINE TECHNICAL SPECIFICATIONS) 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 pressure on the ground is above the load-bearing capacity of the specific type of ground on which the machine is to be used.

TYPE OF GROUND	BEARING CAPACITY IN Kg/ cm ²
Non compact filling earth	0 – 1
Mud, peat, etc.	0
Sand	1.5
Gravel	2
Friable earth	0
Soft earth	0.4
Rigid earth	1
Semi-solid earth	2
Solid earth	4
Rock	15 - 30

Should you have any doubts, verify the load-bearing capacity with specific tests.

In case of constructed surfaces (concrete floors, bridges, etc.) the load-bearing capacity must be provided by the builder.

3.3.6 High-voltage lines

The machine is not electrically insulated and is not protected in case of contact with or vicinity to power lines.

A minimum distance must be kept from the power lines according to applicable laws and the following table

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 Hazardous 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 of 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 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 characteristics "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 order 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 ranges between the min. and max. value (with platform lowered and outriggers lifted).
- § The ground is sufficiently horizontal and solid.
- § The machine carries out all operations in safety.
- § The wheels and drive engines are properly fixed.
- § The wheels are in good condition.
- § 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 controls are perfectly efficient both from the platform control panel and the emergency ground panel, including the dead-man system.

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 rail and is used to:

- § Turn the machine on/off.
- § Move the platform during ordinary working procedures.
- § Display some operation parameters (alarms, deadman's working, etc...).

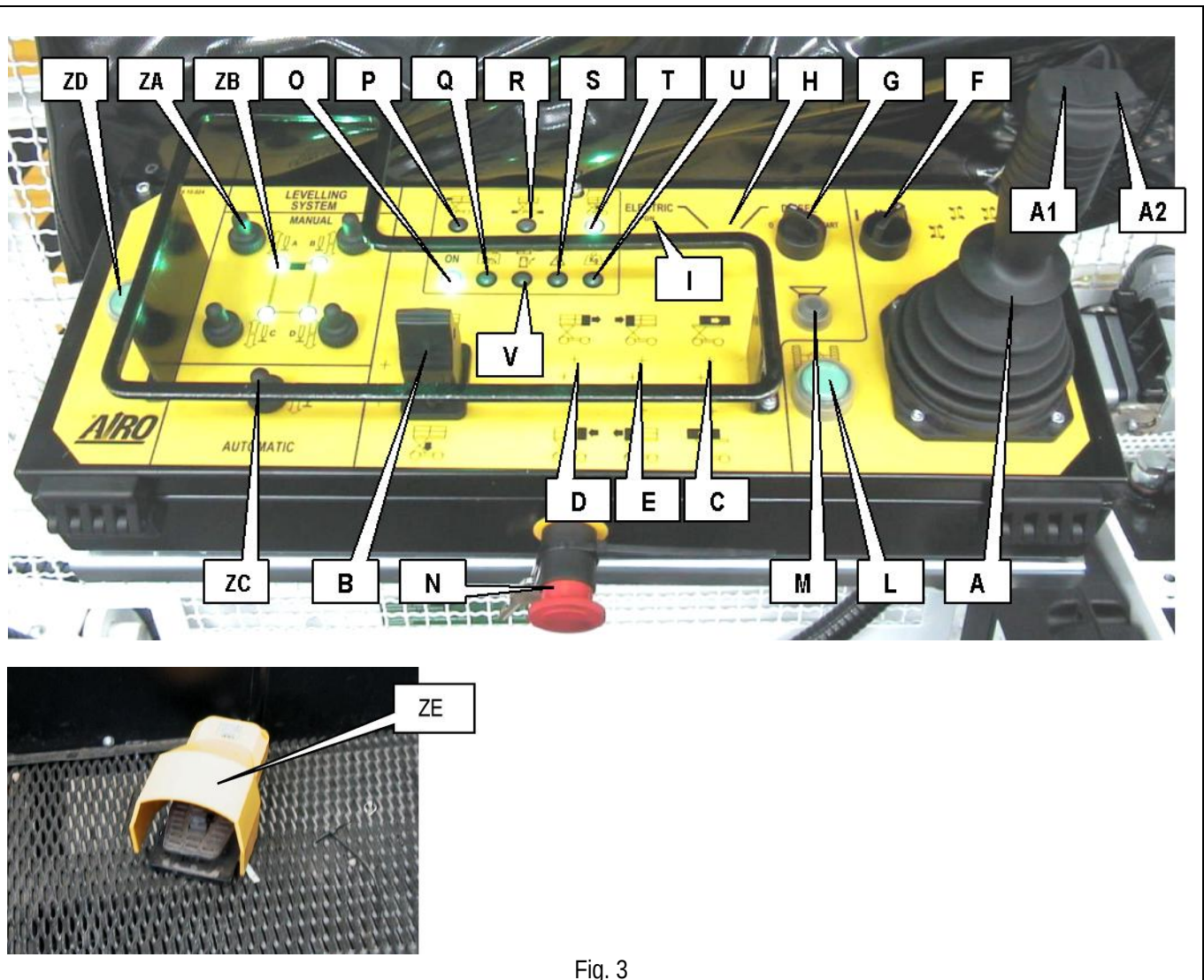


Fig. 3

- A) Drive and steering proportional joystick control
- A1) Left steering control switch
- A2) Right steering control switch
- B) Lifting/lowering control proportional lever
- C) Sliding platform extraction/retraction control proportional lever (optional)
- D) Front extension deck extraction/retraction control proportional lever (optional)
- E) Rear extension deck extraction/retraction control proportional lever (optional)

- F) Drive speed selector
- G) Diesel engine starting switch
- H) Diesel/electric power selector (optional)
- I) Single-phase/three-phase electrical pump start/stop button (optional)
- L) Differential lock button (series/parallel connection drive motors)
- M Manual horn
- N) Emergency stop button
- O) Enabled control panel warning light
- P) Sliding platform position warning light (only for machines with sliding platform)
- Q) Flat battery warning light – Electric models
- R) Drive enable warning light
- S) Danger warning light (unsteady position and faults indicator)
- T) Lifting enable warning light
- U) Overload alarm warning light
- V) Diesel engine fault / low fuel level warning light – Thermic models
- ZA) Manual levelling outriggers control switches (optional)
- ZB) Levelling outriggers position warning lights (optional)
- ZC) Automatic levelling control switch (optional)
- ZD) Dead-man button
- ZE) Dead-man pedal

Drive, lifting and (optional) platform extraction/retraction operations are controlled by the proportional joysticks A-B-C-D-E; 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 and hold down dead-man pedal ZE or press dead-man button ZD at platform before operating the controls. If the dead-man pedal is accidentally released, 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. Once the dead-man button is pressed, you have 2 seconds to activate the controls. If no operation is performed after 2 seconds, the control panel is disabled. The condition of disabled control panel is reported by the green flashing led (see paragraph “Warning lights”). To operate the machine again, it is necessary to release the dead-man pedal and press it again or press the dead-man button.

5.1.1 Drive and steering



Before any movement, verify the presence of people in close proximity to 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 it is necessary to carry out the following operations in sequence:

- a) Press and hold down dead-man pedal ZE or press and release dead-man button ZD located on the platform; the green led O will light up steady indicating its enabling;
- b-1) In case of use of the pedal within 10 seconds from the green steady led O lighting up, set the proportional joystick drive control A forward for forward drive or backward for reverse drive.
- b-2) in case of use of the button within 2 seconds from the green steady led O lighting up, set the proportional joystick drive control A forward for forward drive or backward for reverse drive.



WARNING!!

Drive and steering controls can take place at the same time but they are interlocked with other platform movement controls (lifting/lowering/extraction/retraction/levelling outriggers).

Drive control is active only if drive enable green warning light (R) is ON. If it is OFF, drive control is stopped. See paragraph "Warning lights".

With platform completely lowered, operating the drive speed selector F, and/or differential lock button L, different drive speeds can be selected. Due to the rigid frame 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 lock button L.

NOTE: To achieve maximum drive speed, set speed selector F to position III, hold down the differential lock button L and press down the proportional joystick A.

To operate on high ascending slopes (e.g. while loading the machine onto a truck) set speed selector F to position I (electric models) or II (thermic models).

To operate on high descending slopes (e.g. while unloading the machine from a truck) set speed selector F to position I (all models).

With lifted platform, safety drive speed is automatically enabled, therefore neither speed selector F nor differential lock button L are active.

WARNING!! The differential lock button (L) is to be used by the operator to drive the machine on uneven grounds, if one of the driving wheels is lifted and absorbs the whole drive power and to perform rapid straightforward movements. Do not hold down this press-button while steering.

To steer, press buttons A1 or A2 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 or dead-man button and is possible only if:

- § Enabled control panel green warning led O is ON.
- § Drive enable green warning led R is ON.

5.1.2 Drive with operator on the ground

If drive operations are to be carried out not from the preset control position on the platform (e.g. transit through doors where the machine height is too high) you can proceed as follows:

- § Lower the machine completely.
- § Remove the platform control panel.
- § If necessary, remove or fold down the rails to further reduce the overall height.
- § Select the slow drive speed, as indicated in ("Snail").
- § Carry out the movements at a safety distance from the machine of at least 1 metre.
- § Pay attention to the directions of drive and steering, keeping in mind that the indications on the "platform control panel" refer to its preset position (fixed to the guardrails).



IT IS FORBIDDEN

To lift/lower the machine using the "platform control panel" from the ground

5.1.3 Platform positioning

To carry out all movements, except for drive, use proportional levers C-D-E. To achieve the movement the following operations are to be carried out in sequence:

- a) Press and hold down dead-man pedal ZE or press and release dead-man button ZD located on the platform; the green led O will light up steady indicating its enabling;
- b-1) In case of use of the pedal within 10 seconds from the green steady led O lighting up set the desired proportional control lever in the direction shown by the serigraphy on the control panel.
- b-2) In case of use of the button within 2 seconds from the green steady led O lighting up set the desired proportional control lever in the direction shown by the serigraphy on the control panel.

5.1.3.1 Platform lifting/lowering

To lift/lower the platform, use the proportional lever B. Set the proportional lever forward for lifting or backward for lowering.

By operating the joystick control gradually smooth accelerations and decelerations can be achieved during platform lifting. Platform lowering is performed at one speed only.



WARNING!!

Control the platform lifting movement only on sufficiently solid and flat surfaces.

Lifting control is active only if lifting enable green warning light (T) is ON. If it is OFF, lifting control is stopped. See paragraph "Warning lights".

NOTE:

The machine is equipped with a device to avoid the risk of shearing and crushing in the lifting structure in compliance with "PrEN280:2009". With this installed device, the lowering movement is automatically stopped in a position where the vertical distance between the scissor ends is over 50 mm. In this condition the alarm warns about the danger condition by increasing its frequency. The operator on the platform must release the lowering control and wait until the alarm stops (about 3 sec.), then he can resume the lowering control.

5.1.3.2 Platform extraction/retraction (optional)

5.1.3.2.1 Sliding platform extraction/retraction (optional)

For machines with platform which can slide on both sides, to extract/retract the sliding platform, use the proportional lever C. Set the proportional lever forward for forward sliding; set the proportional lever backward for backward sliding.

By operating the joystick control gradually smooth accelerations and decelerations can be achieved during platform sliding.



WARNING!!

Special microswitches under the platform stop all machine movements (except platform extraction/retraction) if platform is not in central position (green warning light P ON).

The control for sliding the sliding platform forward/backward is fully active only if the instability alarm is not present (warning light S ON in case of alarm). In case of instability alarm (warning light S ON) only the controls allowing the platform to be positioned within its shape are active.

The sliding platform has successfully reached the position within its shape when the green warning light P turns on. See paragraph "Warning lights".

5.1.3.2.2 Extension deck extraction/retraction (optional)

In dual slide-out extension deck machines, the STANDARD control to extract/retract the double slide-out extension decks is of manual type (it is manually operated by the operator).

Upon REQUEST the electro-hydraulic control can be supplied on the platform. With this control (OPTIONAL) the space for the operators on the platform can be increased by sliding the slide-out extension decks.

To achieve extraction/retraction of the front slide-out extension deck, use the proportional lever D; for rear slide-out extension deck, use the proportional lever E. Set the proportional lever forward for sliding the slide-out deck forward; set the proportional lever backward for sliding the slide-out deck backward.

By operating the joystick control gradually smooth accelerations and decelerations can be achieved during platform lifting. Platform lowering is performed at one speed only.



WARNING!!

The control for sliding the slide-out extension decks is active only if the instability alarm is not present (warning light S ON in case of alarm). In case of instability alarm (warning light S ON) only the controls allowing the slide-out extension decks to be retracted within the platform shape are active.

The sliding platform has successfully reached the position within its shape when the green warning light P turns on. See paragraph "Warning lights".

5.1.4 Levelling outriggers control (OPTIONAL)

Some models are fitted with four levelling outriggers to allow the machine to be positioned on inclined grounds. To activate the levelling outriggers it is necessary to:

- a) Press and hold down dead-man pedal ZE or press and release dead-man button ZD located on the platform; the green led O will light up steady indicating its enabling;
- b-1) In case of use of the pedal within 10 seconds from the green steady led O lighting up set the desired switch.
- b-2) In case of use of the button within 2 seconds from the green steady led O lighting up set the desired switch.



WARNING!!

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

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

Specially provided micro-switches located on the levelling outriggers control their position. With lowered outriggers – even if not resting on the ground – drive is stopped. If the pads are neither resting on the ground nor completely lifted, the warning lights ZB are flashing. In order to carry out the drive, lift the pads completely. When warning lights ZB turn off, pads are completely lifted.

To avoid any improper use, machines with levelling outriggers are equipped with a suitable microswitch that checks the position of the platform. When the platform is at a height above 3 meters (approx.) from the ground the levelling outriggers cannot be operated.

The levelling outriggers operation is signalled by warning lights ZB. See paragraph “Warning lights”.

5.1.4.1 Levelling outriggers manual control (OPTIONAL)

To lift/lower the levelling outriggers it is necessary to operate one or more of the four control levers ZA.

If you set levers ZA downwards, the levelling pads extract; vice versa, if you set the levers upwards, they retract.

The location of the control levers ZA and relevant warning lights ZB corresponds to the arrangement of the levelling outriggers:

- § Lever/Warning light A = Front left levelling outrigger
- § Lever/Warning light B = Front right levelling outrigger
- § Lever/Warning light C = Rear left levelling outrigger
- § Lever/Warning light D = Rear right levelling outrigger

5.1.4.2 Levelling outriggers manual control (OPTIONAL)

The machine can be supplied with an optional automatic levelling system. The system has two operating modes:

- § manual mode (see previous paragraph)
- § automatic mode

For AUTOMATIC LEVELLING set the control lever ZC downwards. The control system will independently control the levelling outriggers until the machine is levelled.

Levelling is correct when:

- § All four warning lights ZB turn on.
- § Inclination alarm warning light S turns off (if an alarm condition due to instability was present before levelling control) and lifting enable warning light T turns on at the same time.

For AUTOMATIC RETRACTION of all pads, set the control lever ZC upwards. The control system will retract all pads up to the upper stop. Retraction is complete when all warning lights ZB turn off.



During automatic levelling, the system aims to level the machine within an allowance of 0.4° both longitudinally and transversally. The system continues the pad control until levelling within this tolerance is reached. If the automatic system is unable to obtain levelling within the expected allowance, yet the four pads are firmly resting on the ground and the machine is within the stability limits controlled by the inclinometer, the lifting enable green warning light T will still light up and lifting

can be carried out.
Excessive longitudinal and/or transversal inclinations may prevent the automatic levelling from being reached.

5.1.5 Other functions of the platform control panel

5.1.5.1 Selection of electric/thermic propulsion (OPTIONAL)

On a few models the type of propulsion can be selected using selector H. Set it to position ELECTRIC to use the electric propulsion (battery or mains power); set it to position THERMIC to use the thermic propulsion (Diesel engine for models ED; petrol engine for models EB).

5.1.5.2 Electrical pump start/stop button (OPTIONAL)

Diesel power models can be equipped, on request, with a work pump (230V single-phase or 380V three-phase) as an alternative to thermic propulsion for short works indoors.

If the machine is correctly connected to the mains power (230 V or 380V depending on the available function), and selector H is in position ELECTRIC, by pressing button I – before operating the dead-man pedal ZE or dead-man button ZD – the pump is turned on (if off) or turned off (if on).

The electrical pump is on when the green led close to button I is lighting up.

In the event of a 380V three-phase electrical pump, the machine controls are enabled only after 3 sec. after pump starting.



WARNING!

Always check the position of the cable during the movements.

5.1.5.3 Heat engine starting switch (models" D", "ED", "B", EB")

It starts the heat engine (Diesel or Petrol) on bi-fuel models (ED or EB) and on thermic propulsion models (D or B). With selector H in position THERMIC operating the switch G:

- § 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.

5.1.5.4 Manual horn

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

5.1.5.5 Emergency stop button

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

5.1.5.6 Warning lights

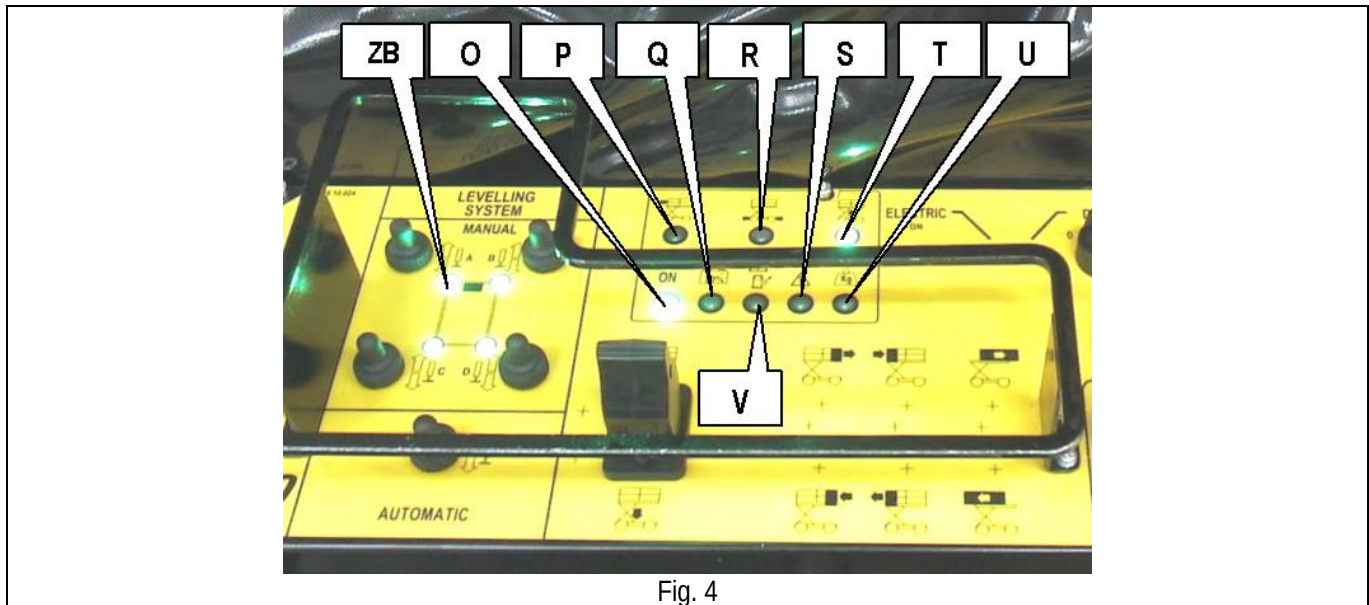


Fig. 4

5.1.5.6.1 Enabled control panel green warning light (O)

On with flashing light when the machine is turned on. If the platform control panel has been selected and this light flashes the controls are not enabled because the dead-man pedal is not pressed or it was pressed for more than 10 seconds and no operation was performed or dead-man button was not pressed or more than 2 seconds went by since its release and no operation was performed

On steady with machine on and dead-man pedal pressed for less than 10 seconds or dead-man button pressed and released for less than 2 seconds. With platform controls all controls are enabled (unless other types of warning show up – see next paragraphs).

5.1.5.6.2 Sliding platform position green warning light (P - only for machines with sliding platform)

This light is present on machines fitted with sliding platform (the whole platform can slide longitudinal).

When sliding platform is not in central position, the warning light is OFF, and only platform extraction/retraction is possible.

When it is ON, the sliding platform is in central position, and the machine operation can be resumed (unless other warnings – see next/previous paragraphs).

5.1.5.6.3 Flat battery red warning light (Q – only Electric and Electro/diesel models)

Flashing when the battery charge is at 20% (only models "E" or "ED" with current continuous electrical pump). In this condition, platform lifting is stopped. It is necessary to recharge the battery immediately.

5.1.5.6.4 Drive enable green warning light (R)

This light is ON when drive can be carried out. Drive movement is stopped (green light OFF) when:

- One or more levelling outriggers are not completely retracted (did not reach the upper stop). See also warning lights ZB – only machines with levelling outriggers.
- Platform is above the maximum drive height (see paragraph "Technical features").
- Sliding platform is "out of center". See also green warning light P – only machines with sliding platform.
- With lifted platform the machine is on a ground inclined over the max. allowed inclination. See warning lights S and T.
- With lifted platform, the platform is overloaded. See warning lights U and T.

5.1.5.6.5 Danger red warning light (S)

It flashes quickly for 4 seconds together with the alarm at the machine start-up in case of fault during safety test on controls (pedal, joystick control, switches, etc) during machine start-up.

It is lit up steady together with the alarm when the chassis inclination exceeds the allowed value. Lifting and platform extractions are stopped (in case of electric control). If platform is lifted, drive is also stopped. It is necessary to lower the platform 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.

5.1.5.6.6 Lifting enable green warning light (T)

This light is ON when lifting can be carried out, i.e. when:

- a) All or none of the pads are resting on the ground (no pads resting means that the machine rests on its wheels). See also warning lights ZB – only machines with levelling outriggers.
- b) Sliding platform is in retracted position. See also warning light R – only machines with sliding platform.
- c) Machine is in levelled position. See also warning light S.
- d) Overload alarm is not present. See also warning light U.
- e) Flat battery alarm is not present. See also warning light Q – only models “E” and “ED”.

5.1.5.6.7 Overload red warning light (U)

On steady and activation of alarm with a platform overload exceeding 20% the rated load. If the platform is lifted, the machine is completely locked. If platform is completely lowered all driving/steering operations are still possible but lifting is stopped. Remove the overload before using the machine again.

Fast flashing in case of fault in the control system of the platform load. With lifted platform the machine is completely blocked.



WARNING!

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

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

5.1.5.6.8 Diesel engine fault / low fuel red warning light (V)

This warning light indicates malfunctioning of diesel engine or low fuel.

On steady with machine on; platform control panel; Diesel power selected. Diesel engine off, ready for start-up. Insufficient engine oil pressure.

Slow flashing in the event of the engine head overheating. If on, it stops the Diesel engine; if off, it prevents the Diesel engine from starting.

Fast flashing in the event of low fuel. This warning is active only with the engine on.

Double fast flashing when the fuse on the electric fan of the air/oil exchanger (if present) is burnt out. **WARNING!** Change the fuse. Danger of overheating of hydraulic oil.

5.2 Ground control panel and electric control unit

The ground control panel (or electric central unit - fig. 5) contains the main electronic boards necessary to operate the machine and to carry out safety checks.

The ground control panel is located on the chassis (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 controls only to start/stop the machine, to select the control panel or in emergency situations to allow the platform to be lowered.



The key must be given to authorized personnel. Keep a duplicate key 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.

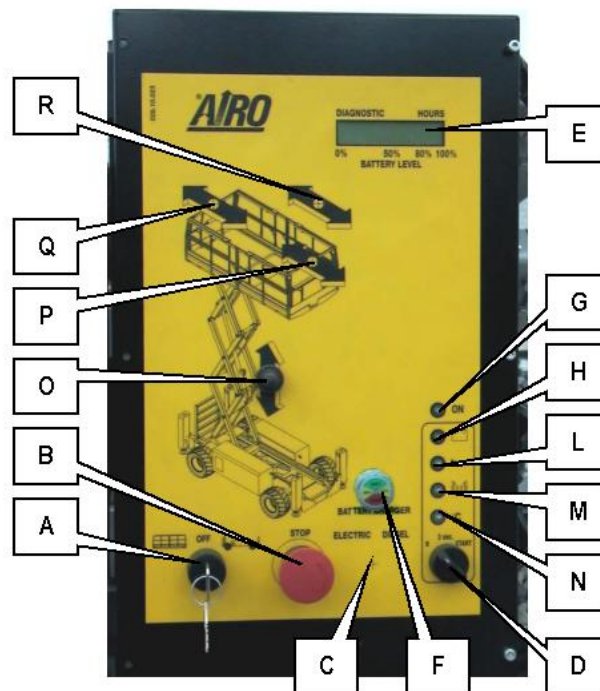


Fig. 5

- A) ON-OFF key and control panel selector (ground/platform)
- B) Emergency STOP button
- C) DIESEL/ELECTRIC power selector
- D) Heat engine starting button (models "D" and "ED")
- E) User interface display
- F) Battery charger warning light (models "E" and "ED")
- G) Enabled control panel 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) Lifting/lowering lever
- P) Front slide-out deck extraction/retraction lever (OPTIONAL)
- Q) Rear slide-out deck extraction/retraction lever (OPTIONAL)
- R) Sliding platform extraction/retraction lever (OPTIONAL)

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

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

- § Turn ON the machine by selecting one of the two control panels:
 - § Platform controls enabled with key switch set to "platform" symbol. Stable key position with possibility to extract the key.
 - § Ground controls enabled (for emergency operations) with key switch set to "chassis" symbol. Position with action to be kept. When the key is released the machine is turned off.
- § Turn OFF the control circuits by turning it to OFF.

5.2.2 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 power selector (C)

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

- § If ELECTRIC is selected and the ON-OFF key is kept active in position "ground controls" the electrical pump is started while operating the ground controls.
- § If DIESEL is selected and the ON-OFF key is kept active in position "ground controls" the Diesel engine can be started.

5.2.4 Heat engine starting switch (D)

Holding the ON-OFF key in position "ground controls" 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 engine 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 work pump (when electric power is selected the working hours are displayed in the format HOURS:MINUTES and final letter E).
- § MINUTES and final letter E); charge level of the battery (only electrical models E).



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

5.2.6 Battery charger warning light (F)

Electric power and bi-fuel 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 "chassis" position).

5.2.8 Diesel engine warning lights (G-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 engine is stopped. A "fault" message is sent to the operator on the platform (see paragraph "Platform control panel"). Once the Diesel engine has stopped due to a problem signalled by one of these warning lights, the engine can no longer be re-started until such problem has been solved.

5.2.9 Platform control levers (O-P-Q-R)

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 ladder hanging on to the rungs, the ladder side rails or 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.



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 entrance uprights.



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



IT IS FORBIDDEN
Leaving or accessing the work platform is forbidden unless this is in the position required for access or leaving.



Fig. 6

5.4 Start-up

To start the machine the operator shall:

- § Release the stop button located 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.
- § Close the protection cover (if available).
- § Get onto the platform.
- § Release the stop button on the platform control panel (see previous paragraphs).

For ELECTRIC propulsion 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 dual propulsion models (Electric/Diesel) (models “ED” or “EB”), it is necessary to select the power supply type by means of the selector. To use the electric propulsion 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 propulsion read the next paragraphs to start the heat engine.

For DIESEL propulsion machines (models “D”) read the following paragraphs concerning the heat engine start-up procedure.

5.4.1 Heat engine start-up

By turning the starting 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 engine 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 engine 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 engine warning lights and read the Use and Maintenance manual of the engine.

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

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

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

To start the electrical 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 electrical pump with the platform controls:
 - § Select the on-platform control panel by means of the key-switch located on the electric control unit on the chassis.
 - § Unlock the push-button turning by a $\frac{1}{4}$ of turn clockwise.
 - § Set the power selector at platform to "Electric" position.
 - § Set the power selector at platform (if any) to "230V" position.
 - § Operate the machine.

N.B. The operations carried out with 230V electrical pump are slightly slower than those with diesel engine.

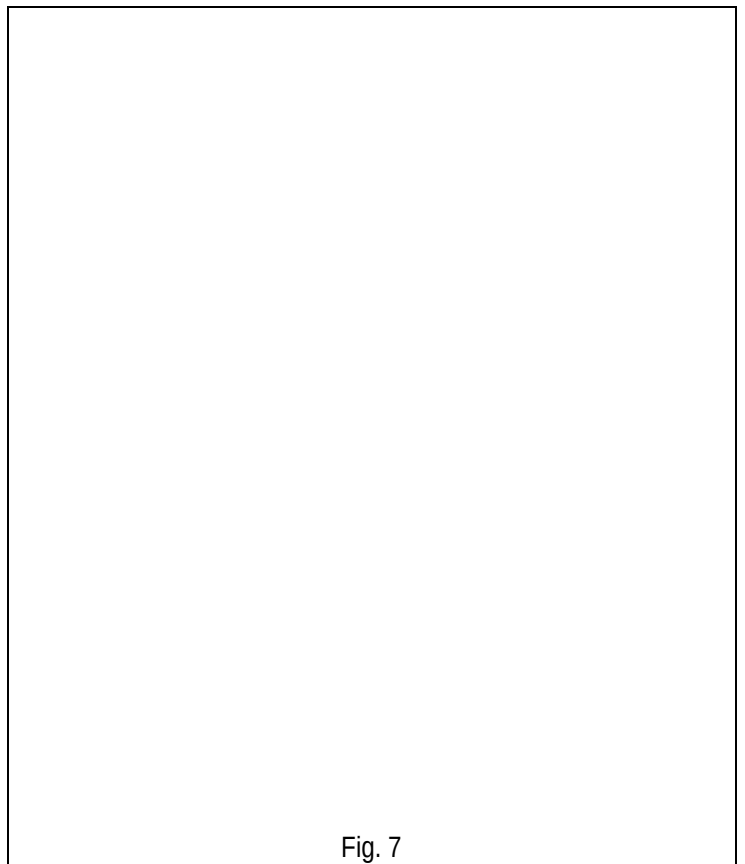


Fig. 7



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

5.4.3 Starting the 380V three-phase electrical pump (OPTIONAL)

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

To start the three-phase electrical pump:

- 1) Insert the 380 V plug of the power cable into socket (A) on the chassis.
- 2) Set the switches (C) shown in figure to ON position.
- 3) Set to 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 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°.
- 4) To start the electrical pump with the platform controls:
 - § Select the platform control panel with the key switch on the ground control unit.
 - § Unlock the push-button turning by a ¼ of turn clockwise.
 - § Set the power selector to "Electric" position.
 - § Select the 380V power with selector.
 - § Press the button (H) When on, the green warning light indicates that the three-phase electrical pump is turned on.
 - § Wait 5 seconds before moving the machine.
- 5) To stop the electrical pump press button (H) again.

Fig. 8

N.B. The platform 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 and button are 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 cases.

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 from both platform and ground control panels.

On the platform control panel:

- § Press the push-button on the control panel and the machine is turned off.
- § Release the dead-man pedal and the operation is immediately stopped. Due to the immediate stop, braking is sudden.

On the ground control panel:

- § Press the stop button and the machine (all models) and the heat engine (models "D", "ED", "EB") are stopped.
- § Press the power stop button (if available – "E" models), thus cutting out machine power (power circuit cut-out).

To resume the operations:

On the platform control panel turn the stop button by a ¼ of turn clockwise.

On the ground control panel:

- § Turn the stop button (if available) of 1/4 turn clockwise.
- § Pull the power circuit push-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 starting key anticlockwise to "0" position.
- § Otherwise, press the push-button.

On the ground control panel:

- § Turn the starting key anticlockwise to position "0".
- § Otherwise, press the push-button.



Do not stop the engine when the r.p.m. is high. Before stopping the engine 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 push-button.

On the ground control panel:

- § Press the push-button.

5.6 Emergency manual pump



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

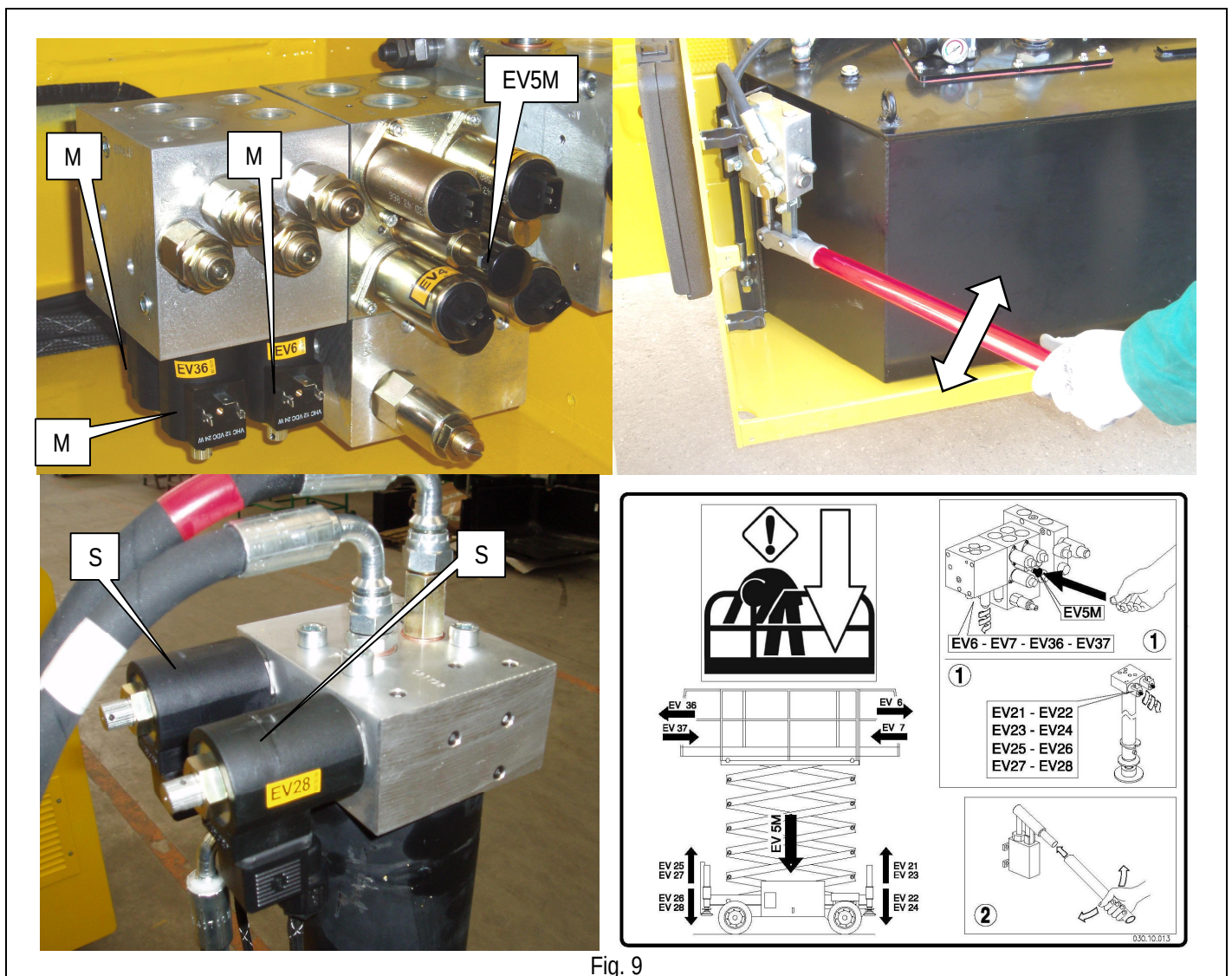


Fig. 9

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

5.6.1 Platform emergency lowering

- § Open the cowl and locate the components shown in the previous figure.
- § Insert the specially provided lever on the manual pump handle.

For platform EMERGENCY LOWERING operate the manual pump and simultaneously the manual operator marked with EV5M.

THE EMERGENCY LOWERING CONTROL CAN BE STOPPED AT ANY TIME BY RELEASING THE MANUAL OPERATOR MARKED WITH EV5AM.

5.6.2 Other emergency operations

For OTHER EMERGENCY OPERATIONS:

- § Open the cowl and locate the components shown in the above figure.
- § Insert the specially provided lever on the manual pump handle.
- § Completely unscrew the knurled knob of the solenoid valve corresponding to the desired movement according to the following table.
- § Activate the emergency pump.
- § Check the correct execution of this manoeuvre.

Solenoid valve abbreviations (M) and relevant platform operations:

EV6 = Front platform extraction (or forward sliding of sliding platform)
EV7 = Front platform retraction (or backward sliding of sliding platform)
EV36 = Rear platform extraction
EV37 = Rear platform retraction

Following the same sequence previously described, also the pads of the levelling outriggers can be operated manually. Such procedure shall be carried out only with platform completely lowered and with no operators on board.

Solenoid valve abbreviations (S) and relevant levelling outriggers operations:

EV21 front left levelling outrigger pad lifting
EV22 front left levelling outrigger pad lowering
EV23 front right levelling outrigger pad lifting
EV24 front right levelling outrigger pad lowering
EV25 rear left levelling outrigger pad lifting
EV26 rear left levelling outrigger pad lowering
EV27 rear right levelling outrigger pad lifting
EV28 rear right levelling outrigger pad lowering



WARNING!
IT IS ABSOLUTELY FORBIDDEN TO ACTIVATE THE EMERGENCY CONTROLS OF THE LEVELLING OUTRIGGERS WITH PLATFORM NOT IN REST POSITION. RISK OF MACHINE OVERTURN!



Once the emergency manoeuvres have been carried out, the knurled knobs must be set to their initial position again in order to resume the operations (in normal position the knobs are completely screwed).

5.7 Socket for electric tool connection (optional)

The platform can be equipped with a socket (A) (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.



Connect to the power mains having the following features:

- § Power voltage 230V $\pm$ 10%.
- § Frequency 50÷60 Hz.
- § Activated ground 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 mm²).
- § Do not use rolled-up cables.



Fig. 10

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

Before using the thermic propulsion (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 filling cap.

- § Visually check the fuel level before starting to work.
- § Keep the fuel tank and the engine 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 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

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

When the platform is 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.

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 manoeuvre from the bodies of Health and Safety at work.



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



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



Backward drive (in the direction of the fixed wheels) does not allow the operator on the control panel a complete visibility. This operation shall be carried out with the utmost care.



Before any movement make sure that the machine plugs are disconnected from the power source.



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



Do not use the machine to tow other vehicles.



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 Carrying

In order to carry the machine to the various working sites, follow the instructions given below.

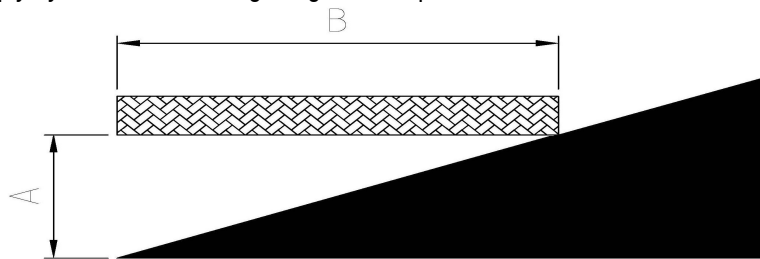
Considering the large dimensions of some models, before carrying, it is recommended to inquire about the overall dimension limits for road transport in force in your country.



Before carrying the machine, turn it off and remove the keys from the control panels. No people are allowed in proximity to or on the machine to avoid any risks deriving from sudden movements. For safety reasons never lift or tow the machine by means of its booms or platform. Loading operations are to be carried out on a flat surface with a suitable capacity, after setting the platform to rest position.

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

- § By means of loading ramps and translation controls located on the platform to load it directly onto the vehicle (if ramp slope is within the gradeability described in paragraph “TECHNICAL FEATURES” and the 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. 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 slope can be determined 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.



- § Through the 4 fastening holes located on the 4 angles of the machine, it can be lifted by means of hooks and steel ropes (with safety factor = 5, see machine weight in Technical Data) connected to the provided holes as indicated in the picture.

- § By means of 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.



Fig. 11



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.



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

6.2.1 Fold-down rails

The machine is fitted with rails folding down to the inside of the platform. Folding down the rails it is possible to reduce the height of the machine for:

- § Transport.
- § Passage through lowered areas (e.g. doors)

To fold down the rails follow this procedure:

- 1) Remove the control panel from the front rail.
- 2) Unlock the two locks of the front rail by pulling the knob A to the inside.
- 3) Fold down the front rail to the inside and repeat steps 2) and 3) for the rail of the entrance area.
- 4) Lift and turn the side rails B with coupling pin to the inside.
- 5) Lift and turn the side rails C to the inside.



WARNING!!

This operation is only for reducing the height of the stowed machine to facilitate carrying operations.

IT IS ABSOLUTELY FORBIDDEN to lift the platform when personnel is on board if rails are not raised and locked by their relevant latches.



WARNING!!

On machines with dual slide-out extension deck it is ABSOLUTELY FORBIDDEN to control the extraction / retraction of the platforms if rails are not raised.

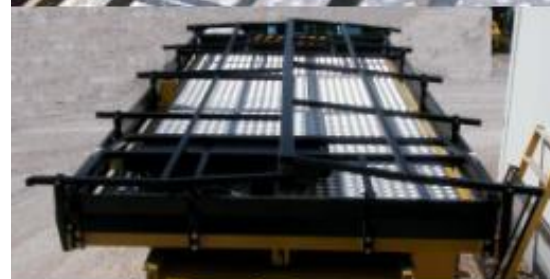
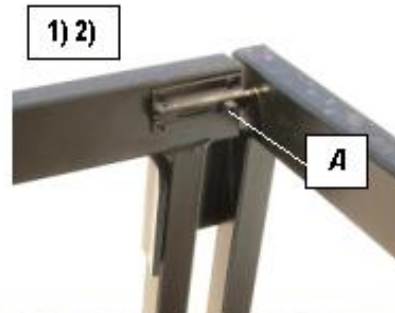


Fig.12

6.3 Emergency towing

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

A) FOR XL11 and XL14:

- § Hook the machine to the provided holes.
- § Completely screw the threaded dowels at the centre of the drive reduction gears by means of a 6 mm hexagonal wrench.
- § Tow at a very reduced speed (remember that in these conditions the machine does not brake).



Fig. 13

B) FOR XL16 and XL19 :

- § Hook the machine to the provided holes.
- § Unscrew the two bolts 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 of the reduction gears along the slots; then, remove the pin 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 reduced speed (remember that in these conditions the machine does not brake). For XL16 E and XL19 E it is necessary to lift the front part during the towing operation.

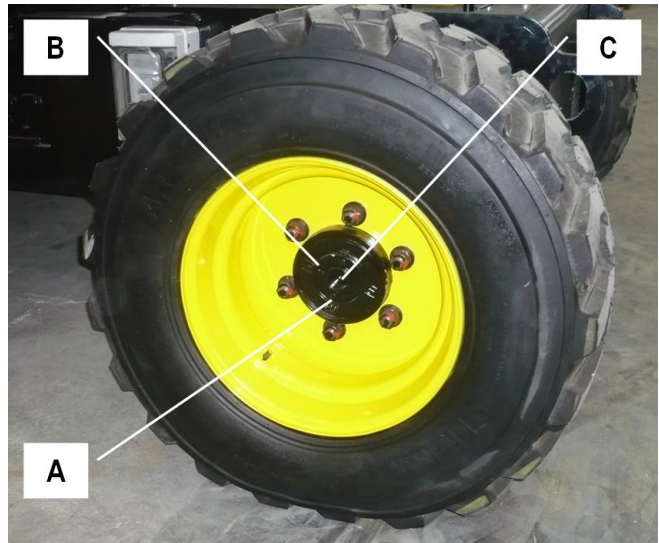


Fig. 14

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 (XL16 XL19).



Tow at a very reduced speed (remember that in these conditions the machine does not brake).

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 when the machine is still, after having removed the key from the control panel, and 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 personnel only. All maintenance operations should be carried out in compliance with the current work safety regulations (work places, personal protection devices, 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 blocked. Before carrying out maintenance operations inside the lifting equipment, check that this is off-line in order to avoid accidental lowering of the booms (chapter "Safety lock").
- § Remove the battery cables and provide batteries with a suitable protection during welding operations.
- § Carry out maintenance operations on the heat engine only when it is not running and sufficiently cool (except for those operations, such as oil change, which must be performed when the engine is hot). Risk of burns in contact with hot parts.
- § Do not use petrol or other flammable materials to clean the heat engine.
- § For maintenance operations on the heat engine, read the manufacturer's manual of the heat engine supplied on machine purchase.
- § In case of replacement, use original spare parts only.
- § Disconnect the 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.

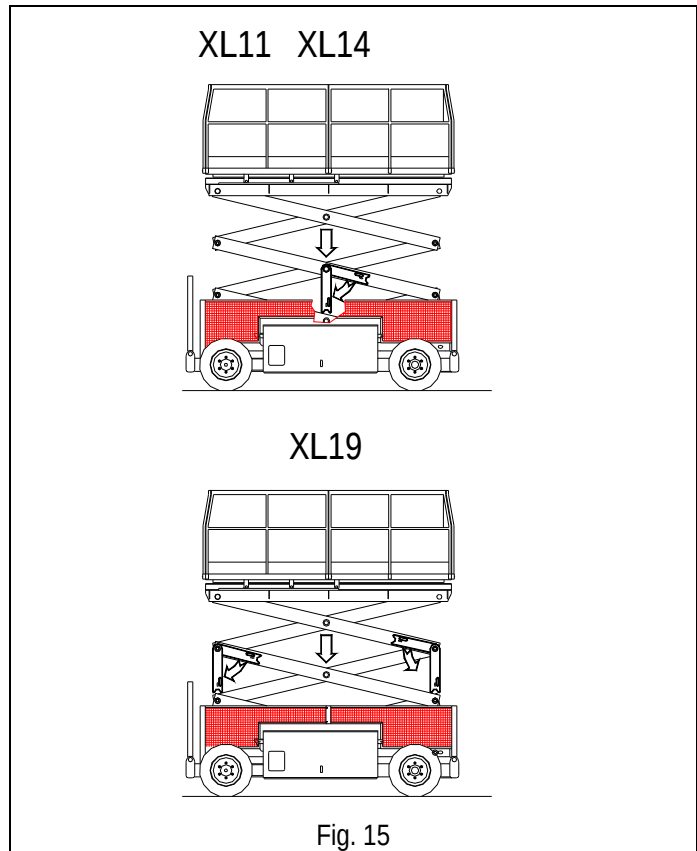


WARNING!

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

7.1 Safety lock for maintenance operations

Before carrying out any maintenance or repairs to it, activate the lifting structure locking system (by placing safety lock as shown in figure).



7.2 Machine cleaning

To clean the machine use non-pressurized water jets after properly protecting the following parts:

- § The control panels (both platform and ground).
- § The electric control unit and all electric boxes in general.
- § The electric motors.



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

After washing the machine, always:

- § Dry the machine.
- § Check integrity of plates and stickers.
- § Lubricate the articulated joints equipped with greaser and the sliding ways.

7.3 General maintenance

Below are listed the main maintenance jobs to be done and the relevant schedule (the machine features an hour counter).

Operation	Frequency
Screw tightening as indicated in paragraph "Various adjustments"	After the first 10 working hours
Oil level check in hydraulic tank	After the first 10 working hours
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 as indicated in paragraph "Various adjustments"	Every year
Check of drive reduction gear oil change	Every year
Adjustment check of main relief pressure valve	Every year
Adjustment check of lifting circuit relief pressure valve	Every year
Brake system operation check	Every year
Air purging from oscillating axe cylinders	Every year
Inclinometer operation check	Every year
Platform overload controller operation check and adjustment	Every year
Operation check of M1 Microswitch	Every year
Operation check of Microswitch M1S (if available)	Every year
Operation check of Microswitch M3 (if available)	Every year
Operation check of Microswitches M5A+M5B (if available)	Every year
Operation check of Microswitches ST1A÷ST4A and STP1÷STP4 (machines with levelling outriggers)	Every year
Operation check of dead-man pedal and button safety system	Every year
Platform extraction 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 ELECTRO-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.



IT IS NECESSARY
TO SEND THE MACHINE TO THE MANUFACTURER WITHIN 10 YEARS OF WORK FOR A COMPLETE CHECK.

7.3.1 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) Platform and rails fixing screws
- 5) Hydraulic fittings
- 6) Lock pins and safety dowels of boom pins
- 7) Elastic supports of heat engine
- 8) Sliding platform counter bearings

For torque wrench setting refer to the table below.

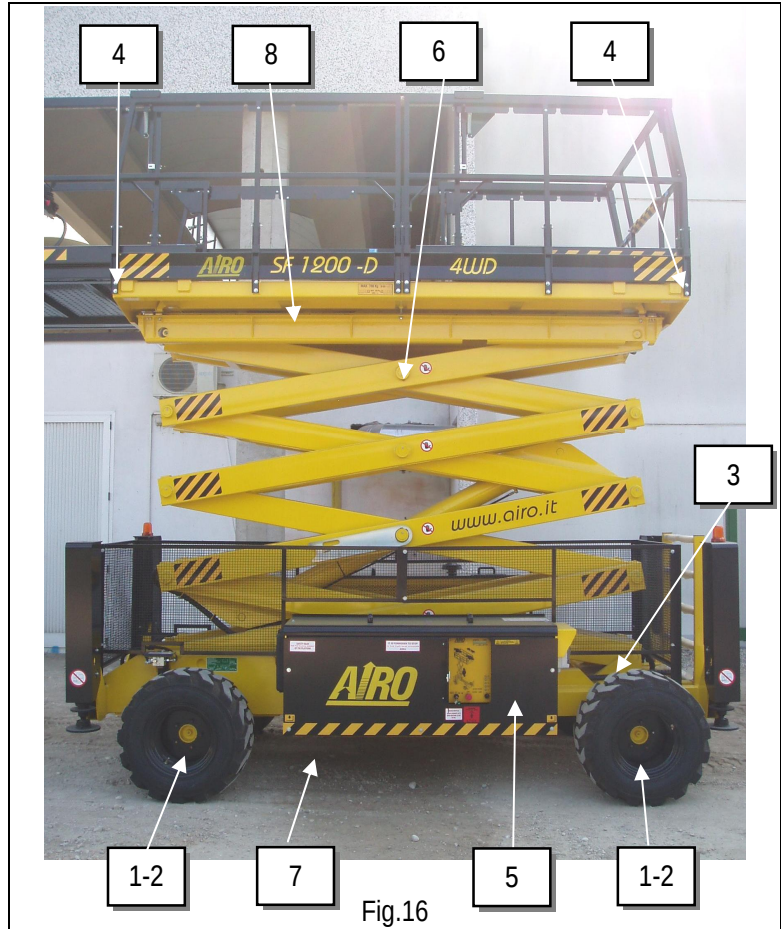


Fig.16

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

7.3.2 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 sliding guides of the:

- Sliding blocks/rolls of the extension structure on the chassis.
- Sliding blocks/rolls of the extension structure under the platform.
- Counter-pressure sliding blocks/rolls of the mobile platform.

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).

Before greasing, clean thoroughly using a wet cloth. Grease all points indicated in the picture aside (and all articulated joints equipped with greaser) with grease type ESSO BEACON-EP2 or similar type.



Fig. 17

7.3.3 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, with sliding platform in central position (if present) and with outriggers completely retracted (if present).

Completely change the hydraulic oil at least every two years.

To empty the tank:

- § Lower the platform completely.
- § Place sliding platform in central position (if present).
- § Retract the outriggers completely (if present).
- § Stop the machine by pressing the push-button of the ground control panel.
- § Place a container under cap (B), under the tank, and unscrew it.

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

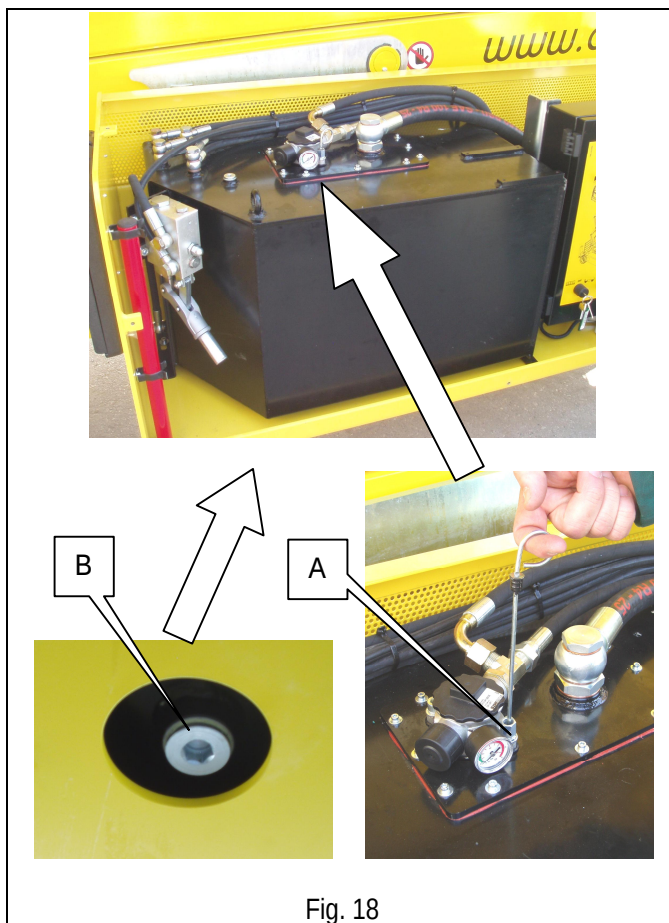


Fig. 18

HYDRAULIC SYSTEM OIL		
BRAND	TYPE	REQUIRED QUANTITY
ESSO	INVAROL EP46	See chapter "Technical features".
AGIP	ARNICA 45	
ELF	HYDRELF DS46	
SHELL	TELLUS SX46	
BP	ENERGOL SHF46	
TEXACO	RANDO NDZ46	



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.

7.3.4 Hydraulic filter replacement

7.3.4.1 Suction filters

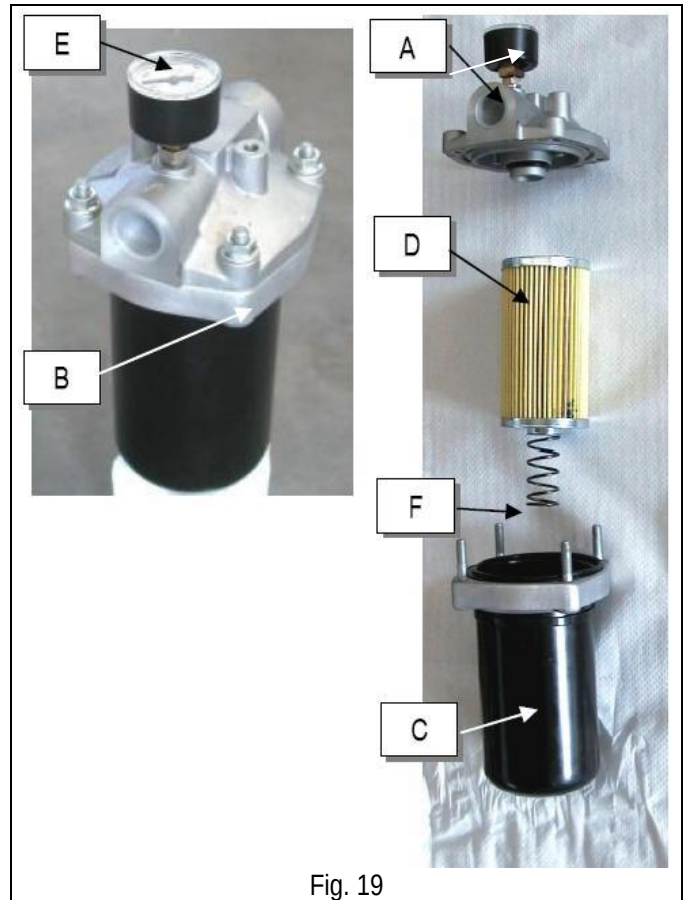
All models are equipped with suction filter. It is advisable to replace it at least every two years. Suction filters can be placed:

- § Outside the tank (XL11 E - XL14 E).
- § Inside the tank (XL14RTD - XL16 E – SL16 RTD - XL19 E – XL19 RTD).

MODELS XL11 E- XL14 E:

The suction filter directly flanged to the tank is equipped with a clogging indicator E indicates the moment when the filtering cartridge is to be cleaned. When the clogging indicator is in the red zone, the filtering cartridge is to be cleaned or replaced. To dismount the filtering cartridge from the suction filter the operator shall (see picture aside):

- § Stop the machine by pressing the push-button of the power line.
- § Remove the cover A of the filter unscrewing the four hexagonal nuts B (13mm wrench) keeping one hand under the bowl C of the filter to prevent it from detaching.
- § Extract the bowl with the cartridge D.
- § Remove the cartridge D and check its condition.
- § If necessary, clean the filter by means of compressed air paying attention not to alter the filtering surface. Otherwise replace the cartridge.
- § Fit the new cartridge paying attention to the correct positioning of the retaining spring F and place the bowl.



It is to be noted that the bowl containing the filtering cartridge is full of oil. Therefore during these operations a quantity of oil may leak out onto the side floor of the machine. In this case remove the oil by means of cloths or the outlet holes by placing a suitable container under it.

MODELS XL16 E - XL19 E:

To replace the suction filters installed inside the tank the operator has to (see picture aside):

- § Stop the machine by pressing the push-button of the power line.
- § Disconnect the power cords of the electrical pumps A (XL16 E).
- § Unscrew the coupling flange B unlocking the screws (5mm Allen wrench) (XL16 E).
- § Unscrew the cover of the tank on which the suction tubes are flanged.
- § Lift the electrical pump and remove it from the tank (the weight of the electrical pump is 25 Kg) (XL16 E).
- § Unscrew the filters C from the suction tubes.
- § To restore the initial condition, carry out the above-mentioned operation in reverse order.

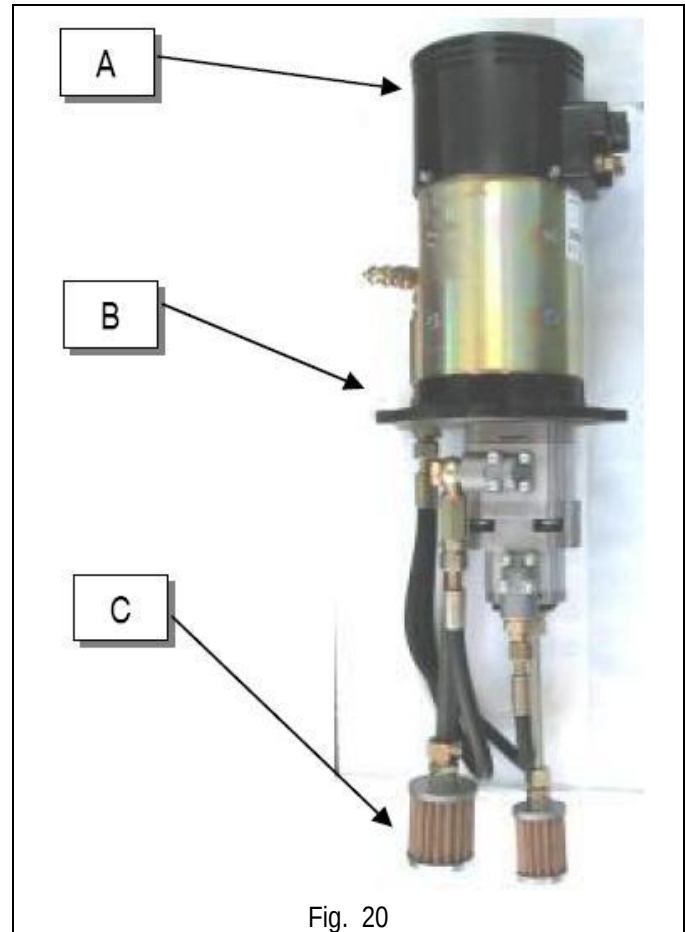


Fig. 20

7.3.4.2 Return filter (XXL14 D - XL14 RTD - XL16 E – XL16 RTD - XL19 E – XL19 RTD)

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 push-button on the ground control unit.
- § Remove the cover of the filter unscrewing the four hexagonal screws (10mm wrench).
- § Remove the cartridge.
- § Fit the new cartridge paying attention to the correct position of the retaining spring and place the cover again.



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.

7.3.5 Drive reduction gear oil level check and change

The oil level should be checked at least once a year. Remove the driving wheels (only for models XL11 and XL14) and place the reduction gears so as to have the two caps A and B in the position shown in the picture aside. The level must be checked 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 leakage in the group. Do not mix different types of oil, of the same or of different brands. Do not mix mineral oils and synthetic oils. The oil must be changed the first time after 50-100 working hours, and afterwards after every 2500 working hours or at least every two years. Depending on the actual working conditions, these periods may be modified according to the single case. While changing the oil it is advisable to wash the internal part of the crankcase with a fluid recommended by the lubricant producer. To avoid sludge deposits, the oil must be changed when the reduction gear is hot.

To change the oil unscrew cap B, and place a container of a 2-litre capacity under it. Empty the reduction gear bodies completely, clean it as described above and then fill it up to the limit level of the cap A through the same hole.

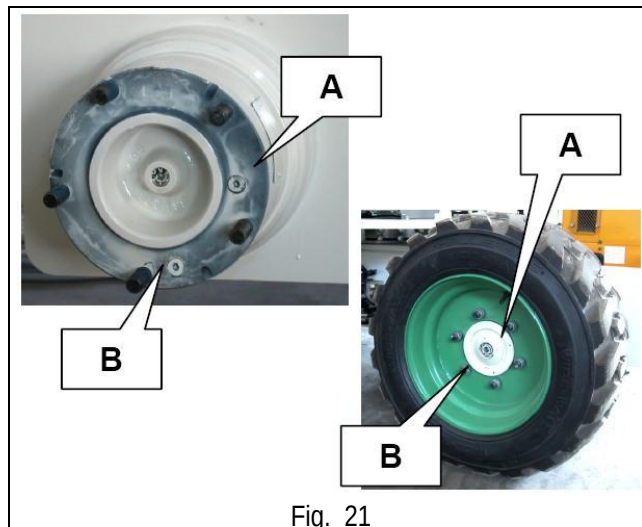


Fig. 21

LUBRICATING OIL FOR DRIVE REDUCTION GEARS			
BRAND	ISO 4438 VG 150-200	REQUIRED QUANTITY	
		XL11... XL14...	XL16... XL19...
ESSO	Compressor oil LG 150	1 litre for each reduction gear	1 litre for each reduction gear
AGIP	Blasia S 220		
ELF	Oritis 125 MS		
CASTROL	Alpha SN 6		
IP	Telesia oil 150		

7.3.6 Air purging from oscillating axle locking cylinders

Once drive has been stopped, the axle locking cylinders are locked in position thus increasing the machine stability.

Check that no air is present inside the oscillating axle cylinders every year. To carry out this check it is necessary to:

- § Remove the protection cylinder crankcases (A) of the oscillating axle.
- § Unscrew cap (B) of one of the two cylinders of the oscillating axle.
- § Carry out the drive operation by bringing the two oscillating axle cylinders to end stop several times, until there is only oil leaking out of the cap of the locking valve.
- § Once purging has been completed, screw cap (B) and check the oil level in the tank.

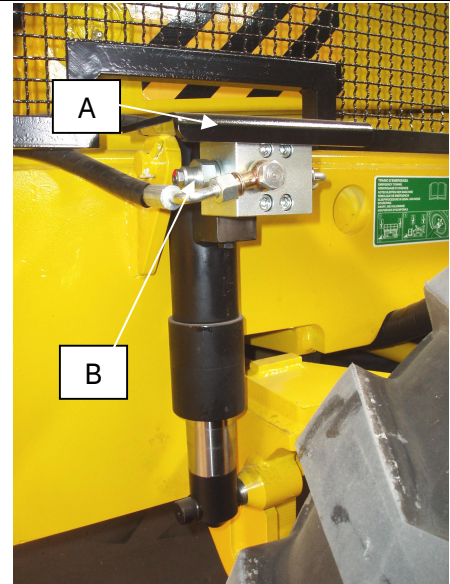


Fig. 22

WARNING!



THIS OPERATION OUGHT TO BE CARRIED OUT SIMULTANEOUSLY BY TWO OPERATORS: ONE IS TO DRIVE THE MACHINE, THE OTHER IS TO CHECK THE OPERATION AND COLLECT THE LEAKING OIL.

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

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

7.3.7 Pressure relief valve adjustment and operation check

The pressure relief valve controls the maximum pressure of the hydraulic circuit. Normally, this valve does not require any adjustment, since it is calibrated at the factory before the machine is delivered.

The pressure relief valve must be adjusted in the following cases:

- § 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 electrical pumps EV2 and EV3 (A and B).
- § Introduce a pressure gauge with full scale of at least 250 bars in the special quick coupling (1/4" BSP) D.
- § Using the platform control panel drive the machine forward and backward. Initially carry out the manoeuvre softly to check that the above mentioned valves have been disconnected properly (the machine should not move)
- § Check the pressure value. The correct value is indicated in the chapter "Technical features".

To adjust the main relief valve:

- § Disconnect the power cords of the electrical pumps EV2 and EV3 (A and B).
- § Introduce a pressure gauge with full scale of at least 250 bars in the special quick coupling (1/4" BSP) D.
- § Locate the main pressure relief valve E.
- § Unscrew the adjusting dowel lock-nut.
- § Using the platform control panel, drive the machine forward or 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 manoeuvre softly to check that the above mentioned valves have been disconnected properly (the machine should not move).
- § Once adjustment has been carried out, lock the adjustment dowel by means of the lock-nut.

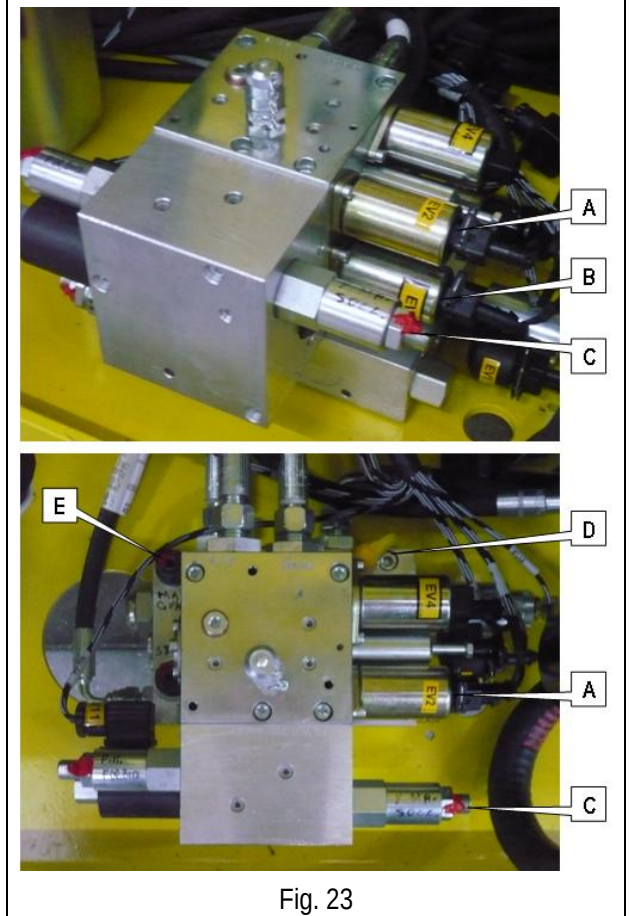


Fig. 23



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

7.3.8 Lifting circuit pressure relief valve adjustment

The self-propelled platforms, XL series, have a relief pressure valve on the lifting circuit to avoid dangerous overpressure values. Normally, this valve does not require any adjustment, since it is calibrated at the factory before the machine is delivered.

The adjustment of the system is required:

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

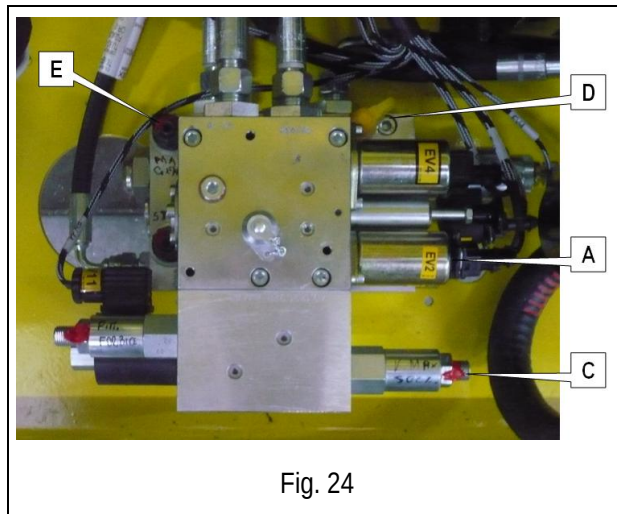
Check operation at least once a year.

To check the pressure relief valve on the lifting circuit :

- § Introduce a pressure gauge with full scale of at least 250 bars in the special quick coupling (1/4" BSP) D.
- § Using the ground control panel lift the machine up to the end stop.
- § Check the pressure value. The correct value is indicated in the chapter "Technical features".

To calibrate the pressure relief valve on the lifting circuit:

- § Introduce a pressure gauge with full scale of at least 250 bars in the special quick coupling (1/4" BSP) D.
- § Locate the pressure relief valve of the lifting circuit C.
- § 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 adjustment 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 SPECIALIZED TECHNICIANS ONLY.

7.3.9 Braking system efficiency check

These valves check the minimum operating pressure during drive (in both running directions) and affect the dynamic braking and the driving 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.

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 100 cm.
- § 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).

Adjustment of both braking valves is required:

- § In case of replacement of the hydraulic unit A.
- § If one or both braking valves are to be replaced.

To calibrate the braking valves:

- § Locate the hydraulic unit called "drive plate".
- § Locate the braking valves B (one for each running direction).
- § Connect a pressure gauge of at least 250-bar scale to the provided quick coupling in the 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.
- § 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.

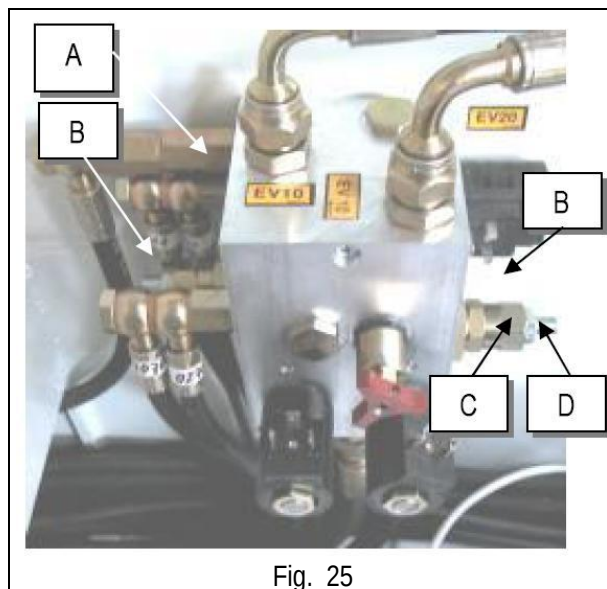


Fig. 25



WARNING!

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

7.3.10 Slide-out extension deck clearance adjustment

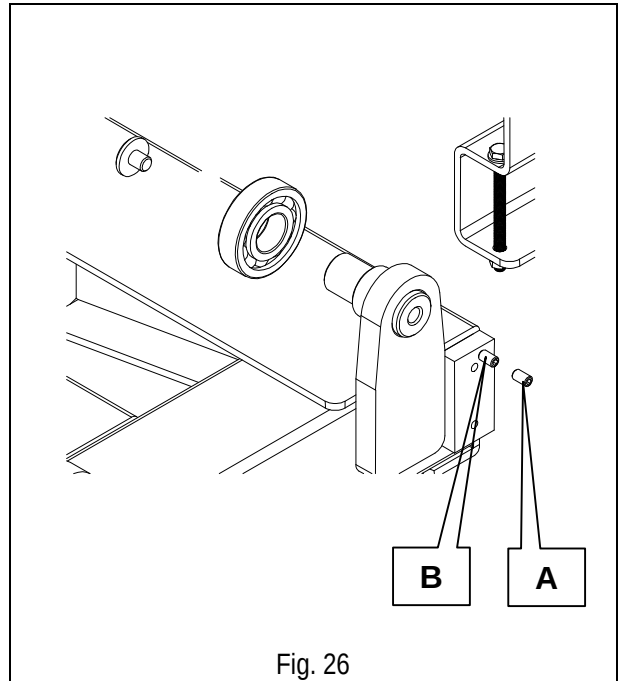
Every year check the clearance of the nylon counter-pressure rolls of both slide-out extension decks.

To adjust:

- § Remove the side rails.
- § Extract the platform completely using the ground controls and turn off the machine.
- § Unscrew dowel A.
- § Screw in the adjusting dowel B unscrewing or screwing depending on the case.
- § Once the desired clearance is achieved, reposition dowel A.

WARNING!! SOME CLEARANCE IS NECESSARY FOR THE GOOD OPERATION OF THE MECHANISM. DO NOT TIGHTEN THE ADJUSTING DOWEL COMPLETELY.

BEFORE USING THE MACHINE, TEST THE PLATFORMS BY MEANS OF THE GROUND CONTROLS (IF AVAILABLE) OR MANUALLY AND WITH UNLOADED PLATFORM.



WARNING!

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

7.3.11 Inclinometer operation check



WARNING!

Usually the inclinometer doesn't 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 SPECIALIZED 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 inclination and when inclined over the allowed value:

- § It stops lifting.
- § It disables drive when platform exceeds a given height (varying according to model).
- § It warns the user of the instability condition by means of the alarm and the platform warning light (see chapter 5).

The inclinometer checks the inclination with respect to the two axes (X;Y); on machine models with 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 controls of the 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 (intervention delay set at factory) until the danger red light and the alarm platform device turn on.
- § If the alarm is not activated CALL THE TECHNICAL ASSISTANCE.

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

- § Using the controls of the 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 (intervention delay set at factory) until the danger red light and the alarm platform device turn on.
- § If the alarm is not activated CALL THE TECHNICAL ASSISTANCE.

MODELS						
SHIMS	XL11...	XL14...	XL14 RTD	XL16...	XL16 RTD...	XL19...
A [mm]	135	135	140	110	220	85
B [mm]	65	65	65	75	95	50

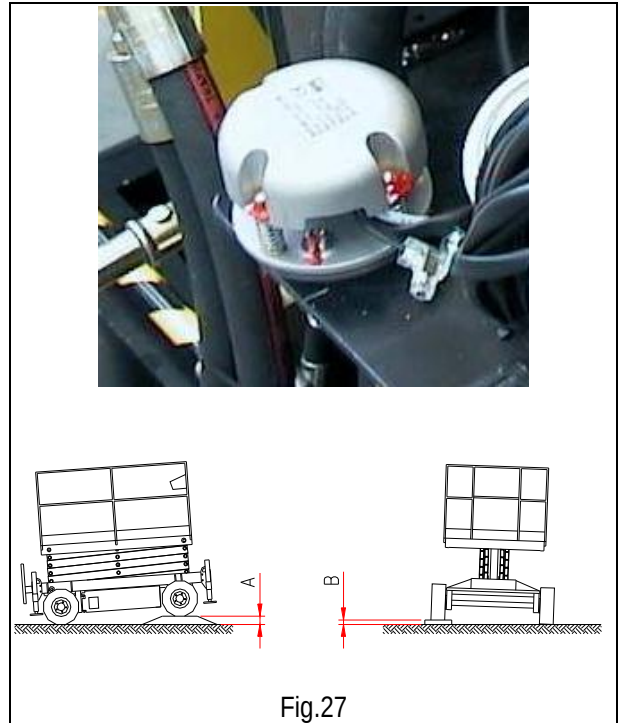


Fig.27



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 adjustment.

7.3.12 Operation check and adjustment of platform overload controller

The AIRO self-propelled aerial platforms, XL series, are equipped with a sophisticated overload controller.

Normally the overload controller does not require any adjustment, since it is calibrated in the factory before the machine is delivered.

This device checks the load on the platform and:

- § Stops all movements if platform is overloaded by 20% compared to the rated load (drive and steering stopped with platform lifted).
- § With platform in transport position and overloaded by 20% compared to the rated load, it stop lifting only.
- § Warns the user of the overload condition by means of the alarm and the platform warning light.
- § By removing the exceeding load, the machine can be operated again.

Check operation at least once a year.

The overload controller consists of:

- § Deformation transducer (A) (load cells).
- § Electronic board (B) for the device adjustment located inside the control panel on the platform.

Operation check of the controller for max. load:

- § When the platform is completely lowered and with extension retracted, load a charge evenly distributed equal to the max. rated load allowed by the platform (paragraph "Technical features"). In this condition all manoeuvres should be possible both from platform and ground control panel.
- § With platform completely lowered, add to the rated load an overload of 25% of the rated load and carry out the lifting operation. In this condition the red alarm light and the alarm turn on.
- § If the platform is at a height from the ground higher than that indicated in chapter "Technical features", the alarm condition locks the machine completely. To operate the machine again, remove the excessive load.

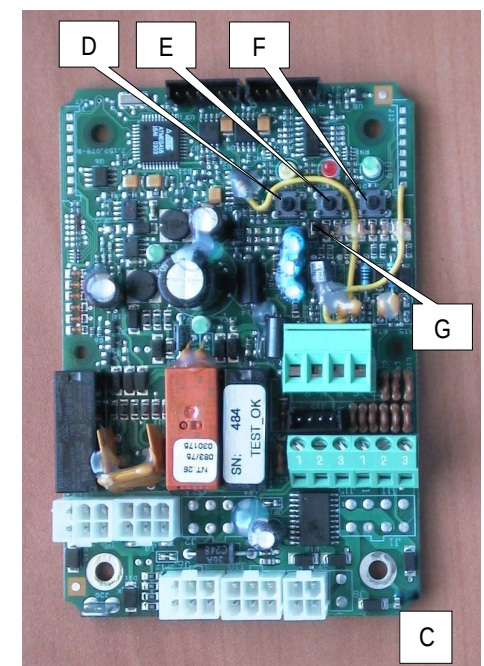
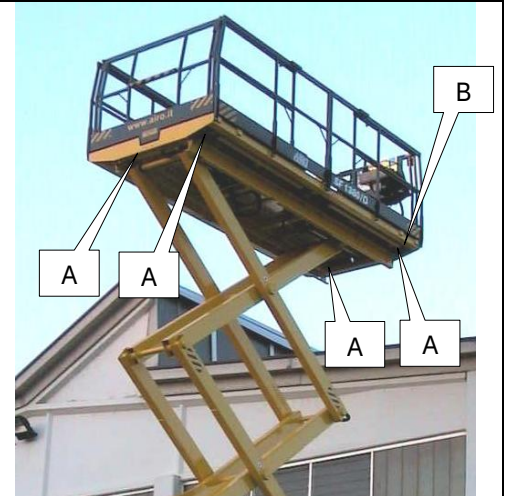


Fig. 28

The system needs adjustment:

- § In case of replacement of one of the items composing the system.
- § When, following an excessive overload, even after removing the excessive load, the danger condition is signalled anyway.

To calibrate the device:

- § Switch off the machine.
- § Open the box which contains electronic board C.
- § With no load on the platform, introduce the jumper to 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 load system will be reset.
- § Place a load at the centre of the platform equal to the rated load + 20%.
- § Press button F (the green light turns on a few seconds) to store the overload condition.
- § Press button D again to exit the adjustment 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.



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

7.3.13 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 key switch (A) under the control panel. Keep the 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 FLASHING LED AND THE ALARMS SIGNAL THE DANGER CONDITION. TURNING OFF THE MACHINE WILL RESET THE SYSTEM, AND UPON STARTING THE LOAD DETECTING SYSTEM OPERATES AGAIN SIGNALLING THE PREVIOUS OVERLOAD CONDITION.

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

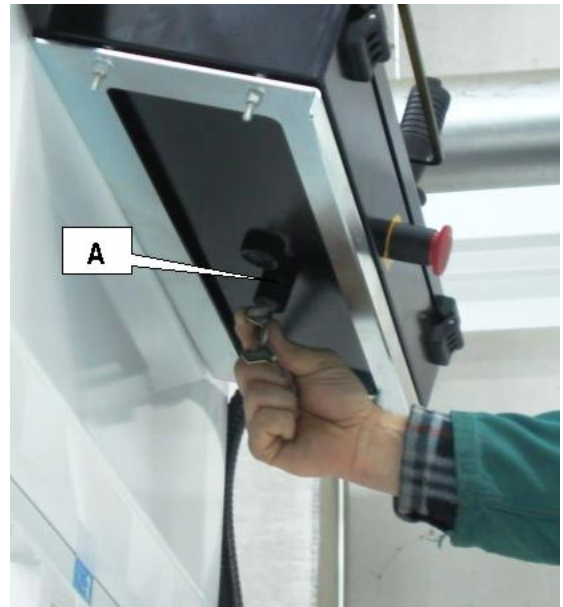


Fig. 29



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.

7.3.14 Operation check of safety microswitches

Some microswitches are placed in strategic positions to check the different configurations of the machine and activate safety functions. Their activation implies visual indication through the warning lights located on the platform control panel (see relevant chapter).

The check of the actual operation of the microswitches should be carried out at least every year.

7.3.14.1 Microswitch M1

The microswitch M1 on the chassis checks the position of the lifting structure. With platform completely lowered the microswitch M1A is not activated.

With lifted platform (with some tolerance due to the type of activation of the microswitch), the microswitch M1 is activated and:

§ If the chassis is inclined over the max. allowed inclination the lifting and drive controls are stopped and:

- § The danger warning light and danger alarm turn on.
- § The drive enable warning light turns off.
- § The lifting enable warning light turns off.
- § The safety drive speed is automatically activated.

§ When platform is overloaded ALL operations until removal of overload are stopped and:

- § The overload warning light and danger alarm turn on.
- § The drive enable warning light turns off.
- § The lifting enable warning light turns off.
- § The levelling outriggers control is stopped (if available).

7.3.14.2 Microswitch M1S (if available)

The microswitch M1S on the chassis checks the position of the lifting structure. The activation of the microswitch M1S stops the drive control at a given platform height from the ground and turns off the drive enable warning light.

Not all machines mentioned in this manual have a microswitch M1S; check in the chapter "TECHNICAL FEATURES" if the maximum drive height is different from the maximum height that the platform can reach.

7.3.14.3 Microswitch M3 (OPTIONAL)

The microswitch M3 on the chassis checks the position of the lifting structure. The activation of the microswitch M3 stops the lifting movement (lifting microswitch) before reaching the lifting cylinder end stop and turns off the lifting enable warning light.

7.3.14.4 Microswitches M5A-M5B (if available)

The microswitches M5 are under the platform (if available) and check its position.

7.3.14.4.1 Microswitch M5A-M5B for machines with sliding platform

With platform outside the central position (moved forward or backward) one of the microswitches M5A-M5B is activated and:

- § Drive/lifting/lowering movements are stopped and:
- § The drive enable warning light turns off.
- § The lifting enable warning light turns off.
- § The platform position warning light turns off.
- § On machines with variable capacity (see chapter "TECHNICAL FEATURES") the overload controller is activated.

The condition of platform within its shape (central position) is signalled by the platform position warning light.

7.3.14.4.2 Microswitches M5A and M5B for machines with dual slide-out extension deck (if available)

The machines with dual slide-out extension deck can have two microswitches M5A (on the front deck) and M5B (on the rear deck).
With one (or both) slide-out extension deck not fully retracted, the microswitch M5A (or M5B or both) is activated and:

- § On machines with variable capacity (see chapter “TECHNICAL FEATURES”) the overload controller is activated.

The microswitches M5A and M5B are available only on machines with dual slide-out extension deck and variable capacity (see chapter “TECHNICAL FEATURE” for capacity changes).

7.3.14.5 Microswitches ST1A-ST1B-ST1C-ST1D (machines with levelling outriggers)

The microswitches ST1A-ST1B-ST1C-ST1D on the chassis near the levelling outriggers check the position of the pads of the levelling outriggers.

With pads completely lifted all microswitches ST1...are activated and:

- § Drive can be controlled – drive enable warning light is on.
- § All levelling outriggers position warning lights are off.

With at least one pad not completely lifted one or more microswitches ST1...is activated and:

- § Drive is stopped – drive enable warning light is off.
- § The levelling outriggers position warning light concerning the levelling outrigger that has not retracted is flashing.

7.3.14.6 Microswitches STP1-STP2-STP3-STP4 (machines with levelling outriggers)

The microswitches STP1-STP2-STP3-STP4 on the chassis near the levelling outriggers check the position of the pads of the levelling outriggers.

With all pads not resting on the ground (the machine rests on its wheels) all microswitches STP... are not activated and:

- § Lifting can be controlled (unless other alarms) – the lifting enable warning light is on.

With all pads resting on the ground (the machine rests on the levelling outriggers) all microswitches STP... are activated and:

- § Lifting can be controlled (unless other alarms) – the lifting enable warning light is on.
- § Drive is stopped – drive enable warning light is off.

When the machine is resting on both pads/ wheels:

- § Lifting is stopped – lifting enable warning light is off.
- § Drive is stopped – drive enable warning light is off.
- § The levelling outriggers position warning lights concerning the levelling outriggers that have not retracted are flashing.

7.3.15 Dead-man safety system operation check

The dead-man pedal and button at platform are for enabling the operation controls of the machine from the platform control panel. The operator can choose to use the most convenient enable device depending on the real position of the platform control panel.

Check operation at least once a year.



WARNING!
IN CASE OF NO OPERATION, CONTACT THE AFTER-SALES SERVICE

7.3.15.1 Dead-man pedal

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 from 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 stopped; 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:

- | | |
|-----------------------------|------------------------|
| § Green led lit up steady | control panel enabled |
| § Green led lit up flashing | control panel disabled |

7.3.15.2 Dead-man button

To check the dead-man BUTTON:

- § Move the drive joystick forward and backward in sequence, WITHOUT PRESSING THE DEAD-MAN BUTTON.
- § Check that the machine does not perform any movement.
- § Press dead-man button, release it and wait more than 3 seconds.
- § Move the joystick forward and backward in sequence.
- § Check that the machine does not perform any movement.

If the device works properly, no machine manoeuvre is possible from the platform control panel unless you press the dead-man button beforehand. If this is pressed for more than 3 seconds and no operation is performed, all movements are stopped; to operate the machine again, release the dead-man button and press it again.

The condition of the switch is indicated by the green led in the platform:

- | | |
|-----------------------------|------------------------|
| § Green led lit up steady | control panel enabled |
| § Green led lit up flashing | control panel disabled |

7.4 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.

7.4.1 Starter battery models “D” “ED”

On machines with heat engine the starter battery is for:

- § Powering the machine control circuits.
- § Starting the heat engine.

7.4.2 Starter type battery for models “E”

On machines with batteries the starter battery is for:

- § Powering the control circuits of the machine.

7.4.3 Starter battery maintenance

The starter battery does not require any special maintenance:

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

7.4.4 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 those machines equipped with a 380 three-phase electrical pump, the electrical pump control system keeps the starter battery charged. On machines with battery a DC-DC converter keeps the starter battery charged.

7.5 “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.

7.5.1 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 mm²).
- § Do not use rolled-up cables.
- § Do not approach the battery with flames. Risk of explosion due to the formation of explosive gases.
- § Do not carry out temporary or irregular electric connections.
- § The terminals must be tightened and without deposits. The cables must be provided with a good insulation.
- § Keep the battery cleaned, dry and free of oxidation products by using antistatic cloths.
- § Do not place tools or any other metal object on the battery.
- § 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.

7.5.2 DRIVE battery maintenance

- § For normal water operating conditions, water topping up is to be carried out every week.
- § Top up using distilled or demineralised water.
- § Top up after battery charging. After this operation, 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 stopped. 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 decharge). To avoid the battery operation from being compromised it is necessary to charge it at least once a month. This has to be done even if the density values of the electrolyte are high.
- § To limit automatic battery decharge during periods of inactivity store the machine in environments with temperatures lower than a 30°C.

7.5.3 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 $230V \pm 10\%$
- § Frequency $50 \div 60$ Hz
- § Activated ground 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 3×2.5 mm²).
- § 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 25°C).

To use the battery charger follow this procedure:

- § 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).

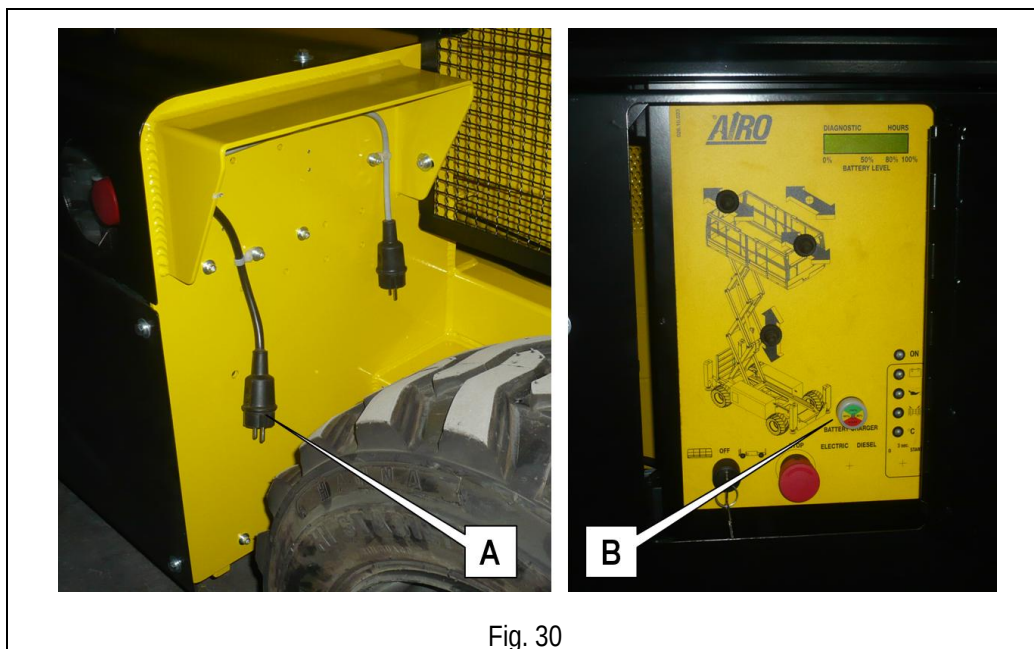


Fig. 30

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.

7.5.4 Battery charger: fault report

An intermittent 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	Timeout	Phase 1 and/or Phase 2 of duration higher than the max. allowed value (check battery capacity).
Alarm+ flashing RED-YELLOW	Battery Current	Loss of output current control (fault in control logic).
Alarm+ flashing RED-GREEN	Battery Voltage	Loss of output voltage control (battery disconnected or fault in the control logic).
Alarm+ 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.

7.5.5 Battery replacement



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



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

8 . MARKS AND CERTIFICATIONS

The models of self-propelled aerial platform described in this manual were subject to the CE type test according to the Directive 2006/42/EC. The certification was issued by:

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

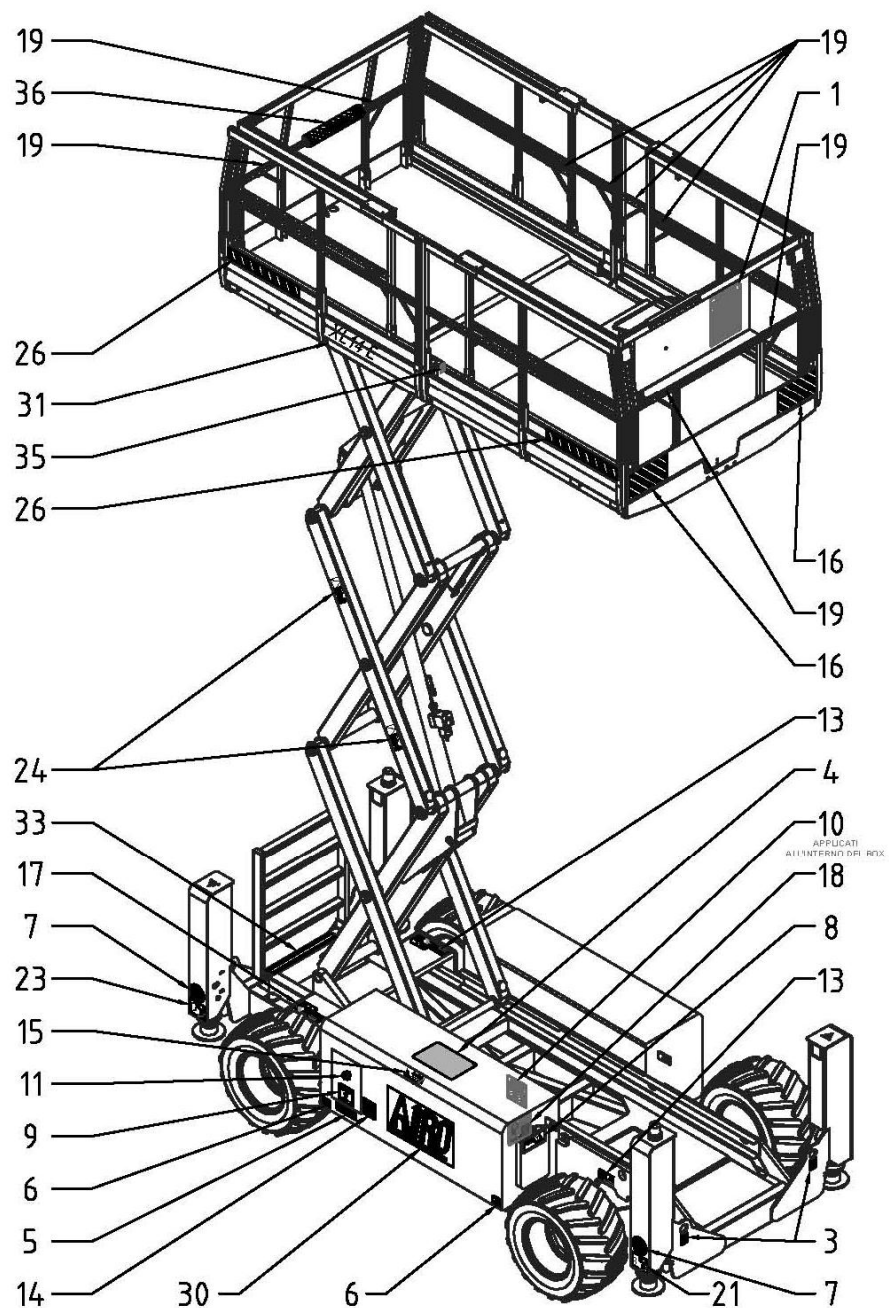
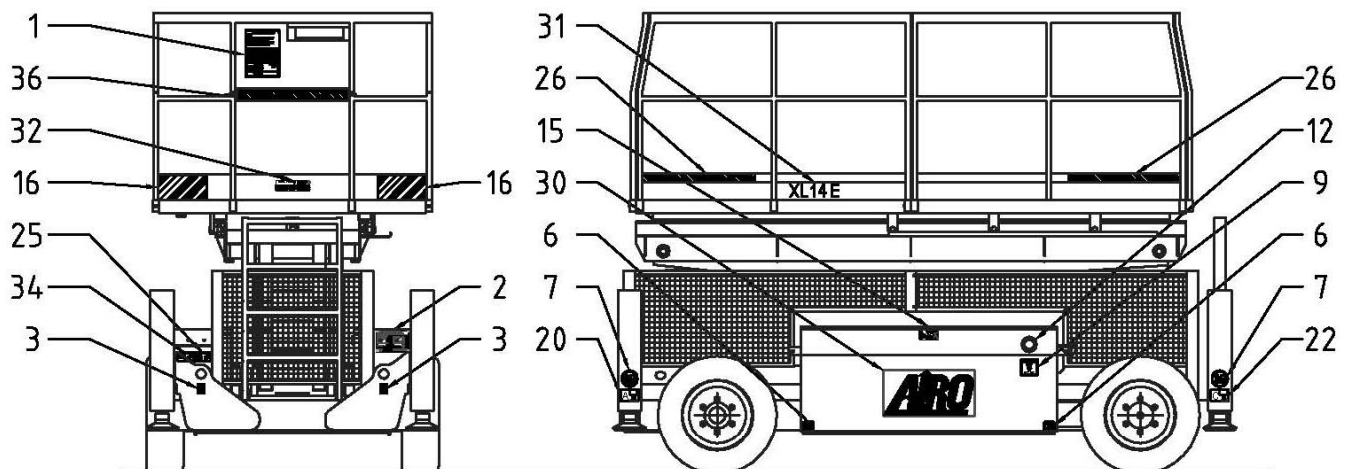
	CODE	DESCRIPTION	QUANTITY	
			ELECTRIC	DIESEL
1	001.10.001	AIRO warnings plate	1	
2	001.10.024	AIRO serial number plate	1	
3	001.10.031	Towing hook sticker	4	
4	001.10.057	General warnings sticker	1	
5	001.10.059	Wheels tightening sticker	1	
6	001.10.060	Lifting point sticker	4	
7*	001.10.076	Feet danger sticker	4*	
8	001.10.088	Document holder sticker	1	
9**	001.10.098	STOP sticker I-D-F-NL-B-GB	2**	1
10	001.10.150	"46" oil type sticker I-D-F-NL-B-G-PL	1	
11	001.10.180	First check sticker	1	
12	001.10.242	Emergency stop button yellow sticker	1	-
13	001.10.243	"Max. Load per wheel" sticker	4	
14	001.10.259	IPAF emergency lowering sticker	1	
15	001.10.261	Symbol scissor no stopping sticker	2	
16	010.10.010	Black-yellow line sticker <150X300>	4	
17	021.10.017	Emergency towing sticker XL16 – XL19	2	4
	023.10.006	Emergency towing sticker XL14 (CWD)	2	4
18	030.10.013	Emergency manual sticker SF large	1	
19	035.10.007	Safety belts coupling sticker	12	
20*	043.10.013	"A" leveling outrigger	1*	
21*	043.10.014	"B" leveling outrigger	1*	
22*	043.10.015	"C" leveling outrigger	1*	
23*	043.10.016	"D" leveling outrigger	1*	
24	045.10.003	Hands danger sticker + no stopping (symbols)	4	
25	045.10.011	Battery charger plug sticker	1	-
26	012.10.007	Yellow-black line sticker for platform L=800	4	
27	008.10.020	Triangle hot parts sticker	-	1
28	029.10.005	Fuel tank sticker	-	1
29	030.10.008	Sound power level sticker 105 dB XL16 – XL19	-	1
	030.10.009	Sound power level sticker 110 dB XL14	-	1
30	001.10.173	AIRO pre-spaced yellow sticker <300x140>	-	1
	001.10.175	AIRO pre-spaced yellow sticker <530x265>	2	1
31	028.10.006	Pre-spaced sticker XL11 E yellow	2	
	027.10.007	Pre-spaced sticker XL14 E yellow	2	
	034.10.007	Pre-spaced sticker XL14 RTD yellow	2	
	021.10.025	Pre-spaced sticker XL16 E yellow	2	
	021.10.026	Pre-spaced sticker XL16 RTD yellow	2	
	030.10.020	Pre-spaced sticker XL19 E yellow	2	
	030.10.016	Pre-spaced sticker XL19 RTD yellow	2	
32	021.10.002	Capacity sticker 500kg (3 pers) XL14 E / XL16 E / XL19 E / XL19 RTD	1	
	034.10.001	Capacity sticker 700kg (3 pers) X14 RTD	1	
	028.10.004	Capacity sticker 700kg (3 pers) XL11 E / XL16 RTD	1	
33	020,077	mm25 non-slip band sticker	1,2 mt	
34***	045.10.010	(Optional) electric line plug sticker	1	
35***	001.10.021	(Optional) ground symbol sticker	1	
36***	001.10.244	(Optional) entrance bar black-yellow line sticker	1	

* models with leveling outriggers

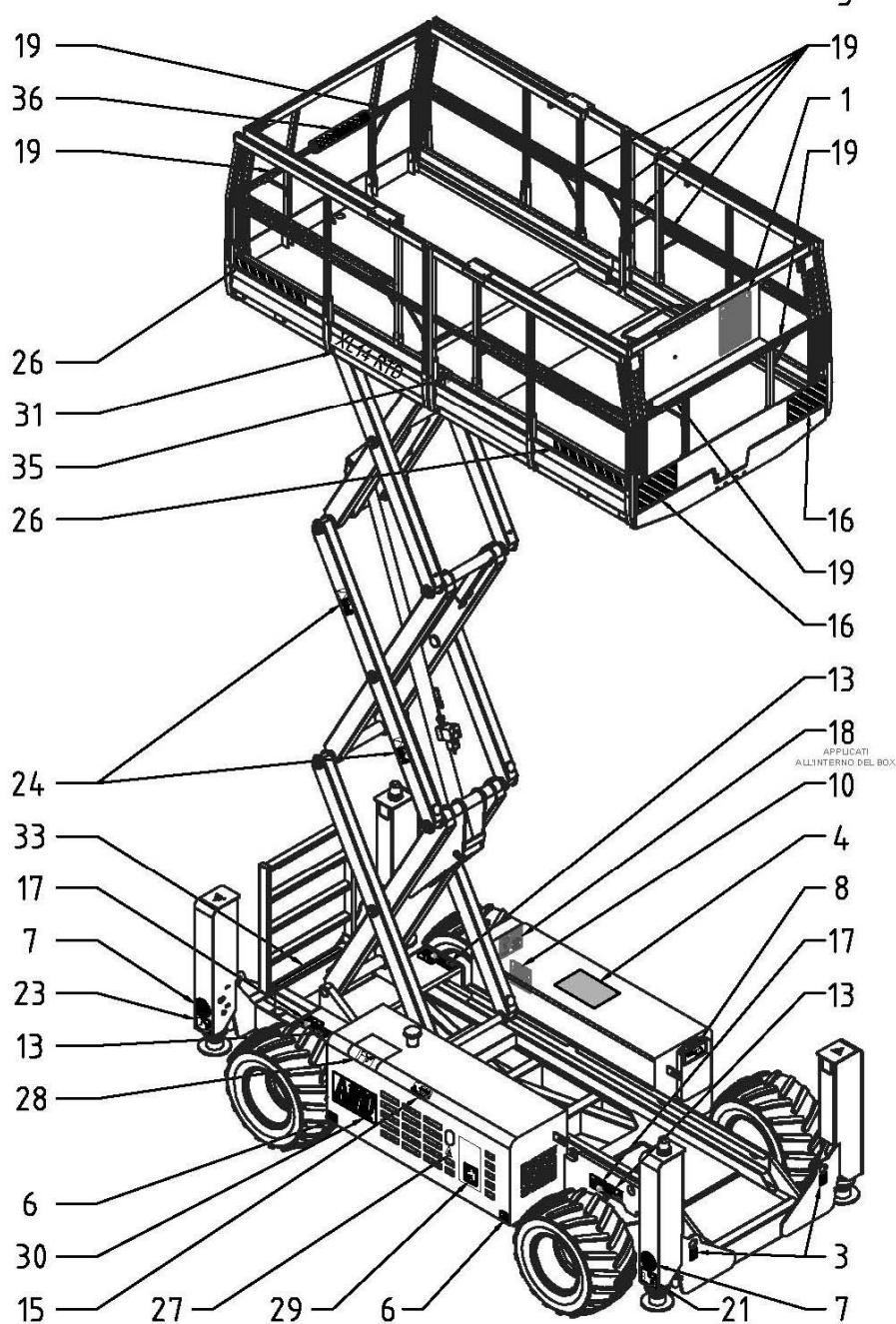
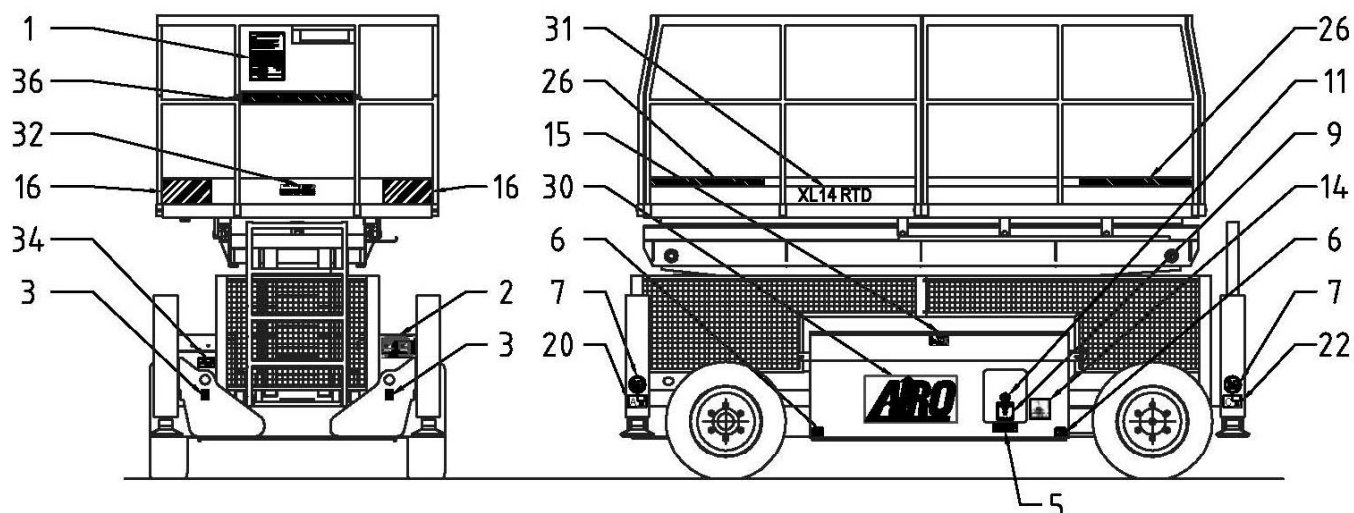
** N°2 only models XL11 E - XL14 E – XXL14 E (N°1 models XL16E – XL19E and ALL DIESEL models)

*** optional features

XL11 E – XL14 E – XXL14 E – XL16 E – XL19 E



XL14 RTD – XL16 RTD – XL19 RTD



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 ISPESL department responsible that the installation of the machine has occurred.
- § Extraordinary maintenance work and replacement of important elements of the machine.

REQUIRED PERIODIC INSPECTIONS BY THE REGULATORY AGENCY

[illegible]

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

STRUCTURAL CHECK		DESCRIPTION OF OPERATIONS TO BE PERFORMED	
Visual check		Check the integrity of the guardrails; state of the lifting structure; of 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 7.3.1	
	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 7.3.2 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 7.3.3 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 7.3.5	
	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	
ADJUSTMENT CHECK OF MAIN RELIEF PRESSURE VALVE		See chapter 7.3.7	
	DATE	REMARKS	SIGNATURE + STAMP
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			
ADJUSTMENT CHECK OF LIFTING CIRCUIT RELIEF PRESSURE VALVE		See chapter 7.3.8	
	DATE	REMARKS	SIGNATURE + STAMP
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK		DESCRIPTION OF OPERATIONS TO BE PERFORMED	
BATTERY STATE		See chapter 7.4 and 7.5 Daily operation. It is not necessary to indicate its execution every day, but at least every year when the other operations are carried out.	
	DATE	REMARKS	SIGNATURE + STAMP
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			
PLATFORM EXTRACTION CLEARANCE ADJUSTMENT		See chapter 7.3.10	
	DATE	REMARKS	SIGNATURE + STAMP
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			

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 7.3.3 and 7.3.5		
	DATE	REMARKS	SIGNATURE + STAMP
2nd YEAR			
4th YEAR			
6th YEAR			
8th YEAR			
10th YEAR			
HYDRAULIC FILTER REPLACING (EVERY TWO YEARS)	See chapter 7.3.4		
	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 7.3.6	
	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 7.3.11	
	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 7.3.12	
	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 7.3.9	
	DATE	REMARKS	SIGNATURE + STAMP
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			

OPERATION CHECK MICROSWITCHES		See chapter 7.3.14	
	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 7.3.15	
	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 characteristics of this machine were in conformance with what was originally required and that any changes have been recorded in this register.

THE SELLER

THE PURCHASER

SUBSEQUENT TRANSFERS OF OWNERSHIP

COMPANY	DATE

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

THE SELLER

THE PURCHASER

SUBSEQUENT TRANSFERS OF OWNERSHIP

COMPANY	DATE

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

THE SELLER

THE PURCHASER

SUBSEQUENT TRANSFERS OF OWNERSHIP

COMPANY	DATE

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

THE SELLER

THE PURCHASER

SUBSEQUENT TRANSFERS OF OWNERSHIP

COMPANY	DATE

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

THE SELLER

THE PURCHASER

IMPORTANT BREAKDOWNS

DATE	DESCRIPTION OF BREAKDOWN	SOLUTION

SPARE PARTS USED		DESCRIPTION
CODE	QUANTITY	

SERVICE

SAFETY MANAGER

DATE	DESCRIPTION OF BREAKDOWN	SOLUTION

SPARE PARTS USED		DESCRIPTION
CODE	QUANTITY	

SERVICE

SAFETY MANAGER

IMPORTANT BREAKDOWNS

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SERVICE

SAFETY MANAGER