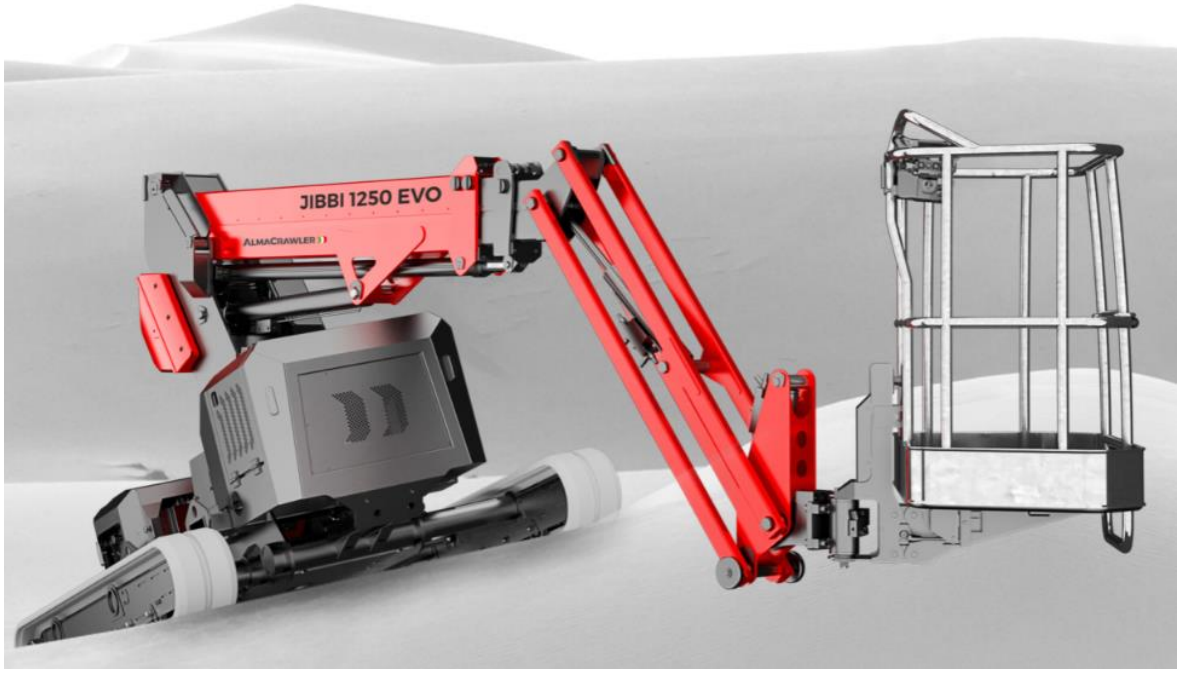
ALMACRAWLER



JIBBI 1250 EVO

Translation of original instructions

Prior to commissioning the machine read carefully this Use and Maintenance Manual

Note: table of contents at the end of the manual

Edition	Date
00	01/10/2018

1 GENERAL INFORMATION

1.1 Documents supplied with each machine

- EC Declaration of Conformity;
- Instruction Manual (this manual);
- Spare Parts Manual;
- Wiring diagrams and hydraulic layouts;
- Control register.

1.2 Details of Manual

- Instruction manual for *Elevating work platform;*
- Version: *JIBBI 1250 EVO.*

Note: Some of the photos and illustrations may not refer specifically to the version of the machine in your possession, but provide indications concerning the purpose for which they have been included.

RECIPIENTS OF THIS MANUAL

- User;
- Maintenance technician.

Attention: The servicing personnel must be properly trained and experienced.

Note: CAREFULLY READ this manual before performing any operation on the machine. If in doubt, do not improvise. Call the assistance service.

1.3 Ownership of the information

This document may only be used by the customer to whom the manual has been supplied along with the machine, and only for the purpose of use and maintenance of the machine to which the manual refers.
ALMAC s.r.l. hereby declares that the information in this manual was congruent with the technical and safety specifications of the machine to which the manual refers. The manufacturer declines all liability for direct or indirect damage to persons, things or animals deriving from use of the machine in conditions differing from those envisaged.
ALMAC s.r.l. reserves the right to make changes or improvements, without prior notice, to the documentary material and to the machines, including marketed machines of the same model as that to which this manual refers but with a different serial number.
The information contained in this manual refers in particular to the equipment specified in "MEWP *identification data*" and to the related documentation.

1.4 Manufacturer's identification data

ALMAC S.r.l.

e-mail: info@almac-italia.com
Tel. +39 0375 83 35 27
Fax. +39 0375 78 43 50
VAT no. and Tax Code 02559800350

Registered Office	Operational Headquarters
Viale Ruggeri 6/A	Via Caduti sul Lavoro 1
42016 – Guastalla (RE) – Italy	42012 – Viadana (MN) - Italy

1.5 MEWP identification data

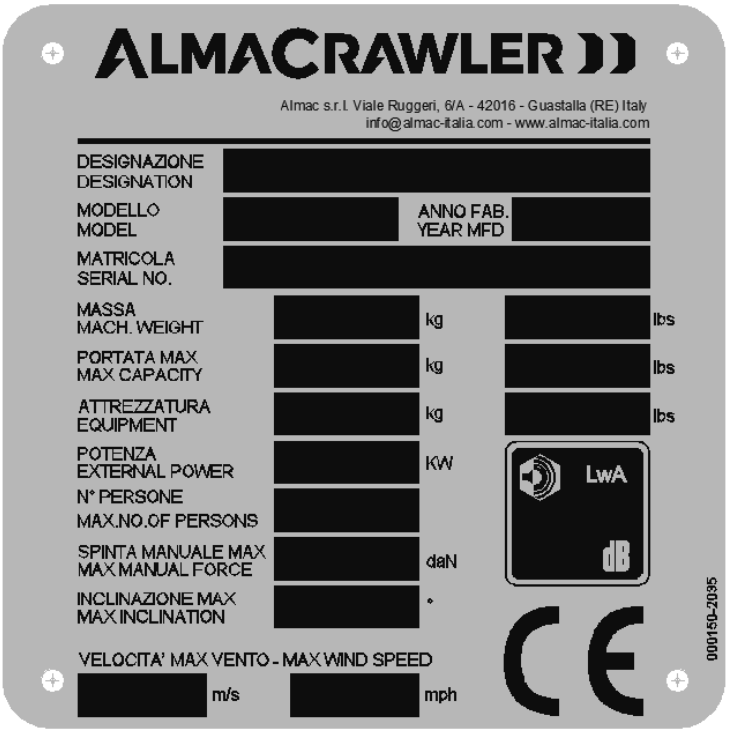
The machine named JIBBI 1250 EVO is defined according to the technical standards in force (ref. EN UNI EN 280:2015), as:

Mobile Elevating Work Platform (MEWP), belonging to group B, type 3 (point 1.4-EN 280)

Meanings:

GROUP B: All types of mobile elevating work platforms other than "Group-A" (mobile elevating work platforms where the vertical projection of the centre of the platform area in all platform configurations at the maximum frame inclination specified by the manufacturer is always inside the tipping lines).

TYPE 3: Mobile elevating work platforms where travelling with a raised work platform are controlled from a point of control on the work platform.



Identification plate

Refer to the data on the identification plate for an exact identification of the MEWP.

1.6 Technical data

Technical Data		
Capacity in basket	Kg / lbs	230 / 507
No. of operators in basket		2
Lifting time	s	50
Lowering time	s	50
Hydraulic side-shift pressure	Bar / psi	210 / 3046
Hydraulic lifting pressure	Bar / psi	180 / 2610
Outreach hydraulic pressure	Bar / psi	120 / 1740
Oil tank capacity	L / US GAL	37 / 9.77
Maximum basket rotation	°	+/- 70
Maximum slewing ring rotation	°	+/- 110
Gradient possible in transport condition	°	30
Ground max side gradient in transport condition with tracks extended	°	20
Max lateral and longitudinal gradient of the carriage in work condition	°	15
Maximum travelling speed	km/h / mph	2.5 / 1.55
Maximum speed with platform lifted	km/h / mph	0.4 / 0.25
Overall weight	Kg / lbs	2850 / 6283
Max wind force	m/s / mph	12.5 / 27.9
Starter battery voltage and capacity	V/Ah	12/54
Weight of starter battery	Kg / lbs	17 / 37.5
Sound power LwA	dBA	104
Sound level at operator position Lp (indoor industrial environment)	dBA	84.5 ± 2.6
Sound level at operator position Lp (outdoor environment on asphalt)	dBA	79.5 ± 2.6
Max peak level L_p peak	dBC	106.0
Vibrations transmitted to hand/arm system (operator hand rest)	m/s^2	< 2.5
Whole-body vibration (platform-measured on flat ground)	m/s^2	0.52 ± 0.10 *
Vibrations transmitted to hand/arm system (operator hand rest)	m/s^2	0.59 ± 0.12 **
Maximum manual thrust	daN	40

* Values refer to platform raised (Operating height)
* Values refer to platform at limit (Transport height)

Standard equipment	Optional equipment
Proportional electro-hydraulic controls	Electrical engine 230V/50 Hz
Internal combustion engine (YANMAR 3TNM68-AS)	Electrical engine 110V/50 Hz
Automatic accelerator	Electric motor 110V-230V/50 Hz
Cable remote control	Radio remote control
Display on consoles for the management of work areas, work times and alarms	Ultrasound anti-collision sensors
Dual speed gear motors	Ultrasound operator anti-crush sensor
Warning buzzer	Hoist
Anchor points for lifting-transportation	Man present pedal
Harness anchorage points	
Proactive levelling system	
Electric start in basket	
Dynamic levelling system of the machine	
Electronic control of the extension of the carriage extension cylinders	
Electronic control of the frame inclination	
Electronic control of the column inclination	
Electronic control of the boom inclination	
Electronic control of the outreach extension	
Electronic control of the antenna inclination (JIB)	
Electronic control of the basket inclination	
Air/water outlet in the basket	

Engine specifications	YANMAR 3TNM68-AS
Dry weight	104 kg / 229.3 lbs
Type of engine	4 TIMES – LIQUID COOLING - DIESEL
Displacement	784 cm^3 / 0.207 US gal
Net power	14.7 kW @ 3600 rpm
Net torque	45.1 Nm @ 2500 rpm
Q.ty engine oil	3 Lt / 0.79 US gal
Fuel tank capacity	24 Lt / 6.34 US gal

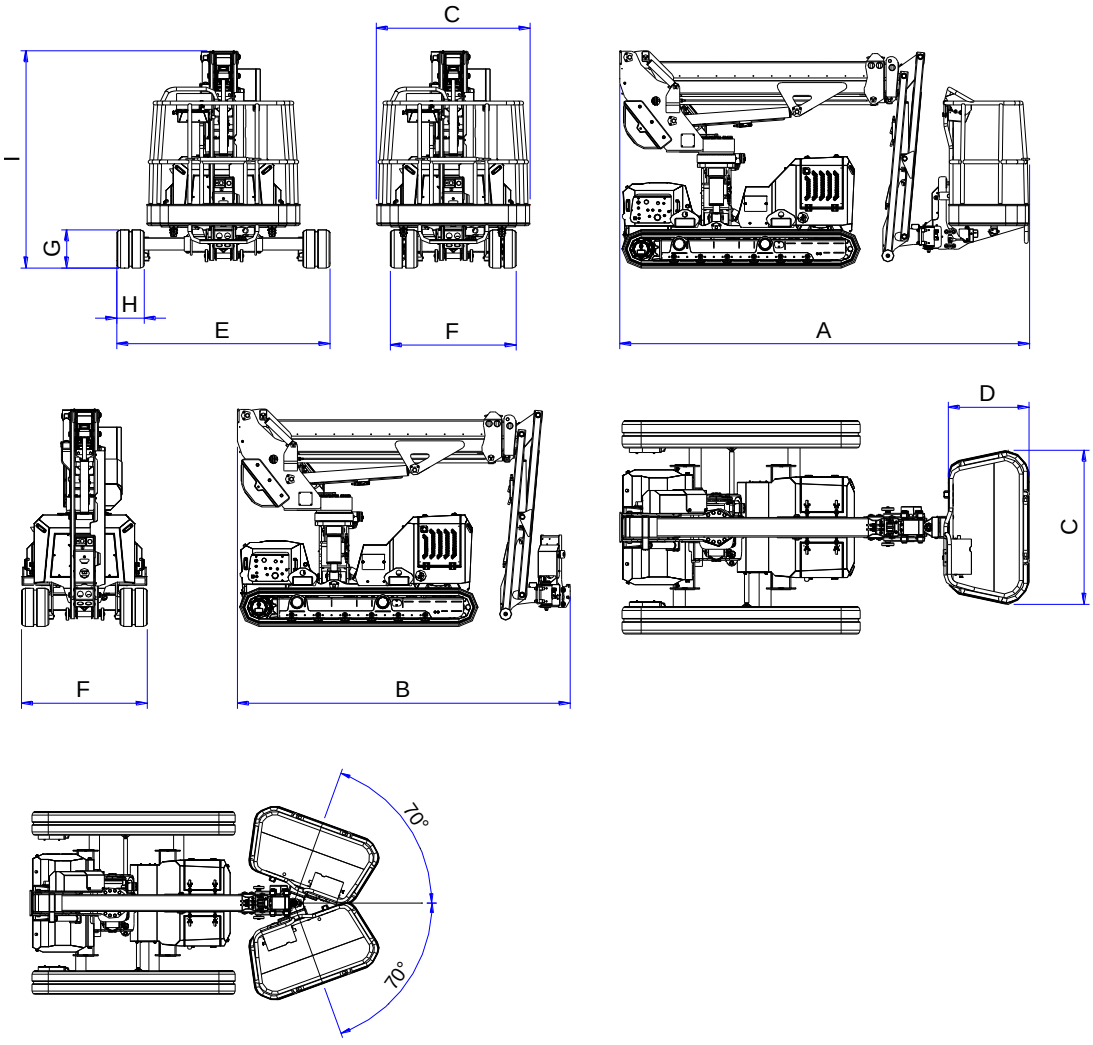
Electric engine	Specifications 230V-50hZ
Dry weight	14 kg / 30.8 lbs
Installed power	2.2 kW
Torque	10.2 Nm
Rpm	1400
Power supply	230 V / 50 Hz
IEC Size	90

Electric engine	Specifications 110V-50hZ
Dry weight	14 kg / 30.8 lbs
Installed power	1.85 kW
Torque	10.2 Nm
Rpm	1400
Power supply	110 V / 50 Hz
IEC Size	90

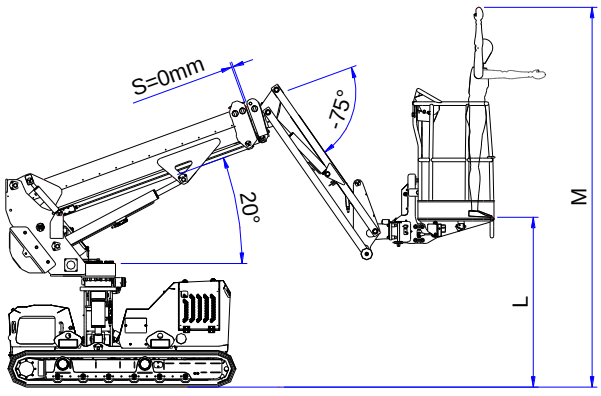
Electric engine	Specifications 110V/230V-50hZ
Dry weight	14 kg / 30.8 lbs
Installed power	1.85 Kw @ 110V 2.2 Kw @ 230V
Torque	10.2 Nm
Rpm	1400
Power supply	110 V-230 V / 50 Hz
IEC Size	90

1.7 Dimensions in transport configuration

Below are the configurations that the MEWP may assume in the transport conditions.



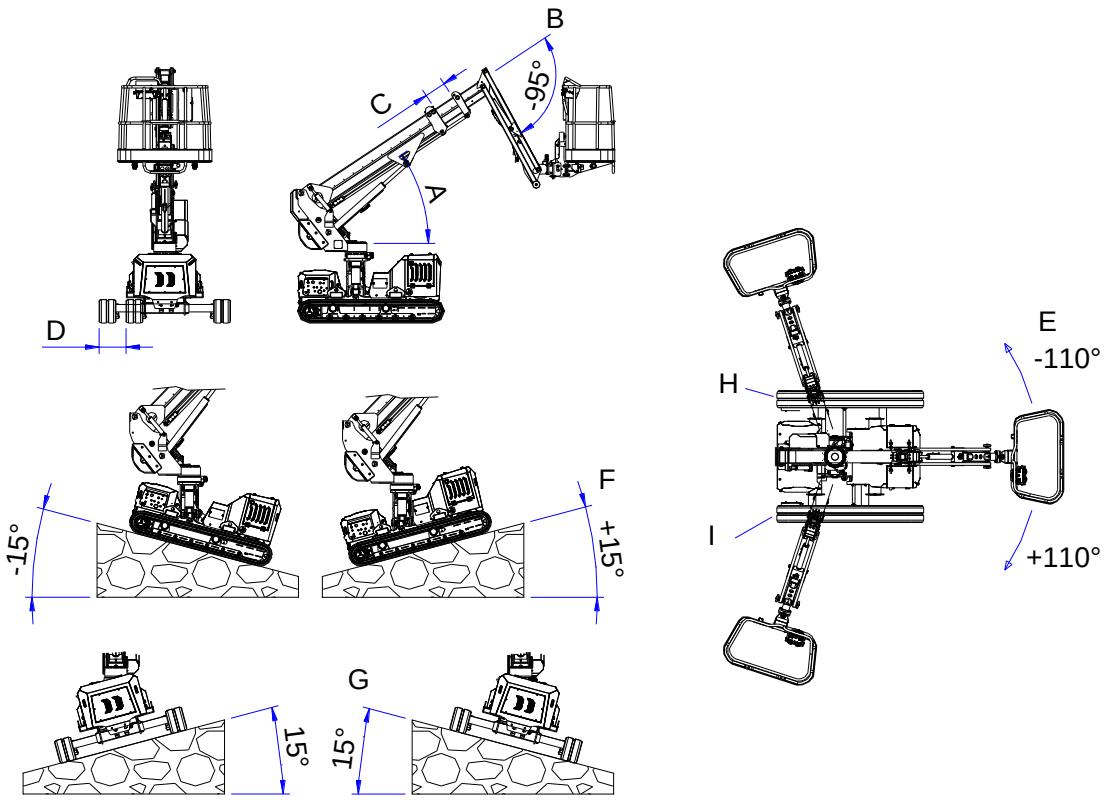
Maximum height in transport configuration.



Characteristic dimensions			
Machine length With basket fitted	A	m / ft	3.75 / 12.3
Machine minimum length With basket dismantled	B	m / ft	3.04 / 9.97
Basket length	C	m / ft	1.41 / 4.65
Basket width	D	m / ft	0.74 / 2.42
Maximum width Widened track configuration	E	m / ft	1.95 / 6.39
Maximum width Narrow track configuration with basket dismantled	F	m / ft	1.15 / 3.77
Height of track	G	mm / in	350 / 13.77
Width of crawler	H	mm / in	250 / 9.84
Maximum height	I	m / ft	1.99 / 6.52
Maximum pedestrian floor height in transport condition	L	m / ft	1.62 / 5.31
Maximum work height in transport condition	M	m / ft	3.62 / 11.87

1.8 Angles and characteristic dimensions of the platform

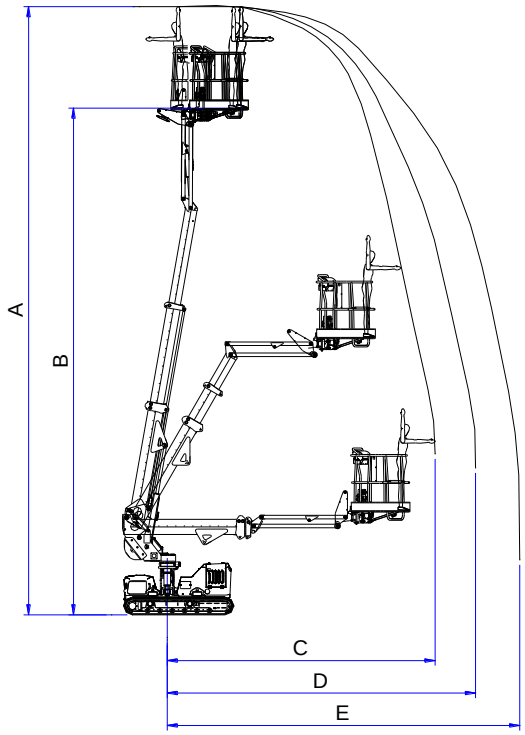
By controlling these variables by means of an electronic control unit, the working areas of the machine are limited.



Characteristic dimensions			
Telescopic boom lifting angle	A	°	0 / 80
Relative angle between the JIB and the telescopic boom	B	°	+10 / -95°
First outreach extension	C	Mm / ft	0-1870 / 0-5.9
Track extension	D	Mm / ft	0-400 / 0-1.31
Slewing ring rotation angle	E	°	+110 / -110
Carriage longitudinal inclination angle	F	°	+15 / -15
Carriage lateral inclination angle	G	°	+15 / -15
Right tracked undercarriage	H		
Left tracked undercarriage	I		

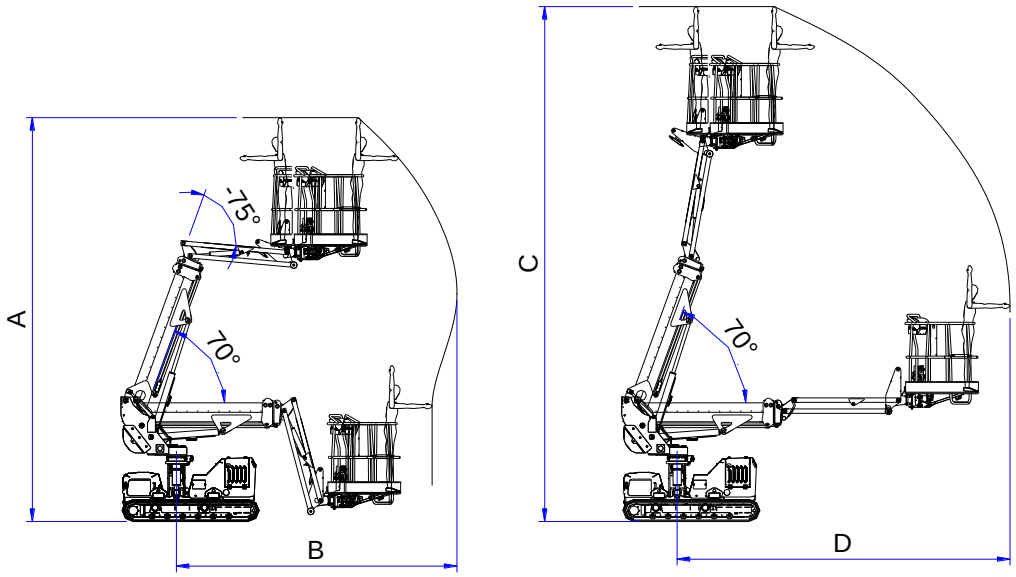
1.9 Platform work performance

Work configuration with tracks completely extended: Maximum height and maximum boom.
Non-permitted translation.



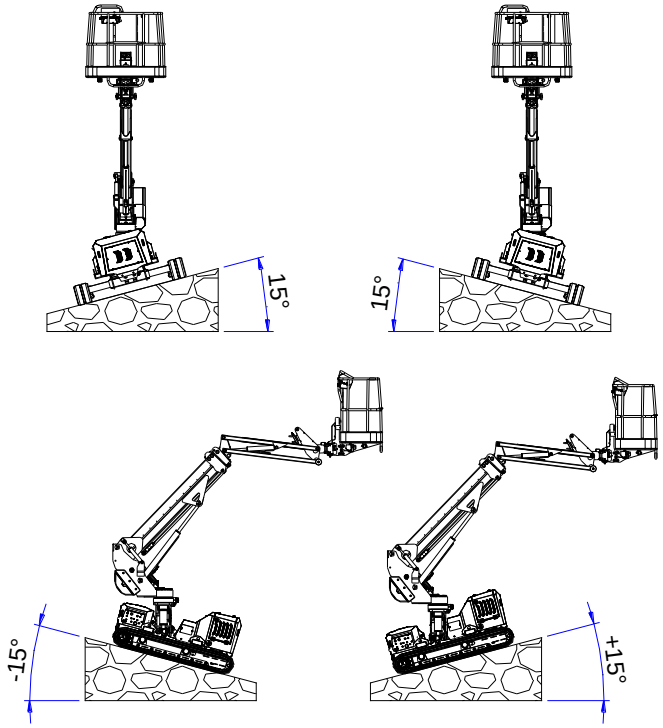
Characteristic dimensions			
Maximum work height	A	m / ft	12 / 39.37
Min height of floor surface	B	m / ft	10 / 32.8
Maximum outreach with 230Kg in basket	C	m / ft	5.3 / 17.38
Maximum outreach with 140Kg in basket	D	m / ft	6.1 / 20.01
Maximum outreach with 80Kg in basket	E	m / ft	7 / 22.96

Work configuration with tracks completely extended: Maximum height and maximum boom.
Translation permitted.

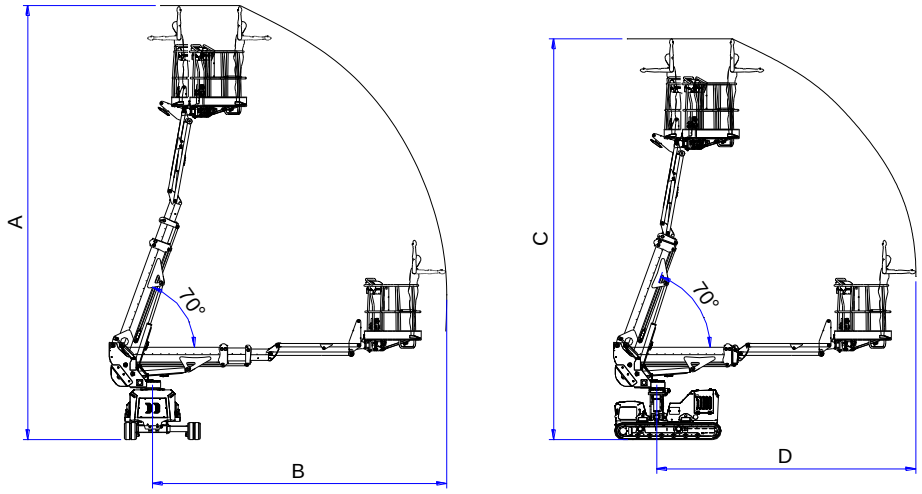


Characteristic dimensions			
Maximum work height from 170Kg to 230Kg in basket	A	m / ft	6.4 / 20.99
Maximum outreach from 170Kg to 230Kg in basket	B	m / ft	4.5 / 14.76
Maximum work height from 80Kg to 170Kg in basket	C	m / ft	8.2 / 26.9
Maximum outreach from 80Kg to 170Kg in basket	D	m / ft	5.3 / 17.38

Work configuration with both the tracks completely extended: Maximum ground inclination.



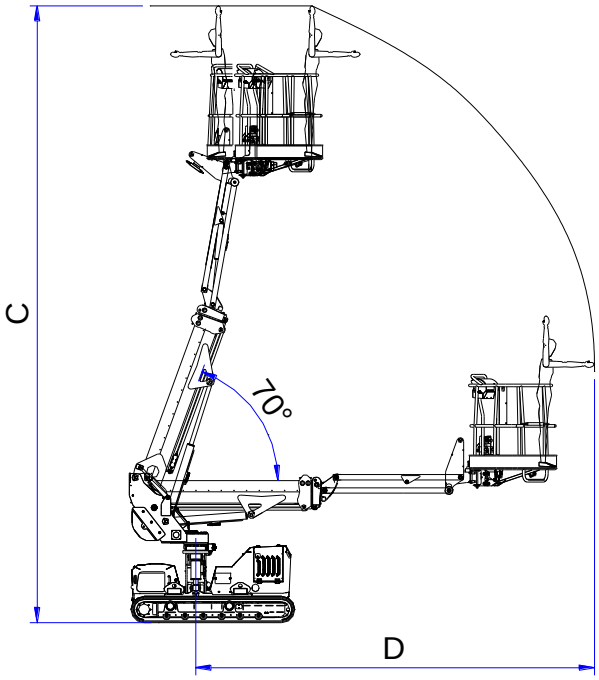
Work configuration with one track not completely extended: Maximum height and maximum boom. Translation only permitted with boom extension fully retracted, maximum load permitted in the basket 140Kg (308.65 lbs).



Characteristic dimensions			
Maximum work height	A	m / ft	8.9 / 29.19
Maximum work outreach	B	m / ft	6 / 19.68
Maximum work height	C	m / ft	8.2 / 26.9
Maximum work outreach	D	m / ft	5.3 / 17.38

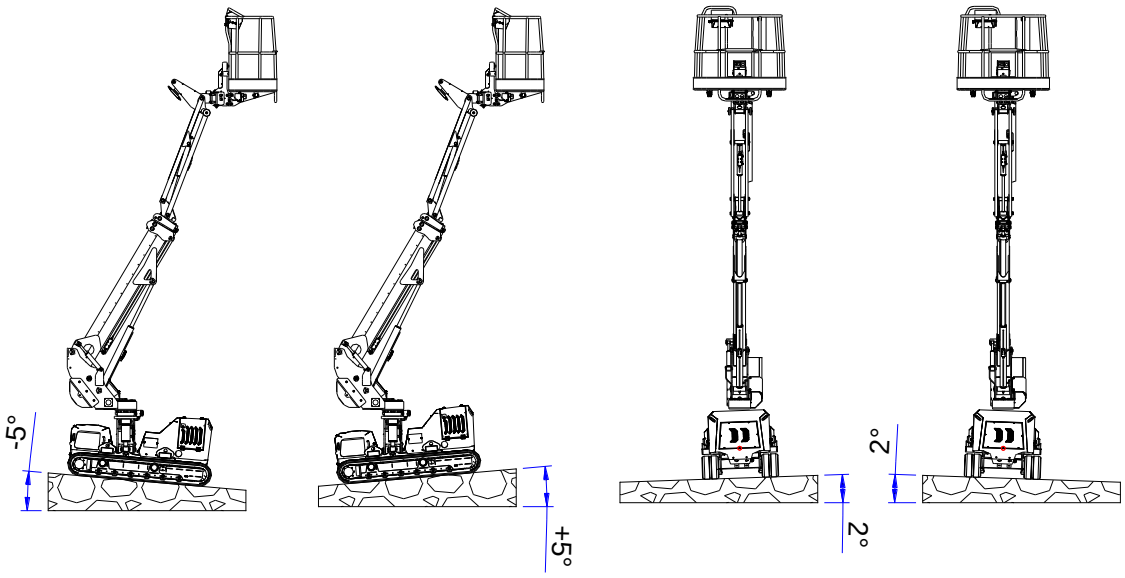
Work configuration with both the tracks not completely extended: Maximum height and maximum boom.

Translation permitted, maximum load permitted in basket 140Kg.



Characteristic dimensions			
Maximum work height	C	m / ft	8.2 / 26.9
Maximum work outreach	D	m / ft	5.3 / 17.38

Work configuration with at least one track not completely extended: Maximum ground inclination.



1.10 Work diagrams

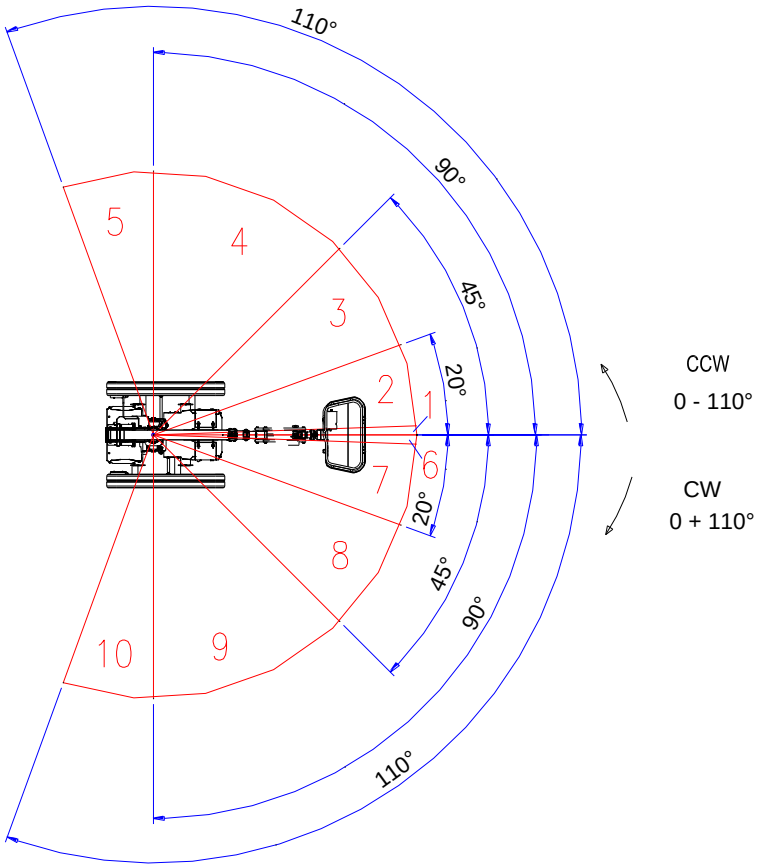
The input conditions that determine the working diagram of the machine in a given configuration are:

1. Load in basket;
2. Lateral inclination of the tracked undercarriage (inclination less than 5° or more than 5°);
3. Longitudinal inclination of the tracked undercarriage (inclination between -15° and + 5° or between + 5° and + 15°);
4. Extension of the right track (or "all extended" or "not all extended");
5. Extension of the right track (or "all extended" or "not all extended").

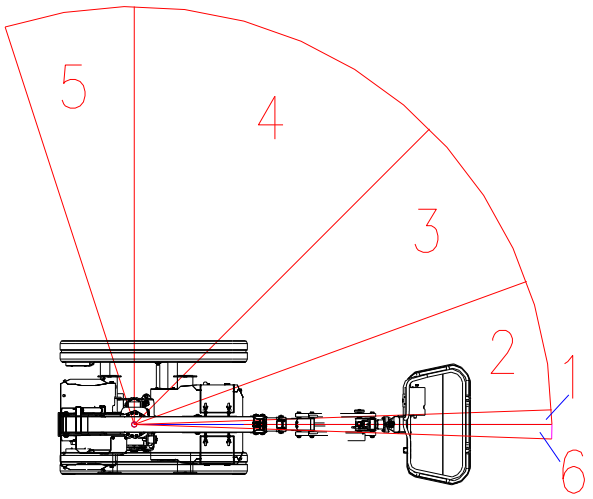
Depending on these input data, the maximum rotation angle of the bearing relative to the centred column condition is determined.

The maximum rotation angle of the slewing ring is determined by the enabling of working sectors whose limit angles are fixed values,i.e. they are not dependent on other parameters.

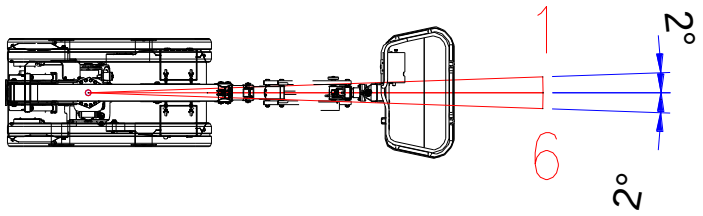
Case with both tracks fully extended.



Case with only one track fully extended.



Case with both tracks not fully extended.



Therefore, depending on the angle of rotation of the column and on the previous entry conditions, the working diagram can be determined.

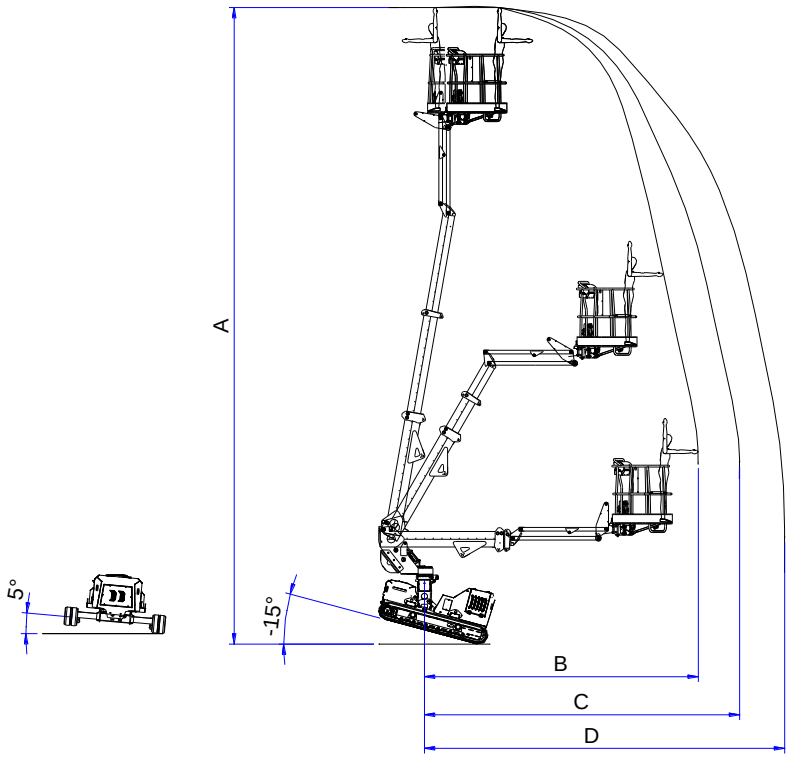
It is also possible, again for the entry conditions, that a diagram cannot be taken in a complete way but is limited to the maximum angle of lifting of the boom or to movement of the Jib.

1.10.1 Work diagrams with both tracks completely extended: Translation not allowed

1.10.1.1 Case 1: Lateral inclination of the carriage between +-5° longitudinal inclination between +5° and -15°.

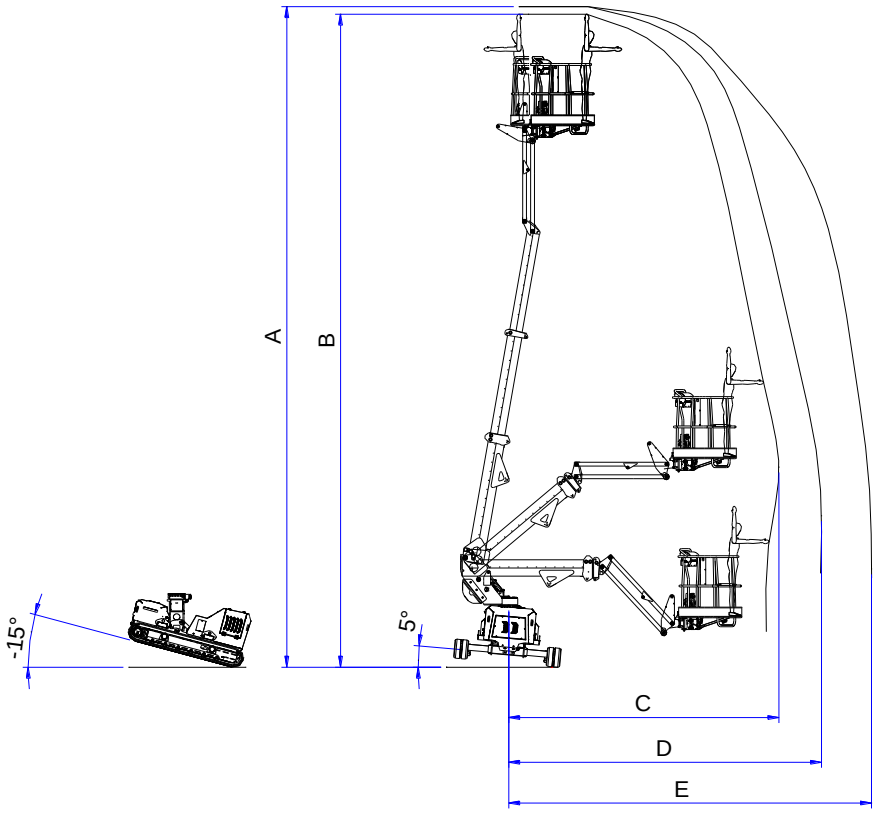
Three diagrams are shown for loads of between 0-80Kg (0-176.4 lbs), 110-140Kg (242.5-308.64 lbs), 200-230Kg (440.9-507.06 lbs).

Sectors 1-2-6-7



Characteristic dimensions			
Maximum work height	A	m / ft	12.3 / 40.35
Maximum outreach with 230Kg in basket	B	m / ft	5.3 / 17.38
Maximum outreach with 140Kg in basket	C	m / ft	6.1 / 20.01
Maximum outreach with 80Kg in basket	D	m / ft	7 / 22.96

Sectors 3-4-5-8-9-10

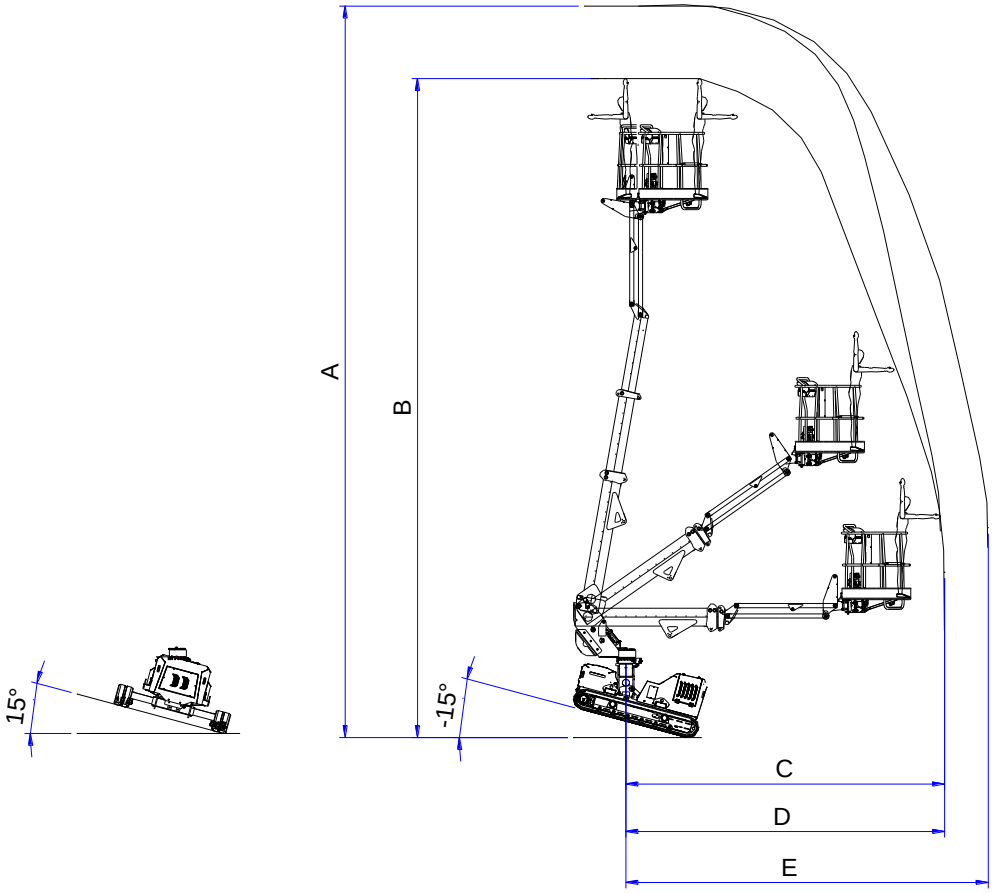


Characteristic dimensions			
Maximum work height with 140Kg (308.64 lbs) in basket	A	m / ft	12.1 / 39.69
Maximum work height with 230Kg (507.06 lbs) in basket	B	m / ft	12 / 39.37
Maximum outreach with 230Kg (507.06 lbs) in basket	C	m / ft	5 / 16.4
Maximum outreach with 140Kg (308.64 lbs) in basket	D	m / ft	5.7 / 18.7
Maximum outreach with 80Kg (176.37 lbs) in basket	E	m / ft	6.6 / 21.65

1.10.1.2 Case 2: Lateral inclination of the carriage greater than +-5° longitudinal inclination between +5° and -15°.

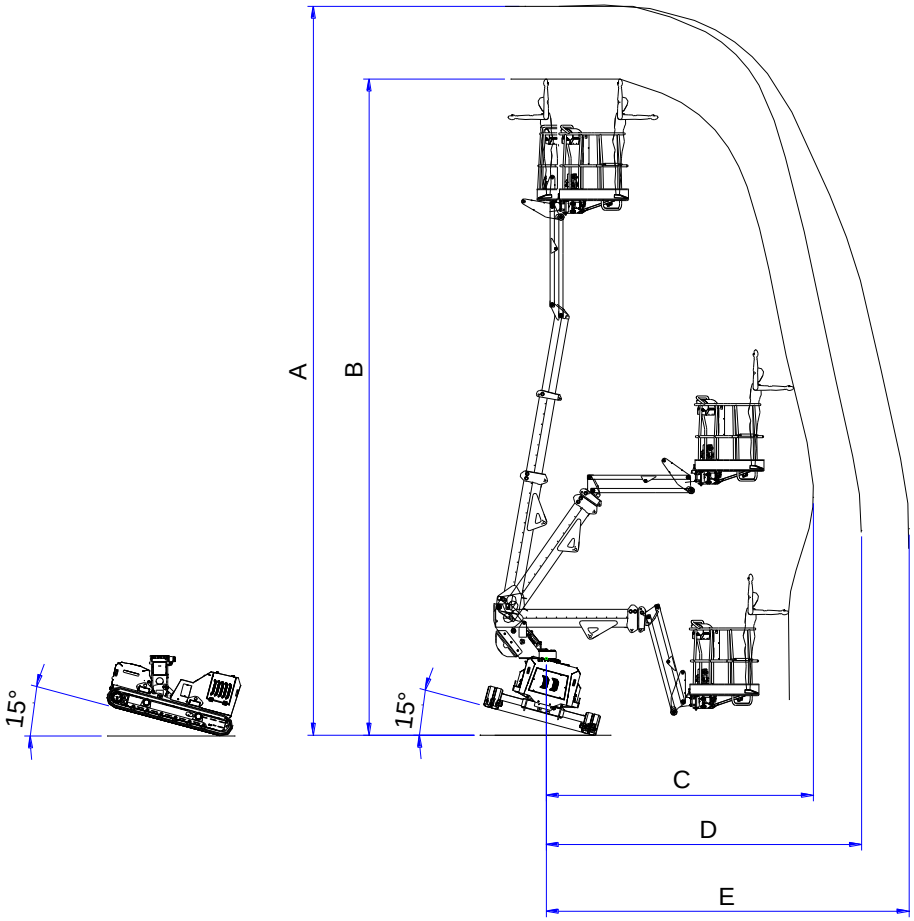
Three diagrams are shown for loads of between 0-80Kg (0-176.4 lbs), 110-140Kg (242.5-308.64 lbs), 200-230Kg (440.9-507.06 lbs).

Sectors 1-2-6-7



Characteristic dimensions			
Maximum work height with 140Kg (308.64 lbs) in basket	A	m / ft	12.3 / 40.35
Maximum work height with 230Kg (507.06 lbs) in basket	B	m / ft	11.1 / 36.41
Maximum outreach with 230Kg (507.06 lbs) in basket	C	m / ft	5.3 / 17.38
Maximum outreach with 140Kg (308.64 lbs) in basket	D	m / ft	5.3 / 17.38
Maximum outreach with 80Kg (176.37 lbs) in basket	E	m / ft	6.1 / 20.01

Sectors 3-4-5-8-9-10

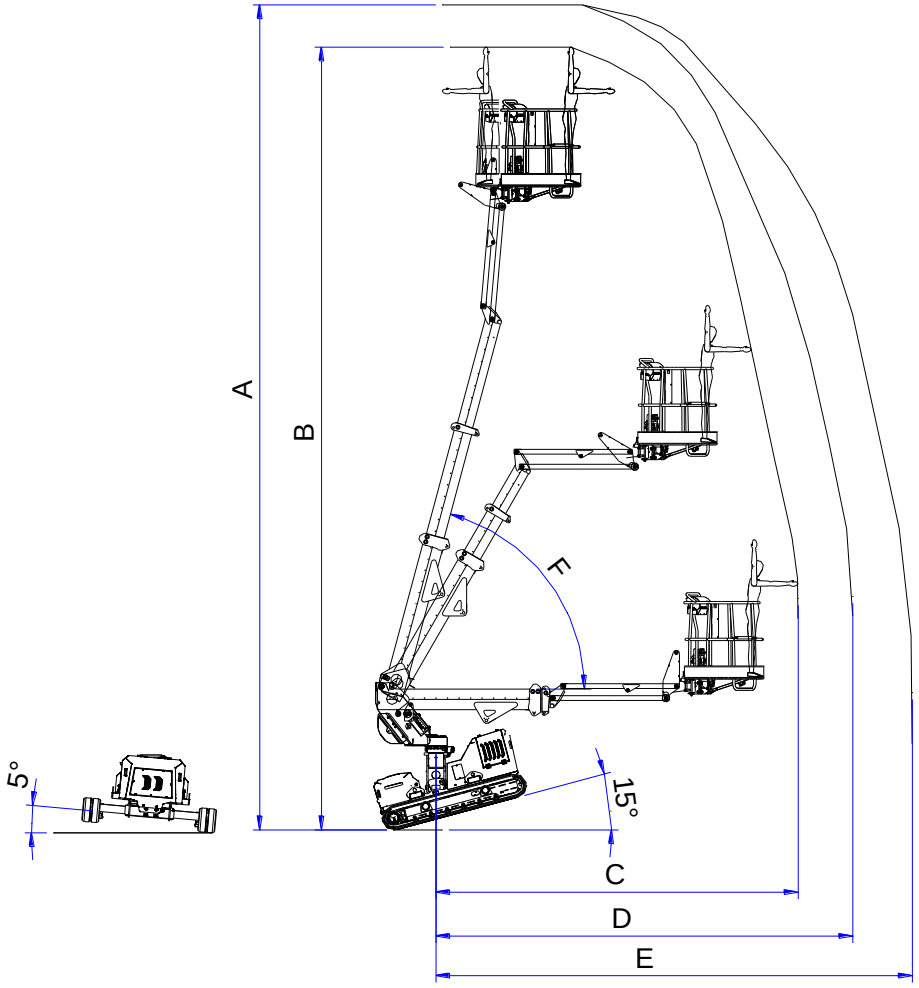


Characteristic dimensions			
Maximum work height with 140Kg (308.64 lbs) in basket	A	m / ft	12.2 / 40.02
Maximum work height with 230Kg (507.06 lbs) in basket	B	m / ft	11 / 36.09
Maximum outreach with 230Kg (507.06 lbs) in basket	C	m / ft	4.5 / 14.76
Maximum outreach with 140Kg (308.64 lbs) in basket	D	m / ft	5.3 / 17.38
Maximum outreach with 80Kg (176.37 lbs) in basket	E	m / ft	6.1 / 20.01

1.10.1.3 Case 3: Lateral inclination of the carriage between +-5° longitudinal inclination between +5° and +15°.

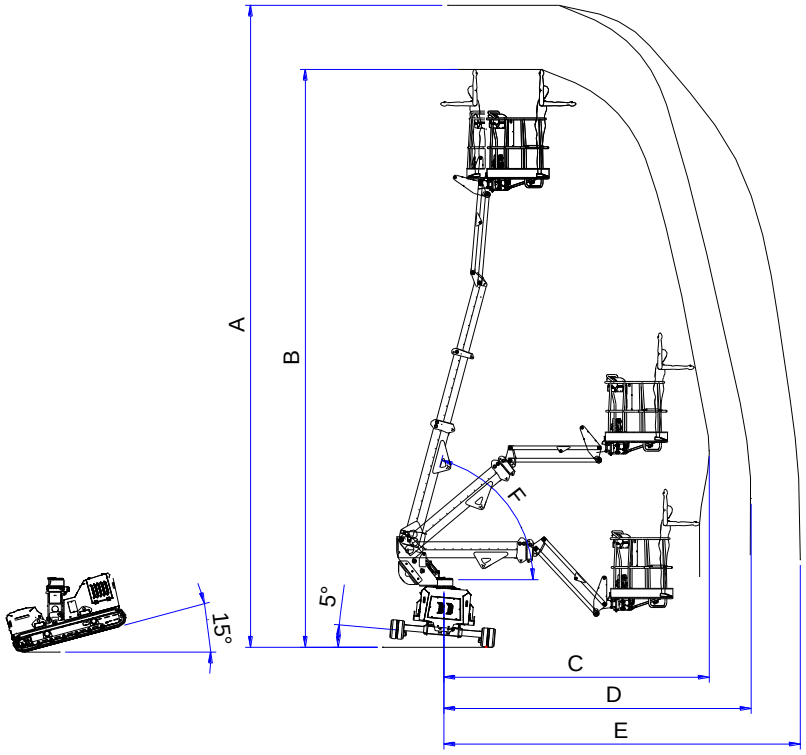
Three diagrams are shown for loads of between 0-80Kg (0-176.4 lbs), 110-140Kg (242.5-308.64 lbs), 200-230Kg (440.9-507.06 lbs).

Sectors 1-2-6-7



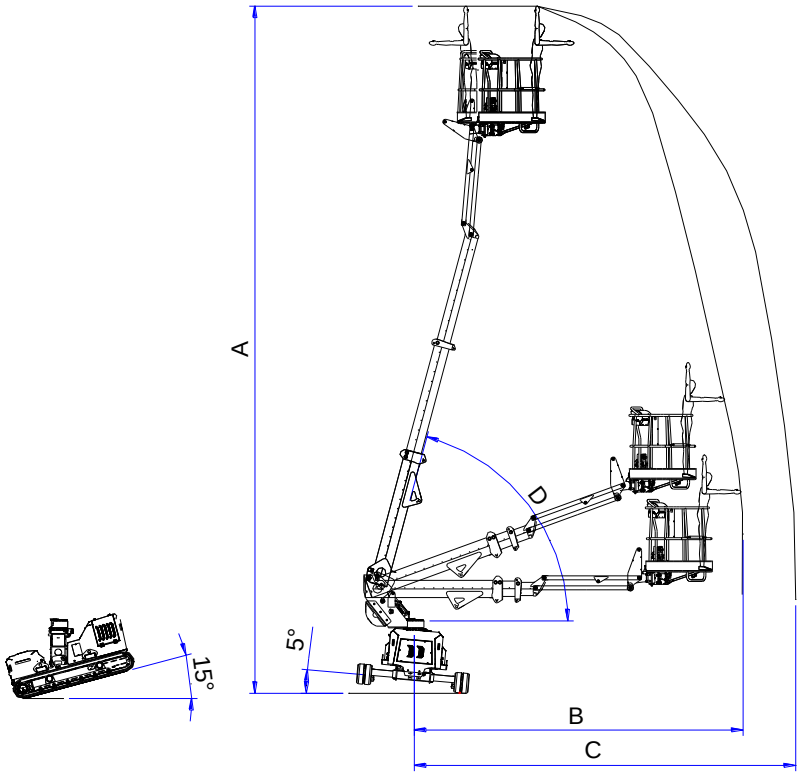
Characteristic dimensions			
Maximum work height with 140Kg (308.64 lbs) in basket	A	m / ft	12 / 39.37
Maximum work height with 230Kg (507.06 lbs) in basket	B	m / ft	11.5 / 37.72
Maximum outreach with 230Kg (507.06 lbs) in basket	C	m / ft	5.3 / 17.38
Maximum outreach with 140Kg (308.64 lbs) in basket	D	m / ft	6.1 / 20.01
Maximum outreach with 80Kg (176.37 lbs) in basket	E	m / ft	7 / 22.96
Maximum boom lifting angle	F	°	75

Sectors 3-8



Characteristic dimensions			
Maximum work height with 140Kg (308.64 lbs) in basket	A	m / ft	12 / 39.37
Maximum work height with 230Kg (507.06 lbs) in basket	B	m / ft	10.8 / 35.43
Maximum outreach with 230Kg (507.06 lbs) in basket	C	m / ft	5 / 16.4
Maximum outreach with 140Kg (308.64 lbs) in basket	D	m / ft	5.7 / 18.7
Maximum outreach with 80Kg (176.37 lbs) in basket	E	m / ft	6.7 / 21.98
Maximum boom lifting angle	F	°	75

Sectors 4-9

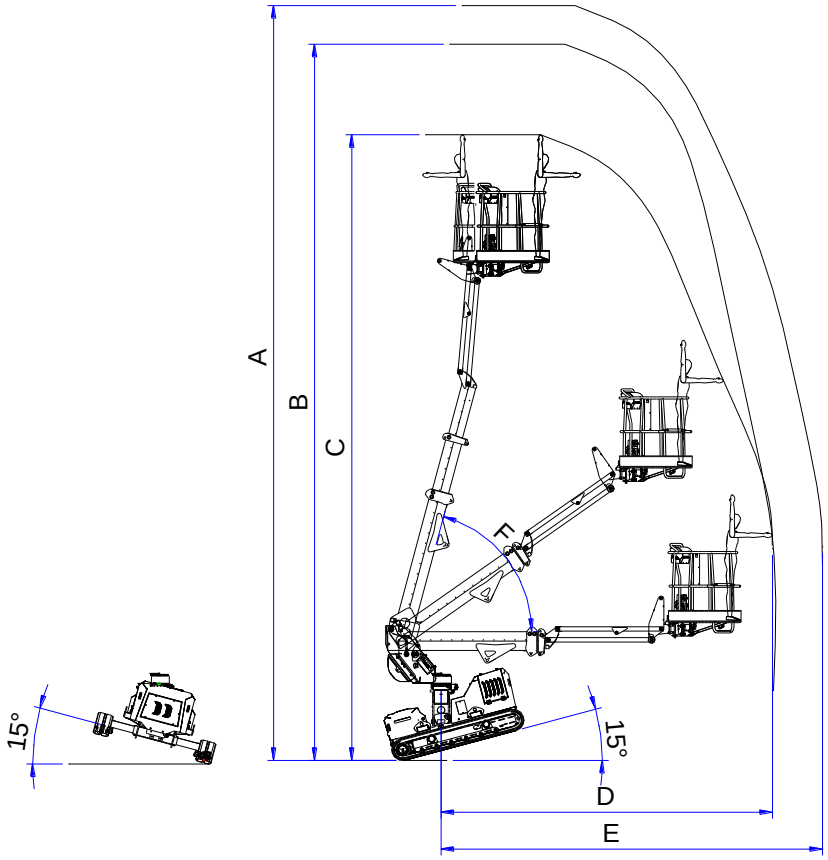


Characteristic dimensions			
Maximum work height with 140Kg (308.64 lbs) in basket	A	m / ft	12 / 39.37
Maximum outreach with 140Kg (308.64 lbs) in basket	B	m / ft	5.7 / 18.7
Maximum outreach with 80Kg (176.37 lbs) in basket	C	m / ft	6.7 / 21.98
Maximum boom lifting angle	D	°	75

1.10.1.4 Case 4: Lateral inclination of the carriage greater than +-5° longitudinal inclination between +5° and +15°.

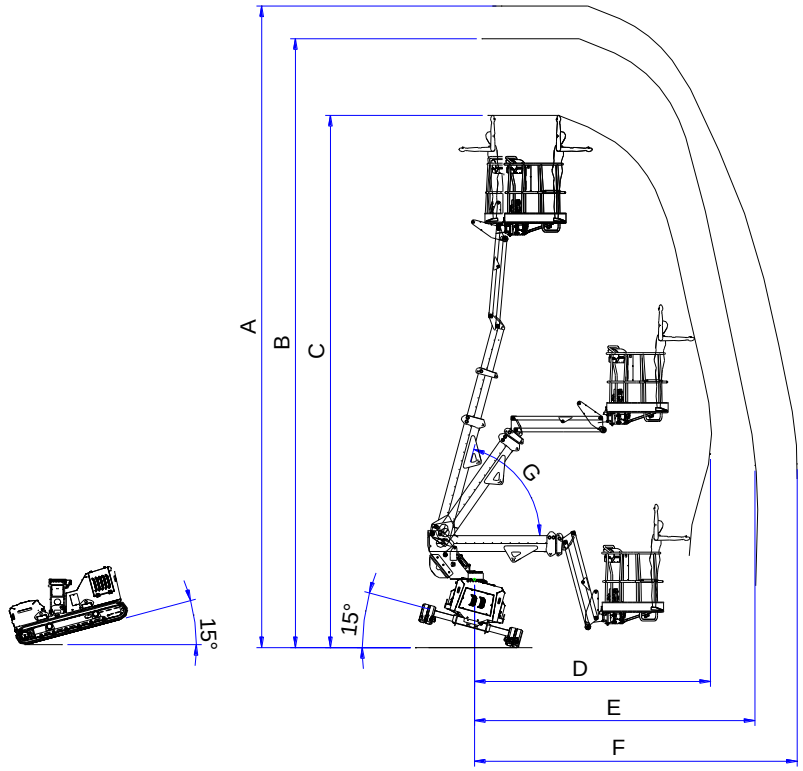
Three diagrams are shown for loads of between 0-80Kg (0-176.4 lbs), 110-140Kg (242.5-308.64 lbs), 200-230Kg (440.9-507.06 lbs).

Sectors 1-2-6-7



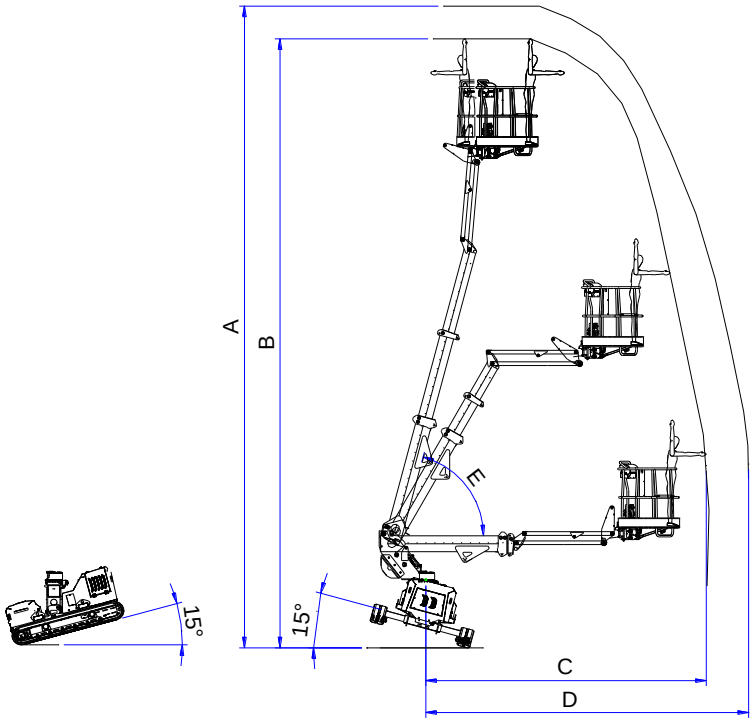
Characteristic dimensions			
Maximum work height with 80Kg (176.36 lbs) in basket	A	m / ft	12 / 39.37
Maximum work height with 140Kg (308.64 lbs) in basket	B	m / ft	11.5 / 37.72
Maximum work height with 230Kg (507.06 lbs) in basket	C	m / ft	10 / 32.8
Maximum outreach with 230Kg (507.06 lbs) in basket	D	m / ft	5.3 / 17.38
Maximum outreach with 140Kg (308.64 lbs) in basket	D	m / ft	5.3 / 17.38
Maximum outreach with 80Kg (176.36 lbs) in basket	E	m / ft	6.1 / 20.01
Maximum boom lifting angle	F	°	75

Sectors 3-8



Characteristic dimensions			
Maximum work height with 80Kg (176.37 lbs) in basket	A	m / ft	12 / 39.37
Maximum work height with 140Kg (308.64 lbs) in basket	B	m / ft	11.5 / 37.72
Maximum work height with 230Kg (507.06 lbs) in basket	C	m / ft	10 / 32.80
Maximum outreach with 230Kg (507.06 lbs) in basket	D	m / ft	4.5 / 14.76
Maximum outreach with 140Kg (308.64 lbs) in basket	E	m / ft	5.3 / 17.38
Maximum outreach with 80Kg (176.37 lbs) in basket	F	m / ft	6.1 / 20.01
Maximum boom lifting angle	G	°	75

Sectors 4-9



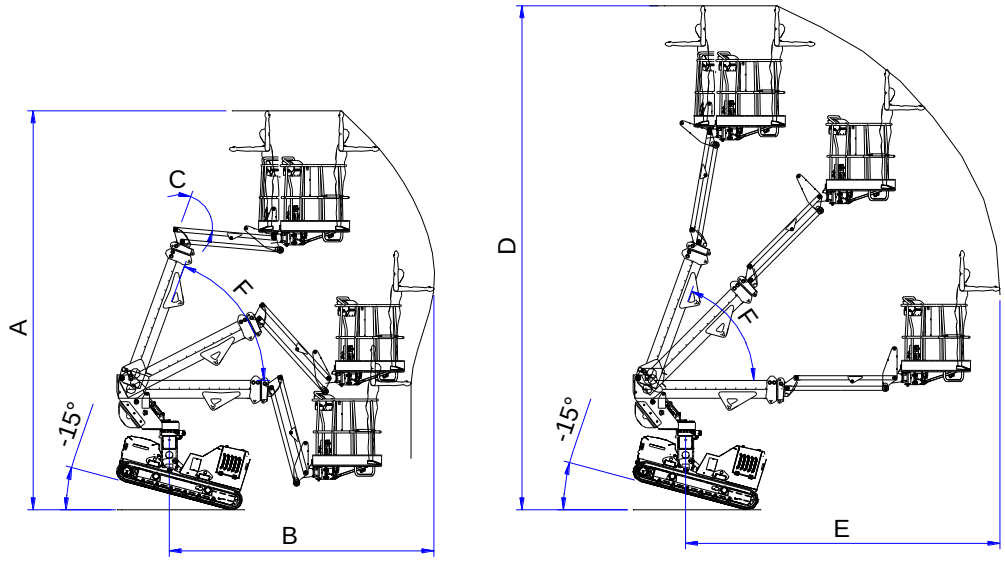
Characteristic dimensions			
Maximum work height with 80Kg (176.37 lbs) in basket	A	m / ft	12.1 / 39.7
Maximum work height with 140Kg (308.64 lbs) in basket	B	m / ft	11.5 / 37.72
Maximum outreach with 140Kg (308.64 lbs) in basket	C	m / ft	5.3 / 17.38
Maximum outreach with 80Kg (176.37 lbs) in basket	D	m / ft	6.1 / 20.01
Maximum boom lifting angle	E	°	75

1.10.2 Work diagrams with both tracks completely extended: Translation permitted (The boom extension must be fully retracted)

1.10.2.1 Case 1: Lateral inclination of the carriage between +-5° longitudinal inclination between +5° and -15°.

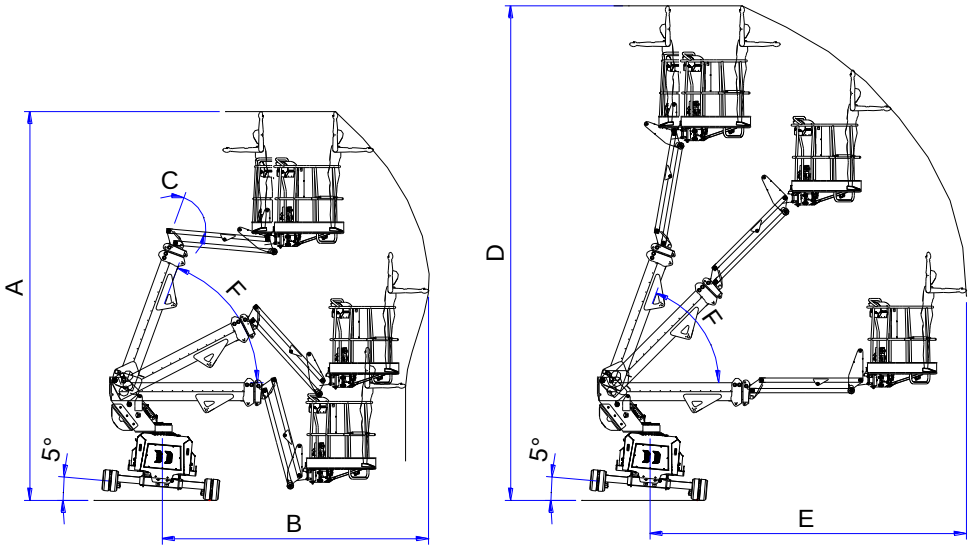
Two diagrams are reported for loads between 0-170Kg (0-374.78 lbs) and 170-230Kg (374.78-507.06 lbs).

Sectors 1-2-6-7



Characteristic dimensions			
Maximum work height with more than 170Kg (374.78 lbs) in basket	A	m / ft	6.7 / 21.98
Maximum outreach with more than 170Kg (374.78 lbs) in basket	B	m / ft	4.5 / 14.76
JIB opening limit with more than 170Kg (374.78 lbs) in basket	C	°	-75
Maximum work height with 170Kg (374.78 lbs) in basket	D	m / ft	8.5 / 27.89
Maximum outreach with 170Kg (374.78 lbs) in basket	E	m / ft	5.3 / 17.38
Maximum boom lifting angle	F	°	70

Sectors 3-4-5-8-9-10

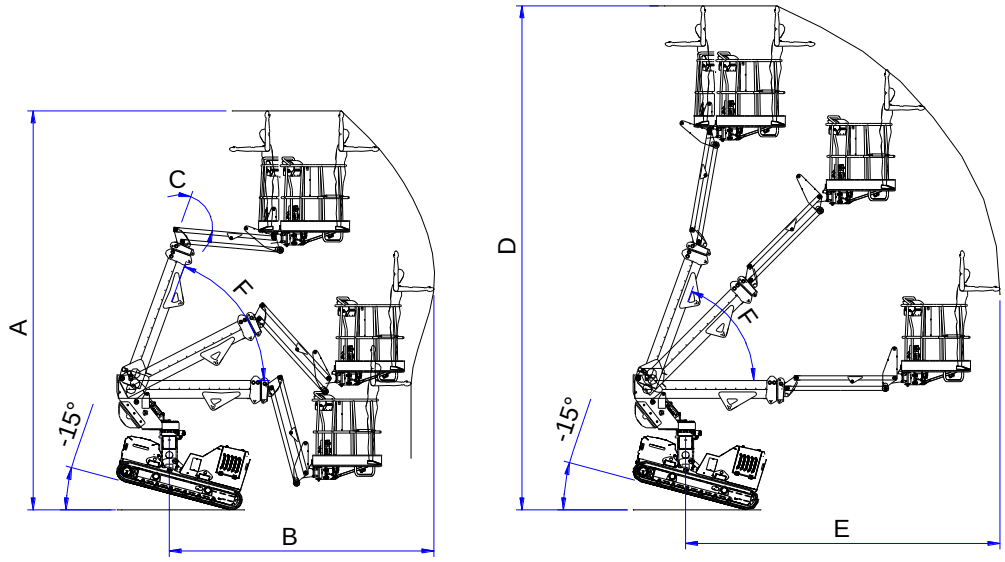


Characteristic dimensions			
Maximum work height with more than 170Kg (374.78 lbs) in basket	A	m / ft	6.5 / 21.32
Maximum outreach with more than 170Kg (374.78 lbs) in basket	B	m / ft	4.5 / 14.76
JIB opening limit with more than 170Kg (374.78 lbs) in basket	C	°	-75
Maximum work height with 170Kg (374.78 lbs) in basket	D	m / ft	8.3 / 27.23
Maximum outreach with 170Kg (374.78 lbs) in basket	E	m / ft	5.3 / 17.38
Maximum boom lifting angle	F	°	70

1.10.2.2 Case 2: Lateral inclination of the carriage greater than +-5° longitudinal inclination between +5° and -15°.

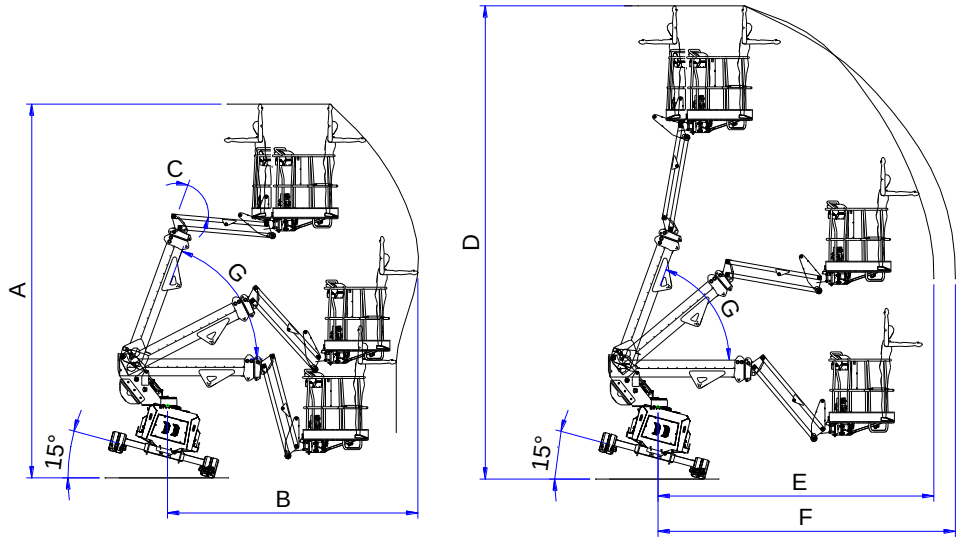
Two diagrams are reported for loads between 0-170Kg (0-374.78 lbs) and 170-230Kg (374.78-507.06 lbs).

Sectors 1-2-6-7



Characteristic dimensions			
Maximum work height with more than 170Kg (374.78 lbs) in basket	A	m / ft	6.7 / 21.98
Maximum outreach with more than 170Kg (374.78 lbs) in basket	B	m / ft	4.5 / 14.76
JIB opening limit with more than 170Kg (374.78 lbs) in basket	C	°	-75
Maximum work height with 170Kg (374.78 lbs) in basket	D	m / ft	8.5 / 27.89
Maximum outreach with 170Kg (374.78 lbs) in basket	E	m / ft	5.3 / 17.38
Maximum boom lifting angle	F	°	70

Sectors 3-4-5-8-9-10

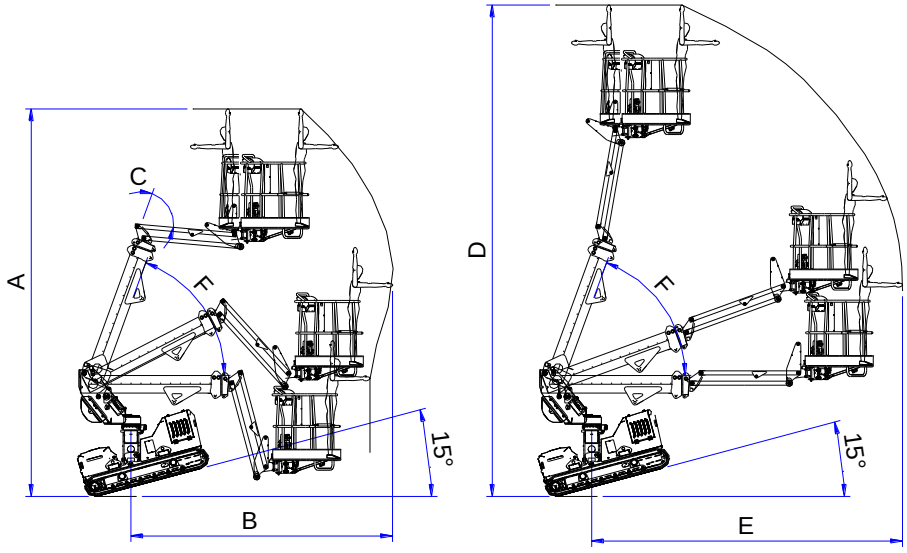


Characteristic dimensions			
Maximum work height with more than 170Kg (374.78 lbs) in basket	A	m / ft	6.6 / 21.65
Maximum outreach with more than 170Kg (374.78 lbs) in basket	B	m / ft	4.5 / 14.76
JIB opening limit with more than 170Kg (374.78 lbs) in basket	C	°	-75
Maximum work height with 170Kg (374.78 lbs) in basket	D	m / ft	8.4 / 27.56
Maximum outreach with 170Kg (374.78 lbs) in basket	E	m / ft	5 / 16.4
Maximum outreach with 140Kg (308.64 lbs) in basket	F	m / ft	5.3 / 17.38
Maximum boom lifting angle	G	°	70

1.10.2.3 Case 3: Lateral inclination of the carriage between +-5° longitudinal inclination between +5° and +15°.

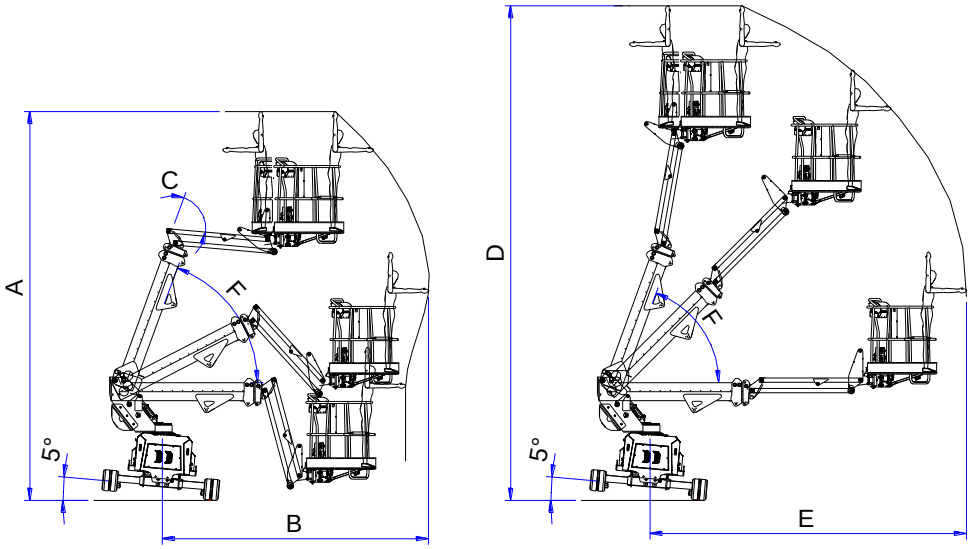
Two diagrams are reported for loads between 0-170Kg (0-374.78 lbs) and 170-230Kg (374.78-507.06 lbs).

Sectors 1-2-6-7



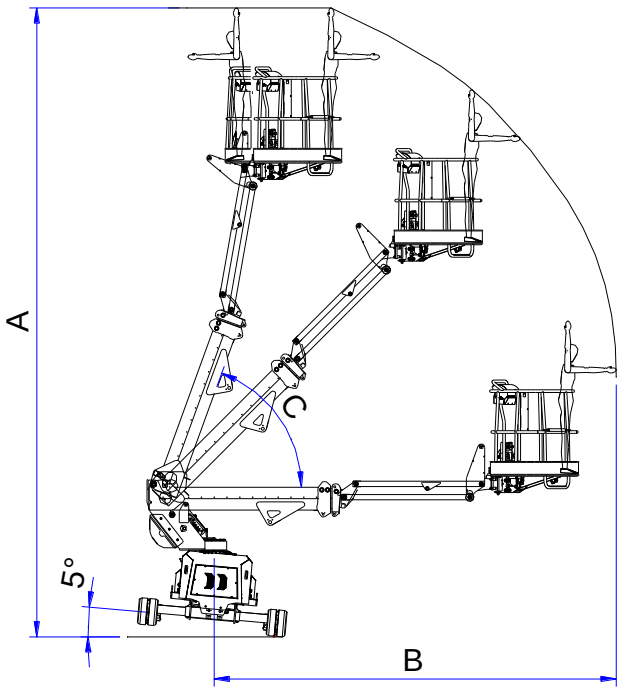
Characteristic dimensions			
Maximum work height with more than 170Kg (374.78 lbs) in basket	A	m / ft	6.6 / 21.65
Maximum outreach with more than 170Kg (374.78 lbs) in basket	B	m / ft	4.5 / 14.76
JIB opening limit with more than 170Kg (374.78 lbs) in basket	C	°	-75
Maximum work height with 170Kg (374.78 lbs) in basket	D	m / ft	8.4 / 27.55
Maximum outreach with 170Kg (374.78 lbs) in basket	E	m / ft	5.3 / 17.38
Maximum boom lifting angle	F	°	70

Sectors 3-8



Characteristic dimensions			
Maximum work height with more than 170Kg (374.78 lbs) in basket	A	m / ft	6.5 / 21.32
Maximum outreach with more than 170Kg (374.78 lbs) in basket	B	m / ft	4.5 / 14.76
JIB opening limit with more than 170Kg (374.78 lbs) in basket	C	°	-75
Maximum work height with 170Kg (374.78 lbs) in basket	D	m / ft	8.3 / 27.23
Maximum outreach with 170Kg (374.78 lbs) in basket	E	m / ft	5.3 / 17.38
Maximum boom lifting angle	F	°	70

Sectors 4-9

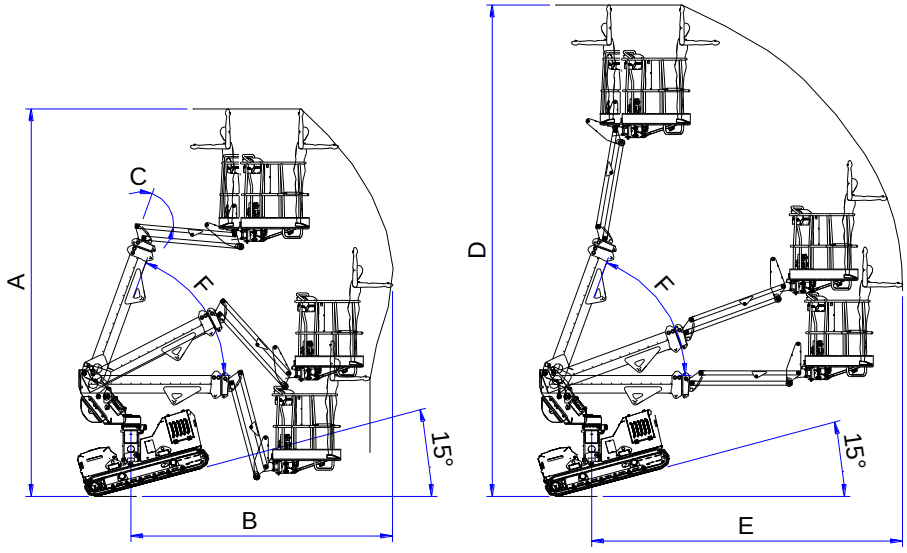


Characteristic dimensions			
Maximum work height with 140Kg (308.64 lbs) in basket	A	m / ft	8.3 / 27.23
Maximum outreach with 140Kg (308.64 lbs) in basket	B	m / ft	5.3 / 17.38
Maximum boom lifting angle	C	°	70

1.10.2.4 Case 4: Lateral inclination of the carriage greater than +-5° longitudinal inclination between +5° and +15°.

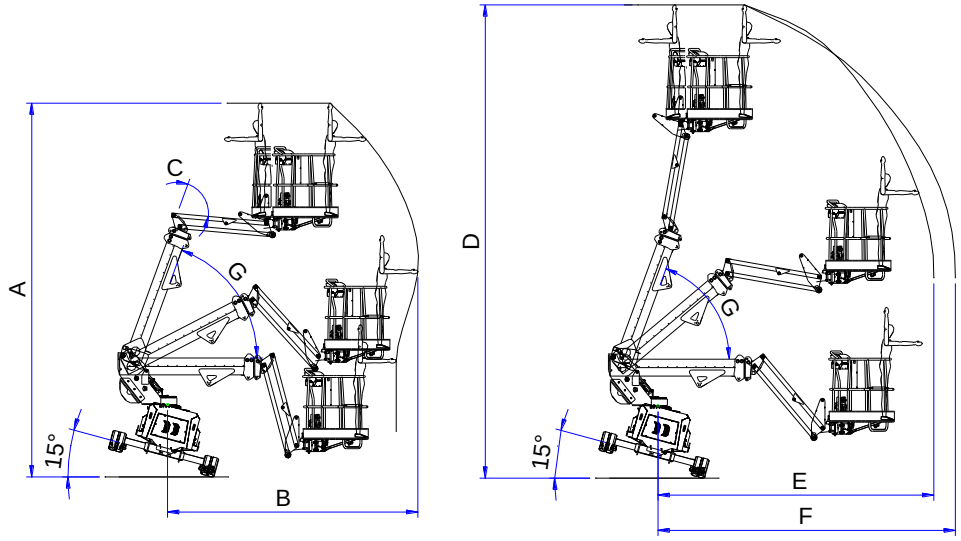
Two diagrams are reported for loads between 0-170Kg (0-374.78 lbs) and 170-230Kg (374.78-507.06 lbs).

Sectors 1-2-6-7



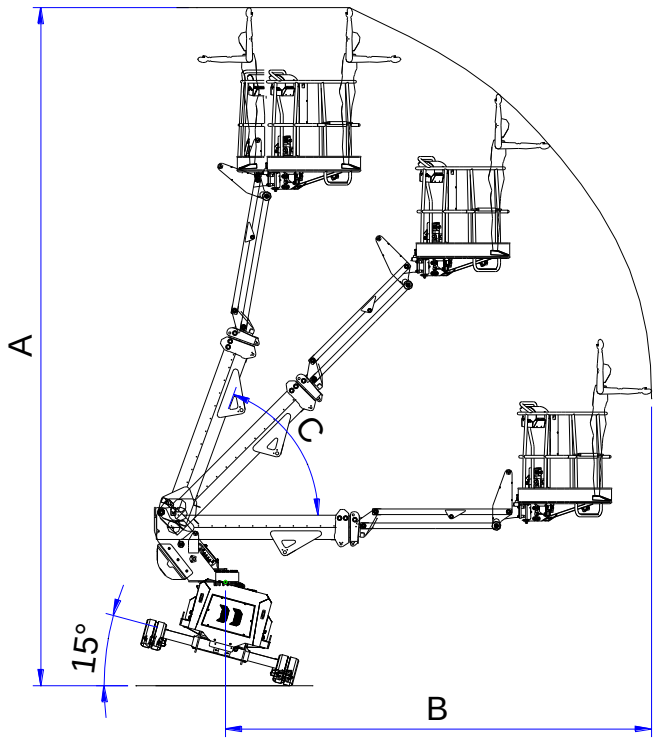
Characteristic dimensions			
Maximum work height with more than 170Kg (374.78 lbs) in basket	A	m / ft	6.6 / 21.65
Maximum outreach with more than 170Kg (374.78 lbs) in basket	B	m / ft	4.5 / 14.76
JIB opening limit with more than 170Kg (374.78 lbs) in basket	C	°	-75
Maximum work height with 170Kg (374.78 lbs) in basket	D	m / ft	8.4 / 27.56
Maximum outreach with 170Kg (374.78 lbs) in basket	E	m / ft	5.3 / 17.38
Maximum boom lifting angle	F	°	70

Sectors 3-8



Characteristic dimensions			
Maximum work height with more than 170Kg (374.78 lbs) in basket	A	m / ft	6.6 / 21.65
Maximum outreach with more than 170Kg (374.78 lbs) in basket	B	m / ft	4.5 / 14.76
JIB opening limit with more than 170Kg (374.78 lbs) in basket	C	°	-75
Maximum work height with 170Kg (374.78 lbs) in basket	D	m / ft	8.4 / 27.56
Maximum outreach with 170Kg (374.78 lbs) in basket	E	m / ft	5 / 16.4
Maximum outreach with 140Kg (308.64 lbs) in basket	F	m / ft	5.3 / 17.38
Maximum boom lifting angle	G	°	70

Sectors 4-9



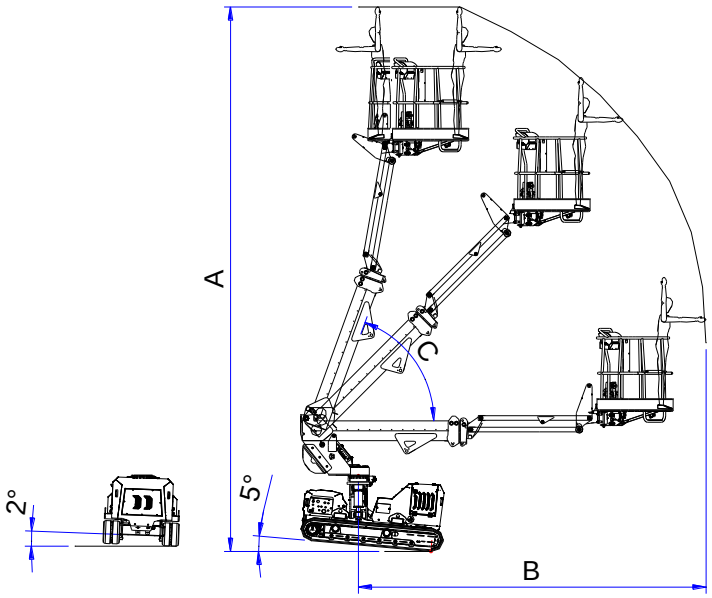
Characteristic dimensions			
Maximum work height with 140Kg (308.64 lbs) in basket	A	m / ft	8.4 / 27.56
Maximum outreach with 140Kg (308.64 lbs) in basket	B	m / ft	5.3 / 17.38
Maximum boom lifting angle	C	°	70

1.10.3 Work diagram with both the tracks not completely extended: Translation permitted (Maximum load permitted in basket 140Kg-308.64 lbs)

There is only one diagram for loads between 0-140Kg (0-308.64 lbs).

The maximum lateral inclination of the carriage is +-2° the longitudinal inclination is +-5°. Beyond these inclinations it is not permitted to open the aerial part beyond the transport condition.

Sectors 1-6



Characteristic dimensions			
Maximum work height with 140Kg (308.64 lbs) in basket	A	m / ft	8.3 / 27.23
Maximum outreach with 140Kg (308.64 lbs) in basket	B	m / ft	5.3 / 17.38
Maximum boom lifting angle	C	°	70

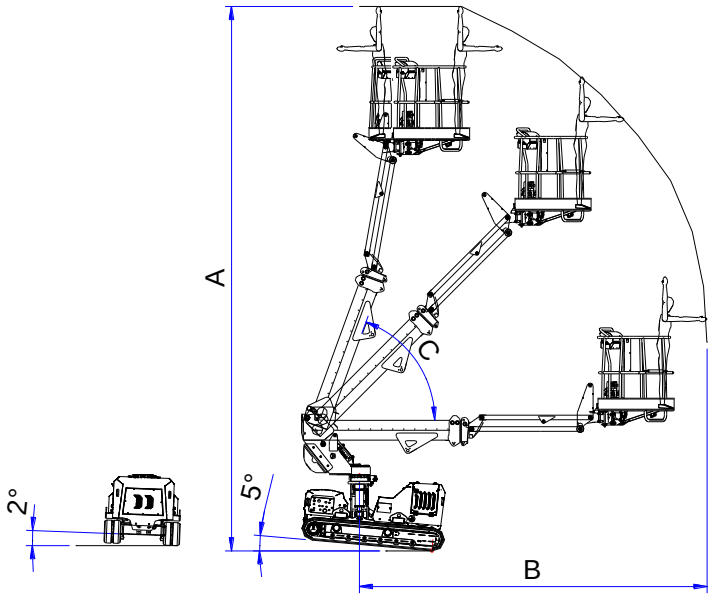
1.10.4 Work diagrams with only one track not completely extended: Translation permitted (Maximum load permitted in basket 140Kg - 308.64 lbs)

There is only one diagram for loads between 0-140Kg (0-308.64 lbs).

The maximum lateral inclination of the carriage is +-2° the longitudinal inclination is +-5°. Beyond these inclinations it is not permitted to open the aerial part beyond the transport condition.

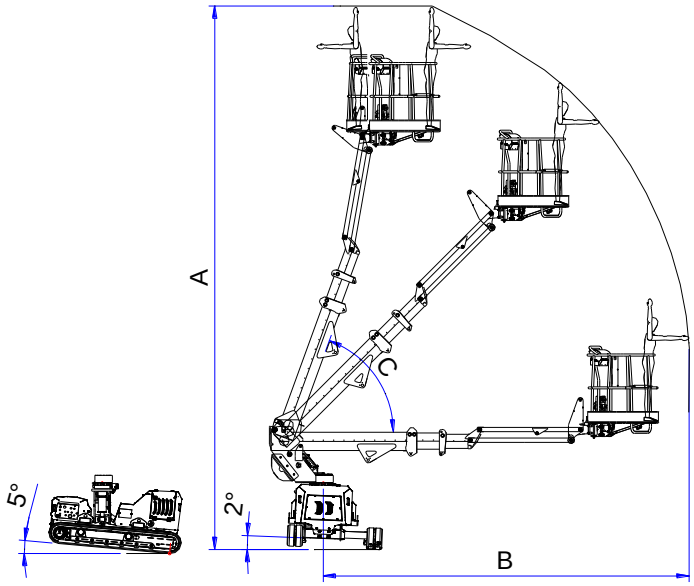
Translation is only permitted if the boom extension is completely retracted.

Sectors 1-2-3-6



Characteristic dimensions			
Maximum work height with 140Kg (308.64 lbs) in basket	A	m / ft	8.3 / 27.23
Maximum outreach with 140Kg (308.64 lbs) in basket	B	m / ft	5.3 / 17.38
Maximum boom lifting angle	C	°	70

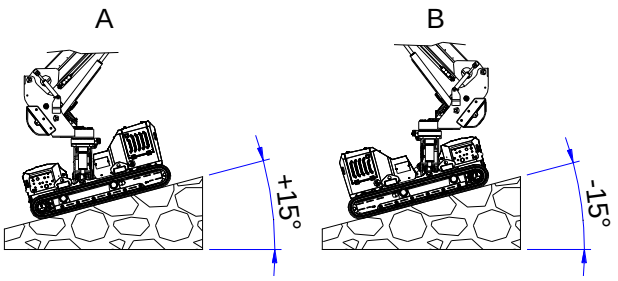
Sectors 4-5



Characteristic dimensions			
Maximum work height with 140Kg (308.64 lbs) in basket	A	m / ft	8.9 / 29.19
Maximum outreach with 140Kg (308.64 lbs) in basket	B	m / ft	6 / 19.68
Maximum boom lifting angle	C	°	70

1.11 Work performance of the platform and longitudinal inclination of the ground

The machine automatically reduces work performance as the inclination of the ground increases. In particular, there is a reduction in performance if the machine is positioned on a longitudinal slope with a value of between +5° and +15° with respect to the case where this slope is between -15° and +5°.



Therefore, to take slopes greater than 5°, it is advisable to position the machine as shown in figure B.

This will therefore result in maximum work performance in terms of height and side outreach.

1.12 How to reach the desired position of work at height

The machine limits possible extension of the telescopic boom according to the configuration of the machine, the load in the basket and the boom lifting angle.

Given a work condition, the extension of the telescopic boom stops automatically once the maximum outreach limit has been reached.

The wording "OUTREACH LIMIT" appears on the screen.

The movements permitted to retract in the diagrams are represented by the arrows shown on the display.

Given an extension of the telescopic boom, the descent of the boom stops automatically once the maximum outreach limit has been reached. In the event that this limit is exceeded, the permitted movements will be:

1) Outreach retraction;
2) Boom lifting;
3) Column rotation towards the side favourable to stability;
4) Lifting and descent of the JIB.

(In some cases it may happen that only the outreach retraction has been enabled).

To reach the work position at height, it is advisable, after having rotated the column in the desired direction, to perform the following sequence of movements:

1) Raise the telescopic boom in the direction of the position to be reached;
2) Extend the telescopic boom.

To bring the machine back into transport condition, it is advisable to perform the following sequence of movements:

1) Retract completely with the boom extension;
2) Fully lower the telescopic boom (turn the slewing ring in the centred column direction if necessary).

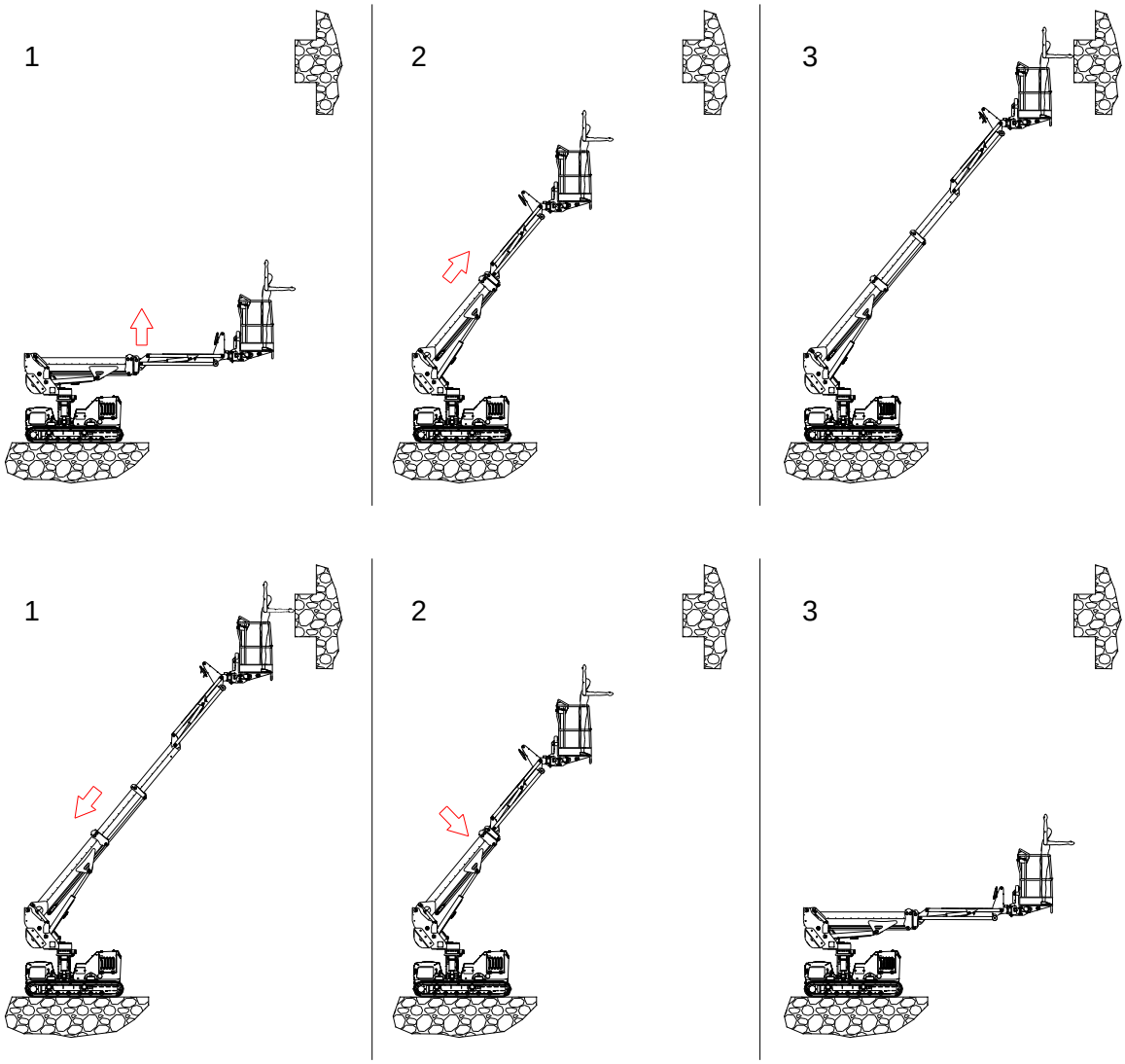
It is therefore advisable to avoid first performing the boom descent and then retraction with the extension.

This would result in the machine moving several times to the maximum outreach limit.

This would result in lengthening of the time necessary to bring the machine back into transport condition and unnecessarily straining the structure.

In addition, the lifting and lowering boom speed is greater if the boom extension does not exceed 400mm (1.31 ft).

The correct sequences are reported in the figures below.


1
2
3
1
2
3

1.13 CE Declaration of Conformity

See facsimile of CE declaration of conformity enclosed with this manual.
The machine described in this manual complies with the following standards:

- Directive 2006/42/EC – Machinery Directive that amends Directive 95/16/EC;
- Legislative Decree 17/2010 – Implementation of Machinery Directive 2006/42/EC;
- UNI EN 280:2015 - Mobile elevating work platforms - Design calculations - Stability criteria - Construction - Safety - Examinations and tests;
- *UNI EN 349:2008 – Minimum gaps to avoid crushing parts of the human body;
- EN ISO 12100:2010 Safety of machinery -General principles for design - Risk assessment and reduction.

All the parts available on the market and the "partly completed machines" installed on the platform conform to the afore-mentioned directives and to those that specifically govern the product.

1.14 Warranty

ALMAC S.r.l. guarantees the equipment it manufactures and undertakes to replace, free of charge and within the shortest possible time, those parts that, in its opinion, possess manufacturing and/or material defects.
Work under guarantee must only be performed by workshops authorised by ALMAC S.r.l. and only when the Customer is up to date with the payments.
The Customer will not be entitled to work under guarantee unless he consigns the equipment for repair within 30 days from the date of the first complaint, to be made in writing.
With the exception of fraud or gross negligence, ALMAC S.r.l. is relieved of all liability towards the Customer for damage deriving from flaws/defects in the traded equipment.
The warranty with which the Customer is provided becomes void if modifications are made to the machines without prior written authorization from ALMAC S.r.l. or should the Customer make incorrect/improper use of the machines.

1.14.1 Request for interventions during warranty period and formalities

ALMAC S.r.l. must be notified of requests for spare parts or technical interventions under guarantee as soon as a defect is discovered.
Always indicate the type of machine and its serial number when requesting spare parts under guarantee or technical interventions under guarantee. This information is given on the identification plate of the equipment.

1.15 Assistance

As far as the optimum use of the machine and extraordinary maintenance are concerned, this manual does not replace the expertise of the Technical Assistance sent by ALMAC S.r.l. (See also *Chapter 6 Maintenance*).

1.15.1 Request for assistance and repairs

To request ALMAC S.r.l. specialized Assistance Service, the Customer may contact:

	REGISTERED OFFICE	***OPERATIONAL HEADQUARTERS***
	ALMAC S.r.l. Viale Ruggeri 6/A 42016 Guastalla (RE) Italy	ALMAC S.r.l. Via Caduti sul lavoro 1 46019 Viadana (MN) Tel. +39 0375 833527 Fax. +39 0375 784350 Mail. info@almac-italia.com

In case of intervention request, specify the machine version and serial number; the data is indicated on the identification plate attached to the machine.

1.16 Use of the manual

Note: Keep this manual in an accessible place known to all users (operators and maintenance workers).
Note: This manual must be kept in a protected place inside the compartment provided in the basket so that it can be easily accessed for consultation throughout the entire technical life of the machine.
Note: If this manual is lost or damaged, a new copy must be ordered from the manufacturer. Specify the serial number of the machine (given on the relative identification plate) when requesting a new copy of the manual. The manufacturer undertakes to provide a new copy.
Note: When selling used equipment, this manual and the related attachments must be handed and the manufacturer must be informed as regards the new owner (*see Appendix 3 - Transfer of Ownership*).

Read carefully: *Chapter 1 General Information, Chapter 2 Safety Information, Chapter 3 Machine Description and Performance, Chapter 4 User instructions, Chapter 5 Emergency procedures, Chapter 6 Maintenance, Chapter 7 Demolition.*
Attention: Always consult the relative chapter when using, servicing the machine or when it is demolished.

1.17 Intended use and improper uses

1.17.1 Intended use

The machine described in this manual is a self-propelled elevating work platform designed to lift personnel and equipment to perform the following jobs:

- Maintaining of green area and general gardening;
- Installation of systems and equipment;
- Cleaning
- Painting and paint removal.

The maximum allowed capacity for this model is 230 kg (507 lbs). Consider the following:

- no. 2 persons each weighing 80 kg (176.37 lbs);
- 70 kg (154.32 lbs) of equipment.

An electronic control system prevents the basket from being lifted into any position when the load exceeds the nominal load established in the technical characteristics by 11Kg (24.25 lbs).
The platform was designed and built to be operated exclusively from the console located in the basket.
The control panel is however removable, both in the cable version and in the radio version.
In the cable version, only for emergency use or maintenance, the control panel can be connected to the outlet near the ground controls.
In this case it will be possible to control from the push-button panel only translation of the machine but only if the load in the basket is less than 20Kg (44.09 lbs).
In the radio version it is possible to control the machine from the ground but only if the load in the basket is less than 20Kg (44.09 lbs).
The electronic control of the machine will automatically prevent use of the panel when the load exceeds 20Kg (44.09 lbs).
If there is a load in the basket, the machine must in any case only be moved in the TRANSPORT position.
The controls on the ground on the rear side are for EMERGENCY use or MAINTENANCE by qualified personnel.

Attention: NEVER exceed the machine's established maximum capacity.
Attention: It is FORBIDDEN to transport large slabs or materials as this could increase wind resistance to a considerable extent and cause the machine to tip over.
Attention: It is FORBIDDEN to apply horizontal loads to the platform when the machine is moving (e.g. the operators on board must not pull ropes or cables etc.)
Attention: It is FORBIDDEN to use the machine to tow other equipment or vehicles.
Attention: The machine is designed for being driven around within public or private areas. It is not designed for road use.

Attention: The machine IS NOT CONFIGURED TO WORK WITHIN ATEX ATMOSPHERES.

Note: ALL LOADS must be positioned inside the basket. NEVER LIFT LOADS HANGING FROM THE PLATFORM, from the lifting structure or from the railings.
Note: If the machine is used in places open to the public or in construction sites where persons may transit or remain in the vicinity, the WORK AREA MUST BE CORDONED OFF in a suitable way (e.g. chains and posts).

1.17.2 Improper uses

Any other use not specifically indicated in *1.11.1 Intended use*.

- The improper uses established for this MEWP include lifting and lowering persons to/from different storeys within space (typical use of elevators).
- It is forbidden to operate the platform on the ground using the remote push-button with an operator present in the basket.

Attention: The platform was designed and built to be operated exclusively from the console located in the basket. The controls on the ground on the rear side are for EMERGENCY use or MAINTENANCE by qualified personnel.
Attention: The control panel can be dismantled and can only be used outside the platform by the operator to use the platform exclusively in the TRANSPORT position. It is forbidden to use the machine beyond the transport conditions with the ground control push-button panel and with a load or persons on the platform.

1.17.3 Cases that relieve the manufacturer from liability

The manufacturer declines all liability in the following cases:

- Use not indicated in this manual;
- Improper use of the machine or its use by untrained personnel;
- Use that fails to comply with the specific standards;
- Insufficient scheduled maintenance;
- Unauthorised modifications or interventions;
- Removal of seals;
- Use of non-original replacement parts;
- Total or partial failure to observe the instructions;
- Failure to perform the routine Inspections required by the laws in force.

2 SAFETY INFORMATION

2.1 Notification of commissioning and routine inspections

The work equipment indicated in Annex VII to Legislative Decree 81/2008 and successive amendments must be subjected to REGISTRATION and ROUTINE INSPECTIONS by the competent authorities, i.e. INAIL, the National Institute for Insurance Against Industrial Accidents (former ISPESL, Higher Institute for Prevention in the Workplace), the Local Health Authority and other public and private bodies established by the criteria laid down in Ministerial decree 11/04/2011.

- The User or Employer must notify Commissioning to the territorially competent National Institute for Insurance Against Industrial Accidents (INAIL) for the purpose of registering the platform;
- Once the platform has been registered, ROUTINE INSPECTIONS must begin. The FIRST of these is performed by INAIL within 45 days (since 21 August 2013) from the date on which the platform is put into service.
- The successive inspections, to be carried out at the frequency indicated in Annex VII to Legislative Decree 81/2008, are carried out by the Local Health Departments (ASL) or, when permitted by the regional laws, by ARPA (Regional Agency for the Protection of the Environment) or by Public or Private undertakings, as freely decided by the Employer or User and in accordance with the established formalities.

Attached are a few EXAMPLES of "Notice of commissioning" and "Request for routine inspection". Users should check them each time in the www.inail.it portal, according to the installation site in question.

2.2 Fitness of the personnel

The operators in charge of using the machine must be properly trained, informed, instructed on how to use the machine in safe conditions and must possess a training certificate issued in accordance with the legislation in force at the time of use*.
The operators who use the machine must be over 18 years of age and be recognised as psychophysically fit for the task in question. The following requirements must be ascertained before the operators are allowed to drive the machine:

- Sight and hearing in good conditions;
- Absence of changes induced by use of alcohol or drugs;
- Psychological equilibrium, absence of depression or stress.

Operators who use the machine for professional purposes must undergo health surveillance as required by Legislative decree D.Lgs 81/2008 and successive amendments, particularly with regard to alcohol addiction and alcohol concentration tests.

**The law that currently governs health control and surveillance of workers is the Provision of the State-Regions Permanent Conference of 16 March 2006.*

Note: ALMAC S.r.l. declines all liability for damage to persons, animals and things deriving from:

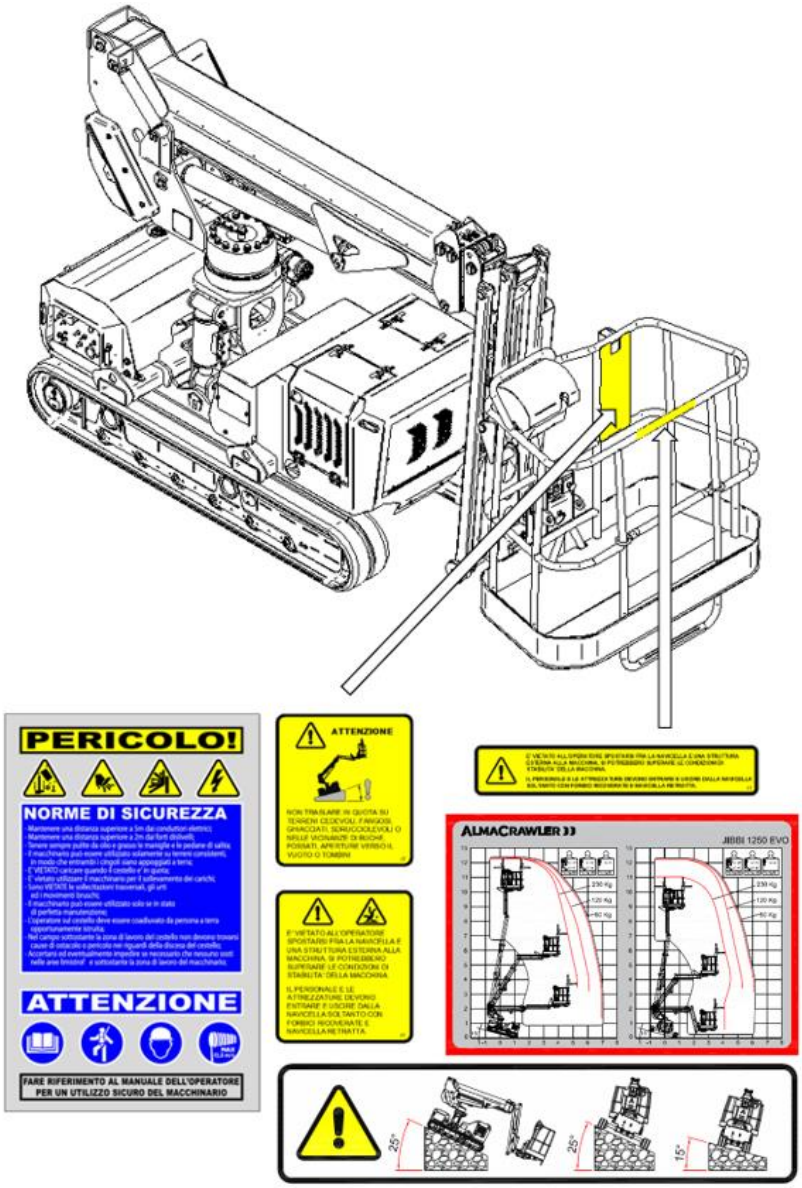
- Failure to comply with the safety regulations;
- Use of the machine by unqualified operators;
- Failure to comply with the recommendations in the documentation supplied.

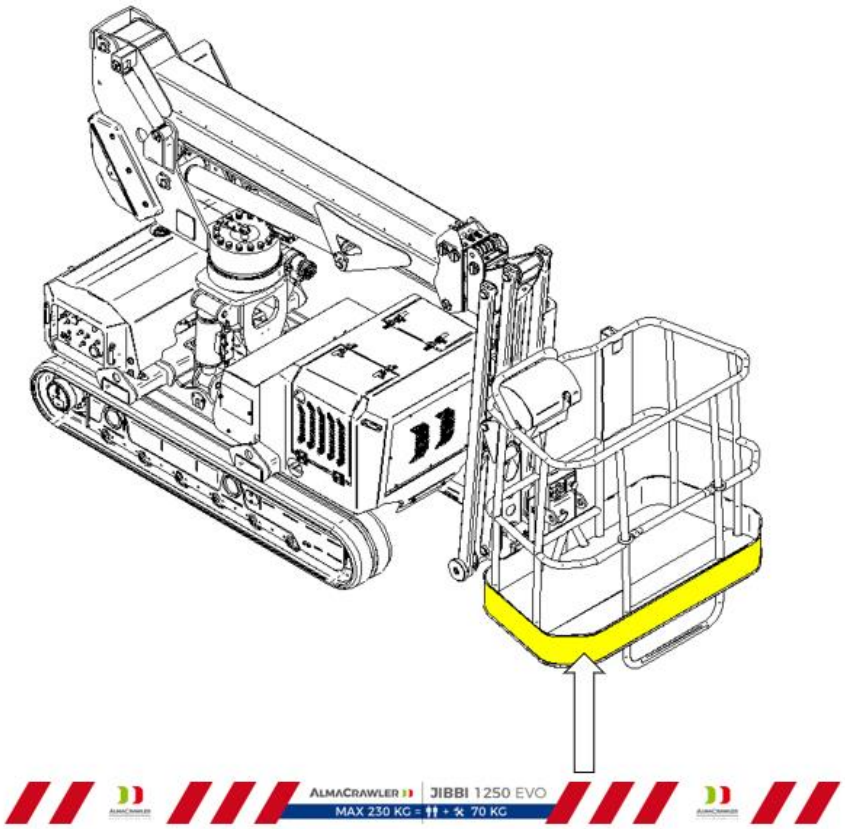
2.3 Warnings

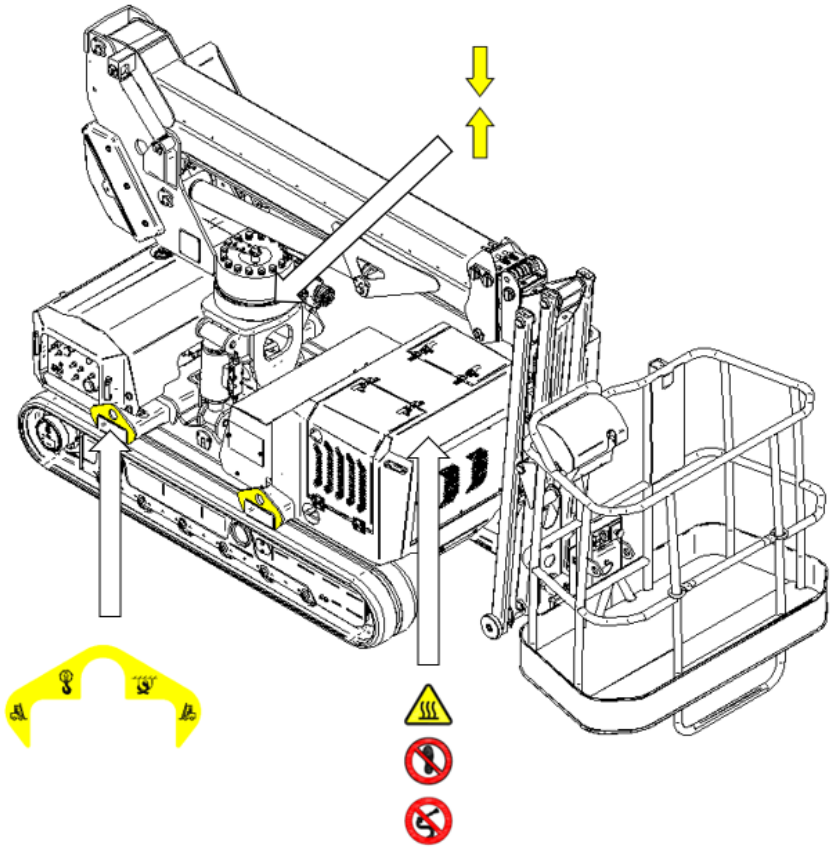
The following sign plates are affixed to the machine:

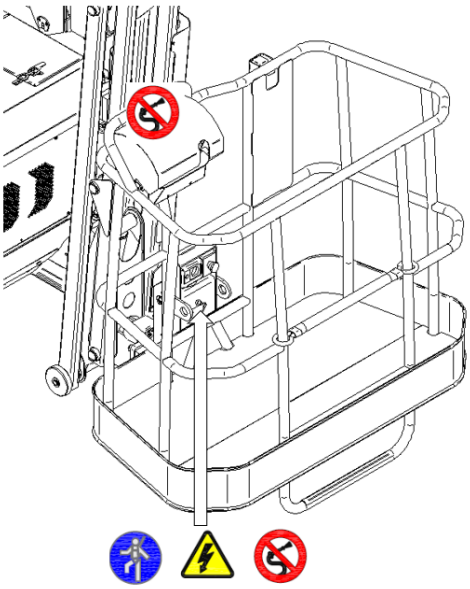
- Identification;
- Instructions;
- Obligation/prohibition;
- Attention;
- Danger;
- Maximum inclinations;
- Work diagram.

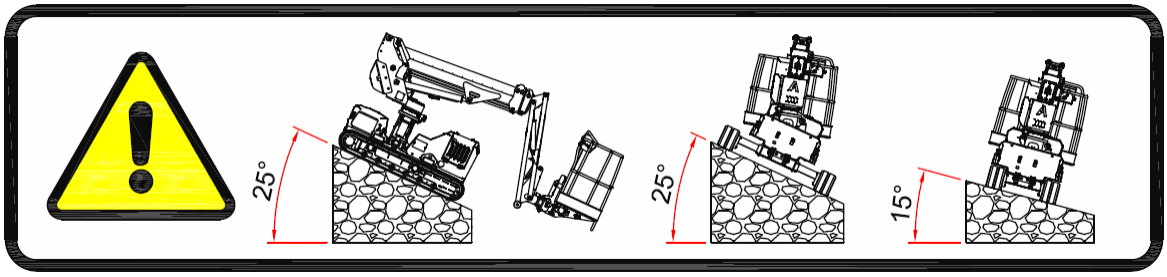
2.3.1 Instruction plates, work diagram, obligation, maximum inclinations, danger, prohibitions and attention.




ALMACRAWLER
JIBBI 1250 EVO
MAX 230 KG = + 70 KG





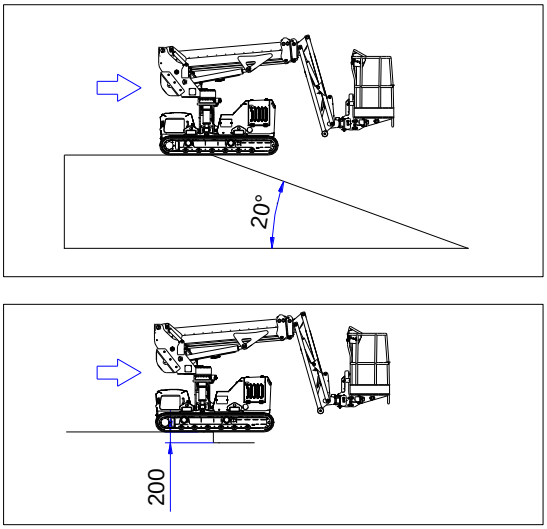


Sticker with maximum inclination of the ground dangerous due to risk of tipping and sliding, in translation with machine in transport configuration and basket without load.

Maximum inclination of the ground:

- Front inclination of the ground: The maximum front inclination of the ground to stay safe is 25°. There is no electronic control for this condition, which is at the discretion of the operator;
- Lateral inclination of the ground: The maximum lateral inclination of the ground, keeping the frame as level as possible and the tracks completely extended, to stay safe is 25°. There is no electronic control for this condition, which is at the discretion of the operator;
- Lateral inclination of the ground with a narrow track: The maximum lateral inclination of the ground, with a narrow track configuration, to stay safe is 15°. There is no electronic control for this condition, which is at the discretion of the operator;

Note: The inclinations listed on the plate above refer to those LIMITS that cannot be exceeded with the machine. Almac s.r.l. has provided an electronic control system on the platform which limits the movements of the machine when the maximum allowed inclinations have been exceeded, but not in the transport configuration.



Sticker with maximum inclination of the access ramps and of the maximum height of the curbs. Machine in transport configuration and basket without load.

Maximum ramp inclination:

- The maximum inclination of the ramps that can be used to access floors of different heights is 20°. There is no electronic control for this condition, which is at the discretion of the operator;

Maximum curb height:

- The maximum height of a curb that can be descended is 200mm (7.87 inches). There is no electronic control for this condition, which is at the discretion of the operator.

The basket must without a load and the machine must be in the transport condition.

Attention: The plates are affixed to the machine for the purpose of helping the operator and/or warning them of the risks to which they may be exposed when using the machine. In no way does the information on the plates substitute this Manual, which is the only reference document containing complete information.
Attention: Comply with the indications on the sign plates. Failure to comply with these indications may result in serious injuries and even death, and in any case could endanger the operators and/or exposed persons. Make sure that the sign plates are always affixed and legible. If this is not the case, they must be fastened back in place or replaced.

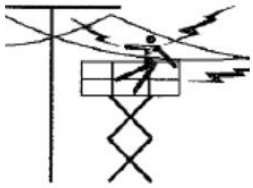
2.3.2 Meanings of the sign pictograms

	**ATTENTION/DANGER**: This symbol means that you must take care or that danger is present. Failure to comply with this alert indication could cause damage to the machine, the operator or exposed persons.
	**ATTENTION:** This symbol means that you must take care of hot parts that could cause burns. Do not touch.
	**ATTENTION:** This symbol means that you must take care of an electric panel or other live electrical devices.
	**ATTENTION**: This symbol means that there is a danger of injury to the upper and lower limbs due to moving parts. Do not insert your hands or feet into openings that could move and cut or between moving parts.
	**PROHIBITION:** Means that it is forbidden to use water at high pressure on these surfaces.
	**PROHIBITION:** Means that it is forbidden to climb onto the parts indicated by this symbol.
	**SIGNAL:** Pay attention to moving parts.
	**OBLIGATION:** This symbol obliges the use of belts on board the basket and identifies the relevant attachment points.
	**OBLIGATION:** This symbol indicates the obligation to use the anchor points marked for lifting of the machine using chains, for lifting the machine using a forklift truck and for anchoring of the machine during transportation.
	**OBLIGATION:** This symbol means that it is necessary to comply with the instructions in the “Use and maintenance manual”.
	**INDICATION:** When the machine is being transported, the two arrows must be aligned.

2.4 Provisions and prohibitions and general rules on safety and use of the platform

- Read this manual carefully before starting, using, servicing or performing other operations on the machine;
- The MEWP must always be kept in perfect conditions by following the maintenance program described in the *Maintenance Chapter*;
- Do not wear rings, wrist watches, jewellery, unfastened or loose clothing such as neck ties, torn garments, scarves, unbuttoned jackets or garments with open zip fasteners that could get caught up in moving parts;
- Wear approved safety garments, such as non-slip footwear and a reflective vest;
- To lower the slipping or tripping risk to the minimum, always keep the operator compartment, platform surfaces, steps, handrails and grip bars clean and free from all foreign objects or traces of oil, mud and snow;
- Clean the soles of your footwear before getting on the M.E.W.P.
- **THE OPERATOR MUST NOT MOVE BETWEEN THE BASKET AND A STRUCTURE EXTERNAL TO THE MACHINE AS THE STABILITY CONDITIONS OF THE MACHINE MAY BE EXCEEDED;**
- **THE STAFF AND EQUIPMENT MUST ONLY ENTER AND EXIT THE BASKET WITH THE PLATFORM IN THE TRANSPORT POSITION. IT IS FORBIDDEN TO LOAD OR UNLOAD THE PLATFORM WHEN IT IS ELEVATED;**
- Do not use the controls or flexible hoses as hand grips;
- Do not lean over the perimeter railings of the basket;
- Inform the maintenance managers of any irregularities in operation;
- Make sure that all guards and other protections are positioned correctly and that all the safety devices are installed and efficient;
- Do not use the platform in places where there is a risk of explosion or fire outbreaks;
- Do not use water jets or high pressure washers to wash the platform;
- The operator on the platform, according to the current accident-prevention regulations, ***must*** use a protective HELMET and connect the appropriate SAFETY HARNESS secured to the support of the basket. The operator on the ground must also wear a hard-hat;
- **USE OF THE PLATFORM ALWAYS REQUIRES AT LEAST 2 OPERATORS, ONE OF WHOM IS ON THE GROUND and able to perform the emergency operations described in this Manual;**
- The platform must not be used if there is insufficient light, as it is not fitted with its own lighting on board;
- In case of rain, be certain to protect the control box in the basket using the dedicated cover;
- Keep a distance of at least 2 m from marked differences in height (ditches, steep terrain, etc.);
- Ensure there is sufficient autonomy to avoid the forced shutdown of the machine;
- It is forbidden to use the platform to lift loads;
- Overloads, transverse stresses, impacts, brusque and sudden movements of the platform are forbidden;
- Abrupt movements on the platform are not permitted;
- When moving or working on the platform, both feet must be firmly placed on the floor of the basket;
- Never walk on the boom to access the basket or to leave it;
- It is forbidden to get on or off the platform while it is being controlled from the ground;
- It is forbidden to remove protective covers (except for maintenance operations);
- It is forbidden to operate near high voltage aerial power lines and in any case the work platform must always remain at a minimum safety distance of 5 m from cables. For voltages greater than 132KV proceed as shown in the table below;

Nominal voltage (kV)	Minimum distance (m / ft)
≤ 1	3 / 9.84
1 < Un ≤ 30	3.5 / 11.48
30 < Un ≤ 132	5 / 16.4
> 132	7 / 22.96



- Do not use the machine during storms. You could be struck by lightning;
- It is forbidden to use the machine if the wind speed exceeds 12.5 m/s.;
- Use the MEWP only within the permitted temperature range;
- It is forbidden to use the platform on soft, slippery or unstable;

Type of terrain, geomorphological characteristics	Permitted surface pressure	
Loose non-compact soil	In general, not solid; requirement for particular measures.	
Mixed, compact soil, sand and gravel	2.0 kg/cm²	0.2 N/mm²
Semi-solid cohesive soil	1.0 Kg/cm²	0.1 N/mm²
Solid cohesive soil	2.0 Kg/cm²	0.2 N/mm²
Hard cohesive soil	4.0 Kg/cm²	0.4 N/mm²
Rock, concrete, road paving suited to the transit of heavy vehicles	Over 10.0 Kg/cm²	over 1 N/mm²

- Never open the engine compartment without having previously removed the power supply from the control panel on the ground;
- In the work area below the platform, there must be no causes of obstacle or danger in case of descent of the platform;
- Ensure and, if necessary, prevent persons from standing in the area below the platform work area;
- Before getting into the basket, ensure horizontality of the same; correct the balance using the appropriate controls;
- An operator must not accept operational responsibilities until adequate training has been given to them by authorised and competent personnel;
- Before operation, check that there are no suspended power lines in the work area, other machines such as bridge cranes, road and track machines and construction equipment. Ensure that operators of other aerial machines or on the ground are aware of the presence of the platform. Remove tension from aerial cranes, place obstacles on the ground if necessary;
- Before starting work, the operator and their supervisor must take the necessary precautions in order to avoid the known dangers;
- Only operate the machine after having carried out the maintenance operations in accordance with the specifications and the deadlines indicated by the manufacturer;
- Never work with a machine in poor operating conditions; if a fault occurs, stop the machine, affix a clearly visible sign and inform the relevant personnel;

- Make sure that daily inspections and functional checks are performed before putting the machine into service;
- Do not push or pull the machine or other subjects using the telescopic boom function;
- Do not affix components on the railing of the basket without the approval of the manufacturer;
- It is forbidden to place ladders or other structures inside the basket to increase their height;
- It is forbidden to place structures inside the basket that increase the surface exposed to the wind;
- Never use your arm for any purpose other than to bring personnel, tools and equipment into a working position;
- It is forbidden to exceed the capacity of the MEWP; the capacity is the work load for which the platform has been designed and includes the weight of the operators and the tools used for their specific tasks (see identification plates);
- If the boom or platform is caught so that one of the tracks is raised off the ground, all personnel must be removed from the basket before starting to free the machine. If necessary, use other equipment for the evacuation of personnel;
- The operator is responsible for preventing the use of machine controls by ground personnel and for warning them not to work, walk or stand under the boom or under the basket. Place barriers on the ground if necessary;
- Do not move the machine on slopes greater than those indicated;
- Always use an assistant or an acoustic signalling device when moving forward in areas where vision is obstructed, keep personnel not involved in the operations at least 2 m away from the machine when it is in motion.

2.5 Transport and loading

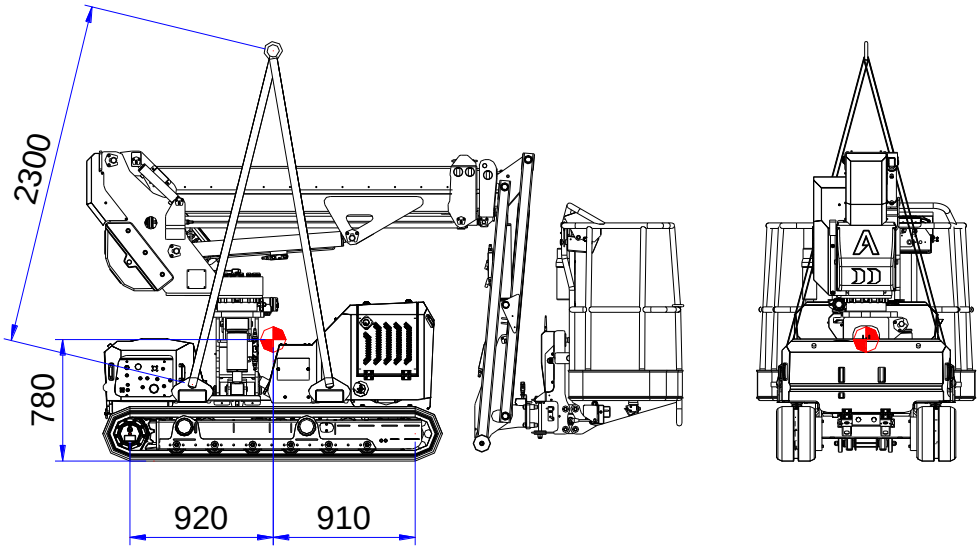
You are advised to check the dimensional limits established for means of transport if the machine must be transported to its specific work site.

The machine can be loaded onto the vehicle in three different ways:

1) **Lift the machine** using a suitable forklift truck using the tubular structures welded directly to the main frame (see photo below).

Attention: The maximum weight of the machine in the heaviest configuration is 2900Kg.
Attention: During this operation the basket must be empty.

2) **Lift the machine** with the use of 4 CE-certified straps or lifting chains with a minimum length of 2300mm, to be connected to the appropriate hook points marked with stickers (see photo below).



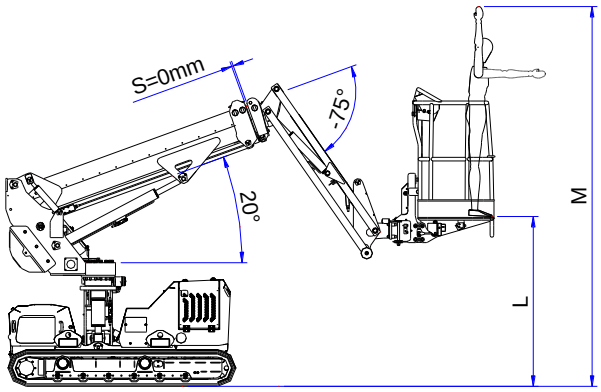
Attention: The maximum weight of the machine in the heaviest configuration is 2900Kg (6393.4 lbs).
Attention: During this operation the basket must be empty.

3) **Using appropriate ramps and the platform translation commands**: with the platform in transport configuration the operator can move the machine by driving it directly on the transport vehicle. In this case, make sure that the ramp gradient is within the grade ability indicated in the PERFORMANCE data and that the bearing capacity of the chutes is appropriate to the weight of the machine.

When the machine is in the transport conditions, the message “TRANSPORT” will be visible in the display of the push-button panel.

Attention: Do not move the machine on ramps if the message “TRANSPORT” does not appear on the display.

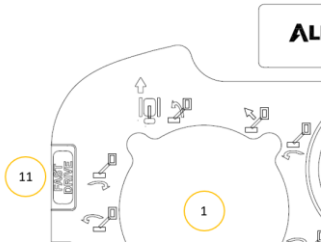
The following drawing shows the maximum height of the aerial part in transport configuration.

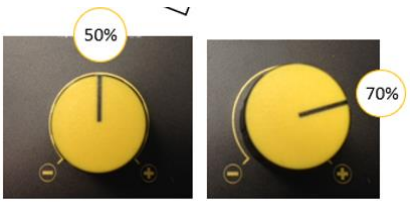


If both tracks are completely extended, the column can be freely rotated +-110° and the machine is always in transport condition;
If only one track is fully extended, rotation will only be permitted on its side;
If both tracks are not completely extended then the column must be completely centred (+-2°);
If however, in this condition, the basket is not mounted on its support then the column will be able to rotate by +-45° (use this function to be able to move in areas with limited room for manoeuvre).

Attention: This procedure can also be performed with the operator not in the basket. In this case, the length of the connecting cable is sufficient to allow the operator to remain at a safe distance from the machine.
Attention: Crushing hazard!

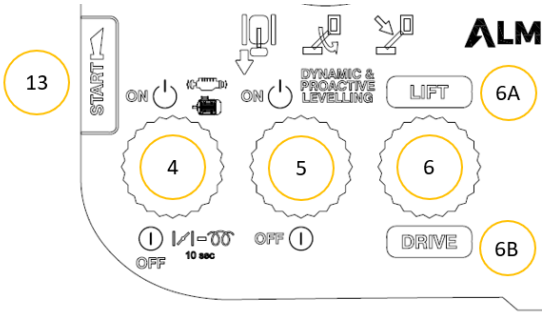
Function 1 (optional): The machine has an advanced traction control function, which is used to advance and steer via the action on the right joystick only. It is advisable to use this mode of operation with the platform in the maximum track configuration, after alignment with the ramps. To activate it, simply press the button (11) of the push-button panel.
The function remains active until the button is pressed again or the machine is switched off or on again via a key or emergency stop.
When the function is selected the word "FAST DRIVE" will appear on the Display.
Attention: Also make sure that the display shows the wording “Booster OFF”. To deactivate the booster simply keep the potentiometer below 90%; it is advisable to position it between 50 and 70%.





Function 2: The machine has an advanced function that allows automatic lifting of the telescopic boom if its angle is between 0 and 5°.

This allows collisions between the lower part of the JIB and the ground to be avoided.
To activate this function simply select Dynamic levelling ON in the selector (5).



The boom will automatically rise up to an angle of 5° when the translation is selected.
When the boom reaches the 5° angle, the machine will start to move.

The mobile push-button panel can be removed and the machine is controlled by an operator on the ground: with the platform in transport position, the operator can move the machine directly from the ground using the portable push-button panel (see photo below).
In the radio version, the machine control system prevents the aerial part of the machine from being raised beyond the transport conditions if the radio control is not placed in the basket in the appropriate housing.
If the radio control is not placed in its housing but the platform load is less than 20Kg, it is in any case possible to lift the aerial part beyond the transport conditions.
In this case, the indication "RADIO OUT BASKET" appears on the display.

Attention: The control panel can be dismantled and can only be used outside the platform by the operator to use the platform exclusively in the TRANSPORT position.

Once the push-button panel has been removed from its seat in the basket, use the shoulder strap provided to fix it to the operator's body in a steady and safe manner to avoid manoeuvring errors.

Attention: When operating in this function, be careful not to come into contact with the platform tracks and check that there are no pedestrians in the machine's trajectory. Stay at a safe distance using the length of the spiral cable.

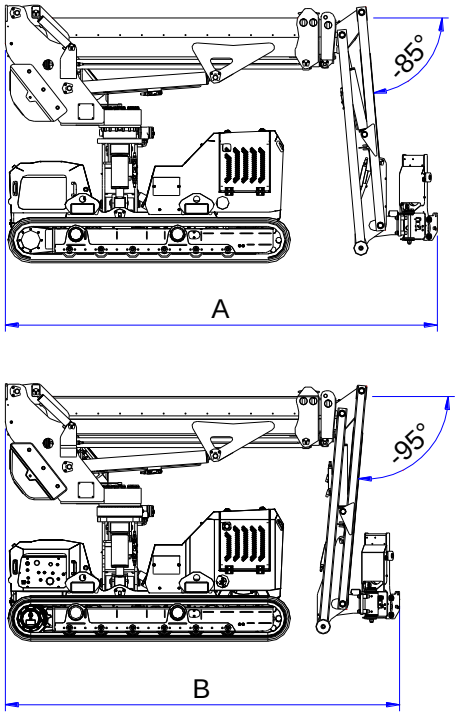
2.6 Anchoring the machine on the means of transport

Use the appropriate points to secure the machine to the transport vehicle (see photo below).

Attention: Do not excessively tighten the fixing straps to avoid damaging the machine structure.
Attention: Before carrying out transportation, make sure that the telescopic boom is COMPLETELY LOWERED and the extension is retracted. The JIB must also be completely lowered.

2.7 Reduction of machine dimensions by complete closure of the JIB

If required, it is possible to reduce the length of the machine by removing the aluminium basket and turning the basket support to the limit switch.



A = 3.3 m (10.82 ft)
B = 3.04 m (9.97 ft)
Normally the JIB is free to close up to -85°.
It is possible to re-close the JIB completely (-95°) with the following procedure:

1) Re-close the JIB to -85°and wait for the movement to stop;
2) Release the JIB closing command and operate it again waiting at least 6 seconds;
3) The JIB will completely close again.

Attention: With the JIB retracted at -95° **it is PROHIBITED** to rotate the column; collision risk with the machine tracks.

2.8 Checks on the machine before each use

- Visually check under and around the machine to make sure that there are no oil or fuel leaks. If leaks are discovered, follow the maintenance instructions;
- Make sure that there is no hydraulic oil leaking from the hoses and from the other hydraulic components (cylinders, distributors, fittings, etc.);
- Check that there are no cut or worn electrical cables and that the connectors are correctly secured;
- Check the fuel level before starting work to prevent interruptions while working;
- Check the engine oil level;
- Check the hydraulic system oil level;
- Do not run the engine in closed areas like garages or similar. The engine exhaust gas contains carbon monoxide, a poisonous gas that can quickly saturate a closed space and cause difficulties or even death;
- Make sure that none of the screws, bolts or ferrules are loose or missing;
- Make sure that all the "Seeger" safety rings are present and correctly in place with their washers;
- Check that all the pins and pin clamps are correctly positioned and fixed in their seats;
- Check that the steel structure is not deformed;
- Make sure there are no cracks in the welds, damage or abnormal wear;
- Check that there are no signs of rust in the steel structure. Any rust may be due to cracks in the structure;
- Make sure the tracks are not cut or abnormally worn;
- Always check to make sure that track tension is correct;
- Check the chains of the telescopic boom are correctly tensioned, both the outreach and the return ones;
- Check and, if necessary, grease the boom blocks;
- Check that the manual, the plates and the stickers are on the machine;
- Make sure that the 12V internal combustion engine ignition battery is fully charged; a simple way to check is turning on the internal combustion engine, which must turn on easily.

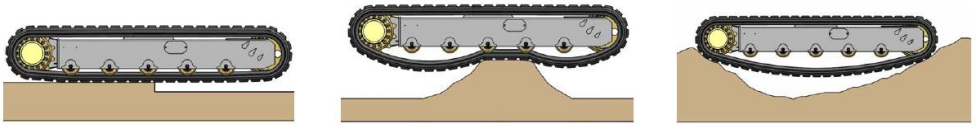
Attention: In case of anomalies, do not use the machine and contact an authorised service centre.

2.9 Safety indications on the use of the travel function

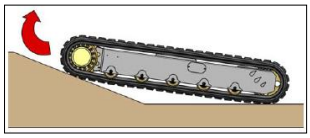
2.9.1 General indications

You must follow the instructions given below:

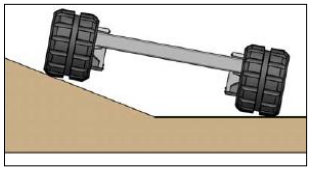
- It is forbidden to drive on roads open to traffic; the machine is not approved for this purpose;
- Make sure that the movement manoeuvres take place on flat and firm terrain;
- Make sure that there are no hollows or ridges in the floor and that there is enough room for the machine to pass through;
- Make sure that there are no bystanders or obstructions in the surrounding area before moving off;
- Do not CHANGE DIRECTION on kerbs, rocks or appreciable differences in level (> 10 cm) when driving the machine. In this case, always proceed perpendicularly to the obstacles;



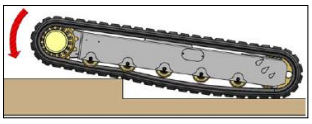
- If you must drive up a slope, do not change direction when the ground changes from flat to sloping. If this is absolutely necessary, perform the manoeuvre gradually.



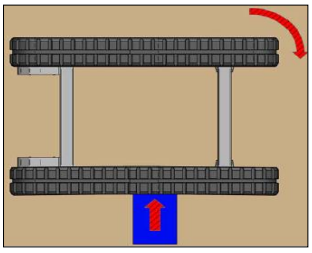
- Do not drive along the edge of slopes or over uneven ground with one track horizontal and the other slanting or partially raised (>10°) as this will damage the tracks. **ALWAYS PROCEED WITH THE TRACKS RESTING ON THE SAME HORIZONTAL PLANE**.



- Driving over an obstacle creates a gap between the bearing rollers and track, which could consequently slip out of its housing.



- If you change direction in a situation where the track could move sideways owing to an obstruction, the track could slip out of its housing.



- Check to make sure that there are no bystanders near moving parts when the platform is lowered.

Attention: In case of inclined flooring, pay attention to the correct LEVELLING direction. **Avoid inclining the platform beyond what is necessary towards the lower side of the floor.**

- Avoid smooth, slippery and/or icy surfaces and those covered with sand: they could cause a risk of sliding or tipping during levelling.

Attention: During movement with ELECTRICAL POWER, be careful of the connection cable in order to avoid dangerously crushing the cable .

2.9.2 Translation with machine in transport configuration

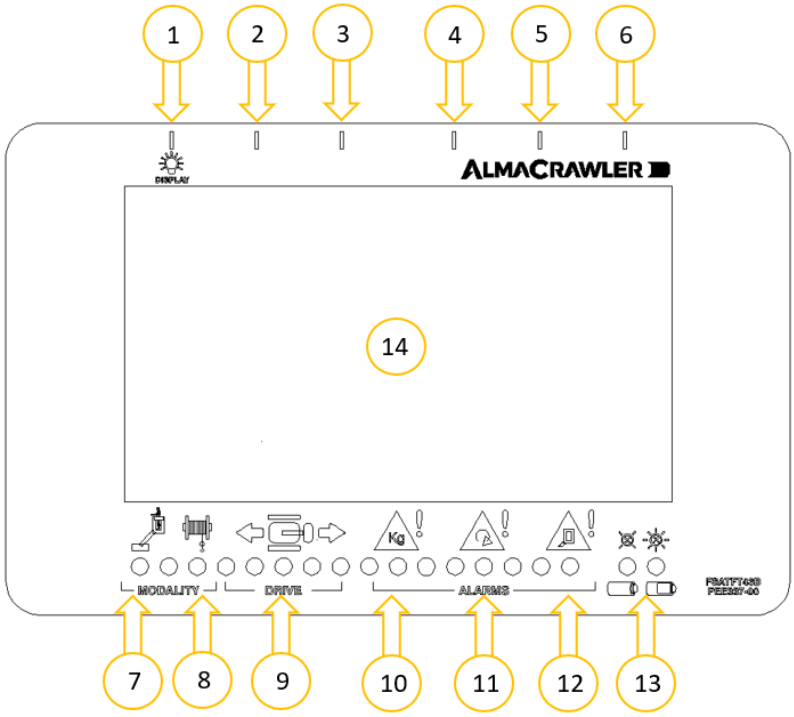
The instructions provided in chapter 2.3.1 must be observed.

2.9.3 Machine translation beyond the transport configuration (translation at height)

The machine can run at reduced speed (0.4 km/h – 0.24 mph) even with the aerial part raised beyond the transport configuration.

Refer to the paragraphs: 1.10.2 – 1.10.3 and 1.10.4 for a description of the working diagrams that allow translation in the various machine configurations.

The mode of translation at height is highlighted in the panel by means of the light 9.



Light on steady: Machine in transport condition, translation enabled;

Light on flashing: Machine beyond the transport condition, transfer at height enabled;

Light off: Translation not enabled.

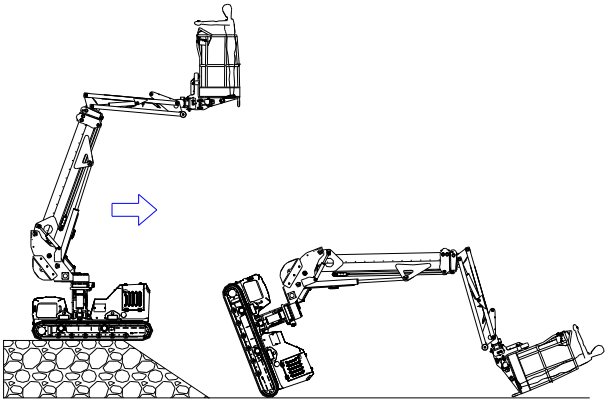
During elevation, the inclination of the fifth wheel level is always controlled and the translation stops if this inclination exceeds the value of 1°.

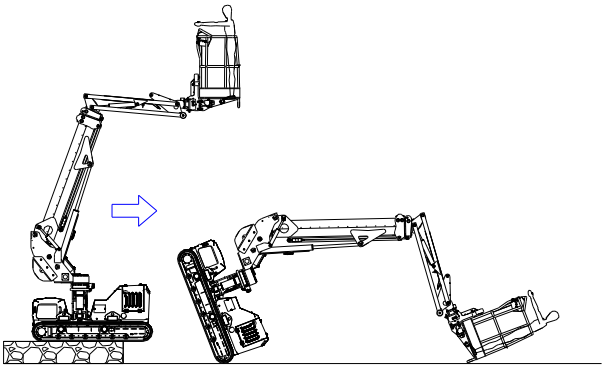
The fifth wheel level can be automatically levelled if the selector 5 in the control panel is positioned on "Dynamic and proactive levelling ON" simply by releasing the translation for a moment and then reselecting it.

This electronic control makes it possible to move safely on land whose slope gradually changes.

Attention: However, the system cannot prevent the machine from overturning in the event of sudden changes in the slope of the ground or curbs.

As shown in an exemplary but non-exhaustive manner in the following drawings:





Attention: Danger of tipping.
Attention: It is strictly forbidden to tackle in translation: Slope changes, curbs, dips, holes or bumps with the machine not in transport configuration.
Attention: It is the operator's complete responsibility to verify the suitability of the ground over which they must travel.

2.10 Compulsory safety instructions to be carried out before lifting the work platform beyond the transport conditions

The instructions given below must be followed.
After levelling the machine, lift the basket only after checking and verifying that all 4 ends of the tracks are resting on the ground.
Avoid the following situation for both tracks:

The ring gear of the wheel drive units and the track tensioner wheels must all be resting on the ground.
If even one of them is not in contact with the ground, the stabiliser area will be reduced and, consequently, the platform will be unstable and there will be the **risk of overturning.**

2.11 Safety checks on the operation of the platform, to be performed before use

The instructions given below must be followed:

- With the platform in transport configuration, operate the carriage extension control to check correct functioning of the system;
- With the platform in transport configuration, position the machine with the slewing ring rotation plane inclined to the horizontal with a value greater than 0.5° on the side. Activate the boom lifting control, make sure that the system automatically reaches the horizontal fifth wheel level;
- With the platform in transport configuration, position the machine with the slewing ring rotation plane inclined to the horizontal with a value greater than 0.5° on the longitudinal. Activate the boom lifting control, make sure that the system automatically reaches the horizontal fifth wheel level;
- With the platform in transport configuration, position the machine with the slewing ring rotation plane inclined to the horizontal with a value greater than 0.5° on the longitudinal and on the side. Activate the boom lifting control, make sure that the system automatically reaches the horizontal fifth wheel level;
- Raise and lower the main boom and make sure that the machine works correctly (balancing of the basket is an automatic movement, check correct operation). The automatic correction of the platform levelling only intervenes if the boom lifting or lowering command is selected and if the inclination of the basket is greater than 2°;
- Execute the outreach extension and outreach retraction manoeuvre and make sure that the machine works correctly;
- Perform the antenna lifting and lowering (JIB) manoeuvre and make sure the machine works correctly;
- Perform rotation of the basket in both directions and make sure that the machine works correctly;
- Check the operation of the translation function with the platform raised. This test is carried out by lifting the platform to a height that involves an angle of the main boom of more than 20° and check that it is possible to move with the machine at reduced speed only (in the display the word "TRANSPORT" must not appear);
- Check that, with the platform raised above the transport height but lower than the maximum travel height, and moving on uneven ground, the machine automatically disengages the

translation when inclination of the frame with respect to the horizontal exceeds 1°. Release the travel control; when this control is operated again or when the lifting control is operated, the system must bring the frame back to the horizontal position automatically. At the end of levelling, the machine executes the selected movement; (Note: If the change in inclination is sudden it is likely that the machine will stop with a tilt of the frame greater than 1°. Up to an inclination of 4° automatic levelling is permitted; over 4° it is necessary to bring the platform back into the transport condition);

- Lift the platform to a height greater than the transport height, check that the manual levelling functions are not permitted;
- Operate the emergency button on the remote control (or radio control); make sure that the engine turns off (both the internal combustion engine and the electrical engine) and that no functions are allowed. Release the mushroom-shaped button after this test;
- Operate the ground movement emergency button; make sure that the engine turns off (both the internal combustion engine and the electrical engine) and that no functions are allowed. Release the mushroom-shaped button after this test;
- Press the emergency button on the basket support (only present in the radio version), check that the engine (both endothermic and electric) is switched off and that no function is permitted. Release the mushroom-shaped button after this test;
- Operate the warning buzzer and make sure it works;
- Check the operation of the buzzer when the drive function is activated;
- Verify with machine in translation and platform in transport position that releasing the Joystick the machine stops immediately;
- Check the correct operation of the manual emergency descent device (Hand pump);
- Get on the platform and check from the display that the load control system measures the correct weight (tolerance +-5Kg/11lbs);
- In case non-perfect sealing of one of the cylinder valves is found (Example: the machine is found with the telescopic boom lowered in relation to the position in which it was left, the inclined basket is found), do not use the machine and contact an authorised service centre.

2.12 Precautions when work terminates or is interrupted

It is forbidden to leave the MEWP in configurations other than that of rest and without first having made sure that the engine has been switched off and the keys removed from the control panel in order to avoid use by unauthorised persons.

2.13 Personal protective equipment (PPE)

To operate the machine in complete safety is necessary to use appropriate personal protection equipment, which must be worn before climbing on the basket and used as indicated.

- Retaining system;
- Safety helmet;
- Safety shoes;
- Protection gloves;

2.13.1 Retaining system

Before climbing in the basket, it is compulsory wearing suitable fall protection systems, which must be such to completely prevent the fall from a height.
The safety device consists of a full body harness (1) complying with UNI EN 361, with front or rear coupling equipped with retaining or adjustable lanyard (2) for EN 358 which allows to prevent the fall, hooked to the pre-arranged hooking point in the basket, by means of connectors (3) EN 362 having a suitable shape and dimensions.

Once in the basket, hook the carabiner to one of the attachment points indicated with the appropriate symbol. Then adjust the cord so that it remains as short as possible in order to keep the operator inside the basket.

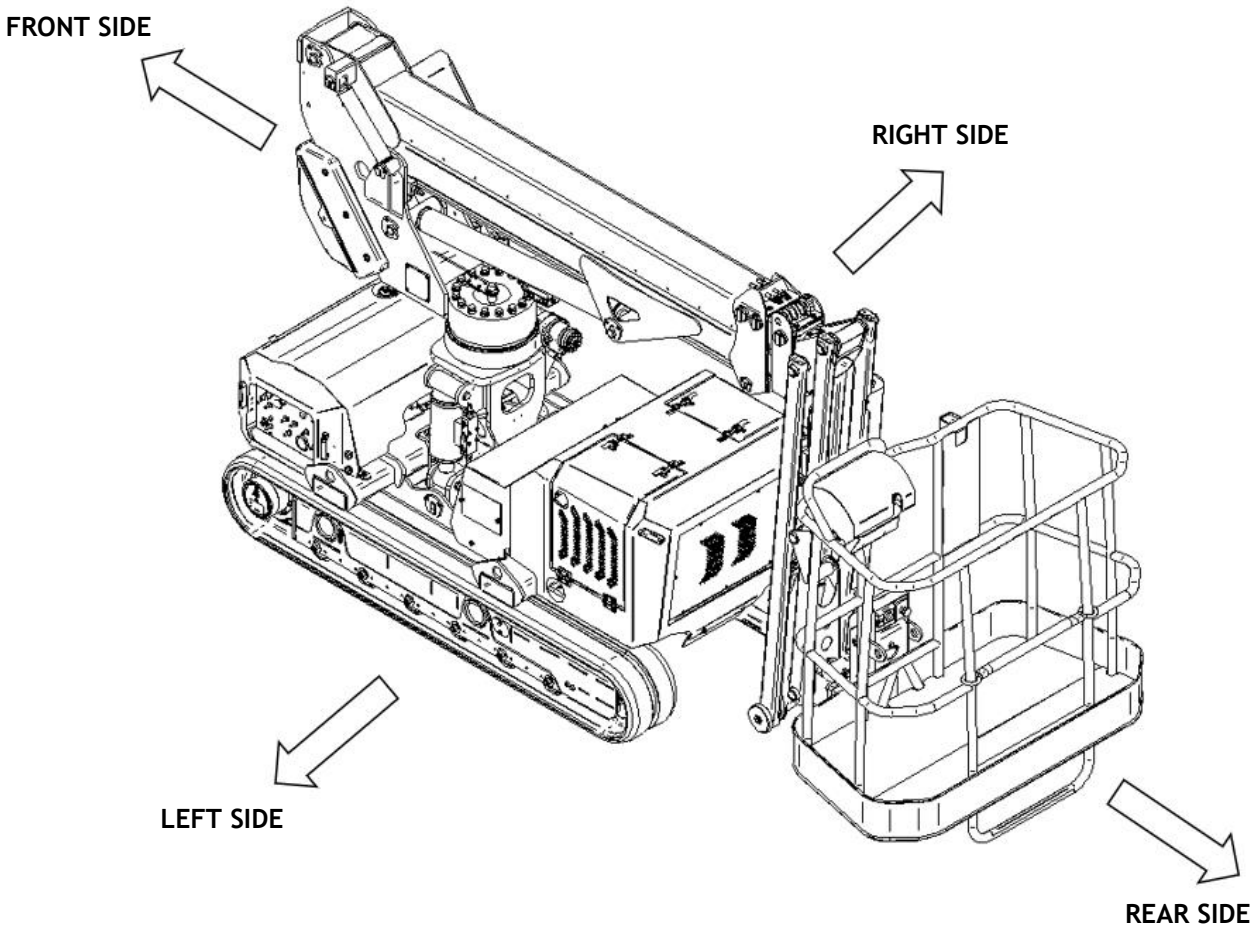
Attention: This device is not to be considered a fall protection system, it is only used to prevent falling.

PERSONAL PROTECTIVE EQUIPMENT

			
Body protection is compulsory	Safety gloves are compulsory	Safety footwear is compulsory	Ear muffs or earplug are compulsory

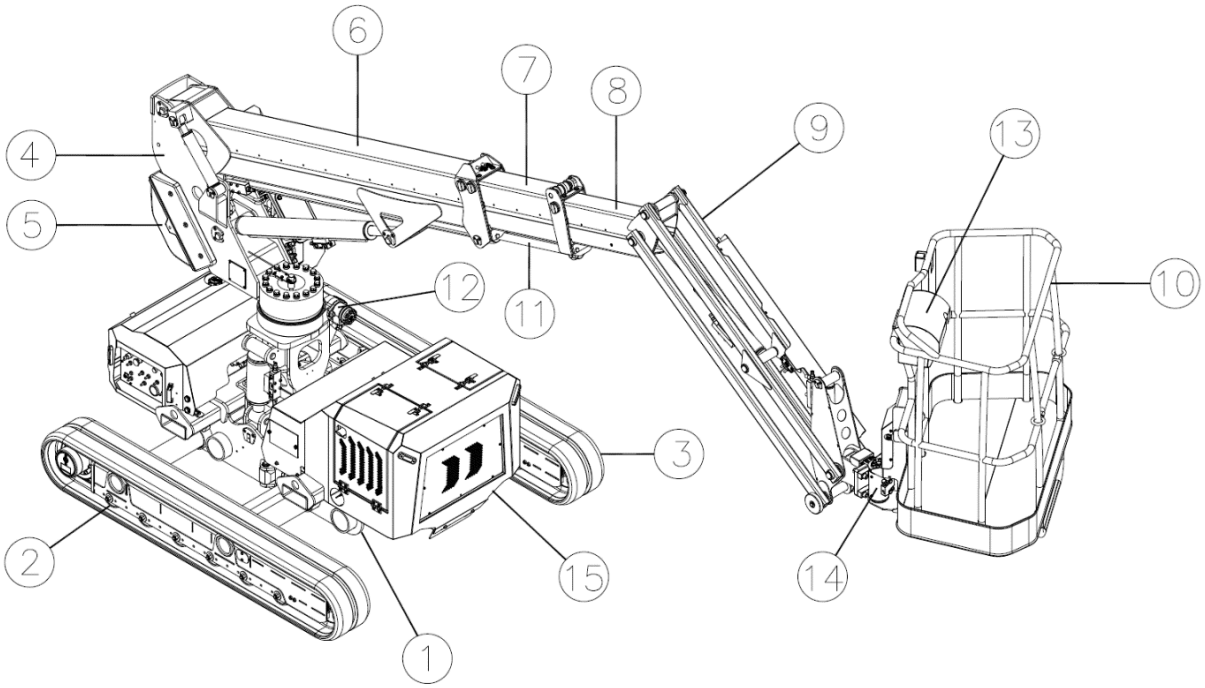
3 DESCRIPTION OF THE MACHINE

3.1 Machine orientation

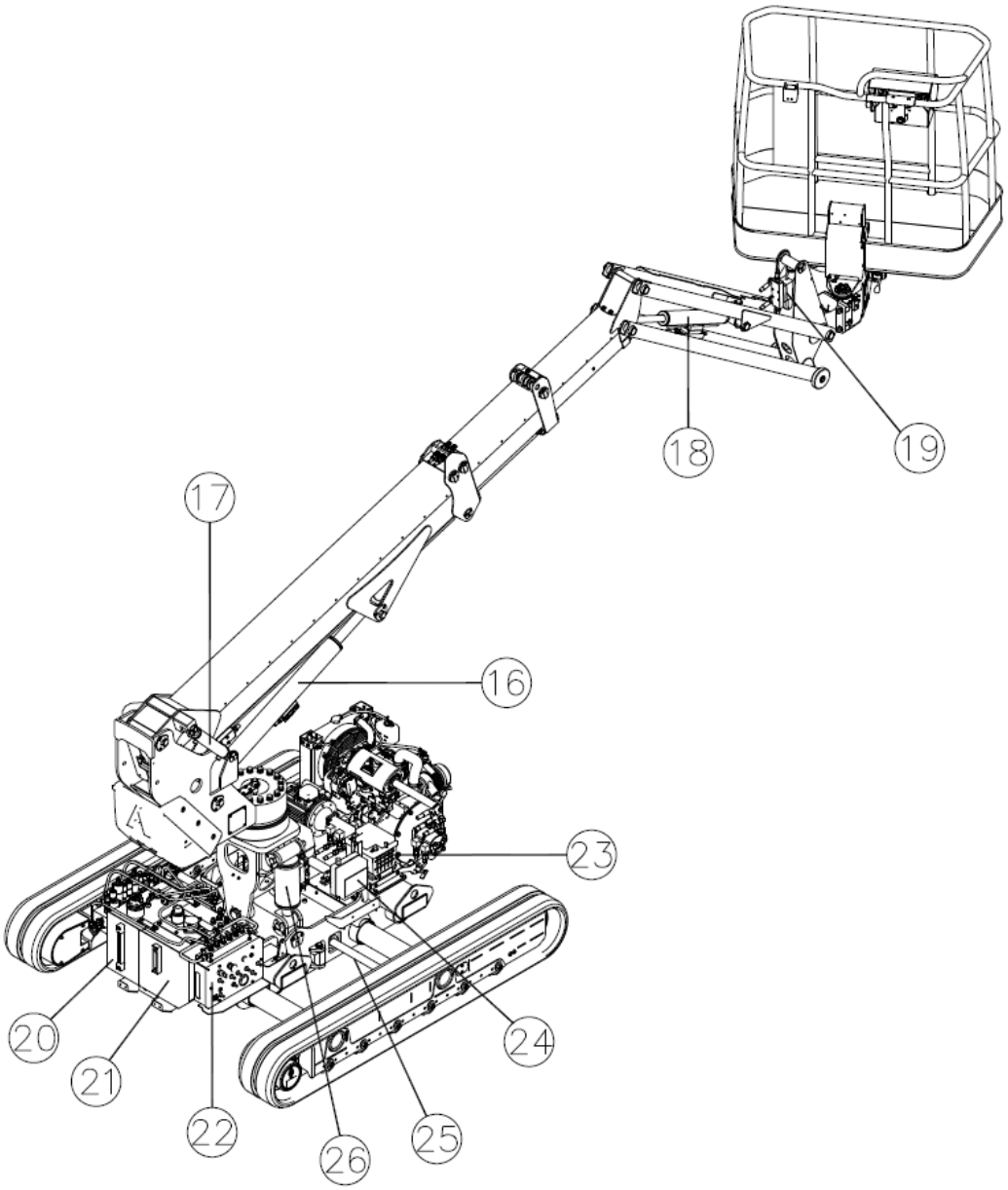


3.2 Structure of the equipment

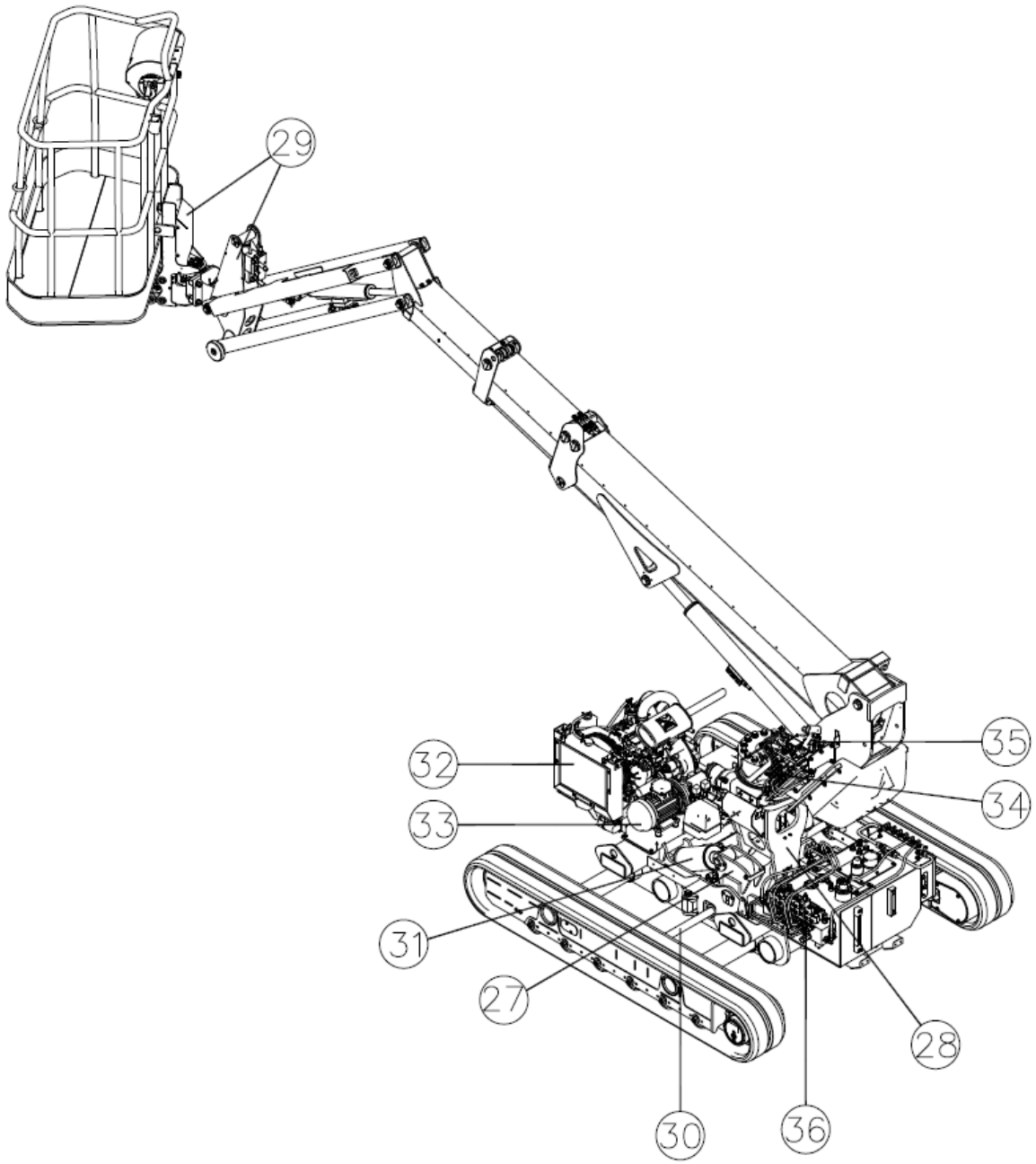
Note: The illustrated model may differ slightly from the model owned.



1. Lower frame
2. Left track
3. Right track
4. Column
5. Ballast
6. Boom
7. First outreach
8. Second outreach
9. JIB
10. Basket
11. Boom extension cylinder
12. Rotation slewing ring and hydraulic motor
13. Control console
14. Platform rotation actuator
15. 230V outlet



16. Boom lifting cylinder
17. “Master” balancing cylinder
18. JIB lifting cylinder
19. “Slave” balancing cylinder
20. Fuel tank
21. Oil tank
22. Ground control electrical panel
23. 12V starter battery
24. Differential magnetothermal switches electrical panel
25. Left track widening cylinder
26. Side levelling cylinder



27. Lower levelling joint
28. Levelling upper joint
29. Basket support and balancing joint
30. Right track widening cylinder
31. Longitudinal levelling cylinder
32. Endothermic engine
33. Electric motor (if present)
34. Overhead movements distributor
35. Hand pump
36. Ground movements distributor

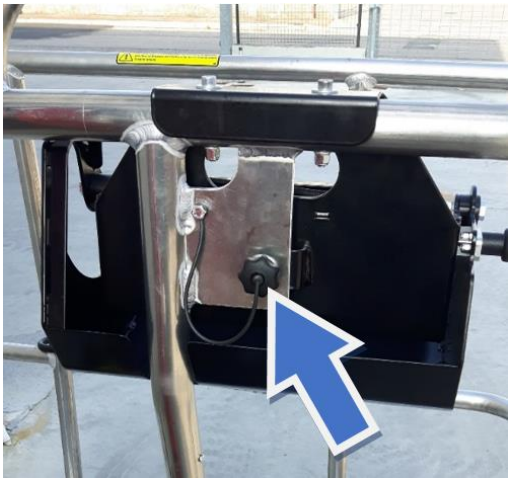
3.3 Control stations

3.3.1 Mobile command push-button panel (with cable)

The platform is equipped with a mobile control push-button panel (console) which allows for normal operation on the platform.

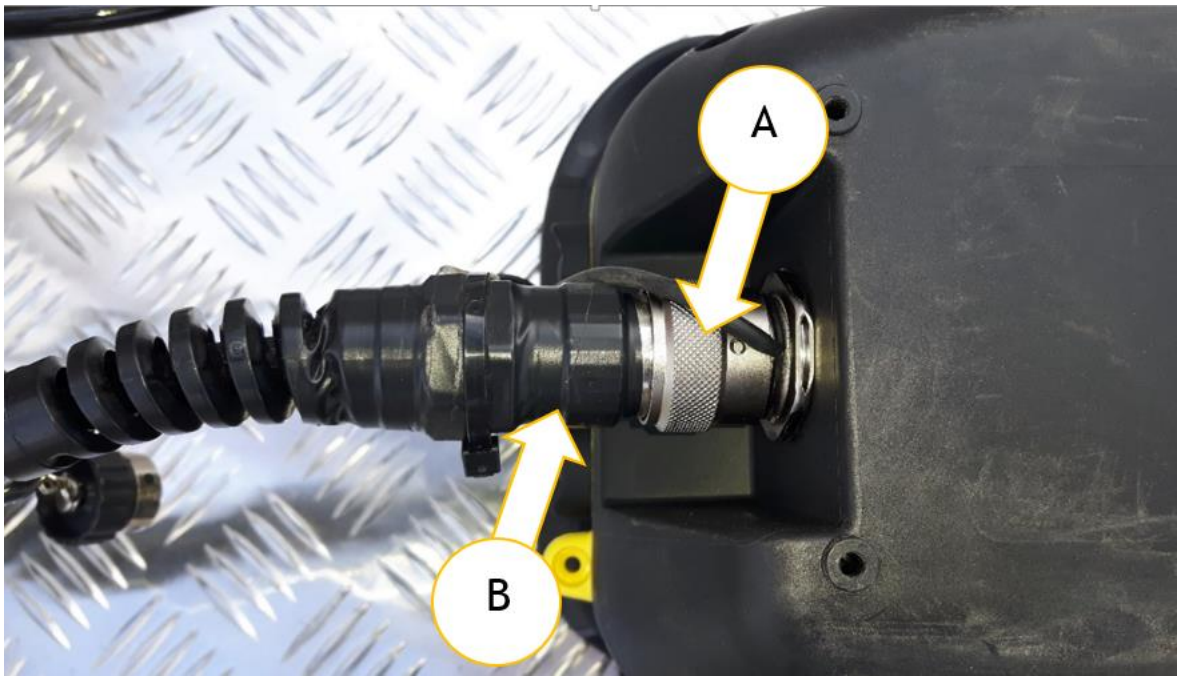
The console can be located in the dedicated metal support attached to the railing of the platform or removed and held by the operator.

The metal support can also be removed by unscrewing the relevant rear knob.

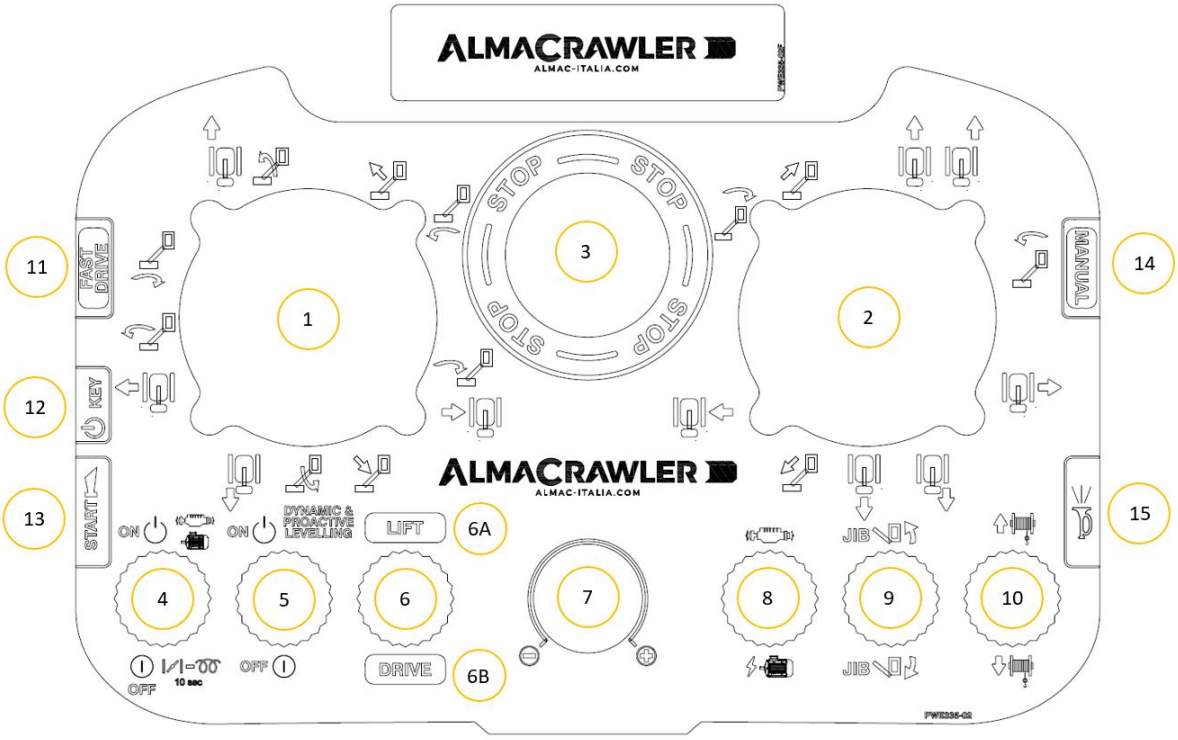


Attention: If the platform is transported on vehicles, always secure the support by means of the threaded knob.
Attention: The metal support is only removable in the cable version. In the version with radio control it is fixed and cannot be removed.

The push-button panel can also be disconnected from the spiral cable by unscrewing the ferrule indicated with (A).



Attention: Do not touch ferrule (B); if ferrule B is turned, the wires inside the connector will be damaged.
Attention: For all operations that require lifting of the basket above the transport height, the console and the operator must be inside the platform itself.


ALMACRAWLER
ALMAC-ITALIA.COM
STOP
STOP
STOP
STOP
3
1
2
11
FAST DRIVE
14
MANUAL
12
KEY
13
START
15
ALMACRAWLER
ALMAC-ITALIA.COM
ON
ON
DYNAMIC & PROACTIVE LEVELLING
LIFT
6A
JIB
JIB
4
5
6
7
8
9
10
OFF
10 sec
OFF
DRIVE
6B


11
13
12

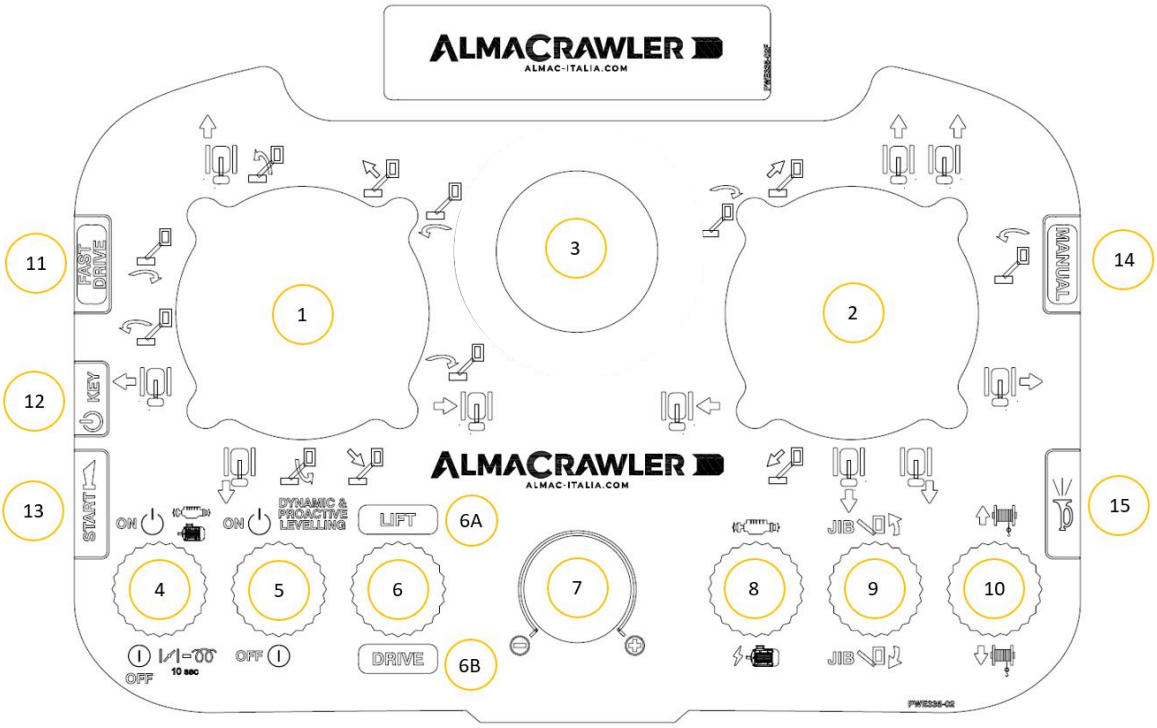

15
14
16

No.	Identification	Function and Status	Description of the function
1	LH joystick	Orange “DRIVE” button	- Left track translation control; - Left track opening/closing.
		Blue “LIFT” button	- Boom lifting/lowering; - Tower rotation.
		Blue “LIFT” button + Green “MANUAL” button (14)	- Side manual levelling; - Longitudinal manual levelling.
2	RH joystick	Orange “DRIVE” button	- Right track translation control; - Right track opening/closing.
		Orange “DRIVE” button ” + Purple “FAST DRIVE” button (11)	- Booster Activation; - Optional mode: translation control command with the right Joystick only.
		Blue “LIFT” button	- Outreach extension/retraction; - Basket rotation.
3	Emergency Button	EMERGENCY STOP	
4	Selector	Ignition - Switching off the combustion/electric engine	To switch on the combustion/electric engine select ON; To switch off the combustion/electric engine select OFF; Selecting OFF and holding down the control for 10 seconds the glow plugs of the internal combustion engine are activated; NOTE: When the machine is powered by an electric motor, if no signal is received after 5 minutes, the electric motor switches off.
5	Selector	Activation - Deactivation of Dynamic Levelling and Proactive Levelling	To activate Dynamic Levelling, turn the selector to ON; To deactivate the Dynamic Levelling, turn the selector to OFF; To activate Proactive Levelling, turn the selector to ON; To deactivate Proactive Levelling, turn the selector to OFF. (With the selector ON, the automatic boom ascent between 0 and 5° is also activated)
6	Selector	Selection of ground movements and aerial part movements	For the movements of the aerial part, turn the selector upwards (6A Blue “LIFT” selector); To activate the ground movements, move the selector downwards (6B Orange “DRIVE” selector).
7	Potentiometer	Selection of revolutions of the internal combustion engine	Turning the device clockwise (+) increases the currents to the proportional valves. Moreover, with the selector over 50% the endothermic engine accelerator is activated; Turning the device anti-clockwise (-) decreases the currents to the proportional valves. Moreover, with the selector below 50% the accelerator of the internal combustion engine is deactivated and the movements can only be carried out individually.
8	Selector	Selection of endothermic engine or electric motor	To select the combustion engine, turn the selector upwards;

No.	Identification	Function and Status	Description of the function
			To select the electric motor, move the selector downwards.
9	Selector	Antenna movement control (JIB)	To raise the antenna (JIB), move the selector upwards keeping it in position; To lower the antenna (JIB) move the selector downwards keeping it in position; Note: This command only works after having previously activated the aerial part using the selector 6 (Blue "LIFT" selector).
10	Selector	Winch movement control (if present)	To lower the hook of the winch, move the selector downwards keeping it in position; To raise the hook of the winch, move the selector upwards keeping it in position.
11	Purple (FAST DRIVE) button	Fast drive activation	- Press and release to activate the Booster. - Optional mode: translation control command with the right Joystick only.
12	Safety key (KEY)	Safety key for console activation	Insert the supplied key to activate the console; If the key is not inserted, the console cannot be activated; The key is encrypted so use only the key provided, otherwise the console cannot be used.
13	Button (START)	Ignition of the console	Press and release to turn on the console.
14	Green (MANUAL) Button	Activation of the manual levelling controls	Press to activate the manual levelling controls using the left joystick.
15	Button (Warning Buzzer)	Warning Buzzer Activation	Press to activate the warning buzzer.
16	Connector	Connector for coiled control cable.	

Note: The machine can perform two simultaneous movements only if the potentiometer (7) exceeds 50%; conversely, the platform will only allow one movement at a time.

3.3.2 "Radio" mobile control push-button panel (if present)

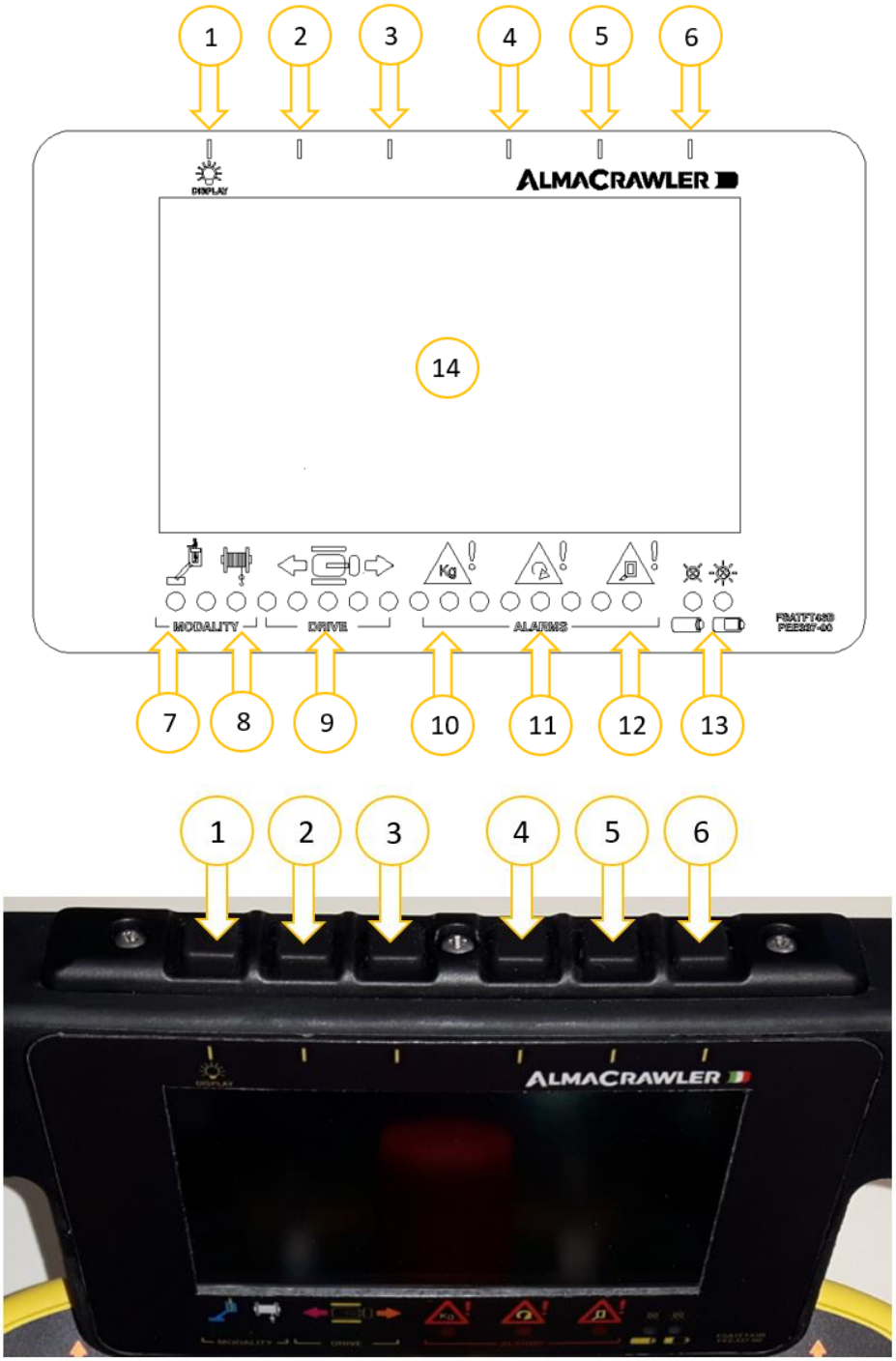


No.	Identification	Function and Status	Description of the function
1	LH joystick	Orange “DRIVE” button	- Left track translation control; - Left track opening/closing.
		Blue “LIFT” button	- Boom lifting/lowering; - Tower rotation.
		Blue “LIFT” button + Green MANUAL button (14)	- Side manual levelling; - Longitudinal manual levelling.
2	RH joystick	Orange “DRIVE” button	- Right track translation control; - Right track opening/closing.
		Orange “DRIVE” button” + Purple “FAST DRIVE” button (11)	- Booster Activation; - Optional mode: translation control command with the right Joystick only.
		Blue “LIFT” button	- Outreach extension/retraction; - Basket rotation.
3	Emergency Button	EMERGENCY STOP	
4	Selector	Ignition - Switching off the combustion/electric engine	To switch on the combustion/electric engine select ON; To switch off the combustion/electric engine select OFF; Selecting OFF and holding down the control for 10 seconds the glow plugs of the internal combustion engine are activated; NOTE: When the machine is powered by an electric motor, if no signal is received after 5 minutes, the electric motor switches off.
5	Selector	Activation - Deactivation of Dynamic Levelling and Proactive Levelling	To activate Dynamic Levelling, turn the selector to ON; To deactivate the Dynamic Levelling, turn the selector to OFF; To activate Proactive Levelling, turn the selector to ON; To deactivate Proactive Levelling, turn the selector to OFF. (With the selector ON, the automatic boom ascent between 0 and 5° is also activated).
6	Selector	Selection of ground movements and aerial part movements	For the movements of the aerial part, turn the selector upwards (6A Blue “LIFT” selector); To activate the ground movements, move the selector downwards (6B Orange “DRIVE” selector).
7	Potentiometer	Selection of revolutions of the internal combustion engine	Turning the device clockwise (+) increases the currents to the proportional valves. Moreover, with the selector over 50% the endothermic engine accelerator is activated; Turning the device anti-clockwise (-) decreases the currents to the proportional valves. Moreover, with the selector below 50% the accelerator of the internal combustion engine is deactivated and the movements can only be carried out individually.
8	Selector	Selection of endothermic engine or electric motor	To select the combustion engine, turn the selector upwards;

No.	Identification	Function and Status	Description of the function
			To select the electric motor, move the selector downwards.
9	Selector	Antenna movement control (JIB)	To raise the antenna (JIB), move the selector upwards keeping it in position; To lower the antenna (JIB) move the selector downwards keeping it in position; Note: This command only works after having previously activated the aerial part using the selector 6 (Blue "LIFT selector").
10	Selector	Winch movement control (if present)	To lower the hook of the winch, move the selector downwards keeping it in position; To raise the hook of the winch, move the selector upwards keeping it in position.
11	Purple (FAST DRIVE) button	Fast drive activation	- Press and release to activate the Booster. - Optional mode: translation control command with the right Joystick only.
12	Safety key (KEY)	Safety key for console activation	Insert the supplied key to activate the console; If the key is not inserted, the console cannot be activated; The key is encrypted so use only the key provided, otherwise the console cannot be used.
13	Button (START)	Ignition of machine and console	1. Press the button to access the radio control (after releasing the emergency mushroom); 2. Press the button again to activate reception (Radio console with machine); in this way the platform electrical system is activated; 3. Press the button to activate the console controls.
14	Green (MANUAL) Button	Activation of the manual levelling controls	Press to activate the manual levelling controls using the left joystick.
15	Button (Warning Buzzer)	Warning Buzzer Activation	Press to activate the warning buzzer.
16	Connector	Emergency connector in case of low battery, battery malfunction or places where radio frequencies cannot be used.	
17	Battery	Battery necessary for console power supply.	
18	Cable	The cable is used under these conditions: - Use of radio remote control by cable; - Radio control batteries recharge.	

Note: The machine can perform two simultaneous movements only if the potentiometer (7) exceeds 50%; conversely, the platform will only allow one movement at a time.

3.3.3 Push-button panel display (cable version and radio version)

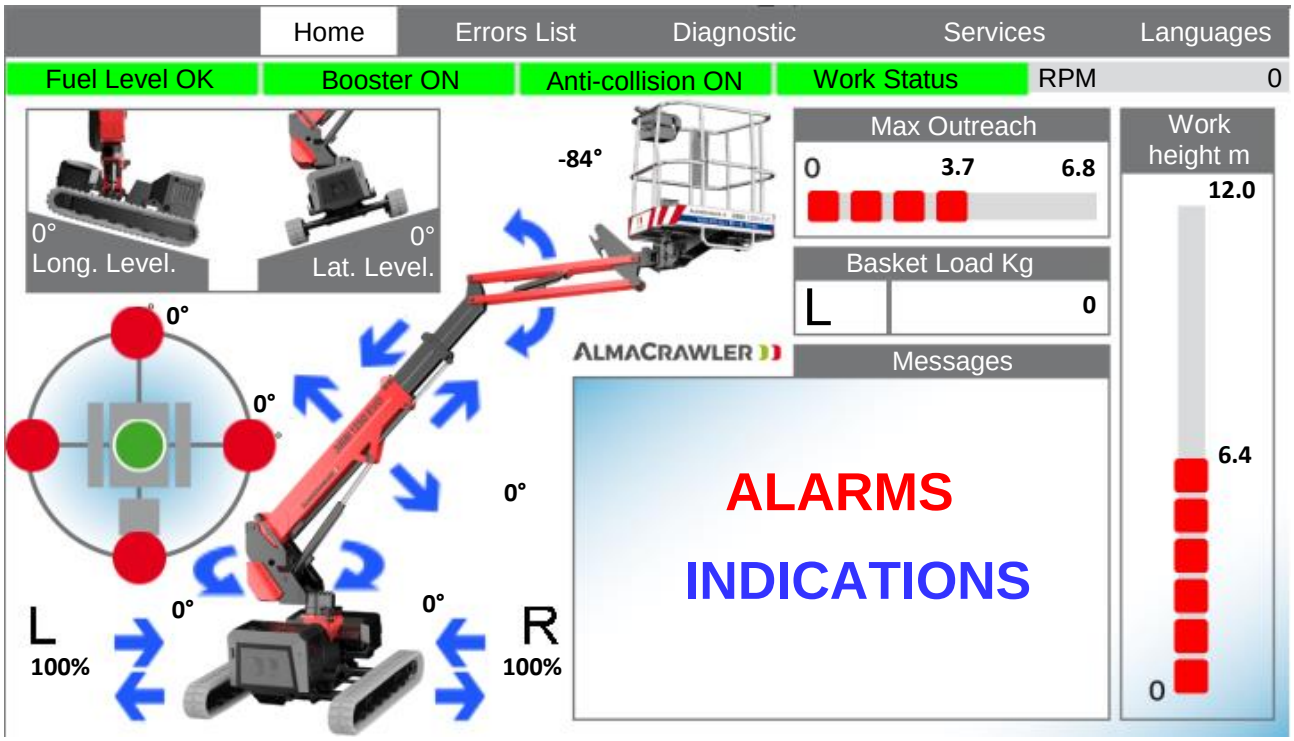


No.	Identification	Function and Status	Description of the function
1	Button	Display brightness selection	It adjusts the screen brightness.
2	Button	HOME key	If pressed it always returns to the HOME screen.
3	Button	ERRORS key	If pressed, the errors list page is entered.
4	Button	DIAGNOSTIC key	If pressed, the diagnostic page is entered.
5	Button	SERVICE key	If pressed, the service page is entered.
6	Button	LANGUAGES key	If pressed, the languages selection page is entered.
7	LED light	Light relative aerial movements	- Fixed green LED: The aerial movements are enabled; - Green LED flashing: In case neither the basket nor the winch is present. The aerial movements enabled will only be: With the cable push-button panel supporting the basket: Limited to the transport condition; With the radio push-button panel: Free if there is no load on the support, otherwise limited to the transport condition.
8	LED light	Winch mode	- Fixed green LED: The winch movements are enabled; - Green LED flashing: When the winch is not present and the basket is not present, the movements permitted in this situation are the same as in the previous case.
9	LED lights	Translation lights	- Fixed green LED: Translation with machine in transport configuration; - Green LED flashing: The machine is in addition to the transport condition and the translation at reduced speed is enabled; - LED off: The machine cannot move.
10	LED light	Overload in basket	- Fixed red LED: Overload exceeded; - Flashing red LED: Overload to the maximum limit; - LED off: Load below the maximum limit.

No.	Identification	Function and Status	Description of the function
11	LED light	Tilt alarm	- Red LED fixed with machine in transport conditions: Inclination of the fifth wheel level above 0.5°; it is not permitted to lift the aerial part; - Fixed red LED with the machine over the transport conditions and over the maximum translation height: Inclination of the fifth wheel level above 1.5°, it is only permitted to retract with the aerial part; - Red LED fixed with the machine over the transport conditions but lower than the maximum translation height: Inclination of the fifth wheel level above 4°, it is only permitted to retract with the aerial part; - Flashing red LED with machine over the transport conditions but lower than the maximum translation height: The fifth wheel level tilt is greater than 1°; the pro active levelling function is permitted; - Led off: the fifth wheel level is levelled; all aerial movements are permitted.
12	LED light	Outreach alarm	- Fixed red LED: If the maximum outreach is reached; - Flashing red LED: The pre-alarm threshold is entered; - LED off: The movements are enabled.
13	LED light (green and red)	Lights relating to the operating status and battery of the radio control	Refer to the radio control manual.
14	Display	Machine status screen	Display of the work diagrams, information on the status of the machine and of any alarms.

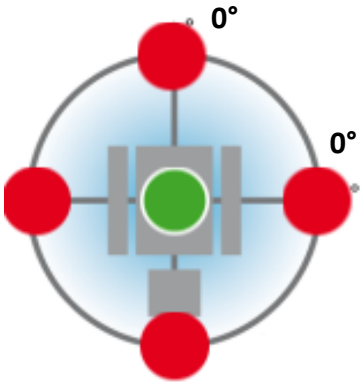
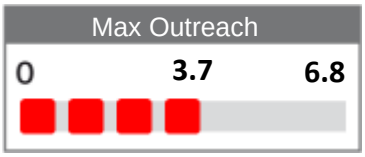
3.3.3.1 Messages and screens on the Display

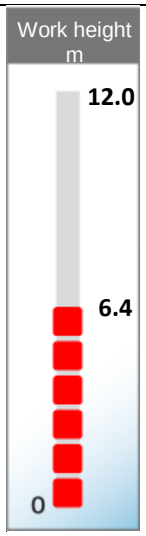
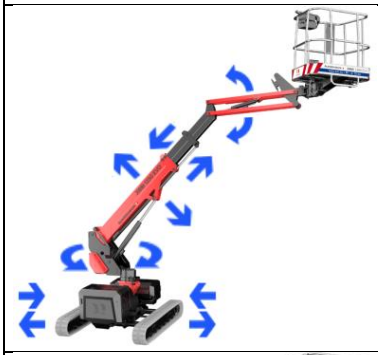
On the mobile keypad is the display (14), where all the parameters, the indications to the operator and any machine alarms are signalled (see photo below).



3.3.3.2 Machine status screens

Fuel Level	**Fuel level indicator**	- Green indicator: “Fuel OK” Diesel level sufficient; - Red indicator: “Fuel reserve” Low diesel level.
Booster	**BOOSTER indicator**	- Green indicator: “BOOSTER ON” Booster active; - Red indicator: “BOOSTER OFF” Booster not active.
Anti-collision	**Anti-collision Indicator**	- Green indicator: “ANTI-COLLISION ON” Anti-collision sensors active; - Red indicator: “ANTI-COLLISION OFF” Anti-collision sensors deactivated;
Work Status	**Machine status indicator**	- Green indicator: “Machine Status” Machine enabled for work; - Red indicator: “Errors Status” Presence of errors in memory.

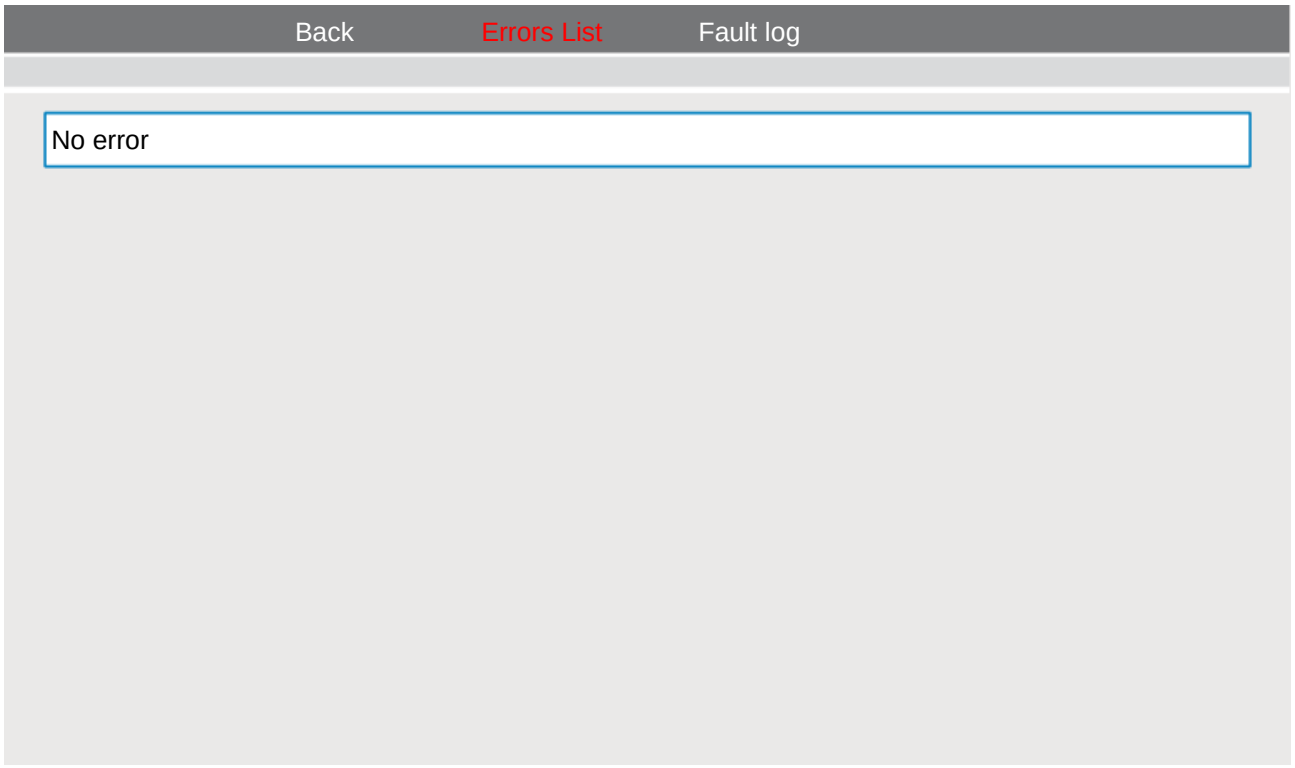
	**Motor indicator**	- Machine off the value is 0; - Machine at minimum rpm 1500; - Machine at maximum rpm 2850;
	**Longitudinal levelling indicator**	The inclination of the frame on the longitudinal level is shown in real time.
	**Lateral levelling indicator**	The inclination of the frame on the side level is shown in real time.
	**Visual level**	- If the central light is green the levelling of the boom column is within the correct limits; - If the machine is longitudinally unlevelled, the red light will switch on according to the position of the unlevelling (front/rear); - If the machine is laterally unlevelled, the red light will switch on according to the position of the unlevelling (right/left); - If the machine is unlevelled both laterally and longitudinally two red lights will come on. Note: These conditions, if they limit the movements, will also be highlighted in the alarms box.
	**Limit outreach indicator**	It updates in real time the maximum distance that the operator can reach with respect to the centre of the slewing ring, according to the diagram and to the actual value of the angle of the boom. This value in the example shown to the left is 6.8m (22.3ft). The value of 3.7m (12.13ft) represents the distance reached by the operator.
	**Indicator of weight in basket and of the work being performed**	- It indicates in real time the weight present in the basket; - The letter indicates the active work diagram.

	**Maximum work height indicator**	It updates in real time the maximum height that the operator can reach with respect to the ground, according to the machine configuration. This value in the example shown to the left is 12m (39.37ft). The value of 6.4 m (20.99ft) represents the height reached by the operator.
	**Track configuration**	- Update in real time of the maximum extension of the two tracks (R = Right, L = Left). - If the arrow is blue, the operator can perform the movement; - If the arrow is not present, the movement is not enabled. - In the transport condition it is possible to extend the tracks. - In the transport condition and with column centred it is possible to retract the tracks.
	**Movements of the aerial part of the machine**	- If the arrow is blue the movement is enabled; - If the arrow is not present, the movement is not enabled; - If the arrow is red, it indicates the first movement to be performed to reset the machine from a stop condition.
	**Movements of the aerial part of the machine With movements of the carriage selected**	- The blue arrows indicate the aerial movements necessary to bring the machine to the condition in which translation is enabled

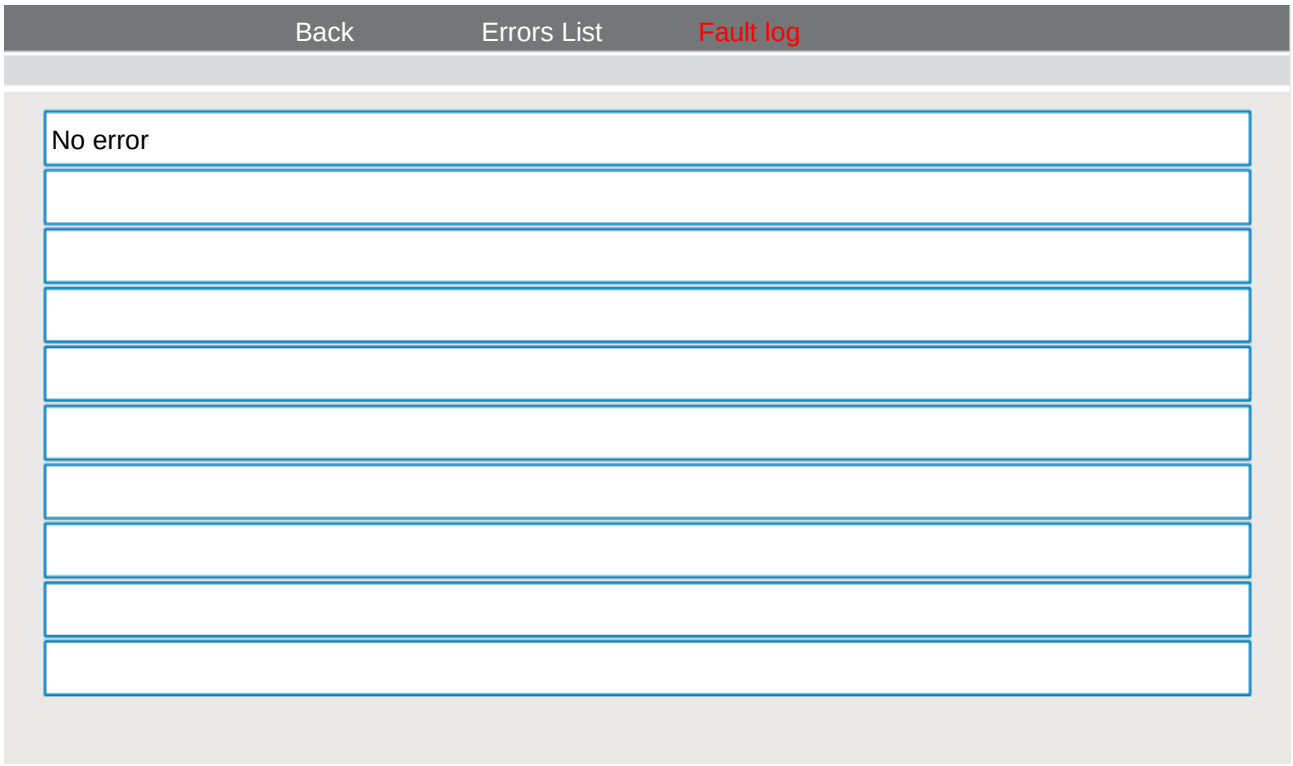
3.3.3.3 Error list screen

Should any alarm occur due to a component not functioning from the system, a generic alarm text "SENSOR ERROR" will appear on the display on the main screen.

All the alarms present at the time are described in detail on the "Error List" page that can be selected using the key (3) above the display.



Selecting the "Fault Log" page it is possible to enter the error memory and to display the last ones that have been detected.



To delete the error list, select the “Fault Log" page, press the display button (1) for more than 5 seconds, thereby resetting all errors in the memory.
The following are the possible error messages:

Error list concerning endothermic engine:

Low engine oil pressure
Water temperature too high

Error list concerning the electronic system of the machine:

Starter battery voltage lower than 9V
Starter battery voltage higher than 16V
Internal error in the ECU EPROM memory
CAN network communication error
No signal from the console
No signal from BASKET ECU

Error list regarding the sensors on the machine:

Redundancy error on chassis angle sensor
No signal from chassis angle sensor 1
No signal from chassis angle sensor 2
Redundancy error on levelling angle sensor

No signal from levelling angle sensor 1
No signal from levelling angle sensor 2
Redundancy error on right crawler extension sensor
No signal from right crawler extension sensor 1
No signal from right crawler extension sensor 2
Redundancy error on left crawler extension sensor
No signal from left crawler extension sensor 1
No signal from left crawler extension sensor 2
Redundancy error fom slewing ring encoder
No signal from Slewing ring encoder 1
No signal from Slewing ring encoder 2
Redundancy error on boom extension sensor
No signal from boom extension sensor 1
No signal from boom extension sensor 2
Broken wire on boom extension sensor
Redundancy error on boom angle sensor
No signal from boom angle sensor 1
No signal from boom angle sensor 2
Redundancy error on Jib angle sensor
No signal from Jib angle sensor 1
No signal from Jib angle sensor 2
Redundancy error on basket angle sensor
No signal from Basket angle sensor 1
No signal from Basket angle sensor 2
Anticollision sensor UP not working
Anticollision sensor FRONT not working
Anticollision sensor DOWN not working
Redundancy error on basket load sensor
No signal from Basket Load sensor 1
No signal from Basket Load sensor 2

Error list regarding the control panel selectors (selector bonded to machine start):

Selector SA3 stuck on ground panel
Selector SA4 stuck on ground panel
Selector SA5 stuck on ground panel
Selector SA6 stuck on ground panel
Selector SA7 stuck on ground panel
Selector SA8 stuck on ground panel
Selector SA9 stuck on ground panel
Selector SA11 stuck on ground panel
Selector SA12 stuck on ground panel
Left Joystick stuck on remote
Right Joystick stuck on remote

Selector D11 stuck on remote
Selector D 2-3 stuck on remote
Selector H5 L5 stuck on remote
Selector H6 L6 stuck on remote
Selector D12 stuck on remote
Pedal Error, Pressed in Booting Up

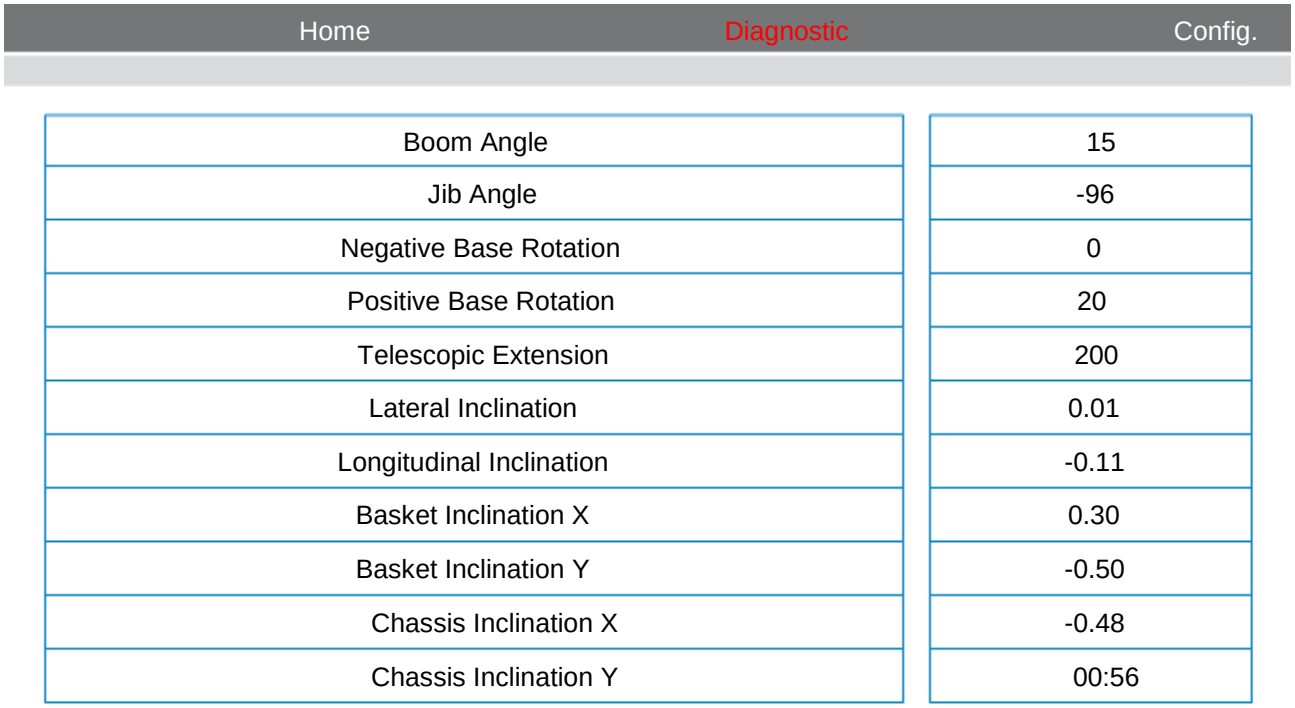
Error list regarding the carriage extension block valves:

Left extension valve failure
Right extension valve failure

3.3.3.4 Diagnostics Diagram

To display the “Diagnostic” page, press the button (4) above the display.

In this window it is possible to view all the sensor values of the machine.

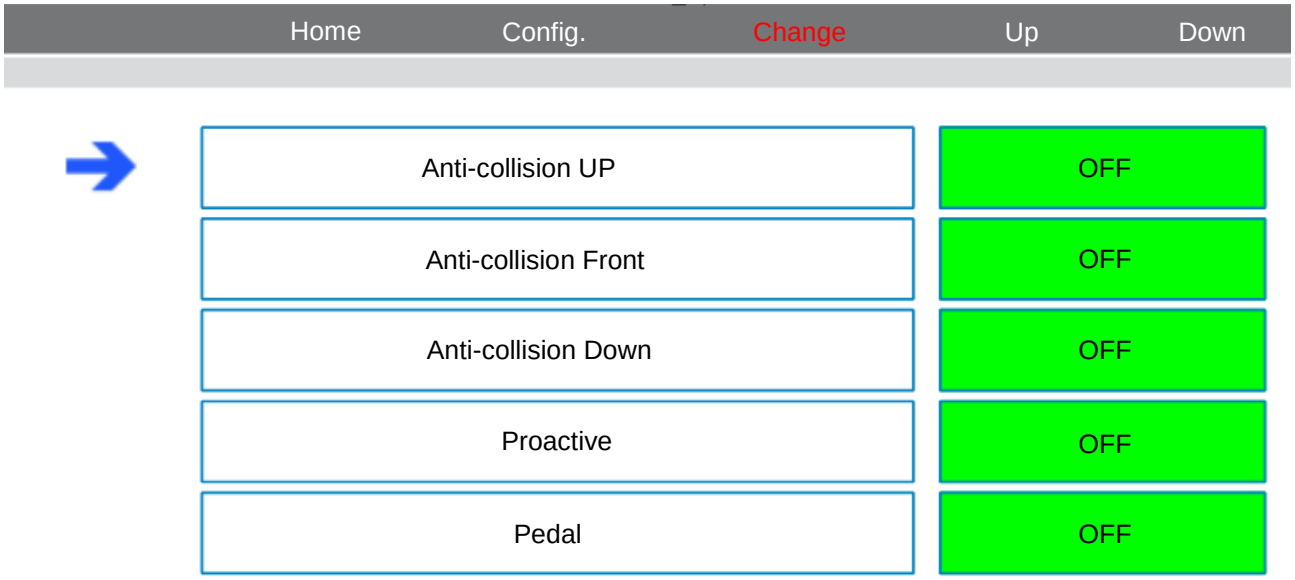


Selecting the “Config” page enters the configuration screen; from here it is possible to view the activation status of the man-present pedal function and of the translation function in addition to the transport condition.

These functions can only be activated or deactivated by an authorised service centre.

On this page it is also possible to see if the various anti-collision sensors are active.

These sensors can be deactivated temporarily by selecting them using the "Up" and "Down" keys and by pressing the "Change" key.



Attention: The anti-collision sensors can only be deactivated temporarily. If the machine is switched off by means of an emergency key or mushroom button, when the machine is switched on again, the sensors will be reactivated automatically.

3.3.3.5 Service Screen

To display the "Service" page, press the button (5) above the display.

In this window it is possible to view all the information on the machine.

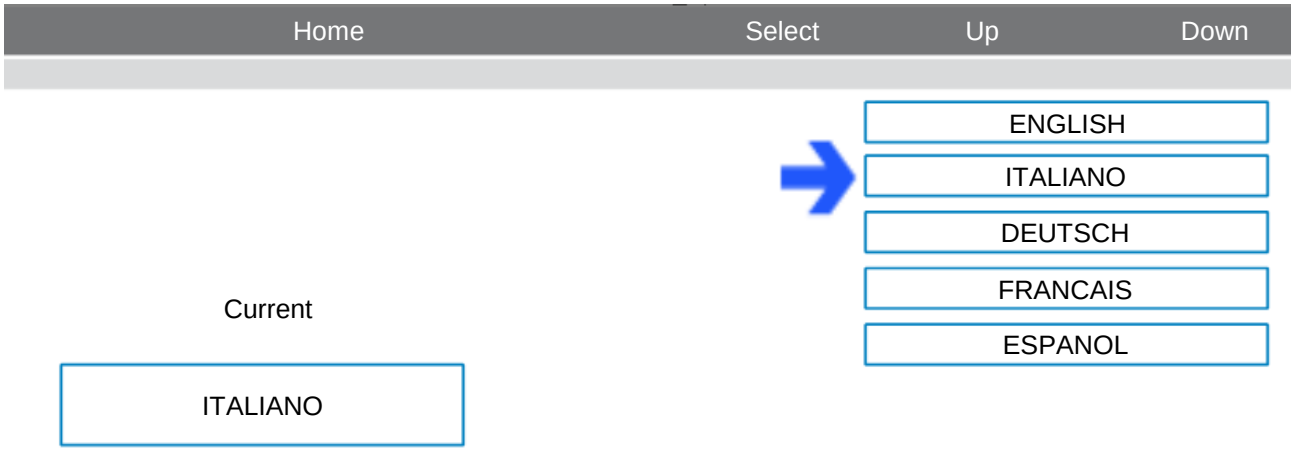
Back	Service	
Software Version	1_1_0	
110V-230V electric engine work hours	9.9	Hours
Number of overloads detected in the basket	2	Num
Maximum overload detected	253	Kg
Safety Devices Bypassed	1	

In particular, it is possible to display if and how many times the machine has been overloaded (load over 230Kg-507.06 lbs) and with which load. It is also possible to check whether the safety functions Bypass button has been selected and how many times it has been used.

3.3.3.6 Languages Screen

To display the “Languages" page, press the button (6) above the display.

In this window it is possible to set the language; automatically all the screens will be translated according to the selected language.

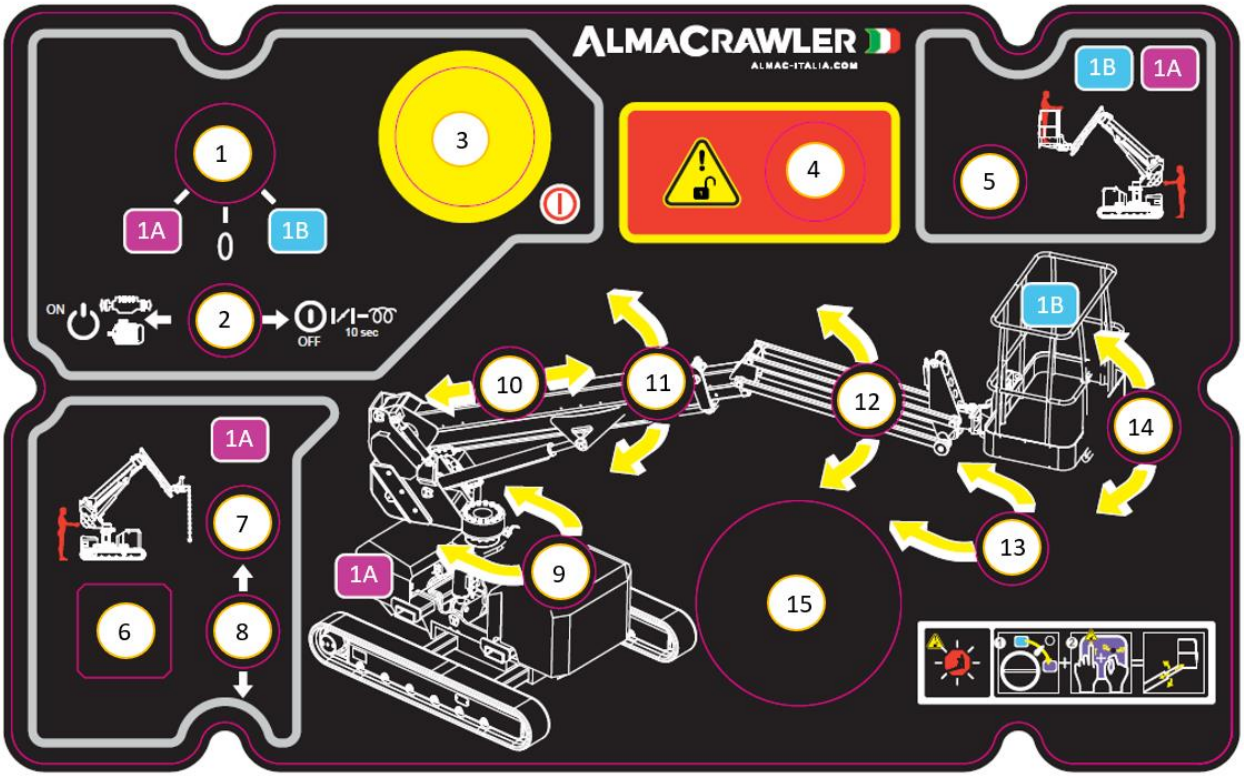


3.3.4 Ground controls

The platform has a control panel located on the carriage, on the front-left side of the machine. These commands are for the operator on the ground in case of maintenance of the platform, or for emergency situations.

Attention: The key must always be available to the recovery operator or the person in charge of the operations from the ground.

Unintentional operation of the ground controls is prevented by automatic selection made via the key (1): Turning the latter to the position (RIGHT-1B) "basket controls" automatically disables the ground control console, selecting the opposite side (LEFT-1A) "ground controls" automatically disables the control console in the basket.



No.	Identification	Function and Status	Description of the function
1	Key selector	Selector for machine on/off and control station selection	Selector in central position (0) machine off; Selector in position 1A machine on with ground control station; Selector in position 1B machine on with platform control station.

No.	Identification	Function and Status	Description of the function
2	Selector	Engine Power On – Off	To switch on the combustion/electric engine select ON; To switch off the combustion/electric engine select OFF; Selecting OFF and holding down the control for 10 seconds the glow plugs of the internal combustion engine are . NOTE: When the machine is powered by an electric motor, if no signal is received after 5 minutes, the electric motor switches off.
3	Emergency Button	EMERGENCY STOP.	
4	Button with cover prepared for leaded seal	Button for emergency handling	To activate the button, open the cover and press it. Attention: This button disables all the safety devices and must only be used in an emergency; example operator incapacitated and machine in block condition due to overload. The button must be kept pressed together with the desired movement which remains active for only 5 seconds. At the end it is necessary to release and press the button again.
5	LED light	Basket LED light installed	If turned on it means that the basket is installed and the machine can only be used for lifting persons and equipment. If it flashes it means that the platform is not installed nor the winch.
6	Connector	Push-button panel cable connector	Connecting the cable of the push-button panel it is possible to control translation by means of the Joysticks. The translation in addition to the transport condition is only permitted if there is no load in the basket. Connector for radio power supply (only if the machine is equipped with radio control).
7	LED light	Winch LED light installed	If turned on it means that the winch is installed and the machine can only be used for lifting material. If it flashes it means that the platform is not installed nor the winch.
8	Selector	Winch movement control (if present)	To lower the hook of the winch, move the selector downwards keeping it in position; To raise the hook of the winch, move the selector upwards keeping it in position.
9	Selector	Tower rotation	By moving the selector upwards and keeping it in position, the tower is rotated to the right; By moving the selector down and holding it in position, the tower is rotated to the left.
10	Selector	Outreach extension/retraction	By moving the selector to the left and keeping it in position, the extension is retracted; By moving the selector to the right and keeping it in position, outreach extension takes place.
11	Selector	Boom movement	By moving the selector upwards and keeping it in position, the boom is raised;

No.	Identification	Function and Status	Description of the function
			By moving the selector down and holding it in position, the boom is lowered.
12	Selector	Antenna movement (JIB)	By moving the selector upwards and keeping it in position, the antenna lift (JIB) is performed; By moving the selector downwards and keeping it in position, the antenna descent (JIB) is performed.
13	Selector	Basket rotation	By moving the selector upwards and keeping it in position, the basket is rotated to the right; By moving the selector down and holding it in position, the basket is rotated to the left.
14	Selector	Basket balancing	By moving the selector upwards and keeping it in position, the basket is manually balanced; By moving the selector downwards and keeping it in position, the basket is manually balanced.
15	Display	Display	Electronic hour meter which displays the operating hours of the internal combustion engine.

Attention: The use of ground controls is reserved for personnel who are adequately trained on the use of these commands.
IT IS FORBIDDEN to remain inside the basket while a second operator is performing manoeuvres with the controls on the ground.

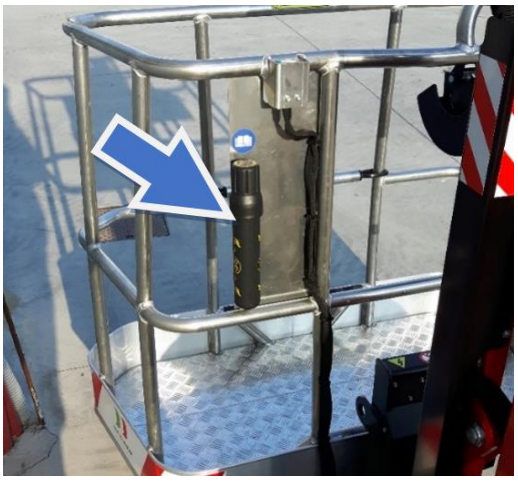
3.4 Radio control charger and radio receiver (In the radio version)

The radio control charger is located on the right rear side of the carriage; it is used when the battery in operation is flat, so it must be recharged. The machine is fitted with two batteries; in this way it is always possible to use the machine without interrupting work.
The receiver of the radio control is also fixed on the same support.
In the receiver there are a number of lights that indicate its operating status.
Refer to the radio control manual.

3.5 Storage compartment

On the external side of the platform there is a compartment that can be opened manually, in which are contained:

- This Use and Maintenance Manual;
- Spare parts catalogue;
- Wiring diagrams;
- Hydraulic diagrams;
- Declaration of conformity;
- Motors/slewing ring manuals.



3.6 Man present pedal (if any)

If the machine has this function activated then it is necessary to press the pedal in order to perform normal work movements.
Operation is as follows:

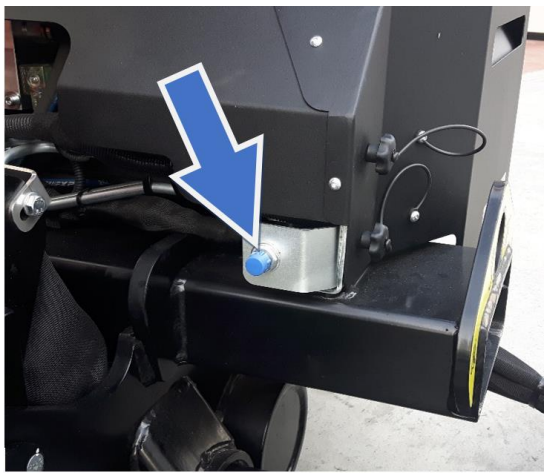
- **Pedal released**: The machine can only move and move the aerial part exclusively within the transport condition;
- **Pedal pressed**: All movements are enabled.

Attention: Do not step on or place weight on the external protection of the pedal. In case of breakage of the part, replace it as soon as possible.

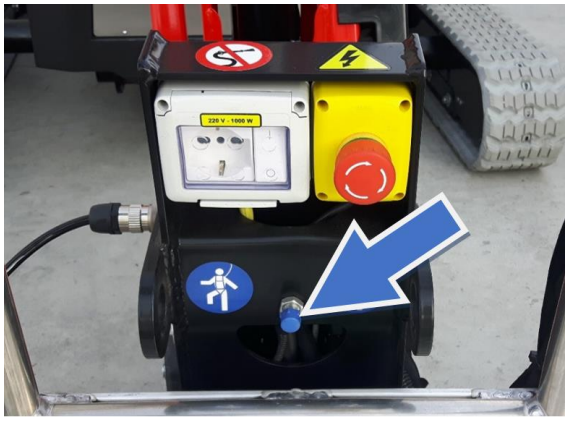
3.7 Air/Water connection

The air/water connection is a connection that allows the use of these two elements in the basket using the appropriate equipment.
Installation procedure:

- Connect the power source at the indicated point (right front side of carriage);



- Attach the equipment to be used in the basket to the indicated point (basket support).



3.8 110/230V electric motor selector (if present)

This selector, located on the right rear side of the carriage, is used to set the "110Vac" or "230Vac" power supply to which the electric motor is connected.

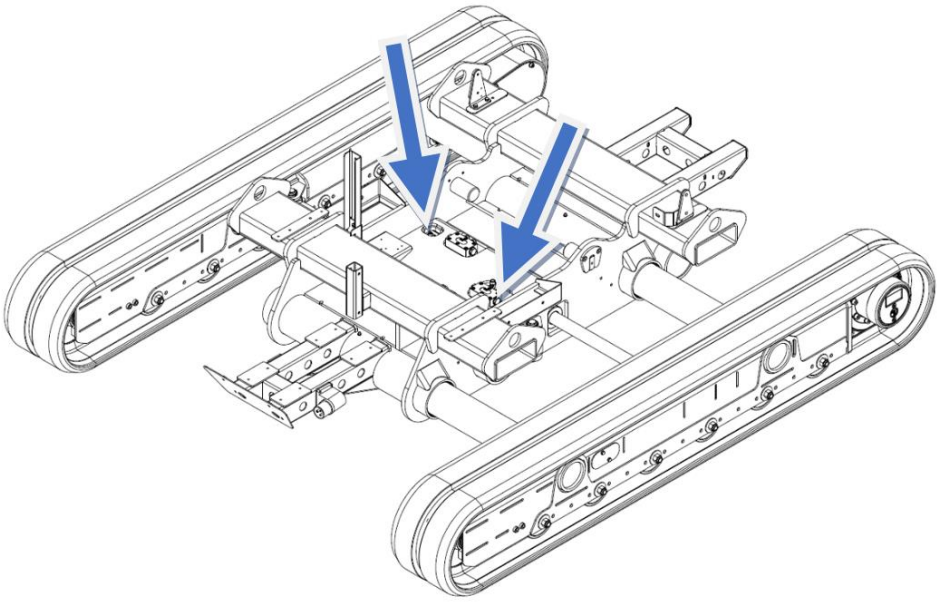
3.9 Platform operation safety devices

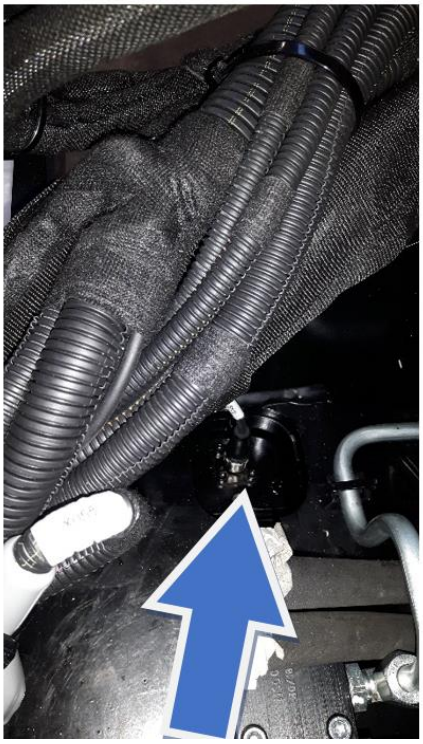
Attention: Periodically verify that the safety devices are operating correctly. During work, the operator must be able to assess, recognize and avoid all dangers and must immediately inform the persons in charge of any faults in the safety devices so that they can be inspected and restored to their original conditions of safety and reliability
Attention: DO NOT TAMPER WITH AND DO NOT CHANGE THE CALIBRATION OF ANY COMPONENT OF THE ELECTRIC AND HYDRAULIC SYSTEM.

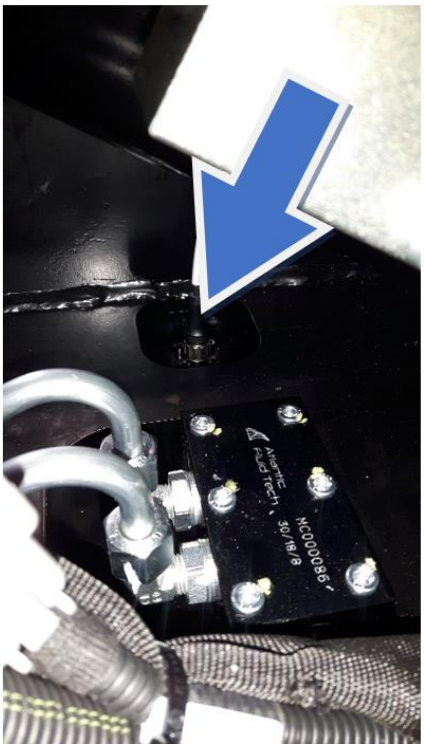
The platform comprises a complete set of safety devices.

3.9.1 Extension control device for the carriage extension cylinders

On the frame of the machine are fixed two magnetostrictive sensors in Can Bus that constantly transmit the extension of the cylinders for widening of the carriage to the electronic control unit. The sensor is redundant (thus consisting of two separate sensors). The signals of the two sensors are constantly compared with each other to assess their consistency.

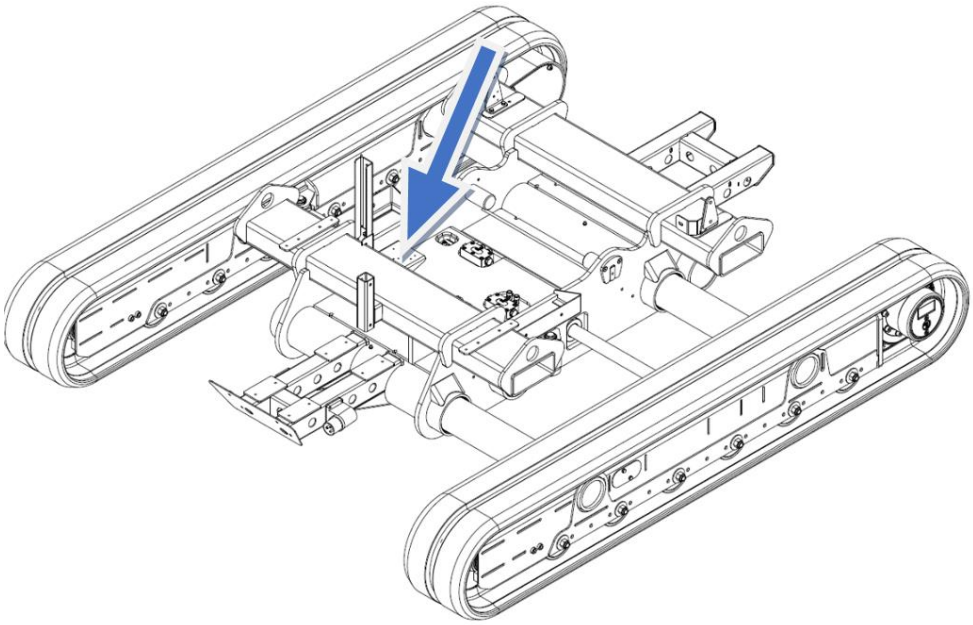


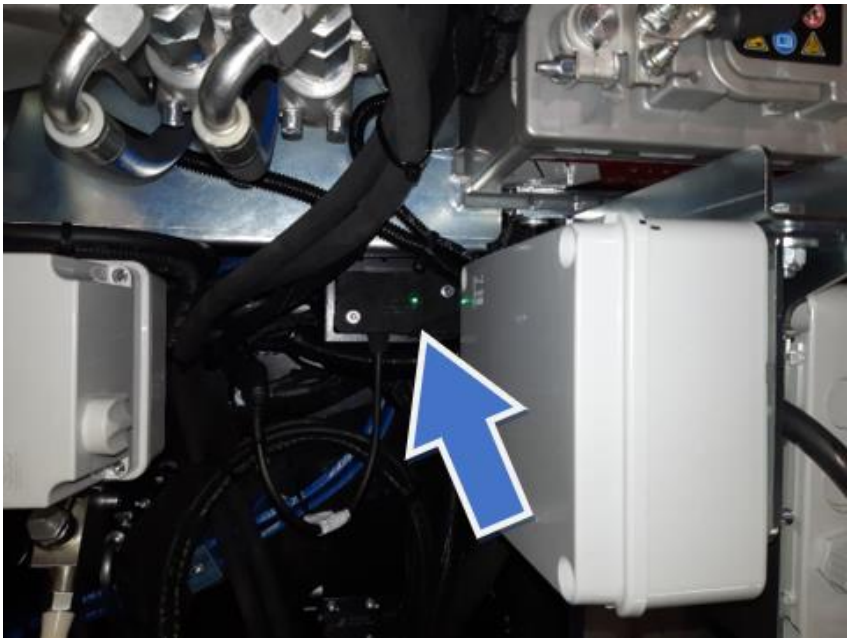




3.9.2 Main frame inclination control device

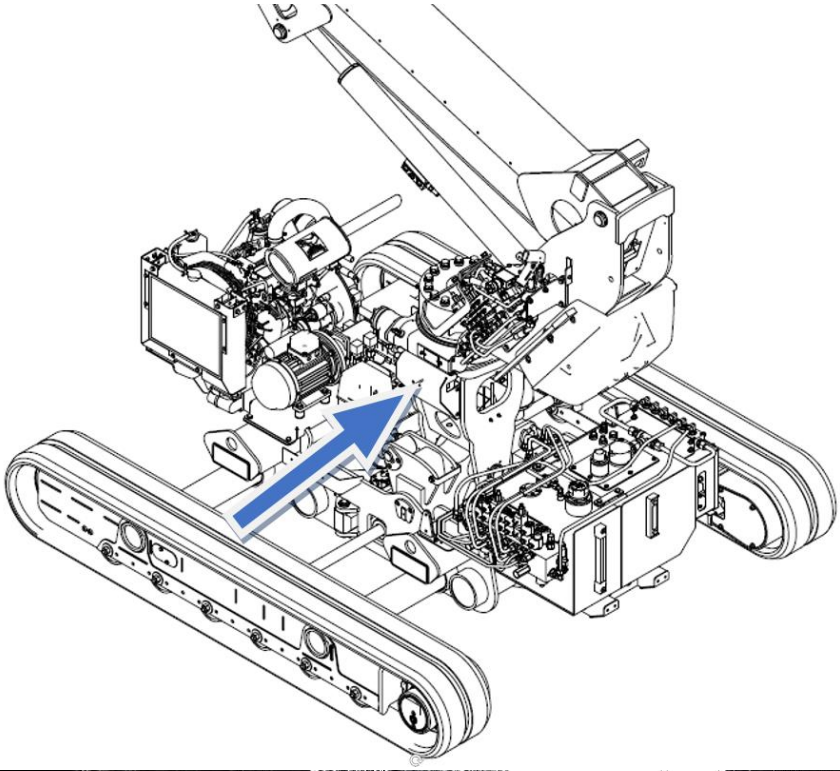
On the machine Frame there is a Can Bus angle sensor that constantly communicates the inclination measured to the electronic control unit.
The angle sensor is redundant (thus consisting of two separate sensors) and the X and Y inclination axes of the machine are monitored (lateral and longitudinal).
The signals of the two sensors are constantly compared with each other to assess their consistency.





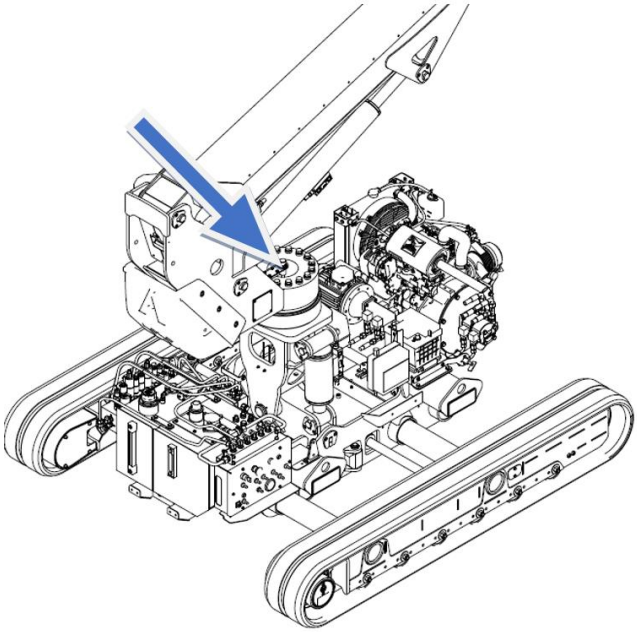
3.9.3 Tower tilt control device

A Can Bus angle sensor is fixed to the upper joint of the machine's tower, which constantly transmits the measured inclination to the electronic control unit.
The angle sensor is redundant (thus consisting of two separate sensors) and the X and Y inclination axes of the machine are monitored (lateral and longitudinal).
The signals of the two sensors are constantly compared with each other to assess their consistency.



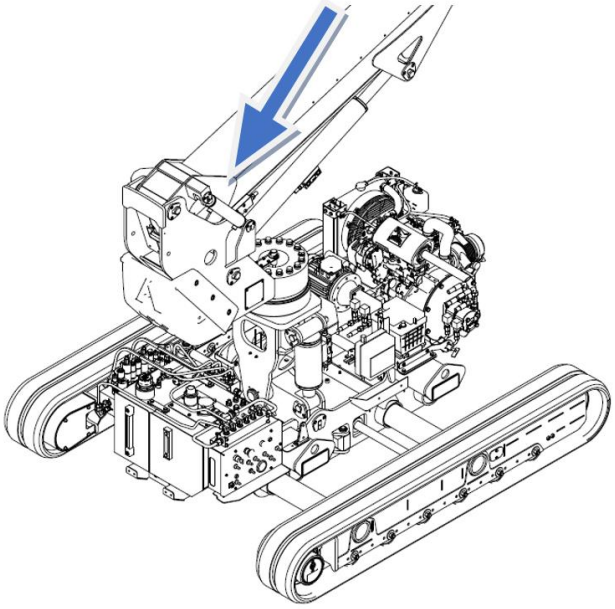
3.9.4 Tower rotation control device

At the centre of the slewing ring is an absolute encoder in Can Bus that constantly transmits the measured rotation to the electronic control unit. The sensor is redundant (thus consisting of two separate sensors). The signals of the two sensors are constantly compared with each other to assess their consistency.



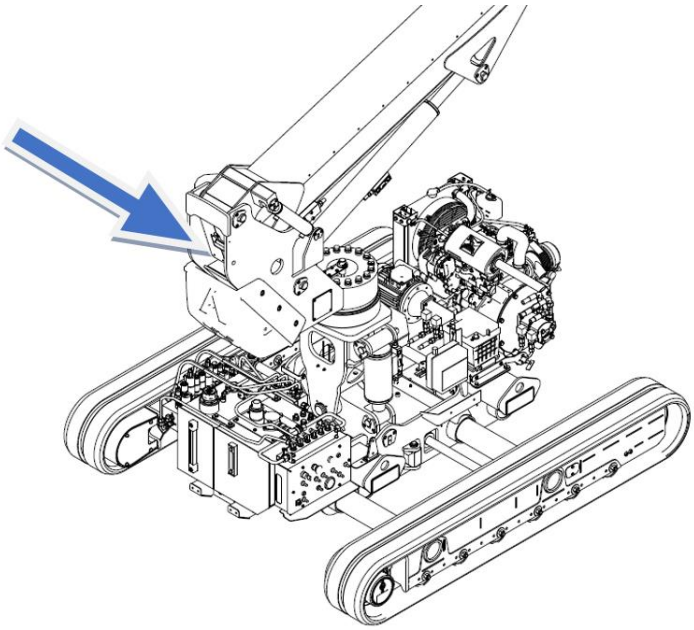
3.9.5 Device for controlling the angle of the main boom

A Can Bus angle sensor is fixed on the boom of the machine and constantly transmits the measured inclination to the electronic control unit.
The angle sensor is redundant (thus consisting of two separate sensors) and the X and Y inclination axes of the machine are monitored (lateral and longitudinal).
The signals of the two sensors are constantly compared with each other to assess their consistency.



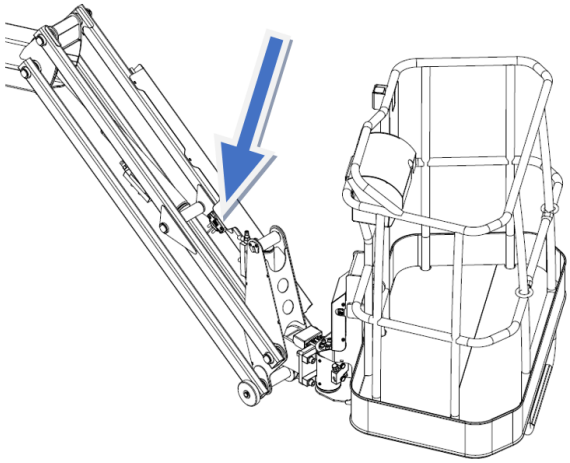
3.9.6 Outreach extension control device

Inside the boom is fixed the extension sensor of the telescopic boom.
This sensor, by means of a steel cable, detects the exit movement of the first extension with respect to the boom.
The sensor is in Can Bus and constantly transmits the measured extension to the electronic control unit. The sensor is redundant (thus consisting of two separate sensors). The signals of the two sensors are constantly compared with each other to assess their consistency.
The case in which the wire is cut is also diagnosed.



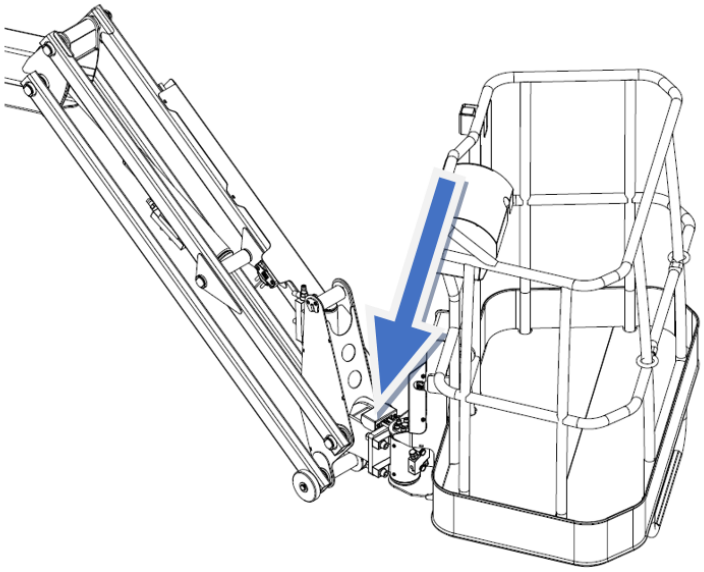
3.9.7 Antenna angle control device (JIB)

On the right-hand side of the antenna (JIB) an angle sensor in Can Bus is fixed which constantly transmits the measured inclination to the electronic control unit.
The angle sensor is redundant (thus consisting of two separate sensors) and the X and Y inclination axes of the machine are monitored (lateral and longitudinal).
The signals of the two sensors are constantly compared with each other to assess their consistency.



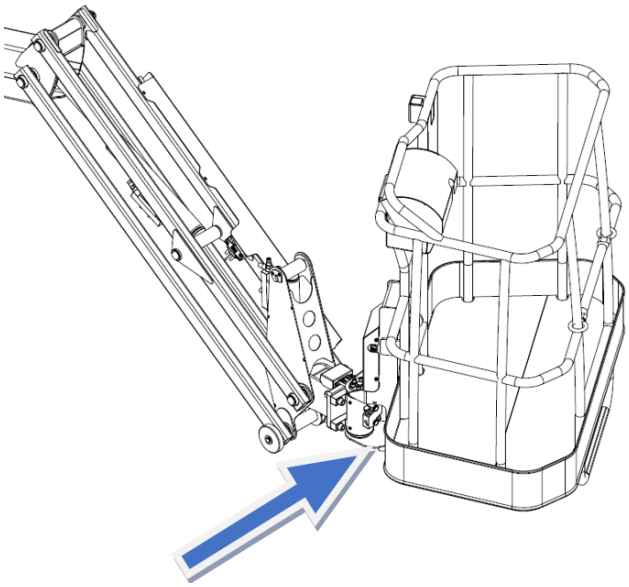
3.9.8 Platform balancing angle control device

Above the basket support a Can Bus angle sensor is fixed which constantly transmits the measured inclination to the electronic control unit.
The angle sensor is redundant (thus consisting of two separate sensors) and the X and Y inclination axes of the machine are monitored (lateral and longitudinal).
The signals of the two sensors are constantly compared with each other to assess their consistency.



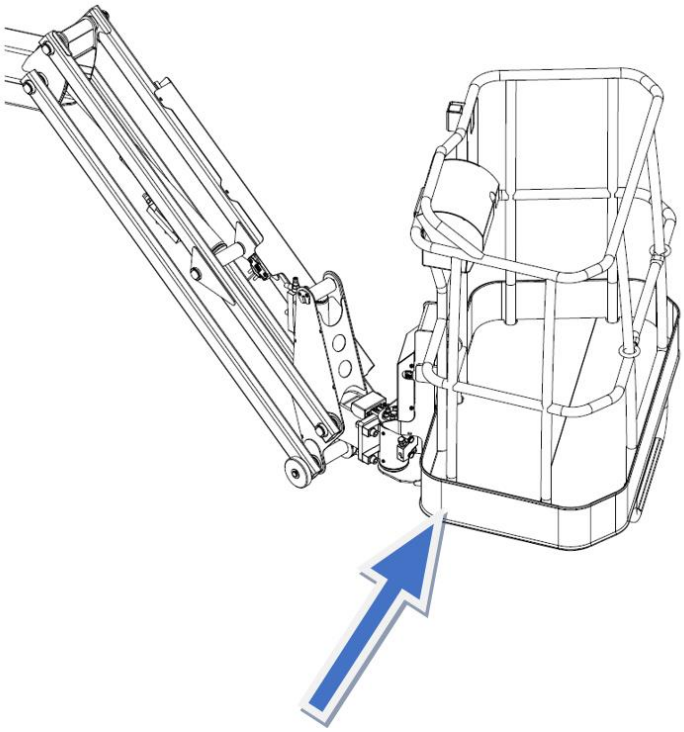
3.9.9 Overload monitoring device

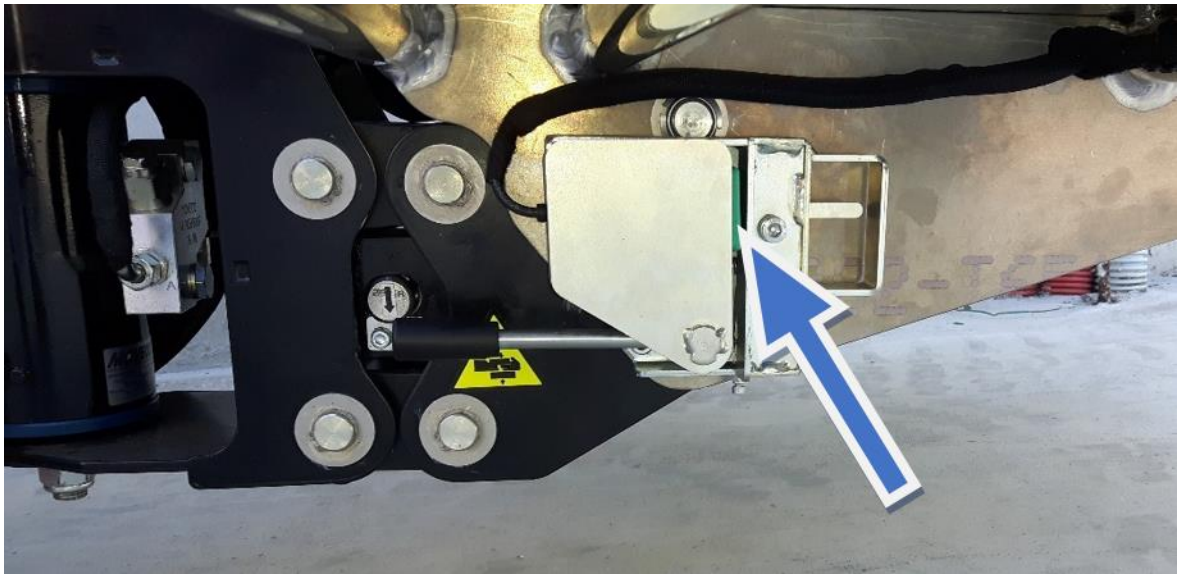
The overload control device is fixed inside the basket support; this sensor constantly detects the weight inside the basket.
If the maximum load limit is exceeded, all movements are blocked. To obtain the commands again it is necessary to discharge the excess weight.
The sensor is redundant (thus consisting of two separate sensors).
The signals of the two sensors are constantly compared with each other to assess their consistency.



3.9.10 Basket pin control device

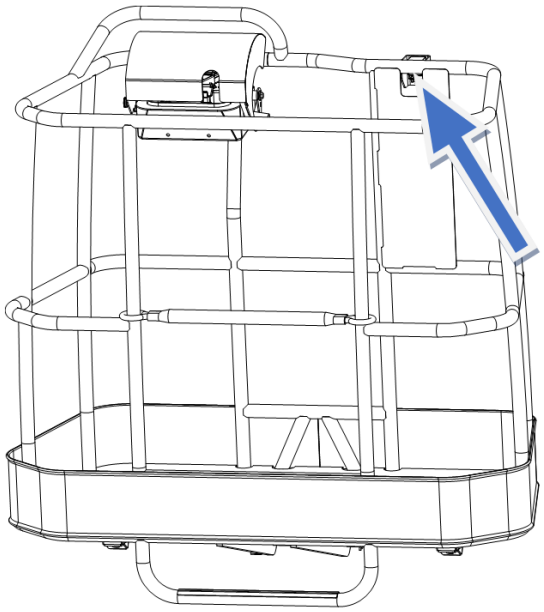
An ultrasound sensor is positioned under the basket which detects the presence and correct locking of the support pin of the platform itself.





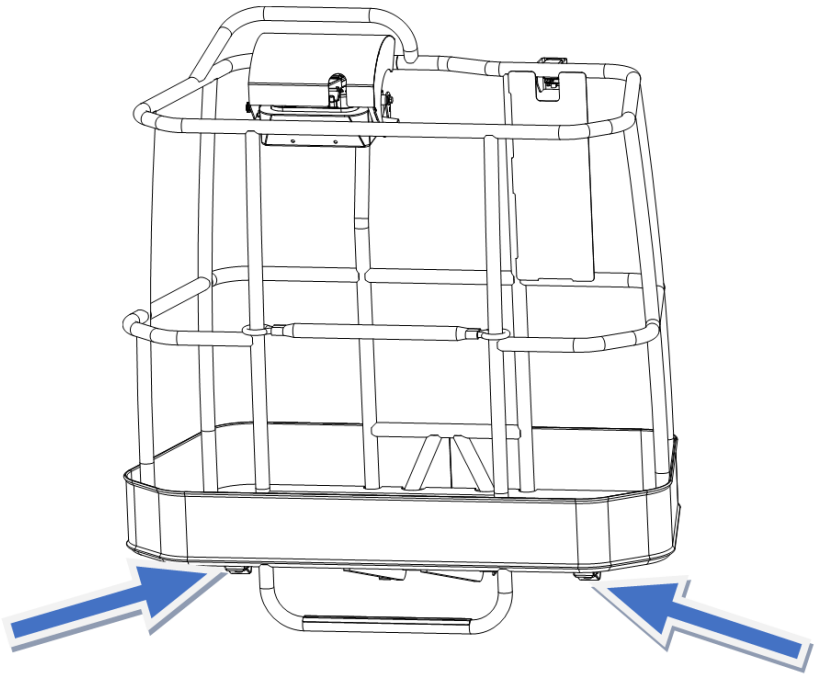
3.9.11 Operator anti-crushing device (optional)

An ultrasound sensor is positioned on the upper right side of the basket.
The device detects any obstacles that are encountered during lifting. If it reaches a minimum distance of 1.5 meters from the object, an acoustic signal will be emitted and the following indication will appear on the display:
“COLLISION UP”
At this point the operator must decide whether to continue the manoeuvre or to proceed otherwise.



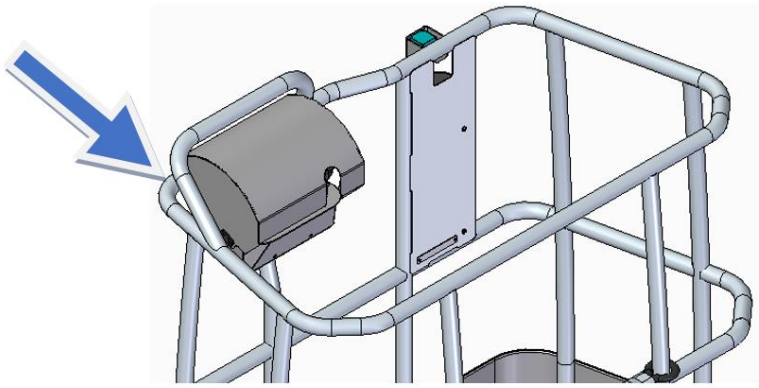
3.9.12 Platform anti-collision device (optional)

Two ultrasonic sensors are positioned under the basket on both the left and right side.
One facing the entry side of the platform and one facing down.
The two anti-collision devices detect any obstacle encountered during the movements. If the minimum distance of 0.8mt (2.62ft) is reached from the object, an acoustic signal will be emitted and the following indication will appear on the display:
“COLLISION DOWN” or “COLLISION FRONT” according to which sensor detects the obstacle.
At this point the operator must decide whether to continue the manoeuvre or to proceed otherwise.

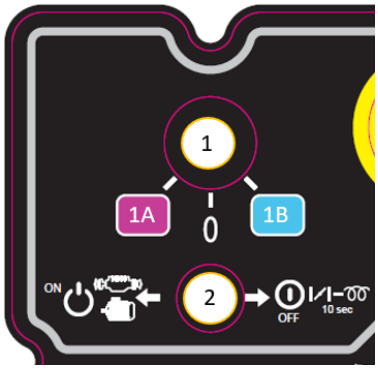


3.9.13 Radio control presence device

In the Radio version, behind the console support in the basket there is a sensor that detects the presence of the radio control.



It works as follows:



1. Selector (1) in position 1B:

   <u>Radio control positioned in the console support and detected by the sensor:</u>
   - All movements are enabled.
   <u>Radio control not positioned in the console support with load present in the basket:</u>
   - Overhead movements and transfer only permitted if the machine is in transport configuration.
   <u>Radio control not positioned in the console support and discharge basket:</u>
   - All movements are enabled.

2. Selector (1) in position 1A:

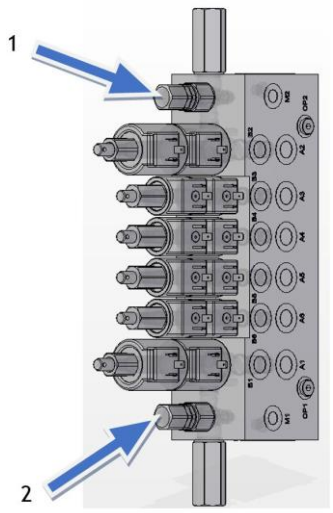
   - The radio control is disabled.

3.10 Hydraulic system safety devices

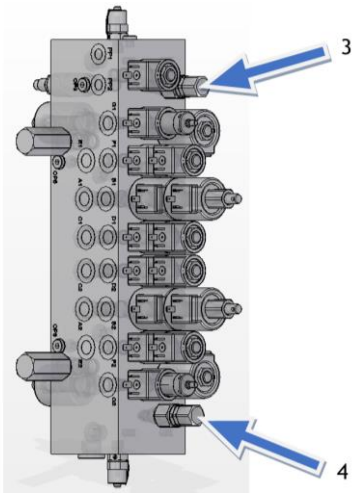
3.10.1 Hydraulic pressure limiting devices

The hydraulic system of the platform has specific limiting valves in order to limit the pressures relative to the operation of the machine while preserving the integrity of the various components. These valves do not require adjustments as they are calibrated directly by ALMAC S.r.l. At the testing phase. In the figure below it is possible to see the "hydraulic column block (1-2)" and the "hydraulic carriage block (3-4)" with the respective limiting valves.

Hydraulic column block



Hydraulic carriage block



The pressure relief valve (1) is calibrated to 180 bar (2610 psi).
The pressure relief valve (2) is calibrated to 120 bar (1740 psi).
Pressure relief valves (3-4) are calibrated to 200 bar (2900 psi).

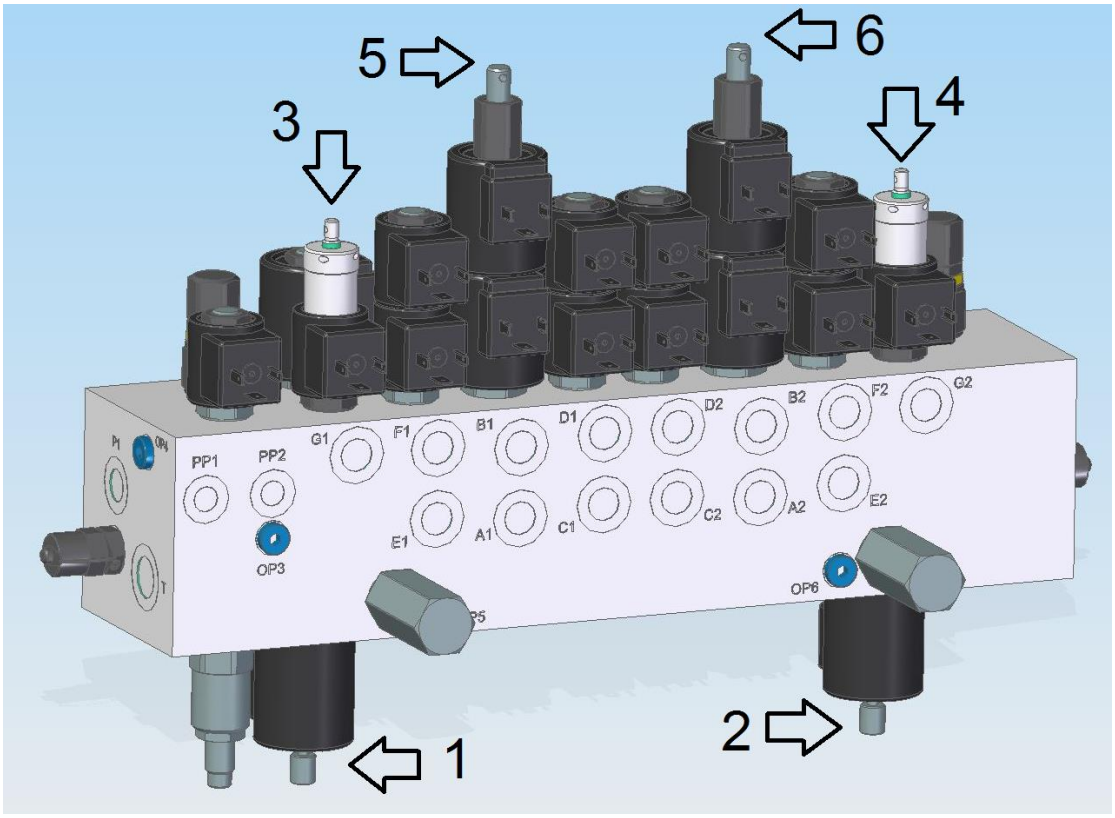
Attention: Modifications to the setting of the pressure relief valves without authorisation from ALMAC S.r.l. will void the warranty and any claims made by the customer.

3.10.2 Hydraulic block safety devices

In the hydraulic block of the carriage there are four solenoid valves with manual bypass which have a safety function for the machine operation. These solenoid valves are therefore part of the safety system and **must never be used by the operator**.

Attention: Changing the position of these valves compromises the safety of the hydraulic system and can cause unwanted movements of the aerial part or of the tracks, with consequent overturning of the platform or crushing of the operators.

These solenoid valves can only be operated by qualified technicians for diagnostic or maintenance requirements of the machine.



Solenoid valves 1 (EV9) and 2 (EV10)

These solenoid valves allow the exchange between the movements of the carriage (translation and levelling) and the movements of the aerial part;

Under normal use conditions of the machine, if they are not energised they send the oil into the aerial part;

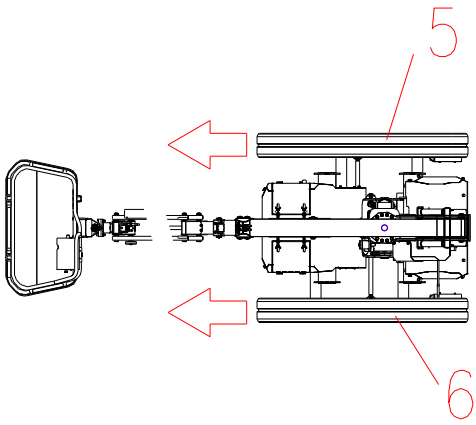
These valves must have the part that can be operated manually fully pressed down and turned anti-clockwise.

Solenoid valves 3 (EV11) and 4 (EV12)

These bypass solenoid valves allow the hydraulic block to be put into pressure in the column;
Solenoid valve 3 powers the extension and retraction of the telescopic boom;
Solenoid valve 4 powers all the other movements of the aerial part;
Under normal use conditions of the machine, if they are not energised they send the oil to be drained;
These valves must have the part that can be manually operated completely unscrewed or fully rotated anti-clockwise.

Solenoid valves 5 (EV1) and 6 (EV2)

These solenoid valves control translation of the machine;
If the solenoid valves 1 (EV9) and 2 (EV10) are manually bypassed, the machine can be moved by simply pressing or pulling the manually operated part of the valve (with the engine running);
Pressing valve 5 controls translation of the left track in the direction indicated by the arrow;
If the valve is pulled, the movement is in the opposite direction;
If valve 6 is pressed, the right-hand track is moved in the direction indicated by the arrow;
If the valve is pulled, the movement is in the opposite direction.

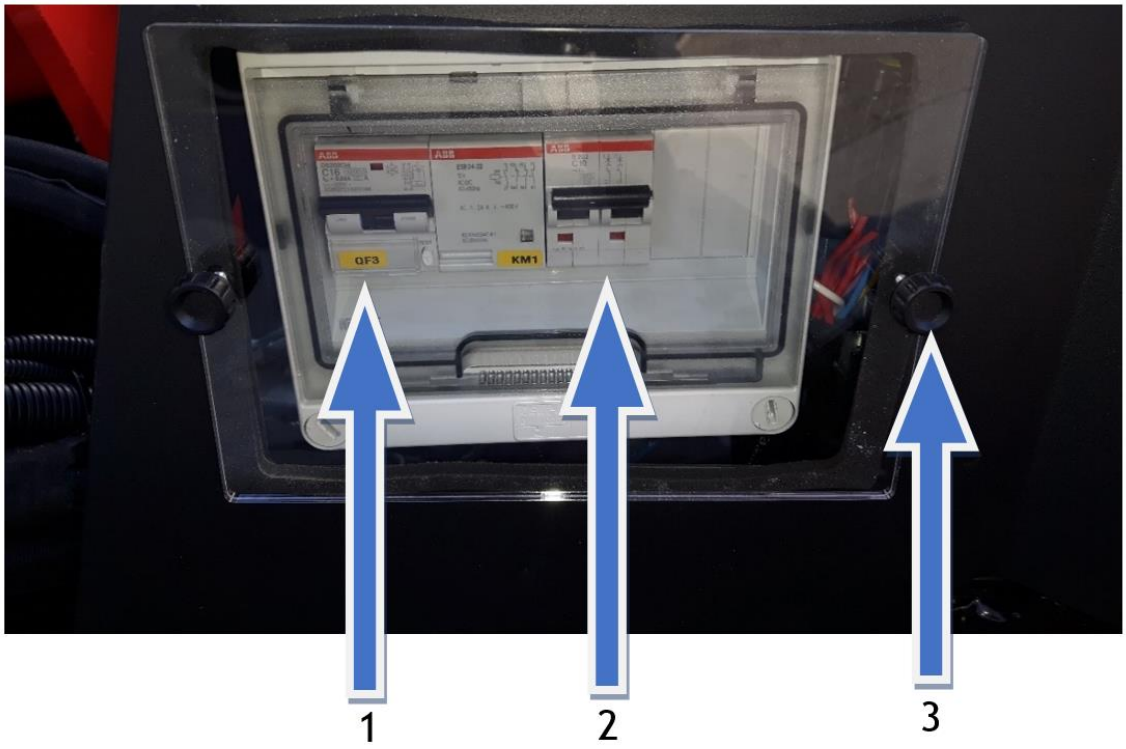


Attention: These manoeuvres may only be performed by technicians authorised by Almac.
Attention: Reset the valves 1-2-3-4 in the correct position at the end of any operation that involves their handling.
Attention: Danger of tipping over of the platform or crushing of the operators.

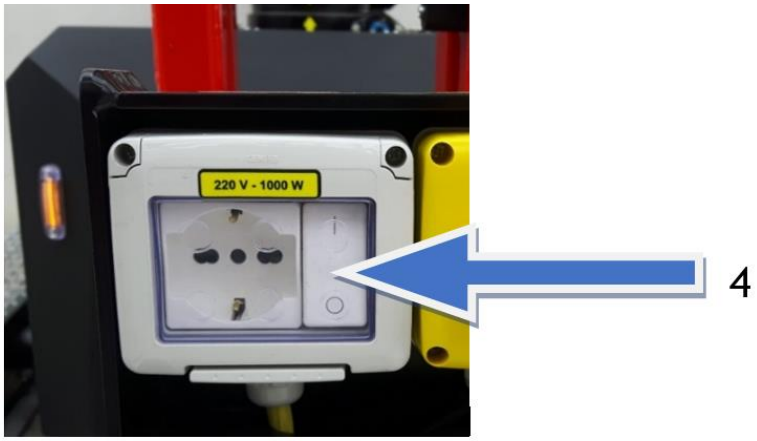
3.11 Blackout safety devices

3.11.1 230V external power source

On board the basket there is a power outlet to power the electrical equipment necessary for the work. For safety purposes, there is an automatic current release device in the event of overvoltage and "Differential magnetothermal switch" (1).
To access the device, unscrew the appropriate knobs on the casing itself by removing the transparent protection panel using the side knobs (3) and open the cover of the electrical box. When finished, replace the guard that was previously removed and thoroughly tighten the knobs.

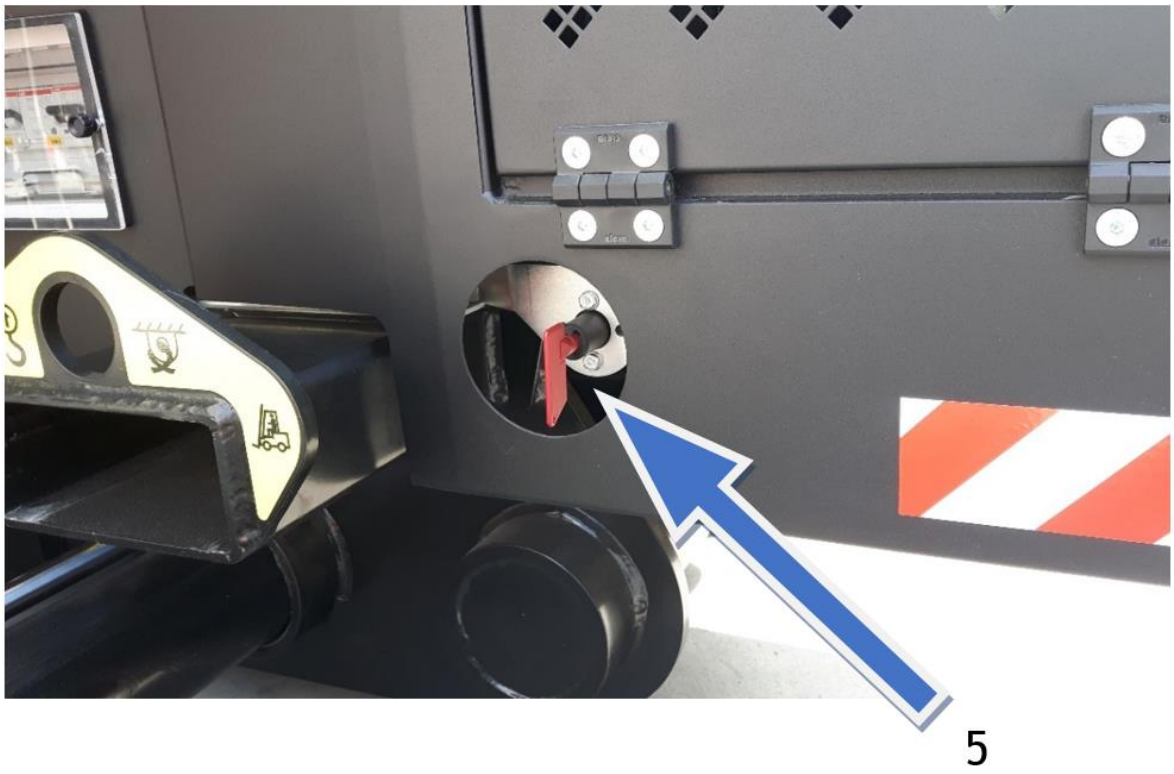


The current socket in the basket is also protected by a magnetothermic switch (2) and can be activated by means of the switch (4) located next to the socket in the basket.

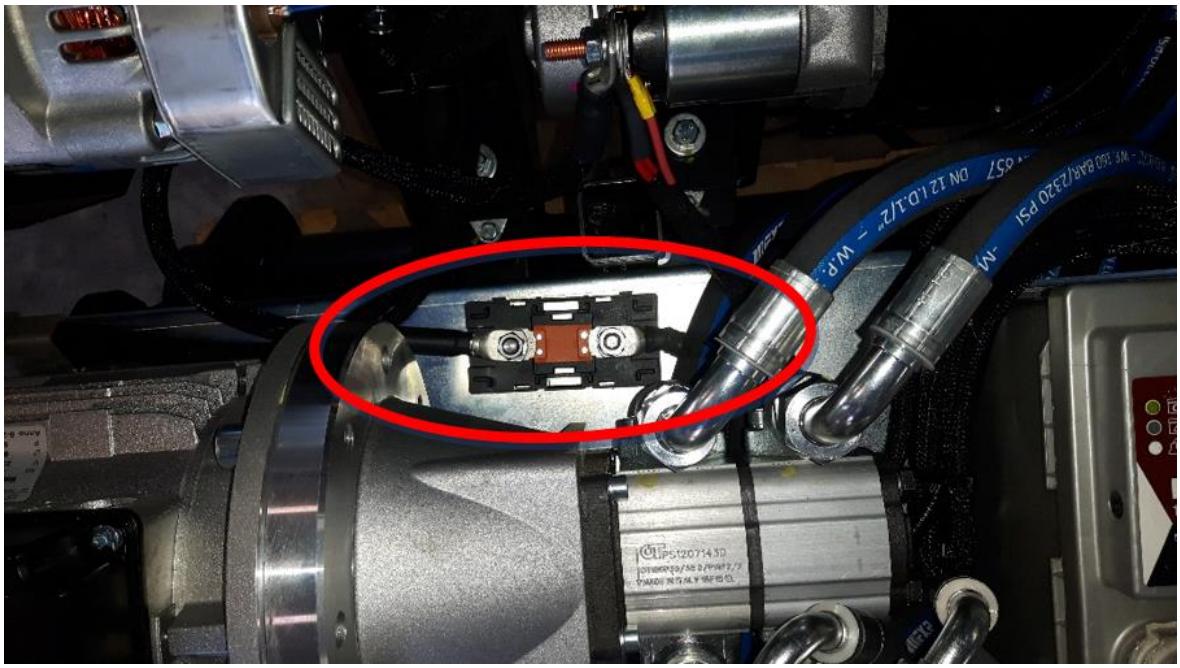


3.11.2 12V system

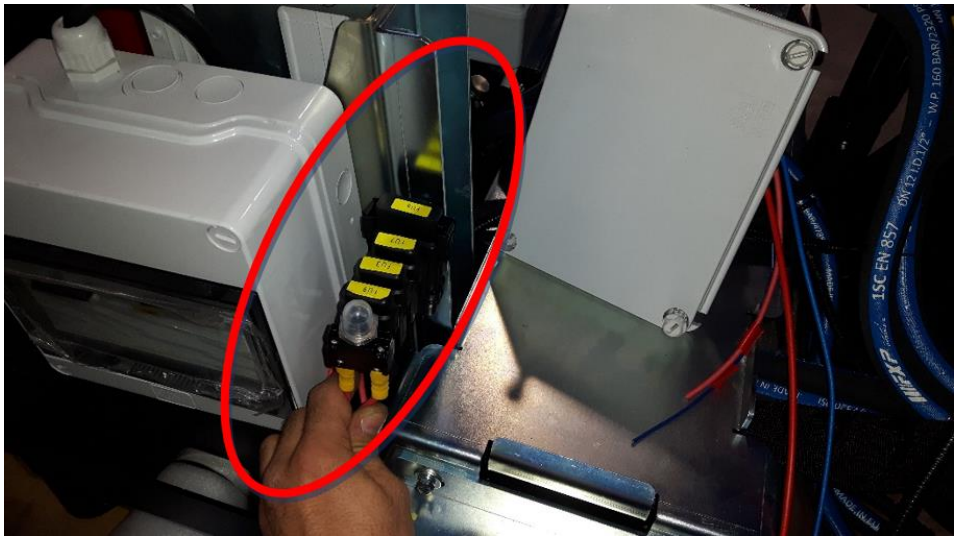
Near the petrol engine is the "battery disconnecter" (5) that physically disconnects the 12V power line coming from the battery and powers the various users.
It is recommended to operate this device at the end of the work day, to prevent draining the batteries.
Inside the motor casing there are also safety fuses to protect 12V-powered electrical equipment.

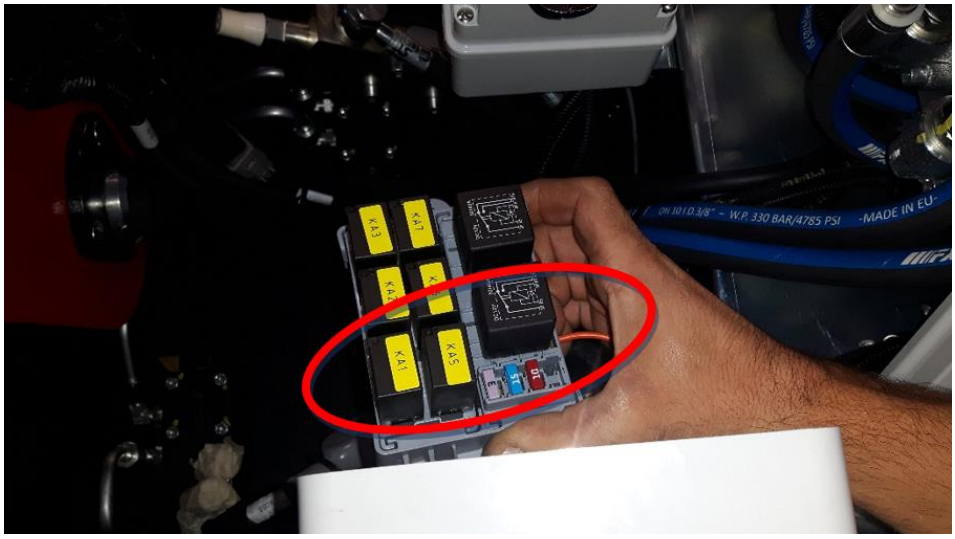


150 A fuse



12V system fuse





To determine the function of each individual fuse, refer to the wiring diagram.

4 Instructions for use

4.1 Preliminary operations

4.1.1 Suitability of the soil

To assess whether the ground is fit to bear the machine, it is extremely important to ensure that the ground surface does not allow the machine to slip once it has been stopped for work.
Two factors contribute towards increasing the danger of slipping:

- Slope;
- Poor grip (or slipperiness) due to a low friction coefficient.

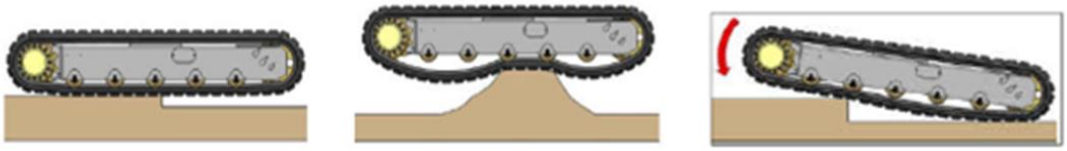
These two factors must be assessed with the utmost care, and at the same time as each other. There are no acceptable values for one "factor" that can exclude the risk of slipping if the other is extremely unfavourable. Ground that is almost flat may not be fit if its surface is icy. On the other hand, a surface with high adhesion may not be fit if it slopes too steeply.
The ideal condition for stability of the platform is represented by flat and horizontal terrain even if in fact this ground condition occurs very rarely.

- Avoid smooth, slippery and/or icy surfaces and those covered with sand. During levelling this could in fact cause a risk of sliding or tipping.

- NO ICE!
- NO SAND!
- NO DUST OR SMOOTH SURFACES!

Note: Do not use the MEWP if you are doubtful about the fitness of the ground surface.

The instructions given below must be followed.
After levelling the machine, lift the basket only after checking and verifying that all 4 ends of the tracks are resting on the ground.
Avoid the following situation for both tracks:



The ring gear of the wheel drive units and the track tensioner wheels must all be resting on the ground.
If even one of them is not in contact with the ground, the stabiliser area will be reduced and, consequently, the platform will be unstable and there will be the **risk of overturning.**

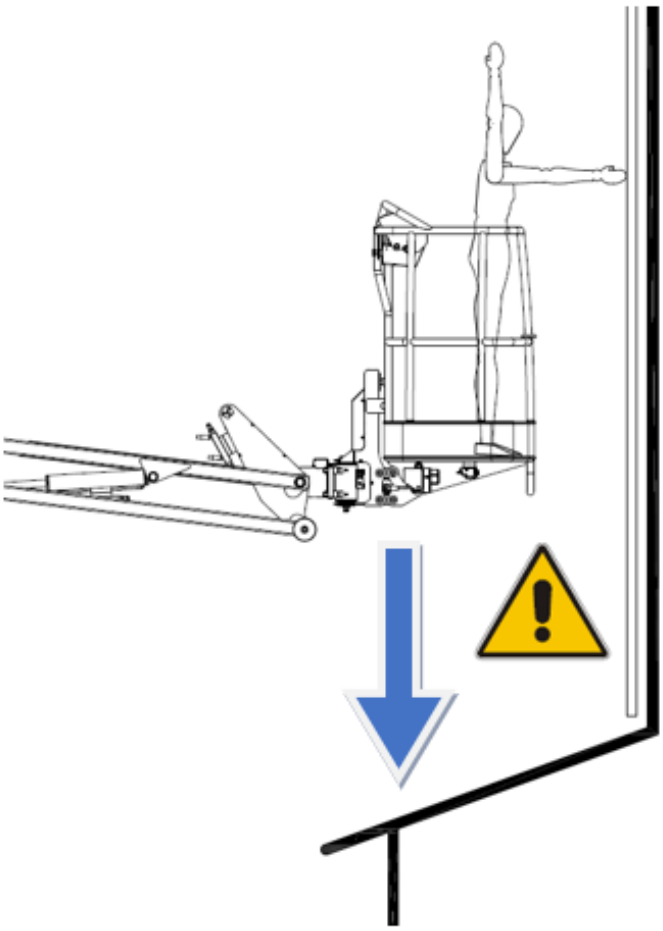
Attention!
Other fundamental indications for safety of the operator, regarding the suitability of the land on which to use the machine are provided in the following chapters of the manual.
Chapter 2.3;
Chapter 2.4;
Chapter 2.9;
Chapter 2.10.

4.1.2 Action of the wind

It is forbidden to use the machine if the wind speed exceeds 12.5 m/s.
The following chart describes the consequences of different wind speeds (Beaufort Scale).

Italian Hydrographic service scale			Beaufort international scale				Consequence
No.	Wind denomination	Speed in km/h	No.	Wind denomination	Corresponding speed		
					km/h	m/sec	
0	Calm	0-7	0	Perfect calm	1.08 3.60	0.3 1.0	Calm, smoke rises vertically.
			1	Light aurora, bora	6.12 7.20	1.7 2.0	Wind direction indicated by smoke, not by weather vane.
1	Light wind	7-14	2	Light breeze	11.16 14.40	3.1 4.0	You can feel the wind on your face, the leaves tremble, the weather vane moves.
2	Moderate wind	14-29	3	Light wind	17.28 21.60	4.8 6.0	Leaves and thin branches move. Flags are raised. The wind lifts dust and leaves. Branches move.
			4	Moderate wind	24.12 28.80	6.7 8.0	
3	Nearing strong wind	29-36	5	Fresh wind	31.68 36.00	8.8 10.0	Small bushes begin to move and turn. On the sea foaming wave crests are evident.
4	Strong wind	36-50	6	Strong wind	38.52 43.20	10.7 12.0	Large branches start to move.
			7	Very strong wind	46.44 50.40	12.9 14.0	All the trees move as the wind blows.
5	Storm	50-83	8	Stormy wind	55.44 61.20	15.4 17.0	The wind brakes branches and it becomes difficult to walk normally.
			9	Storm	64.80 72.00	18.0 20.0	Damage to houses (tiles and chimneys fly)
			10	Heavy storm	75.60 82.80	21.0 23.0	Trees uprooted. Severe damage to houses.
6	Hurricane	83-108	11	Violent storm	86.40 108.00	24.0 30.0	Serious and extensive damage.
	Not classified		12	Hurricane	144.00	40.0	Very serious damage

Danger: The platform must never be used when the wind force corresponds to a value greater than 6 on the Beaufort scale.
For values between 4 and 6 of the scale, always pay the utmost attention.



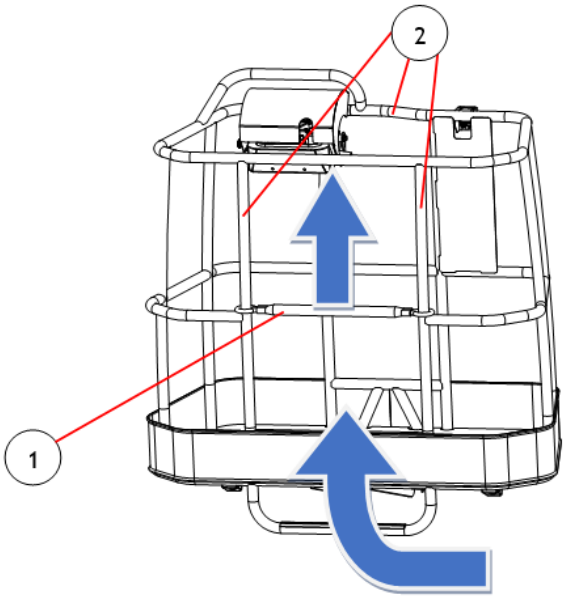
Attention: While descending from the working position, pay attention to possible obstacles beneath the platform to prevent the platform from overturning or from being damaged.

4.2 Access to the platform

Access to the platform is performed exclusively with the machine in a transport condition and with the platform as close to the ground as possible.
Procedure to access the platform:

- Raise the input rod (1);
- Using the uprights get on the platform (2);
- Lower the input rod (1);
- Connect the safety harness to the hooks in the basket (3).

Attention: Get into/out of the basket with your eyes always facing the machine.



Attention: It is PROHIBITED to lock the fall bar (1) in order to maintain access to the platform open.
Attention: It is absolutely forbidden to work at height with the fall bar (1) raised.

4.3 Console fixing in the basket

1. Open the cover by releasing the side piston;

2. Insert the console inside the support and take the cord fitted with hook;

3. Pass the cord underneath the display and fix the hook to the support; in this way the movable console is locked.

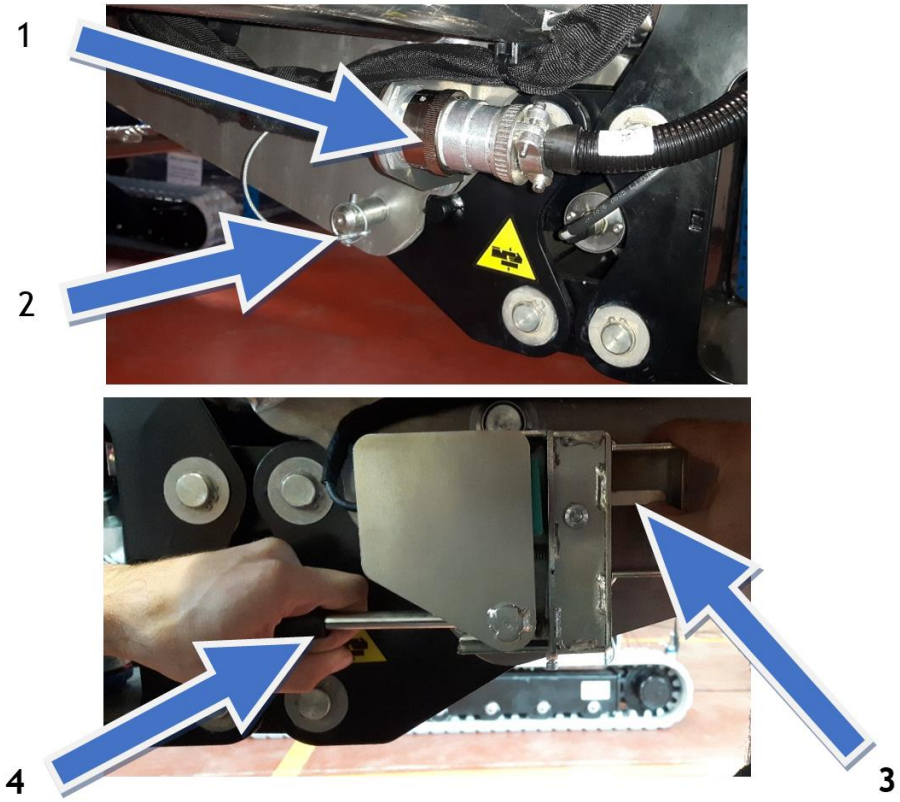
Attention: Fix the console following this procedure when:
Working on the platform;
The machine is transported with a vehicle.

4.4 Removing the basket

The basket is equipped with a quick release device and through this, it is possible to remove it.

Basket release and hooking procedure:

- Disengage the connector (1);
- Remove the split pin (2);
- Remove the basket presence pin by raising the lever (3) and turning the knob (4) anti-clockwise;
- Carefully raise the platform and place it on the ground;
- To connect the platform to the machine, repeat the same sequence in reverse.



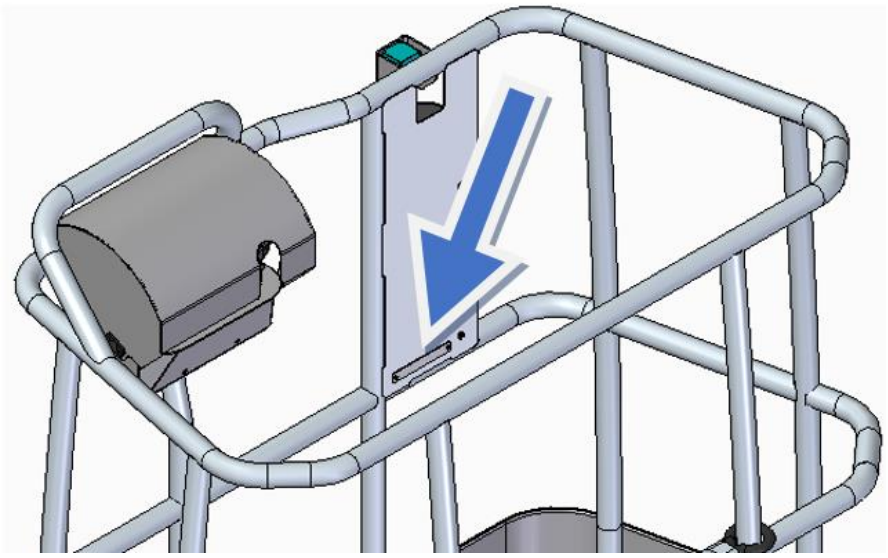
Platform disassembly may be necessary:

- In case of transport with little available space on the vehicle;
- In case of access through 1200mm wide entrances;
- Use of the winch.

Note: The platform can only be removed with the help of two persons avoiding the use of external lifting equipment.

Weight of the basket = 40Kg.

If it is necessary to disassemble the platform, it is mandatory to check the correspondence of the serial number with the identification plate of the machine (plate located on the platform).

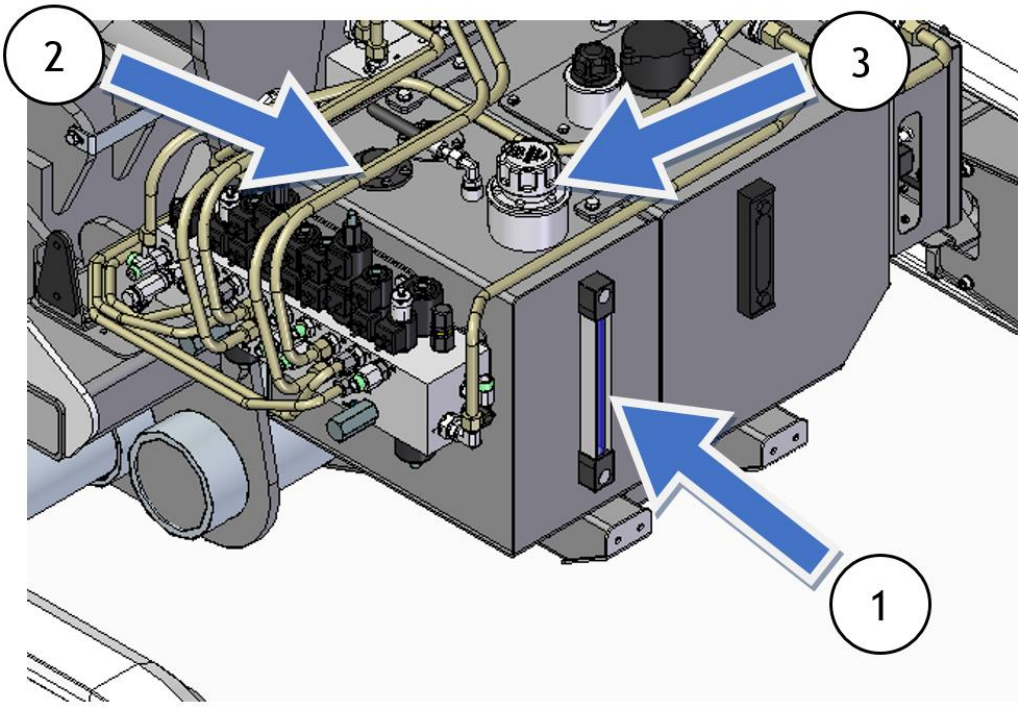


Attention: It is absolutely forbidden to mount a platform that is different from the original.

Attention: Before using the machine, check that the basket has been correctly positioned in its support, that the fixing pin is correctly interlocked and that the safety pin has been fixed.

4.5 Checking the fuel level

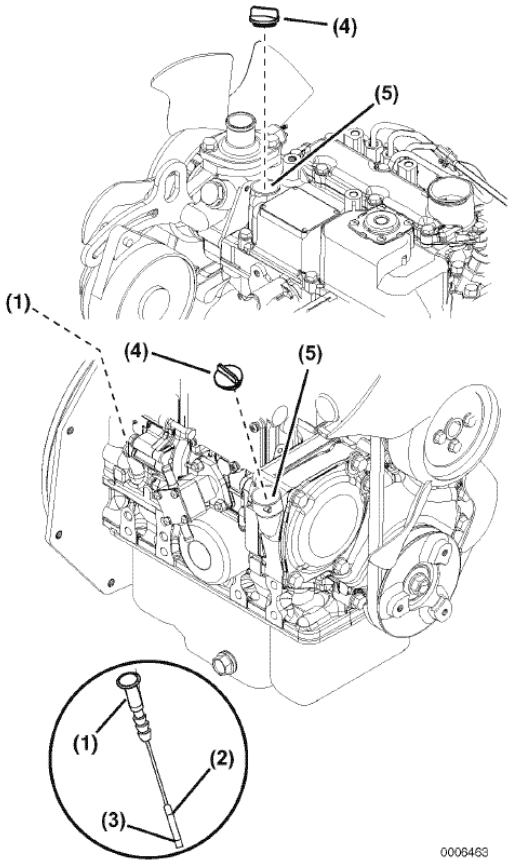
Before turning on the engine and/or starting a work shift, it is advisable to check the fuel level.
The fuel level is visible in the ground control area (1).
There is also a reserve sensor (2).
If the fuel level is too low, the display will show the "Fuel Level Low" alarm and after 15-20 seconds the engine will switch off to avoid completely emptying the supply circuit.
Top up the fuel by means of the dedicated filler cap (3).



- The specific type of diesel fuel and sulphur content in % (ppm) must comply with the applicable emission standards for the area in which the engine is being used;
- It is strongly recommended to use fuel with a sulphur content below 0.1% (1000 ppm;
- Fuels with an EN590 or ASTM D975 specification are recommended;
- For further information, consult the use and maintenance manual of the motor, supplied;
- The minimum recommended cetane number of the fuel is 45. It is preferable to have a cetane number higher than 50, especially for ambient temperatures below -20°C or for altitudes above 1500 mt.

4.6 Checking the oil level in the engine

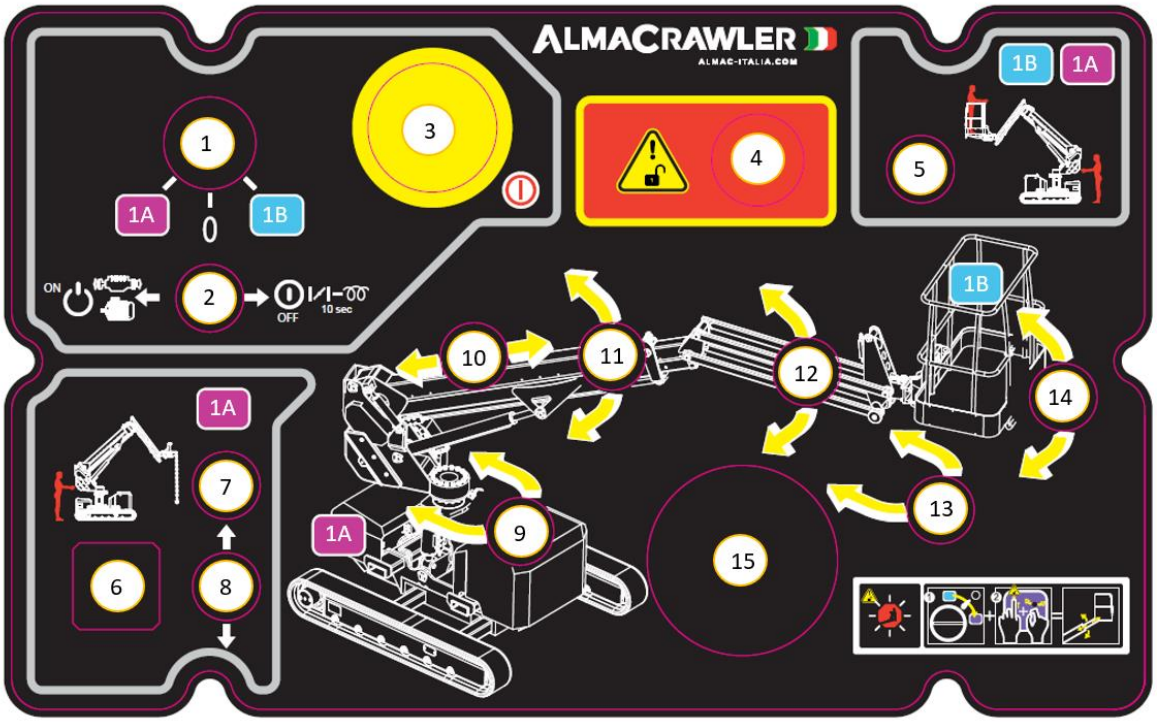
Check the engine oil level before starting it, or when more than 5 minutes have gone by after stopping it.
Pull out the oil level indicator, clean it by wiping it and reinsert it.
Pull the oil level indicator out again and check.
For more information, consult the use and maintenance manual of the engine.



4.7 Machine operation

4.7.1 Endothermic engine start-up via mobile push-button panel/ground control panel

To start the internal combustion engine and the hydraulic pumps, use the ignition key on the ground controls.

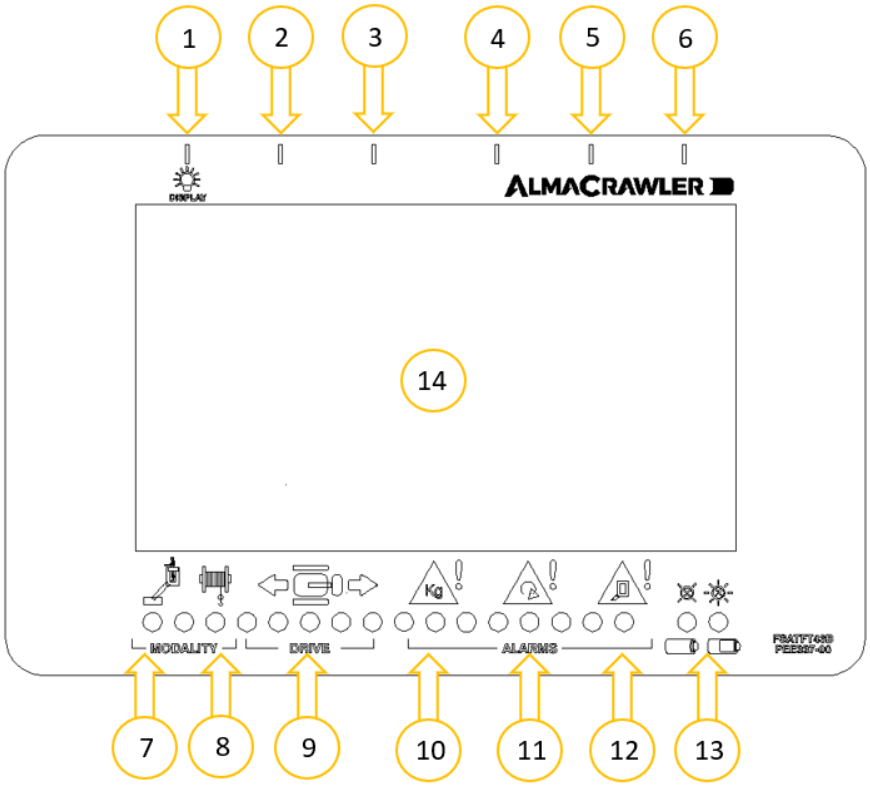


The key-switch functions (1) are:

- (CENTRAL POSITION): Machine off - electrical system not powered;
- (LEFT POSITION “1A" Purple): Ground controls are enabled and the push-button panel in the basket is automatically disabled;
- (RIGHT POSITION “1B”): The push-button panel in the basket is enabled and the ground controls are automatically disabled.

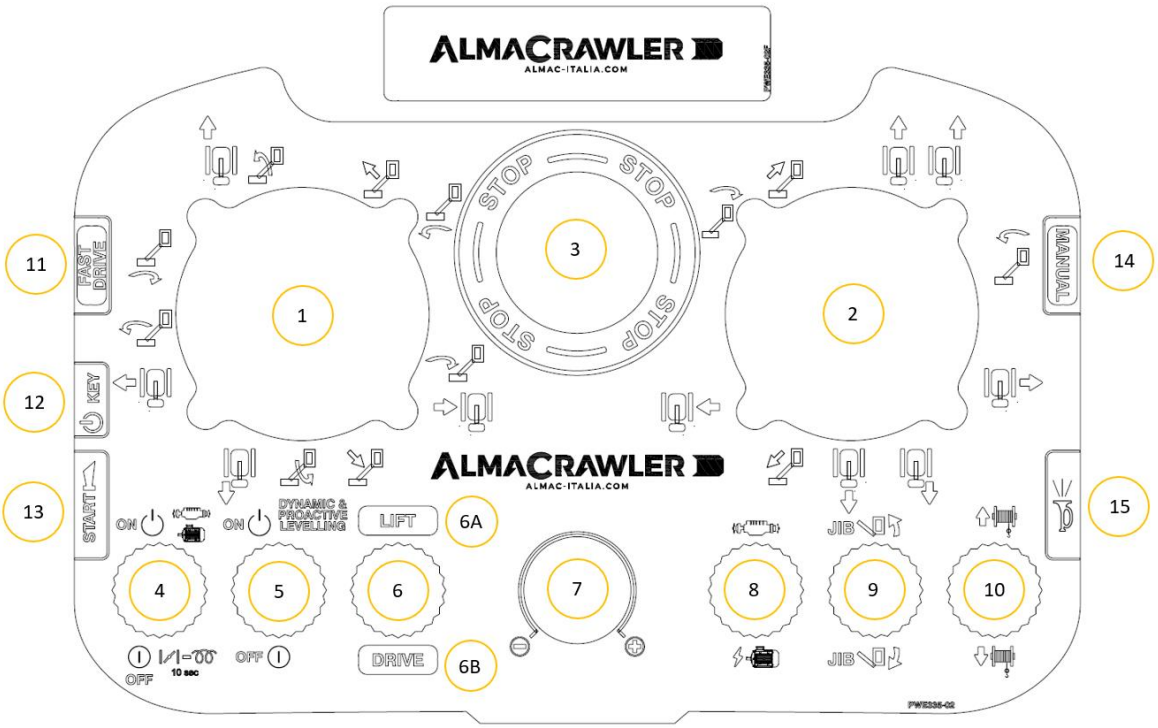
4.7.1.1 Machine start-up with mobile push-button panel

To start the machine using a mobile push-button panel it is necessary to turn the key selector (1) on the Right side ("1B" Blue).



Then the control unit will begin to check the safety systems:

- In the console the display (14) lights up and at the same time an intermittent acoustic signal will be activated;
- Once the system check is completed, the engine can be started via a remote console.



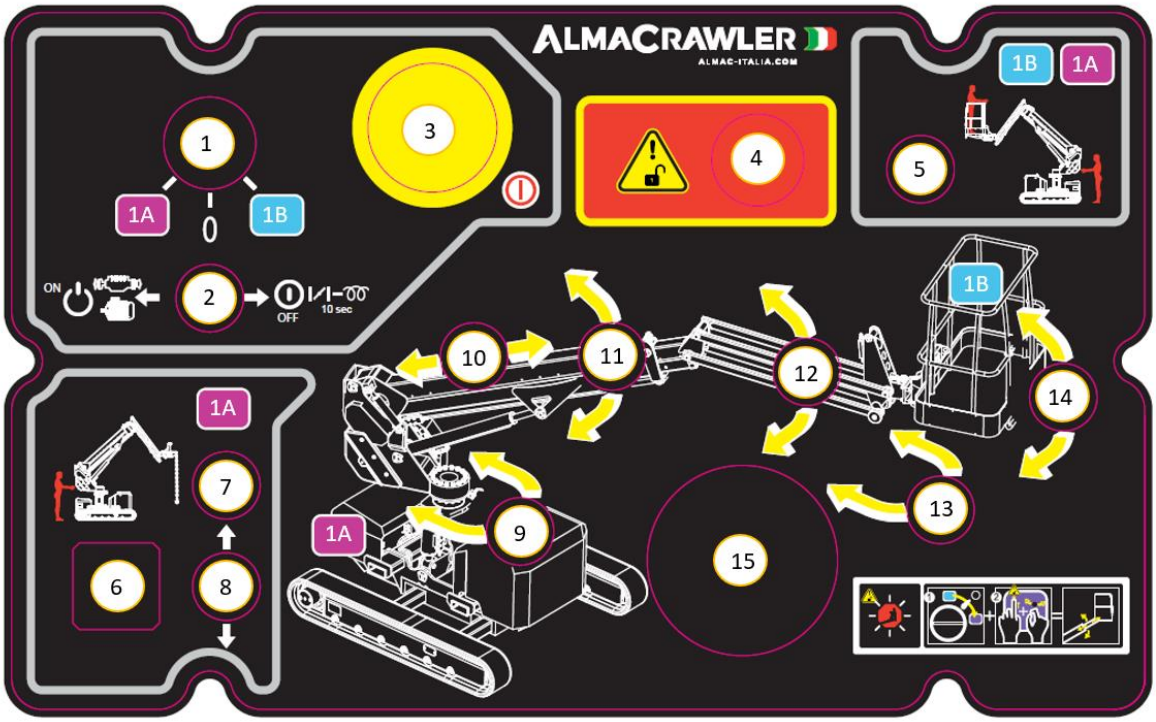
To perform the start-up it is necessary to:

- Press the button (13) (START);
- Using the selector (8) choose ignition with petrol engine or electric engine;
- Activate the selector (4) downwards (OFF) keeping it in position for max. 10 seconds, at the end of the 10 seconds an acoustic signal will sound (this operation is used to activate the glow plugs before ignition of the petrol engine);
- Activate the selector (4) upwards (ON) to start the engine.

Note: After the first switch-on, if the machine is not turned off with the emergency button, the machine can be restarted using only the selector (4) in the position (ON); otherwise it is always necessary to press the button (13) to restart the controls in the console.

4.7.1.2 Machine start-up with the ground control panel

To start the machine via the ground control panel, it is necessary to turn the key selector (1) on the Left side ("1A" Purple).



Then the control unit will begin to check the safety systems:

- An intermittent acoustic signal will be activated;
- Once the check is finished, turn the selector (2) to the right (OFF) keeping it in position for 10 seconds. In this way the glow plugs are activated;
- When the 10 seconds have elapsed, an acoustic signal will sound, at this point turn the selector to the left (ON);
- If the machine is connected to an external power supply by means of an appropriate socket, selecting ON will activate the electric motor (if present).

Attention: The controls located on the ground are for EMERGENCY or MAINTENANCE use and can only be used by qualified personnel.

4.7.2 Starting the electrical engine (if any)

To start the electric motor, and therefore the relative hydraulic pumps, it is necessary to connect a sufficiently long cable with relative three-pin socket that complies with the European IEC 309 standard (see photo below) to the appropriate socket located near the petrol engine.

The power supply characteristics of the electrical network must be compared with the characteristics of the electrical engine installed.
Characteristics of the electrical power supply network:

- Voltage: 230 v ± 10% or 110 v ± 10%;
- Frequency: 50 Hz or 60 Hz;
- Grounding line working and equipped with a differential circuit breaker;
- Use an extension power cord with an appropriate section depending on its length.

Attention: The connection to a network that does not meet the requirements of the electrical engine may cause serious damage to some of the components of the machine.

To start the electric motor through the mobile console in the basket, and therefore the hydraulic pumps, it is necessary to act on the ignition key located on the ground controls (this part is the same as that described in the paragraph "Starting the combustion engine").
Once this phase is completed, turn the selector (8) on the control panel and move it downwards. In this way the electric motor is enabled.
To start or stop the electric motor, choose the selector (4) on the mobile console.

To start the electric motor via the control panel on the ground, and therefore the hydraulic pumps, it is necessary to act on the ignition key located on the ground controls (this part is the same as that described in the paragraph "Starting the combustion engine").
Once this phase is completed, it is necessary to act only on the selector (2). Doing so will turn on the electric motor.

4.7.3 Selection of carriage movements (translation and extension of the carriage)

By moving the selector (6) "Orange" DRIVE downwards, the following movements can be enabled:

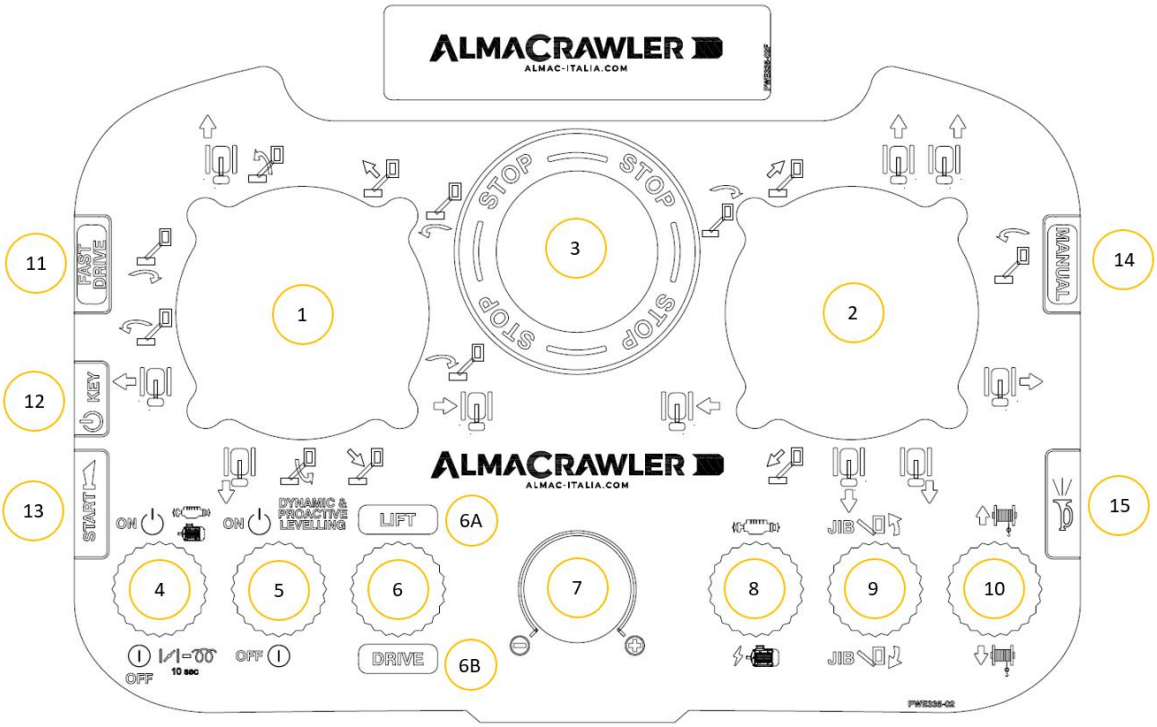
1) Translation;
2) Widening and narrowing of the tracked undercarriage.

4.7.3.1 Translation

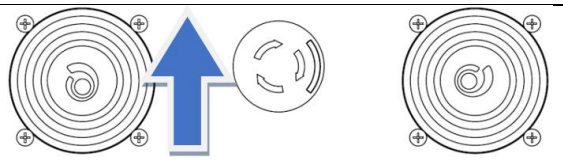
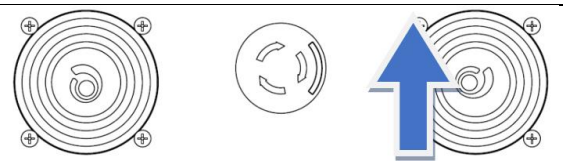
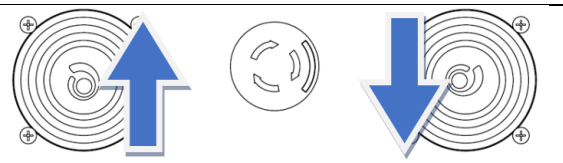
Attention: If selector 5 is positioned on (ON) and the translation is controlled, the telescopic boom will automatically rise up to a value of 5°!!

4.7.3.1.1 Translation in standard mode

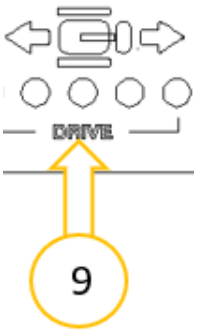
When the machine is switched on, the translation is automatically set in standard translation.
In this mode the operation is as follows:
The controls used to move and steer the platform are represented by 2 joysticks (1-2) located on the control push-button panel (see photo below).



Each lever commands the respective track (Right Lever→Right Lever, Left Lever→Left Lever).
Move the lever forwards to drive the platform forwards. Move the lever backwards to drive in reverse.
You can work with one track at a time, depending on the movement required at that particular moment.
The translation comply with the maximum safety speed allowed by the technical regulations in force (point 5.3.1.11, UNI EN280:2015).
The platform is fitted with a tracked undercarriage with dual speed gear motors equipped with a negative brake, therefore the machine will remain blocked whenever the forward or backward movement is interrupted.
To turn the platform, move the levers as indicated in the following illustrations.

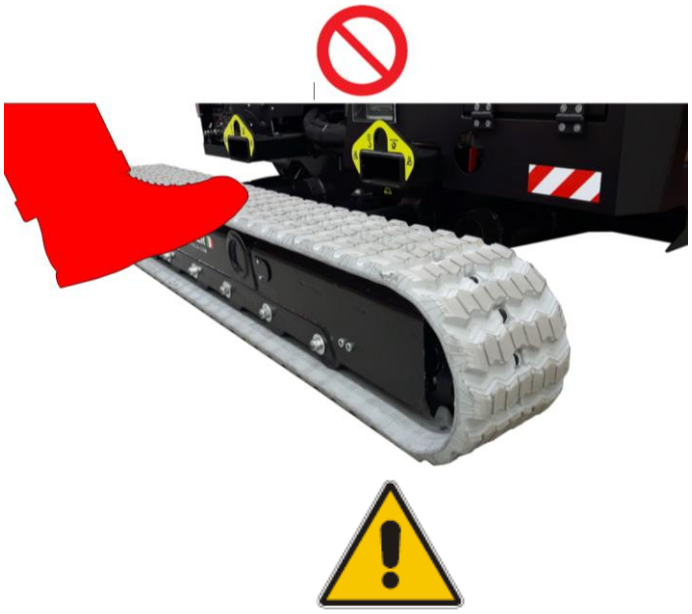
	Right turn
	Left turn
	Rotation on itself towards the right (Counter-Rotation)
	Rotation on itself towards the left (Counter-Rotation)

The indication of the translation enabling is indicated by the status of the consent warning light located on the display on the control panel.



Attention: If you must drive up a slope, do not change direction when the ground changes from flat to sloping. If this is absolutely necessary, perform the manoeuvre gradually.

It is forbidden to climb on the tracks to attempt any operation that is not allowed or to use the controls in the basket.
It is forbidden to climb on the tracks when the machine is moving.



It is forbidden to travel above the transport height in the following conditions:

- Wet ground;
- Snowy and/or icy ground;
- Dry asphalt but covered with sand, gravel or other aggregates.

Warning: slipping hazard!

Attention:

Other fundamental indications for safety of the operator, regarding the suitability of the land on which to use the machine are provided in the following chapters of the manual.

Chapter 2.3;
Chapter 2.4;
Chapter 2.9;
Chapter 2.10;
Chapter 4.1.

Adjusting the speed:

It is possible by using the potentiometer (7) in the console to activate the throttle of the internal combustion engine.

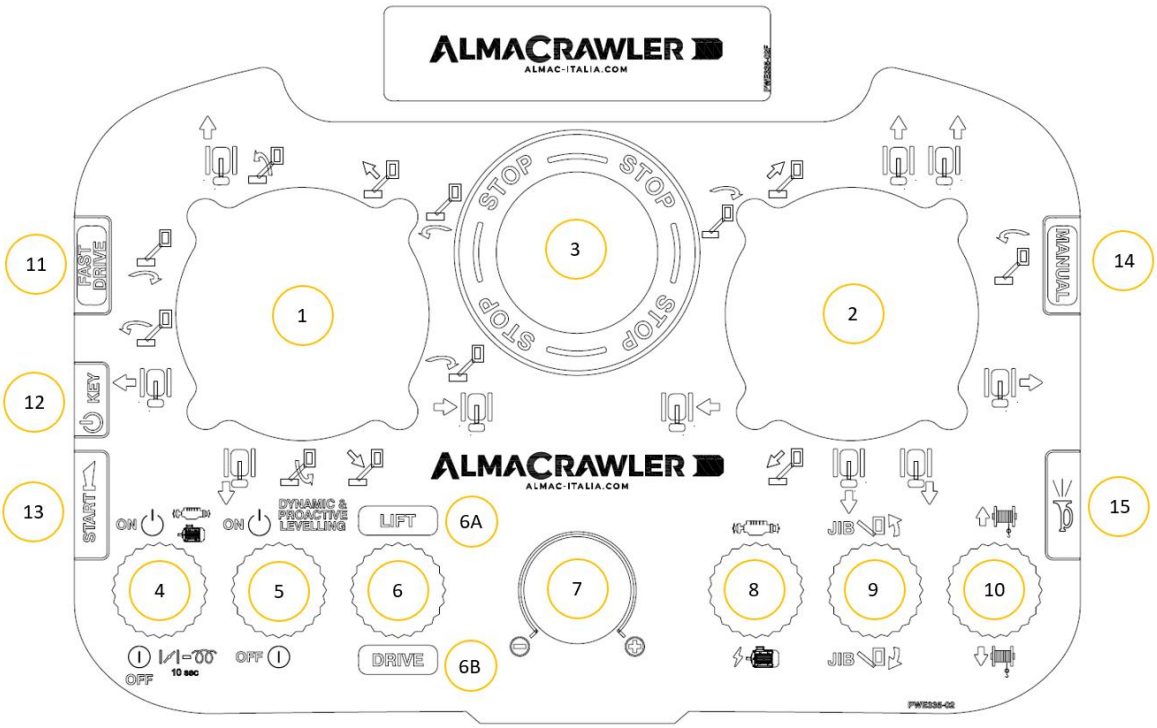
Turning the potentiometer clockwise (+) and exceeding 50% of the stroke activates the accelerator.

Turning the potentiometer anti-clockwise (-) and dropping below 50% of the stroke will deactivate the accelerator.

After a time of 35 minutes without selecting any command the accelerator is automatically deactivated.

4.7.3.1.2 Fast drive

Pressing button 11 (Violet "FAST DRIVE") activates Booster mode (the display will show "FAST DRIVE"); in this way it is possible to move the platform in a straight line simply by operating only the Joystick (2), with the engine at maximum rpm.
This condition is activated regardless of the position of the Dynamic Levelling selector (5) and the position of the potentiometer.
Attention: During this function, automatic levelling is deactivated.
The mode remains active until the button 11 is pressed again or until the machine is switched off by means of an emergency key or mushroom button.

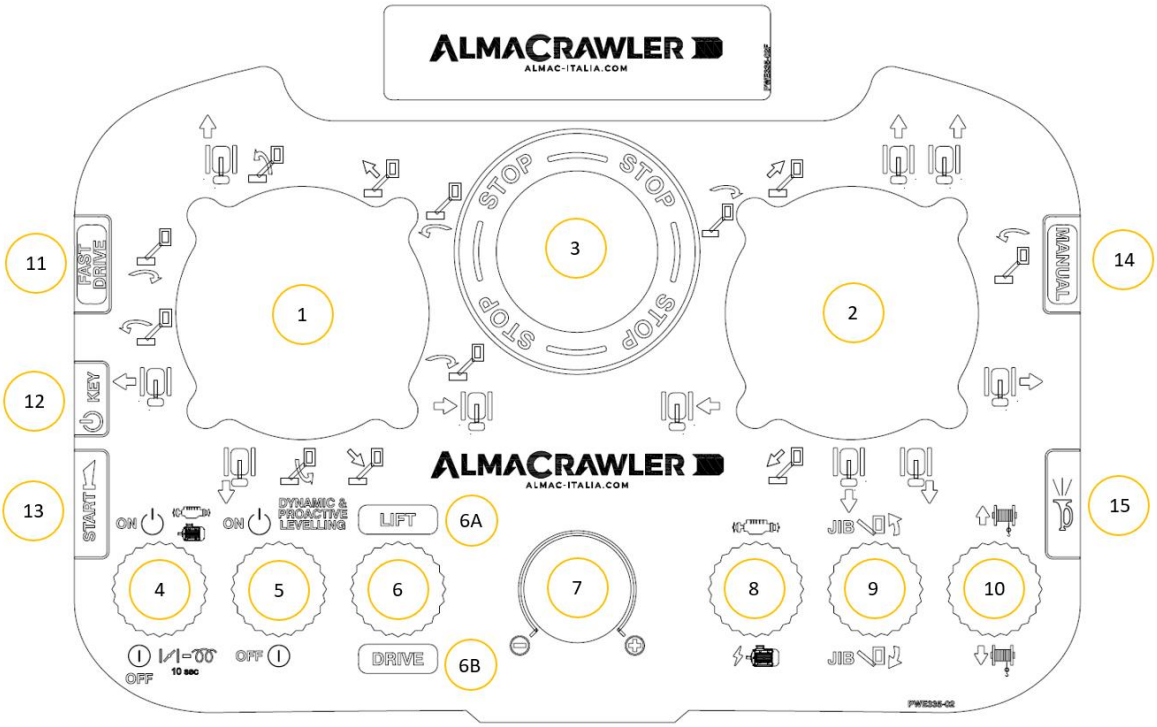


The function is only activated if the longitudinal inclination of the carriage is less than 5°.
With this function active, the hydraulic motors are put in series and engine displacement of the same is activated.
In this way it is possible to move only in a straight line (it is not possible to steer) but at twice the speed of the standard mode.

Attention: With the Booster function active, when the joystick is released the machine does not stop immediately but there is a deceleration ramp. The space travelled before it stops can even be of 50 cm.

4.7.3.1.3 Optional mode: translation control command with the right Joystick

Pressing button 11 (Violet "FAST DRIVE”) and positioning the potentiometer (7) at a value below 90% activates the driving mode with joystick (the display will show "FAST DRIVE”)
With this function enabled, it is possible to control the machine translation in a straight direction and in steering simply by operating the Joystick (2) only.
The mode remains active until the button 11 is pressed again or until the machine is switched off by means of an emergency key or mushroom button.



4.7.3.1.4 Translation mode with basket over the transport height

With the platform raised above the transport height, the maximum travel speed is automatically limited to a maximum value of 0.4Km/h (0.24mph).
All the functions remain the same as with the platform in the transport configuration.
Only the "FAST DRIVE" function is different, in this case the booster function is never activated.

4.7.3.2 Widening and narrowing of the tracked undercarriage

Widening of the tracked undercarriage is only permitted if the carriage is in a transport condition.

Narrowing of the tracked undercarriage is only permitted if the machine is in a transport condition and only if the column is centred.

4.7.3.2.1 Widening and narrowing of the carriage in standard mode

If the machine is in standard translation mode then each lever controls the respective track (Right Lever→Right Track,Left Lever→Left Track).

Moving the left lever to the left widens the left track, moving the left lever to the right narrows the left track.
Moving the right lever to the right widens the right track, moving the right track to the left narrows the right track.
See orange symbols on serigraphy

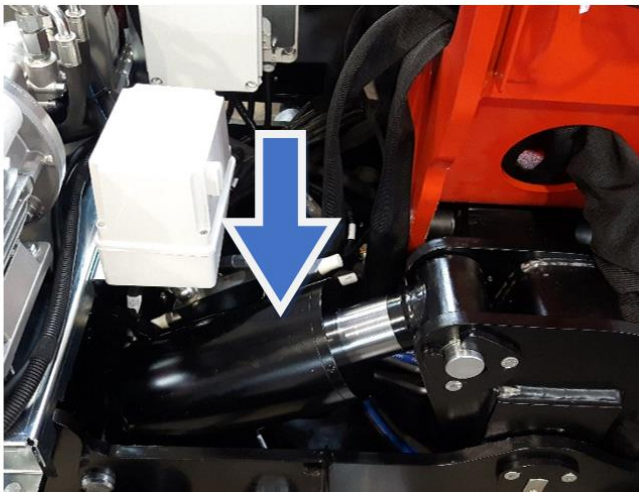
4.7.3.2.2 Widening and narrowing of the carriage in FAST DRIVE mode

If the machine is in FAST DRIVE travel mode then widening or narrowing of both tracks will only be controlled by the left lever.

Moving the left lever to the left, after 2 seconds the left track is widened first and then the right track, moving the left lever to the right after 2 seconds, first the left track and then the right track is narrowed.

4.7.4 Levelling of the slewing ring

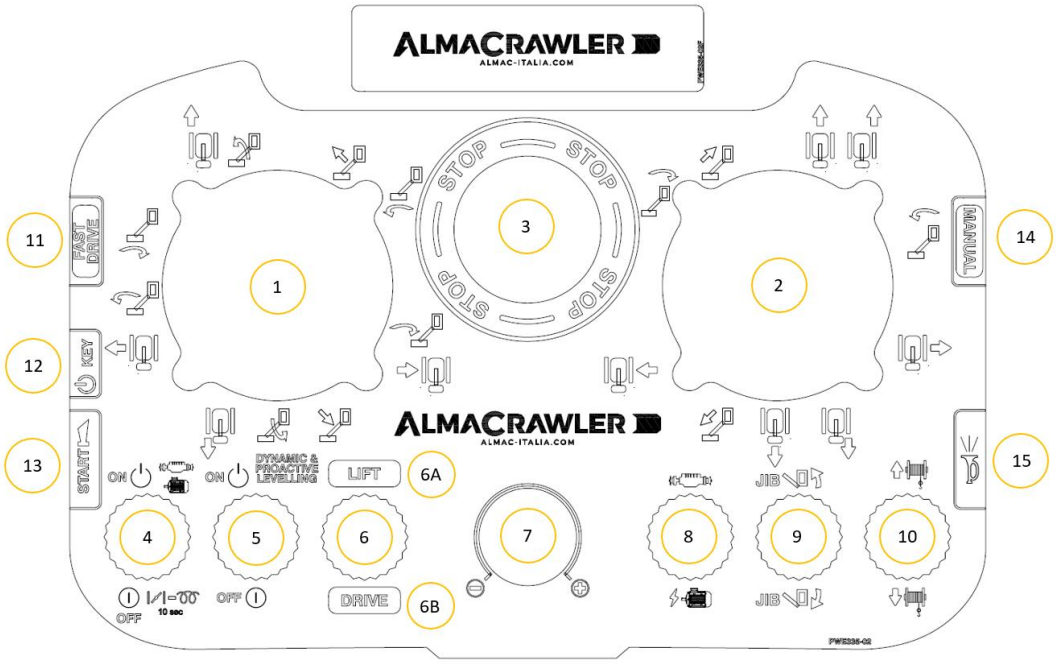
The machine is equipped with an automatic levelling system with hydraulic cylinders to allow the aerial part to operate within the maximum inclination permitted, thereby keeping the fifth wheel level always horizontal within a range of ± 0.5°, both in the longitudinal and lateral direction.



The system is able to compensate for a maximum inclination of 15° both longitudinally and laterally.
The levelling of the fifth wheel level can be performed either with selector 6 positioned downwards (movements of the carriage) or with the selector positioned upwards (movements of the aerial part).

4.7.4.1 Levelling in the transport configuration (Operating the manual controls)

If the machine is in a transport condition and there is a load greater than 20 kg in the basket, it is possible to tilt the fifth wheel level manually to a maximum inclination of 5° both in the longitudinal and lateral directions, if the load in the basket is less than 20 kg it is possible to reach the end of stroke (15°).



To activate this mode it is necessary to:
Set selector 6 upwards (LIFT).

- Press the side button (14) Green “MANUAL”, and at the same time move the joystick (1) to the right/left to act on the side cylinder or up/down to act on the longitudinal cylinder.

Attention: Do not use this function to try to level the fifth wheel level, as manual levelling is less precise than automatic levelling.

4.7.4.2 Levelling in transport configuration (Operating the aerial controls)

a) If the machine is in transport condition, the selector (6) is positioned upwards and selector (5) is positioned upwards (ON) it is possible to automatically level the fifth wheel level by actuating any of the aerial movements. The system will bring the frame back to an inclination of less than 0.5° compared to the horizontal. Once levelled, if the position of the selector is still maintained, the same command is activated.

b) If the machine is in the transport condition, the selector (6) is positioned upwards and the selector (5) is positioned downwards (OFF). By actuating any aerial movement the fifth wheel level does not level and in case of reaching the maximum limit of the transport condition the automatically selected movement is interrupted. At this point, releasing the command and restarting it, levelling of the fifth wheel level is activated. Once levelled, if the position of the selector is still maintained, the same command is activated.

4.7.4.3 Levelling in transport configuration (Activating translation)

If the machine is in the transport condition, the selector (6) is positioned downwards and the selector (5) is positioned upwards (ON), it is possible to automatically level the fifth wheel level during translation of the machine.
Thanks to this system, the platform, while it is moving, will always remain levelled and once the operating area has been reached, the machine will already be in the condition to be lifted.

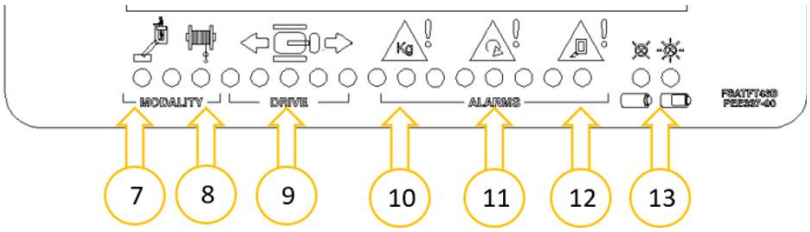
4.7.4.4 Levelling beyond the transport configuration (Translation activation)

If the machine is beyond the transport condition, but in a diagram where translation is permitted, then the levelling function called "proactive levelling" can be activated.
The selector (6) must be positioned downwards and the selector (5) must be positioned upwards (ON).

Note: Proactive Levelling is only active up to the maximum permissible translation height of the machine.

This function is used to correct the levelling of the fifth wheel level when at height, if after a translation on not perfectly level ground, the inclination of the slewing ring becomes 1° higher.
The function is automatically disabled if the inclination of the fifth wheel level exceeds 4°.

The levelling speeds are reduced compared to those with the machine in the transport position.
This is wanted both to make the manoeuvre comfortable for the operators and to minimise the effects due to inertia.



If the LED 11 is on flashing it means that the inclination of the fifth wheel level is lower than 4° but greater than 1°; the proactive function is permitted;
If the LED 11 is on steady it means that the inclination of the fifth wheel level is greater than 4°; the proactive function is not permitted.
Only the machine can be returned to the transport configuration.

Operating principle:
During the translation at height, if 1°of the inclination of the fifth wheel level is exceeded, the translation stops.

- It is necessary to release the joysticks;
- When the joysticks are reactivated, the platform will be levelled again.

Attention: If the levelling is performed by means of the joysticks, once the levelling has been completed, the machine will start to travel automatically in the selected direction.

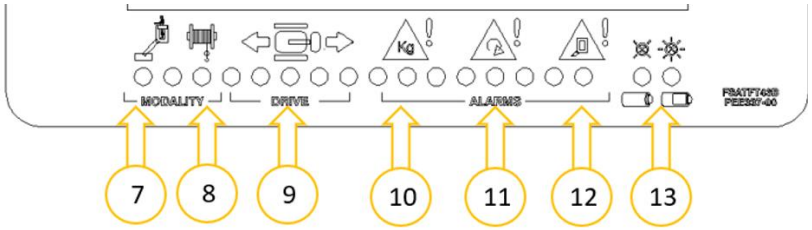
4.7.4.5 Levelling beyond the transport configuration (Activating the aerial controls)

If the machine is beyond the transport condition, but in a diagram where translation is permitted, then the levelling function called "proactive levelling" can be activated.
The selector (6) must be positioned upwards and the selector (5) must be positioned upwards (ON).

Note: Proactive Levelling is only active up to the maximum permissible translation height of the machine.

This function is used to correct the levelling of the fifth wheel level when at height, if after a movement of the aerial part, the inclination of the slewing ring becomes 1.5° higher.
The "TILT ALARM" appears on the display
The function is automatically disabled if the inclination of the fifth wheel level exceeds 4°.

The levelling speeds are reduced compared to those with the machine in the transport position. This is wanted both to make the manoeuvre comfortable for the operators and to minimise the effects due to inertia.



If the LED 11 is on steady it means that the inclination of the fifth wheel level is greater than 4°; the proactive function is not permitted.
Only the machine can be returned to the transport configuration.

Operating principle:
During a movement of the aerial part, if inclination of the fifth wheel level is exceeded by 1.5°, the movements that increase the height of the basket stop.

- It is necessary to release the joysticks;
- When the joysticks are reactivated, the platform will be levelled again.

The aerial movements that activate this function are:

1) Boom lifting;
2) JIB Lifting;
3) Slewing ring rotation;
4) Outreach exit.

4.7.5 Basket levelling

The basket is levelled by a closed hydraulic system, independent from the electronics that always keeps the platform plane parallel to the fifth wheel level.
The electronics automatically intervene to correct the levelling in the following conditions:

1. The command mode in the basket is set.
2. The basket has an error greater than 2° with respect to the fifth wheel level for a time greater than 1 sec;
3. The platform is only levelled when the boom lifting or lowering command is selected;
4. The fifth wheel level is levelled within 1.5°.

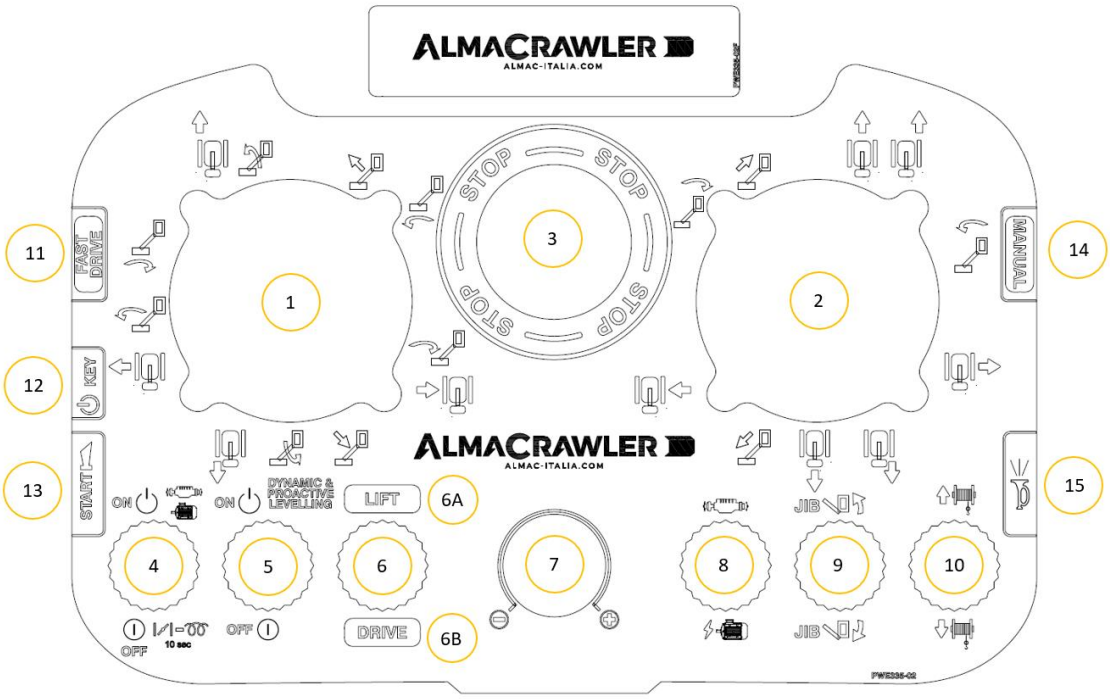
Attention: It is not possible to manually adjust the levelling of the basket from the commands in the remote console.
Attention: If during automatic levelling, the software reads an angle greater than 15° with respect to the horizon, the machine is blocked, hence only the platform can be returned.

It is only possible to manually adjust the levelling of the basket using the ground controls using the basket levelling selector.

Attention: This operation must only be carried out when the machine is stored without an operator in the basket.

4.7.6 Overhead movements

The basket can be moved by means of the appropriate switches on the control push-button panel. The lifting and lowering speeds are controlled by the electronic control unit (ECU) and by the positioning of the potentiometer in the mobile console (7).
The selector (6) must be positioned upwards Blue “LIFT”;



Extension and outreach retraction:

- Move the Joystick (2) up/down for extension or retraction.

Antenna lifting and lowering (JIB):

- Move the selector (9) up/down to lift or lower the antenna (JIB).

Lifting and lowering of the boom:

- Move the Joystick (1) up/down for raising or lowering of the boom.

Column rotation:

- Move the Joystick (1) to the right to rotate to the right with the platform (anti clockwise rotation);
- Move the Joystick (1) to the left to rotate to the left with the platform (clockwise rotation).

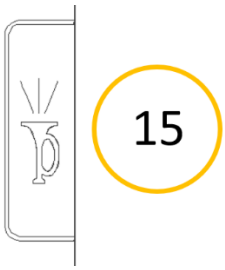
Basket rotation:

- Move the Joystick (2) to the right to rotate to the right with the platform (anti clockwise rotation);
- Move the Joystick (2) to the left to rotate to the left with the platform (clockwise rotation).

4.7.7 Manual warning buzzer

Press the side button (15) from the mobile push-button panel to operate the platform horn. It must be used whenever persons working or moving around the platform area must be warned that platform movements are in progress.

Attention: The continuous use of this device reduces the battery charge.

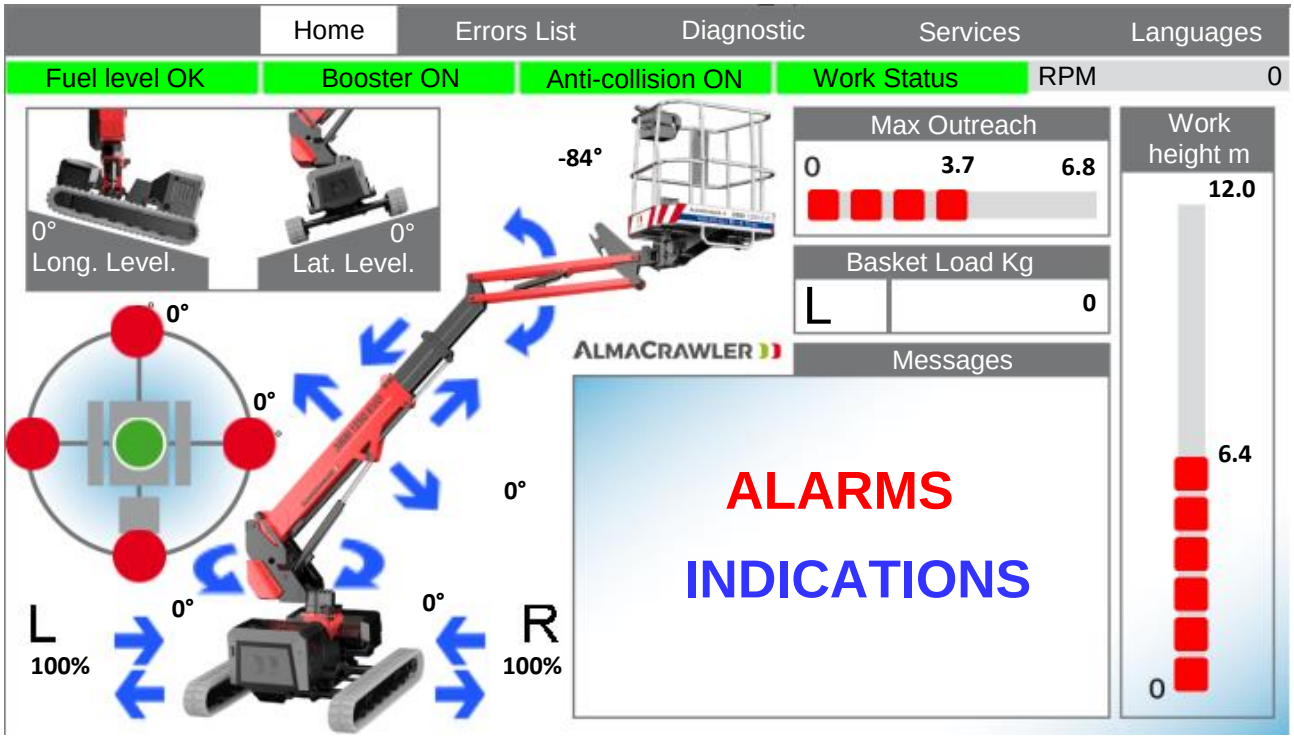


4.8 Indications displayed on the counter in the ground control panel

The counter is located on the side of the machine on the ground control panel, offering the total working hours of the internal combustion engine (see photo below).

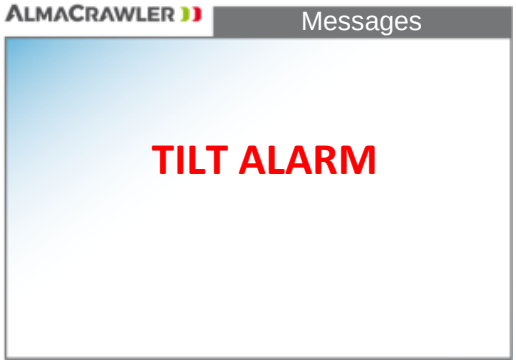
4.9 Indications and alarms shown on the console display

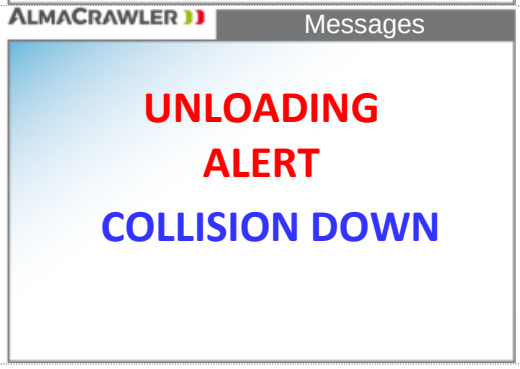
All indications and alarms detected on the moment by the machine will appear in the "Messages" box of the display (see photo below).

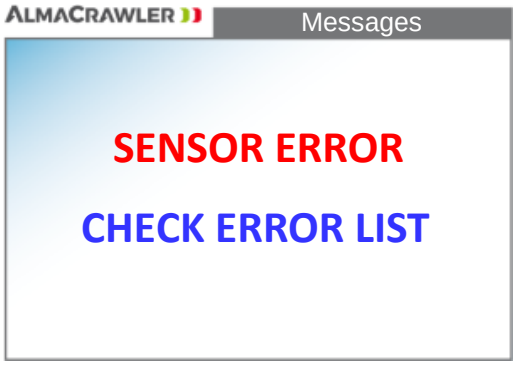


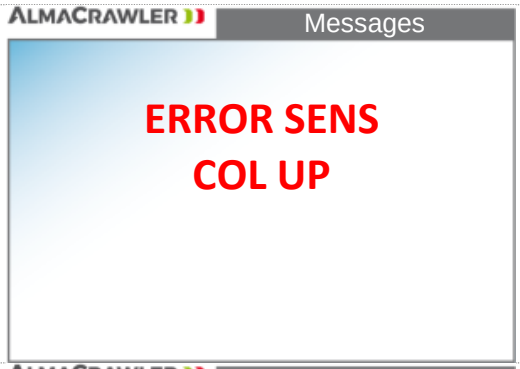
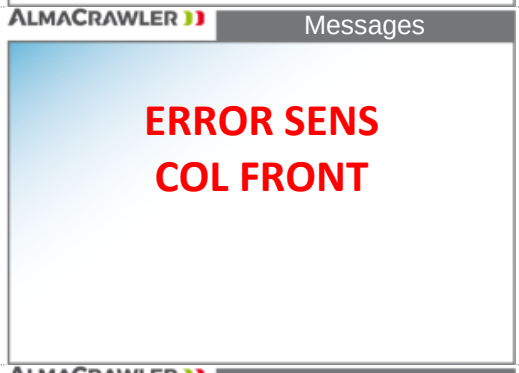
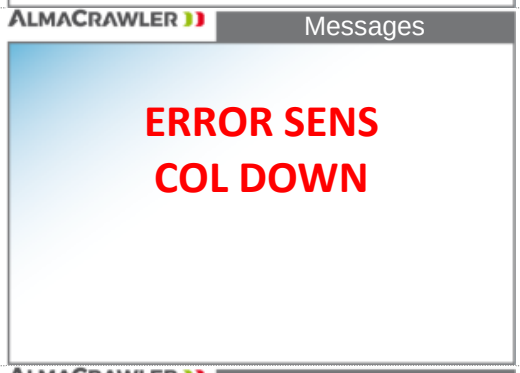
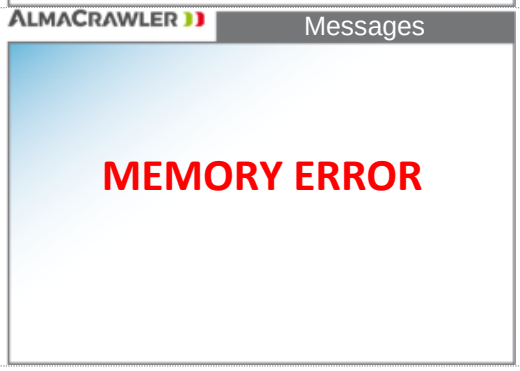
The alarms are shown in the upper message box and the words are red, the indications are shown in the lower message box and the words are blue.

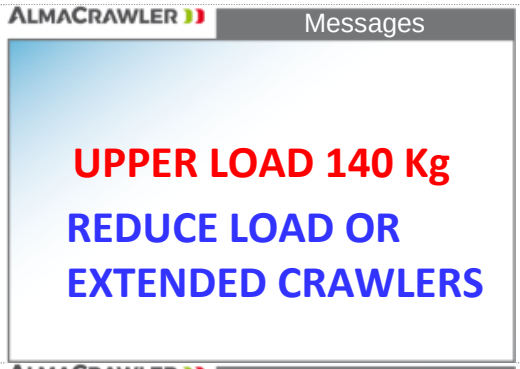
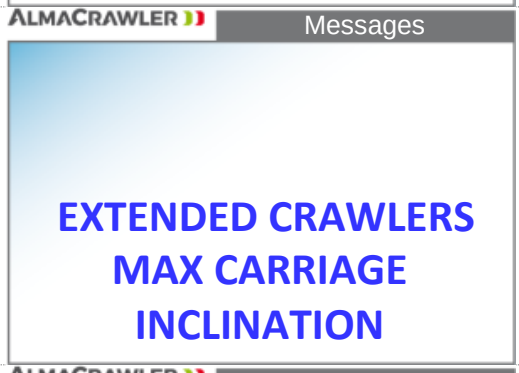
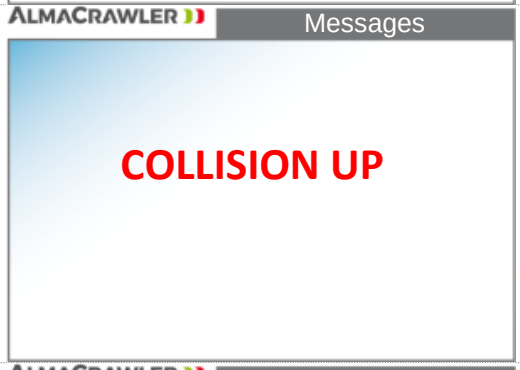
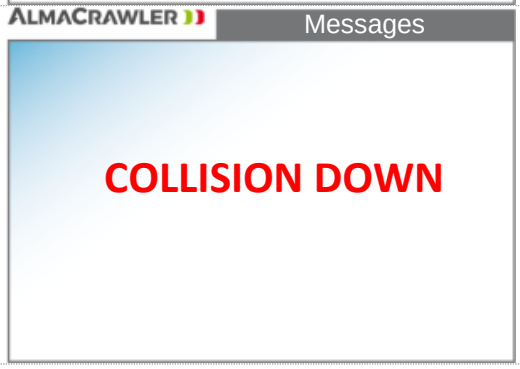
The alarms and indications on the machine are:

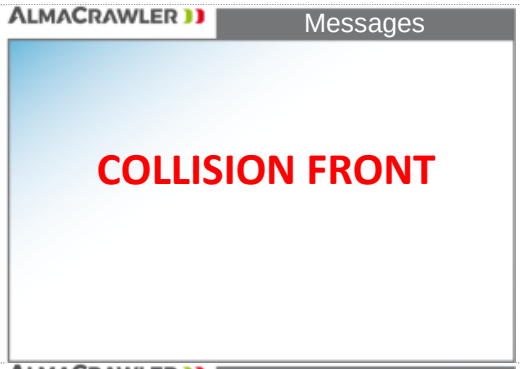
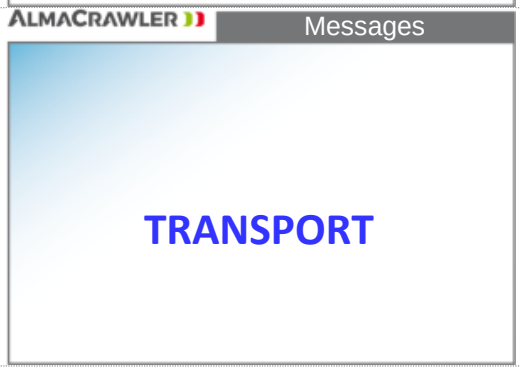
Message	Alarms and Indications	Description
	**TILT ALARM**	- The alarm is activated if the fifth wheel level, with the machine not in transport conditions, tilts with an angle greater than 1.5° for more than 2 seconds. The machine can only carry out the retraction movements or proactive levelling if translation is permitted; - The alarm is activated if the fifth wheel level tilts, or is inclined, by an angle greater than 4° and is out of the transport condition; all the movements are blocked except those for retraction;

Message	Alarms and Indications	Description
	**OVERLOAD ALAMR**	The alarm is activated when the limit load in the basket is exceeded. Note: At the bottom of the message box, the indication REDUCE LOAD will also appear.
	**OUTREACH LIMIT**	The alarm is activated when the outreach limit has been reached.
	**BASKET TILT ALARM**	Malfunction of the basket levelling, this alarm occurs when the angle of the platform becomes greater than 15°.
	**UNLOADING ALERT**	The alarm is activated when the software reads a negative load in the basket (example: basket resting on a roof). Note: The indication COLLISION DOWN will also appear at the bottom of the message box.

Message	Alarms and Indications	Description
	**UNLOCKED BASKET**	This alarm occurs when the basket presence inductive sensor is not active. In this case it means that the basket is not correctly locked with the pin or that it is not present.
	**SAFETY SYSTEM OFF**	The alarm is activated when the safety functions for emergency situations are bypassed using the ground control procedure. Note: This alarm remains present until the machine is switched off.
	**SENSOR ERROR**	- The alarm is activated when a safety component of the machine is not working or is in alarm; - This alarm occurs when the console or radio is activated and the system reads an already selected movement (the same applies to the ground controls). Note: At the bottom of the message box the CHECK ERROR LIS will also appear.
	**NO CAN COMMUNICATION**	The alarm is activated when there is no communication with the control unit.

Message	Alarms and Indications	Description
	**UPPER COLLISION SENSOR ERROR**	This alarm occurs when the upper sensor is not working or is disconnected from the power supply.
	**FRONT COLLISION SENSOR ERROR**	This alarm occurs when the front sensor is not working or is disconnected from the power supply.
	**LOWER COLLISION SENSOR ERROR**	This alarm occurs when the lower sensor is not working or is disconnected from the power supply.
	**MEMORY ERROR**	The alarm is activated when there is a fault inside the electronic control unit.

Message	Alarms and Indications	Description
	**REDUCE THE LOAD OR WIDEN THE TRACKS**	The indication appears when the machine, in transport conditions with at least one track not fully extended, exceeds the maximum load of 140kg and the moving part is moved beyond the transport configuration.
	**EXTENDED CRAWLERS MAX CARRIAGE INCLINATION**	The indication appears when the machine, in addition to or at the limit of the transport conditions, with at least one track not fully extended, exceeds the maximum limit of the wagon carriage (2° laterally or 5°longitudinally).
	**COLLISION UP**	The alarm appears when the sensor located in the railing of the basket detects the presence of objects at a distance of 1.5 m above the basket.
	**COLLISION DOWN**	The alarm appears when the sensor located under the basket detects the presence of objects at a distance of 0.8 m below the basket.

Message	Alarms and Indications	Description
	**COLLISION FRONT**	The alarm appears when the sensor located under the basket detects the presence of objects at a distance of 0.8 m in front of the basket.
	**AUTO LEVEL: ON**	The indication appears when the machine is automatically levelling the fifth wheel level or basket.
	**FAST DRIVE**	The indication appears when the "FAST DRIVE" mobile console button is pressed.
	**TRANSPORT**	The indication appears when the machine is in a transport condition.

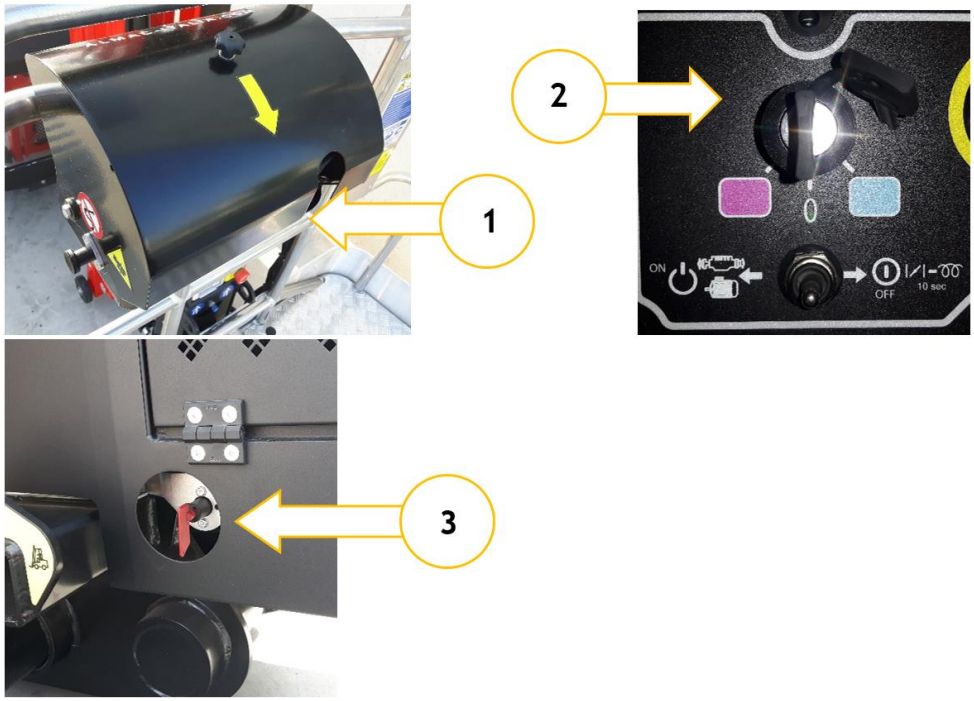
Message	Alarms and Indications	Description
	**START**	The indication appears when the machine is started; pressing the green start button on the side of the console activates all the controls, at which point the machine can be switched on.
	**RADIO OUT BASKET**	The indication appears when the sensor fixed on the console support does not detect the presence of the radio in its housing.

4.10 Stopping the machine

4.10.1 Normal stop

During normal use of the platform, releasing the joysticks and the selectors will stop aerial and ground-based movement.
Deactivation and platform recovery must be performed in this way:

- Bring all lifting members to their rest position;
- Turn off the machine via the console by setting the selector to OFF;
- Cover the mobile push-button panel with its guard (1);
- Get out of the basket;
- Position the key selector (2) on the ground controls in the central position, then remove the key;
- Disconnect the battery using the dedicated command and remove the key (3).



4.10.2 Emergency stop

In case of anomalous circumstances, or in those situations in which it is necessary to interrupt any movement of the machine, the operator can command IMMEDIATE STOPPING of all the functions of the machine by pressing the MUSHROOM button. Three emergency buttons are installed on the machine:

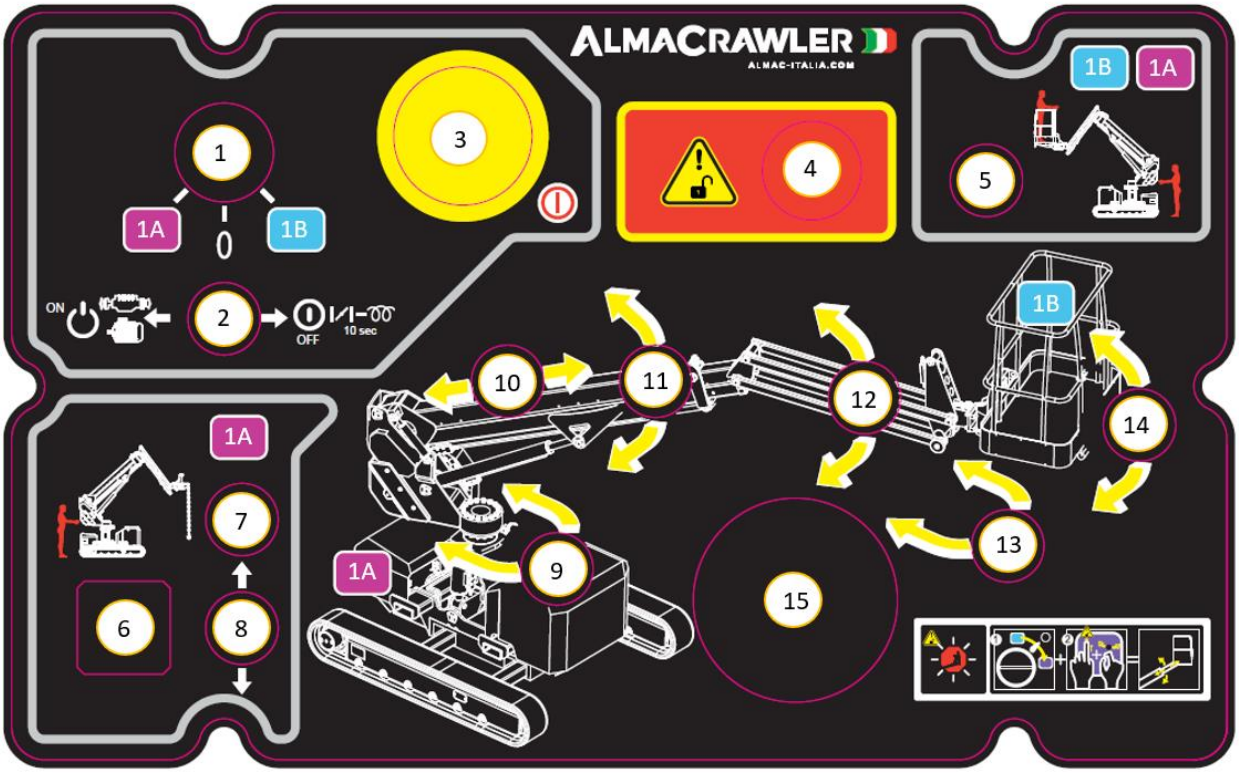
- Ground control panel;
- Remote control push-button panel;
- Basket support (if any).

ONLY RADIO VERSION

After using the emergency button, to restart the machine it is necessary to release the mushroom buttons in order to re-enable all the controls.

5 Emergency procedures

5.1 Operator recovery procedure incapacitated by ground controls, even with the mushroom button pressed in the basket.

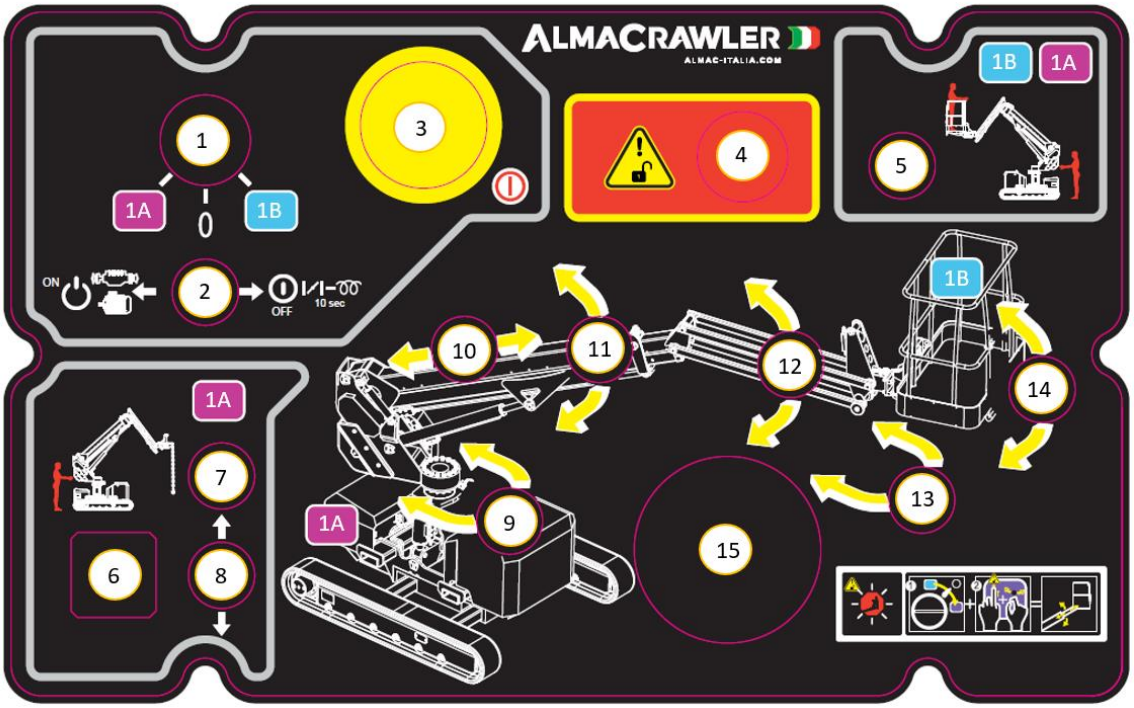


Using the ground control panel, perform the sequence described below for the operator recovery:

1. Turn the selection key (1) to the "Purple" position (1A).
2. Use the selector (2) to switch on the petrol/electric engine;
3. Using the selectors (9-10-11-12-13-14), perform one movement at a time to bring the machine back to the safety position.

<u>During this procedure all the safety functions of the machine are active.</u>

5.2 Procedure to move with the wired push-button panel connected to the ground panel (Outlet 6).

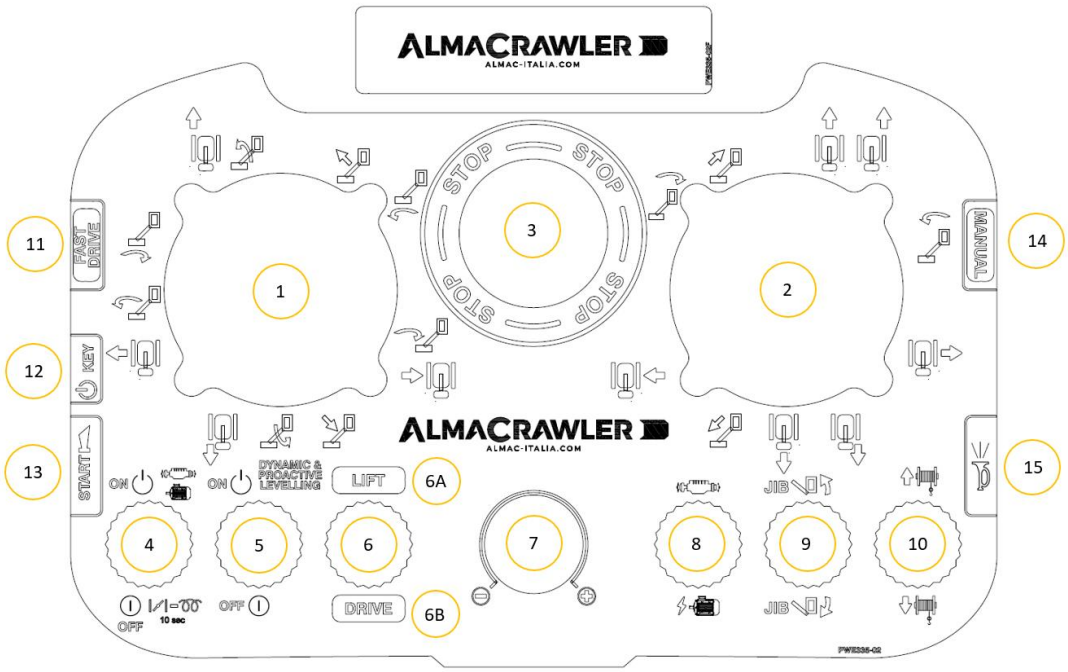


Using the ground control panel, perform the sequence described below:

1. Remove the connector from the ground control outlet 6 and store it carefully.

2. Connect the console cable to the ground control outlet 6.

3. Turn the selection key (1) to the "Purple" position (1A);
4. Use the selector (2) to switch on the petrol/electric engine;
5. Using the selectors (9-10-11-12-13-14), perform one movement at a time to move the aerial part if necessary;
6. Using the Joysticks 1 and 2, perform the translation movements



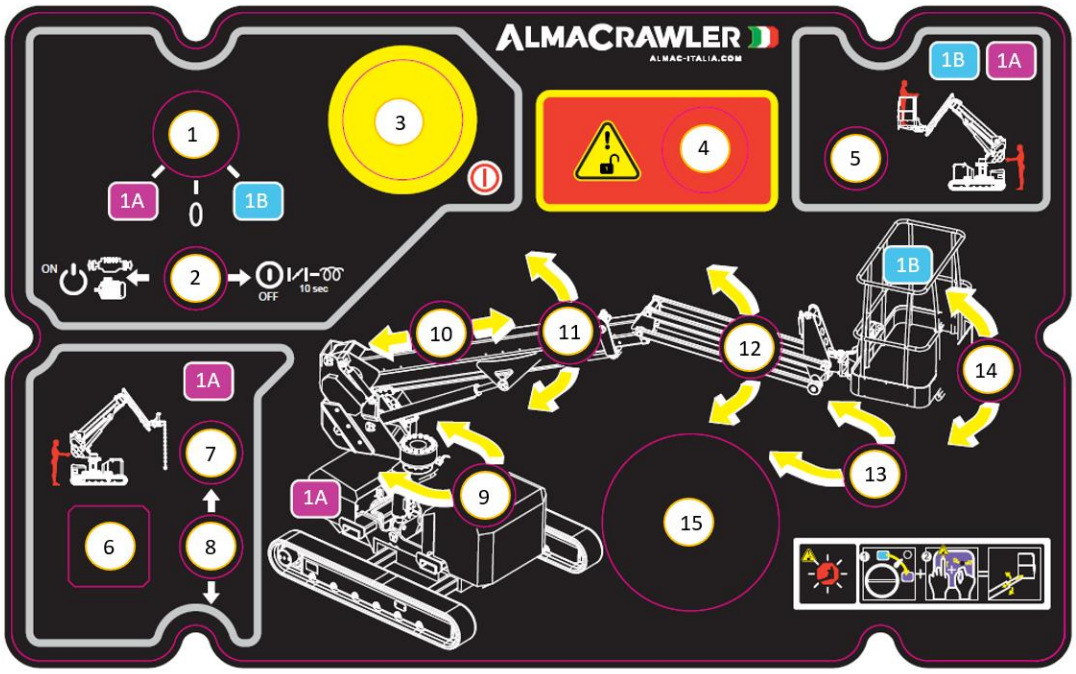
Attention the selector (5) must be set to OFF.
During this procedure all the safety functions of the machine are active.

With this procedure it is possible to move with the machine beyond the transport conditions and to move it in particularly tight spaces.

During this procedure there should be no load in the basket or load on the basket support in case the basket is removed.
In the event of a load presence, the translation will not be permitted.

Attention: Follow all the safety instructions regarding the translation given in chapter 4.7.3.1.1 and the related other chapter called up.

5.3 Operator recovery procedure incapacitated by means of controls on the ground and machine in overload.



Using the ground control panel, perform the sequence described below for the operator recovery:

1. Turn the selection key (1) to the "Purple" position (1A);
2. Use the selector (2) to switch on the petrol/electric engine;
3. Remove the seal on the cover that protects the button (4);
4. Press the button (4) for more than 3 seconds and keep it pressed; in this way the safety functions are bypassed, at the same time the acoustic signal is activated with a continuous sound; in addition the alarm "SAFETY SYSTEM OFF" appears on the display;
5. Keeping the button (4) pressed together with one of the selectors (9-10-11-12-13-14) the aerial movements are performed, the movement lasts at most 5 seconds. Once the time has elapsed it is necessary to release and press the button (4). Only one movement can be executed at a time;
6. At the end of this procedure the acoustic signal and the alarm on the display will always be present. To cancel these alarms it is necessary to switch the machine off and on again with a key or emergency stop;
7. On the “Service" page of the display, however, the button (4) has been pressed. In the last line called "Bypassed Safety Devices" the index will show the number of times the function has been activated.

ATTENTION: During this procedure all the machine safety devices (load control, outreach control and tilt control) are deactivated.
ATTENTION: Carefully perform all movements as there is a constant danger of the machine overturning and overloading of the structure.

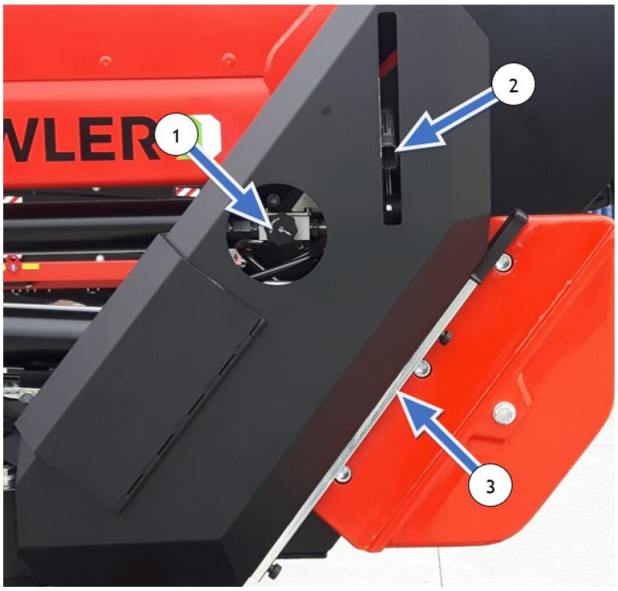
It is therefore necessary to always perform the following sequence of movements:

1. Complete retraction with extension of the telescopic boom;
2. Full lowering of the JIB;
3. Rotation of the slewing ring to bring the column back into a centred position (slewing ring angle 0°);
4. Complete lowering of the telescopic boom.

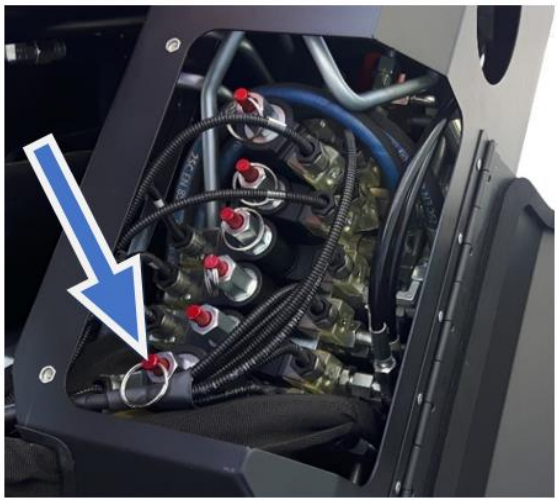
5.4 Emergency manual descent

In the event of a fault in the electrical system or in the hydraulic system, it is possible to perform the DESCENT operation of the platform, using the dedicated manual safety system.
To perform this manual emergency procedure, the following are necessary:

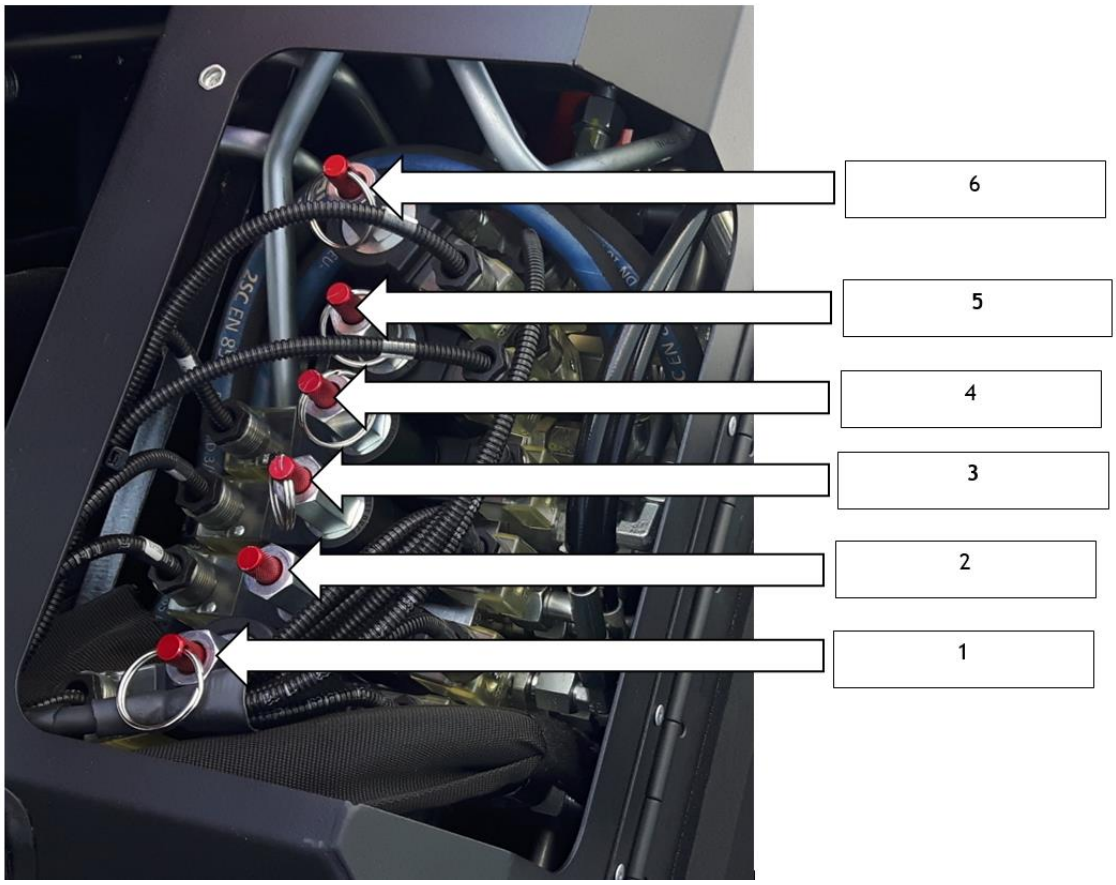
On the right side of the tower, near the distributor, signalled by dedicated stickers, there is a manual diverter (1) and a hand pump (2) provided with lever (3).



<u>Turn the diverter with arrow facing up;</u>
In this way it is possible to manually control the valves A1 and B1 (Exit and retraction of outreach).



Turn the diverter with the arrow pointing downwards;
In this way it is possible to manually control the rest of the valves.



1) Exit and retraction of outreach;
2) Basket rotation;
3) Basket levelling;
4) JIB;
5) Column rotation;
6) Boom lifting and lowering.

With the diverter positioned in one of the two conditions described above, manoeuvre the pump by hand using the appropriate lever, at the same time commanding the valves for the movements to be carried out.

Note: Do not perform two movements at the same time, perform only one movement at a time.
Note: On the valve that controls the outreach there is an accessory to facilitate the retraction procedure; the same device can also be installed on the valve that controls the movements of the boom.

These operations are to be performed with:

1) Combustion or electric engine off;
2) Electrical system switched off (by disconnecting the switch-battery).

These operations simulate emergencies that can happen to the machine such as:

1) Electrical system faulty;
2) Hydraulic system faulty;
3) Motors faulty.

ATTENTION: <u>During this procedure all the machine safety devices (load control, outreach control and tilt control) are deactivated.</u>
ATTENTION: <u>Carefully perform all movements as there is a constant danger of the machine overturning and overloading of the structure.</u>

It is therefore necessary to always perform the following sequence of movements:

1. Complete retraction with extension of the telescopic boom;
2. Full lowering of the JIB;
3. Rotation of the slewing ring to bring the column back into a centred position (slewing ring angle 0°);
4. Complete lowering of the telescopic boom.

ATTENTION: THIS MECHANISM MUST ONLY BE USED IN AN EMERGENCY, i.e. ELECTRICAL OR HYDRAULIC FAILURE.

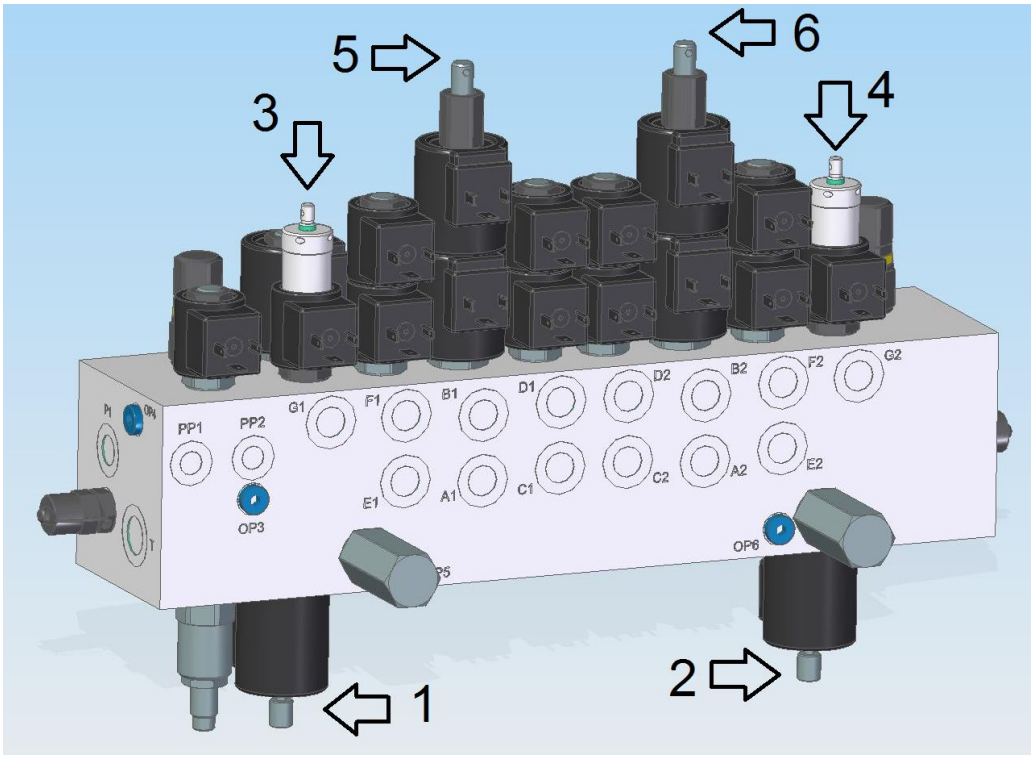
5.5 Transporting the machine in an emergency

To move or transport the platform using external equipment, refer to paragraph 2.5.

5.6 Emergency movements from hydraulic block

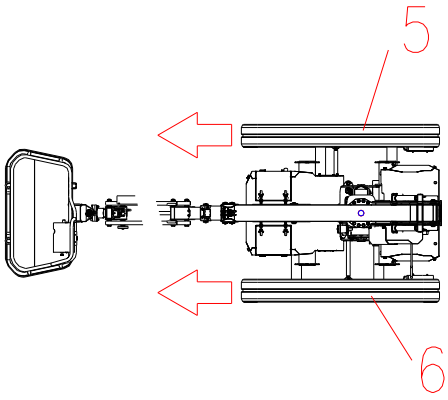
Attention: This operation must be performed only by qualified technicians trained by Almac S.r.l.

In the event that there is a malfunction of the control unit but it is possible to switch on either the internal combustion engine or the electric motor, then control the translation of the machine directly from the hydraulic block.
To perform the movements it is necessary to release (by turning clockwise) the exchange valves 1-2 and then act on the valves 5 and 6; in this way it is possible to translate with the machine.



Pressing valve 5 controls translation of the left track in the direction indicated by the arrow;
If the valve is pulled, the movement is in the opposite direction;

If valve 6 is pressed, the right-hand track is moved in the direction indicated by the arrow;
If the valve is pulled, the movement is in the opposite direction.



Attention: These manoeuvres can only be performed by technicians authorised by Almac S.r.l.
Attention: Reset the valves 1-2-3-4 in the correct position at the end of any operation that involves their handling.
Attention: Danger of tipping over of the platform or crushing of the operators.

6 Maintenance

6.1 Safety regulations during maintenance

Attention: All maintenance operations must be performed as indicated in *Chapter 2 Information regarding safety*. In particular, carry out maintenance only after having pressed the emergency button, having switched off the engine, having disconnected the power from the machine and having put on the personal protective equipment.
Attention: Disconnect the machine from all power sources.
Attention: It is mandatory to perform all MEWP movements required for inspections/maintenance from the ground and without persons in the basket. When checking machine operation from the basket position, the required movements must be performed as near to the ground as possible.

Note: Use of spurious spare parts, or parts that have not been approved by the manufacturer voids the warranty and relieves ALMAC S.r.l. from all liability.
Note: Modifications or variations to the MEWP are forbidden unless authorized by the manufacturer.
Note: All maintenance work that is not described in this manual must be authorized by the manufacturer and must be performed by authorised technicians.

Attention: Do not use the machine if one of its mechanical or hydraulic elements or a control or safety device is faulty. IMMEDIATELY NOTIFY AN ALMAC S.r.l. SERVICE CENTRE.

Note: The maintenance operations described in this Manual refer to platforms in conditions of normal use. In heavy duty use conditions (e.g. extreme temperatures, dust and corrosive substances in the environment, etc.), inform the ALMAC S.r.l. assistance services to have the maintenance intervals checked and changed.
Note: The MAINTENANCE operations must only be performed by authorised and adequately trained personnel.
Note: Only perform the MAINTENANCE and ADJUSTMENT operations described in this Manual. Contact the ALMAC S.r.l. assistance service only, if other operations are required (e.g. if faults occur).
Note: All MAINTENANCE work must be performed in compliance with the laws in force governing safety and protection of the environment.
Note: THE MANUFACTURER IS RELIEVED FROM ALL LIABILITY FOR ACCIDENTS OR FAULTS DUE TO FAILURE TO COMPLY WITH THE RECOMMENDATIONS AND SAFETY REGULATIONS.

- Proceed with maintenance operations only after turning off the machine and deactivating the battery disconnect switch;
- Before proceeding with the interventions, make sure the platform is completely blocked;
- If the basket must be raised for maintenance purposes, the platform and lifting structure must be prevented from accidentally lowering;
- Protect the environment: avoid spilling oil when changing it or topping up. Used oil must be disposed of in accordance with the laws in force;

- Never insert the body, limbs or fingers in sharp, jointed openings on the machine that are not controlled or without proper guards unless securely held in place;

- Never use petrol, solvents or other inflammable liquids as detergents: Instead use the authorised, non-flammable, non-toxic solvents available from the market;

- Do not use open flames for lighting purposes when performing maintenance operations;

- Make sure there are no fluids under pressure before disassembling unions or pipes: oil spattering out under pressure can cause serious injuries. Immediately call a physician if injuries occur or the fluid from pipes is accidentally ingested. Remember that fluid seeping from a very tiny hole can be almost invisible but possess sufficient force to penetrate under the skin. Use a piece of card or wood to check for leaks;

- Make sure that all parts of the hydraulic circuit have been tightened correctly;

- When compressed air is used for cleaning parts, protect yourself by wearing safety goggles with side guards and limit the pressure to 2 atm maximum. (1.9 bar).

6.2 Cleaning the machine

To clean the machine correctly it is possible to use jets of water that are not pressurised, adequately protecting the following parts:

- Electrical components;
- Ground control panel and console;
- Electric motor (if present).

After cleaning the machine, dry all the parts and check the integrity of the stickers.

Attention: Lubricate all the coupling points fitted with grease nipple.
Attention: Never use petrol, solvents or other flammable liquids such as detergents: Instead, use authorised commercial solvents that are non-flammable and non-toxic.

6.3 General maintenance

The main maintenance interventions and the frequencies with which they must be carried out are given in the chart below.

6.3.1 Ordinary maintenance schedule table

The checks and maintenance operations must be performed as indicated in the table below.

ORDINARY MAINTENANCE SCHEDULE TABLE	A	B	C	D	E	F	G	H
		10	50	100	250	500	1500	
Cleaning the machine			X					
Cleaning of the plates and indicator lights	X							
Greasing of joints				X				X
Check the hydraulic oil level	X							X
Track reduction gear oil level inspection						X		X
Checking the oil level in the engine	X							X
Clean the engine air filter.*			X					X
Replace engine air filter.*					X			
Greasing of outreaches				X				X
Change the hydraulic oil							X	
Replace oil in the track reduction gear							X	
Lubrication of telescopic element chains				X				X
Greasing of the tower rotation group *				X				X
Change the motor oil * (after the first 20 hours)				X				
Replace engine oil filter.*				X				X
Suction filters replacement							X	X
Discharge filter cartridge replacement							X	X
Track inspection and tensioning	X							X
Check the condition of the tracks	X							X

Check for wear and tensioning of the telescopic elements output chains. Replace the chains if necessary.	X							
Check the wear and adjustment device of the sliding blocks			X					
Checking the charge status of the engine starting battery (if any)	X							X
Checking the charge status of the traction batteries (if any)	X							X
Check using a torque wrench the tightening of screws and bolts for fixing of the tracked undercarriage to the machine frame, the screws M16 class 10.9 tightening torque 246 Nm (after the first 50 hours)					X			
Check the tightening of screws, bolts and rings (generic checks)	X							
Check correct positioning of the Seeger rings	X							X
Check tower rotation gap						X		
Check basket rotation gap						X		
Visual checks as specified in paragraph 6.3.2	X							X
Functional checks as specified in paragraph 6.3.2	X							X
Structural check (visual inspection, in particular check for the possible presence of rust or cracks)	X					X		X
Structural verification (thorough checking of the carpentries and weldings, in particular check for the possible presence of rust or cracks)						X		X
Check the overload monitoring device						X		
Manual emergency devices	X							X
Check the correct operation of the 230V outlet differential						X		X
Checking of fuses and replacement (if necessary)					X			X
Check the maximum pressure valve							X	
Checking of angle sensors	X							X
Checking of tower rotation sensor	X							X
Checking of carriage extension sensors	X							X
Checking of telescopic boom extension sensor	X							X
Checking of ultrasound sensors (if any)	X							X

A. Whenever the machine is used	D. monthly or every 100 hours	G. annually or every 1500 hours
B. Daily or every 10 hours	E. every two months or every 250 hours	H. after long periods of inactivity (30 days)
C. Weekly or every 50 hours	F. quarterly or every 500 hours	* Refer to the engine use and maintenance manual

Attention: For maintenance operations of commercial components, consult the component-specific use and maintenance manuals.

6.3.2 Checks before each use

Prior to commissioning and before each use the machine must undergo the visual and functional checks given below.
The instructions given below must be followed.

VISUAL CHECK	*CHECK OPERATION*
• Check that the tracks are not loose or worn; • Check that components and bolts are in place and tightened correctly; • Check that the valves and the hydraulic lines are tightened in place, that they are not damaged and that they do not leak; • Check that the cylinders are locked in place and do not show signs of damage and/or leakage; • Check that the electric voltage is within the parameters and that the electrical connections are not damaged; • Check that the gearboxes are not damaged and do not leak; • Check that the ground controls are locked in place and that they are not damaged. Make sure that all switches, selectors, buttons and indicators operate correctly; • Check the oil level of the gearmotors (contact the authorised service personnel if necessary); • Check that the batteries are locked in place, are charged and that they do not show signs of damage or leakage of acid; • Check that tanks and hydraulic and fuel lines are tightened in place and free from damage and/or leakage; • Check that any accessories are tightened in place and do not show any signs of damage; • Check that all the guards are locked in place; • Check the slewing ring is tightened into place, and that there is no damage and/or leaking of grease; • Check that the hydraulic distributors of movements of earth and of movements of the aerial part are tightened into	• With the platform in transport configuration, operate the carriage extension control to check correct functioning of the system; • With the platform in transport configuration, position the machine with the fifth wheel level inclined to the horizontal with a value greater than 0.5° on the side. Operate any control of the aerial part, make sure that the system automatically restores the horizontal frame; • With the platform in transport configuration, position the machine with the fifth wheel level with respect to the horizontal with a value greater than 0.5° on the longitudinal. Operate any control of the aerial part, make sure that the system automatically restores the horizontal frame; • With the platform in transport configuration, position the machine with the fifth wheel level inclined to the horizontal at the maximum angle both on the longitudinal and on the lateral. Operate any control of the aerial part, make sure that the system automatically restores the horizontal frame; • Raise and lower the main boom and make sure that the machine works correctly (balancing of the basket is an automatic movement, check correct operation). No load must be present on the platform; • Execute the outreach extension and outreach return manoeuvre and make sure that the machine works correctly. No load must be present on the platform; • Perform the antenna lifting and lowering (JIB) manoeuvre and make sure the machine works. No load must be present on the platform; • Perform rotation of the basket in both directions and make sure that the machine works . No load must be present on the platform;

place and that there is no damage and/or leakage; • Check that the hand pump and the diverter for emergency manoeuvres are tightened into place and do not show signs of damage and/or leakage; • Check that the sliding blocks of the outreaches are tightened in place and do not show signs of visible damage; • Check that the outreach extension and retraction chains are in position, are properly tensioned and exhibit no visible damage; • Check that the basket is locked in place and is not damaged; • Check that the control console and its support are locked in place and that no damage has occurred; • Check that all the sensors in the machine are locked in place and do not show any signs of damage; • Check the condition of the safety stickers, that they are in place and that they do not show visible signs of damage; • Check that no cracks or rust are visible in the structure.	• Perform rotation of the column in both directions and make sure that the machine works correctly. No load must be present on the platform; • Check the operation of the translation function with platform raised; this test is performed by lifting the platform to a height that involves a corner of the main boom being between 20° and 70° to the horizontal and check that it is possible to move with the machine only at reduced speed; • Check that with the platform lifted higher than the transport height but lower than the maximum travel height and moving on non-level terrain, the machine stops automatically when the inclination of the frame with respect to the horizontal exceeds 1°. Release the travel control; when this control is operated again or when the lifting control is operated, the system must bring the frame back to the horizontal position automatically. After the levelling, the machine will perform the selected movement; • Lift the platform to a height greater than the transport height, check that the manual levelling functions are not permitted; • Operate the emergency button on the remote control (or radio control); make sure that the engine turns off (both the internal combustion engine and the electrical engine) and that no functions are allowed. Release the mushroom-shaped button after this test; • Operate the ground movement emergency button; make sure that the engine turns off (both the internal combustion engine and the electrical engine) and that no functions are allowed. Release the mushroom-shaped button after this test; • Press the emergency button on the basket support (if applicable), check that the engine (both endothermic and electric) is switched off and that no function is permitted. Release the mushroom-shaped button after this test; • Operate the warning buzzer and make sure it works; • Check the operation of the buzzer when the drive function is activated;

	• Verify with machine in translation and platform in transport position that releasing the joysticks the machine stops immediately; • Check the correct operation of the manual emergency descent device (Hand pump). • Using the ground controls, tilt the basket to an angle of between 2° and 15°, turn the key selector on the aerial controls, select the boom lifting control slightly, and the electronic levelling function will be activated. Verify that the basket returns to a level position.

6.4 Maintenance: Details

The following points deal with the most significant specific cases.

6.4.1 Checking and tightening screws, bolts, plug ring nuts

The operation of the following components must be checked. If necessary, the parts must be tightened with the appropriate tools as indicated in the charts on the following pages.
Clamping forces and tightening torque for bolts with a normal stroke metric thread (**Use the Ma' torque**)

Bolt size	Tightening torque M_A [1)] in Nm Strength class	
	8.8	10.9
M4	2.25	3.31
M5	4.61	6.77
M6	7.80	11.5
M8	19.1	28.0
M10	38.0	55.8
M12	66.5	97.7
M14	107	156
M16	168	246
M18	229	336
M20	327	481

[1)]MA in conformity with the VDI 2230 guidelines (February 2003) for μK= 0.08 and μG= 0.12

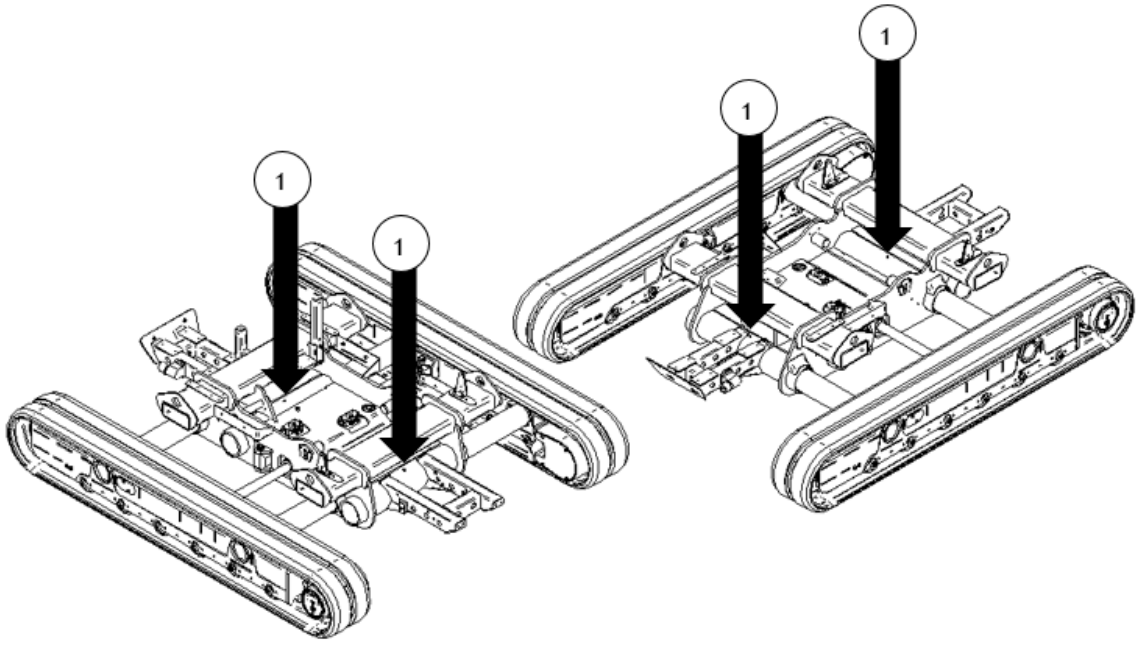
Attention: M16 class 10.9 screws (10 K) were used for fixing of the slewing ring. The torque (Ma ') to be used for tightening of the slewing ring screws is 246 Nm. However, always refer to the specific manual of the slewing ring.
Attention: M10 class 10.9 (10K) screws were used to fix the basket support to the rotary actuator. The torque (Ma ') to be used for the tightening of these screws is 55.8 Nm.
Attention: M16 class 8.8 screws were used to fix the rotary actuator to the balanced joint. The torque (Ma ') to be used for the tightening of these screws is 168 Nm.

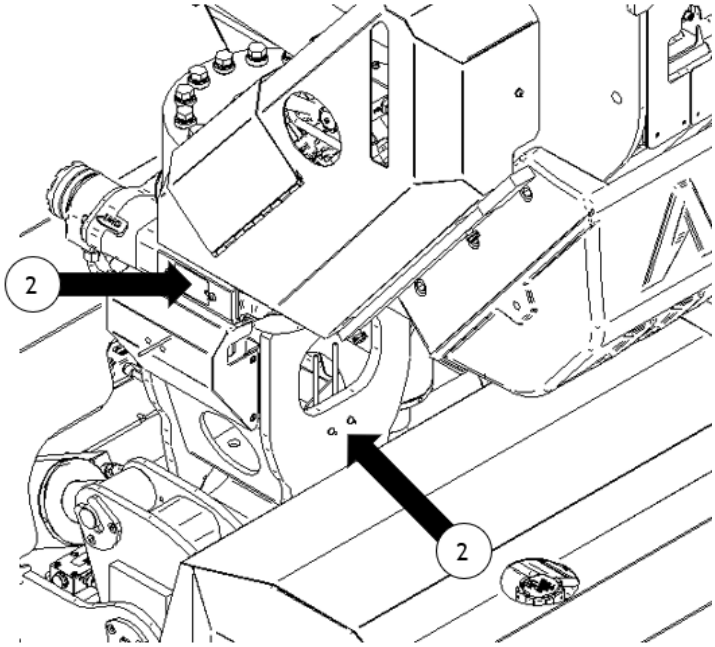
6.4.2 Greasing

With the pump lubricator (3), add lubricating grease through the grease nipples at the points indicated below, until the lubricant leaks out.

This operation must be carried out with both extensions of the carriage completely retracted (narrow carriage).

1. Carriage widening guide grease nipples;
2. Rotation slewing ring grease nipples.





Attention: Use only lubricating grease with the same characteristics as those shown in the table below.

GREASES TABLE	
(The grease normally used by the manufacturer is PAKELO)	
Grease	°C -10 / 40
PAKELO	BEARING EP GREASE NLGI2
BP	GREASE LTX2
CASTROL	LM2 - SPEEROL APT2
SHELL	ALVANIA GR.R.2
ESSO	BEACON 2
SMALL VALVES	LITHIUM 20
ELF	TRASLUBE LI GREASE 2

6.4.3 Visual and structural inspection

Visually check the following points according to the schedule indicated in the general chart. Immediately inform a maintenance technician if faults are discovered.

- Integrity of the basket;
- Integrity of the basket supports;
- Integrity of the antenna (JIB);
- Integrity of the telescopic boom (Main boom and Outreaches);
- Integrity of the tower;
- Integrity of the seat levelling joints under the rotation slewing ring;
- Integrity of the main frame;
- Integrity of the tracked chassis;
- In particular check if there is any rust in the structure;
- State of the rubber tracks;
- Oil leaking;
- Pins and their stop devices;
- Integrity of the cylinders.

6.4.4 Damage to tubes and cables

Visually check at the frequencies indicated in the general chart to make sure that the articulation point of the hydraulic hoses and electric cables are not misshapen or damaged. Examples of such faults are shown on the photos below.

Damaged hydraulic hose pipe

Damaged electric cable

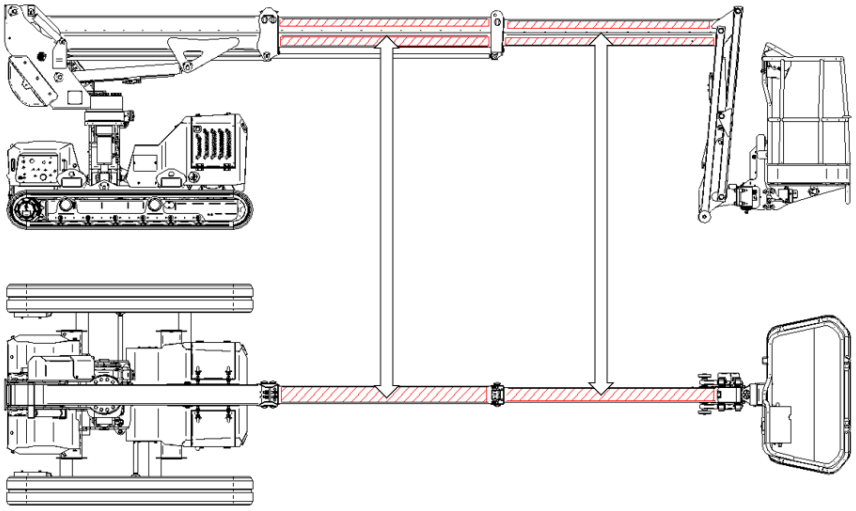
6.4.5 Greasing the runners

Grease these parts at the frequency indicated in the general chart and EACH TIME that the following operations are performed:

- Washing the machine;
- After a long period of inactivity;
- After use in particularly harsh conditions, e.g. damp or dusty places, marine environments, etc.

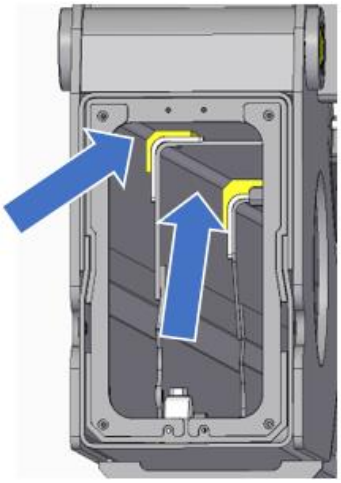
Extend the extensions fully and use the brush to grease the areas shown in the image below.
The surfaces to be greased are:

External sliding surfaces of the telescopic arms.
These are the surfaces in contact with the sliding blocks of the outreaches and of the boom (see figure below):



Remove all dirt from the parts before greasing.

Internal sliding surfaces of the telescopic arms.
These are the surfaces in contact with the internal sliding blocks of the outreaches and of the boom (see figure below):

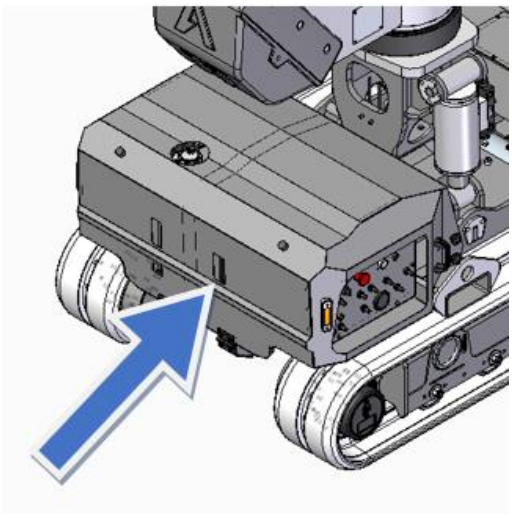


Remove all dirt from the parts before greasing.
Use grease type ADDIFLON PTFE WHITE 3 PASTE or equivalent.

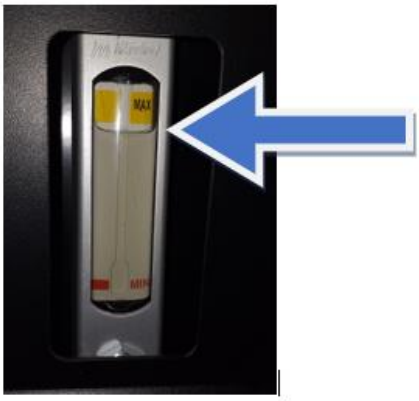
Attention: The correct cleaning and greasing of these surfaces is essential for correct operation of the platform. Failure to perform these operations correctly involves a potential risk for the operators.
Attention: during this operation extend the boom only in the longitudinal direction, with the JIB fully closed and no load in the basket (as shown in the figure). Furthermore, due to the deformation of the structure, the wheels attached to the lower part of the JIB may rest on the floor

6.4.6 Checking the hydraulic tank oil level and topping up if necessary

The hydraulic oil level is checked by means of a level indicator located directly on the tank.
The correct oil level must be checked with the machine in the following configuration: Boom completely lowered and outreaches completely retracted.
Jib fully closed (-95°)
Carriage completely narrow



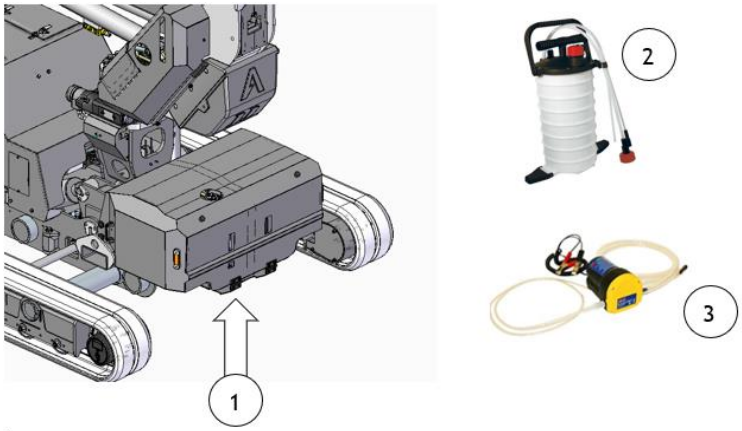
In this configuration, the oil level must be as shown in the figure below.

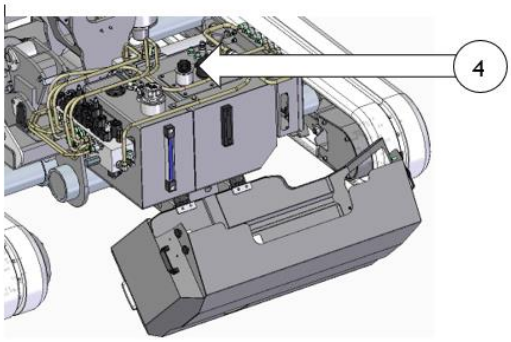


Replacing of the hydraulic tank oil with the frequencies indicated in the general table, replace the hydraulic oil present inside the tank.

Danger: Hot oil. Risk of scalding.
Before carrying out any work, wait a few minutes with the machine stopped and the engine off.

1. Collect the used oil in a suitable vessel and dispose of it in the proper manner;
2. Empty then tank by means of the dedicated cap placed under the tank (1), or use a manual (2) or electric (3) pump making use of the filler cap (4) located on top of the tank. **Attention** the pumps are not included;





Attention: DO NOT DISPERSE USED OIL INTO THE ENVIRONMENT. USE SPECIAL COLLECTION.

3. Open the cap (4) and pour in oil until the correct level is reached;
4. Close the cap (4).

Attention: USE HYDRAULIC OIL WITH THE SAME CHARACTERISTICS.

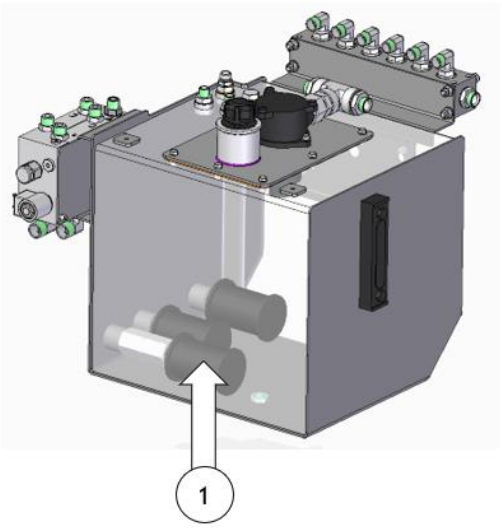
Note: The manufacturer uses Shell Tellus SV68 oil (on request it is possible to use Shell Tellus SV46 or SV32 oil depending on the country of destination).

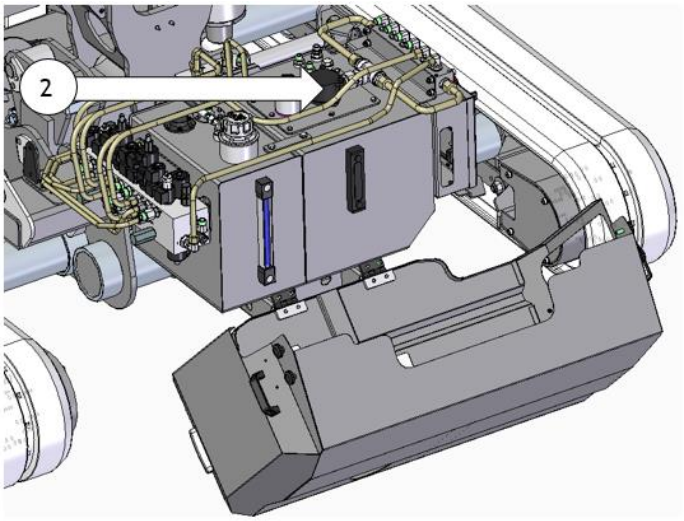
Attention: Do not introduce oil directly into the tank without having previously filtered it.

6.4.7 Hydraulic filter replacement

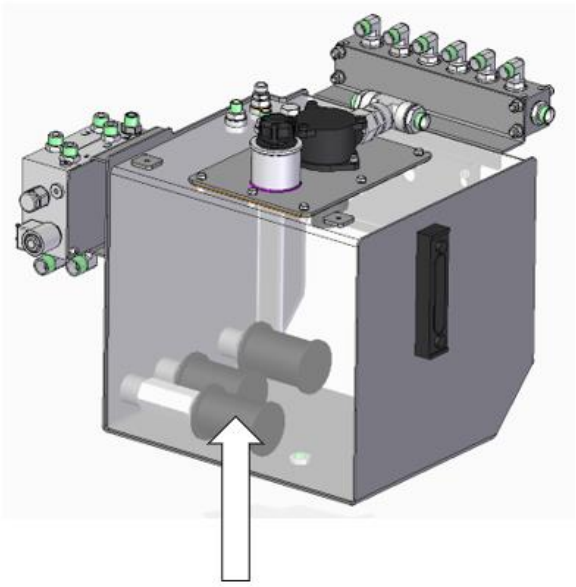
Replace the discharge filters of the hydraulic circuit at the frequencies indicated in the general chart.
The hydraulic oil tank features:

- No.3 intake filters inside the tank (1);
- 1 discharge filter in the top part of the tank (2).



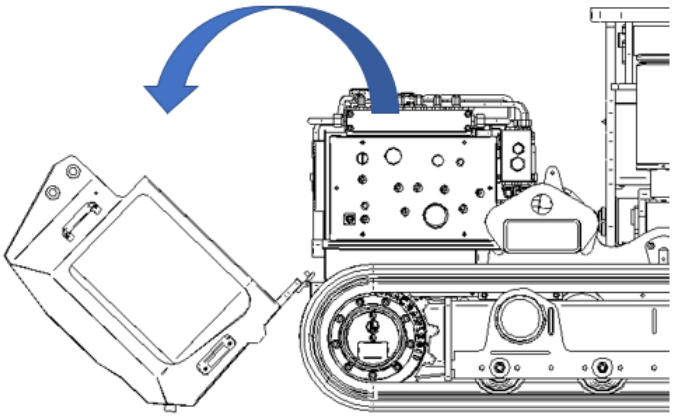


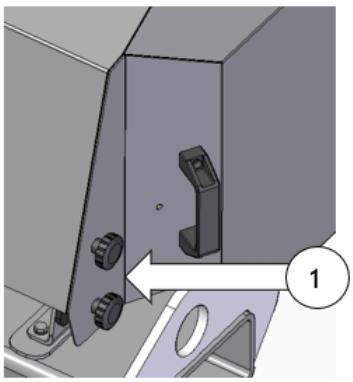
6.4.7.1 Suction filters replacement



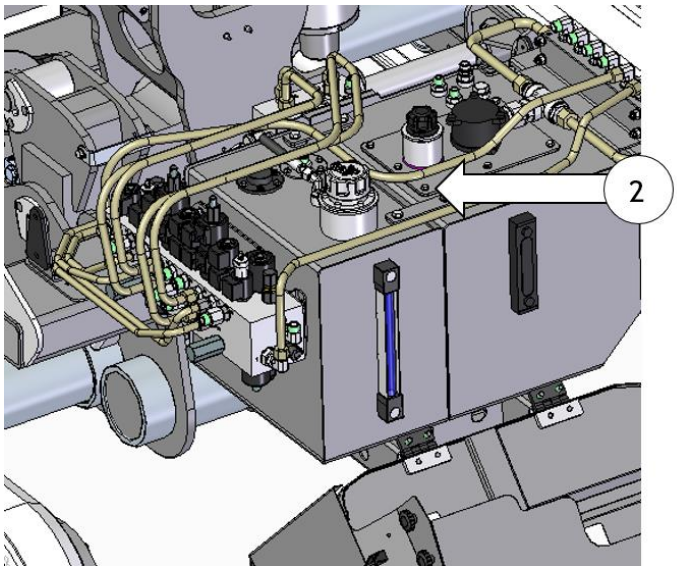
To replace the intake filters located inside the hydraulic tank, proceed as follows:

1) Switch off the machine by deactivating the electrical panel;
2) Open the tank cover hood, unscrewing the fixing handwheels on both sides;

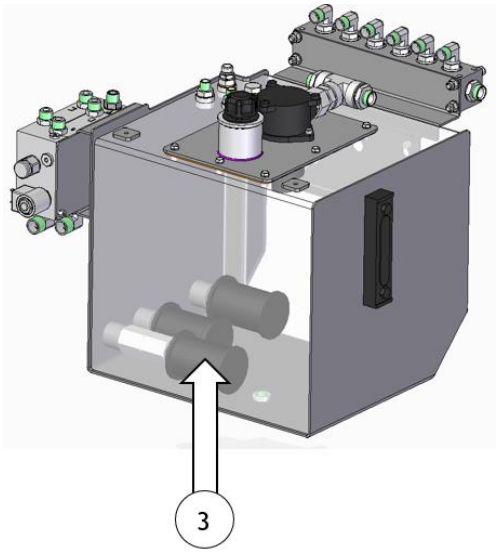




3) Empty the hydraulic oil tank (see previous chapters);
4) Disconnect the pipes on the exhaust filter;
5) Unscrew the blocking screws (2) on the hydraulic tank lid and remove it from its housing;



6) Remove the cartridge of the filters (3);
7) Remove the filter (3) and fit a new one in its place;

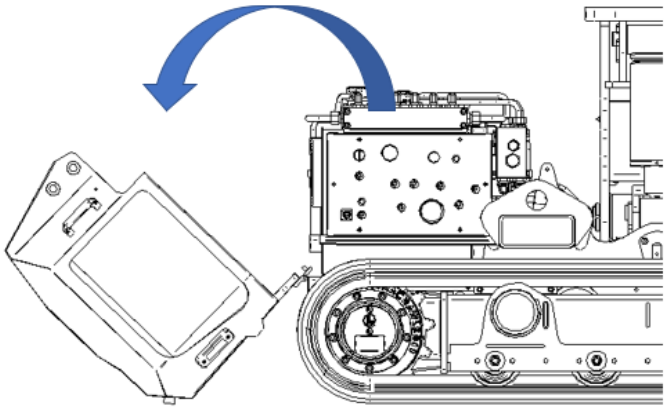


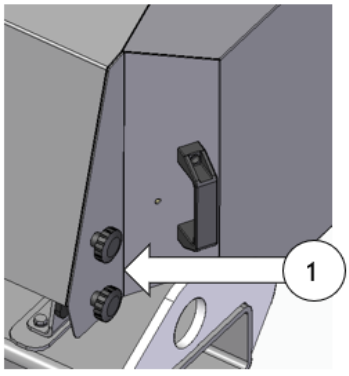
8) Work through the instructions above in reverse order to restore the machine to its normal operating conditions;
9) Seal the lid with sealing paste;
10) Fill the hydraulic tank with the appropriate oil and check its level (see previous chapters).

6.4.7.2 Replacement of return filter

To replace the discharge filter (1) located above the hydraulic tank, proceed as follows:

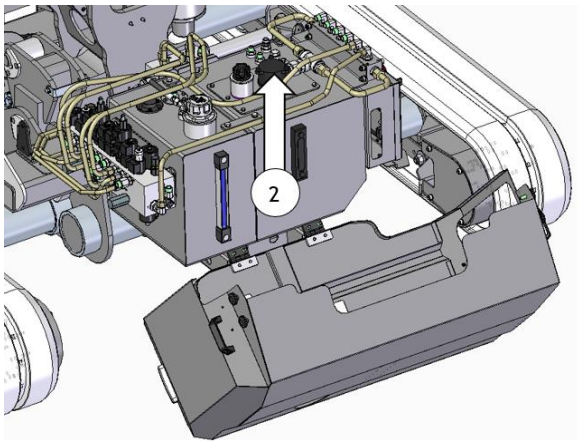
1) Switch off the machine by deactivating the electrical panel;
2) Open the tank cover hood, unscrewing the fixing handwheels on both sides;

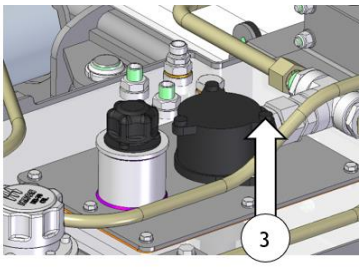


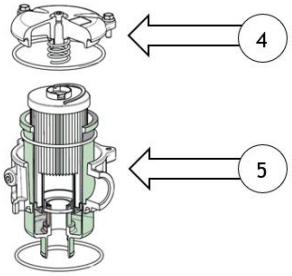


3) Empty the hydraulic oil tank (see previous chapters);
4) Unscrew the blocking screws (**3**) on the filter and remove it from its housing;
5) Unscrew the filter cartridge (**4**), being careful with the seals and/or O-rings;
6) Remove the cartridge (**5**) and fit a new one in its place;
7) Work through the instructions above in reverse order to restore the machine to its normal operating conditions;

8) Once the operation is finished, check the oil level; if necessary fill the tank to bring it back to the working condition.





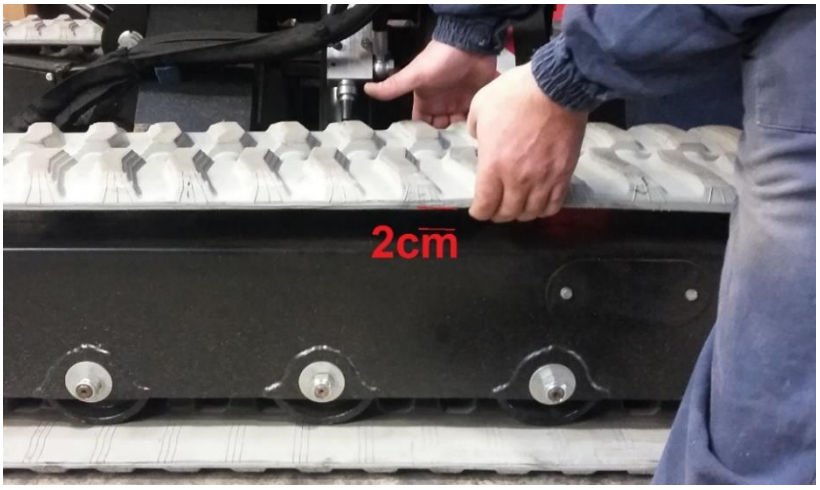


Attention: During operations some oil may spill out. Remove spilt oil with a cloth or place a vessel underneath so that the oil drains into it.

Note: To replace the filters ONLY USE ORIGINAL SPARE PARTS. Contact ALMAC S.R.L. for procurement of the material.
Note: Do not reuse used oil. Do not dispose of it in the environment. Used oil must be disposed of as required by the laws in force.

6.4.8 Track inspection and tensioning

With the frequencies indicated in the general table, check the tension of the tracks.

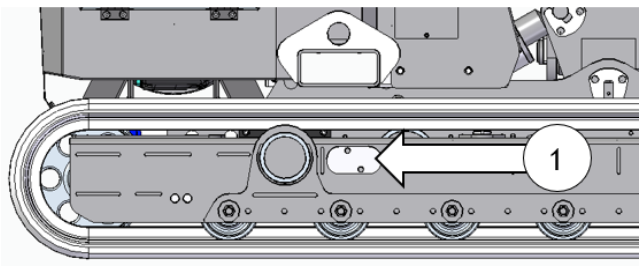


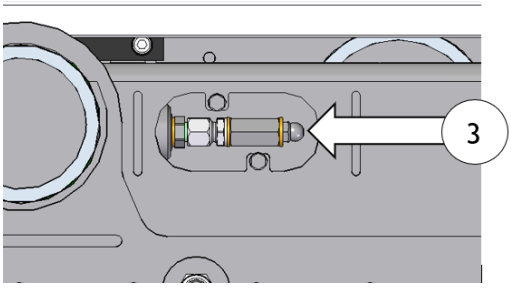
Slightly pull the track upwards at the centre line, the deformation must be approximately 2 cm but not greater.

In particular, if the track becomes noisy during translation due to high flexion, it must be tensioned, proceeding as follows:

1) Remove the protection covers (**1**);
2) To obtain the correct tension of the track, use a kit (**2**), not included in the supply, pumping grease into the valve **(3**) until the pressure indicated below is reached. Consult the grease chart on the next pages for the type of grease required.

Max pressure for correct track tension	Bar / psi	200 / 2900





GREASES TABLE	
(The grease normally used by the manufacturer is PAKELO)	
Grease	°C -10 / 40
PAKELO	BEARING EP GREASE NLGI2
BP	GREASE LTX2
CASTROL	LM2 - SPEEROL APT2
SHELL	ALVANIA GR.R.2
ESSO	BEACON 2
SMALL VALVES	LITHIUM 20
ELF	TRASLUBE LI GREASE 2

6.4.9 Checking the tracks for wear

Check the wear and condition of the tracks, replacing them when the tread is equal to or less than 10 mm.
The tracks must be changed even before they reach this limit if they are cuts or tears are noted.

Attention: Tracks must only be replaced by specialized, properly trained personnel.

6.4.10 Replacing the tracks

Attention: It is forbidden to open the gear unit for any operation that is not included in ordinary maintenance. The manufacturer shall not be held responsible for any operations not included in scheduled maintenance that have caused damage to property and/or harmed people.

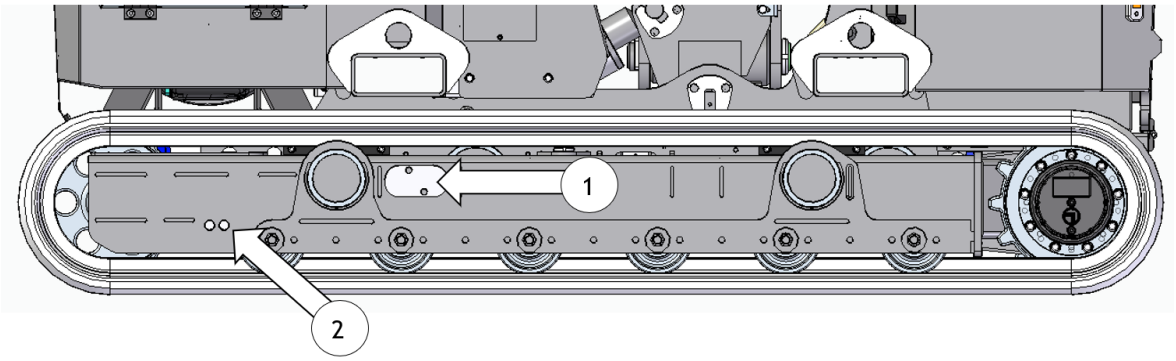
Attention: USE PERSONAL PROTECTIVE DEVICES.

The track must be replaced when 10 mm of tread is left or even earlier if there are any cuts. Proceed as follows:

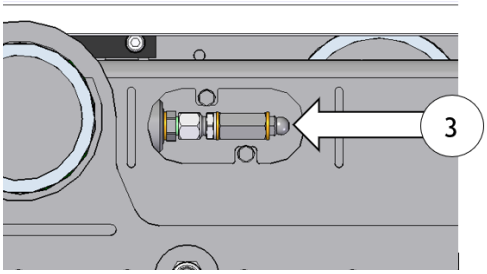
1) Using a forklift or other lifting equipment (see previous chapters) lift the machine off the ground (15-20 cm will be sufficient);

Attention: Make sure the machine is stable.

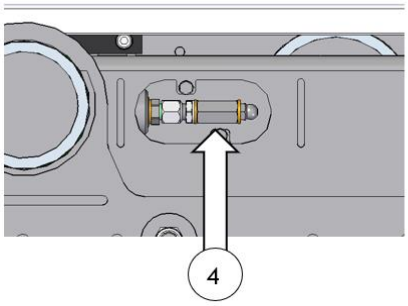
2) Thoroughly clean all parts of the tracked undercarriage;
3) Remove the lateral cover of the tracked undercarriage frame (1);
4) Remove the mechanical stop located inside the tracked chassis (2);

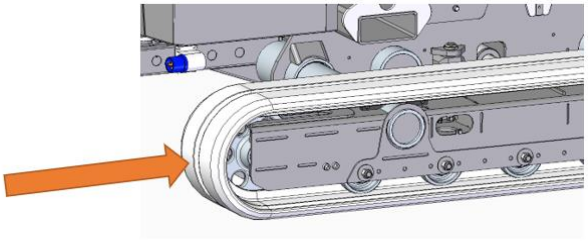


5) Loosen the tensioning valve (3);
6) Remove the tensioning valve only when it is no longer under pressure;



7) Using the nut (4), retract the track tensioner wheel by pressing on the track with your foot;





Attention: BE CAREFUL WHEN THE TRACK FALLS TO THE GROUND.

8) Lift the track at the lower centre line;
9) Pull the track (outwards), prying between the track itself and the idler wheel;
10) To install the new track, proceed as indicated in the previous points, but in reverse order;
11) The track is correctly tensioned by using the tensioning kit, pumping grease until the pressure indicated on the technical data sheet has been reached.

Attention: Before tensioning the track, check the correct pressure in bars in the data sheet.

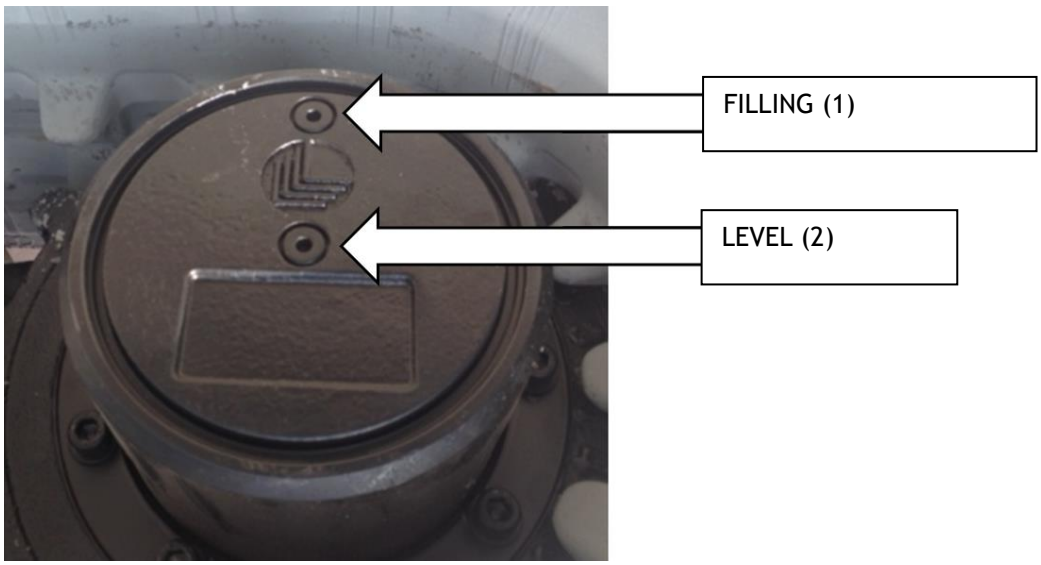
6.4.11 Track reduction gear oil level inspection

Check the level of the oil in the track reduction gears at the frequencies given in the general chart. Comply with the procedure described below.

This model features dual displacement gear motors with gears in oil bath.
It is very important to periodically check the oil level (frequency indicated in the scheduled maintenance and checks table).

1- Move until the geared motor moves to the condition in which the "Fill (1)" cap is at the bottom and perpendicular to the "Level (2)" cap;
2- To drain the oil:
    a. Unscrew the "Filling (1)" cap;
    b. Unscrew the "Level (2)" cap.
3- Once the gear unit has been emptied, move until the geared motor moves to the condition in which the "Fill (1)" plug is at the top and perpendicular to the "Level (2)" cap;
4- To top up the oil:
    a. Using a syringe, pour oil into the "Fill (1)" cap until the oil comes out of the "Level (2)" cap.
5- Screw the "Level (2)" cap back on;
6- Screw the "Filling (1)" cap back on.

USE Shell SPIRAX S3 AX 80W/90 OIL

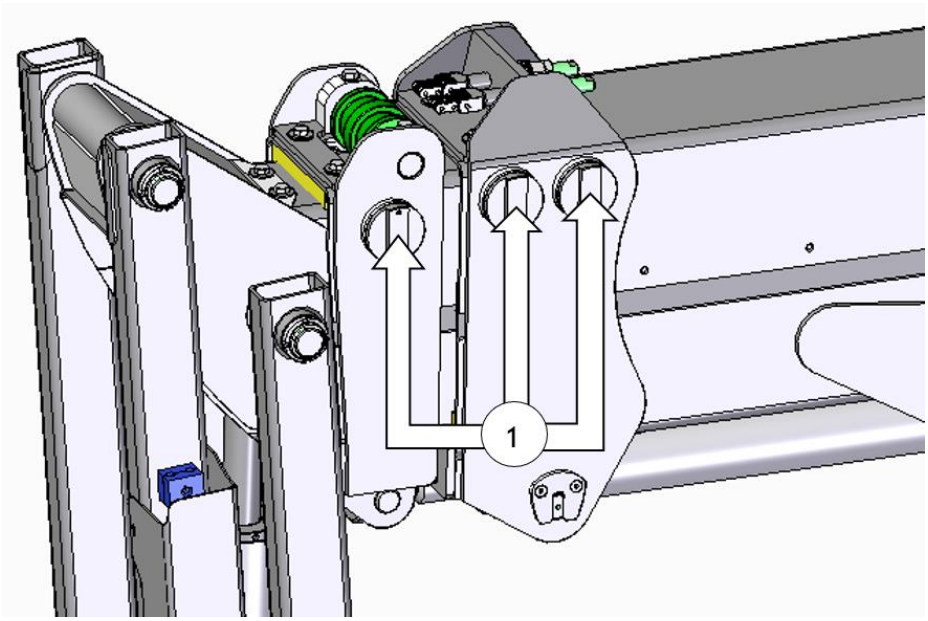


6.4.12 Check the wear of the blocks and the adjustment device of the blocks

Check the wear of the blocks of the outreaches only when the arms and outreaches are completely retracted. If between the boom and the first outreach and/or the first outreach and second outreach a gap of more than 3 mm is found, the blocks must be replaced.

Attention: The blocks replacement operation must be performed at an authorised workshop.

Check the centring of the outreaches and, if necessary, alter the adjustment devices (1) screwing or unscrewing them.

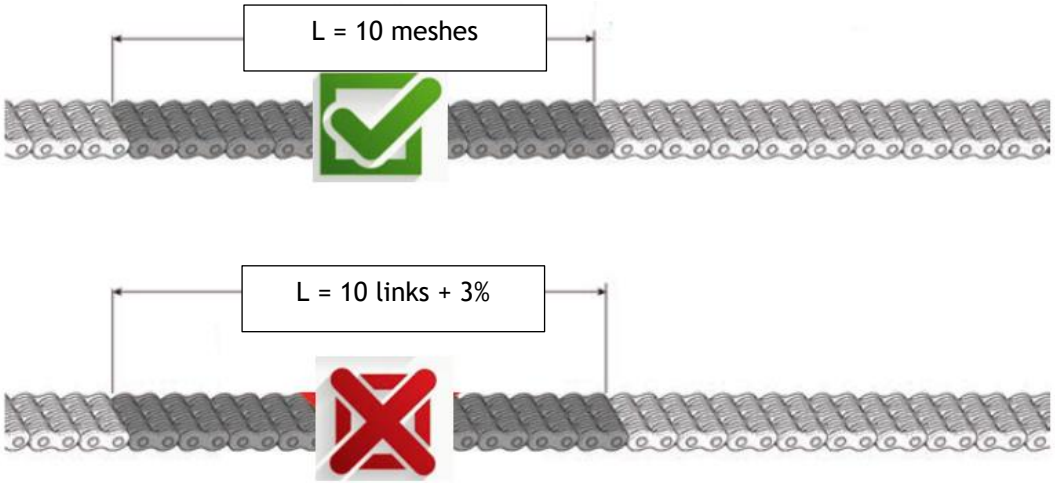


6.4.13 Checking of the outreach extension and retraction chains

6.4.13.1 Lengthening of the chains

Attention: The chain must be replaced when the elongation reaches 3% of the original length.

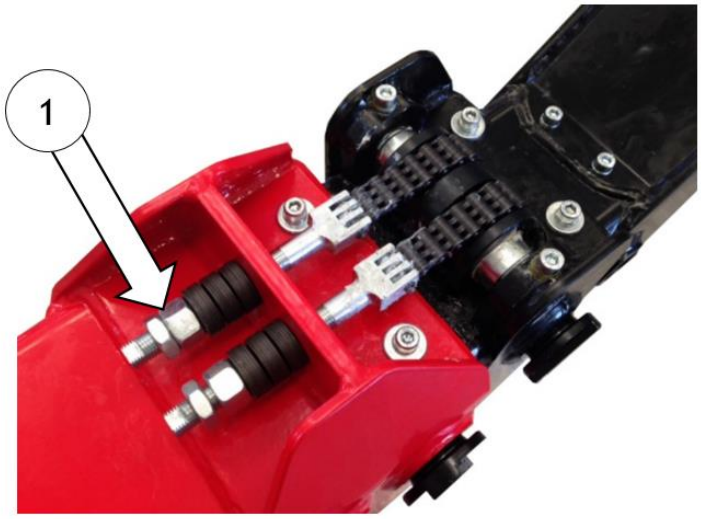
To check the elongation it is necessary to measure the length of approximately 10 links of the chain (record the value) before the machine is put back into service.
Periodically (according to the general table in the previous chapters) the 10 links must be measured by configuring the machine in the same condition it was in when it was originally measured.
If the measured value is greater than 3% of the original value, the chain must be replaced.
Also perform visual checks on the condition of the links in the chain.
Dents and corrosion are conditions that require more thorough checks by an authorised workshop.



6.4.13.2 Tensioning the chains

Periodically it is advisable to check the tension of the chains.
If it is clear that the chains are loose, proceed as follows:

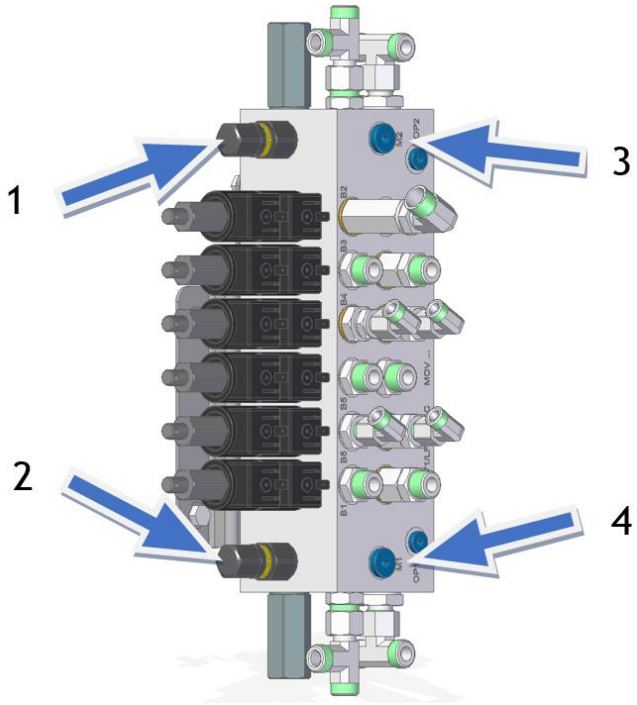
1. Command extension and retraction of the outreaches for 3-4 times;
2. With the machine at rest, with the outreaches retracted, act on the chain tensioning nuts (1) to tension them.



6.4.14 Check operation of the pressure relief valves

With the frequencies indicated in the general table, check the operation of the pressure relief valves of the distributors.

Column distributor limiter valves



The pressure relief valve (1) is calibrated to 180 bar (2610psi).
The pressure relief valve (2) is calibrated to 120 bar (1740psi).

To test them, connect two pressure gauges with a full scale of 250 bar (3625psi) to the pressure outlets supplied (3 and 4).

Outreach pressure limiter valve:

The pressure gauge relating to this valve is the one connected to outlet 4 (M1).

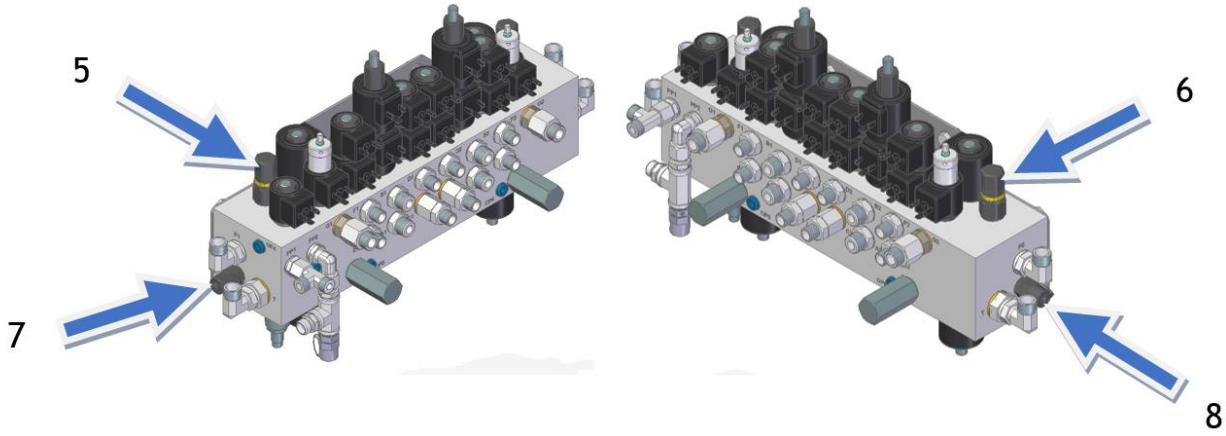
a) Start the internal combustion engine.
b) Select the "outreach extension" command with the boom at 80° and the basket to the end of stroke and keep it selected. In this way the maximum relief valve of the outreach extension circuit starts operating.
c) Read the pressure on the gauge, which should be 120 bar ± 5 bar (1470 psi ± 72 psi)

Pressure relief valve of other aerial movements:

The pressure gauge for this valve is the one connected to outlet 3 (M2).

a) Start the internal combustion engine.
b) Select the JIB close command and execute the movement to -95° and keep it selected.
c) Read the pressure on the gauge, which should be 180 bar ± 5 bar (2610 psi ± 72 psi)

Limiter valve of the distributor in the carriage



Pressure relief valves (5-6) are calibrated to 200 bar (2900psi).

To test them, connect two pressure gauges with a full scale of 250 bar (3625psi) to the pressure outlets supplied (7 and 8).

a) Start the internal combustion engine;
b) Perform the tracked undercarriage extension movements (both) up to the end of stroke and keep them in this position for a few seconds.
c) Read the pressure on the gauge, which should be 200 bar ± 5 bar (2900 psi ± 72 psi).

<u>The valves are calibrated during the testing phase performed by ALMAC S.r.l. and should not require further adjustment unless:</u>

- Replacing the hydraulic system;
- Replacing the maximum relief valve itself.

In these cases, the valve must be calibrated by SPECIALIST PERSONNEL according to the monitoring procedure described above.

Attention: the calibration operation must only be performed by SPECIALIST personnel. It must not be done by a generic operator.

6.4.15 Battery

6.4.15.1 General warnings

The battery is an essential component for machine operation. It is important to ensure that it remains in a good condition over time since this will lengthen its working life, limit any problems that may arise and reduce the running costs of the machine.
Comply with the following instructions:

- Charge the battery in ventilated areas;
- Keep naked flames well away from the battery since explosive gases may form;
- Do not make temporary electrical connection that fail to comply with the regulations in force;
- Do not place tools or any other metal object on the battery;
- Clean any encrustations from the battery terminals and always tighten them;
- Always keep the battery clean, dry and free from rust;
- If the battery is replaced, always comply with the instructions supplied with it.

6.4.15.2 Maintenance

The batteries chosen by ALMAC S.r.l. installed as standard on all models are of the "**Maintenance-free**" type, that is, they are made with a construction technology that considerably reduces water consumption and preserves the electrolyte for the entire life cycle of the battery.

6.4.15.3 Recharging

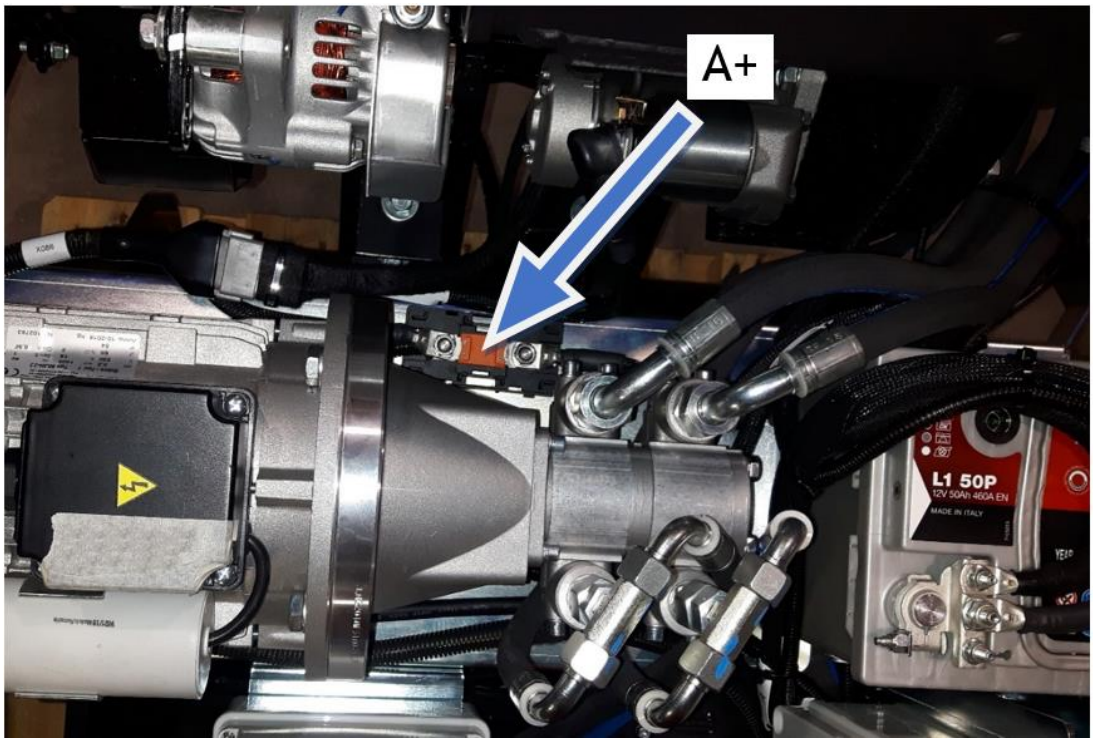
Recharge the battery only in ventilated areas.

Attention: when charging, gas develops that in certain conditions can create EXPLOSIVE ATMOSPHERES.
Always recharge batteries in well ventilated places that conform to standards EN 60079-10 (IEC 31-30), where there is no risk of fire outbreaks and where suitable extinguishers are ready to hand.

6.4.15.3.1 Charging method No. 1 with 12V battery charger

Recharge the battery only in ventilated areas.

With the main switch (battery disconnect) in the ON position, connect the positive terminal of the battery charger to the fuse (A +), connect the negative terminal of the battery charger to the chassis.



Disconnect the battery charger when the relative indicator shows that the battery is charged.
Connect the battery charger to an electric power supply that conforms to the following specifications:

- Voltage: 230 v ± 10% or 110 v ± 10%;
- Frequency: 50 Hz or 60 Hz;
- Grounding line working and equipped with a differential circuit breaker;
- Use an extension power cord with an appropriate section depending on its length.

6.4.15.3.2 Charging method no. 2 use of the 230V plug next to the engine

If the machine is equipped with a 230V electric motor, it is possible to recharge the battery simply by connecting the plug present to the external power supply network.
The 230V-110V AC/12V DC converter will recharge the battery.

2 = Converter 230V-110V AC/ 12V DC

Connect the plug to an electric power supply that conforms to the following specifications:

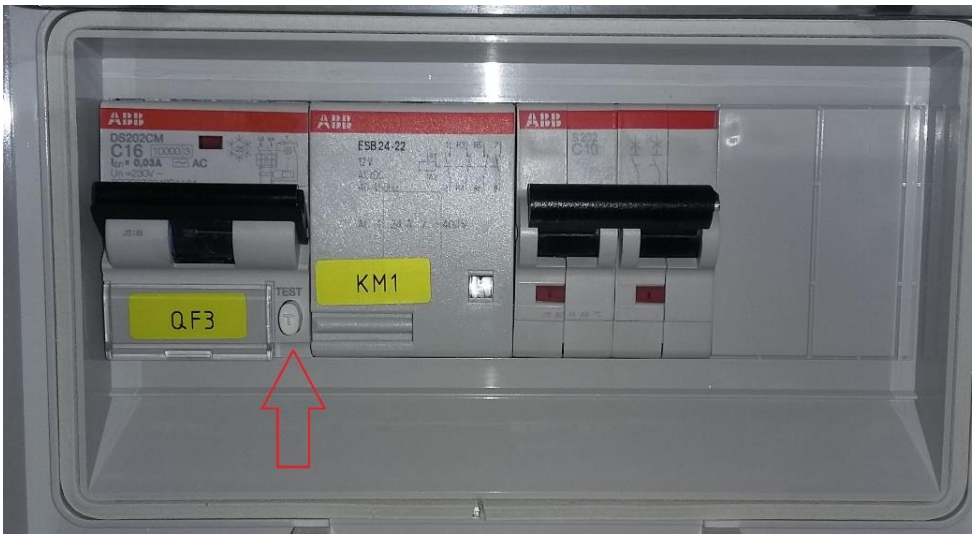
- Voltage: 230 v ± 10% or 110 v ± 10%;
- Frequency: 50 Hz or 60 Hz;
- Grounding line working and equipped with a differential circuit breaker;
- Use an extension power cord with an appropriate section depending on its length.

6.4.15.3.3 Charging method No. 3 using the internal combustion engine

With the internal combustion engine running, the battery recharges automatically.
Charging will be carried out at 18-20 amps.

6.4.16 Checking the differential circuit breaker

With the frequency indicated in the general chart, check the differential circuit breaker.



Connect the plug in the ladder to an electric power supply that conforms to the following specifications:

- Voltage: 230 v ± 10% or 110 v ± 10%;
- Frequency: 50 Hz or 60 Hz;
- Grounding line working and equipped with a differential circuit breaker;
- Use an extension power cord with an appropriate section depending on its length;

Press the button indicated in the figure and make sure that the differential switch is triggered.

Attention: IN THIS CONFIGURATION THE OUTLET IN THE BASKET IS POWERED, THEREFORE PRESENCE OF HIGH VOLTAGE. THIS OPERATION MUST BE PERFORMED ONLY BY QUALIFIED TECHNICIANS.

6.4.17 Manual emergency device operation test

Test the operation of the manual EMERGENCY DESCENT device at the inspection frequency indicated in the general chart.
To verify the correct functioning of the emergency device it is necessary to refer to the procedure described in chapter 5.4.

6.4.18 Maintenance of the rotating slewing ring

Refer to the use and maintenance manual of the rotating slewing ring supplied.

Note: Always keep the slewing ring manual together with the rest of the machine's technical documentation

6.4.19 Maintenance of the engine

Below are general instructions for the correct maintenance of the engine.
Refer to the use and maintenance manual of the motor, supplied.

System	Check the item	Upon each use	Every 50 hours	Every 250 hours	Every 500 hours	Every 1000 hours	Every 1500 hours	Every 2000 hours
Motor systems	Check and top up engine coolant	C						
	Check and clean the radiator fins	C	C					
	Check and adjust the trapezoidal belt of the cooling fan		C First time	C Second and subsequent times				
	Drain, flush and fill the cooling system with a new coolant					S Or every year		
Head cylinder	Adjust the clearance of the intake and exhaust valve					R		
	Polish the intake and exhaust valve seats (if required)							R
Electrical/equipment	Check the indicators	C						
	Check the battery		C					
Motor oil	Checking the oil level in the engine	C						
	Drain and fill the engine oil		S First time	S Second and subsequent times				
	Replace the engine oil filter			S				
Engine speed control	Check and adjust the regulator lever and check the engine speed	C		C Second and subsequent times				
Emissions check guarantee	Inspect, clean and test the fuel injectors						R	
	Inspect the crankcase ventilation system						R	

Fuel	Check and top up the fuel oil level	C						
	Drain the fuel tank			C				
	Drain the fuel filter/water separator		C					
	Check the fuel filter/water separator	C						
	Clean the fuel filter/water separator				C			
	Replace the fuel filter/water separator				S			
Sleeves	Check or replace the supply and cooling system hoses	C						R or every 2 years
Aspiration and discharge	Clean or replace the air filter element			C	S			
Complete motor	Daily complete visual inspection	C						

C: Check;
S: Replace:
R: Contact an authorised workshop.

6.4.19.1 FUEL

ATTENTION:

To avoid personal injury:

- Do not mix diesel fuel with petrol or alcohol. This mixture can cause explosions;
- Be careful not to spill fuel when refuelling. Should this happen, clean it immediately as it may cause a fire;
- Never forget to switch off the engine before topping up. Keep the engine away from fire;
- Be sure to turn off the engine during daily and periodic maintenance, when refuelling and during repairs and cleaning. Do not smoke while working near the battery or when refuelling;
- Check the fuel systems in a well-ventilated and spacious area;
- In case of fuel and lubricant spillage, top up the fuel only when the engine has cooled down;
- Always clean fuel and lubricant from the engine.

The fuel must meet the following technical specifications. The table lists the various specifications adopted worldwide for diesel fuels.

Diesel fuel specifications	**Position**
ASTM D975 No. 1D S15, S500 No. 2D S16, S500	The U.S.
EN590:96	European Union
ISO 8217 DMX	International
BS 2869-A1 or A2	UK
JIS K2204 Grade no.2	Japan
KSM-2610	Korea
GB252	China

- Cetane number: The minimum recommended fuel cetane number is 45;
- The specific type of diesel fuel and sulphur content in % (ppm) must comply with the applicable emission standards for the area in which the engine is being used;
- It is strongly recommended to use diesel fuels with a sulphur content below 0.10% (1,000 ppm);
- If high sulphur diesel fuel is used (sulphur content from 0.50%) (5.000 ppm) to 1.0% (10,000 ppm), change the engine oil and the oil filter with shorter intervals (approximately half);
- DO NOT USE fuels with sulphur content higher than 1% (10.00 ppm);
- Diesel fuels with the specification EN 590 to ASTM D975 are recommended;
- No.2-D is a low volatility distillate diesel fuel for engines used in industry and heavy goods vehicles (SAE J313 JUN87).

IMPORTANT:

- When topping up the fuel, always use a filter, as dirt and sand can cause serious damage to the fuel injection pump;
- Only liquid fuel is used as fuel. Do not use other types of fuel as their quality is not known or even lower, and not even kerosene which, having a limited cetane number, can damage the engine. The degree of fuel quality varies according to the external temperature;
- Be careful not to empty the fuel tank completely; in this case air could enter the fuel supply system, requiring it to be vented before starting the engine again.

6.4.19.1.1 Ventilation of the fuel supply system

ATTENTION:

To avoid personal injury:

- **Do not purge a hot engine as this may result in the fuel being poured onto the exhaust manifold creating a flame hazard.**

The ventilation of the fuel supply system is necessary:

- After removing and then reinserting the fuel filter and pipes;
- After completely emptying the fuel tank;
- Before starting the engine after a period of prolonged inactivity.

PROCEDURE:

1. Fill the fuel tank to the top. Open the fuel filter cap;
2. Slightly loosen the fuel filter breather screw;
3. Retighten the screw when no more air bubbles are visible;
4. Loosen the vent screw located above the fuel injection pump;
5. Retighten this screw when no more air bubbles are visible.

6.4.19.1.2 Checking the fuel lines

ATTENTION:
To avoid personal injury:

- **Only change or check fuel lines after stopping the engine. Defective pipes can cause fires.**

Check the fuel lines every 50 hours of operation. When or if:

1. The clamp is loosened, apply oil to the screw of the clamp and tighten the clamp securely;
2. The fuel hoses are worn out. Replace them together with the clamps every two years;
3. The fuel pipes and the clamps are worn or damaged before two years, replace or repair them immediately;
4. After replacing pipes and clamps, purge the fuel system.

IMPORTANT

- If the fuel hoses are not installed, cover them at both ends with cloth or clean paper to prevent dirt from entering the pipes. Dirt in the pipes can cause the fuel injection pump to malfunction.

6.4.19.1.3 Cleaning the fuel filter cup

Every 100 hours of operation, clean the fuel filter. Operation to be performed in a clean place in order to avoid dust intrusion.

1. Close the fuel filter cup valve;
2. Remove the top cap and rinse the inside with diesel fuel;
3. Remove the element and rinse with diesel;
4. After cleaning, reinstall the fuel filter, protecting it from dust and dirt;
5. Purge the injection pump.

IMPORTANT:

- The entry of dust and dirt can cause the injection nozzle fuel injection pump to malfunction. Periodically wash the fuel filter cup.

6.4.19.2 ENGINE OIL

ATTENTION:

To avoid personal injury:

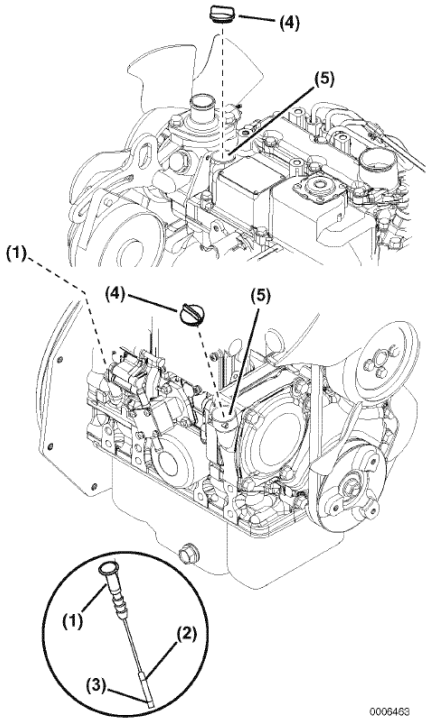
- **Be sure to turn off the engine before checking the oil level and before changing the oil filter cartridge;**
- **Do not touch the muffler or exhaust pipe while they are hot; this could cause serious burns. Be sure to turn off the engine and allow it to cool before inspecting, maintaining or cleaning;**
- **Contact with engine oil can be harmful to the skin. Wear gloves before using oil. If oil is spilt on you, wash the part immediately.**

NOTE:

- Be sure to inspect the engine, placing it in a level position. If it is placed on a slope, it is not possible to accurately measure the quantity of oil;
- Be careful to keep the oil level between the upper and lower limits of the oil level indicator. Excessive oil could cause a drop in the engine's developed power or excessive leakage gas. In the case of the closed vent type engine, the oil mist is drawn through the opening and too much oil could cause oil hammer. Too little oil, instead, could cause the engine parts to seize in contact, sliding or rotating. (The closed vent is optional).

6.4.19.2.1 Checking the level and topping up the engine oil

1. Check the engine oil level before starting it, or when more than 5 minutes have gone by after stopping;
2. Pull out the oil level indicator, clean it by wiping it and reinsert it;
3. Remove the oil level indicator again and check the oil level;



- Oil filling caps (4);
- Oil level indicator (1).

[Low end of the oil dipstick]

The engine oil level is appropriate if it is within the range between (2) and (3).

4. If the oil level is too low, remove the oil cap and add oil until it reaches the prescribed level;
5. Added oil, wait more than 5 minutes and check the level again. This time the oil must reach the sump.

6.4.19.2.2 Engine oil quantity

MODEL	Dip stick upper limit/lower limit	
3TNM68	2.5 L / 1.3 L	2.6 qt / 1.4 qt

The oil quantity indicated above refers to standard oil sumps.

IMPORTANT:

Use only the specified engine oil to avoid engine damage.
Other oils could affect the warranty coverage, cause the seizure of internal engine components and/or shorten the life of the engine.

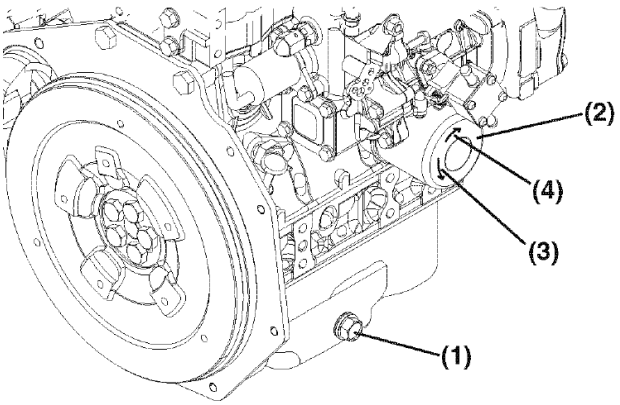
6.4.19.2.3 Engine oil change

ATTENTION:

To avoid personal injury:

- **Be sure to turn off the engine before changing the engine oil;**
- **When the engine oil drips, place a container under the engine and proceed with disposal according to local regulations;**
- **Do not drain the oil after running the engine. Allow the engine to cool sufficiently.**

1. Change the oil after the first 50 hours of initial operation, thereafter every 100 hours;
2. Remove the oil drain cap located on the bottom of the engine and drain all the used oil. Oil drainage is easier and more complete if it is carried out when the engine is hot;



- Oil drain screw cap (1).

3. Add new engine oil to the upper level of the oil level indicator.

6.4.19.2.4 Replacing the oil filter cartridge

ATTENTION:

To avoid personal injury:

- **Change the oil filter cartridge only when the engine is off;**
- **Allow the engine to cool sufficiently; the oil can be very hot and burn.**

1. Change the oil filter cartridge after the first 50 hours of initial operation, thereafter every 200 hours;
2. Remove the used filter cartridge using a key;
3. Lightly oil the gasket for the new cartridge;
4. Tighten the cartridge by hand. When the seal comes into contact with the sealing surface, tighten the cartridge as much as necessary and always by hand. This is because using a key the cartridge would be overly tightened;
5. After the cartridge has been replaced, the oil level usually lowers a little. For this reason, run the engine for a while and check for oil leaks from the seal before checking the oil level. If necessary, add oil.

NOTE: Completely remove any oil stuck to the machine.

6.4.19.3 RADIATOR

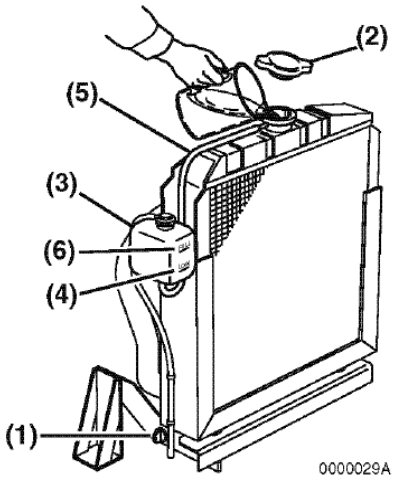
The refrigerant, if fully topped up before starting the engine, lasts a day's work. Therefore the coolant level must be checked regularly before each start-up.

ATTENTION:

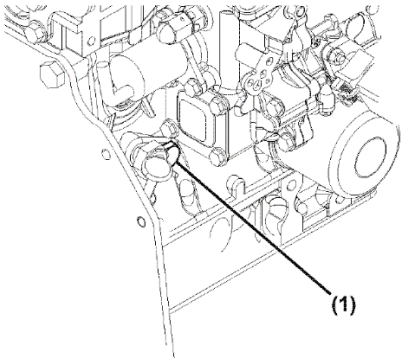
To avoid personal injury:

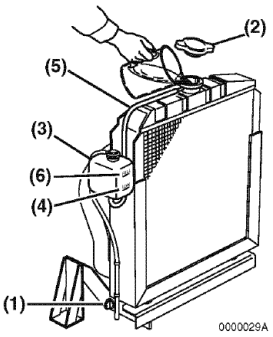
- **Do not stop the engine suddenly, stop it after 5 minutes of operation without load;**
- **Work only after having completely cooled the engine and radiator (more than 30 minutes after it has been stopped);**
- **Do not remove the radiator cap when the engine is very hot. Next, loosen the cap slightly to the stop to release the excess pressure, then remove it completely. If overheating occurs, the steam may come out of the radiator or reserve tank. This could result in serious fires.**

6.4.19.3.1 Check the coolant level, addition of coolant



1. Remove the radiator cap (2) and check that the coolant reaches the filler neck;
2. If the radiator is equipped with a reserve tank (3), check the coolant level in the reserve tank. If it is between the "FULL (6)" and "LOW (4)" indications, the coolant is sufficient for a day's work;
3. When the coolant level drops due to evaporation, add the water to the maximum level of the tank;
4. Check the drain cap and the drain valve; the cap (1) is located in the low part and the valve (1) in the lower part of the radiator (see the figures below).





IMPORTANT:

- To remove the radiator cap, follow the precautions above and tighten it securely;
- Should there be a water leak, consult the dealer;
- To fill the recovery tank, use clean, soft and anti-freezing water;
- Make sure seawater mud does not enter the radiator;
- Do not fill the reserve tank with coolant above the "FULL" level mark (Full);
- Be sure to have closed the radiator cap securely. If the cap is not properly closed, the coolant can run and fall rapidly.

6.4.19.3.2 Cooling liquid change

1. To discharge the coolant, always open both drain valves and open the radiator cap at the same time. Complete water discharge cannot be carried out if the radiator cap is kept closed;
2. Remove the overflow pipe of the radiator pressure cap to drain the reserve tank;
3. Required coolant volumes:

Model	Quantity
3TNM68	1.0 l/1.1 qt

NOTE: The coolant quantities indicated above refer to radiators of the standard type.

4. If the radiator cap is not properly closed or partially closed, this accelerates the loss of coolant;
5. Coolant (radiator antifreeze).

Seasons	Coolant
All seasons	Clean water and antifreeze

Use LLC (Long Life Coolant) or ELC (Extended Life Coolant)

6.4.19.3.3 Control of radiator hose clamps and sleeves

ATTENTION To avoid personal injury:

- **Be sure to check the radiator sleeves and the hose clamps periodically. If the sleeve is damaged or the coolant leaks, it can cause overheating and fires.**

Check to see if the radiator pipes are tightly fixed every 200 hours of work or every 6 months, whichever occurs first.

1. If the hose clamps are loose, or there is a water leak, tighten the hose clamps firmly;
2. Replace and tighten the clamps firmly when the radiator hose couplings are swollen, hardened or have cracks.

Beware of overheating

The event in which the temperature of the coolant approaches or exceeds the boiling point is called "**OVERHEATING**".
During operation, perform the following checks to verify that all parts are working properly. **If there is anything unusual, carry out the inspection referring to the relative description given in the "MAINTENANCE" and "PERIODIC MAINTENANCE" section.**

6.4.19.3.4 Coolant

If the coolant temperature warning light comes on, or if the steam or coolant continues to escape from the radiator hose or cap, stop loading and **keep the engine idling** (**COOLING**) **for at least 5 minutes** to allow its gradual cooling. Then stop the engine and perform the following inspection and maintenance.

1. Check to see if the coolant is absent or if any coolant leak is present;
2. Check that the cooling air inlet or outlet is not blocked;
3. Check that there is no dust or dirt between the cooling fin and its pipe;
4. Check to see if the ventilation belt is too loose;
5. Check to see if the radiator water pipe is blocked.

6.4.19.3.5 Radiator cleaning (outdoors)

If dust is deposited between the tube fin, wash it under running water.

IMPORTANT:

- Do not clean the radiator with solid tools such as spatulas or screwdrivers. These could damage the fin or pipe in question, and this could result in coolant leakage or decreased cooling capacity.

6.4.19.3.6 Radiator cleaning (internal)

1. Clean the inside of the coolant line in the following cases:
- As shown in the PERIODICITY OF MAINTENANCE list;
- When the coolant is replaced.
2. Use a **radiator cleaning agent**. This helps to eliminate deposits of encrustations.

6.4.19.4 ANTIFREEZE

ATTENTION:

To avoid personal injury:

- **When using anti-freeze; take some protective measures, such as wearing rubber gloves (antifreeze contains poisonous substances);**
- **In cases of accidental ingestion of the anti-freeze agent, it causes vomiting and illness, therefore immediately seek medical attention;**
- **If the antifreeze is in contact with the skin or clothes, wash it off immediately;**
- **Do not mix different types of antifreeze. The mixture can produce chemical reactions causing harmful substances;**
- **Anti-freeze is extremely flammable and explosive under certain conditions. Keep flames and children away from antifreeze;**
- **When the fluids are discharged from the engine, place a container under the motor unit;**
- **Do not pour the residues onto the ground, into a drainage channel or into any water source;**
- **Furthermore, observe the environmental protection regulations for the disposal of antifreeze.**

Use a 50/50 mixture of long-life coolant and distilled water.
For extreme coolant conditions, contact your dealer.

1. Long-life coolant (hereafter referred to as LLC) is produced in different types. For this engine use the ethylene glycol (EG) type;
2. Before using the LCC-water coolant mixture, wash the radiator thoroughly with fresh water. Repeat this procedure 2 or 3 times to completely clean the inside of the radiator and the engine block;
3. LLC Mixing:
   Mix 50% of LCC with 50% distilled water. At the time of mixing, mix well, and then fill the radiator;
4. The procedure for mixing water and antifreeze varies depending on the formulation of the antifreeze. Refer to the SAE J1034 standard, and more specifically to SAE J814c.
5. Addition of LLC:
   (1) Add only water if the coolant level in the cooling system is reduced by evaporation;
   (2) If a coolant leak occurs, add LLC of the same brand and type, in the same percentage of coolant mixing.

* Never add different brand long-life anti-freeze. (Different brands may have different additive components, and the engine may experience a decline in performance as specified).

6. When mixing LLC, do not use any type of radiator cleaning agent. LLC contains an anticorrosive agent. If mixed with cleaning agents, deposits may appear, adversely affecting engine components;
7. The original Yanmar long-life coolant has a 2-year service life. Be sure to change the coolant every 2 years.

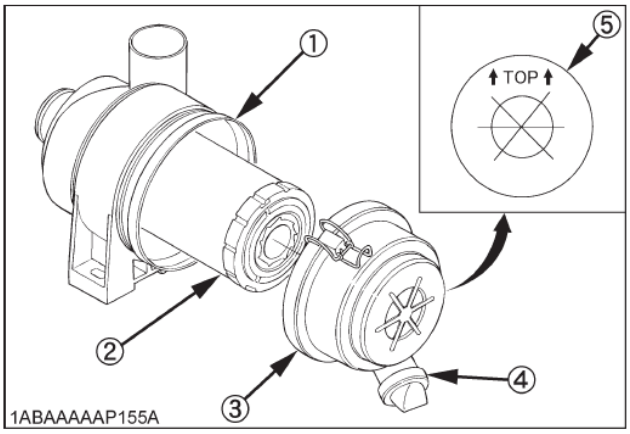
NOTE:

- The above data represent the industry standards that necessarily require a minimum glycol content in the concentrated antifreeze agent.

6.4.19.5 AIR FILTER

If the air filter element used in this engine is of the dry type, it must never be oiled.

1. Under normal operating conditions, the evacuation valve must be opened once a week or every day if it is used in a dusty environment, in order to remove dust and minor impurities;
2. Clean the inside of the air filter with a cloth or similar if it is dirty or damp;
3. Avoid touching the element except to clean it;
4. If dust adheres to the element, remove it by compressed air from inside to outside, by rotating the element. The compressed air pressure must be less than 205 kPa (2.1 kgf/cm^2, 30psi);
5. Replace the element every year or every 6 cleaning operations.



(1) Air filter;
(2) Element;
(3) Cover;
(4) Evacuation valve;
(5) “TOP” brand.

IMPORTANT:

- Make sure that the attachment clip on the cover is tight. If it is loose, dust and dirt could be sucked in, wearing the cylinder and the seal ring with a consequent decrease in engine output.

7 Demolition

7.1 Machine life

The machine has been designed to work for 10 years in normal operating environments considering proper use and correct maintenance.

7.2 Decommissioning and demolition

Once the machine has reached the end of its technical and operational life, it must be subjected to a detailed and complete inspection/review by the manufacturer or specialised and qualified technicians. If the test does not have a positive outcome, the equipment must be deactivated and demolished. The machine must be reduced to conditions in which it can no longer be used for the purposes for which it was designed and built. In addition, the raw materials used to make it must be recovered for recycling purposes where possible.

Note: ALMAC S.r.l. declines all liability for damage to persons, animals or things deriving from reuse of parts of the equipment for functions or assembly situations differing from the original ones.

Danger: Machine decommissioning and demolition must be carried out only by properly trained and equipped personnel.

The machine must be demolished following the adoption of safety measures that must take account of the logistic, environmental and wear conditions of the machine itself.
Comply with the following general rules:

- Wear approved protective clothing and accessories (hard-hat, safety footwear, gloves, goggles and face mask if necessary) in accordance with the accident-prevention laws in force;
- Disconnect the machine from all power sources;
- Check and, if necessary, relieve the pressure from pressurised systems;
- Ensure that the machine is unable to operate and that it cannot be used, by breaking some of its vital components and take it to a place where you are certain that it cannot be accessed by anyone;
- Use appropriate lifting devices;
- Disassemble the machine into small, easily transportable units;
- Separate non-polluting materials from polluting ones when disposing of the machine (insulating materials, plastic, rubber, etc.);
- Never burn the machine or parts of it because the combustion products of plastic materials and paints could develop harmful, polluting gases.

7.3 Battery disposal

Battery recycling is mandatory (European Directive 2006/66/EC) and recommended.

- Cells and batteries, even if fully discharged, may still contain a considerable amount of energy. It is therefore necessary to always protect the terminals to prevent short circuits;
- Dispose of the batteries in compliance with local laws and regulations (contact your nearest dealer);
- Keep the material to be disposed of as indicated in the specific Section of the Safety Data Sheet attached;
- DO NOT throw into sewers, on the ground or in water courses.

8 ATTACHMENTS

8.1 Declaration of conformity

ALMACRAWLER

Declaration of Conformity

Original declaration

ALMAC S.r.l.
Viale Ruggeri 6/a
c.a.p. 42016, Guastalla (RE) - Italia
Tel 0375-833527
http: www.almac-italia.com
e-mail: info@almac-italia.com
P.IVA e Cod.Fisc. 02559800350

Declares, under our own responsibility that the Mobile Elevating Workir

MODEL: JIB
SERIAL NUMBER:
MANUFACTURING YEAR:

as described in the documentation attached to this ... ance with:

- *Directive 2006/42/EC on machinery*
- *UNI EN 280:2015 Mobile elev ... Design calculations. Stability criteria. Construction. Safety. Examin*
- *UNI EN ISO 12100:2010 ... sk assessment. Principles*
- *Directive 2014/30/UE ... n of the laws of the Member States relating to electromagnetic c*
- *Directive 200 ... the noise emission in the environment by equipment for use outdoors*
  - *power level (LWA): 100 dB*
  - *stic power level (LWA): 104 dB*
  - *e covered by EC certification (annex IV)*

an ... th attachment IV of the Directive, each and every part of the machine has ... C-type examination performed by:

CERT srl – Certificazioni e Verifiche – Notified Body No. 1878
office in Via Luigi Masotti, 5 – 48124 Fornace Zarattini - Ravenna - Italy
which has issued the EC-TYPE EXAMINATION CERTIFICATE:
n° 1878M171120CU1218 of the 18/12/2018.

The Legal person charged with the constitution of the Technical Dossier is:

Name: **PIETRO**
Surname: **AGOSTA DEL FORTE**
Position: **Legal representative of ALMAC s.r.l.**

PIETRO AGOSTA DEL FORTE
(Legal representative)

Guastalla (RE), lì _____ _____
(Place and Date) (Stamp and Signature)

8.2 Report register

Report register

The Report register is issued to the platform user with reference to:

- Technical standard UNI EN280:2015;
- Italian Legislative Decree 17/2010– Implementation of Machinery Directive 2006/42/EC.

The purpose of this Register is to record events concerning the life of the machine; in detail:

- Mandatory routine inspections (INAIL, ASL, authorised bodies);
- Maintenance and obligatory inspections to check the integrity and structure of the machine and protection and safety;
- Transfers of ownership, to be notified to the competent INAIL (former ISPESL) department;
- Supplementary maintenance or replacement of important parts of the machine.

MANDATORY ROUTINE INSPECTIONS		
Date	Observations	Stamp and signature

Type of inspection		Description	
Checking and tightening screws, bolts, plug ring nuts			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: Frequency of the operation as reported in the table in Chapter 6. Daily registration is not necessary, but should be made at least once a year when other operations are performed.

Type of inspection		Description	
Visual and structural inspection		Check the integrity of the anchors, supports, carpentry, welding and pins	
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: Frequency of the operation as reported in the table in Chapter 6.

Type of inspection		Description	
Damage to tubes and cables			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: Frequency of the operation as reported in the table in Chapter 6. Monthly registration is not necessary, but should be made at least once a year when other operations are performed.

Type of inspection		Description	
Greasing the runners			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6. Monthly registration is not necessary, but should be made at least once a year when other operations are performed.

Type of inspection		Description	
Hydraulic tank oil level inspection			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: Frequency of the operation as reported in the table in Chapter 6.

Type of inspection		Description	
Hydraulic reservoir oil change			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6. Monthly registration is not necessary, but should be made at least once a year when other operations are performed.

Type of inspection		Description	
Check operation of the pressure relief valves			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6.

Type of inspection		Description	
Hydraulic filter replacement			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6.

Type of inspection		Description	
Check the operation of the angle sensors			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6.

Type of inspection		Description	
Check operation of the outreach sensor			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6.

Type of inspection		Description	
Check operation of the slewing ring rotation encoder			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6.

Type of inspection		Description	
Check operation of the carriage widening sensors			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6.

Type of inspection		Description	
Check operation of the load cell			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6.

Type of inspection		Description	
Check operation of inductive sensors on installed platform or installed winch			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6.

Type of inspection		Description	
Check operation of the anti-crushing ultrasonic sensors (optional)			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6.

Type of inspection		Description	
Check operation of the ultrasonic anti-corrosion sensors (optional)			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6.

Type of inspection		Description	
Check the operation of the differential switch of the 230V outlet			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6.

Type of inspection		Description	
Manual emergency device operation test			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6.

Type of inspection		Description	
Engine oil inspection			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6. Daily registration is not necessary, but should be made at least once a year when other operations are performed.

Type of inspection		Description	
Engine oil change			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6.

Type of inspection		Description	
Track inspection and tensioning			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6. Daily registration is not necessary, but should be made at least once a year when other operations are performed.

Type of inspection		Description	
Track inspection and replacement			
	Date	Observations	Signature
1st year			
2nd year			
3rd year			
4th year			
5th year			
6th year			
7th year			
8th year			
9th year			
10th year			

NOTE: frequency of the operation as indicated in the table in Chapter 6.

Type of inspection	Description
Track reduction gear oil level inspection	

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

NOTE: frequency of the operation as indicated in the table in Chapter 6. Daily registration is not necessary, but should be made at least once a year when other operations are performed.

Type of inspection	Description
Negative brake of geared motors	Check the correct intervention of the negative brake of the gearmotors when the drive is stopped

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

NOTE: frequency of the operation as indicated in the table in Chapter 6. Registration every six months is not necessary, but should be made at least once a year when other operations are performed.

Type of inspection	Description
Check seal of the cylinder valves	

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

NOTE: frequency of the operation as indicated in the table in Chapter 6.

Type of inspection	Description
Check chain length	

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

NOTE: frequency of the operation as indicated in the table in Chapter 6.

Serious faults		
Date	Description of fault	Solution

Spare parts used		Description
Code	qty	

Serious faults		
Date	Description of fault	Solution

Spare parts used		Description
Code	qty	

Serious faults		
Date	Description of fault	Solution

Spare parts used		Description
Code	qty	

8.3 Property transfers

Copy to be kept	
on:	
Owner of the MEWP:	
serial no.	
Year of manufacture:	
It was transferred to:	
It is hereby certified that, as of the date above, the technical, dimensional and functional characteristics of the aforementioned platform conformed to the original characteristics and that variations, if any, have been recorded in the register.	
Seller's business name:	
Seller	
Purchaser	

Copy to send to ALMAC SRL	
on:	
Owner of the MEWP:	
serial no.	
Year of manufacture	
It was transferred to:	
It is hereby certified that, as of the date above, the technical, dimensional and functional characteristics of the aforementioned platform conformed to the original characteristics and that variations, if any, have been recorded in the register.	
Seller's business name:	
Seller	
Purchaser	

8.4 Hydraulic diagram

See attachment

8.5 Wiring diagram

See attachment

9 INDEX

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