ORMET
reachforthesky

SPX312CP - SPX312C+

OPERATION AND MAINTENANCE MANUAL

TRANSLATION OF ORIGINAL INSTRUCTIONS

SERIAL NUMBER: _____

ORMET S.p.A.
Via Campardone, 7
31014 Colle Umberto (TV) - Italia
Tel. +39 0438 434443
Fax +39 0438 430115
info@ormet.it
www.ormet.it

REVISIONS OF THE MANUAL		
VERSION	**DATE**	**REVISION**
1.0	07/2014	First edition

TABLE OF CONTENTS

1 FOREWORD

1.1 General information

The manual

Every manufactured machine is supplied with a copy of this manual.
The manual was written to assist the user and maintenance technician in performing the various operations required to operate and use the machine, operations designed in order to work in safe conditions. The operational techniques highlighted in these paragraphs are the basic ones.
Ability and techniques are developed as the user acquires knowledge of the machine.

Note:	This manual is an integral part of the machine and must accompany it in case of resale or transfer of the same.

The instructions indicated in this manual are, however, integrated from the training given at machine delivery.

Note:	As regards other applicable accessories, please refer to the relevant operation and maintenance manuals..

Preservation of themanual

This manual must be stored near the machine and must accompany it in its various movements for work so that it is readily available to the operator if he/she needs to consult it.

Note:	In case of loss or deterioration of the manual, request another copy from the *manufacturer*.

Information rights

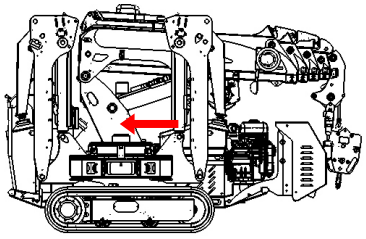
This manual contains information of a confidential nature. All rights are reserved.
This manual cannot be reproduced or photocopied in whole or part without the written consent of ORMET S.p.A. The use of this document is reserved solely for the client to whom the manual was supplied with the machine for theuse and maintenance of the equipment to which the manual refers.
When writing this manual all the operations that concern the normal use and regular maintenance of the machine were taken into consideration.
Therefore, for correct and optimal use of the machine itself, it is necessary to carefully follow the detailed instructions. The operation of the machine must only be entrusted to suitably trained personnel.
It is recommended not to carry out any repairs or interventions that are not indicated in the manual. Any operations that require disassembly of machine components must be entrusted to authorised technicians.
The manufacturer assumes no responsibility for direct or indirect damages to persons or animals as a result of using this manual or the machine in conditions other than those specified. ORMET S.p.A. reserves the right to make changes or improvements without updating this manual and the machines, and possibly even machines sold of the same model as that to which this manual refers, but with a different serial number.

The applied CE mark guarantees conformity with the ***2006/42EC Machinery directive***.

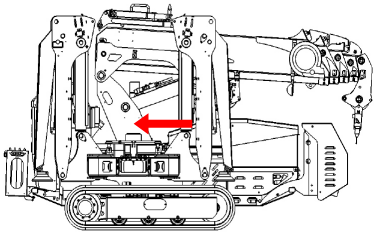
1.2 Identification plate

An identification plate is applied on the crane, containing information on the machine model, production number, year of construction, year of commissioning and installed power. The machine is marked with the CE mark for the markets where it is required.
This mark means that the machine is compliant with the European directives for this type of machine.

SPX312CP



SPX312C+

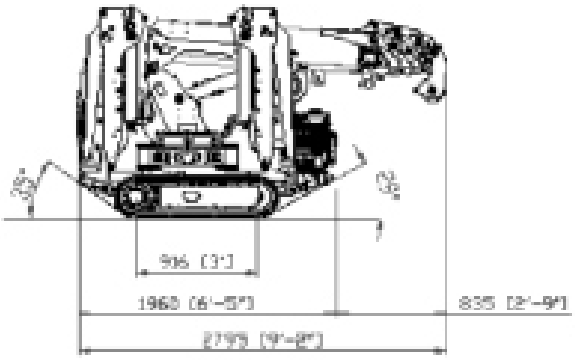


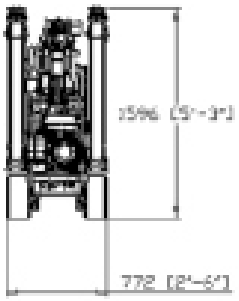
1.3 Technical data

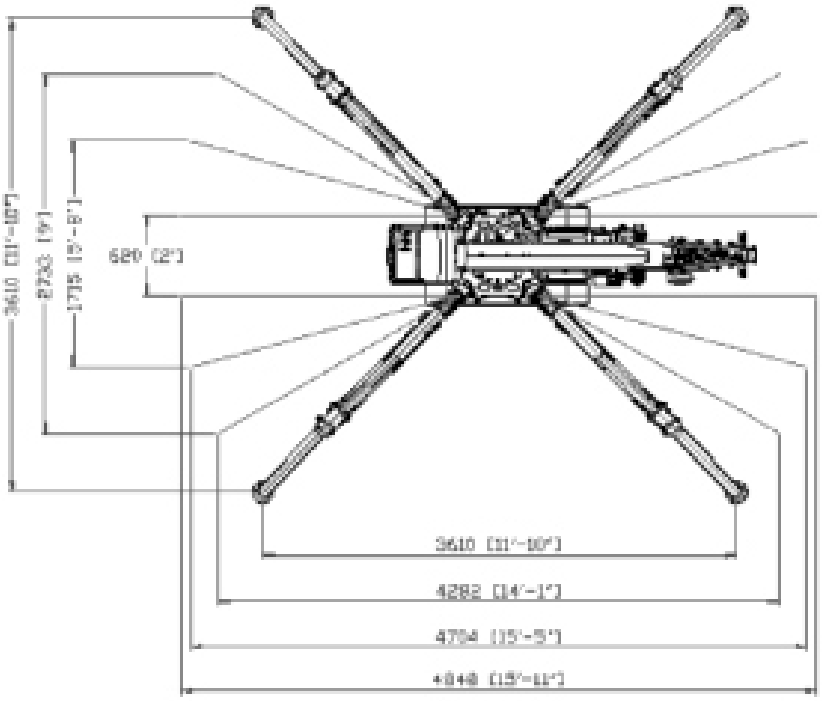
Mobile crane model	SPX312CP	SPX312C+
Lifting capacity	1200 Kg (2646 lbs)	1200 Kg (2646 lbs)
Dimensions	2800 x 770 x 1600 mm (9'1" x 2'6" x 5'3")	2800 x 770 x 1600 mm (9'1" x 2'6" x 5'3")
Weight	1800 Kg (3968 lbs)	1800 Kg (3968 lbs)
Telescopic boom	2,2-7,6 m (7'2"-24'9" ft)	2,2-7,6 m (7'2"-24'9" ft)
Working angle	0° + 75°	0° + 75°
Slewing	330°	330°
Max. winch pull	1200 kg (2646 lbs)	1200 kg (2646 lbs)
Rope	63 m – Ø7 mm (210ft – Ø5/16")	63 m – Ø7 mm (210ft – Ø5/16")
Maximum reaction of individual outrigger	1400 kg (3086 lbs)	1400 kg (3086 lbs)
Ground pressure of individual crawler	0,44 kg/cm^2 (901 lb/ftq)	0,44 kg/cm^2 (901 lb/ftq)
Motorisation	Yamaha MZ360 7,6 kW 10,4 Hp 6 litre tank - Petrol	24V-3F n.4 6V 240Ah 4kW 5,5Hp
Wind speed in service and off service	not falling within point 4.1.2.2.2 of standard UNI EN 13000 since the machine has a closing time lower than 10 minutes	not falling within point 4.1.2.2.2 of standard UNI EN 13000 since the machine has a closing time lower than 10 minutes
Counterweight	not present	not present
Sound emission value	LWA 99 dB - controlled according to annex VI, Directive 2000/14/CE	Internal use
Storage temperature	-20° / +40°	-20° / +40°
Operative temperature	-20° / +40°	-20° / +40°

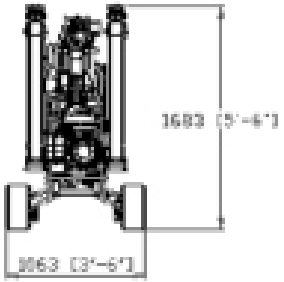
Use the machine complying with the capacity values set out in the "Technical Data" table.

DIMENSIONS SPX312CP - SPX312C+







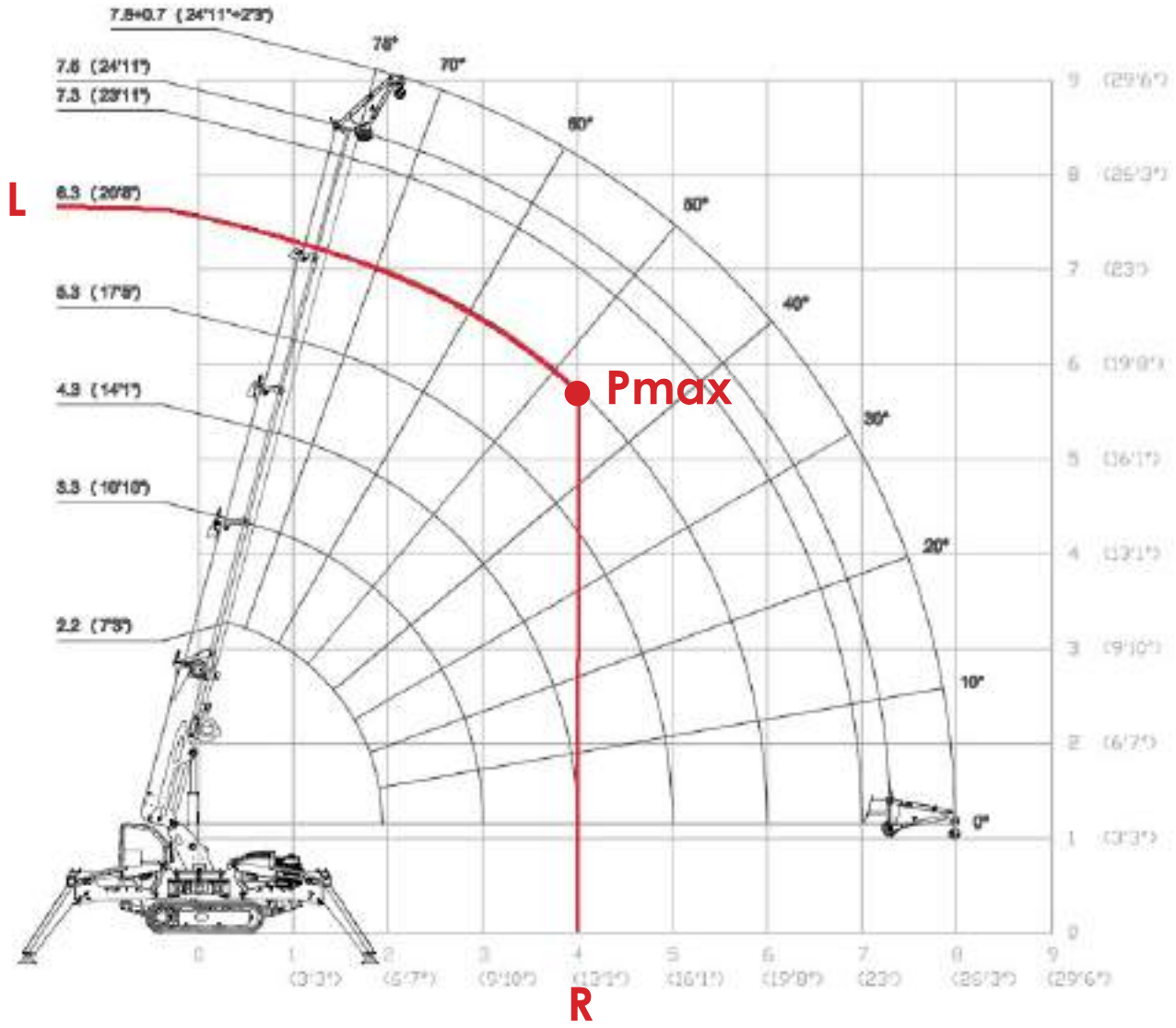


1.4 Diagrams and load charts

Every machine is supplied with a booklet containing the diagrams and relevant load charts.

The diagram represents the mobile crane's working area in every specific configuration, while the chart contains detailed information on the maximum capacity in the various points of the working area.

WORK DIAGRAM



There may be two types of charts:

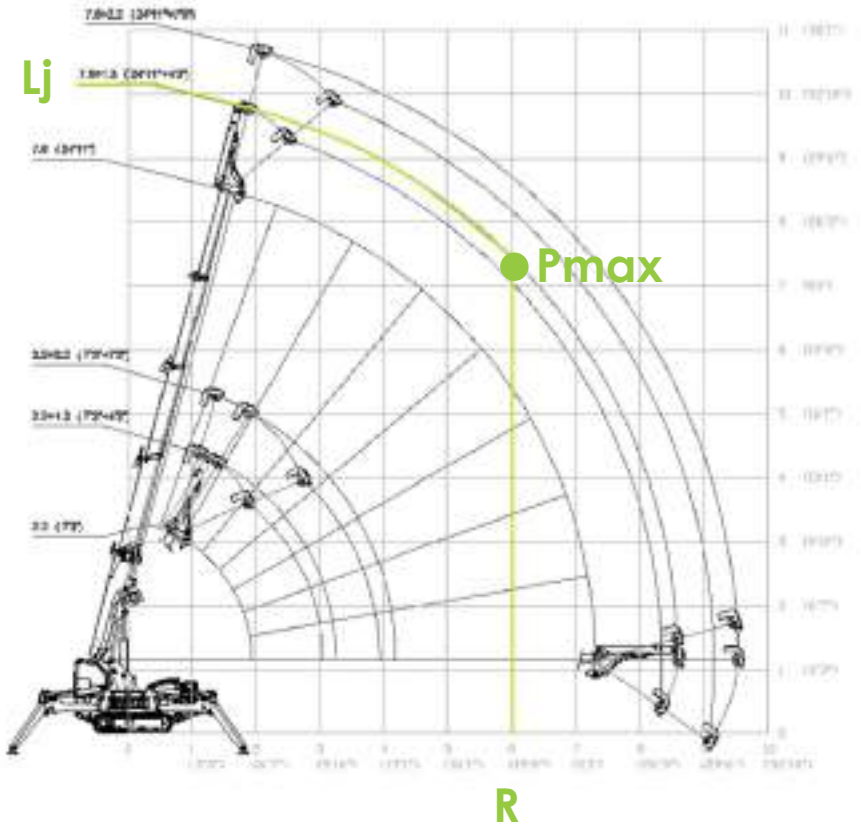
1- Chart based on crane boom: in this case the maximum load in a given point P is identified by the extension L of the crane boom and by the distance R from the crane's slewing centre (radius)

L = Length of telescopic boom

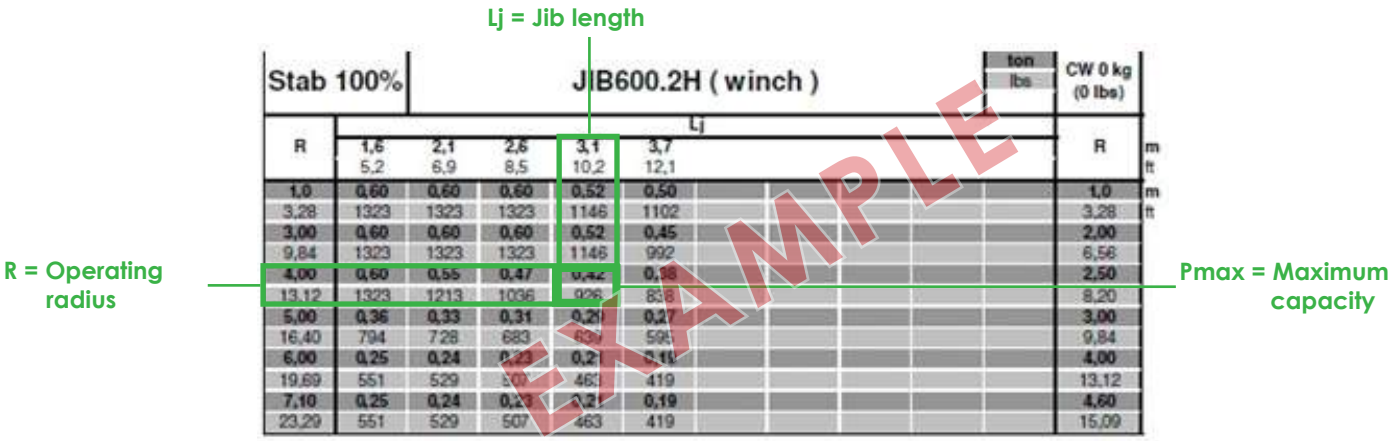
R = Operating radius

Pmax = Maximum capacity

Stab 100%	Main Boom (winch)										ton lbs	CW 0 kg (0 lbs)
R	L											R
	3,4	4,4	5,5	6,2	6,9	7,9	8,9	9,9	10,9	12,1		
	11,2	14,4	18,0	20,3	22,6	25,9	29,2	32,5	35,8	39,7		ft
1,0	2,70	2,50	2,10	1,90	1,80	1,70	1,60	1,40	1,30	1,00		1,0 m
3,28	5952	5512	4630	4189	3968	3748	3527	3086	2866	2205		3,28 ft
2,00	2,70	2,50	2,10	1,90	1,70	1,60	1,60	1,40	1,30	1,00		2,00
6,56	5952	5512	4630	4189	3748	3527	3527	3086	2866	2205		6,56
2,50	2,50	2,30	2,00	1,80	1,70	1,60	1,50	1,40	1,30	1,00		2,50
8,20	5512	5071	4409	3968	3748	3527	3307	3086	2866	2205		8,20
3,00	2,50	2,30	2,00	1,80	1,70	1,60	1,50	1,30	1,20	1,00		3,00
9,84	5512	5071	4409	3968	3748	3527	3307	2866	2646	2205		9,84
4,00		1,30	1,30	1,30	1,30	1,30	1,20	1,10	1,00	0,90		4,00
13,12		2866	2866	2866	2866	2866	2646	2425	2205	1984		13,12
4,60			1,20	1,10	1,10	1,10	1,00	1,00	0,90	0,70		4,60
15,09			2646	2425	2425	2425	2425	2205	1984	1543		15,09
5,00				1,00	1,00	0,90	0,90	0,80	0,70	0,60		5,00
16,40				2205	2205	1984	1984	1764	1543	1323		16,40
6,00				0,90	0,90	0,70	0,70	0,60	0,60	0,50		6,00
19,69				1984	1984	1543	1543	1323	1323	1102		19,69
7,00						0,70	0,60	0,50	0,50	0,40		7,00
22,97						1543	1323	1102	1102	882		22,97
8,00							0,60	0,50	0,40	0,35		8,00
26,25							1323	1102	882	772		26,25
9,00								0,45	0,35	0,25		9,00
29,53								992	772	551		29,53
10,00									0,35	0,25		10,00
32,81									772	551		32,81
11,20										0,25		11,20
36,75										551		36,75



2- Chart based on boom and attachment: in this case the maximum load in a given point P is identified by the extension Lj of the attachment and by the distance R from the crane's slewing centre (radius)



Stab 100%	JIB600.2H (winch)					ton / lbs	CW 0 kg (0 lbs)
R	Lj 1,6 / 5,2	2,1 / 6,9	2,6 / 8,5	3,1 / 10,2	3,7 / 12,1		R m / ft
1,0	0,60	0,60	0,60	0,52	0,50		1,0 m
3,28	1323	1323	1323	1146	1102		3,28 ft
3,00	0,60	0,60	0,60	0,52	0,45		2,00
9,84	1323	1323	1323	1146	992		6,56
4,00	0,60	0,55	0,47	0,42	0,38		2,50
13,12	1323	1213	1036	926	838		8,20
5,00	0,36	0,33	0,31	0,29	0,27		3,00
16,40	794	728	683	639	595		9,84
6,00	0,25	0,24	0,23	0,22	0,19		4,00
19,69	551	529	507	485	419		13,12
7,10	0,25	0,24	0,23	0,22	0,19		4,60
23,29	551	529	507	463	419		15,09

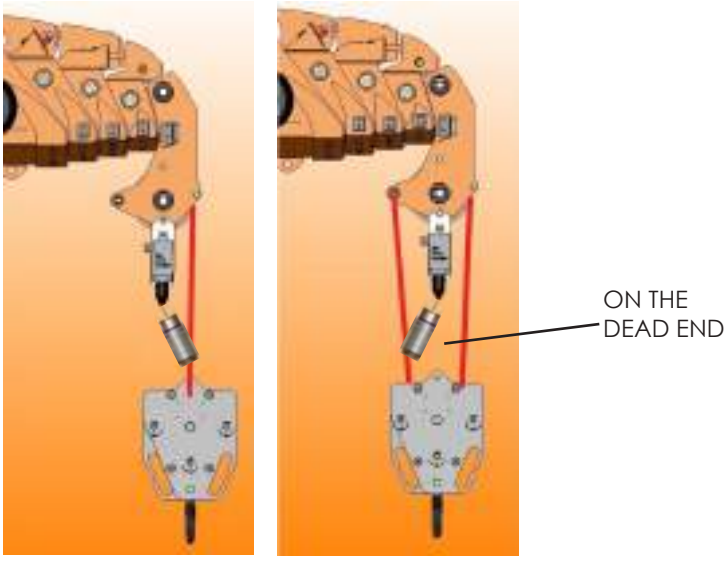
Each chart also contains information concerning the operative method it refers to, the type of installed attachment, whether or not a counterweight is present and the stability condition of reference 100% - 50% - 0% - track (pick&carry).

With regards to the winch, it is specified that the respective maximum capacity for mobile cranes SPX312CP - SPX312C+ is 1200 kg (2646 lbs)..

To lift greater loads, the arrangement of the pulleys must be changed using double pull.

In order to increase the rope capacity, the hook device must be assembled as highlighted in the picture.

SPX312CP - SPX312C+ with winch		
Lifting capacity	Pulleys	Number of ropes
600 kg (1323lbs)	-	1
1200 kg (2646lbs)	1	2



The rope must be replaced and adequately adjusted only by trained technical personnel.

Set the chosen reeving in the machine settings on the control display as indicated in the operation chapter.

1.5 Original sealings

To guarantee machine operation in safe conditions, some valves have been sealed by the manufacturer.

Removing the seals of individual solenoid valves implies UNSAFE machine operation.
The manufacturer disclaims all liability.

1.6 Operator training

The training for the operator who uses the machine is obligatory for its correct use.
ORMET S.p.A. makes available specialised technicians for this training.
Please contact the manufacturer for further information.

1.7 Permitted use

The mobile crane is designed for handling loads with hook, winch or any attachments.
The loads must comply with the capacity charts supplied with the manual.

All uses not specifically mentioned are to be considered unintended uses specifically:

- any use other than specified in this manual for which the machine has been designed and constructed.

CAUTION!!
Within the European Union it is strictly forbidden to use the machine to lift people.

CAUTION!!
Outside the European Union comply with the regulations in force.
Refer to your dealer or contact Ormet S.p.A.

CAUTION!!
Use of the crane model SPX312C+, is exclusively allowed indoors.

CAUTION!!
THE MACHINE HAS NOT BEEN DESIGNED FOR LIFTING PEOPLE, HENCE IT DOES NOT MEET THE SAFETY REQUIREMENTS SET FORTH BY THE EUROPEAN REGULATIONS.

1.8 Warranty

LIMITED WARRANTY OF THE MANUFACTURER ORMET S.p.A.

The limited warranty of the ORMET Jekko Manufacturer covers the following products against defects of materials or manufacturing for the following periods of time:

- Structural crane components – twenty-four (24) months
- Components of the crane's moment and load indicator – twenty-four (24) months
- All other crane components – twelve (12) months
- Part replacement – six (6) months, unless the part is replaced under warranty within the first six (6) months from the crane's commissioning date, the limited warranty periods of parts extend to the remainder of the twelve (12) months of the basic crane limited warranty.

The limited warranty period commences on the date the customer commissions the crane or spare part. This date shall be documented by the Distributor and by the Customer.
The limited warranty includes parts, materials and labour for the time mentioned above.
In appropriate circumstances, where it is not economically advantageous to repair a crane, ORMET shall replace the crane.

EXCLUSIONS

1. Parts and components not supplied by ORMET.
2. The repair or replacement of any covered part if a mechanical fault has not occurred
3. Any breakdown due to physical damage or collision.
4. Any breakdown due to overloading, improper use, misuse, negligence, incompetence or lack of maintenance.
5. Any breakdown caused by unauthorised alterations or changes.
6. Any breakdown due to fire, theft, acts of vandalism, riots explosion, force majeure, war or environmental damage.
7. Hydraulic oil, filters, bushings, maintenance parts or materials, boom sliding surfaces, breakdown of the part due to excessive wear, shop procurement, purifiers, expenses or sundry taxes.
8. Any bonus for overtime work requested by the Customer.
9. Business interruptions, loss of sales and/or profits, rental or equipment replacement, costs of delay for any other loss, cost or special, indirect, incidental or consequential damage.
10. Liability for damage to property, or injury, or death of a person arising from crane operation..
11. Any material subject to normal wear and/or deterioration.

PROCEDURES FOR WARRANTY CLAIMS

- The Customer shall inform the Distributor of the warranty claim.
- The Distributor shall promptly alert the after-sale department (“RPV”) of ORMET to the claim.
- The Distributor shall immediately investigate the claim and, if covered by the limited warranty, shall prepare and send to ORMET's after-sale department a written estimate, including the parts, materials and labour to perform the required warranty repairs.

- ORMET shall examine and promptly approve all covered warranty claims. Should ORMET reject a warranty claim, owing to the fact that it is not covered or it is excluded, it shall specify its reasons to the Distributor so the Distributor may inform the Customer.
- ORMET's after-sale department reserves the right, at its own expense, to have them or the Dealer ship the covered parts or materials, for an inspection by ORMET.

  Should it be required, the repair shall not be hindered or delayed, in order to preserve the Customer's goodwill.

  Should ORMET request the return of parts or materials, it shall specify the type and methods of transport for the return.
  All removed parts and materials shall become the property of ORMET.
- The Distributor shall not effect a repair or hire Third Parties to perform a repair, unless ORMET has approved the written estimate, except in special circumstances:
  - unavailable after-sale department personnel (owing to holidays or other);
  - where immediate action is required for safety or to preserve the Customer's goodwill.
- The Distributor shall cooperate with ORMET to provide all information reasonably required to examine the claim and/or for quality control purposes.

This limited warranty is the only authorised warranty of the manufacturer ORMET and replaces all other warranties, whether explicit, implicit, or representations, including any warranties of merchantability or fitness for any particular purpose or any other obligation by ORMET or the Distributor.

The repair provided for in the limited warranty, is the exclusive repair provided for ORMET products. In no case shall ORMET or the Distributor be liable for business interruptions, loss of sales and/or profits, rental or equipment replacement, costs of delay or any other loss, cost or special, indirect, incidental or consequential damage.

Further information on liability

THE MANUFACTURER FURTHER DECLARES TO DISCLAIM ANY LIABILITY IN THE EVENT OF:

1. *Improper use of the machine*
2. *Tampering with the machine or its components*
3. *Use of the machine by unauthorised persons*
4. *Poor maintenance*
5. *Complete or partial failure to comply with the instructions*
6. *Failure to perform checks and top ups on the lubrication system*
7. *Failure to perform periodic checks*
8. *Use of non-original spare parts*
9. *Unauthorised modifications or repairs*
10. *Exceptional events*

2 SAFETY INFORMATION

In the design and manufacture of this machine, criteria and measures were taken with the aim of satisfying the essential safety requirements contained in the standards indicated in the EC certificate. The careful risk analysis carried out by the manufacturer has enabled the elimination of the vast majority of hazards associated with the conditions of use of the machine, both those provided for and reasonably foreseeable. The full documentation of the adopted safety measuresis contained in the technical file of the machine, which is kept at the offices of the manufacturer.
The manufacturer recommends that you carefully follow the instructions, procedures and recommendations contained in this manual and as well as the current legislation on safety in theworkplace, in order to use the provided safety devices, both integrated on the machine and individual.

2.1 Requirements

For greater operator and workplace safety, the following list of good norms, operational requirements, to follow in order to operate with the machine.

Remarks on the operator

⇒ Physical and mental health
⇒ Sense of responsibility
⇒ Sense of direction
⇒ The right care in executing manoeuvres, in evaluating dangerous situations and the workplace on which he/she is operating
⇒ Reflex response
⇒ Excellent concentration
⇒ No drug or alcohol addiction!

General requirements

Requirement no. 1

- Protect yourself!
- Protect the environment and animals!
- Ensure there are no persons exposed to hazards!
- Climbing onto the system is forbidden, slipping hazard!
- Beware of moving parts. Shearing hazard!

Requirement no. 2

- Use Personal Protection Equipment (PPE)!
- *Watch out for sharp edges!*

Requirement no. 3

- Use of the machine is forbidden to non-authorised or untrained personnel!
- In the event of operator changeover, hand over the basics and the manual!
- Operate calmly, accurately and with concentration!

Personnel requirements

The operator must not wear:
⇒ rings
⇒ watches
⇒ jewellery

Loose clothing such as:
⇒ ties
⇒ torn clothing
⇒ scarves
⇒ unbuttoned blouses, jackets or aprons
⇒ coats with open zipper
⇒ anything else might be dangerous with moving parts

Requirement no. 4

Work rules

⇒ The machine may only be used in well lit areas, ensuring the ground is level and adequately consistent (see table on page 58). The machine may not be used if the lighting conditions are insufficient
⇒ Ensure the lifting operations comply with the crane's intended use (e.g. required crane capacity, working radius, hook height)
⇒ Check the suitability for the purpose of all parts (e.g. components, additional parts, load lifting equipment, harnesses)
⇒ Do not use thermal propulsion (Diesel or Petrol engine) in closed premises or insufficiently aerated premises
⇒ Do not go near the electric and hydraulic system components with sources of heat or flames
⇒ Pay attention to protecting the machine (especially the controls area) and the operator while working in hostile environments (painting, stripping, sanding, washing etc.)
⇒ It is forbidden to use the machine in adverse weather conditions (snow, unfavourable temperature and fog);
⇒ Take care to protect the control area in rain or when parking the machine
⇒ Do not use the machine in premises where there are risks of explosion or fire
⇒ Keep the handling parts, controls and signalling devices clean.

Do not smoke
Do not use open flames

2.2 Noise

According to annex VI of Directive 2000/14/CE, the **SPX312CP** features a guaranteed sound emission **LWA of 99 dB**. **SPX312C+**, however, is exclusively intended for use in indoor premises.

If the personal daily exposure may be greater than or equal to 85 dB (A) it is recommended to use PPE (protective earmuffs, protective plugs, etc.).
If the personal daily exposure may be greater than or equal to 90 dB (A) it is obligatory to use PPE (protective earmuffs, protective plugs, etc.).

2.3 Handover of the basics of the manual

This part of the manual is dedicated to any operations in the event a newmachine operator is to take over and the succession in case of sale.

OPERATIVE RESPONSIBILITY OF THE MACHINE
LIES WITH WHOMEVER,
upon collecting the machine from the manufacturer,
ASSUMES THE ROLE OF OPERATOR.

HOWEVER

The collection of the machine may be carried out by personnel appointed by the buyer or, in case, by someone who will not be taking on the role of operator.

ⓘ These individuals cannot take on responsibility for all the machines they collect, THEY WILL THEREFORE **TAKE ON A ROLE OF "TEMPORARY OPERATOR,"** WHICH WILL END WHEN THE MACHINE IS DELIVERED TO THE BUYER.

ⓘ Every temporary operator is, however, expected to take on and hand over the basics on the machine operation received from the manufacturer to the person who will then assume the role of **OPERATOR.**

CAUTION!
When the machine is intended to be driven by several operators in the company, it is obligatory to transfer knowledge on operation and to hand the manual to the operators taking over.

What to do during knowledge handover?

⇒ Instruct the new operator or new owner on all aspects relevant to machine operation;
⇒ *Particularly highlight the components relevant to operational safety;*
⇒ Advise fully on danger zone aspects and machine hazards;
⇒ *Hand over the manual to the new operator (or new owner), pointing out the contents;*
⇒ Point out the presence of the Declaration of Conformity and the EC plate;
⇒ *In case of sale, also give the manufacturer's Declaration of Conformity to the new owner and point out the presence of the marking plate;*
⇒ Make sure your collegue has understood the instructions and has no doubts on operation.

How to prove knowledge and manual handover?
Given the great importance that is given to an adequate knowledge of the machine and considering that the operator, as soon as he/she ceases as operator, is no longer responsible, we considered

it appropriate to include some printouts specifically drafted with the aim of witnessing thecorrect successful removal of the machine at the manufacturer's premises (statement of responsibility) and thesuccessful handover between operators.

Use of the machine is only allowed to trained adults who have carefully read this manual.

Failed or incomplete transfer of knowledge and manual might lead to involvement or even indictment in the event of damage or injury to the health of persons, property, animals or the environment.

The owner of the machine and/or the safety manager are responsible for ensuring that operators have been adequately trained on how to use the machine in question.

IN SUMMARY

- *Inform.*
- *Hand over the manual and point out its content.*
- *Fill out and sign the printout.*
- *It is in the interest of the person who carries out the knowledge and manual handover to make a photocopy of the page attesting the handover and to keep it.*

2.4 Danger areas

The machine consists of areas that are particularly dangerous for the operator or for whoever finds themselves inside it.
The area considered hazardous is determined by the operating range of the crane boom.

It is strictly forbidden to stand underneath suspended loads.

Further dangers are generated by the working area, some requirements are:

It is forbidden to work near electrical cables.
Danger of death in the event of contact with electrical cables.

Shearing hazard with moving parts.
Do not lean onto the machine during operation.

During operation, the following minimum safety distances are recommended from unprotected or insufficiently protected active parts of power lines and electrical systems:

Nominal variation Un (KVolt)	Minimum allowed distance
<=1	3 m (9,8 ft)
1< Un <= 30	3.5 m (11,4 ft)
30< Un <= 132	5 m (16,4 ft)
> 132	7 m (22,97 ft)

2.5 What to do in case of emergency

In an emergency, bring the machine to a ZERO ENERGY state via the red emergency stop button..

FIRE
Put the fire out with fire extinguishers, with which the site must be equipped.

BURNS

1) Put the fire out with fire extinguishers, with which the site must be equipped:
   - dousing with water
   - a powder extinguisher, avoiding spraying in the face
   - coperte o rotolamento della vittima per terra
2) Do not remove bits of fabric stuck to the skin
3) In case of scalding, quickly but carefully remove wet clothes
4) Cover the burn with a special anti-burn pack or with a sterile bandage (the machine must be equipped, by the user, with a suitable first-aid kit).

CARBON MONOXIDE POISONING (CO)
The carbon monoxide contained in motor exhausts is odourless and dangerous because it results in poisoning.
In closed rooms, carbon monoxide is very dangerous because it reaches critical concentration in a short time.
If assisting a poison victim, bring him/her to safety in a ventilated place. Place the victim on his/her side if unconscious and carry out artificial respiration if necessary.

Only use the crane in ventilated premises.
It is forbidden to use the machine in closed premises, poisoning hazard!

CAUSTIC BURNS
Caustic skin burns are caused by the leakage of the battery acid:

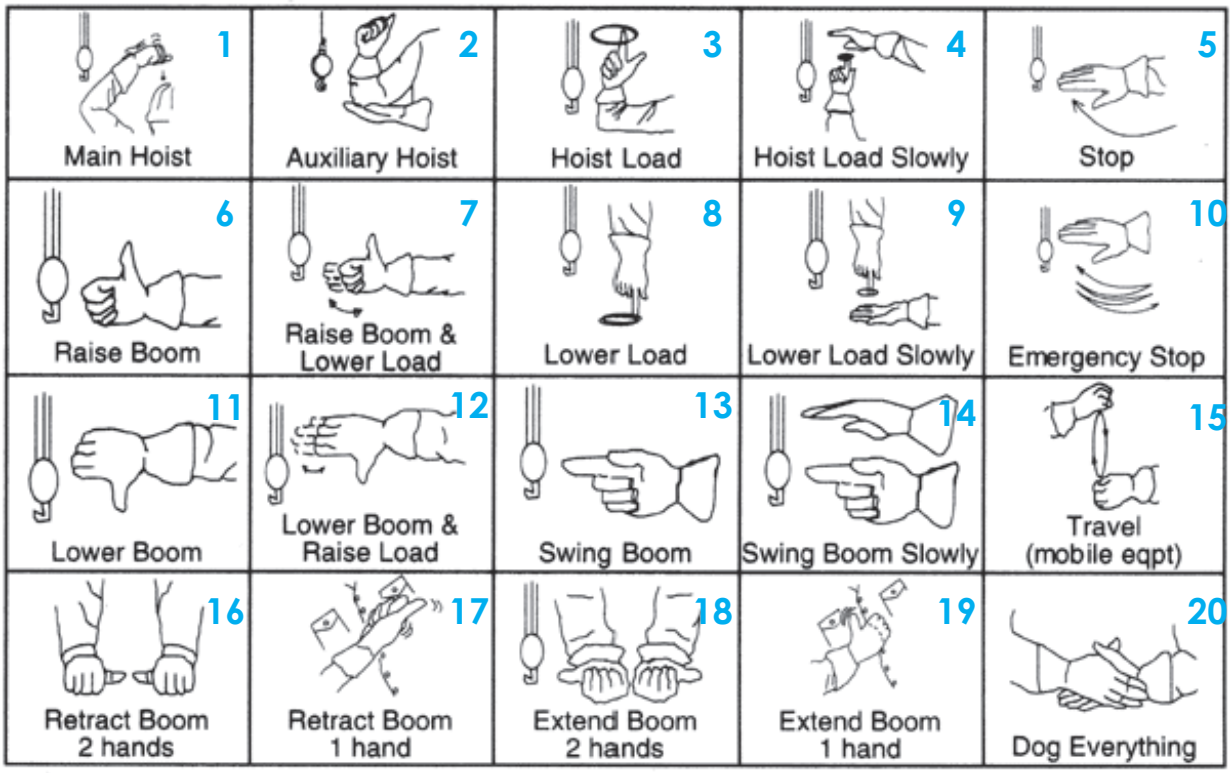
- Remove clothing and wash with running water, taking care not to affect the healthy parts

Caustic eye injuries are caused by both battery acid and lubrication oil as well as diesel:

- Rinse the eye with water for at least 10 minutes while holding the eyelids open so the water flows onto the eyeball, while moving the eye in all directions.

ELECTRIC SHOCK
Electric shock may be caused by the electrical system of the motor or the system (12/24V).
The low voltage value does not result in high current flows through the human body. However, in the case of a short circuit, for example, by a metal tool, this can result in torching and burns.

2.6 Lifting signalling - symbols



1 Main lifting
2 Auxiliary lifting
3 Lift the load
4 Lift the load slowly
5 Stop
6 Lift the boom
7 Lift the boom and lower the load
8 Lower the load
9 Lower the load slowly
10 Emergency stop
11 Lower the boom
12 Lower the boom and lift the load
13 Slew the boom
14 Slew the boom slowly
15 Move the crawlers
16 Retract the boom (2 hands)
17 Retract the boom (1 hand)
18 Extend the boom (2 hands)
19 Extend the boom (1 hand)
20 Stop

2.7 Features of the operating area

In order to avoid unpleasant accidents, the operating area must have certain features.
More precisely, ensure:

- sufficient space for placing the outriggers configured compatibly with handling requirements;
- terrain slope not exceeding 5%;
- the crawlers and outrigger feet must rest onto consistent ground, able to withstand the maximum load, without manholes or panels as covering etc.
  Pay special attention to hidden inadequacies in the ground and to the presence of mud or ice;
- if necessary, ensure the operating area is served by a source of electrical power with characteristics compatible with the requirements of the machine and compliant with the regulations in force.
- sufficient free operating space for lifting operations.

Do not use the crane on terrain whose conditions are uncertain or if the ground pressure exceeds the limit value.

2.8 Emergency stop

Note: The stop procedure described may be carried out at any time.

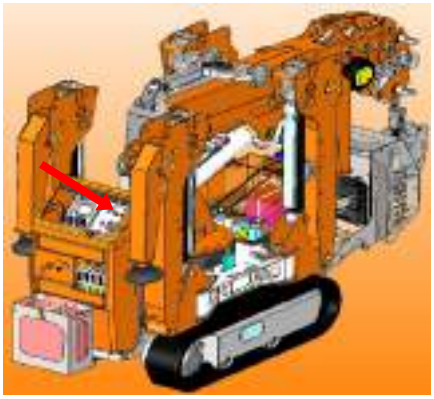
According to current standards in safety matters, the machine features a series of emergency systems which must be used in cases where the normal stop procedure takes too long, in order to safeguard the safety of the operator and any person that might be in a hazardous area, as well as the machine itself.

CAUTION!
Before restarting the machine after an emergency stop, remove the causes that led to using the device.

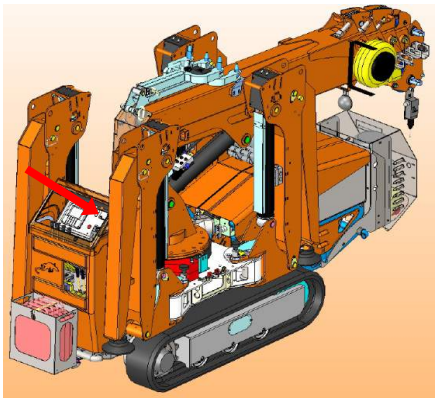
Arrangement of emergency controls
The machine features various types of emergency systems.
The type and position are as follows:

- Emergency button - on the **control panel**

SPX312CP

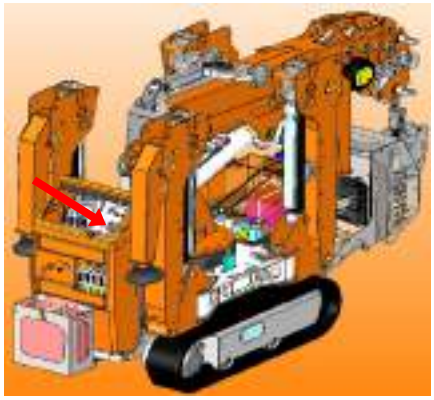


SPX312C+

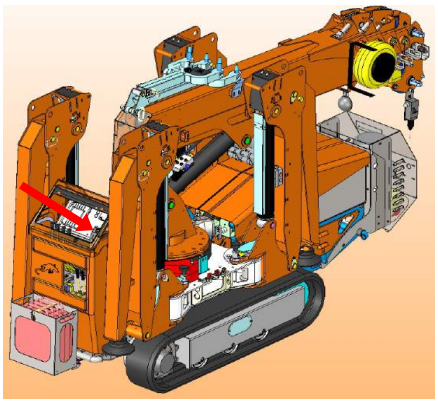


- Emergency button - on the **joystick of wire controls**

SPX312CP



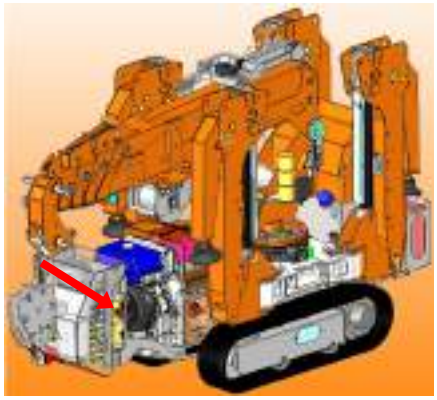
SPX312C+



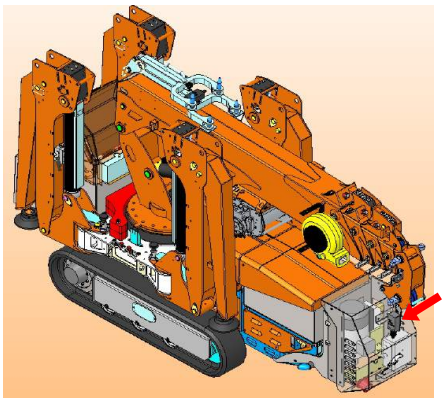
- Emergency button - on the **radio control** (optional)

- Emergency button - on the **power pack** (accessory)

SPX312CP



SPX312C+



Use of the emergencies

In order to assure the safety of the machine, the installed emergency devices are of the mushroom-headed emergency push-button.
To activate the emergency stop, just PRESS THE MUSHROOM-HEADED BUTTON.

Reset emergency push-buttons

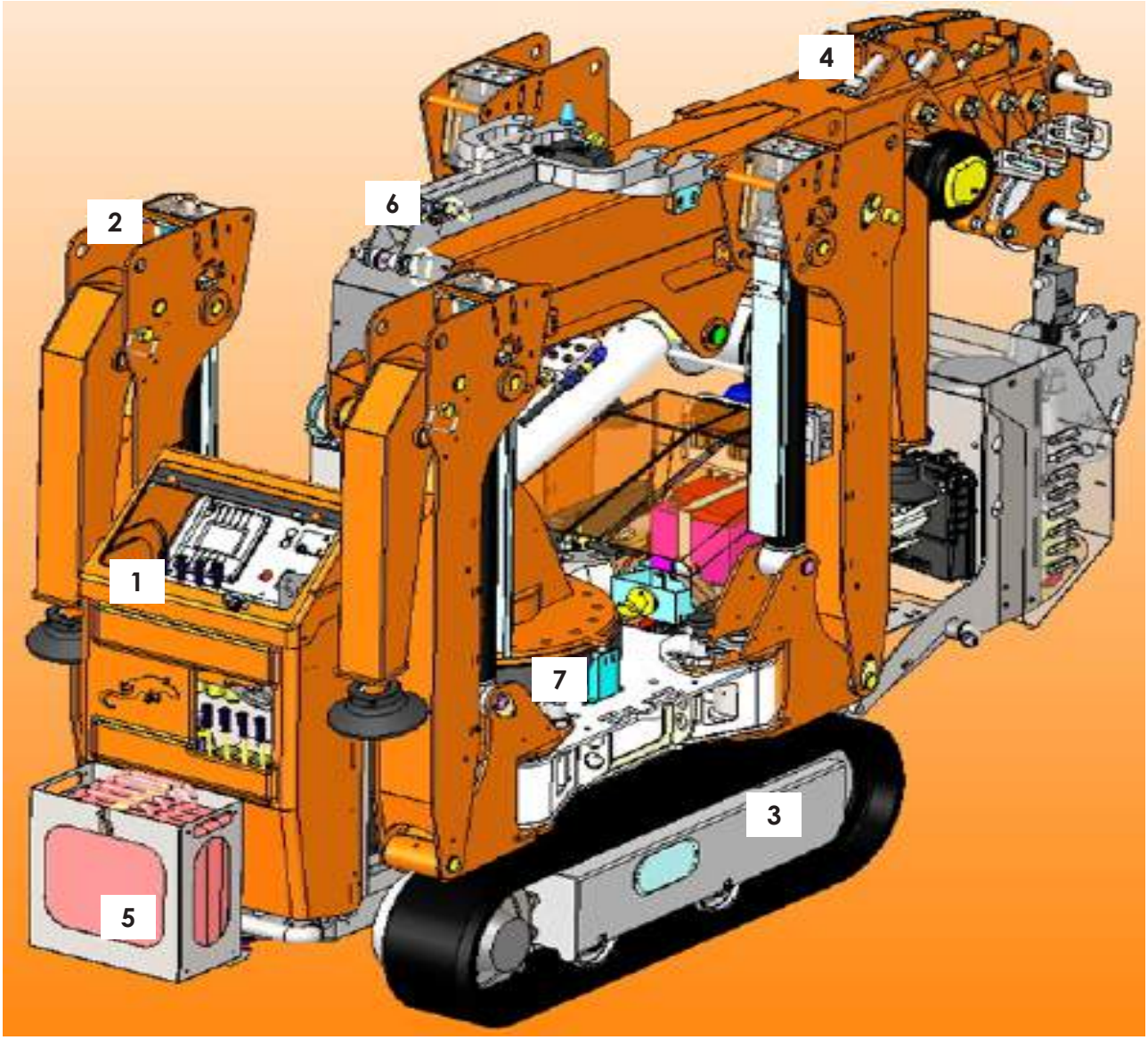
The emergency situation remains such to prevent accidentally re-starting, until resetting.
To reset proceed as follows:

- identify the button which has activated the emergency status;
- rotate the red "mushroom" in the direction indicated by the engraved arrows;
- the button resets and the machine is ready for the starting-up procedure;
- enable the plant.

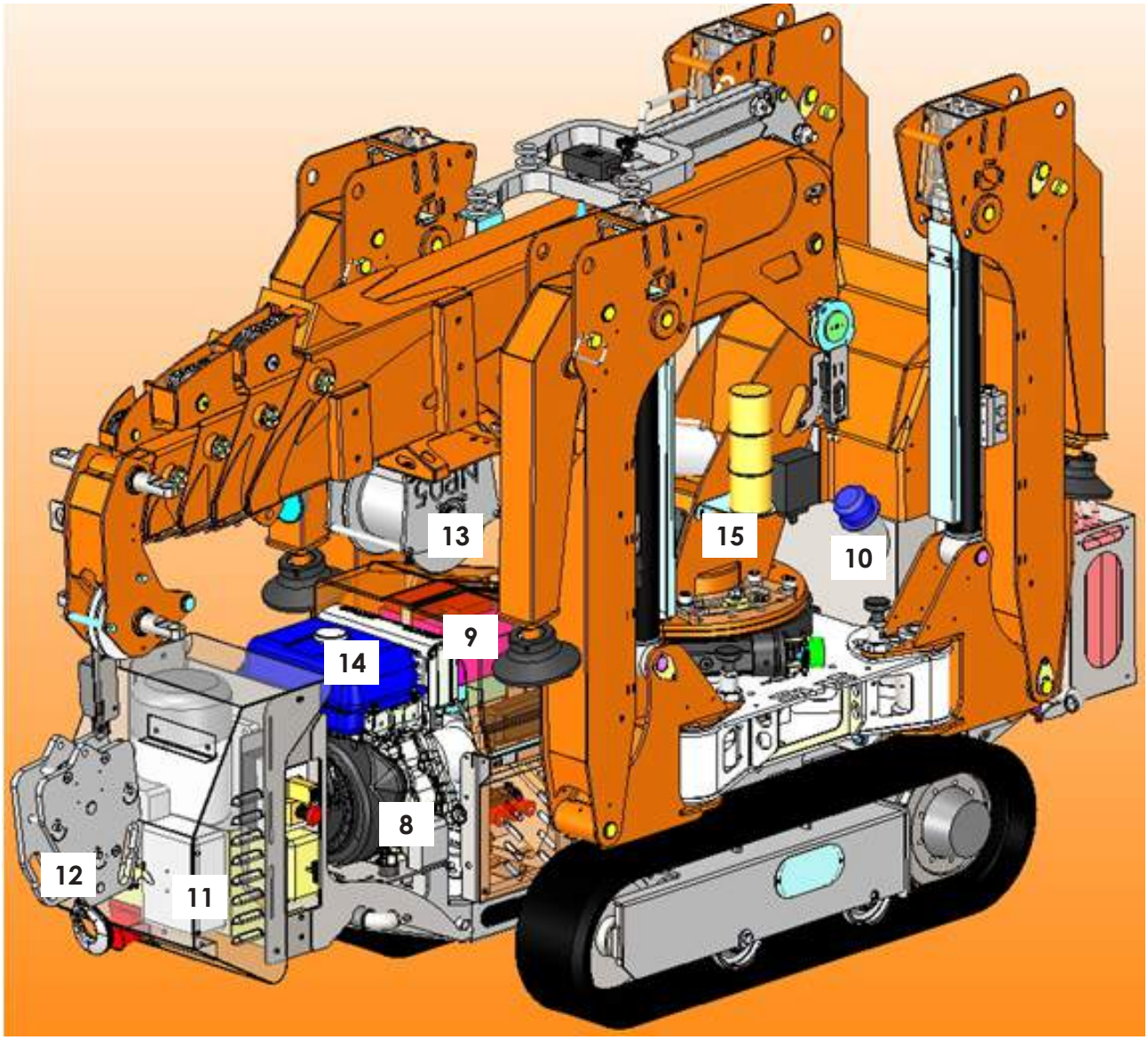
MAIN PARTS

3 MAIN PARTS SPX312CP - SPX312C+

SPX312CP

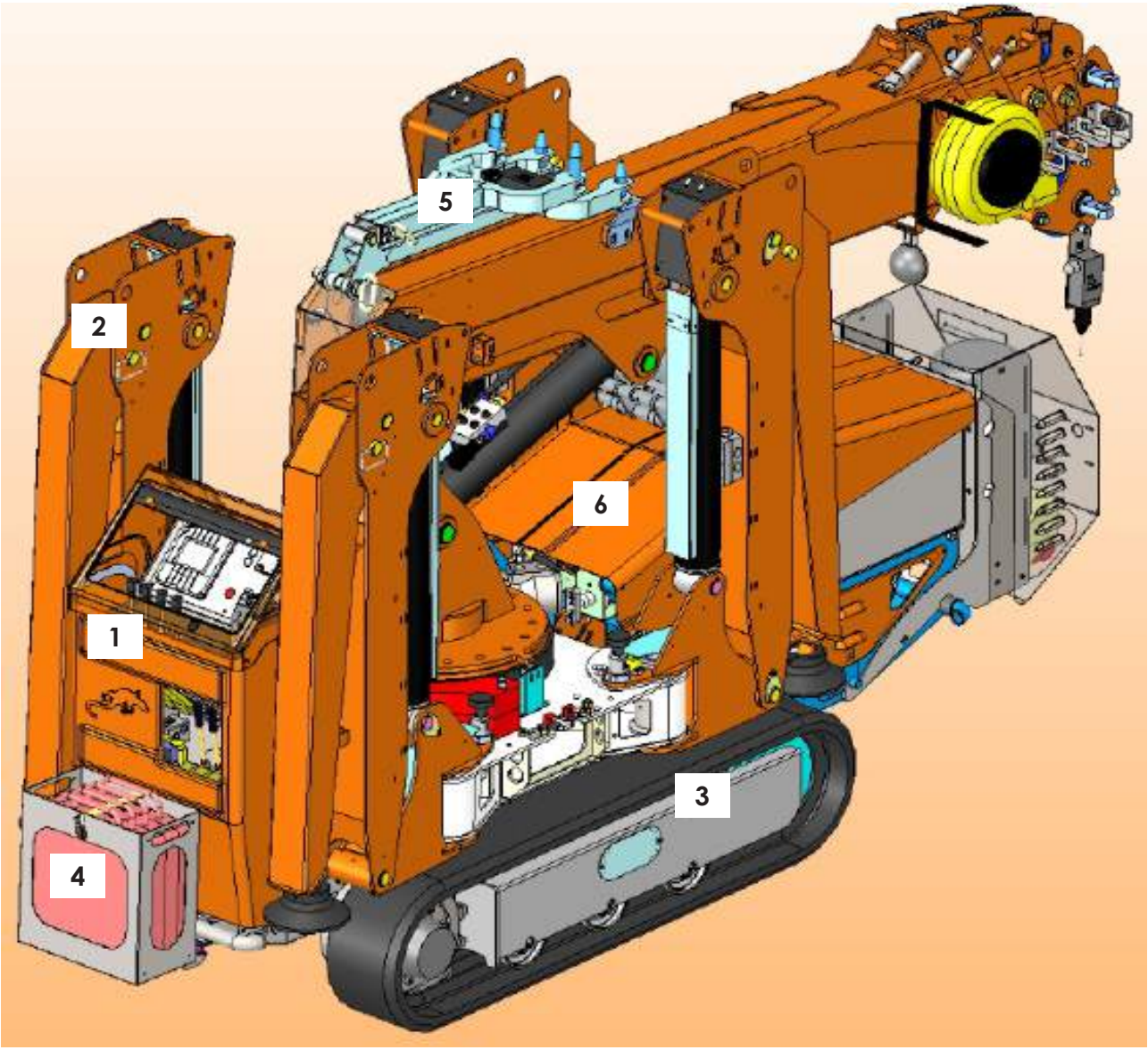


Ref.	Description
1	Control station
2	Outrigger
3	Crawler carrier
4	Boom pack
5	Platform carrier (optional)
6	Mechanical jib (optional)
7	Slewing ring

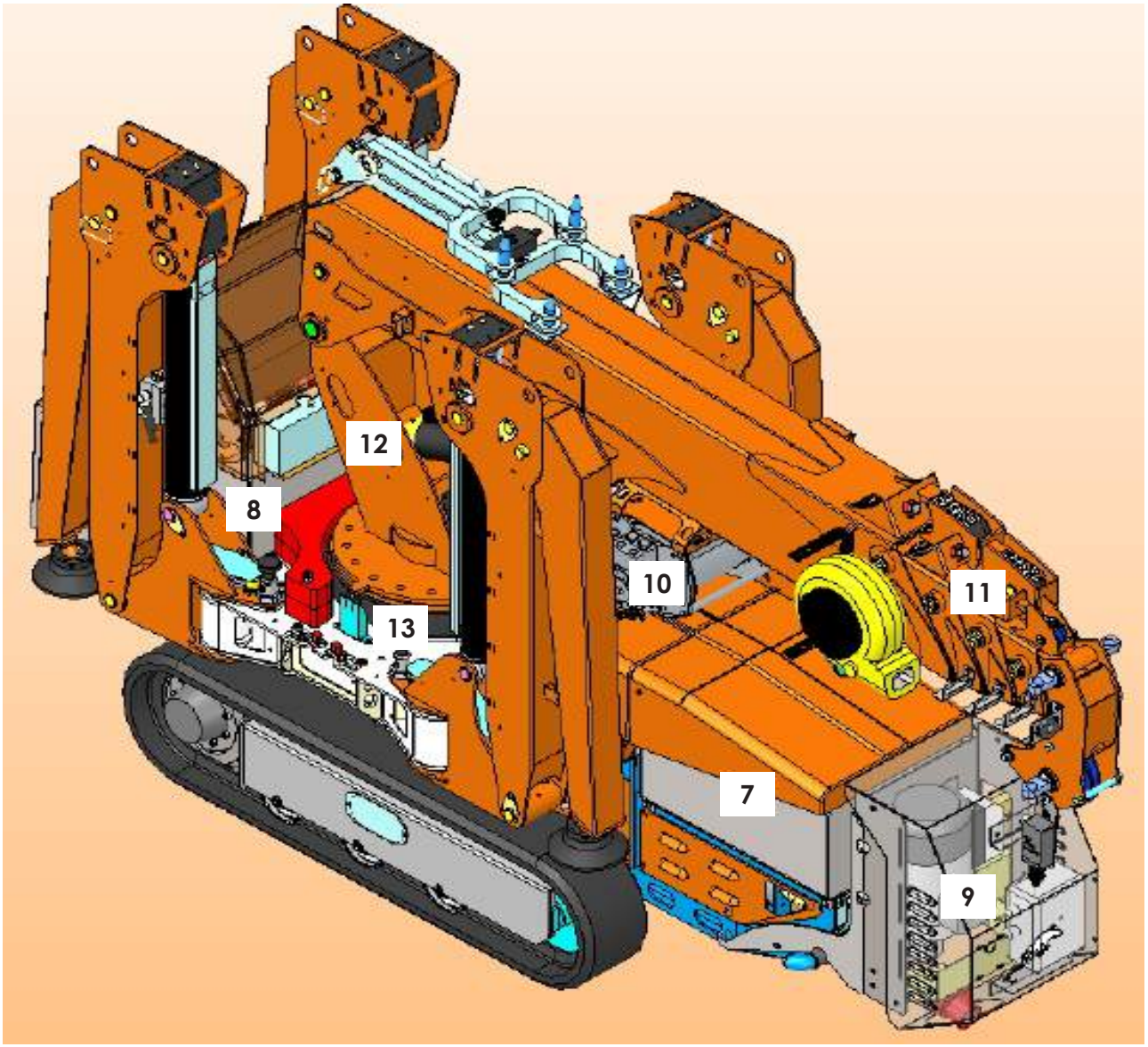


Ref.	Description
8	Motor assembly
9	Battery compartment
10	Oil tank
11	Power pack (optional)
12	Block (optional)
13	Winch
14	Petrol tank
15	Crane pillar

SPX312C+



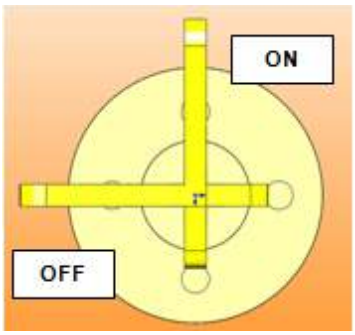
Ref.	Description
1	Control station
2	Outrigger
3	Crawler carrier
4	Platform carrier (optional)
5	Mechanical jib (optional)
6	Power supply compartment



Ref.	Description
7	Battery unit
8	Oil tank
9	Power pack (optional)
10	Winch
11	Boom pack
12	Crane pillar
13	Slewing ring

BATTERY SWITCHES

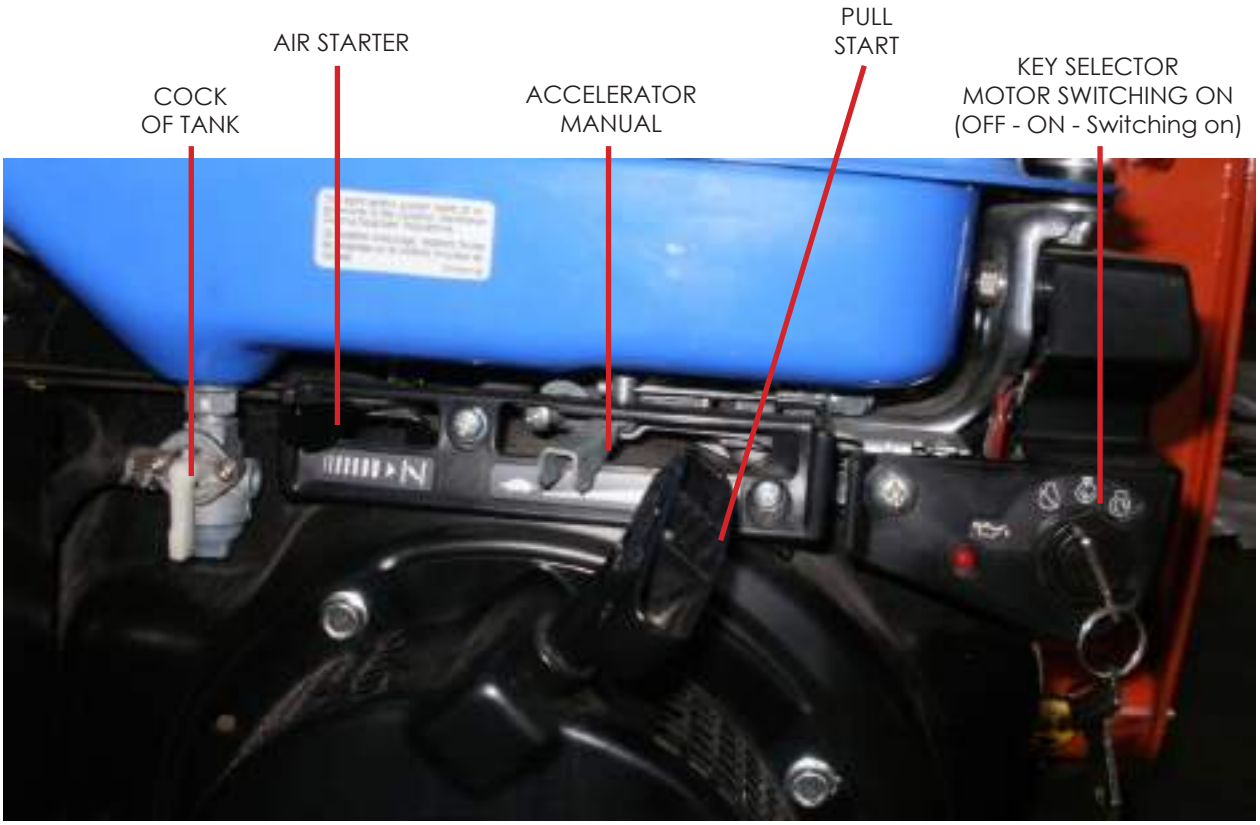
SPX312CP



SPX312C+

BYPASS KEY
MOTOR
ELECTRICAL

*MOTOR CONTROLS **SPX312CP***



MOTOR SUPPLY SPX312CP

DELIVERY LINE HYDRAULIC OIL FILTER

BATTERY

HYDRAULIC ACCELERATOR

POWER FUSES

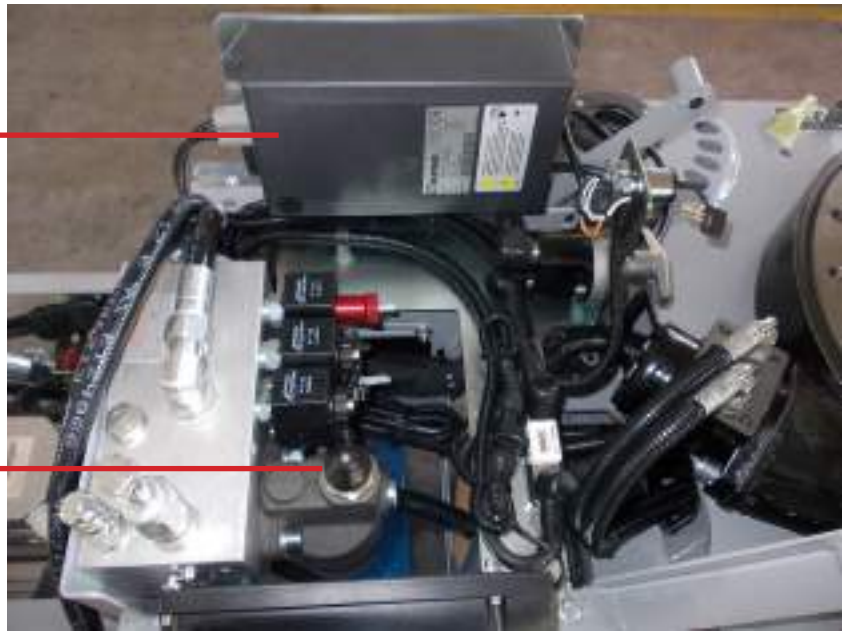
MOTOR SPX312CP

BATTERY COMPARTMENT SPX312C+

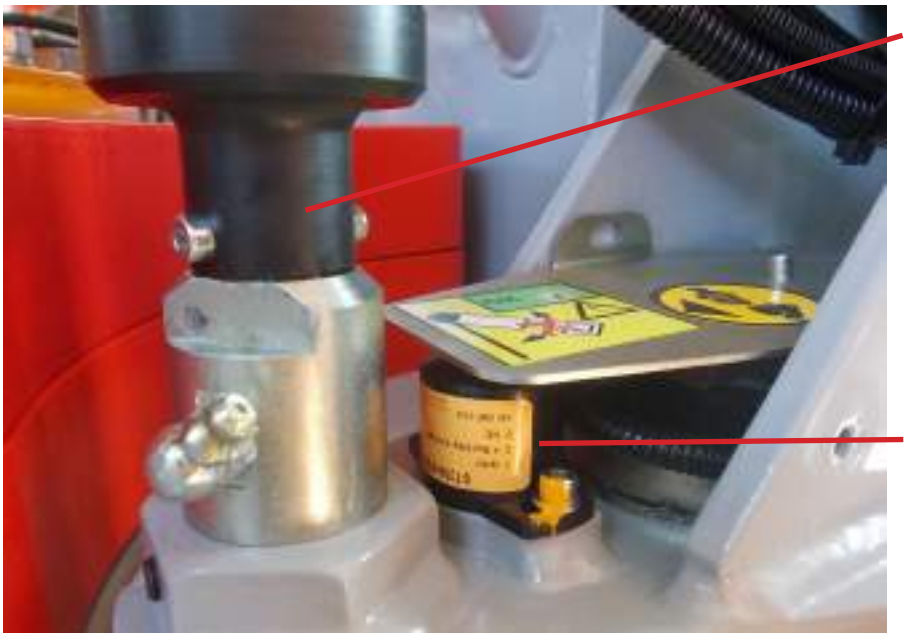
BATTERIES

MACHINE-BATTERY COMPARTMENT
SUPPLY PLUG

ELECTRICAL POWER SUPPLY SPX312C+



SPX312CP - SPX312C+



SLEWING LOCKING
OUTRIGGER (X 4)

POSITION SENSOR
OUTRIGGER (X 4)

FOOR OPENING PIN
OUTRIGGER (X 4)

SPX312CP - SPX312C+

SEMAPHORE.
INDICATES STATUS OF MOMENT LIMITER AND LIFTED LOAD
- GREEN (OK)
- YELLOW (LOAD 90%)
- RED (OVERLOAD)

SAFETY ELECTRONIC UNIT

SPX312CP - SPX312C+

SPX312CP - SPX312C+

CENTRING SENSOR
PILLAR ROTATION

POSITION SENSOR
PILLAR ROTATION

HORN

QUICK OIL CONNECTORS
FOR POWER PACK (ACCESSORY)

ELECTRICAL
CONNECTION
POWER PACK

SPX312CP - SPX312C+

WINCH

RADIO CONTROL RECEIVER

LIMITER BYPASS

WORK LIGHT

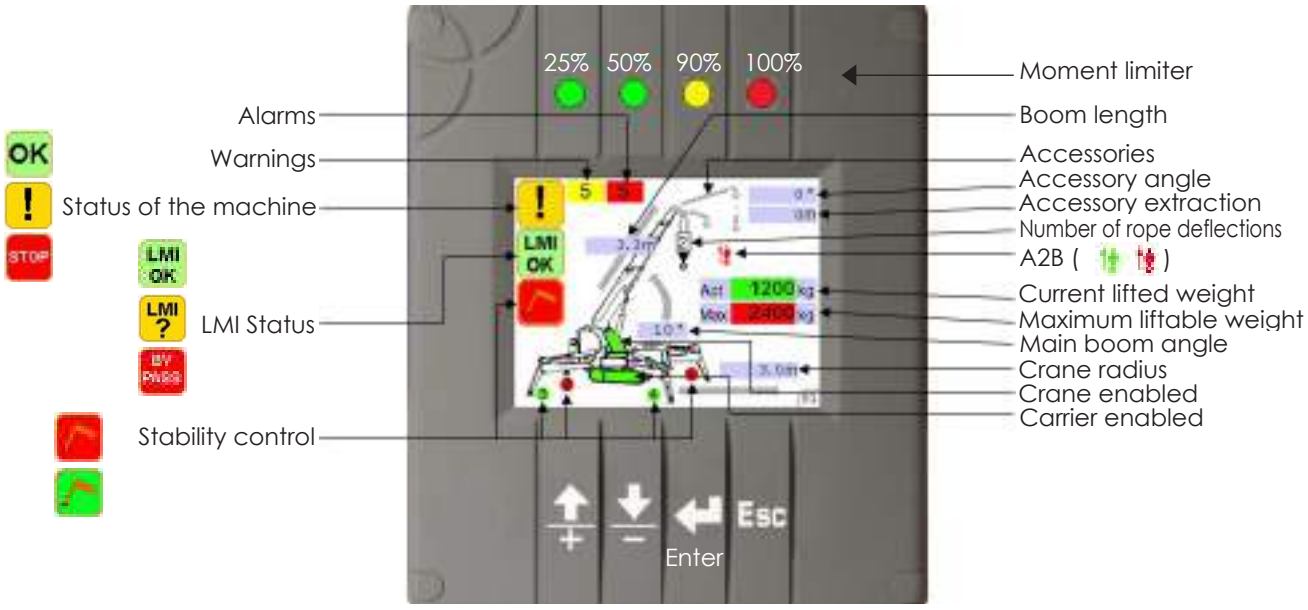
HOOK FOR SETTING ROPE ASIDE **(NO LIFTING!)**

4 MACHINE SIGNALLING AND CONTROL INSTRUMENTS

4.1 Main control panel

MAIN PANEL SPX312CP - SPX312C+

DISPLAY SPX312CP - SPX312C+



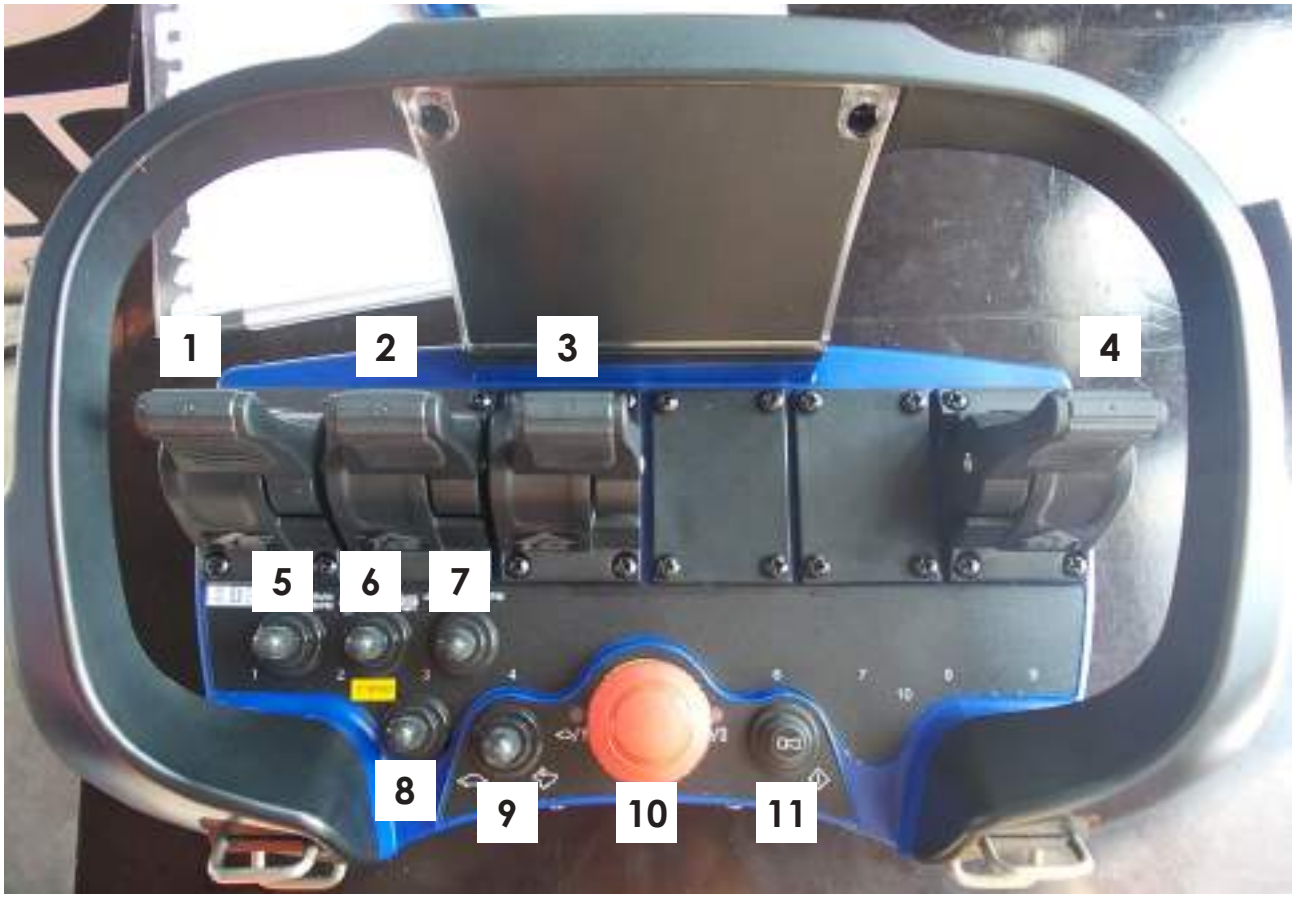
4.2 Control instruments

JOYSTICK SPX312CP - SPX312C+

DISTRIBUTORS SPX312CP - SPX312C+

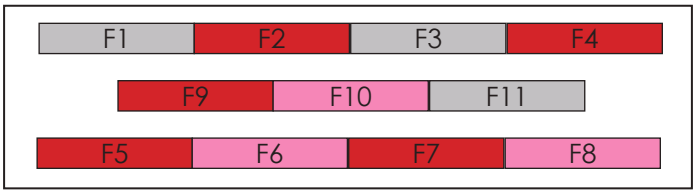
LEFT AND RIGHT DISTRIBUTOR
OF CRAWLERS
(INTERNAL COMPARTMENT)
(FOR EMERGENCY ONLY)

RADIOCONTROL SPX312CP - SPX312C+



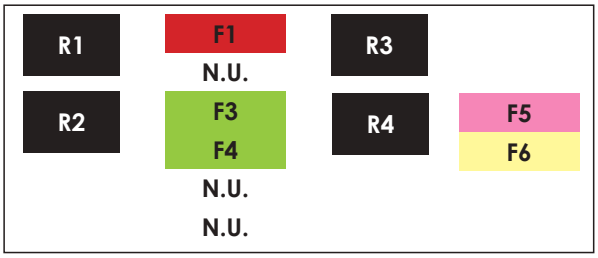
Ref.	Description
1	Crane slewing lever. When the machine is not outrigged, LH crawler translation
2	Lifting lever
3	Extraction lever
4	Winch lever. When the machine is not outrigged, RH crawler translation
5	With lever to left position, the crane can be translated forward and backward in straight direction with lever no. 1 (STRAIGHT RUN)
6	Motor switch on / off
7	Not used
8	Only SPX312CP - If kept all LH, it doubles machine speed in any operation
9	Reduce / Increase crane speed
10	Emergency button
11	Start up / Horn

FUSE BOX ON CONTROL PANEL SPX312CP - SPX312C+



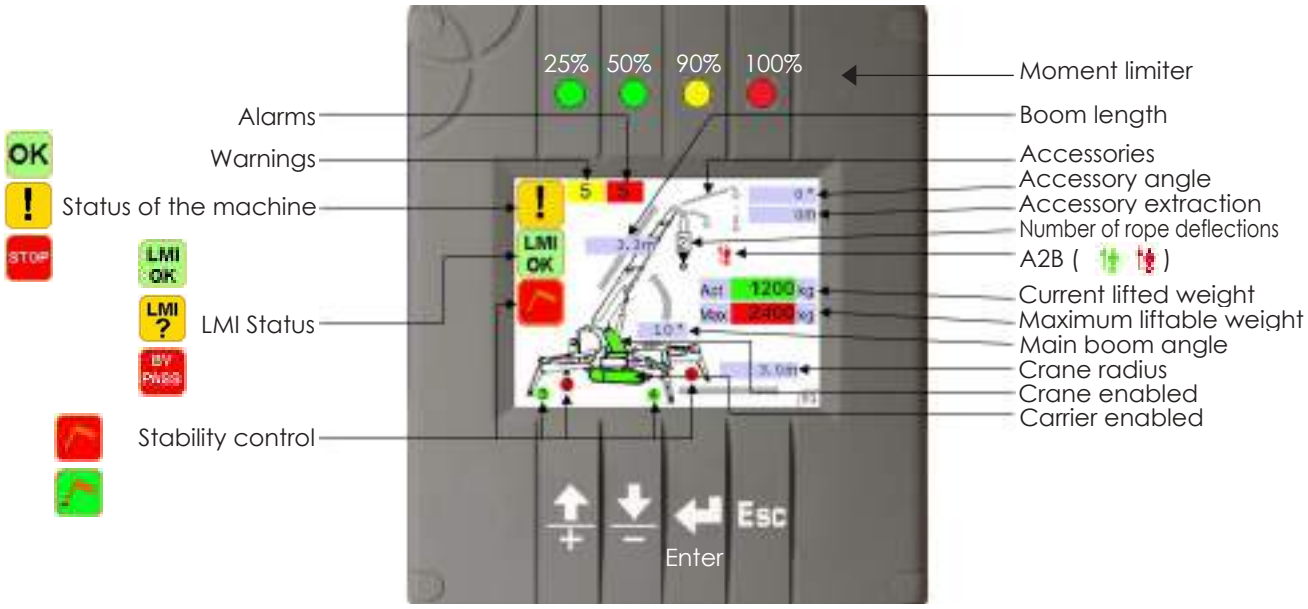
F1	2A	CLS logic supply
F2	10A	CLS power outputs supply
F3	2A	IOEXT logic supply
F4	10A	IOEXT power outputs supply
F5	10A	MIDAC power outputs supply
F6	2A	AMIDAC-CCR-IOEXT logic supply accessories
F7	10A	IOEXT power outputs supply accessories
F8	3A	Carrier sensors supply Stability control encoder CURTIS unit
F9	10A	Accessories supply Work light Horn button
F10	3A	Crane sensors supply
F11	2A	Emergency line supply

MOTOR FUSE BOX SPX312CP



F1	50A	Plant supply
F_	N.U.	
F3	30A	Power supply (outputs conditioned by emergency)
F4	30A	Starter power supply
F_	N.U.	
F_	N.U.	
F5	3A	Radio control battery charger supply
F6	5A	Horn
R1		Power lines relay
R2		Starter relay
R3		Motor switch off relay
R4		Horn

5 DESCRIPTION OF DISPLAY CLS INTERFACE PAGES



Button to move within a screen or to change pages

Button to SELECT and CONFIRM

Button to move within a screen or to change pages.

Button to EXIT a screen or for ACCESSORY CHANGE

1. LED BAR - MOMENT INDICATOR

On upon exceeding 25% of the overload pressure

On upon exceeding 50% of the overload pressure

On upon exceeding 90% of the overload pressure

On upon reaching 100% of the overload pressure, at which the manoeuvres for main lowering, extraction and winch lift are blocked

Upon reaching 110% of the overload pressure boom lift is also blocked

2. STATO DELLA MACCHINA

Machine enabled and ready for use

Machine not enabled or with emergency pressed

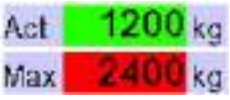
Indicates that alarms are active concerning the fault of one or more units or electric components

3. WARNINGS AND ALARMS

Indicates the code identifying one or more faults

Indicates the code identifying one or more alarms

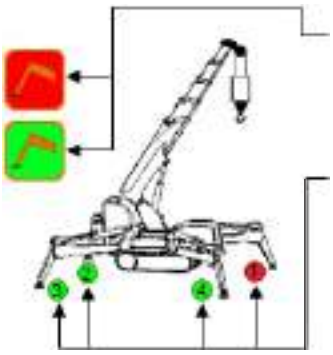
4. CURRENT WEIGHT AND MAXIMUM WEIGHT



Indicates the weight currently lifted

Indicates the maximum liftable weight in the current position

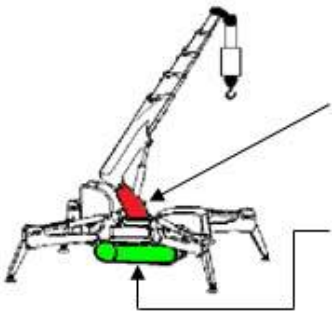
5. STABILITY CONTROL



Indicates the status of the line of micro-switches in series for stability control
Green = all the feet are on the ground and all four contacts are closed
Red = one or more than one of the four micro-switches is open

Indicate the status of each individual outrigger
Green = outrigger on ground
Red = outrigger not on ground

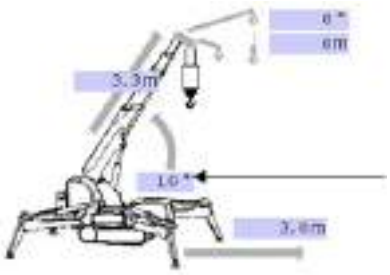
6. CARRIER-CRANE ENABLE



Indicates crane status (green = crane enabled; red = crane not enabled)

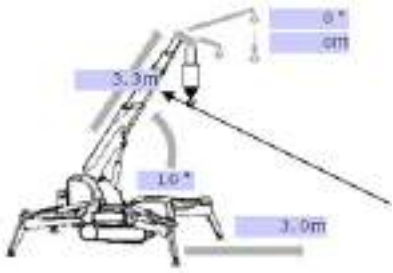
Indicates carrier status (green = carrier enabled; red = carrier not enabled)

7. ANGLE INDICATOR



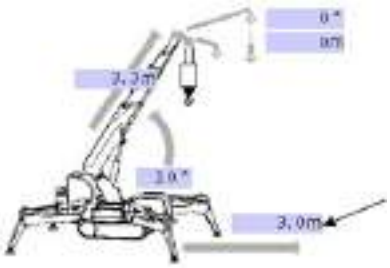
Indicates boom angle value

8. EXTENSION INDICATOR



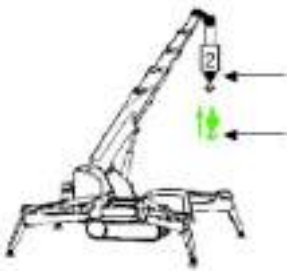
Indicates the extension length

9. RADIUS INDICATOR



Indicates radius length

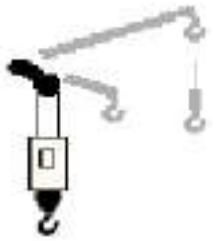
10. ROPE LIFT MICRO-SWITCH (A2B) AND ROPE DEFLECTION NUMBER INDICATOR



Indicates the set number of rope deflections

Indicates the set number of rope deflections
Indicates whether the rope lift block is active
Green = rope lift block disabled
Red = rope lift block enabled, rope lift and extension manoeuvres are blocked

11. CRANE ARRANGEMENT



Indicates the type of selected accessory through icons:

Main boom

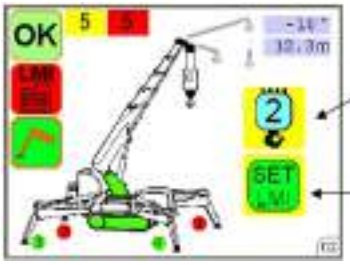
Runner

Hook JIB

Rope JIB

To go to the next page press

PAGE 2 LMI CONFIGURATION



Load limiter configuration page

Selection of number of rope deflections

LMI Status

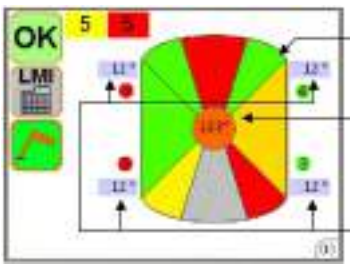
To go to the next page press

PAGE 3 LOAD CHART

This page shows the current load chart

To go to the next page press

PAGE 4 STABILITY CONTROL



Stability control page

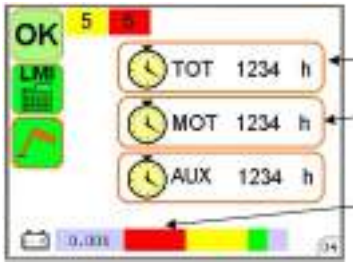
Stability areas

Degrees of crane slewing

Degrees of outriggers rotation

To go to the next page press 

PAGE 5 TIMER



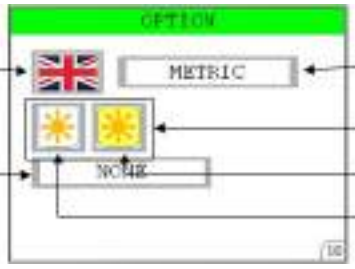
Total machine hours

Combustion engine/electric motor hours

Battery charge indicator

To move to the next page press and hold ENTER for a few seconds 

PAGE 6 OPTIONS



Language

Unit of measure

Screen lighting

Electro-accelerator control (not used)

Increase brightness

Decrease brightness

To go to the next page press 

PAGE 7 ALARMS

Active alarms

The current alarms are displayed with code and description

To go to the next page press 

PAGE 8 NETWORK

The status of network units may be controlled in this page.
Units with a green icon work correctly.
Units with a grey icon are not working correctly or are not used.

E.g.: as you can see in the picture, the first unit (IOEXT) is networked and working correctly, whereas the other two units (MIDAC and CCR) shown in grey are not networked.

To go to the next page press

PAGE 9 CLS DIAGNOSTICS

In this page you may carry out diagnostics of inputs and outputs both proportional and on-off and control of the power supply voltage of the CLS unit

PIN	ID CODE	FUNCTION
11	OUT0	Acoustic alarm
12	OUT1	Radio unit
14	OUT3	Horn
15	OUT4	RH crawler forward
16	OUT5	LH crawler forward
17	OUT6	RH crawler backward
18	OUT7	LH crawler backward
21	INP00	Spool sensor 1 (slewing lever)
22	INP01	Spool sensor 2 (main lever)
23	INP02	Spool sensor 3 (extraction lever)
24	INP03	Spool sensor 4 (winch lever)
25	INP04	Spool sensor 5 (AUX SPX424 lever)
26	INP05	Outrigger 1
27	INP06	Outrigger 2
28	INP07	Outrigger 3
29	INP08	Outrigger 4
30	INP09	Set of outriggers l.s. (series N.O.)
31	INP10	Outriggers+ lever l.s. parallel translation joystick dead man button

To go to the next page press

PAGE 10 IOEXT DIAGNOSTICS

In this page you may carry out diagnostics of inputs and outputs both proportional and on-off and control of the power supply voltage of the IOEXT unit

PIN	ID CODE	FUNCTION
1A	OUT7	Motor stop (electro-stop)
2A	OUT5	Electro-accelerator output
3A	OUT4	Second speed valve
4A	OUT3	Carrier Bypass Valve
5A	OUT2	Crane Bypass Valve
6A	OUT1	NA Carrier-Crane Exchange Valve
7A	OUT0	NC Carrier-Crane Exchange Valve
2B	OUT6	Semaphore green light output
3B	INP0	Centred crane l.s.
4B	INP2	Water temp. + oil bulb
5B	CA0	Remote/local selector
3C	INP1	Emergency button re-reading
4C	INP3	X Axis crawler joystick
5C	CA1	Y Axis crawler joystick

To go to the next page press

PAGE 11 MIDAC DIAGNOSTICS

In this page you may carry out diagnostics of inputs and outputs both proportional and on-off and control of the power supply voltage of the MIDAC unit

PIN	ID CODE	FUNCTION
4	OUT0	N.U
5	OUT1	N.U
6	OUT2	Speed reduction
7	OUT3	Yellow semaphore light
8	OUT4	Red semaphore light
24	IN0	Pad A pressure transducer
25	IN1	Pad B pressure transducer
26	IN2	Stem A pressure transducer
27	IN3	Stem B pressure transducer
31	IN7	LMI bypass button
32	IN8	LMI bypass key
33	IN9	Spooled out rope l.s.
34	IN10	Spooled in rope l.s.
35	IN11	JIB operation exchange

To go to the next page press

PAGE 12 STABILITY ENCODER DIAGNOSTICS

In this page you may carry out diagnostics of the stability control encoders

POS.	ID	FUNCTION
Outr. 1	ENC01	Outr. 1 rotation
Outr. 2	ENC02	Outr. 2 rotation
Outr. 3	ENC03	Outr. 3 rotation
Outr. 4	ENC04	Outr. 4 rotation
Crane sl.	ENC TOR	Crane slewing

To go to the next page press

PAGE 13 RADIO CONTROL DIAGNOSTICS

In this page you may carry out diagnostics of levers and buttons of the radio control

To go to the next page press

PAGE 14 IOEXT ACCESSORIES DIAGNOSTICS

In this page you may carry out diagnostics of inputs and outputs both proportional and on-off and control the supply voltage of the IOEXT unit of accessories

PIN	ID CODE	FUNCTION
3B	INP0	Spooled in rope limit switch
3C	INP1	Angle sensor
4C	INP3	JIB extraction limit switch (N.O.)

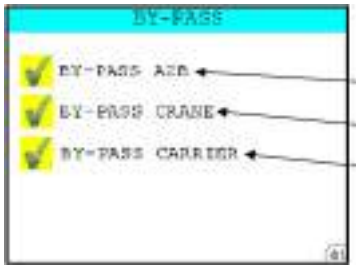
To go to the next page press

PAGE 15 PASSWORD PROTECTED MENU

Page to enter the password to access the menu for bypass activation, reset timer and reset spool sensors

To go to the next page press 

PAGE 16 BYPASS ACTIVATION (LEVEL 1 PW)



Page to activate the bypass

Bypass microinterruttori fune avvolta e svolta

Crane bypass

Carrier bypass

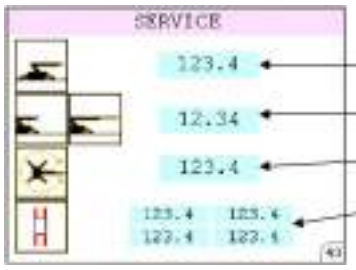
To go to the next page press 

PAGE 17 RESET TIMER AND SPOOL SENSORS (LEVEL 2 PW)

Page to reset the maintenance timers and to calibrate the spool sensors and joystick

To go to the next page press 

PAGE 18 SENSOR CALIBRATION (LEVEL 2 PW)



Page for calibration of sensors and encoders

Main boom angle

Main boom min and max extension

Crane slewing encoder

Outriggers rotation encoder

To go to the next page press 

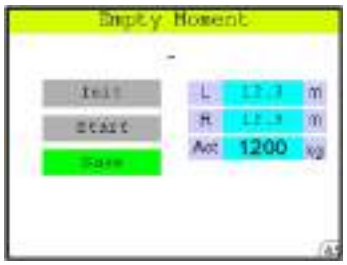
PAGE 19 OVERRIDE CHARTS (LEVEL 2 PW)

In this page it is possible to override the charts automatically loaded by the machine

Group = stability
Config = crane

To go to the next page press 

PAG. 20 EMPTY MOMENT CALIBRATION (LEVEL 3 PW)



Page for empty moment calibration

To go to the next page press 

PAG. 21 WEIGHT CORRECTION OF THE VARIOUS ACCESSORIES (LEVEL 3 PW)

Page to correct the weights of accessories

6 USING THE MACHINE IN NORMAL CONDITIONS

6.1 Inspection before use

The machine is delivered fully assembled, therefore it can safely perform all the functions described by the manufacturer.
Before operating the machine, you must read the operating instructions in this manual, verify the perfect integrity of the machine (visual inspection) and have the operators complete an adequate training course. The following checks must be carried out prior to every time the machine is used:

- assess load condition before lifting it;
- check required crane capacity;
- ensure the type of ground supports the outrigger's maximum pressure (see table page 58);
- check adequacy of the working area to use of the crane.
  Visibility of the load and working area must be clear and unrestricted.
  Otherwise, ensure the communication system between the supervisor and the crane operator assures operation in safe conditions;
- assess crane placement;
- ensure the outrigger feet are in good condition;
- ensure the crawlers are in good condition;
- check conditions of the lifting chain: winch, rope, pulleys, eyebolts, block and hook;
- check hydraulic oil level in the tank and absence of any oil leaks from the oil-hydraulic system;
- check engine operation, oil level and fuel level (SPX312CP);
- check correct operation of safety devices (stability sensors group, safety electronic unit, pillar rotation position sensor, rope block sensor);
- check efficiency of the outriggers' locking system;
- ensure controls and gauges are perfectly efficient (e.g. load condition, fluid level, engine operation, hydraulic pressure, electrical power supply, wear limitations);
- visual inspection of the structural metal frame condition;
- ensure the structure does not show any evident defects (check the welds of the lifting structure);
- check greasing;
- ensure there are no persons other than the operator in the machine's operating range;
- when working in public areas, close off the work area with barriers or other suitable signs;
- the key selector for switching on the motor, must be in the "off" position (SPX312CP) see motor controls page 30);
- check battery liquid level (SPX312C+);
- check battery charge level (SPX312C+);

In the event the machine should be working on floor slabs, check bearing capacity according to the specifications of the "Technical data" paragraph.

CAUTION!!

Do not work on floor slabs of which the bearing capacity is not known. The manufacturer is not liable for damage or collapses caused by insufficient floor slabs.

6.2 Starting up the machine

SPX312C+

- Ensure the supply plug machine-battery compartment is in.

- Turn the battery switch ON.
- Power on the machine by turning the main key selector on the control panel in position I, wait a few seconds for the initial screen to load and press Enter to confirm the utilisation configuration.
- Keep the button Enter pressed until the icon SET LMI turns yellow. Press Enter to confirm and the first two icons at top left from ! will turn OK and from LMI ? the limiter LMI will be confirmed.
- When the machine is enabled, the relevant green semaphore light switches on.

This operation must be performed every time the machine is started and at each accessory change.

SPX312CP

- Turn the battery switch ON.
- Power on the machine by turning the main key selector on the control panel in position I, wait a few seconds for the initial screen to load and press Enter to confirm the utilisation configuration.
- Keep the button Enter pressed until the icon SET LMI turns yellow. Press Enter to confirm and the first two icons at top left from ! will turn OK and

from  the limiter  will be confirmed.

- When the machine is enabled, the relevant green semaphore light switches on.

This operation must be performed every time the machine is started and at each accessory change.

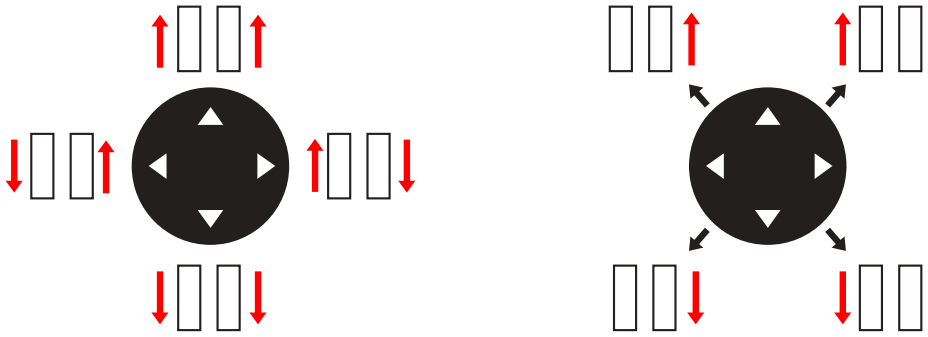
- When the machine is enabled, the motor may be started by turning the key on start and releasing upon start.

For cold starting, move the engine air lever on closed and back to open as soon as the engine has started  **.**

To make starting easier it is also recommended to move one of the levers of the outriggers' distributors at the same time as the start-up key is turned.

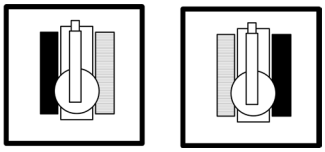
6.3 Moving the machine SPX312CP - SPX312C+

- Start the machine (see ch. 6.2)..
- Hold the joystick and press the "DEAD MAN" button and move the central lever forward and backward to translate the machine.



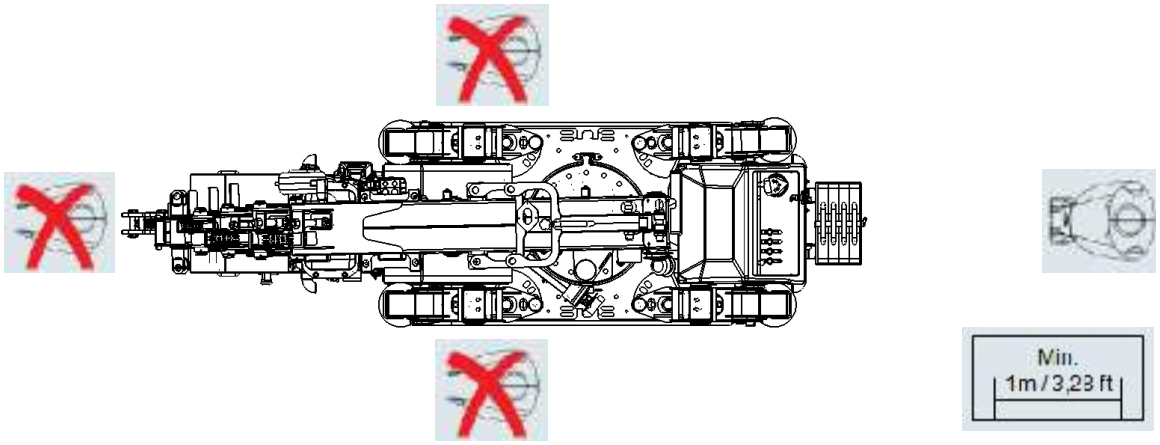
To move the crane with the radio control (optional), instead, turn the suitable key on the control panel ON and refer to page 42.

- CRAWLER OPENING (OPTIONAL): to increase machine stability during translation, if the machine is fitted with it, the crawlers may be widened by pressing and holding the button "OUTRIGGERS SELECTION/CRAWLERS OPENING-CLOSING" on the control panel and pushing up or down the first two levers of the control panel to open or close the crawlers (see page 41).



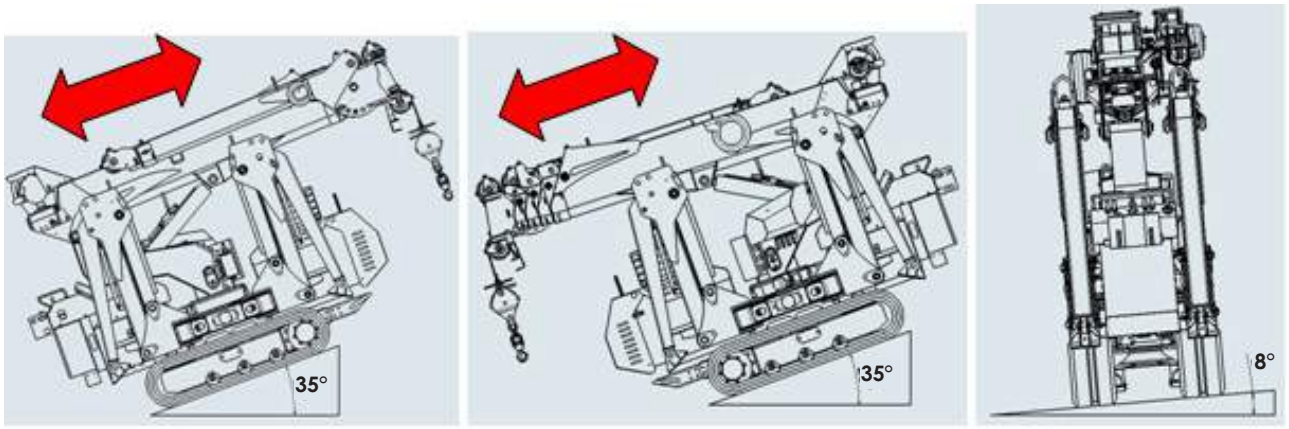
- After positioning the machine in the desired point, release the button "OUTRIGGERS SELECTION/CRAWLERS OPENING-CLOSING"
- Ensure the crawlers on the picture in the display are highlighted in green.

CAUTION!
During translation, the only safe station is the rear one.



CAUTION!
Always move along the maximum slope direction

MAXIMUM GRADEABILITY (ONLY IN CARRIER MODE):



6.4 Outrigging the machine SPX312CP - SPX312C+

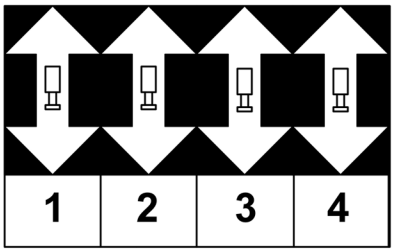
- Open the outeriggers by removing the locking pin, placing it in the maximum opening hole and reinsert the safety pin.

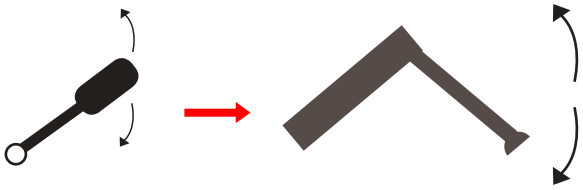
- Move the outrigger out, opening the "OUTRIGGER ROTATION LOCK", up to maximum opening 45° (as indicated in the sticker) to obtain maximum capacity.

Check successful blocking moving the outrigger manually.

An incorrectly outrigged machine may tilt over.

- Lower the outriggers with the suitable levers until the crawler is raised.

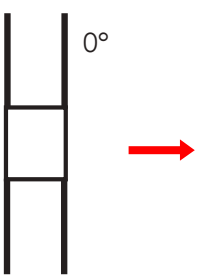




- Place the platforms (OPTIONAL) before the foot touches the ground.
- If the machine is correctly outrigged, the red dots and the outriggers icon on the display will turn green.
- Ensure the machine is suitably levelled.

CAUTION!

With maximum outriggers opening (45°), the machine must not work with crawlers on the ground. MAXIMUM HEIGHT OF CRAWLERS FROM THE GROUND 100 mm (0'3"). With outriggers open but at 0°, open the crawlers and place them on the ground to have a stable crane. In this mode THE MAXIMUM BOOM HEIGHT is 2 m (6 ft) and MAXIMUM PILLAR ROTATION is 2° to the RH and 2° to the LH.



The machine is equipped with a control system of the outrigger feet ground support.

When all the feet are resting on the ground, all movements are allowed except the crawlers control.

Do not tamper with the outrigger positioning detection system to alter machine operation.

The manufacturer disclaims all liability!

Do not work on floor slabs of which the structural features are not known.

Do not use incorrectly sized platforms.

The owner of the machine and/or the safety manager are responsible for verifying that starting up, movement and outrigging operations are carried out by qualified personnel. During placement, either on floor slab or soil, it is the operator's responsibility to have adequate support for the outriggers.

The following table provides indicative values of the bearing capacity of various types of soil.
These values are purely indicative and do not provide binding information on the actual bearing capacity of the various types of soil in various compositions and conditions.
The actual bearing capacity data of each type of soil may only be obtained through penetration tests carried out by an experienced professional.

INDICATIVE TABLE ON THE BEARING CAPACITY OF SOME SOIL TYPES	
TYPE OF SOIL	**BEARING CAPACITY IN Kg/cm2 (lb/ftq)**
Non-compacted filling soil	0 - 1 (0 - 2080)
Mud, peat etc.	0 (0)
Sand	1,5 (3120)
Gravel	2 (4160)
Loose soil	0 (0)
Soft soil	0,4 (832)
Hard soil	1 (2080)
Semi-solid soil	2 (4160)
Solid soil	4 (8320)
Rock	15 - 30 (31200 - 62400)

In order to correctly size a support plate to be inserted underneath the outrigger plate - once the actual bearing capacity of the soil is known - follow this expression:

MAX OUTRIGGER REACTION [kg-lbs]/SOIL BEARING CAPACITY [kg/cm2-lbs/ftq]= MINIMUM PLATE SURFACE [cm2-ftq]

Example:

Max. reaction exerted by individual outrigger (check "Technical Data" paragraph) = 1400 kg (3086 lbs)

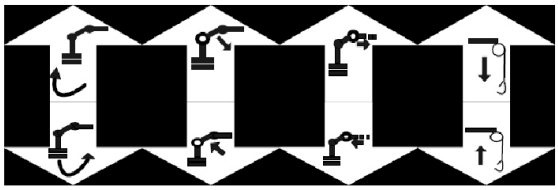
Soil bearing capacity = 4 kg/cm2 (8320 lb/ftq)

***Minimum** surface required for the support plate = 1400 / 4 = 350 cm2 (3086 / 8320 = 0.370 ftq)*

CAUTION !!!
Only use certified and suitably sized plates.

6.5 Use of the crane SPX312CP - SPX312C+

Use the manual levers on the control unit (see page 41) or the radio control (optional) (see page 42).



Safety requirements during operation:

- assess load condition before lifting it;
- correctly use the harness (rope or chain), correctly sized for the load to be lifted, and the vertical hook above the the load's centre of gravity;
- before starting and stopping movements, ensure there are no persons and/or obstacles in the hazardous area of the crane and moving load;
- stop movements in case of emergency;
- pay attention when actuating several operations at the same time;
- pay attention to the semaphore on the machine or to the lights at the top left of the display in the controls area;
- it is forbidden to drag loads, including lifting an overload by luffing inward;
- take precautions to avoid contact between the load (or the load lifting equipment) and the structure;
- it is forbidden to work in adverse weather conditions such as storm or lightning storm. Immediately close the machine and take it to a sheltered area;
- should the crane be hit by lightning, stop with emergency button and contact the support service for complete testing
- do not perform welding on lifted loads that have not been properly insulated.

6.6 Switching off and setting aside the machine

SPX312CP

- Ensure the crane boom is in central, horizontal position and with no applied loads. To be sure the boom pillar is in the central position, it must be perfectly aligned with the "PILLAR ROTATION CENTRING SENSOR"
- When the pillar and carrier on the display are green, the outriggers may be retracted
- Retract the outriggers and park the machine
- Move the key on the control panel to 0 position
- Turn the battery switch OFF.
- To avoid machine deterioration, keep it away from weathering and cover it with a waterproof tarpaulin

At the end of the work, to avoid use of the machine by unauthorised persons, the keys must be extracted from the control panel and placed in a safe place.

SPX312C+

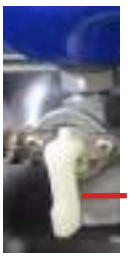
- Ensure the crane boom is in central, horizontal position and with no applied loads.
- When the pillar and carrier on the display are green, the outriggers may be retracted
- Retract the outriggers and park the machine
- Move the key on the control panel to 0 position
- Turn the battery switch OFF.
- Unplug the machine-battery compartment supply plug
- To avoid machine deterioration, keep it away from weathering and cover it with a waterproof tarpaulin
- In the event of setting aside the machine for extended periods of time, before starting up check the charge level of batteries and, if necessary, recharge them before operating the crane

At the end of the work, to avoid use of the machine by unauthorised persons, the keys must be extracted from the control panel and placed in a safe place.

6.7 Manual electrical starting combustion engine SPX312CP

In the event the engine should not start from the control panel, it may be started manually with the electrical starter motor on the engine.

- Turn the battery switch ON.
- Ensure the engine tank cock is open.



TANK COCK

- First turn the engine key ON (first click) then on starting up (second click).
  When the key is released, it automatically goes back to ON.
- In case of first ignition or particularly cold climates, move the engine's "MANUAL ACCELERATOR" lever to the maximum. When the machine has started up, move the lever back to minimum.

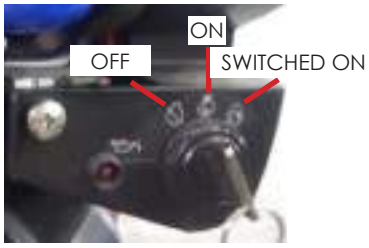
- To accelerate manually, use the suitable lever on the engine compartment.

6.8 Pull start / Emergency start

SPX312CP

In the event the engine should not start from the control panel, it may be started manually by pull starting.

- Turn the key to the ON position.



- Pull the rope with the handle.

- In case of first ignition or particularly cold climates, move the engine's "MANUAL ACCELERATOR" lever to the maximum. When the machine has started up, move the lever back to minimum (see 6.7).

SPX312C+

In the event the electrical motor should not start from the control panel:

- Ensure the battery switch is in the ON positon.
- Turn the electrical motor bypass key located above the battery switch (see page 30)

6.9 Low temperature starting

Heating kit:

- Heat the hydraulic oil. Connect the grey plug under the control unit.

- Connect the blue plug to power supply.

- Press the button and wait 30 min. for the heating. When the temperature is reached, the light goes out.

6.10 Use in emergency SPX312CP - SPX312C+

CAUTION!!
IN THE EVENT THE ELECTRONIC CONTROL UNITS SHOULD NOT WORK, CALL TECHNICAL SUPPORT!!

For emergency use, some seals must be removed from the solenoid valves and one must act directly on the hydraulic distributors, by manually actuating the individual manoeuvres.

6.11 Limiter bypass SPX312CP - SPX312C+

The Bypass limiter key allows the desired manoeuvres to be performed with activation of alarms no. 22 and 23 ("Maximum radius lock" and "Spooled out rope micro lock"). When one of the two alarms is triggered, the bypass may be activated with the suitable key, which makes it possible to proceed with the manoeuvre within a maxim time of one minute after pressing the horn button on the control unit.
When the timer has expired, the bypass may be activated again with the key for another minute to perform other manoeuvres or to complete the manoeuvre in progress.

CAUTION!!

Pay the utmost attention during this operation.

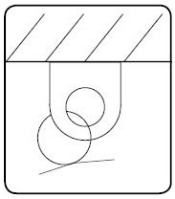
The bypass system may ONLY be used to restore the machine's safety condition.

During bypass operations, responsibility lies exclusively with the operator.

The manufacturer disclaims any responsibility in the event of use of the crane outside the above mentioned warnings.

7 HANDLING AND TRANSPORT

7.1 Anchoring for transport



Each machine has four fastening points indicated by a suitable sticker for anchoring the machine during transport:

Turn off the machine, turn the battery switch OFF and close the petrol tank valve before performing transport. No person is allowed to stand near or on the machine to avoid risks connected with sudden movements.

For safety reasons, never lift or toe the machine by means of the booms.

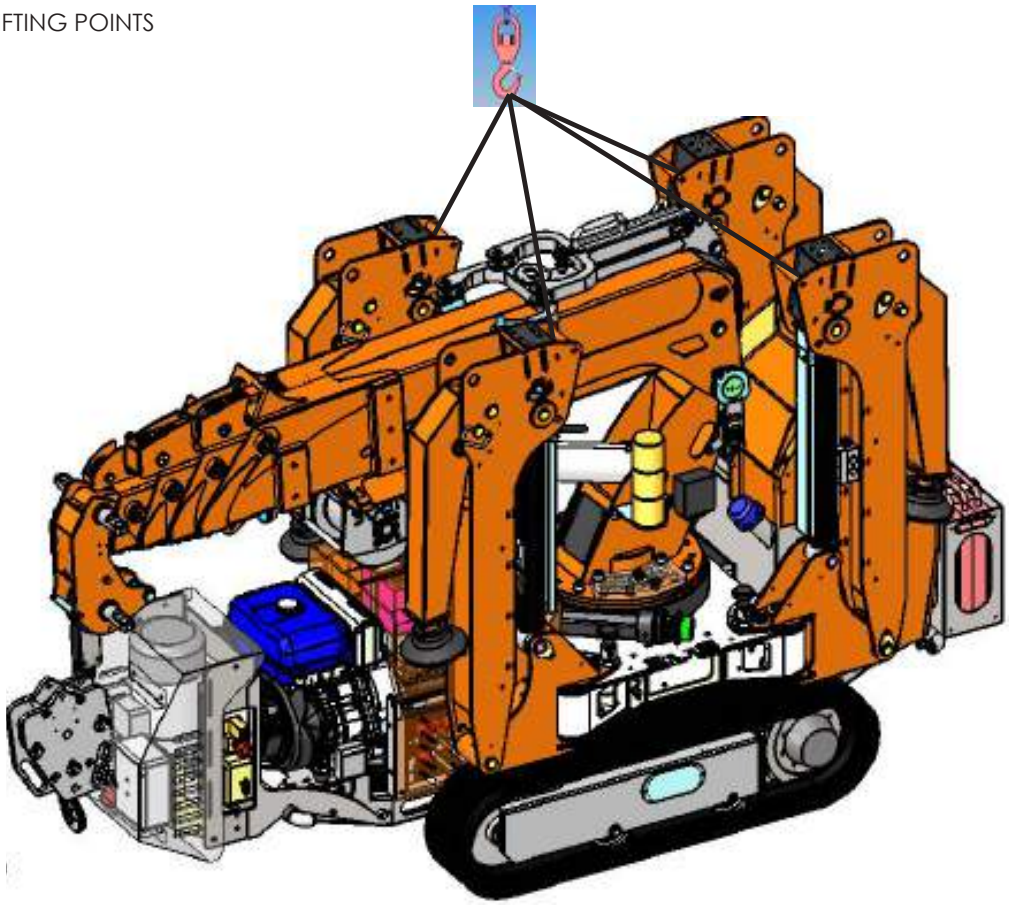
Perform the loading operation on a flat surface and with adequate bearing capacity.

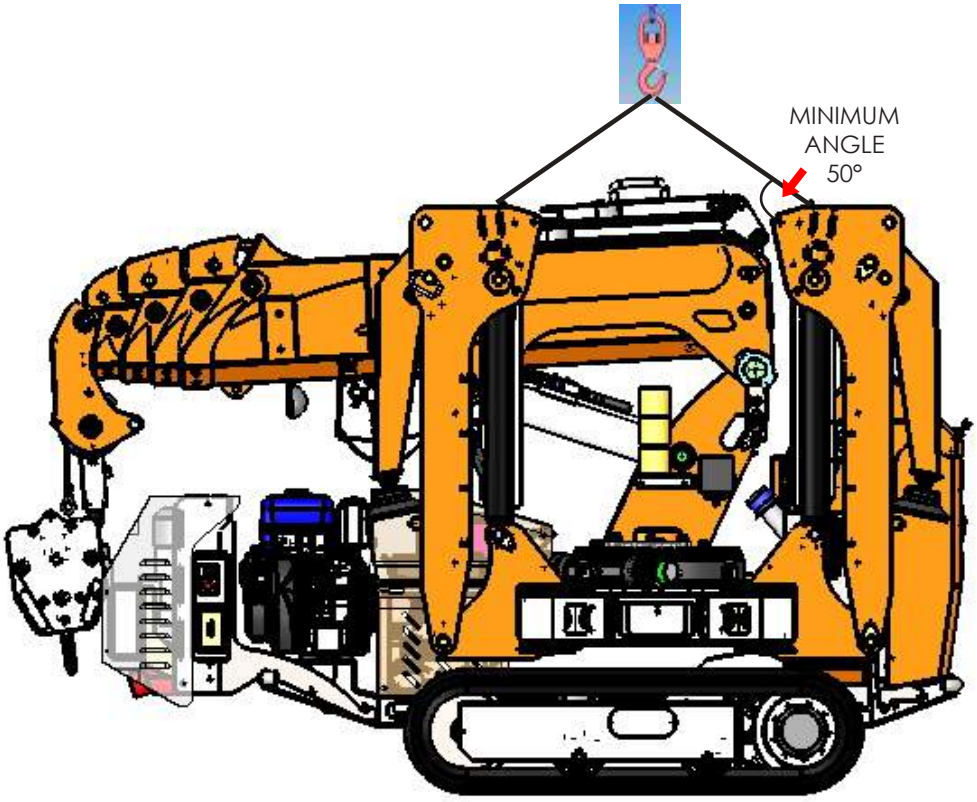
7.2 Lifting anchors

Each machine has four anchoring points indicated by a suitable sticker for lifting the machine:

Before performing any removal operation, ensure there are no persons near the machine and, in any case, proceed with the utmost caution.

LIFTING POINTS





IT IS FORBIDDEN to lift the machine with other systems than indicated in the points above.

Before every machine removal it is necessary to ensure that any connection plugs are detached from the power supply point.

Before proceeding with transport, ascertain the degree of stability.

Do not use the machine on uneven and non-solid ground to avoid possible instability. To prevent the machine from tipping over, you must comply with the maximum admissible slope set out in the relevant paragraph.

In any case movement on slopes must be carried out with the utmost caution.

The machine must not be used directly for road transport.

Check the work area to ensure there are no obstacles or other dangers.

Do not use the machine to tow other equipment.

8 MALFUNCTIONING SELF-DIAGNOSIS

8.1 Machine alarms and warnings

The file delivered separately and attached to this manual, provides the tables with alarms (viewed on the display, see 4.1) and possible solutions.

Note: every time a fault or alarm occurs, after carrying out the appropriate diagnostics and removing the cause, the alarm must be reset:
- by pressing ENTER from the alarms page
or
- power cycle the machine after pressing and releasing the emergency
or
- upon switching on the machine, the green light switches on only after the machine is enabled, by pressing the ENTER button.

9 COMMISSIONING

9.1 Inspection before commissioning / Periodic checks / Check after a long period of inactivity

Below is a list of all specific and accurate measures to be taken before, during and after a long period of inactivity for the mobile crane.

SPX312CP - SPX312C+			
	INSPECTION BEFORE COMMISSIONING	PERIODIC CHECKS	INSPECTION AFTER A LONG PERIOD OF INACTIVITY
check cleanliness of all components	X	X	X
check correct operation of safety devices	X	X	X
ensure the outrigger feet are in good condition	X	X	X
ensure the crawlers are in good condition	X	X	X
check conditions of the lifting chain: winch, rope, pulleys, eyebolts, block and hook	X	X	X
check hydraulic oil level in the tank and absence of any oil leaks from the oil-hydraulic system	X	X	X
check engine operation, oil level and fuel level	X	X	X
ensure controls and gauges are perfectly efficient (e.g. load condition, fluid level, engine operation, hydraulic pressure, electrical power supply, wear limitations)	X	X	X
check all electrical components	X	X	X
check isolating parts of external cables	X	X	X
visual inspection of the state of the metal structure	X	X	X
check braking system efficiency	X	X	X
ensure the structure does not show any evident defects (check the welds of the lifting structure)	X	X	X
check correct slewing and lifting movement of the boom	X	X	X
check correct lifting movement of the jib (accessory)	X	X	X
check liquid level in batteries	X	X	X
check charge level of batteries	X	X	X
check greasing	X	X	X

10 MAINTENANCE

10.1 Scheduled maintenance

This section describes the routine maintenance that the operator can perform on his/her own.
Please note that regular and careful maintenance maintains and prolongs machine performance.
Failures and malfunctions often entail higher costs in terms of time and money compared to those incurred with proper maintenance.
Upon reaching an extraordinary maintenance deadline, when the display turns on it shows the suitable deadline warning icon.
The basic set deadlines are at 500 and 1000 working hours.

The owner of the machine and/or the safety manager are responsible for verifying that maintenance and/or repairs are carried out by qualified and instructed personnel.

Perform maintenance with the machine stopped.

Only perform the maintenance and adjustments described in this manual. In case of need (e.g. fault, crawler replacement), exclusively contact technical support.

SPX312CP - Perform engine maintenance operations when it has been turned off and has cooled sufficiently (with the exception of those operations - such as oil change - that require hot engine). Burn hazard in contact with hot parts. (Refer to the relevant engine manual).

SPX312CP - Do not use petrol or other flammable materials to clean the engine.

SPX312CP - For engine maintenance operations, always refer to the instructions booklet of the engine manufacturer provided upon purchasing the machine.

Do not tamper with or modify the setting of any components of the electric and hydraulic system.

CAUTION!! IT IS STRICTLY FORBIDDEN TO MODIFY OR TAMPER WITH MACHINE COMPONENTS AFFECTING.

Washing

Avoid using degreasers and/or acid detergents. The plant is suitable to be washed with detergents for painted surfaces, taking care to adequately protect:
- the controls area;
- the battery compartment area;
- the electrical panel and all electrical boxes in general;
- the electrical motors.

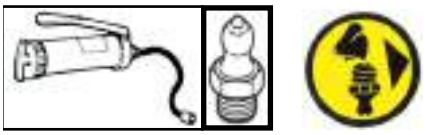
IT IS STRICTLY FORBIDDEN TO USE DIRECT WATER SPRAY ON WIRING, PLUGS, ELECTRIC MOTORS AND ELECTRONIC BOARDS.

Once the machine washing process is completed, it is important to:
- dry the machine;
- verify the integrity of plates and adhesives;
- lubricate the pivot points fitted with grease nipples.

Lubrication

All greasing operations must be performed with machine stationary and emergency button pressed.

The greasing areas provided by the manufacturer are fitted with suitable greasing nipple and marked by a suitable sticker:



The pivot points must be greased at least once a month.
Furthermore, remember to grease the pivot points:
- after washing the machine;
- before using the machine again after a long downtime;
- after using the machine in particularly harsh environmental conditions (high humidity, very dusty, coastal areas, etc.)

RECOMMENDED GREASE:
LITHIUM BASED GREASE for temperatures between -20° and +50°

Welding

Welding operations do not fall within routine maintenance.
Welding operations must be performed only at authorised centres.

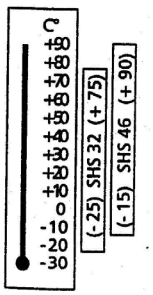
Engine (PETROL) (SPX312CP)

- For information on maintenance, refer to the relevant use and maintenance manual

Hydraulic oil

For any top-ups or to replace the hydraulic oil, only use:

CAUTION!!
If operating in especially cold climates with temperatures dropping considerably below zero, it is recommended to use oil with viscosity VG32



Waste oil must exclusively be disposed of through an authorised collection centre.

10.2 Battery recharge SPX312C+

The machine is equipped with an automatic battery charger to be used during operation with motor off.

- Connect the machine-battery pack connector

- Connect the power supply cable with the suitable plug

- The machine does not need to be on for the battery to be recharged nor for the battery switch to be ON. After connection, the warning light comes on (Red=Discharged Yellow=80% Green=100%)

- The battery charger starts and stops automatically with no need for any outside intervention.

Do not perform temporary or anomalous electrical connections.

Properly check the battery charge status.

The terminals must be properly tightened and free from scaling/ oxidation. The cables must have isolating parts in good conditions.

Avoid taking the battery to the discharge limit (<10.5 Volt) since recharging times would subsequently extend significantly and there is the risk of damaging it. As soon as the machine is outrigged, if you wish to work with the three-phase motor, it is recommended to connect electrical power supply as soon as possible and work on the mains.

At the end of the work day, or when long inactive periods are scheduled for the machine, always remember to disconnect the machine-battery pack connector.

Warnings on the battery charger and recharging

- Ensure the type of available power supply matches the stated voltage in the battery charger plate
- In the event of using an extension cord or power strip, ensure these support the total required current
- Disconnect the power supply before connecting or disconnecting connections to the battery
- To recharge Lead batteries: ATTENTION !!!:EXPLOSIVE GAS > Avoid the formation of flames and sparks. The battery must be positioned in a well ventilated area
- Ensure the rated voltage of the battery to be recharged matches that indicated in the battery charger plate
- Do not attempt repairing the battery charger. Opening the cover might expose you to the risk of electrical shocks
- In the event the battery charger should not work correctly or be damaged, immediately disconnect it from the power outlet and the battery socket and contact the dealer
- Always wear personal protection equipment (gloves, goggles,…) when operating on the batteries
- Never add acid to the batteries
- Always keep the batteries clean and dry
- Do not expose to heat sources
- Ensure the electrolyte caps are closed well

How to extend battery life

- Ensure the electrolyte level is above the plates
- Close the caps well before recharging
- Do not interrupt the charge cycle
- Never recharge a cold battery
- Only perform recharging in well ventilated areas
- Only add water after completely recharging the battery
- Never let the electrolyte level go below the plates
- Exclusively use distilled water or with low mineral content
- Do not let anything fall into the battery
- Exclusively clean with water and dry
- Protect the cables with anti-corrosion products
- Place in a cool and dry area

- Avoid exposing it to heat sources

Keep the battery clean, dry and free from oxidation products using anti-static cloths.

Do not place tools or any other metal object on the battery.

In the presence of operation anomalies attributable to the battery, avoid intervening directly and warn the Technical Support Service.

In order to limit battery self-discharge during periods of inactivity, store the machine in premises with temperatures lower than 30°C.

Replace the old batteries only with models having identical voltage, capacity, dimensions and mass.

The batteries must be approved by the manufacturer.

10.3 General safety warnings for maintenance operations

- The machine must be parked on a level surface
- Operate when cold.
- Do not perform repairs or maintenance when the machine is connected to the power supply.
- The lifted machine should be placed on blocks and must not remain suspended
- All removed parts must be supported by solid surfaces and placed so they do not fall if the hydraulic pressure drops
- All lifting equipment must comply with regulations in force
- Avoid climbing on the machine if possible.
  Use suitable lifting platforms for work at height
- Protect yourself with appropriate PPE (gloves, goggles, clothing, etc.)
- Do not wear jewellery or other items that may be lost while working
- Pay attention to damaging hydraulic piping and electric cables during repair operations, check their condition upon completing the work
- Only use correct equipment
- During maintenance, do not disperse any waste in the surrounding environment, but comply with the provisions of the regulation in force
- SPX312CP - For engine maintenance (Petrol), integrate the instructions of this manual with the instructions in the engine's manual

10.4 Extraordinary maintenance

Maintenance to be carried out only by the authorised technical service centre.

The next page shows the maintenance sheet with hourly deadlines.
Extraordinary maintenance operations are those with 500, 1000 hour intervals and yearly.
The operator must contact the support service upon reaching a deadline in order to avoid voiding the warranty.

10.4.1 Maintenance sheet

SPX312CP - SPX312C+ MAINTENANCE CARD						
MODEL	**CUSTOMER**	**SERIAL NUMBER:**				
COMPONENT	**TYPE OF CHECK**	Daily	Weekly	500 hours	1000 hours or yearly	
1. STRUCTURE						
• Main supports	Lack of cracking		X	X	X	
• Crane boom frame and extensions	Lack of cracking-Greasing		X	X	X	
• Outriggers	Lack of cracking-Greasing		X	X	X	
• Extensible chains	Wear-Greasing-Fastening		X	X	X	
• Pins	Conditions-Fastening			X	X	
• Carrier	Conditions and wear of crawlers			X	X	
• Carrier fastening bolts	Conditions-Tightening			X	X	
• Crane fastening bolts	Conditions-Tightening			X	X	
• Structure fastening bolts	Conditions-Tightening			X	X	
2. LIFTING SYSTEM						
• Lifting hook	Lack of cracking	X				
• Winch cable	Conditions and wear	X				
• Lifting chains	Lubrication-Elongation check-Loading tests		X			
3. HYDRAULIC SYSTEM						
• Pumps	Oil leaks-Noise level			X	X	
• Oil tank	Oil level-Oil conditions			X	X	
• Hydraulic oil	Replacement				X	
• Filters	Replacement			X	X	
• Crane jacks valves	Seepage-Operation	X				
• Outriggers valves	Seepage-Operation	X				
• Carrier and crane distributor	Seepage-Operation				X	
• Flexible piping	Seepage-Wear			X	X	
• Hydraulic pressure	Check			X	X	
4. ELECTRICAL COMPONENTS						
• All boards	Oxidation			X	X	
• Power line	Conditions			X	X	
• Battery charger	Conditions and operation	X		X	X	
• Batteries	Electrolyte level		X	X	X	
• Electric motor	Conditions and operation				X	
• Pressure transducer	Operation	X				
• Extension and angle transducer	Operation	X				
• Proximity sensors	Operation	X				
5. SAFETY DEVICES						
• Emergency button	Operation	X				
• Control panel signals	Operation	X				
• AntiTwoBlock	Triggering	X				
• Limiter	Triggering			X	X	
• Rope limit switch	Triggering			X	X	
6. ACCESSORIES						
• Winch	Lubrication			X	X	
• Three-phase kit	Operation-Absence of seepage		X	X	X	
7. SAFETY SIGNALS						
• Crane and accessories "CE" plate	Status and visibility		X	X	X	
• Stickers and visual signs	Status and visibility		X	X	X	
8. ENGINE (PETROL) SPX312CP						
• Crankcase oil level*	Check	X				
***Refer to the relevant use and maintenance manual of the engine (petrol) for additional details on its maintenance.**						

10.4.2 Check of chains measurement, wear, tensioning

The chains must be checked by skilled and instructed personnel.

The machine is equipped with flyer chains type DIN LH 0844 - BL 444, DIN LH 1244 - BL 644, DIN LH 1266 - BL 666.

Due to the friction between pins and plates in flyer chains, the chains are subject to elongation; **maximum allowed elongation is 3%, beyond this limit the chain must be replaced (3% = 30 mm/m)**. The chains must also be replaced if visible damage is present.

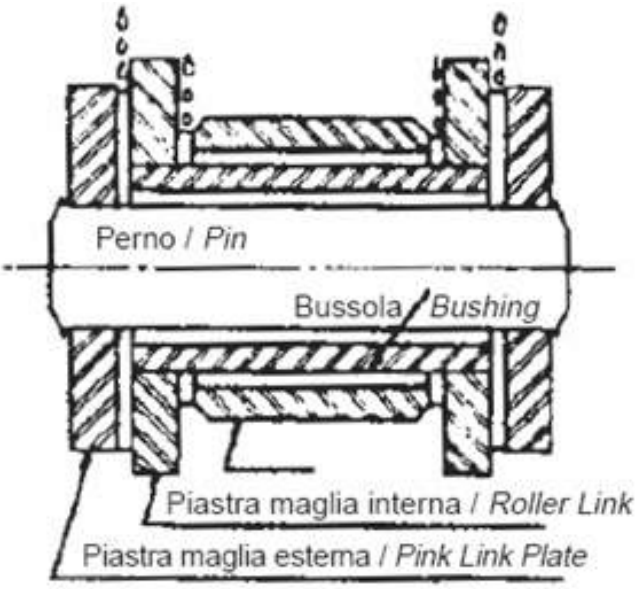
- The chain must be tensioned.
- Perform the check as close as possible to the transmission pulley, on a straight chain stretch.
- Perform the check by measuring 8 chain pitches.
- Position appendices 1 and 2 on the protruding pins of the chain.

Suitable instruments which may be purchased on the market are used for the check.
Below is an example:

The marks will indicate:

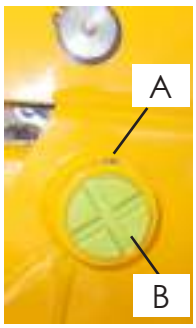
- new chain with length close to nominal value
- chain with 1.5% elongation
- **chain with 3% elongation to be replaced according to the regulations**

The oil is applied with paintbrush or sprayer, in the gap between the chain roller and pin.
It shall be applied at approx. 40-hour cycles or shorter intervals in the event the application should lead the parts to dry early.



Temperatura °C *Temperature*			Lubrificante consigliato *Recommended lubricant*
Da / *From* −6	a / *to* +5		SAE 20
Da / *From* +5	a / *to* +38		SAE 30
Da / *From* +38	a / *to* +49		SAE 40
Da / *From* +49	a / *to* +60		SAE 50

10.4.3 Adjustment of shoe and boom play



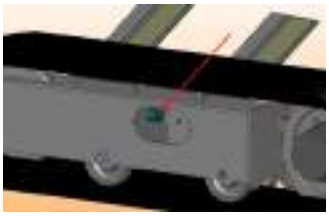
Check yearly the wear condition of the boom sliding shoes.
The correct play between shoes and boom is 0.5 - 1 mm (0'002" - 0'003"); in the event of high play, tighten the shoes as follows:
- unscrew the locking grub screw (**A**);
- tighten the shoe (**B**) with a screwdriver until achieving the play mentioned above.

IN VIEW OF THE IMPORTANCE OF THE OPERATION, IT IS RECOMMENDED IT IS CARRIED OUT ONLY BYvSKILLED TECHNICAL PERSONNEL.
CONTACT TECHNICAL SUPPORT.

10.4.4 Check crawler condition and tension

The duration of the rubber crawlers depends on the type of terrain on which the machine is used. Crawler replacement is necessary in the event tread grooves reach a height less than or equal to 10-12 mm (0'03" - 0'04"), or when cuts and/or tears are apparent.
For longer duration of the crawlers, tensioning must be checked at least once a month.

To check crawler tensioning:
- lift the carrier off the ground with the outrigging control;
- visually check the play of the crawlers;
- in the event of higher play than stated, tension the crawlers by pumping lubricating grease into the suitable valve (see photo). (refer to relevant crawler manual).



CAUTION!!
ANY CRAWLER REPLACEMENT MUST BE PERFORMED BY SKILLED PERSONNEL. CONTACT TECHNICAL SUPPORT.

10.4.5 Rope checks

The procedures to check a rope are detailed below, listing the cases when it must be replaced, in order to assure efficiency and safety of lifting operations.
The rope is a component that must be replaced every time the inspection should prove that its resistance has decreased to the point that any use would be dangerous.
The life of a rope varies in relation to the special conditions of use.
The ropes may be permanently marked even after performing few lifts or
even after the first lift if they work on sharp edges or very narrow curvature radii of the material, thus decreasing their rated capacity up to more than 50 %.
At any event, safe handling of loads always requires regularly checking the rope to allow it to be replaced properly in time.
Furthermore, at times the ropes are used in special settings or in difficult conditions where the rope might be exposed to risks of accidental damage. (e.g. collision with other blocks).

In these cases, the rope must be checked with special care and it must be immediately replaced should critical damage conditions be found.
The ropes for handling loads must undergo daily visual inspection to identify any deterioration and deformation.
The criteria to check and replace a rope are as follows:
- check connecting points at both ends;
- check for broken wires of the strands;
- check all parts of the rope that might be subject to abrasion (contact with the material);
- check the internal part of the rope (corrosion and fatigue).

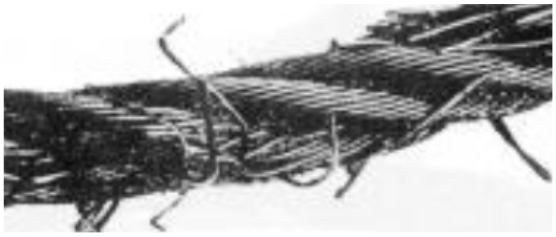
When a modification in the rope's original condition is detected, a more detailed inspection must be carried out by competent personnel, who shall decide whether to replace the rope or not.
The rope must be replaced based on the following:
a) nature and number of the broken wires;
b) broken metal wires in the connecting point;
c) broken strands;
d) diminished elasticity;
e) degree of wear (external and internal);
f) degree of corrosion (external and internal);
g) deformation.

a) Nature and number of broken wires
The broken wires visible on the outside of the rope must be counted, obviously taking under consideration the most worn stretch of rope.
The count must be done on both lengths and the rope must be replaced if the broken wires exceed the stated minimum values even in one length only.

Broken wires in a strand together with slight wear, in a parallel lay rope.
Keep the rope under control, remove the broken wires so that the ends are flush against the outer profile.
Replace the rope

Broken wires and wires moving in two adjacent strands in a cross-lay rope.
Replace the rope

Broken wires in a number of strands.
Immediately replace the rope



Rope strained by continuous rubbing, leading to flattening and deformation with wear and broken wires.
Immediately replace the rope

High number of broken wires, together with severe wear, in a cross-lay rope.
Immediately replace the rope

Cumulative effects of several deterioration factors. Wear of outer wires, their deformation in a birdcage and many broken wires.
Immediately replace the rope

b) Broken metal wires in the connecting point

Broken metal wires in connecting points, or close to them, indicate that the tension exerted there is high and may have been caused by incorrect fitting of the connecting terminals.
The exact cause of the damage must be sought and, if possible, remake the connection very accurately, shortening the rope, as long as a sufficient length remains for the subsequent use.

Broken wires in two strands, close to the connecting point due to strain.
Replace the rope

c) Broken strand

If a strand breaks, the wire rope must be replaced.

d) Diminished elasticity

In some cases a rope may undergo a substantial decrease in elasticity, which will make its subsequent use dangerous. The decrease in elasticity is hard to assess, in case of doubt it will be necessary to request the opinion of an expert in the matter of ropes.
This fault is generally associated to the presence of the following symptoms:

- reduction of the rope diameter;
- rope elongation;
- lack of space between individual wires and between strands, caused by mutual compression of the various elements;
- appearance of a fine dark dust within the strands;
- although no rupture is visible, the rope is a lot stiffer to handle and certainly features diameter reduction, greater than that caused by wear of individual wires.

This type of condition may lead to sudden rupture under dynamic load and this is enough to lead to immediate replacement.

e) Degree of wear (external and internal)

Another cause which might bring about rope replacement is wire wear.
Flattening of the wire foretells their rupture in a short time.
When a rope is worn therefore, the interval between inspections must be reduced in order to keep under control the wires and, in the event the worn wires should feature a reduction in diameter equal to 50%, the rope must be replaced.

Wear decreases rope resistance, when the outer rope diameter is reduced by 7% or more with respect to the rope's nominal diameter, it must be replaced, even if no broken wires are visible.
Wear may take place in two ways:
- internal wear and denting (caused by friction between individual strands and rope wires);
- external wear (rubbing under pressure of the rope with the pulley grooves and drums,

this phenomenon is especially evident in moving ropes, in points of contact with the pulley, when the load is in the starting or braking stage and is highlighted by flattening of the surface of outer wires).
In order to prevent this phenomenon, it is recommended to lubricate correctly the rope and reduce to the minimum the presence of sand and dust.

f) Degree of corrosion (external and internal)

Corrosion may also lead to broken wires, but diameter reduction being equal, corrosion brings about more severe deterioration and wear.
The rule set out in the previous paragraph is thus valid but it should be applied with more caution since if corrosion is inside the rope, it requires much experience for its identification (opening the strands with appropriate clamps).
Corrosion may not only decrease breaking strength, due to the reduction in the rope's metal section, but also accelerate phenomena due to fatigue, thus bringing about unevenness on the surface.
Corrosion may take place in two ways:
- external corrosion (may be visually detected);
- internal corrosion.

It is harder to detect, but may be recognised through the following phenomena:
a) change in the rope diameter;
b) decreased space between strands in the rope's outer layer.
In the event internal corrosion is suspected, the rope must undergo an internal inspection, carried out by skilled personnel.
Confirmation of internal corrosion calls for immediate replacement of the rope.

g) Deformation

"Rope deformation" is a visible distortion with respect to its normal composition.
There are various types of distortion which, based on their appearance are divided into the following main deformations:

1. HELICAL DISTORTION

This deformation occurs when the axis of the rope looks like a helix.
This distortion, if of a certain severity, may transmit a vibration which brings about irregular rope control, and may cause wear and rupture of wires in the long term.
Replace the rope in case:
$d1 \geq 4\ d / 3$
“d1” is the diameter corresponding to the envelope of the deformed rope;
“ d ” is the rope diameter;
the length of the rope taken under consideration must not exceed 25 d.

Helical distortion: a deformation where the longitudinal axis of the rope takes a helix shape. The rope must be replaced when the deformation exceeds the value set out in point a) "Nature and number of wire ruptures".

2. BIRDCAGE DISTORTION

This type of deformation occurs in ropes with metal core, it is brought about when the layer of outer wires shifts or when the outer strands are longer than the inner ones.
When "birdcage distortion" occurs, the rope must be replaced immediately.

Protrusion of the metal core,
generally associated to
birdcage distortion in the adjacent area.
Immediately replace the rope

Birdcage distortion of a multi-strand rope.
Immediately replace the rope

3. PROTRUSION OF STRANDS

This phenomenon is often associated to birdcage distortion, when rope imbalance is indicated by core protrusion.
When strand protrusion occurs, the rope must be immediately replaced.

Strand wire protrusion due to repeated
“Tearing”.
Immediately replace the rope

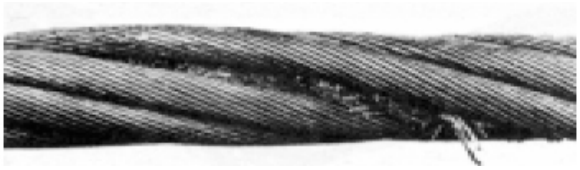
4. PROTRUSION OF STRANDS

This phenomenon arises when some wires or groups of wires separate on the side of the rope opposite the pulley groove, with formation of knots.
This case usually occurs when the load is subject to a sudden shock.
When the protrusion of wires is significant, it is justified to replace the rope.

Protrusion of wires from a strand, normally
this anomaly occurs on the same strand
in the length equal to one winding.
Replace the rope

5. LOCALISED ROPE DIAMETER INCREASE

Occurrence of this phenomenon
normally involves core distortion,
bringing about an imbalance in the outer strands.
An excessive increase may justify
rope replacement.



Rope diameter increase due to
the textile core protruding.
Replace the rope

Protrusion of the metal core due to
a distortion arising from sudden load.
Immediate rope replacement

6. LOCALISED ROPE DIAMETER DECREASE

This phenomenon arises when some wires or
groups of wires separate on the side of the rope
opposite the pulley groove, with formation of knots.
This case usually occurs when the load is subject
to a sudden shock.
When the protrusion of wires is significant, it is justified to
replace the rope.

Localised decrease in the rope diameter
as the outer strands occupy the place
of the textile core which has been destroyed.
Immediately replace the rope

Localised crushing with presence of broken wires.
Replace the rope

7. FLATTENED PARTS

It is the result of a mechanical damage.
If the flattened parts are of a certain extent, the rope
must be replaced.

Flattened multi-strand rope due to
incorrect spooling onto the drum, this
causes tension imbalance in load conditions.
Replace the rope

8. TWISTING

This deformation is caused by a kink
in the rope, when it remains taut without
being able to rotate around its axis.
An imbalance occurs in the laying length, which
causes excessive wear and in the most severe cases,
the rope will be distorted to the point of retaining
only a minimal portion of its resistance.
Twisting is grounds for immediate replacement.

Severe rope twisting which causes
the textile core protruding.
Immediately replace the rope

Twisted rope during installation but
equally mounted, features
localised wear with loosening of the strands.
Immediately replace the rope

9. KINKS

These are angular distortions which arise
from external causes.
This phenomenon justifies immediate rope
replacement.

Severe bend.
Immediately replace the rope

10.5 Spare parts

All spare parts required in case of breakage or during routine machine maintenance are available by directly accessing service.jekko.it .

If components are replaced, use only original spare parts.

10.6 Tools required for maintenance

All activities related to preventive and routine machine maintenance are carried out using standard equipment (e.g. screwdrivers, spanners, etc.) with the exception of bolts, for which we recommend using a torque spanner.

11 TOOLS REQUIRED FOR MAINTENANCE

11.1 Introduction

Directive 2006/42/EC stipulates theobligation of the machineuser, to maintain a log where routine and extraordinary maintenance operations will be noted, as well as the obligatory hourly servicing required for the validity of the warranty on structural parts, (see specific warranty certificate) and the required annual audits by the body responsible for the checks.
ORMET S.p.A. has thought to provide you with this log which will be up to you to preserve and keep updated.
Routine maintenance will, be carried out by carefully following the instructions provided in the individual instruction manuals attached to the machine.
Extraordinary maintenance not covered in the manuals, such as the replacement of a component or the repair of safety devices, will be performed by highly specialised personnel and at service centres authorised by the manufacturer.
The care and compilation of this log has an important function, as it allows you to keep the system under control, with clear benefits for your safety and that of others, and to demonstrate its efficiency and proper operation to any inspectors.
The instructions in this log and in the user manuals are provided in accordance with the provisions known at the time of the first start-up. New provisions could intervene to change your obligations. Our company, to the best of their skills and knowledge, will be at your full disposal for any clarifications.
The following can be noted in this log:

- The faults pertaining to a certain entity and its repairs, periodic checks.
- The replacement of structural, hydraulic and safety components.
- The transfers of ownership.

This log and operation manuals are an integral part of the machine and must accompany it throughout its service life.

This log includes the following:

- Use and storage.
- Maintenance and periodic check card.
- Service reports with sequential numbers and attachments.
- Transfer of information in the event of a sale or change of operator.

11.2 Cases that relieve the manufacturer from responsibility

THE FITTER SHALL BE RELIEVED FROM ANY LIABILITY IN THE FOLLOWING CASES:

1. IMPROPER USE OF THE MACHINE
2. TAMPERING
3. USE BY PERSONNEL NOT TRAINED IN PROFESSIONAL UTILISATION
4. SERIOUS DEFICIENCIES IN SCHEDULED MAINTENANCE
5. FULL OR PARTIAL BREACH OF INSTRUCTIONS
6. FAILURE TO COMPLETE OR UNDERWRITE PERIODIC INSPECTION CARD AND RELATIVE REPORTS
7. NO PERIODIC CHECKS
8. USE OF NON-ORIGINAL SPARE PARTS
9. UNAUTHORISED MODIFICATIONS AND INTERVENTIONS
10. EXCEPTIONAL EVENTS

11.3 Maintenance log

Among the following attachments are some pages to assist the operator in documenting the various interventions involving the machine during its service life.

Be sure to complete and to keep constantly updated.

11.4 List of maintenance operations

DATE	TYPE OF OPERATION	no. REPORT	MACHINE HOURS	SIGNATURE TECHNICIAN

11.5 Detailed maintenance operation cards

SERVICE REPORT No _____ date ____/____/____

(The service reports with corresponding sequential number are attached to the maintenance operation card)

Machine type: ..... Serial No. : .....

WORKSHOP THAT CARRIED OUT THE SERVICE

Company: .....

City: ..... postal code: .....

street address: ..... no. .....

DESCRIPTION OF OPERATION

STAMP AND SIGNATURE

.....

SERVICE REPORT No _____ date ____/____/____

(The service reports with corresponding sequential number are attached to the maintenance operation card)

Machine type: ..... Serial No. : .....

WORKSHOP THAT CARRIED OUT THE SERVICE

Company: .....

City: ..... postal code: .....

street address: ..... no. .....

DESCRIPTION OF OPERATION

STAMP AND SIGNATURE

.....

11.6 Detailed mandatory periodic inspection data sheets provided by the owner

INSPECTION		DESCRIPTION OF OPERATIONS TO BE PERFORMED	
• Visual inspection		Rust, oil leaks, pin retaining nuts on the structure, external cable insulation parts, welding, fuel leaks	
	DATE	**COMMENTS**	**STAMP and SIGNATURE**
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			
• Sundry adjustments		Nuts retaining pins on the structure, hydraulic fittings, bolts fastening the carrier, the crane and the structure	
	DATE	**COMMENTS**	**STAMP and SIGNATURE**
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			

INSPECTION		DESCRIPTION OF OPERATIONS TO BE PERFORMED	
• Deformation of pipes and cables		Check that the pipes and cables have no visible defects, especially in the pivot points	
	DATE	**COMMENTS**	**STAMP and SIGNATURE**
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			
• Greasing (weekly operation; log a report at least once every 6 months)		See page 68	
	DATE	**COMMENTS**	**STAMP and SIGNATURE**
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			

INSPECTION		DESCRIPTION OF OPERATIONS TO BE PERFORMED	
• Adhesive and plate check (monthly operation; log a report at least once a year)		See chapter 15. Check the presence and legibility of all the adhesives and any aluminium plates.	
	DATE	**COMMENTS**	**STAMP and SIGNATURE**
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			
• Oil level check and top-up		Keep under control the relevant oil level gauge on the machine and top up as needed, unscrewing the suitable tank cap	
	DATE	**COMMENTS**	**STAMP and SIGNATURE**
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			

INSPECTION		DESCRIPTION OF OPERATIONS TO BE PERFORMED	
• Lifting ropes wear conditions		See pages 74-75-76-77-78-79-80	
	DATE	**COMMENTS**	**STAMP and SIGNATURE**
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			
• Boom shoe play adjustments		See page 74	
	DATE	**COMMENTS**	**STAMP and SIGNATURE**
1st YEAR			
2nd YEAR			
3rd YEAR			
4th YEAR			
5th YEAR			
6th YEAR			
7th YEAR			
8th YEAR			
9th YEAR			
10th YEAR			

INSPECTION	DESCRIPTION OF OPERATIONS TO BE PERFORMED
• Check battery liquid level	Keep under control the liquid level by opening the suitable caps on the battery. Top up as needed with distilled water

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

12 SHEET FOR THE TRANSFER OF INFORMATION

TRANSFER OF KNOWLEDGE OF THE MANUAL

Date:.....

The undersigned, Mr.: .....

resident in ..... postal code.: .....

street address: ..... no. .....

Phone: .....

DECLARES UNDER THEIR OWN RESPONSIBILITY TO:

☑ have received and understood the machine operating instructions;
☑ have taken delivery of the manual and have mastered its content.

from Mr.: .....

resident in ..... postal code.: .....

street address: ..... no. .....

Phone: .....

AND AGREES TO THE TRANSFER OF KNOWLEDGE AND THE HANDOVER OF THE MANUAL TO ITS SUCCESSOR OR NEW OWNER.

IN WITNESS THEREOF
PREVIOUS OPERATOR

……..……

IN WITNESS THEREOF
NEW OPERATOR

……..……

13 ACCESSORIES

The accessories supplied must exclusively be installed and used on machines of the JEKKO line for which they have been designed and constructed.
The manufacturer disclaims all liability for unintended use.

13.1 Three-phase supply kit PP400-4DX for SPX312CP - PP400-4EX for SPX312C+

Premise
The three-phase kit on SPX312CP and on SPX312C+ allows the crane and carrier to be used with electrical power supply (400V).

Installation
- Anchor the three-phase kit with the quick connectors which are at the front of the mobile crane.

- Connect the relevant connector

- Connect the red plug for three-phase power supply (400V) in the suitable kit socket.

- Fasten the kit by tightening the suitable side bolts.

During installation, pay attention to persons in the surrounding area.

CAUTION!!
Tilting/falling hazard of unsupported sections!

Use

- Switch on the motor by means of the suitable black button and rotate the selector in position 1 or 2 (leave the selector in the position that involves correct rotation of the electric motor - clockwise direction indicated by the arrow).

In the event the motor has started but the machine does not work, invert the selector position (from 1 to 2 or from 2 to 1) in order to invert the motor's rotation direction.

In the event the motor should not start:
ensure the emergency button is not pressed or the rotation direction is correct.

- To switch off the motor, press the red emergency mushroom-headed button or turn the selector to 0

Removal

CAUTION!!
To remove the kit from the machine, turn off the motor as indicated above, disconnect the red power supply plug then the relevant fittings and connectors.

A different disconnection procedure might lead to dangers arising from ejection of fluids at high pressure.

In order to use the accessory, after mounting it, keep the button 

pressed on the display until the icon 

turns yellow. Press 

to confirm and the first two icons at top left from 

will turn 

and from 

the limiter 

will be confirmed.

13.2 Mechanical jib JIB800GX for SPX312CP - SPX312C+

Installation

During installation, pay attention to persons in the surrounding area.
CAUTION!!
Tilting/falling hazard of unsupported sections!

Remove the mechanical JIB 800GX from the rear of the boom on which it is fastened, removing the two side pins.

Fasten the JIB at the front-bottom of the boom using the two pins to fasten it to the crane.

IMPORTANT!!
Insert the relevant safety pins

Open the mechanical accessory, loosening the relevant screw knob.

After opening, fasten the JIB also at the front-top of the crane boom by using two more pins.

IMPORTANT!!
Insert the relevant safety pins

Correct position and fastening of the accessory.

Connect the relevant connector.

Remove the safety pin, unscrew the second bolt, remove the screw and lengthen the accessory to the required extent.

Maximum JIB opening.
Upon reaching the desired opening, place the screw back in the suitable slot, the bolt and the safety pin.

In order to use the accessory, after mounting it, keep the button 

pressed on the display until the icon 

turns yellow. Press 

to confirm and the first two icons at top left from 

will turn 

and from 

the limiter 

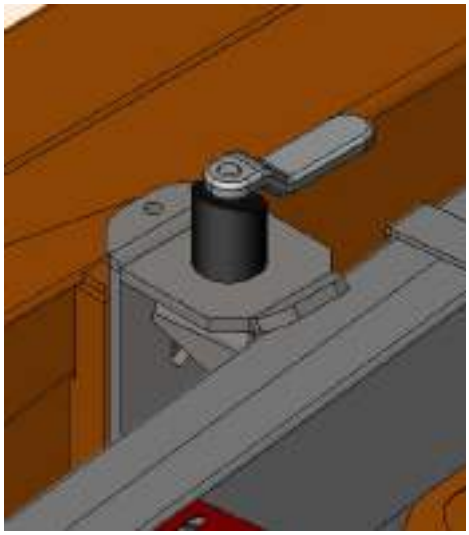
will be confirmed.

13.3 Mechanical jib JIB400.1MX for SPX312CP - SPX312C+

Installation

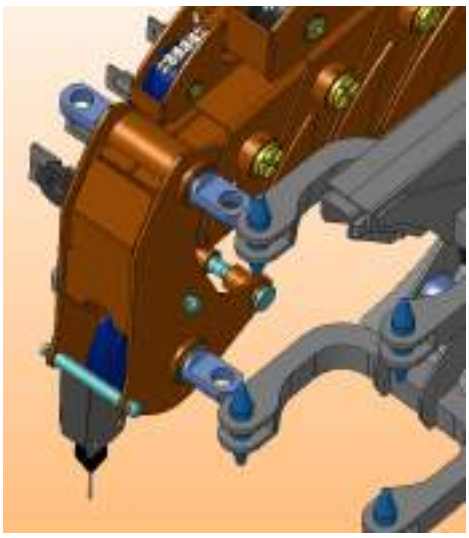
During installation, pay attention to persons in the surrounding area.

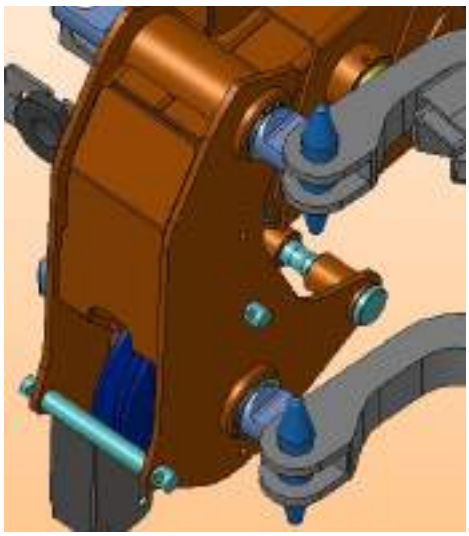
CAUTION!!
Tilting/falling hazard of unsupported sections!



Release the locking lever.

Slightly move the mechanical JIB to the outside and extend the boom until the slots for hooking the locking pins match.

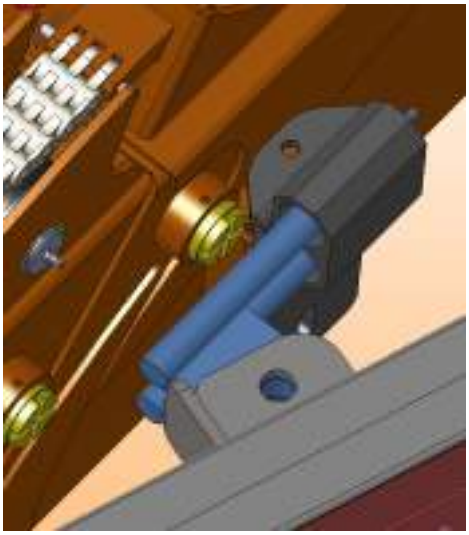


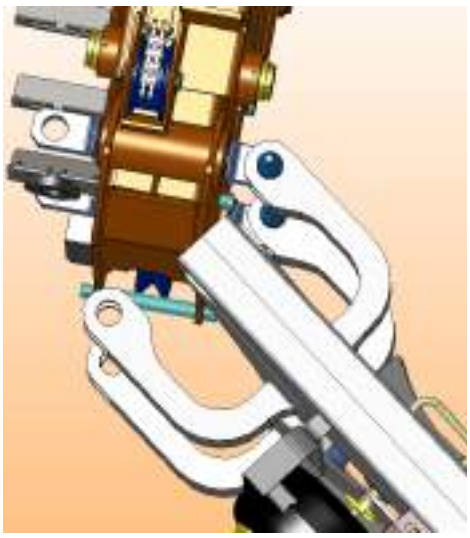


Fasten the JIB to the boom with the aid of the two pins to secure it to the crane.

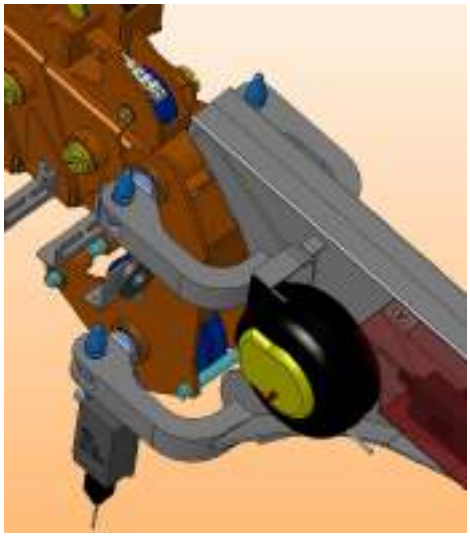
IMPORTANT!!
Insert the relevant safety pins

Extend the boom until the JIB anchoring system shown in the photo on the side is completely extracted.





Rotate the mechanical JIB in a position at the front of the crane boom and fasten the other two locking pins.



IMPORTANT!! Insert the relevant safety pins

Connect the relevant connector.

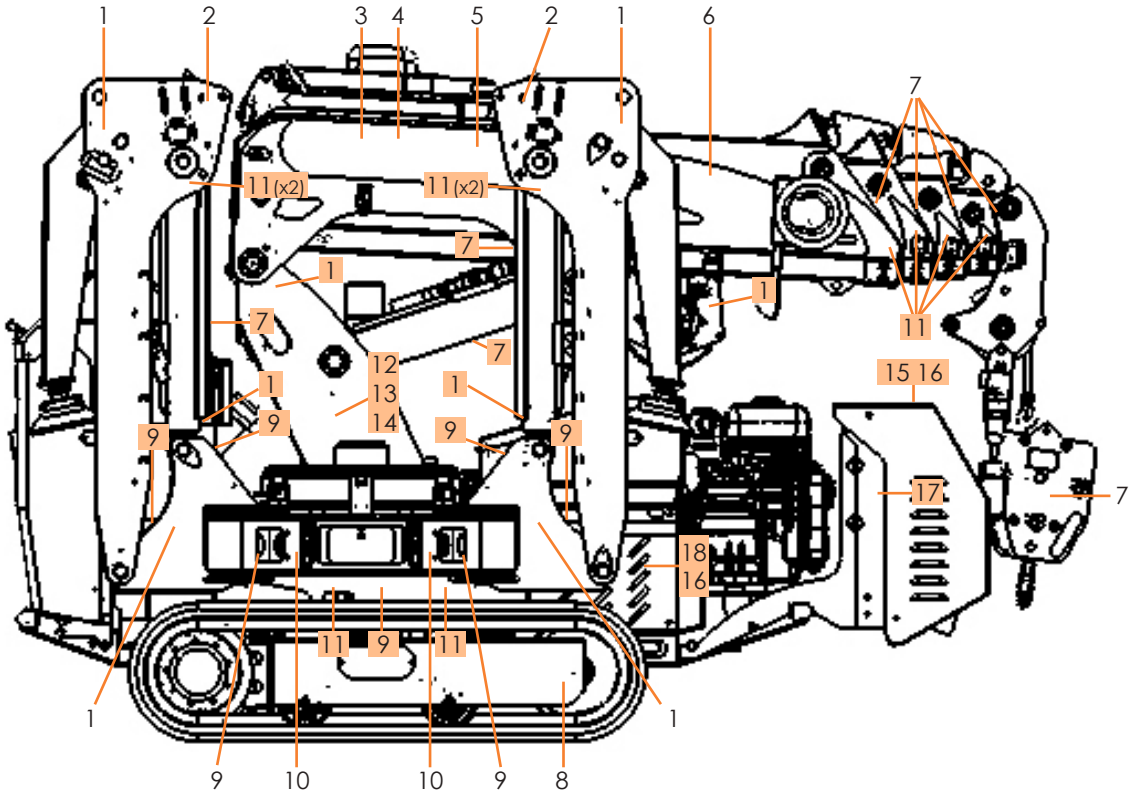
In order to use the accessory, after mounting it, keep the button Enter **pressed on the display until the icon** SET LMI **turns yellow. Press** Enter **to confirm and the first two icons at top left from** ! **will turn** OK **and from** LMI ? **the limiter** LMI **will be confirmed.**

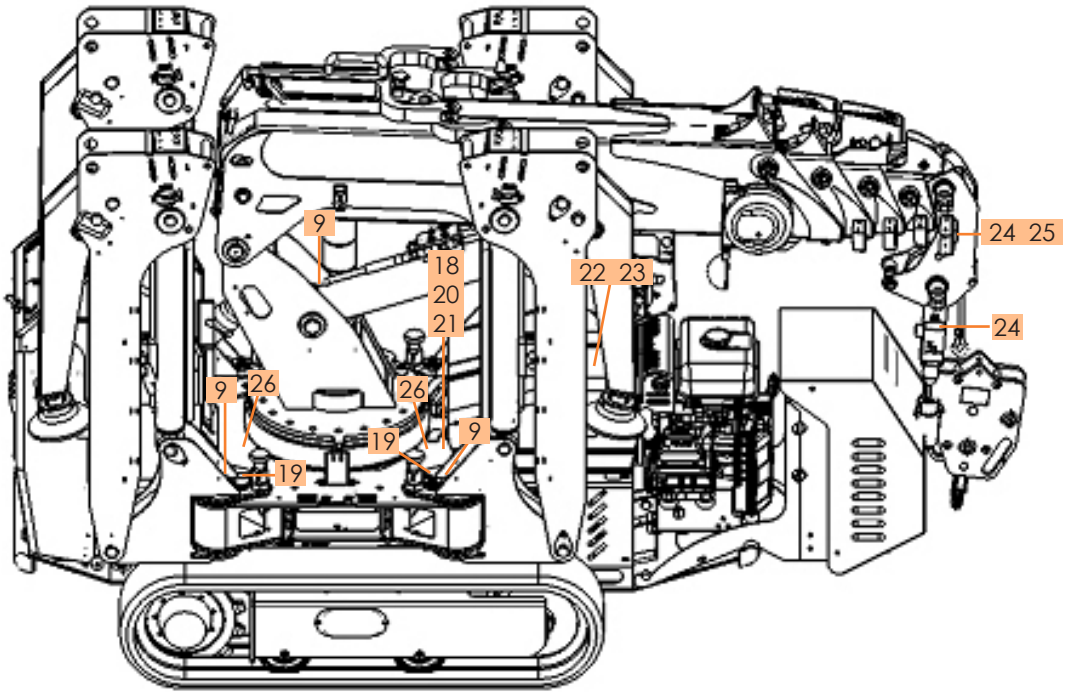
14 ATTACHMENTS

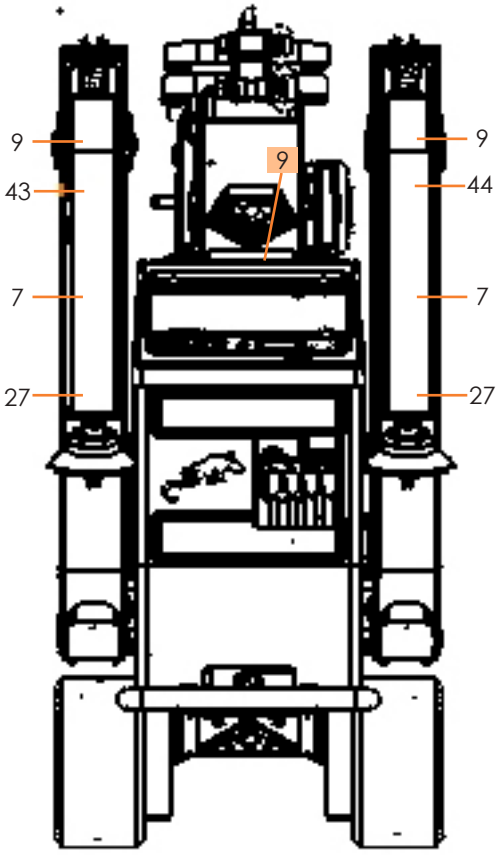
- → CE
- → OPERATION AND MAINTENANCE MANUAL
- → ENGINE MANUAL (DIESEL or PETROL)
- → DIAGRAM AND LOAD CHART BOOKLET
- → CERTIFICATE OF ORIGIN
- → RADIOCONTROL CERTIFICATE
- → WINCH CERTIFICATE
- → WINCH ROPE CERTIFICATE
- → BLOCK CERTIFICATE
- → TROUBLE SHOOTING
- → HYDRAULIC DIAGRAM (ON DEMAND)
- → WIRING DIAGRAM (ON DEMAND)

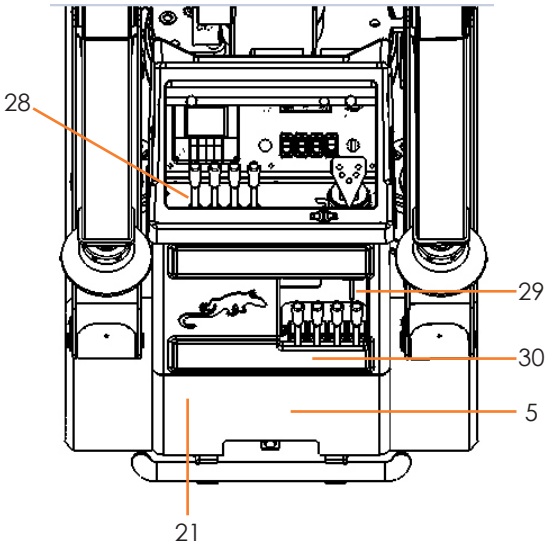
15 STICKERS

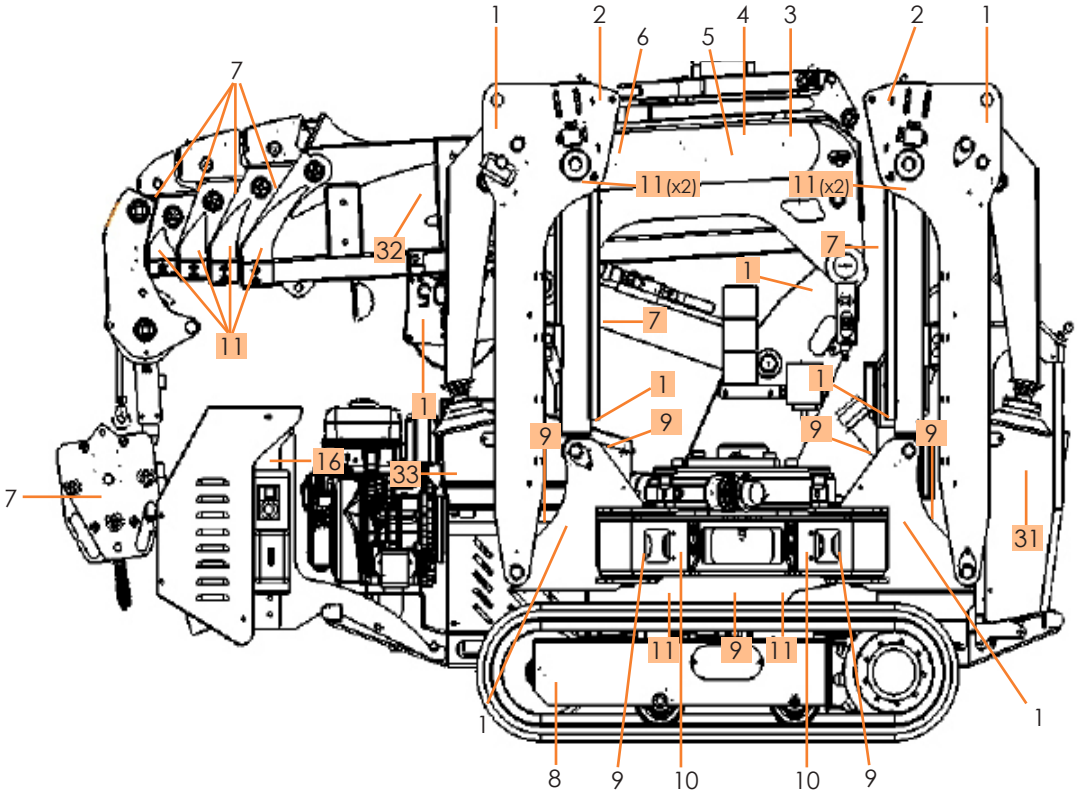
15.1 SPX312CP Stickers

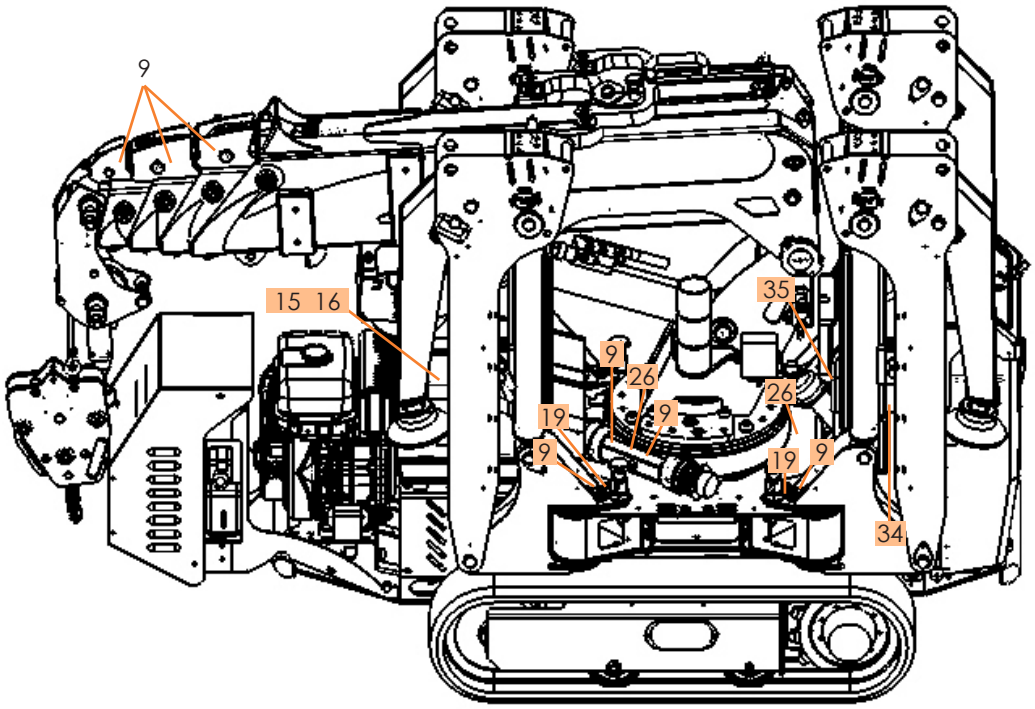


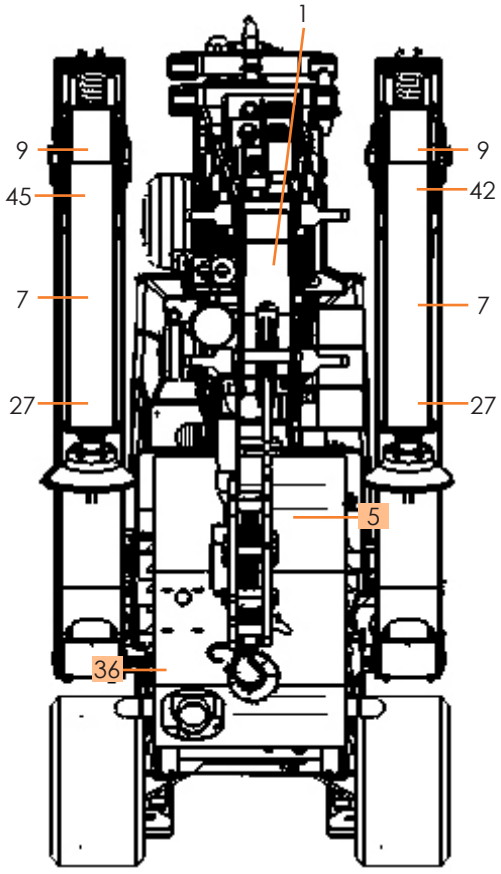




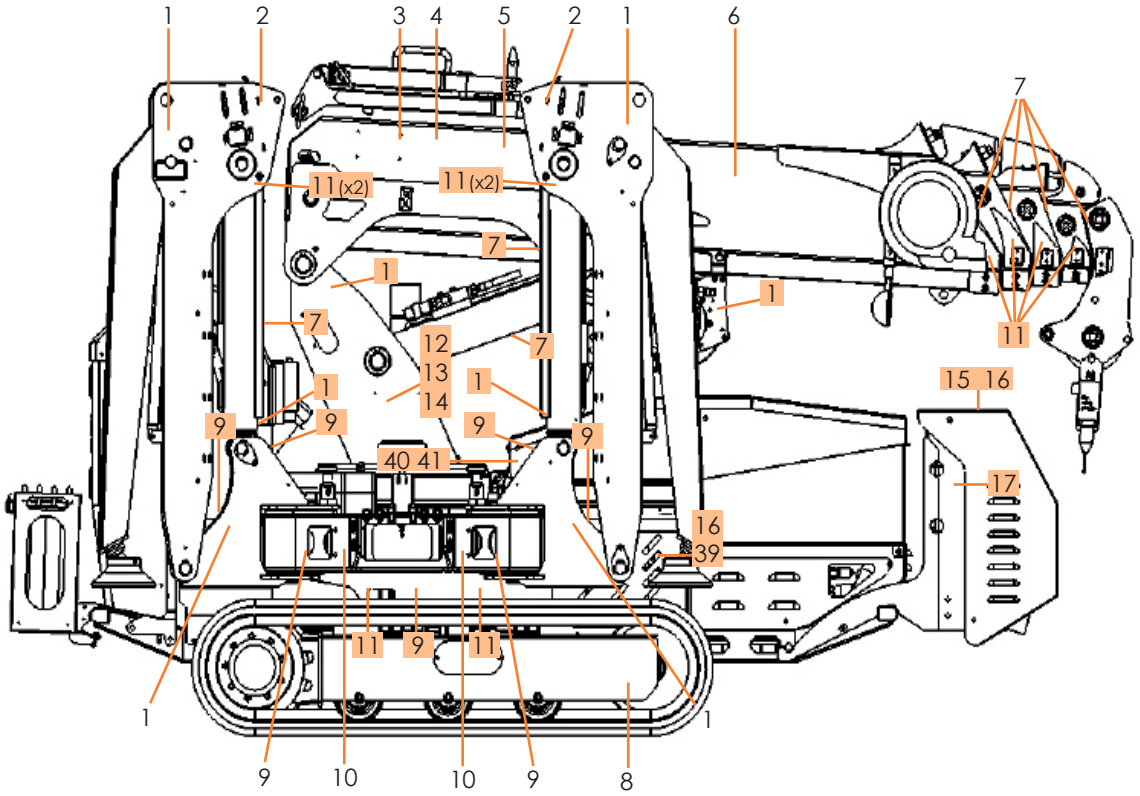


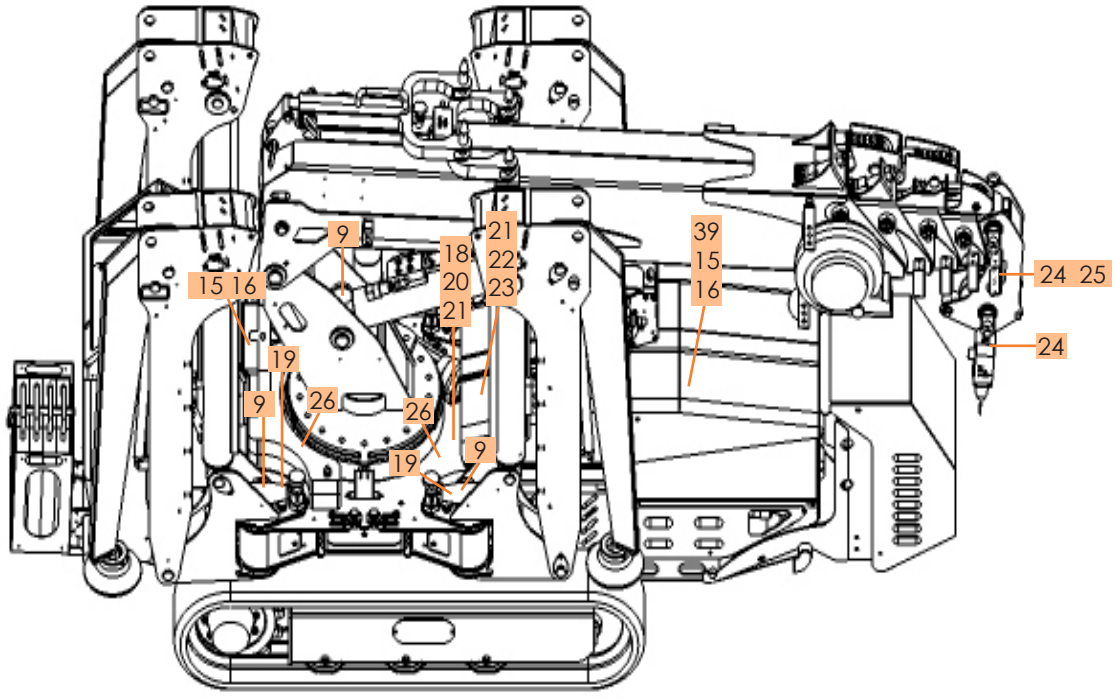


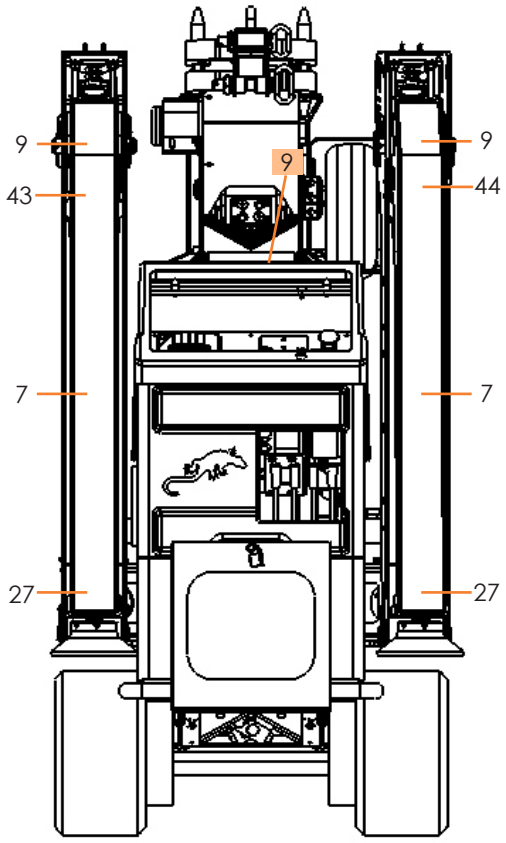


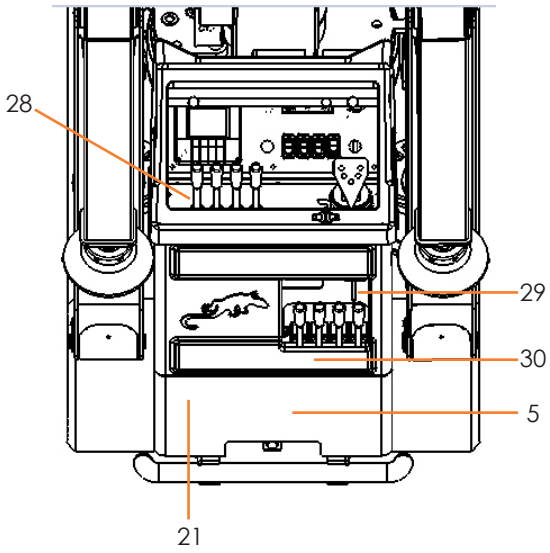


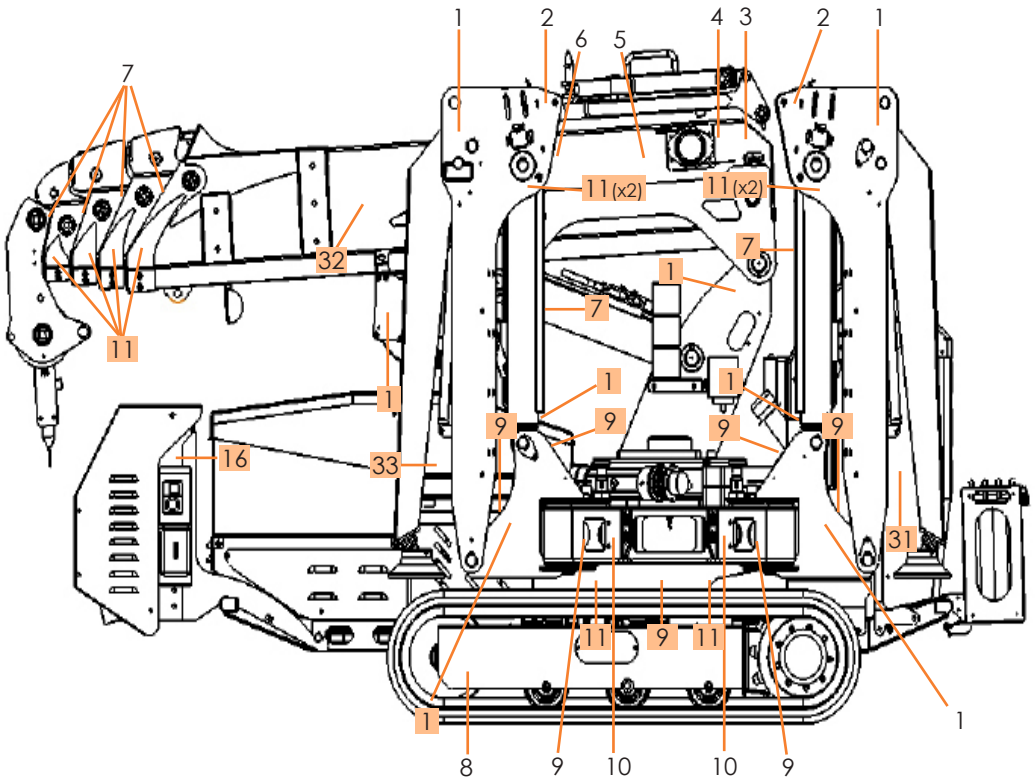
15.2 SPX312CP Stickers

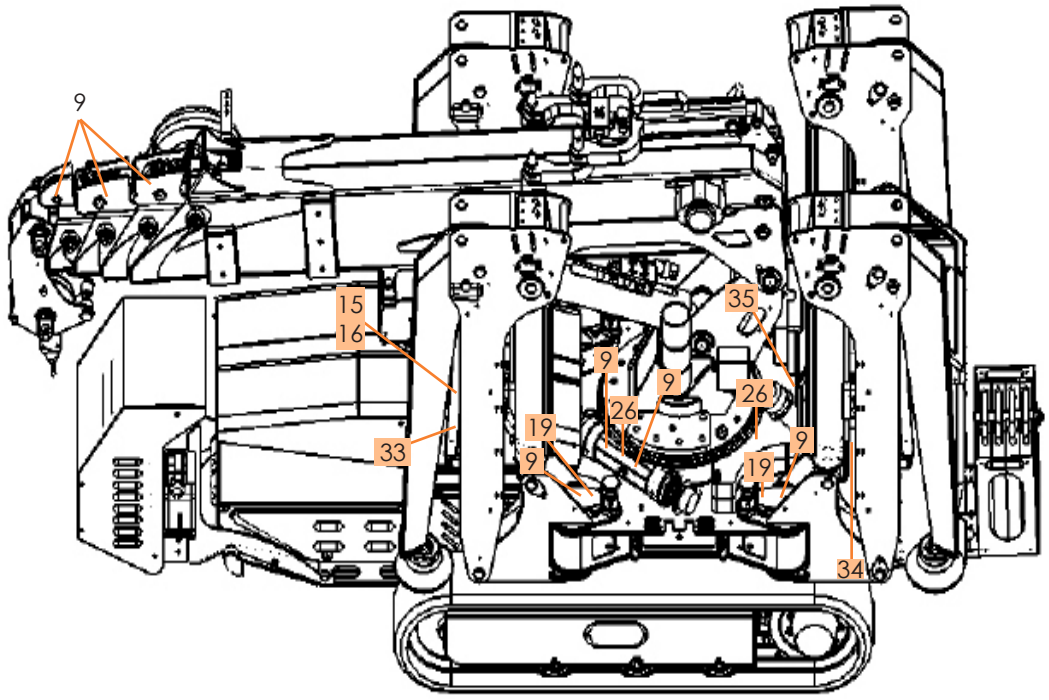


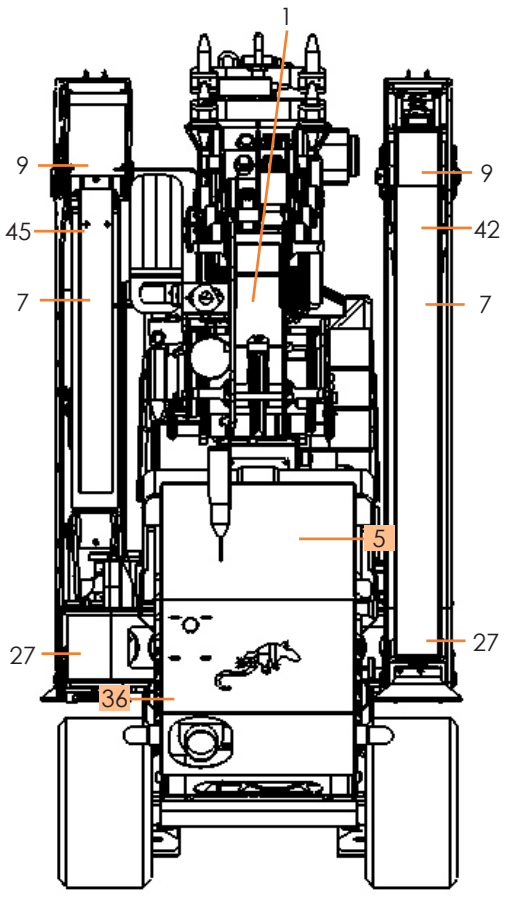


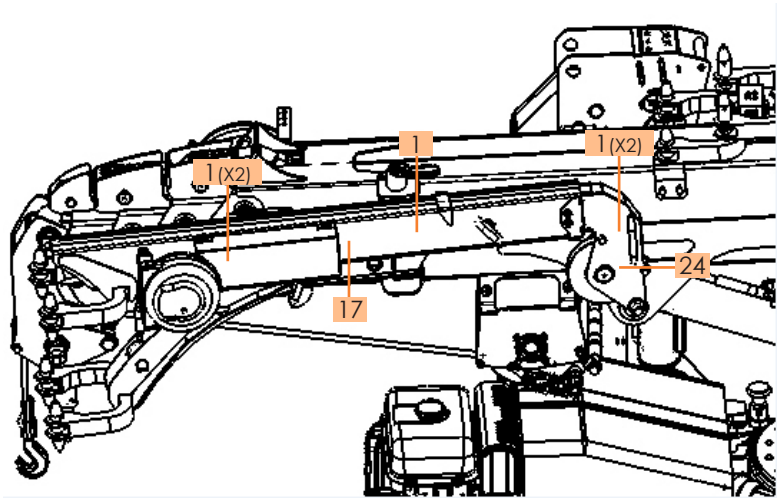


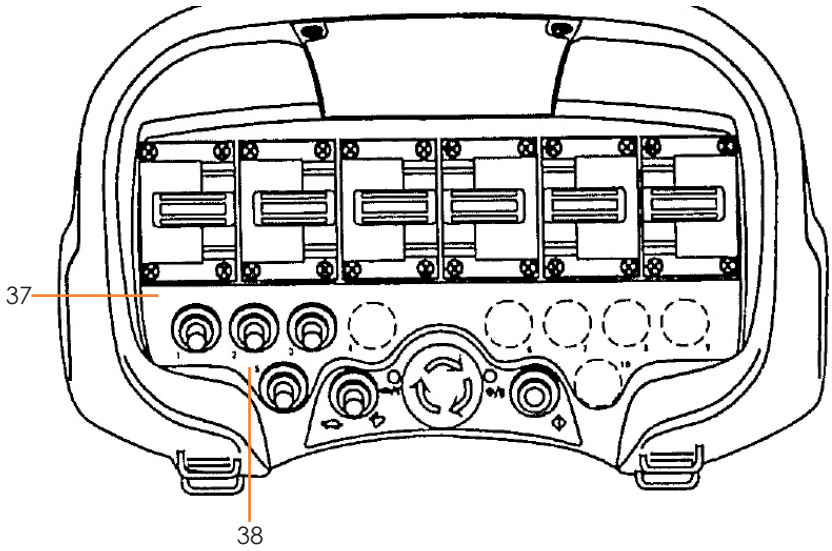












1

2

3

4

5

SPX 312

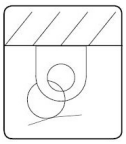
6

7

8

9

10



11

12

13

14

15

16

17

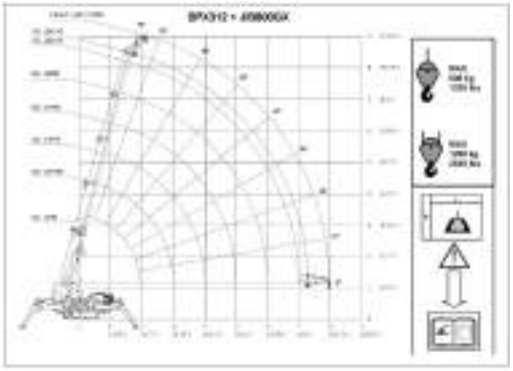
18

19

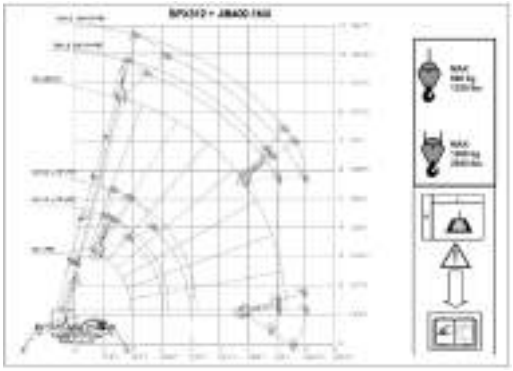
20

21

22



23



24

A2B

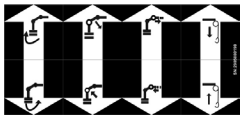
25

TOOLS

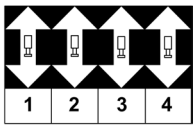
26

27

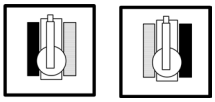
28



29

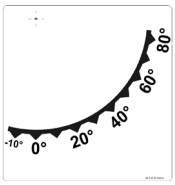


30



31

32



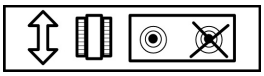
33

34

35

36

37



38

39

40

41

42

43

44

45

ORMET S.p.A.
Via Campardone, 7
31014 Colle Umberto (TV) - Italia
Tel. +39 0438 434443
Fax +39 0438 430115
info@ormet.it
www.ormet.it