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

„X2“ SERIES

X6EN - X8EW - X8EN - X10EW - X10EN - X12EW

USE AND MAINTENANCE MANUAL

- ENGLISH -

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

CONTENTS

1. INTRODUCTION

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

1.1. LEGAL ASPECTS

1.1.1. DELIVERY OF THE UNIT

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

Only for Italy:
- Declaration of commissioning to ISPESL
- List of local ISPESL departments
- Declaration of internal testing.

1.2. DECLARATION OF COMMISSIONING AND PERIODICAL CHECKS

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.
In ITALY the owner of the Aerial Platform must notify the use of the unit to the local competent ISPESL (National Institute for the prevention of accidents at the workplace) within 90 days from receipt (use the Form delivered with the conformity declaration). ISPESL issues a "Control booklet" indicating only the detectable data of the machine already in use or inferable from the relative User Manual. Afterwards ISPESL sends a copy of the same booklet to the territorial inspection boards (ASL/USL or ARPA) which carry out the periodical mandatory checks (every year).
The annual checks are compulsory and must be carried out also when the "Check booklet" is not available. Thus, we recommend you to apply for a periodical check by sending a registered letter to the local competent inspection board (ASL/USL or ARPA) before the expiry of the year from the purchase date or the last periodical check.
This manual contains a final section called "Control Register" for a better filing of documents and recording of any modifications. It is to be noted that the Use and Maintenance Manual is an integral part of the machine and 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. The new owner must notify the transfer of property to the local competent ISPESL.

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”.

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 de-placing the unit with lifted platform do not load horizontal loads onto the platform (the operators on board must not pull ropes, wires, etc.).
A load control system interrupts the operation of the unit if the load on the platform exceeds by 20% approx. the rated load (see chapter "General use rules") and platform is lifted.
The unit cannot be used in areas where road vehicles operate. Always surround the working area by means of suitable signs when the unit is used in public areas.
Do not use the machine to tow trucks or other vehicles.

1.4. DESCRIPTION OF THE UNIT

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

- motorized chassis equipped with wheels
- vertical scissor lift structure operated by one or more hydraulic cylinders (the number of cylinders varies according to machine model)
- operator platform with manual roll-out deck extension (the max. capacity varies according to the model - see chapter "Technical features")

The chassis is motorised to allow the machine to move (see "General use instructions"). The chassis is equipped with two rear idle wheels and two front steering and driving wheels. The rear wheels are equipped with hydraulic parking brakes, positive logic type (when drive controls are released brakes are automatically activated).
The hydraulic cylinders which move the articulated structure are provided with solenoid safety valves directly flanged on the same. These devices allow the booms to remain in position even if one of the supply tubes accidentally breaks.
The platform, which can be manually extended from the front side, 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, the entrance area has a toe-board of at least 100 mm). When no motive power is available, the manual emergency lowering can be controlled enabling the knob manually from the ground (see instructions plates).
The allowed capacity on the platform does not change depending on the position of the deck extension.

1.5. CONTROL STATIONS

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

1.6. POWER SUPPLY

The machines are powered by an electro-hydraulic system consisting of rechargeable accumulators and electric pump.
Both the hydraulic and the electric systems are equipped with all necessary protections (see electric and hydraulic circuit diagrams annexed to this manual).

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

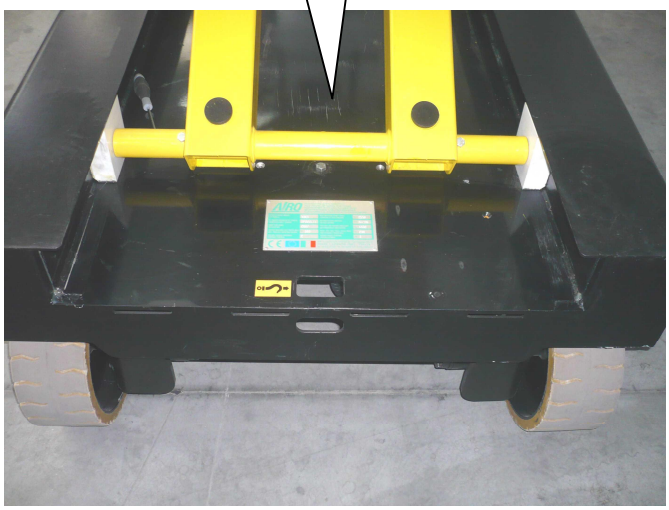
NOTE:

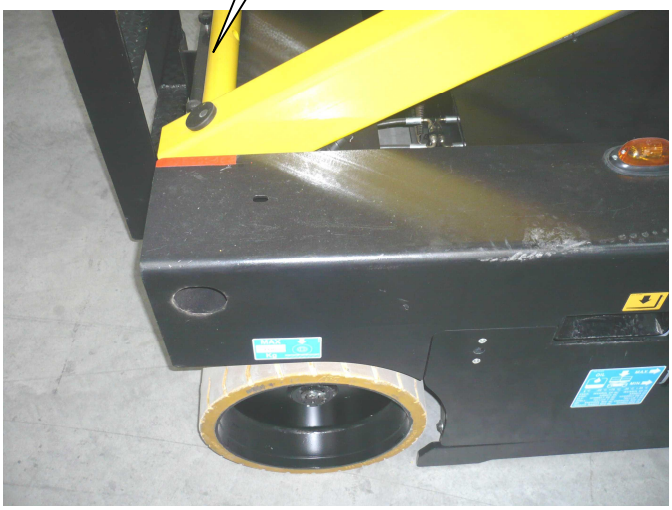
If disposal of the unit is necessary, comply with current local regulations.
The machine consists mainly of metal parts which are easy to be identified (steel for the most parts, and aluminium for the hydraulic blocks); thus, we can state that the machine can be recycled at 75%.

1.7. IDENTIFICATION

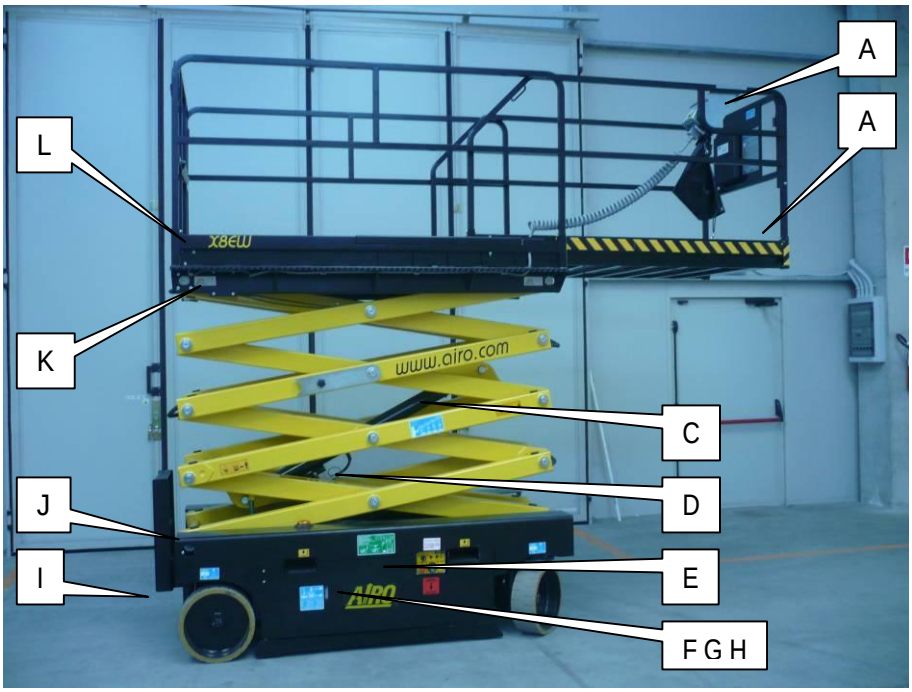
In order to identify the machine, when spare parts and service are required, always mention the information given in the serial number plate. Should this plate (as well as the various stickers applied on the unit) be lost or illegible, it is to be replaced as soon as possible. In order to identify the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

MODEL: _____	CHASSIS: _____	YEAR: _____

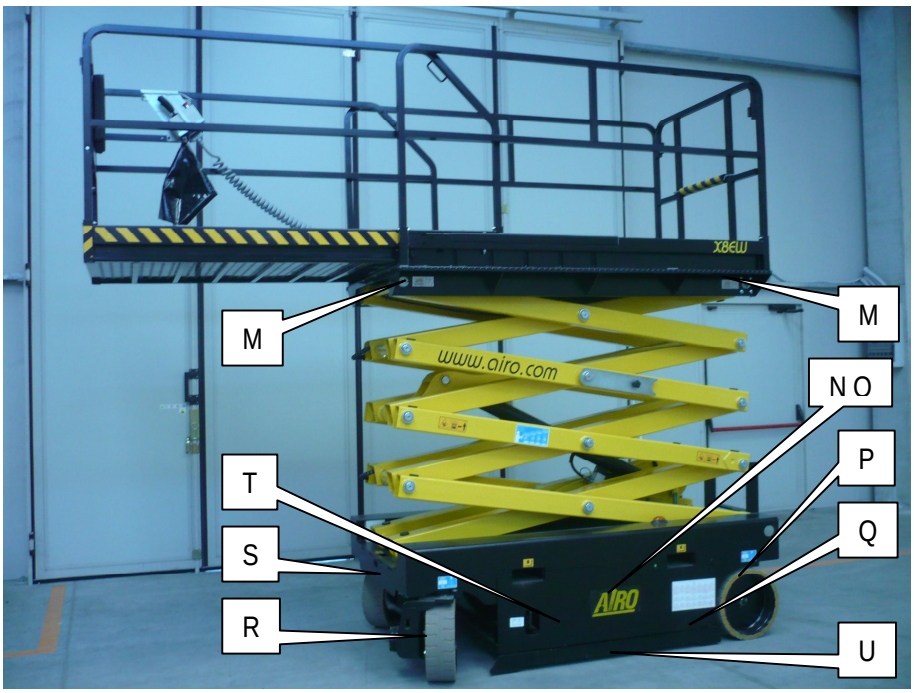




1.8. LOCATION OF MAIN COMPONENTS



1-1: Right view



1-2: Left view

A. Control panel on the platform
B. Bubble level for visual check of platform levelling
C. Lifting cylinder
D. Lower control valves
E. Ground control panel
F. Electric control unit and inclinometer
G. Tank
H. Electric pump
I. Manual device for emergency lowering
J. M1 microswitch platform height control
K. Electronic control board of platform load
L. 230V plug (optional)
M. Load control system sensors
N. Batteries
O. Battery charger
P. Parking brakes
Q. MPT1 and MPT2 microswitches to control the position of the pot-hole
R. Hydraulic traction motors
S. Steering cylinder
T. Power bipolar connector
U. Pot-hole guards

2. TECHNICAL FEATURES OF STANDARD MACHINES

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

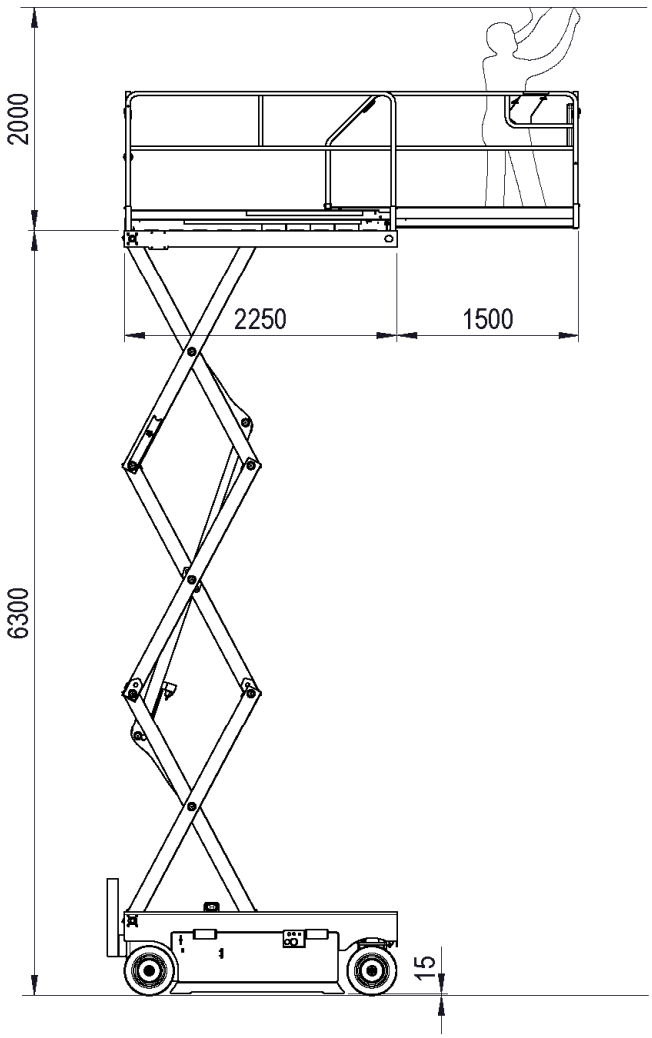
2.1. MODEL X 6 EN

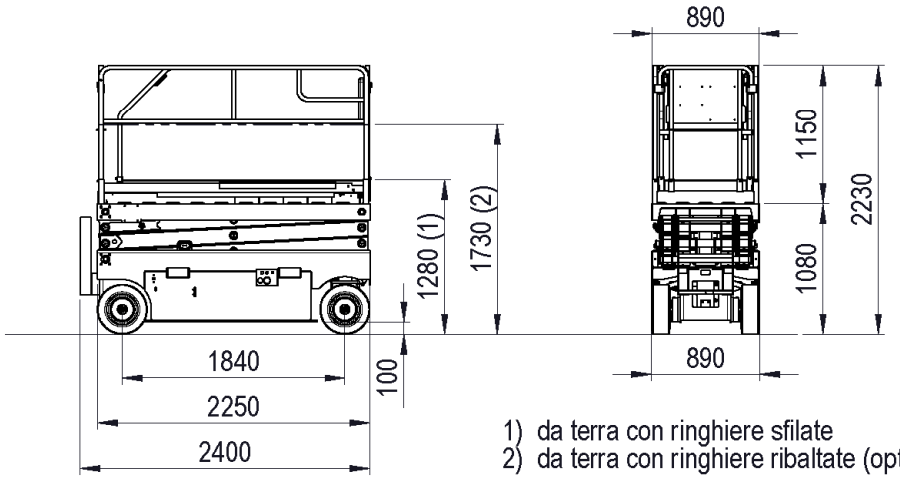
Dimensions:		X 6 EN	
	Max. work height	8.3	m
	Max. platform height	6.3	m
	Ground clearance (pot-hole raised)	100	mm
	Ground clearance (pot-hole lowered)	15	mm
	Safety speed activation height	2.4	m
	Inside turning radius	0	m
	Outside turning radius	2.28	m
	Max. capacity	400	kg
	Max. number of people on the platform	3	
	Max. extension of extendable platform	1.5	m
	Max. capacity on deck extension	400	kg
	Max. number of people on deck extension	3	
	Max. drive height	Max	
	Max. dimensions of platform extended	0.89 x 3.75	m
	Max. hydraulic pressure	230	bar
	Max. pressure of lifting circuit	160	bar
	Min. pressure of braking circuit	60÷70	bar
	Tyre dimensions	Ø410 x 150	mm
	Tyre type	Cushion soft	
	Transport dimensions with removable rails installed *	0.89x2.4x2.23	m
	Transport dimensions with removable rails not installed *	0.89x2.4x1.28	m
	Transport dimensions with rails folded down (optional) *	0.89x2.4x1.73	m
	Machine weight (unloaded)	2000	kg
Stability limits:			
	Longitudinal inclination	3	°
	Transversal inclination	2	°
	Max. wind speed	0	m/s
Performance:			
	Voltage and battery capacity	4 x 6 / 200	V/Ah
	Battery weight	4 x 32	kg
	Single-phase battery charger	24 / 25	V/A
	Max. current absorbed by the battery charger	12	A
	Electric pump power	3	kW
	Max. absorbed current	160	A
	Max. drive speed	3	km/h
	Safety drive speed	0.6	km/h
	Tank oil capacity	30	Litres
	Lowerering/lifting time (unloaded)	47 / 47	Sec.
	Max. gradeability	26	%
	Max. operating temperature	+50	°C
	Min. operating temperature	-15	°C

In some cases different limits can be fixed. It is recommended to comply with the data shown on the machine plate.
Noise tests have been carried out under the most unfavourable conditions to study the effects on the operator. The level of acoustic pressure weighed (A) at work places does not exceed 70dB(A).
As to vibrations in ordinary working conditions: the rms. value weighed according to acceleration frequency relevant to the upper limbs is lower than 2.5 m/sec^2 . the rms. value weighed according to acceleration frequency relevant to the body is lower than 0.5 m/sec^2 .

(*) removing the ladder, the machine overall dimensions are further reduced (length = 2.25 m)

X-6-EN





1) da terra con ringhiere sfilate
2) da terra con ringhiere ribaltate (optional)

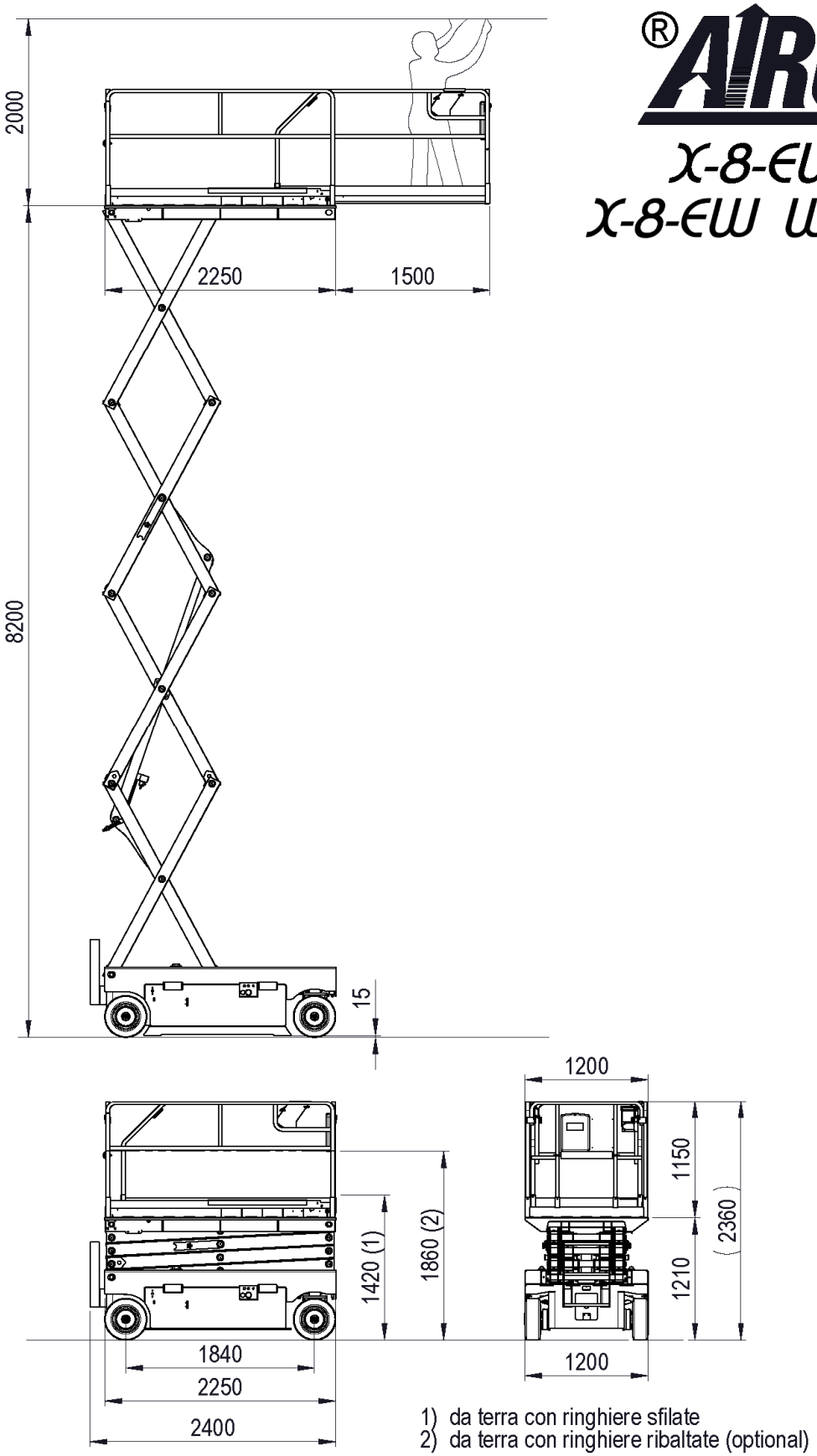
2.2. MODEL X 8 EW - X 8 EW WIND

Dimensions:		X8EW WIND	X8EW	
	Max. work height	10.2	10.2	m
	Max. platform height	8.2	8.2	m
	Ground clearance (pot-hole raised)	100	100	mm
	Ground clearance (pot-hole lowered)	15	15	mm
	Safety speed activation height	2.5	2.5	m
	Inside turning radius	0	0	m
	Outside turning radius	2.43	2.43	m
	Max. capacity	500	500	kg
	Max. number of people on the platform – indoors	3	3	
	Max. number of people on the platform – outdoors	1	-	
	Max. extension of extendable platform	1.5	1.5	m
	Max. capacity on deck extension	500	500	kg
	Max. number of people on deck extension – indoors	3	3	
	Max. number of people on deck extension – outdoors	1	-	
	Max. drive height	Max.	Max.	
	Max. dimensions of platform extended	1.2 x 3.75	1.2 x 3.75	m
	Max. hydraulic pressure	230	230	bar
	Max. pressure of lifting circuit	240	240	bar
	Min. pressure of braking circuit	60÷70	60÷70	bar
	Tyre dimensions	Ø410 x 150	Ø410 x 150	mm
	Tyre type	Cushion soft	Cushion soft	
	Transport dimensions with removable rails installed *	1.2x2.4x2.36	1.2x2.4x2.36	m
	Transport dimensions with removable rails not installed *	1.2x2.4x1.42	1.2x2.4x1.42	m
	Transport dimensions with rails folded down (optional) *	1.2x2.4x1.86	1.2x2.4x1.86	m
	Machine weight (unloaded)	2850	2350	kg
Stability limits:				
	Longitudinal inclination	3	3	°
	Transversal inclination	2	2	°
	Max. wind speed	12.5	0	m/s
Performance:				
	Voltage and battery capacity	4x6 / 200	4x6 / 200	V/Ah
	Battery weight	4x32	4x32	kg
	Single-phase battery charger	24/25	24 / 25	V/A
	Max. current absorbed by the battery charger	12	12	A
	Electric pump power	3	3	kW
	Max. absorbed current	160	160	A
	Max. drive speed	3	3	km/h
	Safety drive speed	0.6	0.6	km/h
	Lowerering/lifting time (unloaded)	47 / 47	47 / 47	Sec.
	Tank oil capacity	30	30	Lt.
	Max. gradeability	18	25	%
	Max. operating temperature	+50	+50	°C
	Min. operating temperature	-15	-15	°C

In some cases different limits can be fixed. It is recommended to comply with the data shown on the machine plate.
Noise tests have been carried out under the most unfavourable conditions to study the effects on the operator. The level of acoustic pressure weighed (A) at work places does not exceed 70dB(A).
As to vibrations in ordinary working conditions: the rms. value weighed according to acceleration frequency relevant to the upper limbs is lower than 2.5 m/sec^2 . the rms. value weighed according to acceleration frequency relevant to the body is lower than 0.5 m/sec^2 .

(*) removing the ladder, the machine overall dimensions are further reduced (length = 2.25 m)

X-8-EW
X-8-EW WIND



1) da terra con ringhiere sfilate
2) da terra con ringhiere ribaltate (optional)

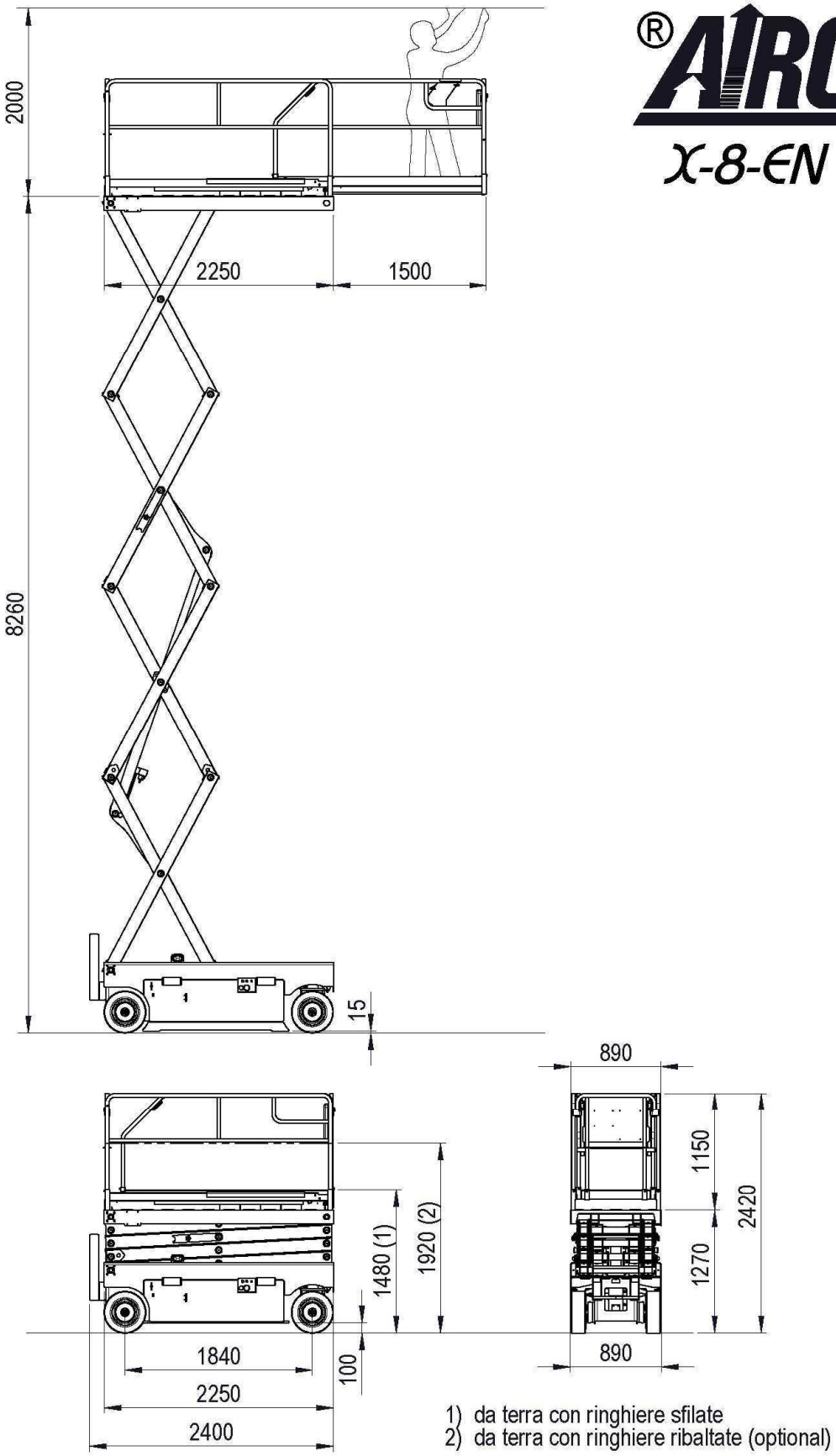
2.3. MODEL X 8 EN

Dimensions:		X 8 EN	
	Max. work height	10.2	m
	Max. platform height	8.2	m
	Ground clearance (pot-hole raised)	100	mm
	Ground clearance (pot-hole lowered)	15	mm
	Safety speed activation height	2.5	m
	Inside turning radius	0	m
	Outside turning radius	2.28	m
	Max. capacity	400	kg
	Max. number of people on the platform – indoors	3	
	Max. number of people on the platform – outdoors	-	
	Max. extension of extendable platform	1.5	m
	Max. capacity on deck extension	400	kg
	Max. number of people on deck extension – indoors	3	
	Max. number of people on deck extension – outdoors	-	
	Max. drive height	Max.	
	Max. dimensions of platform extended	0.89 x 3.75	m
	Max. hydraulic pressure	230	bar
	Max. pressure of lifting circuit	210	bar
	Min. pressure of braking circuit	60÷70	bar
	Tyre dimensions	Ø410 x 150	mm
	Tyre type	Cushion soft	
	Transport dimensions with removable rails installed *	0.89x2.4x2.42	m
	Transport dimensions with removable rails not installed *	0.89x2.4x1.48	m
	Transport dimensions with rails folded down (optional) *	0.89x2.4x2.42	m
	Machine weight (unloaded)	2750	kg
Stability limits:			
	Longitudinal inclination	3	°
	Transversal inclination	2	°
	Max. wind speed	0	m/s
Performance:			
	Voltage and battery capacity	4 x 6 / 200	V/Ah
	Battery weight	4 x 32	kg
	Single-phase battery charger	24 / 25	V/A
	Max. current absorbed by the battery charger	12	A
	Electric pump power	3	kW
	Max. absorbed current	160	A
	Max. drive speed	3	km/h
	Safety drive speed	0.6	km/h
	Lowerering/lifting time (unloaded)	47 / 47	Sec.
	Tank oil capacity	30	Lt.
	Max. gradeability	20	%
	Max. operating temperature	+50	°C
	Min. operating temperature	-15	°C

In some cases different limits can be fixed. It is recommended to comply with the data shown on the machine plate.
Noise tests have been carried out under the most unfavourable conditions to study the effects on the operator. The level of acoustic pressure weighed (A) at work places does not exceed 70dB(A).
As to vibrations in ordinary working conditions: the rms. value weighed according to acceleration frequency relevant to the upper limbs is lower than 2.5 m/sec^2 . the rms. value weighed according to acceleration frequency relevant to the body is lower than 0.5 m/sec^2 .

(*) removing the ladder, the machine overall dimensions are further reduced (length = 2.25 m)

AIRO X-8-EN



1) da terra con ringhiere sfilate
2) da terra con ringhiere ribaltate (optional)

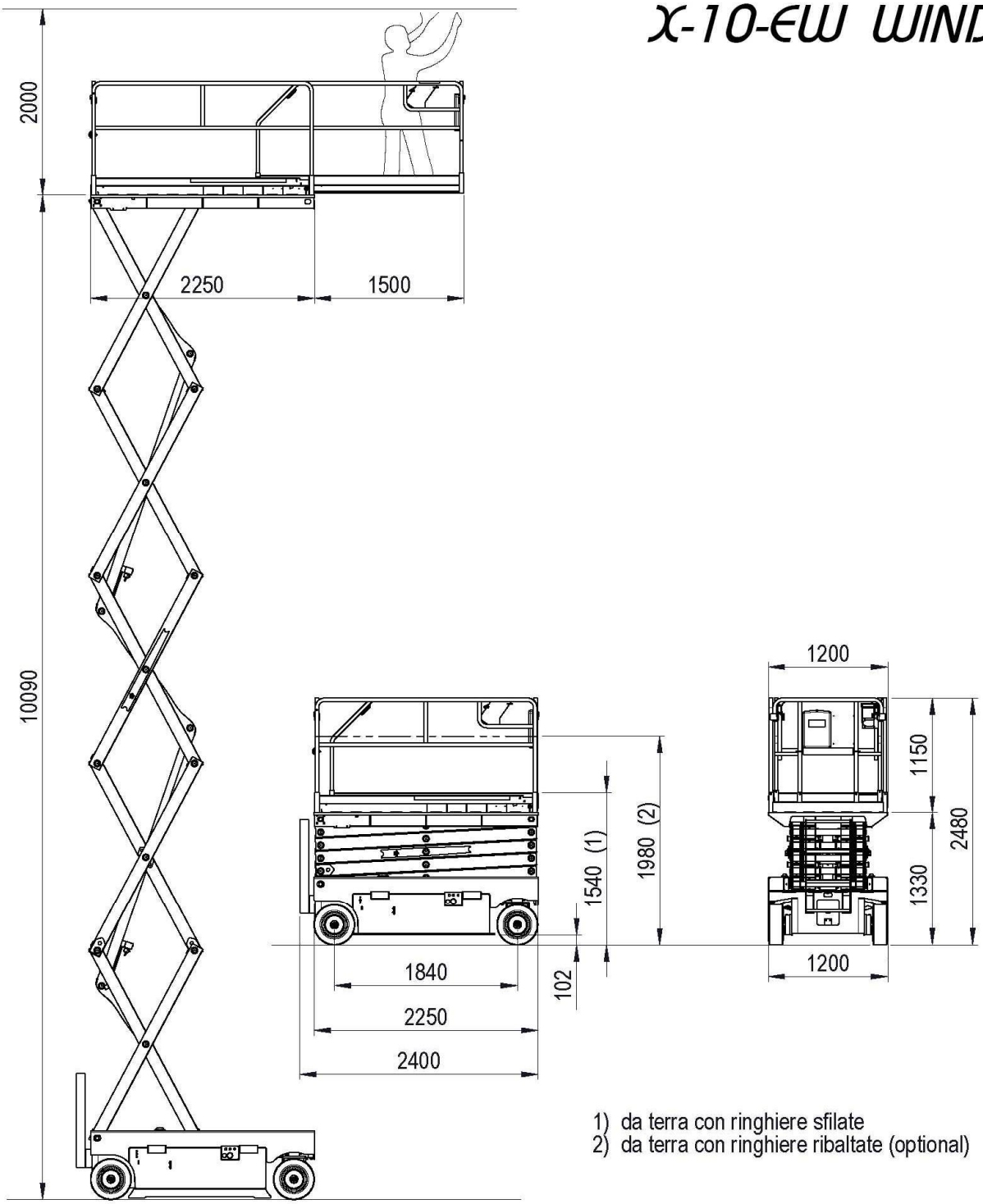
2.4. MODEL X 10 EW - X 10 EW WIND

Dimensions:		X10EW WIND	X10EW	
	Max. work height	12.1	12.1	m
	Max. platform height	10.1	10.1	m
	Ground clearance (pot-hole raised)	100	100	mm
	Ground clearance (pot-hole lowered)	15	15	mm
	Safety speed activation height	2.6	2.6	m
	Inside turning radius	0	0	m
	Outside turning radius	2.43	2.43	m
	Max. capacity	300	450	kg
	Max. number of people on the platform – indoors	3	3	
	Max. number of people on the platform – outdoors	1	-	
	Max. extension of extendable platform	1.5	1.5	m
	Max. capacity on deck extension	300	450	kg
	Max. number of people on deck extension – indoors	3	3	
	Max. number of people on deck extension – outdoors	1	-	
	Max. drive height	Max.	Max.	
	Max. dimensions of platform extended	1.2 x 3.75	1.2 x 3.75	m
	Max. hydraulic pressure	230	230	bar
	Max. pressure of lifting circuit	160	170	bar
	Min. pressure of braking circuit	60÷70	60÷70	bar
	Tyre dimensions	Ø410 x 150	Ø410 x 150	mm
	Tyre type	Cushion soft	Cushion soft	
	Transport dimensions with removable rails installed *	1.2x2.4x2.48	1.2x2.4x2.48	m
	Transport dimensions with removable rails not installed *	1.2x2.4x1.54	1.2x2.4x1.54	m
	Transport dimensions with rails folded down (optional) *	1.2x2.4x1.98	1.2x2.4x1.98	m
	Machine weight (unloaded)	3320	2820	kg
Stability limits:				
	Longitudinal inclination	3	3	°
	Transversal inclination	1.5	2	°
	Max. wind speed	12.5	0	m/s
Performance:				
	Voltage and battery capacity	4x6 / 280	4x6 / 280	V/Ah
	Battery weight	4x47	4x47	kg
	Single-phase battery charger	24 / 25	24 / 25	V/A
	Max. current absorbed by the battery charger	12	12	A
	Electric pump power	4	4	kW
	Max. absorbed current	200	200	A
	Max. drive speed	3	3	km/h
	Safety drive speed	0.6	0.6	km/h
	Lowerering/lifting time (unloaded)	70 / 70	70 / 70	Sec.
	Tank oil capacity	30	30	Lt.
	Max. gradeability	23	26	%
	Max. operating temperature	+50	+50	°C
	Min. operating temperature	-15	-15	°C

In some cases different limits can be fixed. It is recommended to comply with the data shown on the machine plate.
Noise tests have been carried out under the most unfavourable conditions to study the effects on the operator. The level of acoustic pressure weighed (A) at work places does not exceed 70dB(A).
As to vibrations in ordinary working conditions: the rms. value weighed according to acceleration frequency relevant to the upper limbs is lower than 2.5 m/sec^2 . the rms. value weighed according to acceleration frequency relevant to the body is lower than 0.5 m/sec^2 .

(*) removing the ladder, the machine overall dimensions are further reduced (length = 2.25 m)

X-10-EW
X-10-EW WIND



1) da terra con ringhiere sfilate
2) da terra con ringhiere ribaltate (optional)

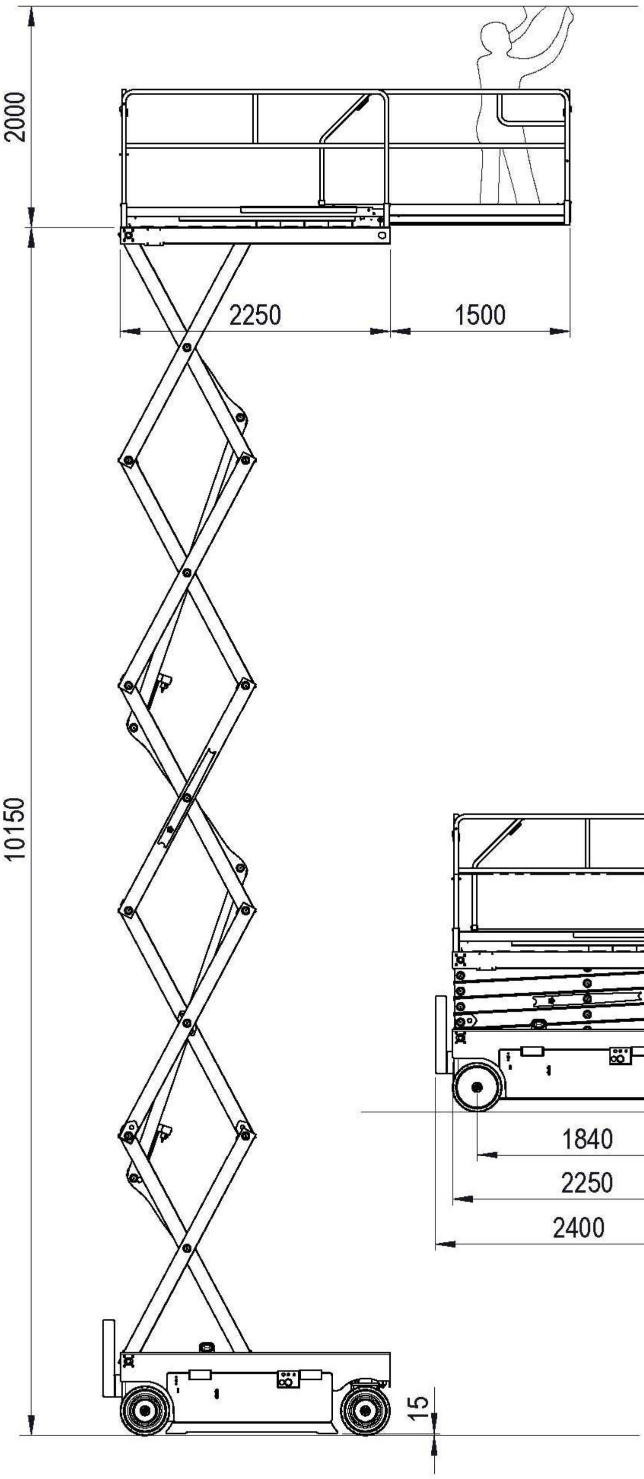
2.5. MODEL X 10 EN

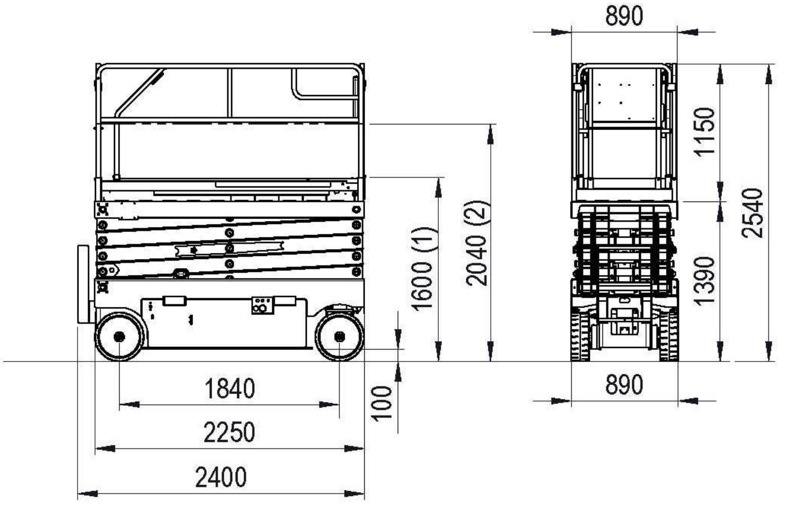
Dimensions:		X 10 EN	
	Max. work height	12.1	m
	Max. platform height	10.1	m
	Ground clearance (pot-hole raised)	100	mm
	Ground clearance (pot-hole lowered)	15	mm
	Safety speed activation height	2.6	m
	Inside turning radius	0	m
	Outside turning radius	2.28	m
	Max. capacity	300	kg
	Max. number of people on the platform – indoors	3	
	Max. number of people on the platform – outdoors	-	
	Max. extension of extendable platform	1.5	m
	Max. capacity on deck extension	300	kg
	Max. number of people on deck extension – indoors	3	
	Max. number of people on deck extension – outdoors	-	
	Max. drive height	Max.	m
	Max. dimensions of platform extended	0.89 x 3.75	m
	Max. hydraulic pressure	230	bar
	Max. pressure of lifting circuit	160	bar
	Min. pressure of braking circuit	60÷70	bar
	Tyre dimensions	Ø410 x 150	mm
	Tyre type	Cushion soft	
	Transport dimensions with removable rails installed *	0.89x2.4x2.54	m
	Transport dimensions with removable rails not installed *	0.89x2.4x1.6	m
	Transport dimensions with rails folded down (optional) *	0.89x2.4x2.04	m
	Machine weight (unloaded)	3430	kg
Stability limits:			
	Longitudinal inclination	3	°
	Transversal inclination	1.2	°
	Max. wind speed	0	m/s
Performance:			
	Voltage and battery capacity	4x6 / 280	V/Ah
	Battery weight	4x47	kg
	Single-phase battery charger	24 / 25	V/A
	Max. current absorbed by the battery charger	12	A
	Electric pump power	4	kW
	Max. absorbed current	200	A
	Max. drive speed	3	km/h
	Safety drive speed	0.6	km/h
	Lowerering/lifting time (unloaded)	70 / 70	Sec.
	Tank oil capacity	30	Lt.
	Max. gradeability	23	%
	Max. operating temperature	+50	°C
	Min. operating temperature	-15	°C

In some cases different limits can be fixed. It is recommended to comply with the data shown on the machine plate.
Noise tests have been carried out under the most unfavourable conditions to study the effects on the operator. The level of acoustic pressure weighed (A) at work places does not exceed 70dB(A).
As to vibrations in ordinary working conditions: the rms. value weighed according to acceleration frequency relevant to the upper limbs is lower than 2.5 m/sec^2 . the rms. value weighed according to acceleration frequency relevant to the body is lower than 0.5 m/sec^2 .

(*) removing the ladder, the machine overall dimensions are further reduced (length = 2.25 m)

AIRO
X-10-EN





1) da terra con ringhiere sfilate
2) da terra con ringhiere ribaltate (optional)

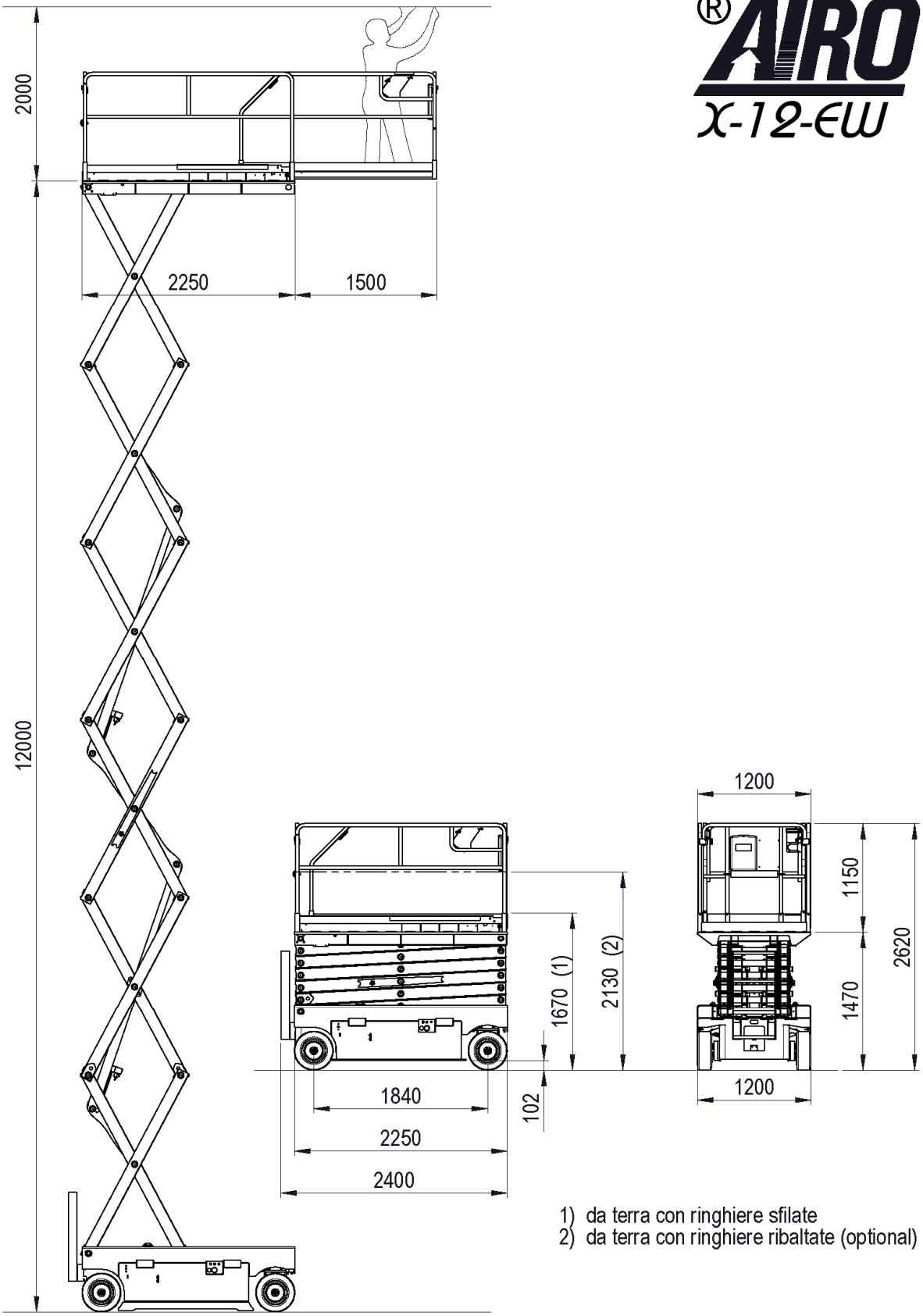
2.6. MODEL X 12 EW

Dimensions:		X 12 EW	
	Max. work height	14	m
	Max. platform height	12	m
	Ground clearance (pot-hole raised)	100	mm
	Ground clearance (pot-hole lowered)	15	mm
	Safety speed activation height	2.7	m
	Inside turning radius	0	m
	Outside turning radius	2.43	m
	Max. capacity	400	kg
	Max. number of people on the platform – indoors	3	
	Max. number of people on the platform – outdoors	-	
	Max. extension of extendable platform	1.5	m
	Max. capacity on deck extension	400	kg
	Max. number of people on deck extension – indoors	3	
	Max. number of people on deck extension – outdoors	-	
	Max. drive height	Max.	m
	Max. dimensions of platform extended	1.2 x 3.75	m
	Max. hydraulic pressure	230	bar
	Max. pressure of lifting circuit	200	bar
	Min. pressure of braking circuit	60÷70	bar
	Tyre dimensions	Ø410 x 150	mm
	Tyre type	Cushion soft	
	Transport dimensions with removable rails installed *	1.2x2.4x2.62	m
	Transport dimensions with removable rails not installed *	1.2x2.4x1.67	m
	Transport dimensions with rails folded down (optional) *	1.2x2.4x2.13	m
	Machine weight (unloaded)	3365	kg
Stability limits:			
	Longitudinal inclination	3	°
	Transversal inclination	1.5	°
	Max. wind speed	0	m/s
Performance:			
	Voltage and battery capacity	4x6 / 280	V/Ah
	Battery weight	4x47	kg
	Single-phase battery charger	24 / 25	V/A
	Max. current absorbed by the battery charger	12	A
	Electric pump power	4	kW
	Max. absorbed current	200	A
	Max. drive speed	3	km/h
	Safety drive speed	0.6	km/h
	Lowerering/lifting time (unloaded)	70 / 70	Sec.
	Tank oil capacity	30	Lt.
	Max. gradeability	23	%
	Max. operating temperature	+50	°C
	Min. operating temperature	-15	°C

In some cases different limits can be fixed. It is recommended to comply with the data shown on the machine plate.
Noise tests have been carried out under the most unfavourable conditions to study the effects on the operator. The level of acoustic pressure weighed (A) at work places does not exceed 70dB(A).
As to vibrations in ordinary working conditions: the rms. value weighed according to acceleration frequency relevant to the upper limbs is lower than 2.5 m/sec^2 . the rms. value weighed according to acceleration frequency relevant to the body is lower than 0.5 m/sec^2 .

(*) removing the ladder, the machine overall dimensions are further reduced (length = 2.25 m)

AIRO X-12-EW



1) da terra con ringhiere sfilate
2) da terra con ringhiere ribaltate (optional)

3. SAFETY PRECAUTIONS

3.1. POWER SUPPLY

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

DO NOT TAMPER WITH AND MODIFY THE CALIBRATION OF ANY COMPONENT OF THE ELECTRIC AND HYDRAULIC SYSTEM.

OPERATING AND MAINTENANCE RULES

- 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.
- The use of safety harness is not compulsory except in certain countries with specific regulations.
- 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.

- 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 1.1 1.2 1.3).
- Do not increase the max. allowed height by means of scaffolds, ladders or other.
- Do not use the machine as a crane.
- Do not use the machine as a hoist or lift.
- Protect the unit (in particular the platform control switchboard by means of the specially provided cover) and the operator when working in adverse environmental conditions (painting, de-painting, sand-blasting, washing, etc.).
- It is forbidden to use the unit in case of severe weather conditions (particularly with wind exceeding the limit speed indicated in chapter 2).
- Machines with a wind speed limit of 0m/s are to be used indoors only.
- In the event of rain or in parking condition always protect the on-platform control panel by means of the specially provided cap.
- Do not use the machine in areas where risks of fire or explosion exist.
- Do not use pressurized water jets (high-pressure cleaners) to wash the machine.

3.2. SAFETY RULES

3.2.1. GENERAL

- § Only adults (18 years old), after carefully reading this manual, are allowed to use the machine.
- § 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.
- § Use the machine at a distance of at least 5 metres from high-tension lines (in any case not in proximity to live elements).
- § Use the machine according to the capacity values indicated in the technical features section. The max. No. of people allowed on the platform and the capacity are specified on the identification plate.
- § 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.

3.2.2. 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 features 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 – see chapter 0).
- § Drive the unit 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 unit.
- § Backward drive (in the direction of the fixed wheels) does not allow the operator on the control post a complete visibility. This operation shall be carried out with the utmost care.
- § While driving the unit 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 to transport any material (see paragraph 1.3).
- § The machine is equipped with a platform load control system 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 audible warning device and the red light located on the platform control panel turn on, then the machine is overloaded (see chapter 5). Remove the exceeding load before starting operations again.
- § Do not operate the machine if components boxes are not properly closed.

3.2.3. 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 audible device and the red light on the platform control panel turn on, the machine is not correctly positioned (see paragraphs relevant to general use instructions). Bring it to safety rest position before starting operations again. If the platform inclination is activated with platform raised, the only possible platform operation is lowering.
- § The machine is equipped with a device to avoid the risk of shearing and crushing in the lifting structure in compliance with EN280:2001: 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 audible alarm warns about the danger condition by increasing its frequency. The operator on the platform must release the lowering control and wait until the audible alarm stops (about 3 sec.), then he can resume the lowering control (see chapter 5).

- § The machine has a charge check indicator for the battery level ("battery-protection" 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.
- § Do not lean over the platform guard-rails.
- § During operations in public areas, in order to prevent people other than the personnel from approaching the machine and being endangered, surround the working area by means of barriers or other suitable signs.
- § Avoid severe weather conditions and, in particular, snowy days.
- § Make sure that no people, apart from the operator, are in the area where the machine is operating. While moving the platform, the operator on board should pay particular attention to avoid any contact with the personnel on the ground.
- § After each work session, always take the keys out of the control panels and keep them in a safe place to prevent unauthorized people from using the machine.
- § Always place working tools in a steady position to prevent them from falling and hurting the operators on the ground.

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 6.
Place the machine onto a firm ground and with a gradeability lower than the max. allowed (see "Stability limits"). The machine is equipped with on-platform spirit levels for visual check and an inclinometer on the chassis to always check machine levelling, both transversal and longitudinal.
Before operating the machine make sure the guardrails are properly positioned.
Before using the machine read the instructions given in this manual and the concise instructions indicated on the platform plate.
Before starting any operations verify the integrity of the unit (by means of a visual check) and read the plates indicating the operating limits.

4.1. BEFORE USING THE MACHINE

Before using the machine the operator must always check visually that:

- the battery is completely charged
- the oil level lies between the min. and max. value (with lowered platform)
- 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 fixed to the platform
- 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 post and the emergency ground post.

Do not use the machine for purposes different from those it was intended for.
If disposal of the unit is necessary, comply with current local regulations. The machine consists mainly of metal parts which are easy to be identified (steel for the most parts, and aluminium for the hydraulic blocks).
We can state that the machine can be recycled at 75%.

5. GENERAL USE INSTRUCTIONS

Before using the machine read this chapter thoroughly.

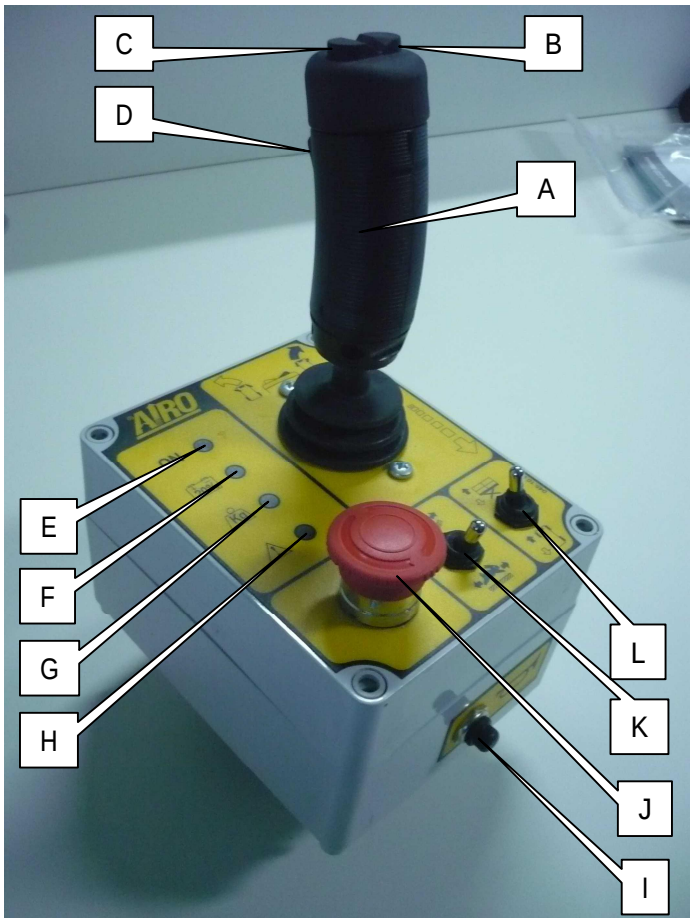
CAUTION!

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 station is placed on the platform (see paragraph 1.8), the control panel is fixed to the right rail and is used to:

- § turn the machine ON/OFF
- § select the operating mode (lifting/lowering or drive)
- § move the platform during ordinary working procedures
- § display some parameters (alarms, deadman's working, etc…)



A. Proportional joystick control for platform drive / lifting / lowering
B. Switch for "RIGHT" steering
C. Switch for "LIFT" steering
D. "Dead-man" switch
E. Warning light control station enabled
F. Warning light flat battery
G. Platform overload warning light
H. Danger warning light due to instability or malfunctioning of the electric system
I. Horn switch
J. Emergency stop (Stop)
K. Drive speed selector (hare/snail)
L. Movement selector (drive or lifting/lowering)

5-1: Platform control panel

All movements (steering excluded) are controlled by proportional joystick; it is therefore possible to adjust movement speed by means of the relative controls (except lowering which occurs by gravity).
To avoid sudden shakes during movements, it is advisable to operate the proportional joystick controls gradually.
For safety reasons, to operate the machine, it is necessary to press the "dead-man" switch D on the front part of the proportional joystick before activating the joystick. If the "dead-man" switch is accidentally released while the machine is operating, the movement is immediately stopped. To resume the operation, release the joystick and follow the steps described above.

CAUTION!

Holding down the “dead-man” switch for over 10 seconds without carrying out any operation will disable the control station. The green led (E) is OFF in this condition. To operate the machine again it is necessary to release the “dead-man” switch and press it again. Now, the green led (H) will light up steady and for the next 10 seconds all controls will be enabled.

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 unit when the platform is lifted unless the ground is flat and steady with no holes and steps.

The controls used to move the machine (refer to figure 5-1: Platform control panel) are:

- Control joystick A
- Movement selector (drive or lifting/lowering) L
- Switch for “RIGHT” steering B
- Switch for “LEFT” steering C
- Drive speed selector (hare/snail) K
- ”Dead-man” switch D

To drive the machine it is necessary to carry out the following operations in sequence:

- select “drive” mode with selector L
- press “dead-man” switch D (the green led E will light up steady indicating its enabling)
- within 10 seconds from the green steady led lighting up, set the proportional joystick control A forward for forward drive or backward for reverse drive by holding down the “dead-man” switch as long as the movement has been carried out

By means of the speed selector K you can select two drive speeds:

- low speed with selector in “Snail” position
- high speed with selector in “Hare” position

To steer use the steering switches B or C while activating the “dead-man” switch D; press button B for right steering and button C for left steering.

NOTE:

To achieve maximum drive speed, set the speed selector K to position “Hare” , and activate the proportional joystick A.
To drive the machine on steep upward or downward slopes (for instance, while loading/unloading the machine onto/from a truck) set speed selector K to position "Snail" and activate joystick control A.

With platform lifted (see chapter 0), safety drive speed is automatically enabled, therefore the maximum speed is automatically adjusted by the control system regardless of the position of speed selector K.

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 as indicated in paragraph 6.5
- If necessary, remove or fold down the rails to further reduce the overall height.
- Select the slow drive speed, as indicated in 5.1.1
- 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 unit using the “platform control panel” from the ground

5.2. PLATFORM LIFTING AND LOWERING

The following controls are to be used to lift and lower the platform (see FIGURE 5-1: Platform control panel)

- joystick control A
- movement selector L
- ”dead-man” switch D

To lift/lower the platform it is necessary to carry out the following operations in sequence:

- select “lift/lower” mode with selector L
- press “dead-man” switch D (the green led E will light up steady indicating its enabling)
- within 10 seconds from the green steady led E lighting up, set the proportional joystick control A forward for lifting or backward for lowering by holding down the “dead-man” switch D as long as the movement has been carried out.

Platform lowering is performed at fixed speed.

NOTE:
The machine is equipped with a device to avoid the risk of shearing and crushing in the lifting structure in compliance with “EN280:2001”.
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 audible alarm warns about the danger condition by increasing its frequency. The operator on the platform must release the lowering control and wait until the audible alarm stops (about 3 sec.), then he can resume the lowering control.

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

5.3 OTHER FUNCTIONS OF THE PLATFORM CONTROL PANEL

5.3.1 MANUAL HORN

I – FIGURE 5-1: Platform control panel： Horn to warn that the machine is moving. The manual operation of the horn is carried out by pressing key I

5.3.2 EMERGENCY STOP

J - FIGURE 5-1: Platform control panel：By pressing the red STOP button all control functions are interrupted. Normal functions are enabled by rotating the button of 1/4 turn clockwise.

5.3.3 GREEN WARNING LIGHT, CONTROL STATION ENABLED

E - FIGURE 5-1: Platform control panel： On with flashing light when the machine is turned on. If the platform control station has been selected and this light flashes the controls are not enabled because the “dead-man” switch D is not pressed or it was pressed for more than 10 seconds and no operation was performed.
On steady with machine on and “dead-man” switch D pressed for less than 10 seconds. With platform controls, all controls are enabled (unless other warnings are present).

5.3.4 RED WARNING LIGHT, FLAT BATTERY

F - FIGURE 5-1: Platform control panel： It flashes when battery is charged at 20% only. In this condition, lifting is disabled. It is necessary to recharge the battery immediately.

5.3.5 RED WARNING LIGHT, OVERLOAD

G - Figure 5-1: Platform control panel： On steady and activation of acoustic alarm with a platform overload exceeding 30% the rated load. If the platform is lifted, the machine is completely locked. If platform is lowered all driving/steering operations are still possible but lifting is prevented. Remove the overload before using the machine again.
Fast flashing with audible alarm activated in case of fault in the control system of the platform load. With lifted platform the machine is completely blocked.

5.3.6 RED WARNING LIGHT, DANGER DUE TO INSTABILITY OR DRIVE CONTROL STOP

H - Figure 5-1: Platform control panel： On steady with activation of audible alarm when the machine is not perfectly levelled. The lifting movement is no longer possible (nor drive if platform is lifted). To resume machine operation, it is necessary to lower the platform completely and to position the machine on an even ground to ensure its stability.
Or, in condition of platform raised, with one or both pot-hole guards not lowered, drive control is stopped.

5.4 GROUND CONTROL STATION

The ground control station is located on the chassis (see paragraph 1.8) and is used to:

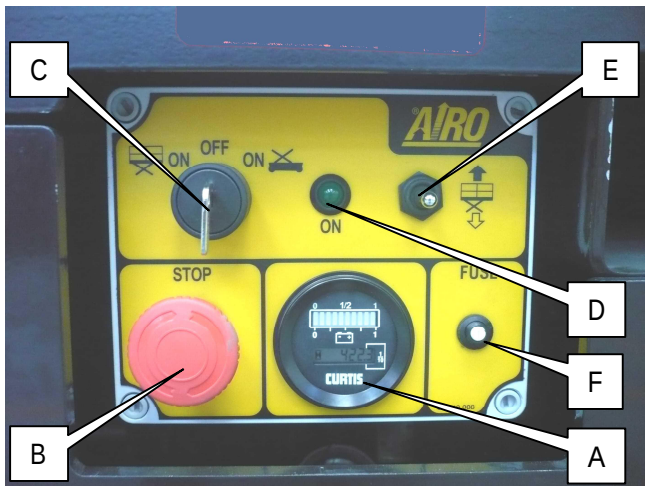
- § turn the machine ON/OFF
- § select the control station (ground or platform)
- § operate the platform in emergency cases
- § display some working parameters (work hours, battery charge level, etc…)

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

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

⚠ 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.

A. Hour-meter / battery protection voltmeter
B. Emergency stop button
C. On-off key / control station selection
D. Warning light control station enabled
E. Platform lifting/lowering lever
F. Fuse
G. Movement audible alarm



5-2: Ground control panel

5.4.1 HOUR-METER / BATTERY PROTECTION VOLTMETER

The hour-meter displays the working hours of the electric pump. Platform lowering occurs by gravity and does not require the switching on of the electric pump, therefore the time used for this operation is not counted by the hour-meter.
The function of the battery protection Voltmeter is for preserving the battery, avoiding it from discharging excessively. Once the battery has reached a discharge level of 20%, the control system informs the operator on the platform of this condition through the red flashing led (previously described). Lifting is inhibited and batteries must be recharged. At the ground control station, the condition of flat battery is signalled in the following way:

- § the last two leds on the left flash alternatively if the indicator is round-shaped
- § only the last two small squares are lit if the indicator is a LCD display

5.4.2 EMERGENCY STOP BUTTON

If you press this button, the machine is completely switched off. By rotating it of 1/4 turn (clockwise) the machine can be turned ON by means of the ON-OFF key.

5.4.3 ON-OFF KEY / CONTROL STATION SELECTION

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

- turn ON the machine by selecting one of the two control stations:
  - platform controls enabled with key switch set to platform symbol. Stable 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. Stable position with possibility to extract the key

5.4.4 GREEN WARNING LIGHT, CONTROL STATION ENABLED

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

5.4.5 PLATFORM LIFTING/LOWERING LEVER

This lever is to be used to lift or lower the platform. This control can be operated only if the on-off key is set to ON downwards (ground control station selected). We shall also remind you that the ground controls are to be used to operate the platform only in emergency situations and must not be used for any other purposes.

5.4.6 MOVEMENT ALARM

The machine has a movement audible alarm that is activated as follows:
always with intermittent sound, every 2 seconds approx., to indicate any movement of the machine;

with intermittent sound every 0.5 seconds to indicate the danger of being trapped in the lifting structure during the last section of the lowering movement (see paragraph “ Platform lifting / lowering”).

5.5 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.

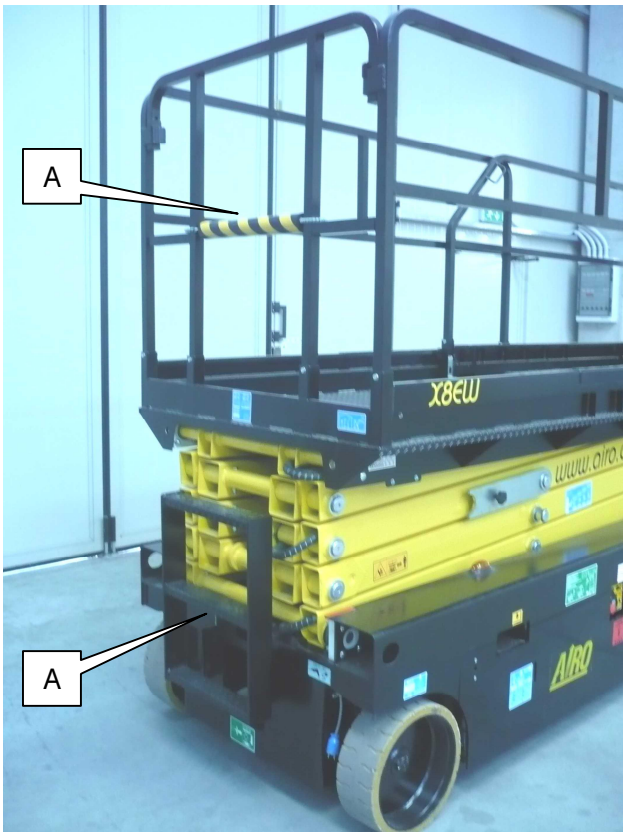
To access the platform (Figure 5-3: Platform access):

- § get on the ladder A hanging on to the rungs, the ladder side rails or the entry side rails
- § raise the bar B 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 or to the handrail.

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

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

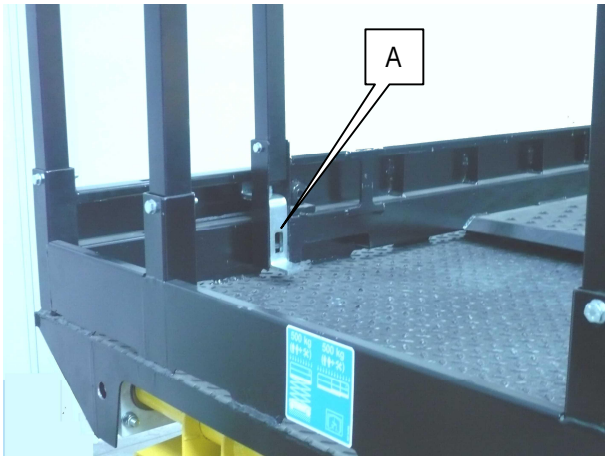


5-3: Platform access

5.6 MANUAL EXTENSION OF THE PLATFORM

The extension of the mobile platform is carried out manually. To extend the mobile platform (Figure 5-4: Mobile platform extension unlock pedal): you have to:

- § press lock pedal A
- § manually push the platform from the inclined part of the rails while holding down pedal A
- § release pedal A at one of the two slots depending on the extension you wish to achieve
- § make sure that the lock pedal A is actually inserted into the slot to be sure that the mobile platform is blocked.



5-4: Mobile platform extension unlock pedal

5.7 MACHINE START-UP

To start the machine the operator shall:

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

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 (see paragraph 7.16.03). If the battery charger is working, the machine is off and cannot be turned on.

5.8 MACHINE STOP

5.8.1 NORMAL STOP

During the normal stop of the machine, if you release the controls, the operation is stopped. Stop occurs within a time limit set in the factory, which guarantees smooth braking.

5.9 END OF WORK

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

- always set the machine to rest position
- press the Stop button on the ground control station
- remove the key from the control panel to prevent unauthorised people from using the machine
- recharge the battery according to the instructions given in section "Maintenance".

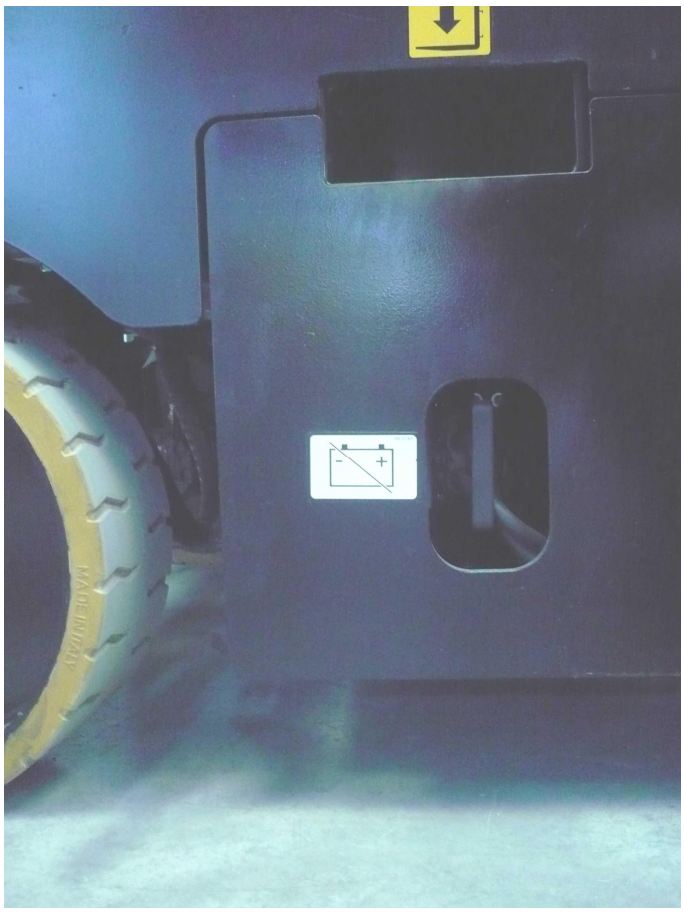
5.9.1 EMERGENCY STOP

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

From the platform control station if you press the push-button on the control panel, the machine is turned off.

From the ground control station:

- press the ground control station stop button and the machine will be turned off
- by pulling the power connector (Figure 5-5: Power connector) to the outside (battery side) the machine power is cut out (power circuit cut-out).



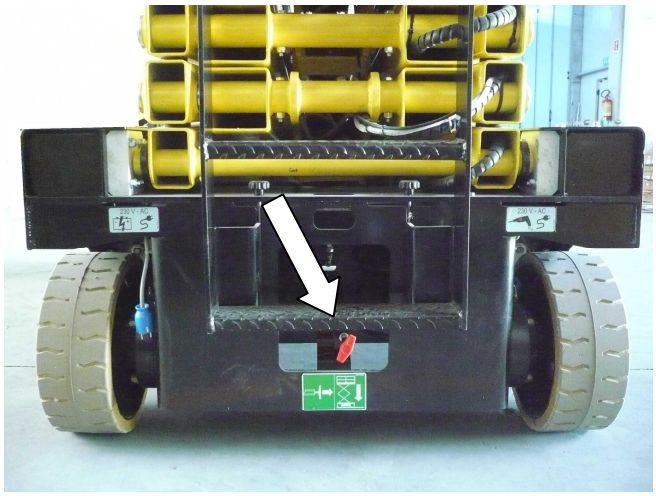
5-5: Power connector

To resume the operations:

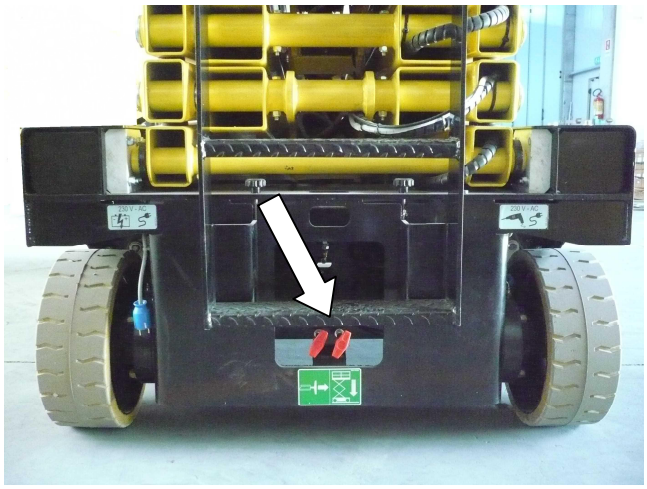
- From the platform control station turn the stop button by a ¼ of turn clockwise.
- From the ground control station turn the stop button by a ¼ of turn clockwise and insert the connector thoroughly to power the machine again.

5.10MANUAL EMERGENCY LOWERING

IT IS FORBIDDEN
to use the manual emergency lowering control to lower the platforms with overloads.



5-6: Manual emergency lowering with one knob

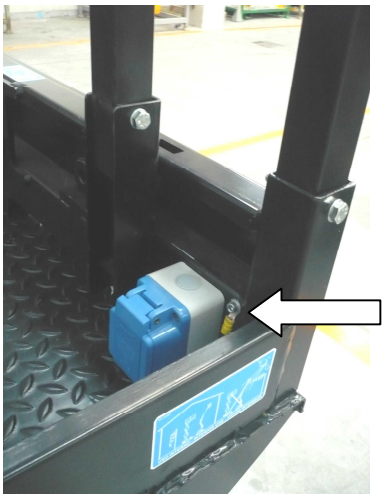


5-7: Manual emergency lowering with two knobs

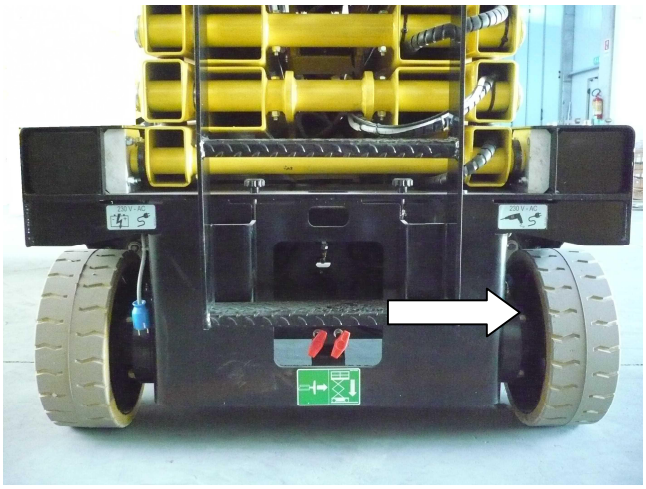
In case of fault in the electric or hydraulic system, to carry out the emergency manual lowering pull the knob indicated in (Figure 5-6: Manual emergency lowering with one knob) to the outside.
Where two knobs are present, you should activate them together (Figure 5-7: Manual emergency lowering with two knobs).
Attention, the emergency control can be stopped at any time by releasing the knob.

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

5.11 SOCKET FOR ELECTRIC TOOL CONNECTION (OPTIONAL)



5-8: Platform current socket



5-9: Electric line connection plug

The platform can 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.

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 ± 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 mm^2)
Do not use rolled-up cables.

6 HANDLING AND CARRYING

6.1 HANDLING

To handle the machine in normal operating conditions follow the instructions given in chapter "GENERAL USE INSTRUCTIONS" under paragraph "Drive 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.
When the platform is lifted and exceeds a given height, the machines with lowered pot-hole guards can be driven only at a lower speed (automatically reduced) up to the height specified in chapter “Technical Features”.
It is important to make sure that the pot-hole guards function properly and there are no objects in the area where the device is operating.

CAUTION!
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 unit 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 post 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.

If the machine while travelling hits a hump or a hole with platform lifted (pot-hole guards lowered and safety speed enabled), the machine will rest on one or both guards with no danger to the operator.

Now, if you lower the platform completely, and both driving wheels are lifted from the ground, the machine might not able to quit the block condition with its own means. Emergency towing is necessary (see “Emergency towing”).

6.2 CARRYING

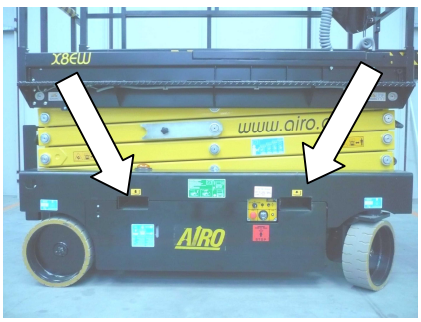
In order to carry the machine to the various working sites, follow the instructions given below.
Considering the large dimensions of some models, before carrying, it is recommended to inquire about the overall dimension limits for road transport in force in your country.

⚠ Before carrying the machine, turn it off and remove the key from the control panel. 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 chutes 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 capacity is adequate to weight - according to the instructions given in chapter "GENERAL USE INSTRUCTIONS" under paragraph "Drive and steering" for the 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 or the machine is in towing mode (see par. Emergency towing)
- § Through the 4 fastening holes located on the 4 angles of the unit, 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 6-2: Forks chock
- § 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 unit by means of a lift truck is a dangerous operation, which must be carried out by qualified operators only

6-1: Fastening holes



6-2: Forks chock

⚠ After placing the machine onto the carrying vehicle, fasten it by means of the same holes used for lifting.

⚠ Before carrying the unit check the stability grade. Platform must be completely lowered.

⚠ Do not use the machine to tow other vehicles.

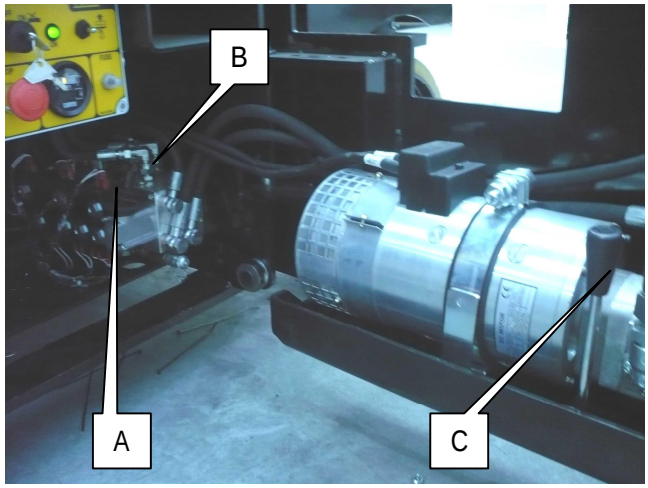
6.3 EMERGENCY TOWING

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

- § Hook the machine to the provided holes (the same used for lifting – see previous pictures)
- § Screw knob B completely on the hydraulic block.
- § Screw lever C on manual pump A
- § Activate the manual pump until the control is bound; by doing so the parking brakes are unlocked
- § Tow at a very reduced speed (remember that in these conditions the machine does not brake)

At the end of towing operation, resume initial conditions:

- § Unscrew knob B completely.
- § Remove lever C from the manual pump and set it to the position as shown in the figure



6-3: Emergency towing

This operation should be carried out only on a flat ground.

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

6.4 REMOVABLE RAILS

Standard machines are fitted with rails which can be removed from the platform. Removing the rails it is possible to reduce the height of the machine for:

- § carriage
- § transit through standard doors.

To remove the rails it is necessary to remove the fixing screws.

Make sure the rails are properly secured before using the unit.

CAUTION!

This operation is only for reducing the height of the stowed machine to facilitate carrying operations.
It is absolutely forbidden to lift the unit with personnel on the platform if the rails are not raised.

6-4: Removable rails

6.5 FOLD-DOWN RAILS

(OPTIONAL)

The machines can be fitted with rails (optional) folding down to the inside of the platform. Folding down the rails it is possible to reduce the height of the machine for:

- **§** carriage
- **§** transit through standard doors.

To fold down the rails, referring to the pictures of the next page:

1. extract the mobile platform and lock it in the indicated position
2. remove the control panel
3. raise and turn the front rail to the inside
4. remove the locking pins of the two sliding side rails
5. turn to the inside and press downwards the side sliding rails
6. remove the locking pins of the entrance rail
7. raise and turn the entrance rail to the inside
8. remove the locking pins of the two fixed side rails
9. lift and turn the two side fixed rails to the inside
10. retract the extendible platform.

To restore the initial condition, repeat the a.m. operations in reverse order.
Make sure the rails are properly secured before using the unit.

CAUTION!

⚠ THIS OPERATION IS ONLY FOR REDUCING THE HEIGHT OF THE STOWED MACHINE TO FACILITATE CARRYING OPERATIONS.
IT IS ABSOLUTELY FORBIDDEN TO LIFT THE UNIT WITH PERSONNEL ON THE PLATFORM IF THE RAILS ARE NOT RAISED.

RAILS FOLDING-DOWN SEQUENCE

1

2

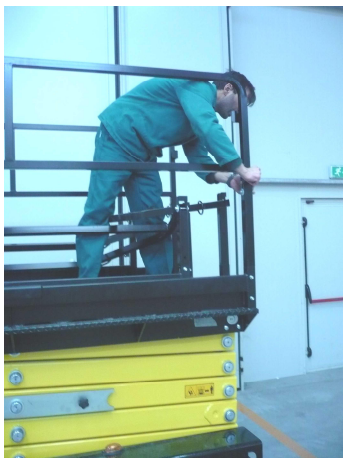
3


4

5


6

7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9

10

7 MAINTENANCE

- § The maintenance operations described below refer to a machine with ordinary working use. In case of difficult use (extreme temperatures, corrosive environments, etc.) please contact AIRO after-sales service to change the operation interval.
- § 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...)
- § Always carry out maintenance operations when the machine is still, after having removed the key from the control panel, and with the platform in rest position.
- § Carry out only the maintenance and adjustment operations described in this user manual. In emergency situations (e.g. breakdown, tyres 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.
- § Remove the battery cables and provide batteries with a suitable protection during welding operations.
- § In case of replacement, use original spare parts only.
- § Disconnect the 220V 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.

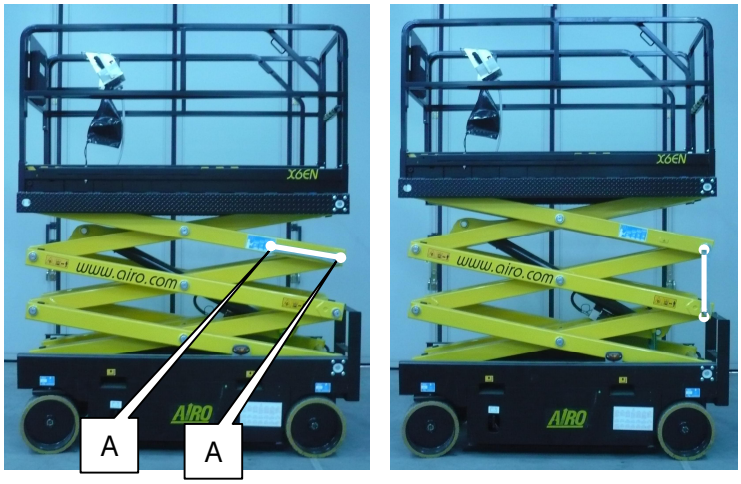
CAUTION!
NEVER MODIFY OR TAMPER WITH MACHINE PARTS TO IMPROVE THE MACHINE PERFORMANCE AS THIS MAY AFFECT ITS SAFE OPERATION.

7.1 SAFETY STOP FOR MAINTENANCE OPERATIONS

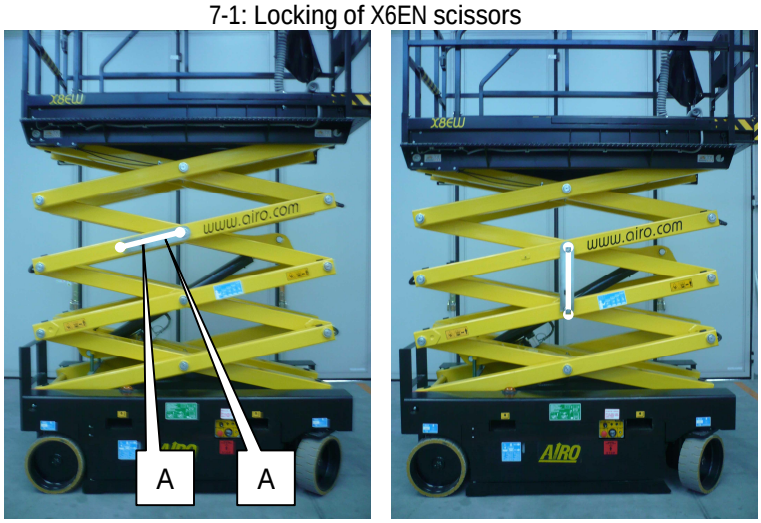
Procedure to be carried out for placing the lifting structure in safety conditions for maintenance operations.

Watch the pictures aside to understand how the lifting locking system works before carrying out any maintenance or repairs to it.

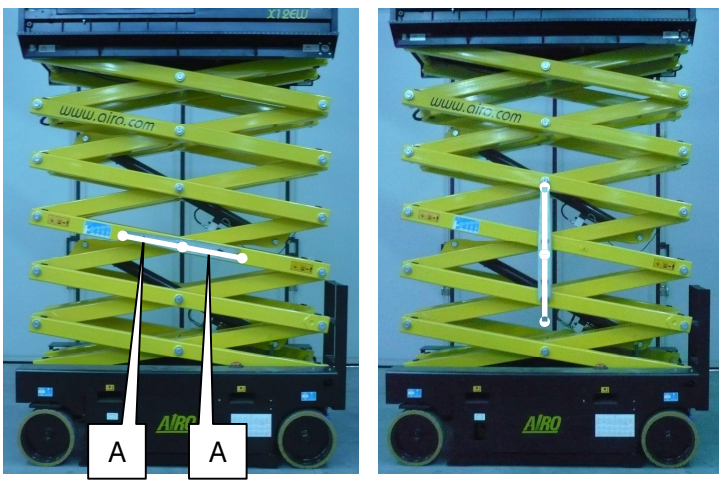
- § Unscrew knobs B completely (on both sides of the lifting structure)
- § Rotate safety bars A by setting them in vertical position
- § Lower the structure until it rests on bars A firmly
- § Check the correct positioning of bars A



7-1: Locking of X6EN scissors



7-2: Locking of X8EN, X8EW scissors



7-3: Locking of X10EN, X10EW, X12EW scissors

7.2 MACHINE CLEANING

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

Do not use pressurized water jets (e.g.: 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

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

OPERATION	FREQUENCY
Screw tightening as indicated in paragraph "Various adjustments"	After the first 10 working hours
Oil level check in hydraulic tank	After the first 10 working hours
Screw tightening as indicated in paragraph "Various adjustments"	After the first 10 working hours
Battery state (charge and liquid level)	Every day
Deformation of tubes and cables	Every month
Oil level check in hydraulic tank	Every month
Articulated joints / sliding blocks greasing	Every month
Stickers and code plates	Every month
Screw tightening as indicated in paragraph "Various adjustments"	Every year
Electric connections check	Every year
Hydraulic connections check	Every year
Periodic operation check and structure visual check	Every year
Inclinometer operation check	Every year
Operation check of platform load control device	Every year
Calibration check of main relief pressure valve	Every year
Calibration check of lifting circuit relief pressure valve	Every year
Operation check of M1 Microswitch	Every year
Operation check of MPT1 and MPT2 microswitches	Every year
Braking valve efficiency check	Every year
Emergency devices efficiency check	Every year
Hydraulic filter replacement	Every two years
Total oil change in hydraulic tank	Every two years

IT IS NECESSARY

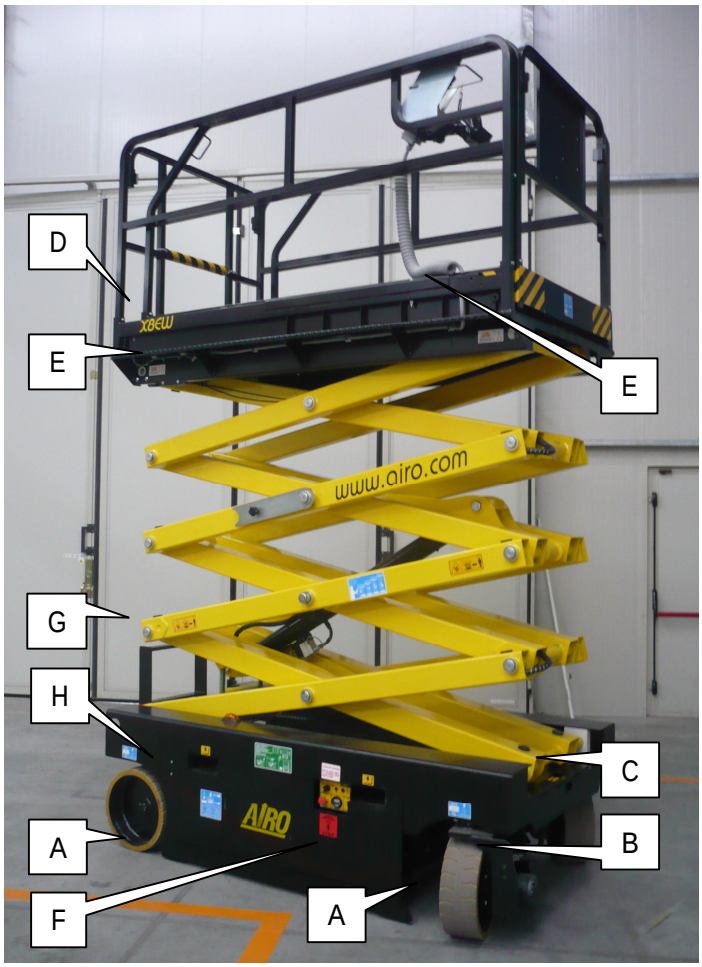
TO SEND THE MACHINE TO THE MANUFACTURER WITHIN 10 YEARS OF WORK (OR 1600÷2200 WORK HOURS) FOR A COMPLETE CHECK

7.4 VARIOUS ADJUSTMENTS

Check the conditions of the following components and, if necessary, tighten (Figure 7-4: Location of parts to be adjusted):

A. Wheels nuts and wheels nuts blocking pins
B. Traction motor fixing screws
C. Steering cylinder fixing screws
D. Platform and rails fixing screws
E. Lifting structure fixing screws
F. Hydraulic fittings
G. Boom pins locking nuts and rings
H. Parking brakes fixing screws
I. Mobile platform stop blocks

For torque wrench setting refer to the table below.



7-4: Location of parts to be adjusted

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

7.5 GREASING

The articulated joints of the lifting structure are equipped with self-lubricating bushings which are maintenance-free.

At least once a month, using a spatula or a brush, lubricate the sliding guides (Figure 7-5: Location of parts to be greased) : of the

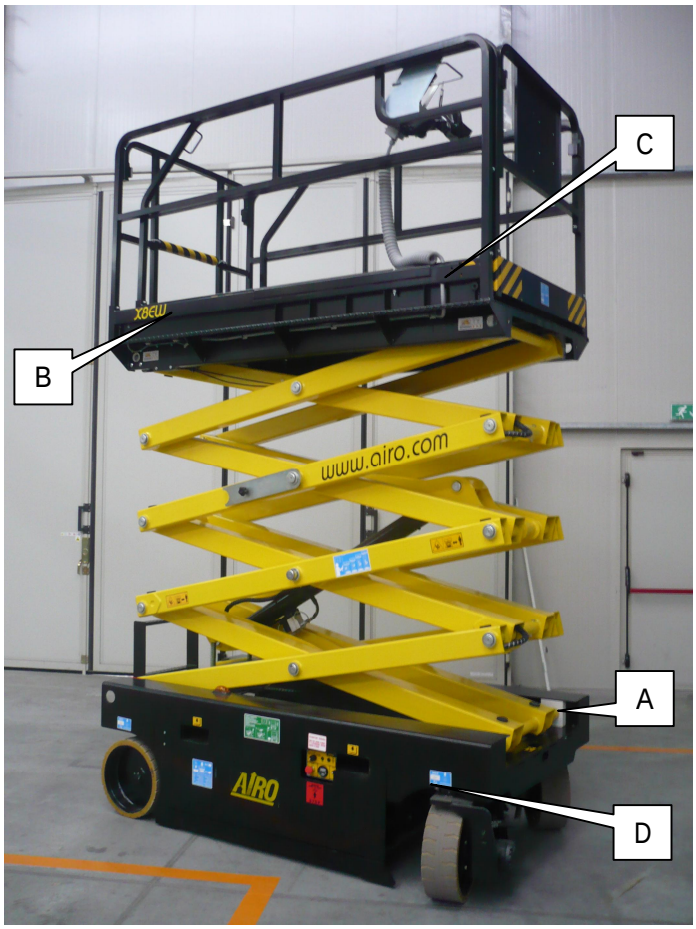
A. sliding blocks of the extension structure on the chassis
B. sliding blocks of the extension structure under the platform
C. counter-pressure sliding blocks of the mobile platform

At least once a month lubricate:
D. the support pins of the steering wheels equipped with greaser

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.



7-5: Location of parts to be greased

7.6 LEVEL CHECK AND HYDRAULIC CIRCUIT OIL CHANGE

Periodically check the tank level through the special window (figure 7-7:) and make sure it always lies between the min. and max. values. If necessary top up until max. level is reached.
Completely change the hydraulic oil according to the frequency indicated in the table of paragraph 7.3.

To empty (figure 7-7:):

- lower the platform completely
- stop the machine by pressing the push-button of the ground control station
- disconnect the tubes from the tank
- unscrew flange A unlocking the screws with a Phillips screwdriver
- remove the tank from its seat after removing bar C
- pour the tank content in a suitable container, through the filling cap.

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

HYDRAULIC SYSTEM OIL		
BRAND	TYPE	REQUIRED QUANTITY
ESSO	INVAROL EP46	28 Litres
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.

7-6 : Oil check window

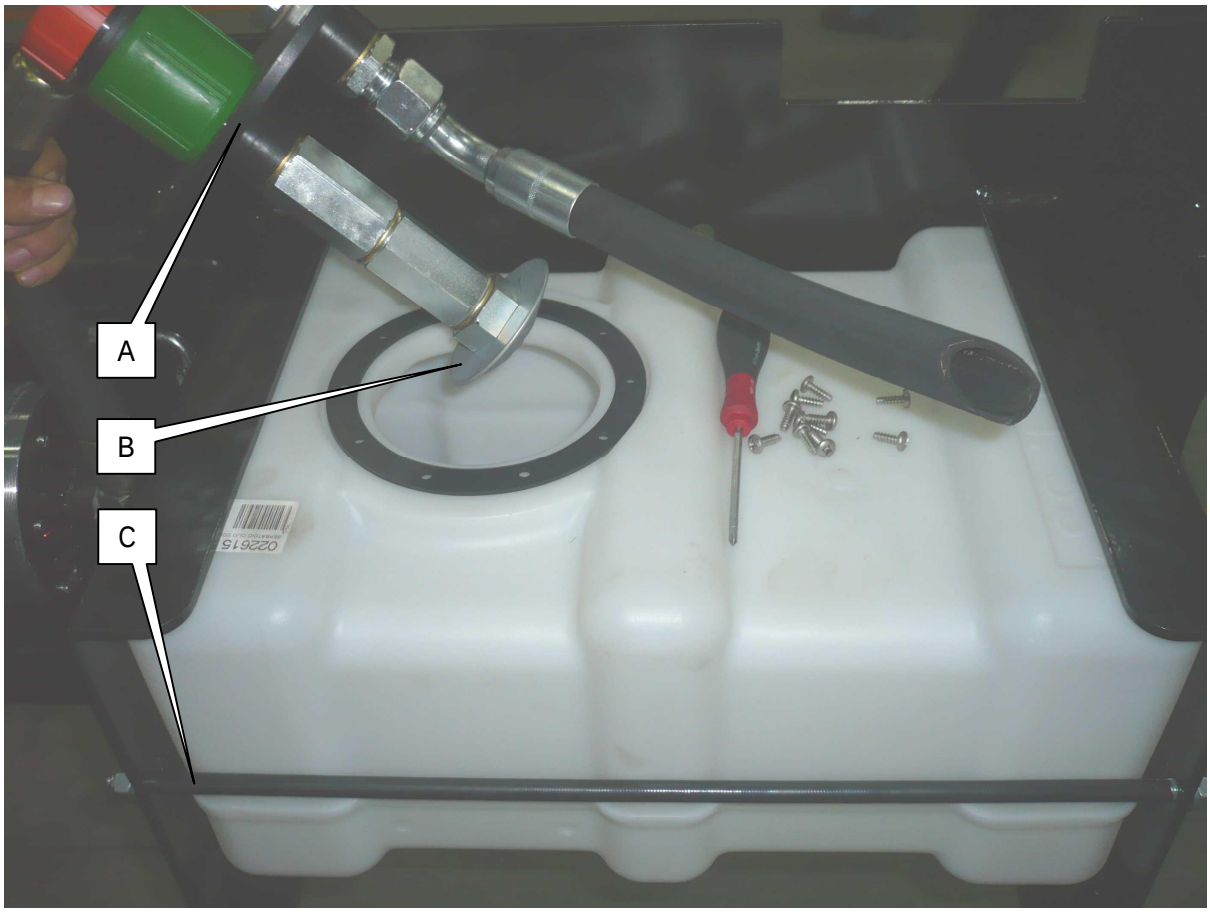
7.7 HYDRAULIC FILTER CLEANING / REPLACING

All models are equipped with suction filter inside the tank. It is advisable to replace it every two years.

To replace the suction filter installed inside the tank (figure 7-7:):

- stop the machine by pressing the push-button of the ground control station
- disconnect the tubes from the tank
- unscrew flange A unlocking the screws with a Phillips screwdriver
- unscrew filter B from the suction tube and clean it with a detergent and a compressed air jet by blowing from the connection or replace the filtering element

to restore the initial condition, carry out the above-mentioned operation in reverse order.



7-7:

⚠ Replace the filter 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 filter has been replaced (or cleaned), check the hydraulic oil level in the tank.

7.8 MAIN PRESSURE RELIEF VALVE ADJUSTMENT AND OPERATION CHECK

The main 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

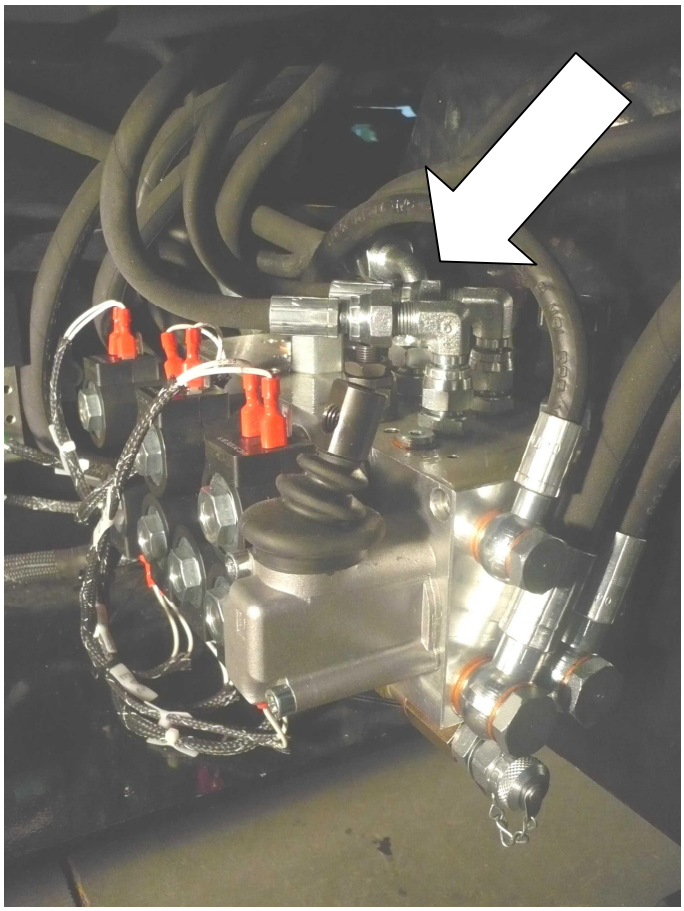
To check the operation of the main pressure relief valve (figure 7-8: Hydraulic block):

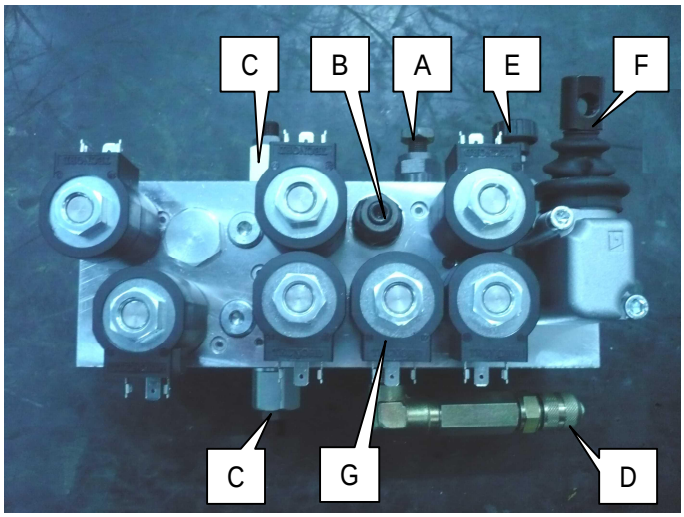
- Disconnect the power cord of the solenoid valve EV4 (G)
- Introduce a manometer with full scale of at least 250 bars in the special quick coupling (1/4" BSP) D
- From the ground control station lift the unit
- Check the pressure value. The correct value is indicated in the chapter "Technical features"

Check operation at least once a year.

To adjust the main relief valve:
(FIGURE Errore. L'origine riferimento non è stata trovata.):

- Disconnect the power cord of the solenoid valve EV4
- Introduce a manometer with full scale of at least 250 bars in the special quick coupling (1/4" BSP) D
- Locate the main pressure relief valve A
- Unscrew the adjustment dowel lock-nut
- From the ground control post, lift the unit and 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 adjustment dowel by means of the lock-nut.





7-8: Hydraulic block

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

7.9 OPERATION CHECK OF LIFTING CIRCUIT RELIEF PRESSURE VALVE

The self-propelled platforms, X2 series, have a main 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 calibration of the system is necessary:

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

To check the pressure relief valve on the lifting circuit (figure 7-8: Hydraulic block):

- Introduce a manometer with full scale of at least 250 bars in the special quick coupling (1/4" BSP) D
- From the ground control station lift the unit up to the stop block
- Check the pressure value. The correct value is indicated in the chapter "Technical features"

Check operation at least once a year.

To calibrate the pressure relief valve on the lifting circuit (figure 7-8: Hydraulic block):

- Introduce a manometer 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 B
- Unscrew the adjustment dowel lock-nut
- From the ground control station lift the unit up to the stop block
- 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 adjustment dowel by means of the lock-nut

CAUTION!

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

7.10 BRAKING VALVES OPERATION 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 unit on a flat ground, free of obstacles, operate the drive control and when the max. speed is reached, release the control immediately
- The correct operation of the braking system allows the machine to stop within a distance lower than 70 cm
- The braking system can stop and keep the machine on slopes as indicated in "Technical features" (the braking distance on descents is longer; drive downwards at the min. drive speed).

Calibration of both braking valves is required:

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

To calibrate the braking valves:

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

CAUTION!

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

7.11 INCLINOMETER OPERATION CHECK

CAUTION!

Usually the inclinometer does 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.

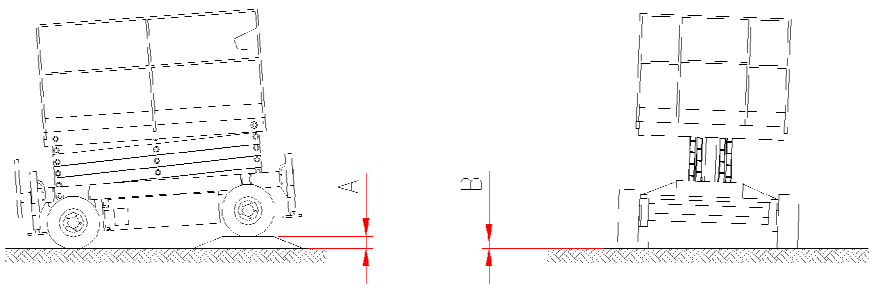
The inclinometer does not require any adjustment since it is calibrated in the factory before the machine is delivered.
This device controls the chassis inclination and when inclined over the allowed value:

- 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 audible device 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).

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 audible 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 audible platform device turn on
- if the alarm is not activated CALL THE TECHNICAL ASSISTANCE



	MODELS							
SHIMS	X 6 EN	X 8 EW	X 8 EW WIND	X 8 EN	X 10 EW	X 10 EW WIND	X 10 EN	X 12 EW
A [mm]	97	97	97	97	97	97	97	97
B [mm]	26	37	37	26	37	28	16	28

7.12 OPERATION CHECK OF PLATFORM OVERLOAD CONTROLLER

The AIRO self-propelled aerial platforms, X2 series, are equipped with a sophisticated system controlling the platform overload.

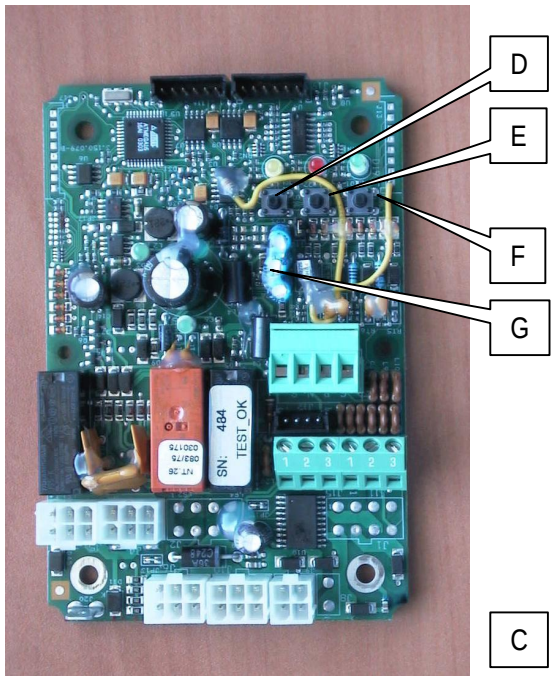
Normally the overload controller does not require any adjustment, since it is calibrated in the factory before the machine is delivered. This device checks the load on the platform and:

- it disables all movements if the platform is lifted and overloaded by 20% compared to the rated load
- with platform in transport position and overloaded by 20% compared to the rated load, it stop lifting only
- it warns the user of the overload condition by means of the audible device and the platform warning light (see chapter 5).
- by removing the exceeding load, the machine can be operated again.

The overload controller consists of:
- deformation transducer (A) (load cell)
- electronic board (B) for the device calibration 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 station;
With platform completely lowered, add to the rated load an overload of 20% of the rated load and carry out the lifting operation. In this condition the red alarm light and the audible device turn on (see chapter 5).

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.



7-9: Load control

The calibration of the system is necessary:
- 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:

- § turn off the machine
- § open box B which contains electronic board C
- § with no load on the platform, introduce the jumper to connector G
- § turn on the machine
- § press button D (the yellow 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 + 15%
- § press button F (the green light turns on a few seconds)
- § press button D again to exit the calibration procedure (the yellow light turns off and if the procedure has been carried out correctly, the red light stays on signalling the overload)
- § turn off the machine
- § open the jumper on connector G
- § turn on the machine
- § check that after removing the 15% overload (only the rated load stays on the platform) the alarm condition does not occur in any of the platform positions (platform down, up, driving, extended)
- § once the adjustment has been completed, close the box which contains the board.

⚠

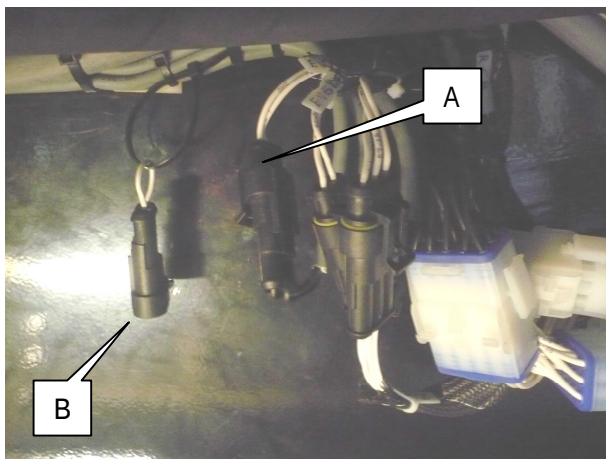
AS THIS OPERATION IS VERY IMPORTANT IT IS TO BE CARRIED OUT BY SPECIALIZED TECHNICIANS ONLY.

CALL THE TECHNICAL SUPPORT

7.13 LOAD CONTROL SYSTEM BY-PASS

In case of fault and impossibility to calibrate the device, a by-pass of the system is possible in the following way (FIGURE 7-70: Load control by-pass):

- § locate connector A inside the central unit box
- § remove connection
- § locate connector B (by-pass), usually fixed to connector A by means of clamp
- § introduce connector B instead of connector A
- § once this operation has been completed, the machine is without overload controller.



7-70: Load control by-pass

⚠

CAUTION!
THIS OPERATION IS ALLOWED ONLY FOR EMERGENCY HANDLING OF THE UNIT 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.

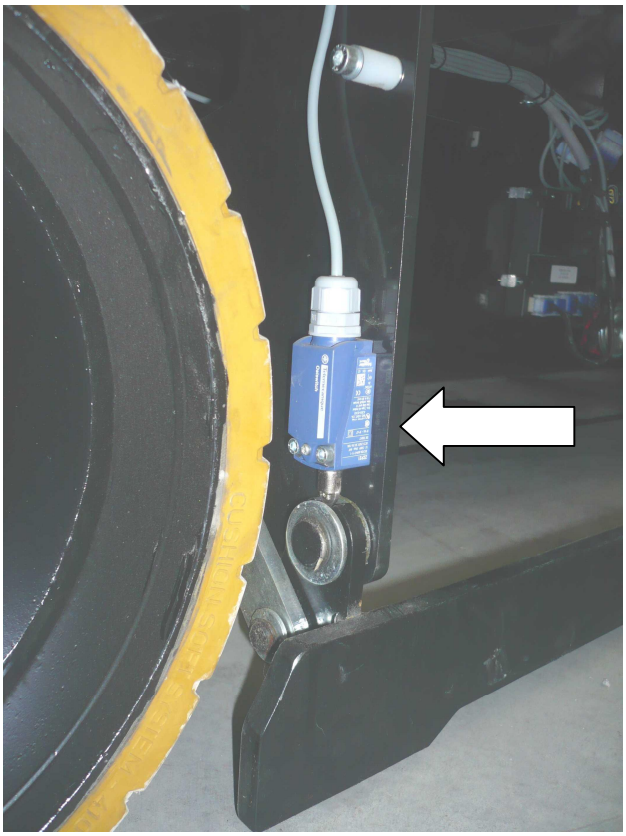
7.14OPERATION CHECK OF SAFETY MICROSWITCHES

All micro-switches are to be found on the chassis and platform and can be identified by means of labels.

Micro-switch functions:

MPT1 and MPT2 (figure 7-11: MPT1 Micro):

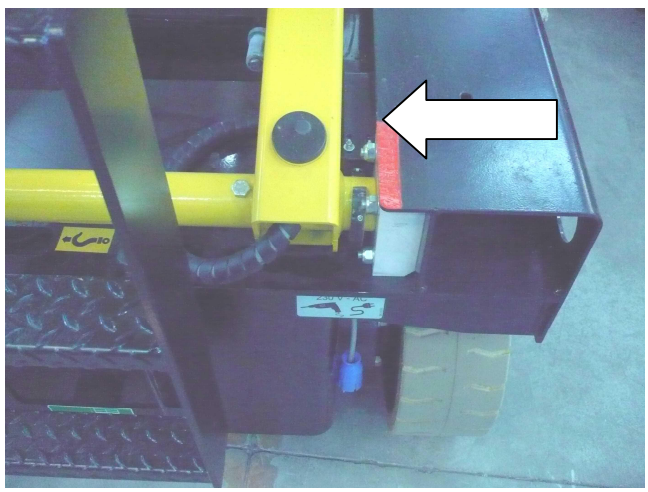
- § control the position of the two pot-hole guards. with one or both microswitches open (guards lifted or not completely lowered) drive is stopped if platform is lifted at a height from the ground indicated in chapter "Technical Features" (M1 activated). Their function is excluded if platform is lowered (M1 free).



7-11: MPT1 Micro

M1 (figure 7-82: M1 Micro):

- § activates drive safety speed with platform a height from the ground indicated in chapter "Technical features".
- § stops lowering automatically in a position where the vertical distance between the scissor ends is over 50 mm. In this condition the audible alarm warns about the danger condition by increasing its frequency. The operator on the platform must release the lowering control and wait until the audible alarm stops (about 3 sec.), then he can resume the lowering control.



7-82: M1 Micro

Check operation at least once a year.

7.15 "DEAD-MAN" SWITCH OPERATION CHECK

To check the "dead-man" switch operation:

- set "drive" mode with selector L (5-1: Platform control panel)
- move the joystick control forward and backward in sequence, WITHOUT PRESSING THE "DEAD-MAN" SWITCH
- check that the machine does not perform any movement

- set "drive" mode with selector L (5-1: Platform control panel)
- hold down the "dead-man" switch for more than 10 seconds
- with the switch 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 post unless you press the "dead-man" switch 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" switch and press it again.
The condition of the switch is indicated by the green led H (figura 5-1: Platform control panel):

- green led lit up steady post enabled
- green led lit up blinking post disabled

Check operation at least once a year.

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

7.16 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.

7.16.01 GENERAL WARNING INSTRUCTIONS

- In case of new batteries do not wait for the flat battery warning before recharging; recharge batteries after 3 or 4 working hours for the first 4/5 times.
- In case of new batteries full performance is achieved after approx. ten cycles of discharge and charge.
- Charge the battery in airy rooms and open the caps to allow the outflow of gas.
- Do not use extension leads exceeding 5 metres to connect the battery charger to the mains.
- Use a cable of suitable section (min 3x2.5 mm^2).
- Do not use rolled-up cables.
- Do not approach the battery with flames. Risk of 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 splashguard 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.

7.16.02 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 splashguard 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.
- 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.

7.16.03 BATTERY CHARGING

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

Connect the battery charger to the power mains having all protections according to the current standards in force and with the following features:

- Power voltage 230V ± 10%
- Frequency 50÷60 Hz
- Activated ground line
- Magneto-thermic switch and residual current device (“circuit breaker”)

Moreover:

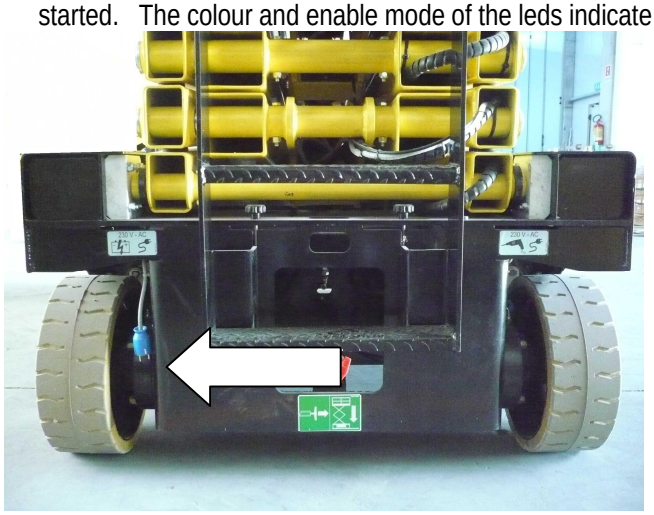
- Do not use extension leads exceeding 5 metres to connect the battery charger to the mains.
- Use a cable of suitable section (min 3x2.5 mm^2).
- Do not use rolled-up cables.

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

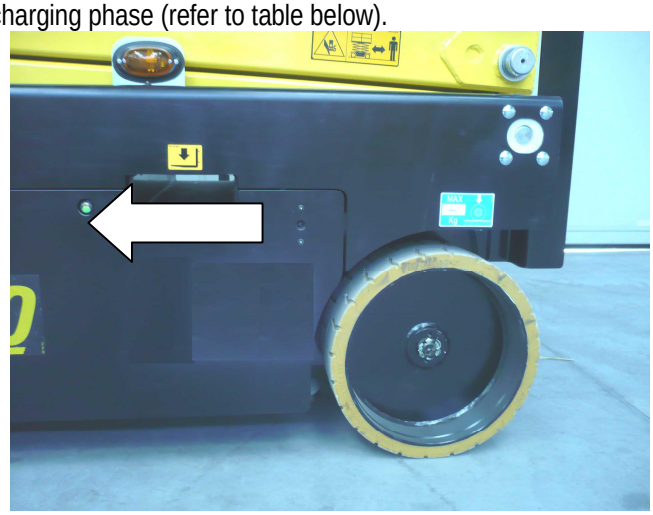
CAUTION!
After charging, when the battery charger is still connected, the electrolyte density values should range from 1.260 g/l to 1.270 g/l (at 25°C).

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 leds indicate the charging phase (refer to table below).



7-93: Battery charger plug



7-104: Battery charger light

WARNING	DESCRIPTION
Red led blinking 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:

§ Simply disconnect the machine from the electric line.

CAUTION!

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

7.16.04 BATTERY CHARGER: FAULT REPORT

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

WARNING	PROBLEM	SOLUTION
Red led constantly blinking	No connection with the battery	Check the connections with the battery
	Connections with the battery inverted	
Red and yellow led blinking	Connection problems	Check all connections
		Check that battery was not disconnected during charging phase
	Battery problems	Check the battery
		Check the fluid level (pb-acid batteries only)

7.16.05 BATTERY CHANGE

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

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

CALL THE TECHNICAL SUPPORT

8 MARKS AND CERTIFICATIONS

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

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

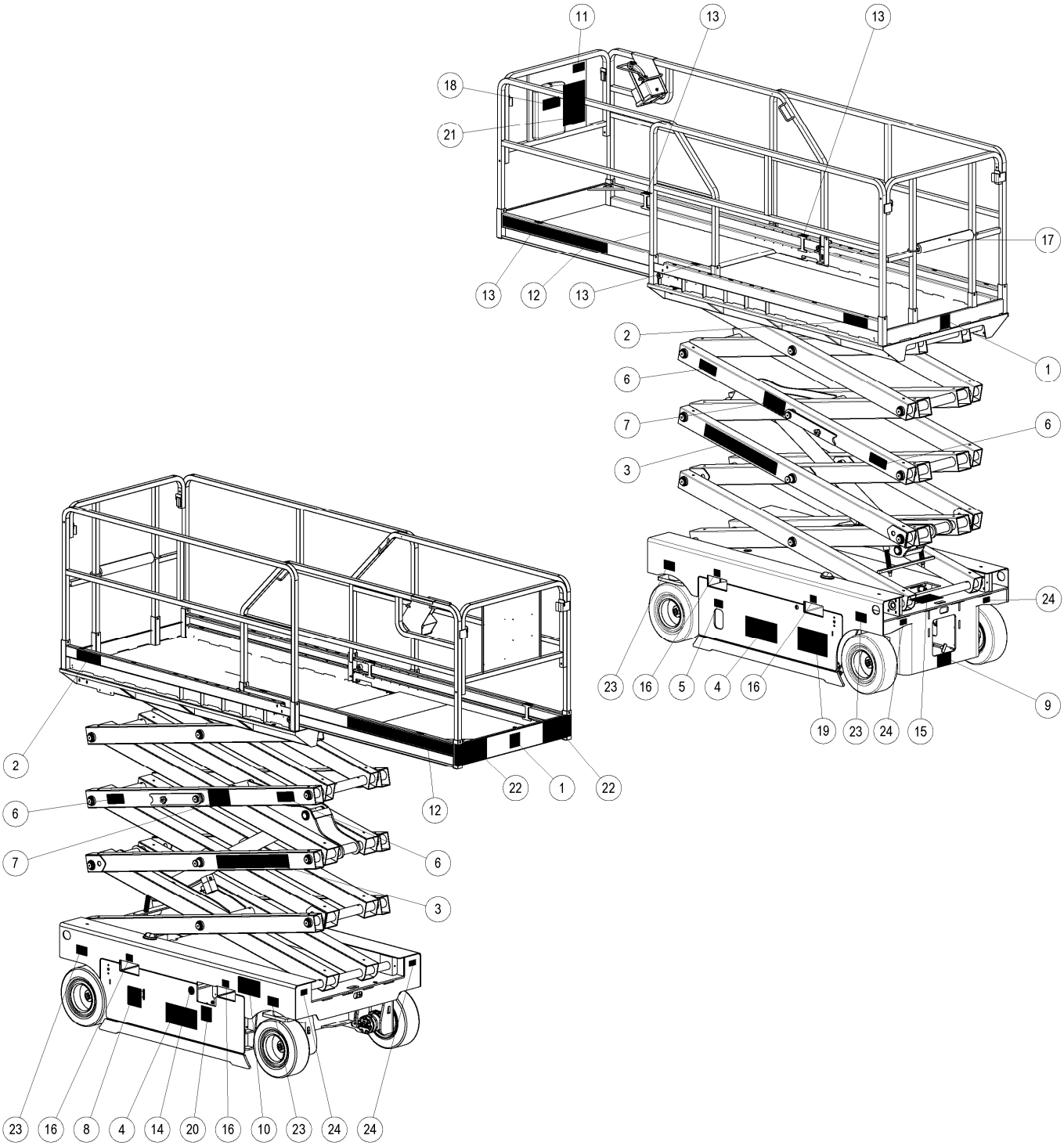
Test carrying out is shown by the above plate with CE mark applied on the machine and by the declaration of conformity enclosed in this user manual.

9 PLATES AND STICKERS

STANDARD STICKERS CODES

	Code	Description	Quantity
24	001.10.031	Towing hook sticker	2
23	001.10.243	“Max. load per wheel” sticker	4
22	010.10.010	Yellow-black line sticker	2
21	001.10.001	AIRO warnings plate*	1
20	001.10.098	STOP sticker	1
19	001.10.057	General warnings sticker	1
18	001.10.088	Document holder sticker	1
17	001.10.244	Entrance bar yellow-black line sticker	1
16	001.10.060	Lifting point sticker	4
15	001.10.024	AIRO serial number plate	1
14	001.10.180	First check sticker	1
13	035.10.007	Safety harness coupling sticker	4
12	001.10.245	Sliding platforms yellow-black line sticker	2
11	037.10.007	Machine for indoors universal sticker	1
10	045.10.001	X2 series emergency towing sticker	1
9	045.10.004	Manual lowering sticker	1
8	045.10.002	Oil level and type sticker	1
7	045.10.006	Safety bar sticker	2
6	045.10.003	Hands danger + no stopping sticker	4
5	045.10.005	Battery isolator sticker	1
4	001.10.173	AIRO translucent background yellow sticker	2
3	037.10.011	“www.airo.com” pre-spaced black sticker	2
2	046.10.001	X6EN code sticker	2
	047.10.001	X8EW code sticker	2
	048.10.001	X8EN code sticker	2
	049.10.001	X10EW code sticker	2
	050.10.001	X10EN code sticker	2
	051.10.001	X12EW code sticker	2
1	046.10.002	X6EN X8EN X12EW capacity sticker	2
	047.10.002	X8EW capacity sticker	2
	049.10.002	X10EW capacity sticker	2
	050.10.004	X10EN capacity sticker	2

* Sticker in Italian. Other languages available on request.


11
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16
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23
24
24

10 CONTROL REGISTER

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

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

- Periodic obligatory inspections 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 ANNUAL frequency.
- Transfers of Ownership. In Italy, the purchaser must notify the ISPESL department responsible that the installation of the machine has occurred.
- Extraordinary maintenance work and replacement of important elements of the machine.

REQUIRED PERIODIC INSPECTIONS BY THE REGULATORY AGENCY		
DATE	REMARKS	Signature + Stamp

REQUIRED PERIODIC INSPECTIONS BY THE REGULATORY AGENCY			
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
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° 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
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

STRUCTURAL CHECK	DESCRIPTION OF OPERATIONS TO BE PERFORMED
Various adjustments	See chapter 7.4

	DATE	REMARKS	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

Greasing	See chapter 7.5 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
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	DESCRIPTION OF OPERATIONS TO BE PERFORMED
Hydraulic tank oil level check.	See chapter 7.6 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
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

Calibration check of lifting circuit relief pressure valve.	See chapter 7.9

	DATE	REMARKS	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	DESCRIPTION OF OPERATIONS TO BE PERFORMED
Calibration check of main relief pressure valve.	See chapter 7.8

	DATE	REMARKS	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

Battery state.	See chapter 7.16 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
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER			
CHECK		DESCRIPTION OF OPERATIONS TO BE PERFORMED	
Total oil change in hydraulic tank (EVERY TWO YEARS)		See chapter 7.6	
	DATE	REMARKS	Signature + Stamp
2° Year			
4° Year			
6° Year			
8° Year			
10° Year			
Hydraulic filter cleaning / replacing (EVERY TWO YEARS)		See chapter 7.7	
	DATE	REMARKS	Signature + Stamp
2° Year			
4° Year			
6° Year			
8° Year			
10° Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

SAFETY SYSTEM CHECK	DESCRIPTION OF OPERATIONS TO BE PERFORMED
Inclinometer calibration and operation check.	See chapter 7.11

	DATE	REMARKS	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

Efficiency check of platform load control system.	See chapter 7.12

	DATE	REMARKS	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

SAFETY SYSTEM CHECK	DESCRIPTION OF OPERATIONS TO BE PERFORMED
Braking system efficiency check.	See chapter 7.10

	DATE	REMARKS	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

Microswitch operation check: M1, MPT1, MPT2	See chapter 7.14

	DATE	REMARKS	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

SAFETY SYSTEM CHECK	DESCRIPTION OF OPERATIONS TO BE PERFORMED
Stickers and plates check.	Check the legibility of the aluminium plate on the platform where the main instructions are summarised; that the capacity stickers are on the platform and that they are legible; that the stickers on the ground and platform control stations are legible.

	DATE	REMARKS	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

CHECK OF EMERGENCY DEVICES	DESCRIPTION OF OPERATIONS TO BE PERFORMED
Emergency manual controls check	See chapter 5.10

	DATE	REMARKS	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER			
SAFETY SYSTEM CHECK		DESCRIPTION OF OPERATIONS TO BE PERFORMED	
"DEAD-MAN" SYSTEM CHECK		See chapter 7.15	
	DATE	REMARKS	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° 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

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