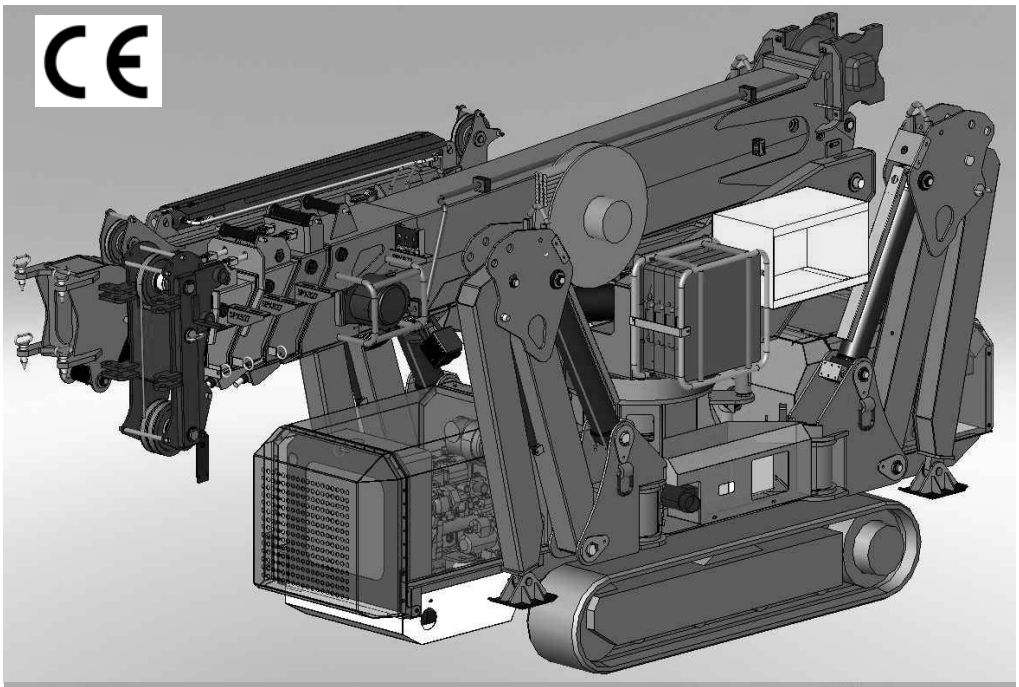
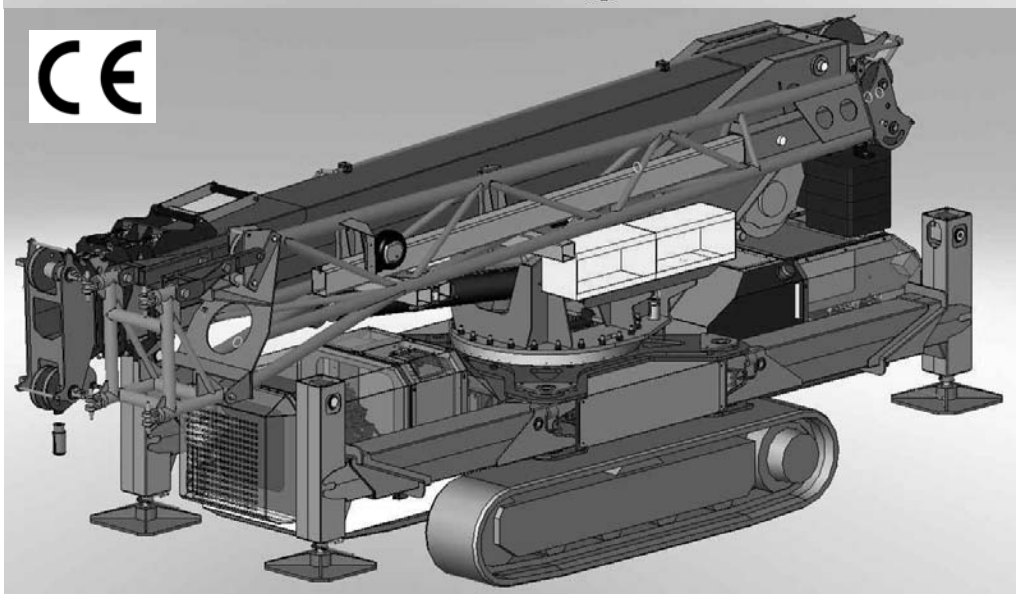
OPERATING AND MAINTENANCE MANUAL_U.S.A.

TRANSLATION OF ORIGINAL INSTRUCTION

SPX 527 CDH	SPX 1040 CDH	SPX 1275 CDH

SERIAL NUMBER: _____





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MANUAL REVIEW		
VERSION	**DATE**	**REVIEW**
1.0	07/2010	First Print
1.1	01/2014	Rev.1
1.2	05/2014	Rev.2

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1 PREFACE

1.1 General Information

Each machine is equipped with a copy of this manual.
This instruction manual is intended to facilitate users and maintenance technicians to carry out all of the operations necessary to operate the machine under **safety conditions**.
Only fundamental operations have been described. After practicing with the machine, the user will be able to develop further technical skills.

> **Note:** This manual is an integral part of the machine and must therefore accompany the machine should this be sold, passed on or moved to another place.

A proper training at the moment of delivering must complete the instructions described in this manual.
As regards the accessories, please read their own instruction and maintenance manual.

Keeping the Manual
The Manual shall always be kept with the machine, even in case of sale.
In case of resell of the machine, the manual must follow it in its present conditions, even in case of integrations and modifications sent by the manufacturer.
The Manual will always be kept with the machine until its last demolition: for this reason, it must be kept with care in a safe place.
In case this manual was lost or subject to wear, please order another copy from the manufacturer

Ownership information

This manual deals with all normal operations to be performed by the machine and with the main regular maintenance operations required. The instruction herewith provided must be carefully observed in order to properly use the machine. Machine operator training is required to operate the machine. Take care not to perform operations and maintenance not recommended in this manual. Make sure that only suitably qualified and authorized personnel carries out servicing when dismantlement of some parts of the machine is required.
The manufacturer does not undertake any responsibility whatsoever for any direct or indirect damage to objects or pets arising from the use of this manual or the machine in other conditions than those stated herein. ORMET SPA reserves the right to modify or improve this manual and the machines without notice, even those sold under the same model this manual refers to, but having different serial numbers.
ORMET SPA reserves the right to change data equipment without prior notice as well as instructions for maintenance and other measures. The measurements, weights and performance etc. given in this manual are approximate and can vary depending on the equipment.
The CE marking approves the conformity by the machinery **guideline 2006/42/CE**.

Conventions:

Qualified technicians: people who have the necessary expertise, skill and knowledge concerning the standards, safety regulations and service conditions, to recognise and avoid any possible danger for people and damage to the processed materials and to the machine itself.

Right side: Right side of the system, as identified by the operator positioned in the back part of the crane, in front of the switchboard and of the valve bank.

Left side: Left side of the system, as identified by the operator positioned in the back part of the crane, in front of the switchboard and of the valve bank.

Marking

On the right side of the crane frame there is an identification plate bearing the machine's model, manufacturing number, year of manufacturing and weight. Model and number are also punched closed to the plate. The machine is supplied CE-marked where required by the market. The CE marking means that the machine meets the EU's requirements.

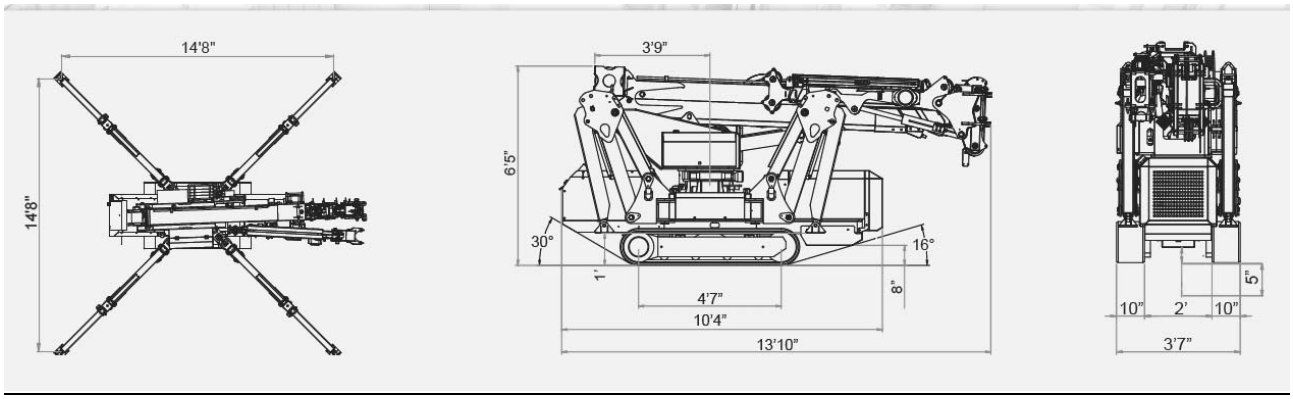
1.2 Technical Specifications

Model	SPX 527 CDH	Model	SPX 1040 CDH
Maximum SWL	5952 lbs	**Maximum SWL**	8818 lbs
Maximum working height	11.15 – 39.6 ft	**Maximum working height**	15 - 47.5 ft
Angle range	-2° +80°	**Angle range**	+4° +80°
Maximum winch SWL	5952 lbs Triple line pull	**Maximum winch SWL**	8818 lbs Double line pull
Rope	D 0.026 ft L 196ft	**Rope**	D 0.026ft L 262ft
Rotation	360°continue	**Rotation**	360° continue
Dimensions	13.86x3.6x6.42 ft	**Dimensions**	17.4x4.5x6.5 ft
Max outriggers load	6172 lbs	**Max outriggers load**	9990 lbs
Weight	8157 lbs	**Weight**	11023 lbs+ 1432 ft counter weight
ENGINE	ISUZU 3CB1 22.3 kW INTERIM TIER4 tank 25 l	**ENGINE**	ISUZU 3CB1 22.3Kw INTERIM TIER4 tank20 l

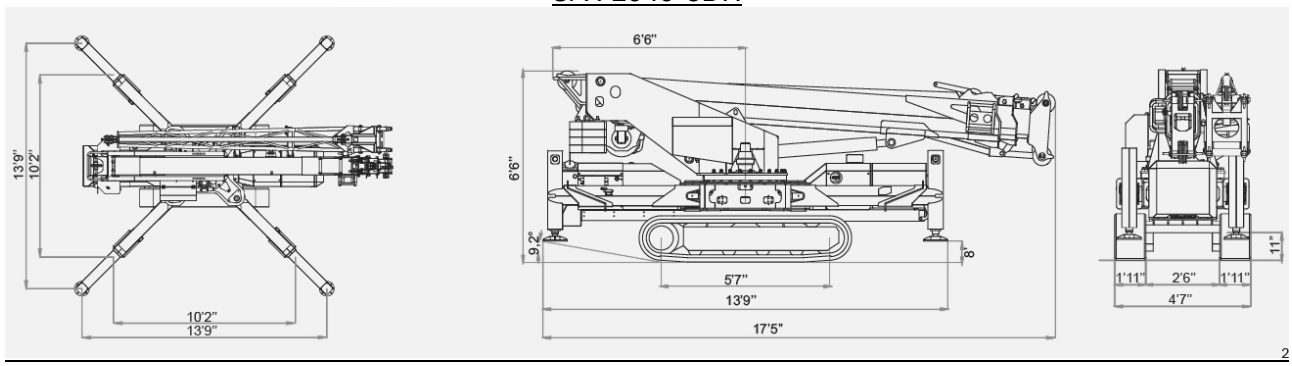
Model	SPX 1275 CDH		
Maximum SWL	16535 lbs		
Maximum working height	16 - 58 ft		
Angle range	+0° +75°		
Maximum winch SWL	16535 lbs Fifth line pull		
Rope	D 3/8 in L 410ft		
Rotation	360° continue		
Dimensions	18.x4.76x6.69 ft		
Max outriggers load	14991 lbs		
Weight	14991 lbs+ 3307 lbs counter weight		
ENGINE	ISUZU 3CB1 22.3Kw INTERIM TIER4 tank20 l		

DIMENSIONS

SPX 527 CDH



SPX 1040 CDH



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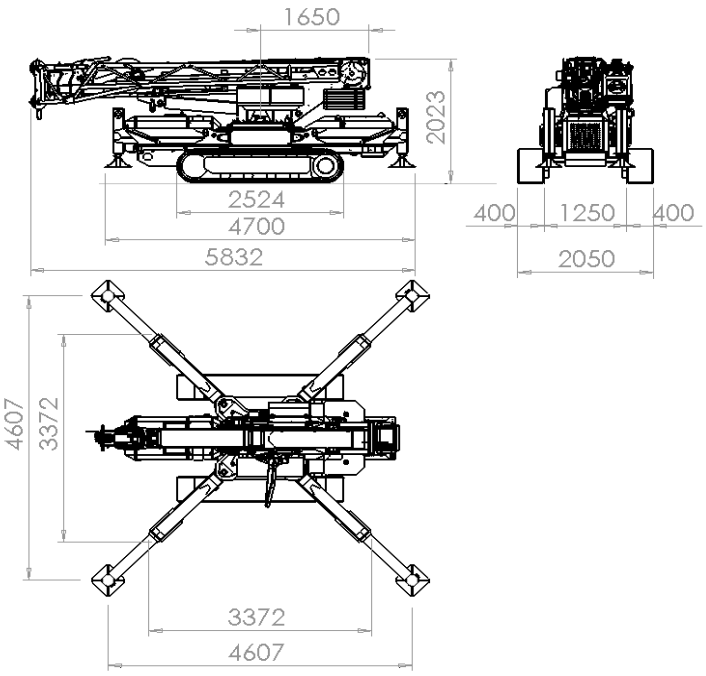


WINCH LOADING DIAGRAM

The winch capacity is 1984 lbs for SPX527,2204 lbs for SPX1040 and 3307 lbs for SPX1275

The load limiting device avoids the machine tilting while using the winch. In any case, the operator has to make sure not to lift loads exceeding the boom capacity.

In order to lift heavier loads it is necessary to modify the pulley configuration by using a single, double, triple or fourth line pull.

In order to increase the rope lifting capacity it is necessary to assemble the hook device as indicated in the picture and to set the machine by means of the switchboard.

SPX 527 with winch		
SWL lbs	Pullley	N° of rope
1984	-	1
3968	1	2
5952	2	3
SPX 1040 with winch		
2204	-	1
4409	1	2
8818	3	4
SPX 1275 with winch		
3307	-	1
6614	1	2
9921	3	3
13228	4	4
16535	5	5

The rope replacement or shortening has to be carried out by specialized technicians, only.

1.3 Original Seals

The manufacturer has placed lead sealings on machine components to assure working under safe conditions.

ORIGINAL SEAL REMOVAL WILL CAUSE MACHINE UNSAFE WORKING. THE MANUFACTURER DECLINES ANY RESPONSIBILITY ARISING FROM UNSAFE USE OF MACHINES.

1.4 Operator Training

Technical training is required to the operator in order to correctly operate this machine. Qualified personnel is available to train your personnel in many European countries. Contact your dealer for more information. If you can not find a dealer in your country please call ORMET SPA.

1.5 Intended use

The machine has been designed to handle loads by means of a lifting hook, a winch or an accessory jib: loads must not exceed the load diagram printed or labelled on the crane.

- All uses not expressly declared in this manual are to be considered not intended, especially any use different from those described in this manual.

CAUTION!
Inside the European Community it's forbidden use the machine to lift people

ATTENTION
THE MACHINE HAS NOT BEEN PROJECTED TO LIFT PEOPLE, IT DOESN'T RESPECT THE SAFETY REQUIREMET OF THE U.E. NORMATIVE FOR THIS KIND OF LIFTING. PLEASE CHECK LOCAL STANDARDS

1.6 Warranty

ART.1 This warranty cancels and replaces any other kind of explicit or implicit warranty; any variations shall have no effect unless stated in a document issued by ORMET SPA. Any disputes as to the interpretation or fulfilment of the warranty conditions shall be submitted to the jurisdiction of the court of Conegliano (TV).

ART.2 ORMET SPA' s warranty will expire after 12 months from the day of delivery of the machine to the final user. Within this period, IMAI S.r.l. shall replace free of charge any parts that have manufacturing defects in ORMET SPA 's opinion.

ART.3 The warranty shall not cover any labour involved in assembling and dismantling the machine to replace the faulty parts, nor any transport costs for the delivery of the replacement parts. The warranty doesn't include goods damaged or perished after the forwarding from the factory.

ART.4 Under no circumstance is expected a refund for the machine's stop working because of the fault and the repairing. Delays on repairing don't give right to refund or extension of the warranty.

ART.5 The warranty does not include deficiencies and defects due to the normal wear of component parts that are usually subject to rapid and continuous wear (oil, grease, brass, ecc.). As for hydraulic devices dilate cylinders and bended piston rods are excluded because those events are caused by not right loads or not right movements of the machine.

ART.6 All requested spare parts should be invoiced at the price-list in force at the time of the enquiry. ORMET SPA shall acknowledge any right to replacements under warranty by means of a credit note.

ART.7 Equipment not manufactured by ORMET SPA and applied to ORMET SPA products – such as engines, electrical components and others – are not covered by this guarantee but by their own manufacturer's guarantee. ORMET SPA will warrant to its customers only and all the terms of the manufacturer's guarantee.

ART.8 The buyer shall not be entitled to interrupt payments or other obligations related to the purchase, even in case of a valid complaint. This warranty cancels and replaces any other kind of explicit or implicit warranty; any variations shall have no effect unless stated in a document issued by ORMET SPA.

ART.9 The warranty claim will be effective only if it is returned with the delivery verbal to ORMET SPA. within 30 days from the date of delivery of the machine. All warranty claims will have to be submitted to ORMET SPA. within 8 days from the moment the damage occurred.
The warranty will expire in case of:

- Improper use of the machine (not complying with the instructions given)
- Non authorized modifications, repairs and dismantling (carried out by technicians non authorized by ORMET SPA)
- Use of non authorized accessories or accessories not fit for ORMET SPA's machines
- Wrong installation of the accessories and equipment the machine is supplied with
- Damages due to accidents, negligence, non-performance of periodical maintenance, use of non genuine spare parts
- Damages due to exceptional events.

Tampering with the safety seals placed on the valves or on the accessories will cause the warranty expiration and will release ORMET SPA of whatever liability.

Further information on responsibility

THE MANUFACTURER DECLARES HE WILL BE RELIEVED FROM ANY RESPONSIBILITY OR LIABILITY UNDER WARRANTY IN CASE OF:

1. *Improper use of the machine*
2. *Tampering with the machine or with its component parts*
3. *Machine used by not authorized personnel*
4. *Serious maintenance shortage*
5. *Partial or complete non-observance of instructions*
6. *Non-topping up of lubrication system in the periodical checks and non-filling in of relevant reports*
7. *Non-performance of periodical checks*
8. *Use of non genuine spare parts (spare parts not recommended by the manufacturer)*
9. *Non authorized modifications and repairs*
10. *Exceptional events*

2 SAFETY INFORMATION

The designing and manufacturing of this machine is based on specific safety criteria in compliance with the rules indicated on the CE certificate:
A careful risk assessment, carried out by the manufacturer, has allowed to remove the major risks connected both to scheduled and to rationally foreseeable operative conditions. Complete records about safety measures adopted can be found in the technical manual of the machine, which is kept by the manufacturer.
The manufacturer strongly recommends to follow all operative instructions and procedures herein described and to observe all safety rules at work, above all as regards both personal protection equipment and machine safety equipment.

2.1 Rules

Some operative rules should be applied in order to best preserve environment and the operator's safety.

The operator

- He must be a healthy person
- He must be responsible
- He must have sense of direction
- He must act with circumspection when operating with the machine and be able to estimate dangers and working conditions.
- He must have quick reflexes.
- He must have very good powers of concentration.
- He mustn't be used to drink alcohols and to take drugs!

The operator must not wear:

- rings;
- watches;
- jewellery.
- torn clothes;
- scarves;
- unbuttoned shirts or smocks;
- jackets not zipped up;
- other clothes which could cause dangers with parts in motion

General directions

1st regulation

- Preserve your own safety!
- Preserve environment and animals!
- Take care nobody is exposed to dangers!
- Don't get on the machine, slipping danger!

2nd regulation

- Use personal protection equipment! (DPI)
- Be careful about sharp corners!

3rd regulation

- Prohibit unauthorized and untrained staff from using the machine!
- In case of alternation, the manual must pass from one to the following operator.
- Always operate with calm, precision and concentration!

Keep the machine clean in all of its component parts: handling members, switchboard and signalling apparatus.

- **Don't smoke.**
- **Don't use open fires.**

2.2 Noise

If workers are exposed to a time-weighted average (TWA) sound level of 85dB or more, hearing protectors are recommended. Hearing protectors must be worn by all operators exposed to a TWA of 90dB or more.

2.3 Conveyance of instructions

This chapter of the manual is intended to facilitate possible operations in case of change of operator and in case of inheritance of the machine due to sale.

THE OPERATIVE RESPONSIBLE OF THE MACHINE IS
THE ONE WHO,
having picked up the machine at the manufacturer's,
ACCEPTS THE ROLE OF OPERATOR.

BUT

The machine can be picked up for the purchaser by someone else, who won't be the final operator or owner.

ⓘ In this case, the one who picks up the machine will not be responsible for the machines, but **WILL TAKE UP THE ROLE OF "TEMPORARY OPERATOR"** ONLY UNTIL THE MACHINE IS DELIVERED TO THE PURCHASER.

ⓘ Each "temporary operator" must receive the machine operative instructions from the manufacturer and convey them to the person who, later, will be the effective machine **OPERATOR.**

BE CAREFUL!
When in the firm the same machine is to be used by more than one operator, working instructions as well as the use and maintenance manual must be conveyed to all the operators in charge of the machine.

How to convey the machine instructions

Train the new operator (or the new owner) properly.

- → Make sure the operator understands instruction on safe operating and safety devices.
- → Make sure the operator understands the information pertaining the machine's dangerous zone and component parts.
- → Give the operating manual to the new operator (or to the new owner) and explain its contents to him.
- → Tell him about the existence of the Declaration of Conformity and of the CE marking
- → In case of resell, give the Declaration of Conformity to the new owner, and tell him about the hallmarks.
- → Be sure the new operator has correctly understood the instruction and has no doubts about the machine's functioning.

How to prove the conveyance of instructions

Considering that a proper knowledge of the machine is absolutely necessary and that the operator, when ends its operative role, is no more responsible for it, we have prepared some forms intended to prove the machine has been correctly picked up at the manufacturer's site (**Declaration of responsibility**) and it has been properly conveyed in case of resell.

Lacking or incorrect conveyance of instructions and of the manual could cause involvement in (also penalty) punishment in case of environmental damage or harm suffered by persons, things or animals.

IN SHORT

☞ *Inform and train the new operator*

☞ *Give him the manual and highlight safety instructions*

☞ *Fill in the form in all details and sign it*

☞ It is in the conveyor's interest to take and keep a copy of the page proving the correct conveyance.

2.4 Dangerous zones

There are some very dangerous zones near the machine.
The dangerous zone is determined by the field of action of the crane.

It is absolutely forbidden to stay under hanging loads

There could be further dangers in the working area: please, observe the following rules

Don't work near electric wires, danger of death in case of contact with electric wires. While working, keep the following minimum distance from the power line:

Voltage (KV)	Min dist. Insulated electric wire (ft)
<1	9.8
1< Un <= 30	11.5
30< Un <= 132	16.4
> 132	22.96

2.5 Features of the working area

To avoid unpleasant troubles or even accidents working areas have to meet specific requirements such as:

- Enough space to allow outriggers setting according to the different handling necessities
- Ground slope smaller than 5 %
- The foots of the outriggers must lie on solid ground, without manhole, cover, etc.
- Check power supply availability at the voltage required by the machine and in conformity with the rules in force.

In case the machine has to work on upper floors, verify their maximum loading capacity according to what indicated in paragraph 'Technical Specifications'.

CAUTION!!!

Don't work on floors without having verified their loading capacity. The manufacturer declines any responsibility arising from damage or collapse.

2.6 Emergency stop

Note: This procedure can be performed in any moment.

In compliance with the safety rules in force, the machine has been provided with emergency devices. They must be operated to reduce the stopping time when the usual stop procedure would not enable actual or impending danger to the operator or to the machine itself to be averted.

CAUTION!!!

Before putting the machine back into service, remove the cause of danger.

Location of emergency devices

The machine has been provided with several types of emergency devices.

- Emergency push-button - located on **main switchboard**
- Emergency push-button - located on **radio remote control**

About emergency devices

The main features of the installed emergency devices are:

Mushroom-shaped emergency push-button;

PUSH the mushroom-shaped button to stop the machine.

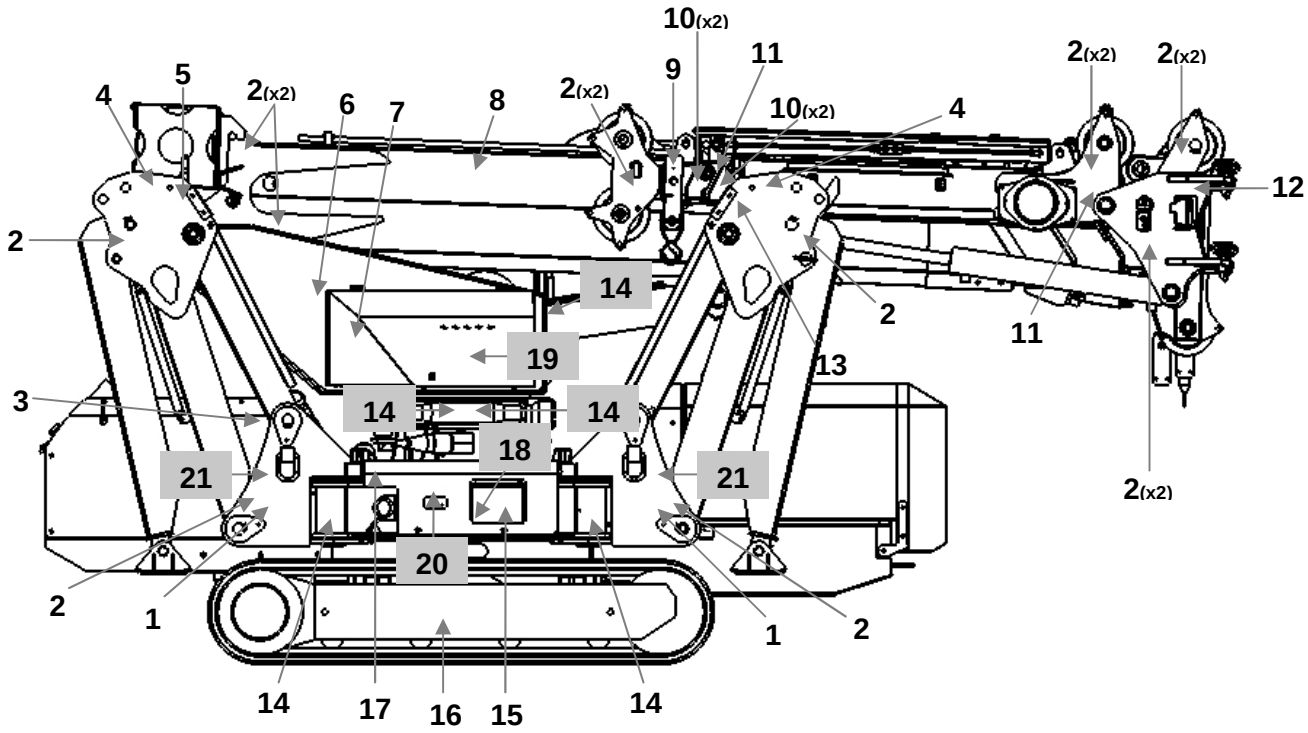
Machine back into service after emergency

In order to avoid unintended start-up, the emergency state remains active until the machine is put into service.
To put the machine back into service:

Note:	Before putting the machine back into service, remove the cause of danger.

→ Find out the push button used to activate the emergency state;
→ Rotate the mushroom-shaped button in the direction indicated by the arrows printed on it;
→ The push-button is now back in service and the machine is ready to work.
→ Push the turn on engine button to start-up the machine

2.7 Labels SPX527



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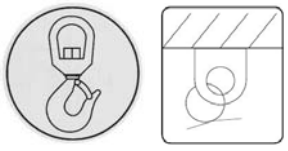
4		5	PRX5	6	
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 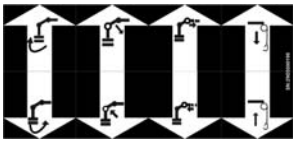
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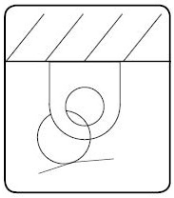
<td>  </td>
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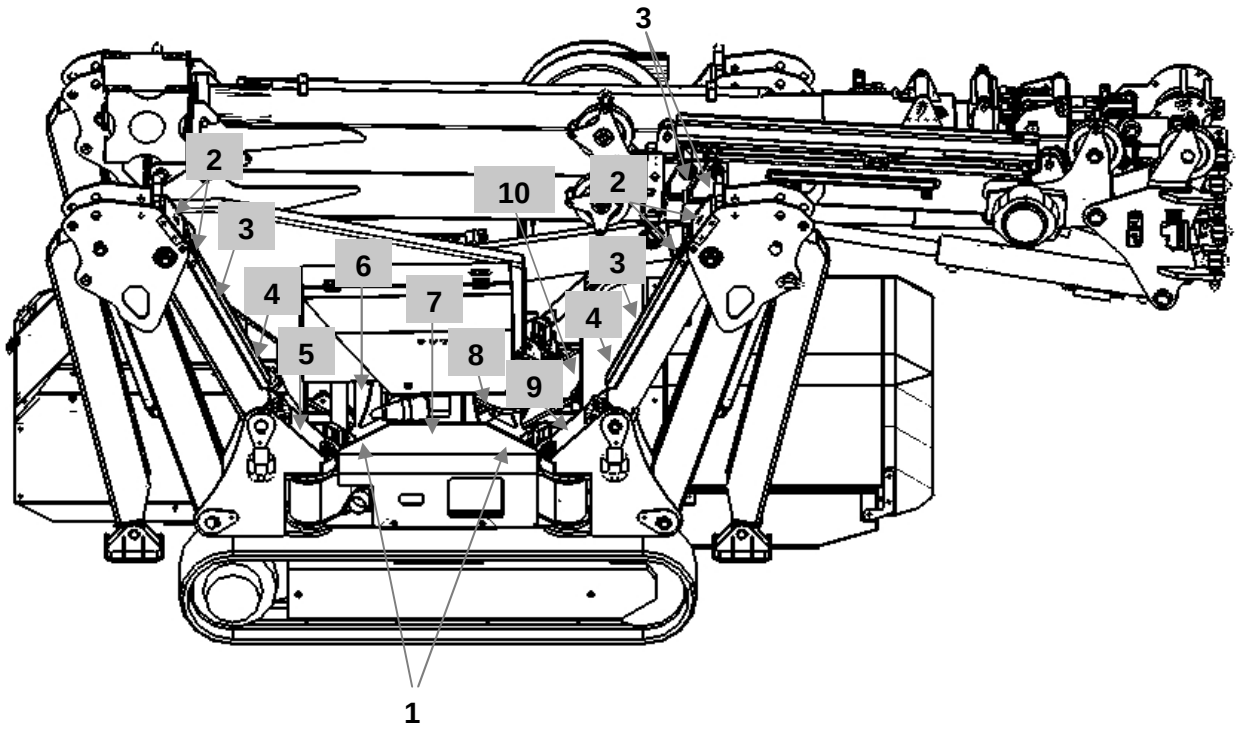

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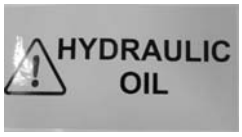
4		5	PRX4	6	
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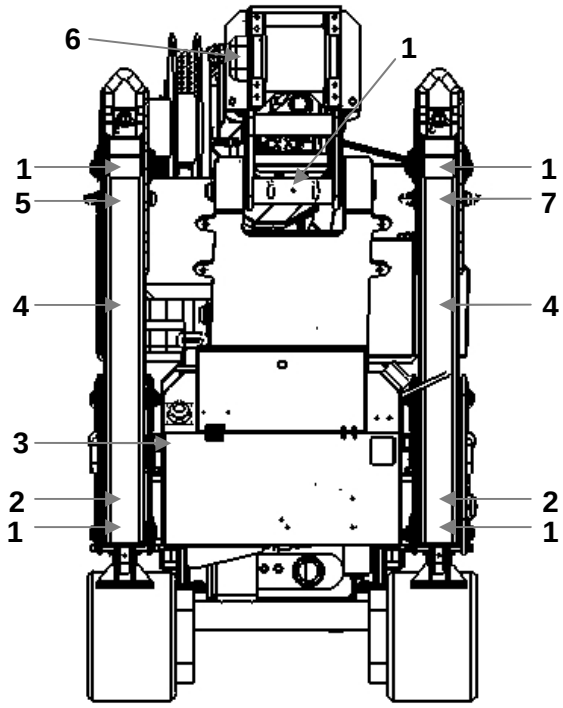
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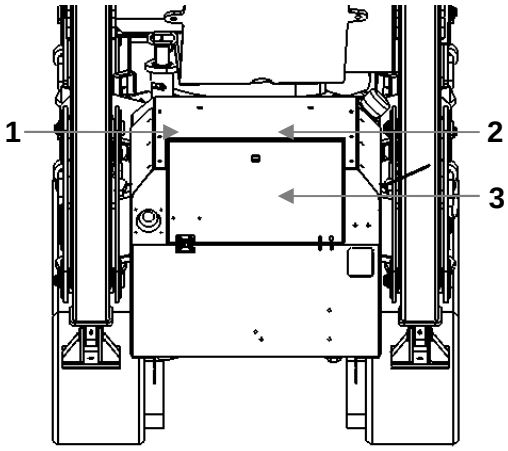
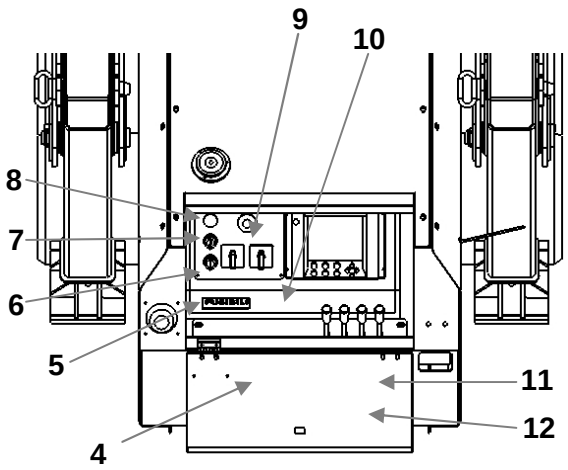
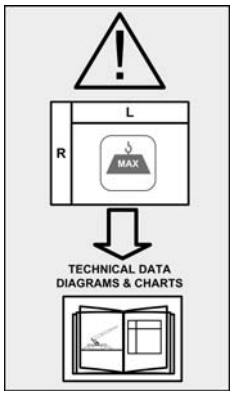
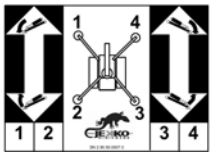
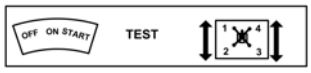
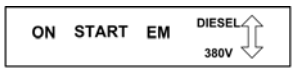
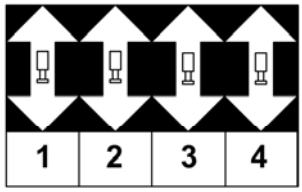
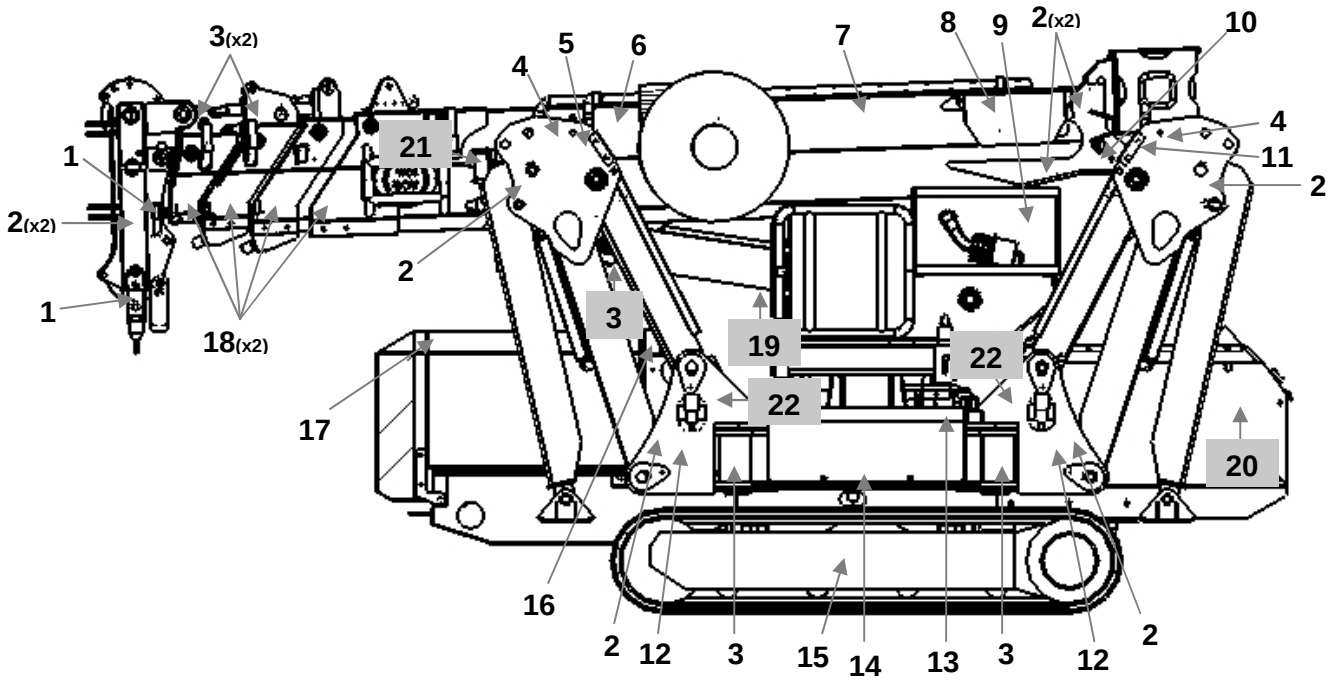




1		2		3	
4		5	F1 F2 F3 F13 F14 F15 F4 F5 F6 F16 F17 F18 F7 F8 F9 F19 F20 F21 F10 F11 F12 F22 F23 F24	6	
7	CAN BUS 2	8		9	
10	HANDY PTHBO	11		12	



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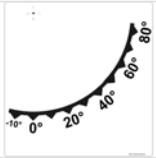
4		5	PRX8	6	
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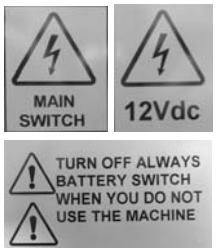

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LMI — ALARMS ARE INDICATED IN THE ICONS FIRST COLUMN

PICTURE	N°	DESCRIPTION
	1	"Crc_Run1" Internal breakdown in the powerpack MC2
	2	"Crc_Tab1" Internal breakdown in the powerpack MC2
	3	"Crc_Prg1" Internal breakdown in the powerpack MC2
	4	"E2promAlarm" Internal breakdown in the powerpack MC2
	5	"Time Out Radio" failing communication between powerpack and remote control
	6	"Time Out Arm1" failing communication with the first CPU of the ARM
	7	"Time Out Arm2" failing communication with the second CPU of the ARM
	10	" Time Out Acq1A" failing communication with the CPU of the Acq1A
	11	"Angle LOW-HIG" internal problem of calibration
	12	"Main boom extension LOW-HIGH" internal problem of calibration
	16	"PREL LOW" disconnected cable on the bottom plate sensor
	17	"PREL HIG" internal breakdown on the bottom plate sensor
	18	"PREH LOW" disconnected cable on the cylinder
	19	"PREH HIGH" internal breakdown of the cylinder sensor
	20	MOTORE Diesel" General motor alarm
	23	"PIN" the pin is in, but the boom is not in the correct position
	24	"OVERLOAD" load limiting device if machine is overloaded
	25	"KA2" security relay KA2 is broken
	26	"KA3" security relay KA3 is broken
	27	"BATTERIA" low battery
	28	"MAX ANGLE" maximum boom inclination
	30	"Angle LOW-HIGH" internal problem of hydraulic jib sensor calibration
	31	"Angle LOW-HIGH" internal problem of hydraulic jib angle sensor calibration
	32	"Jib extension LOW-HIGH" internal problem of hydraulic jib sensor calibration

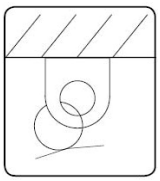
LMI — WARNINGS ARE INDICATED IN THE ICONS FIRST COLUMN

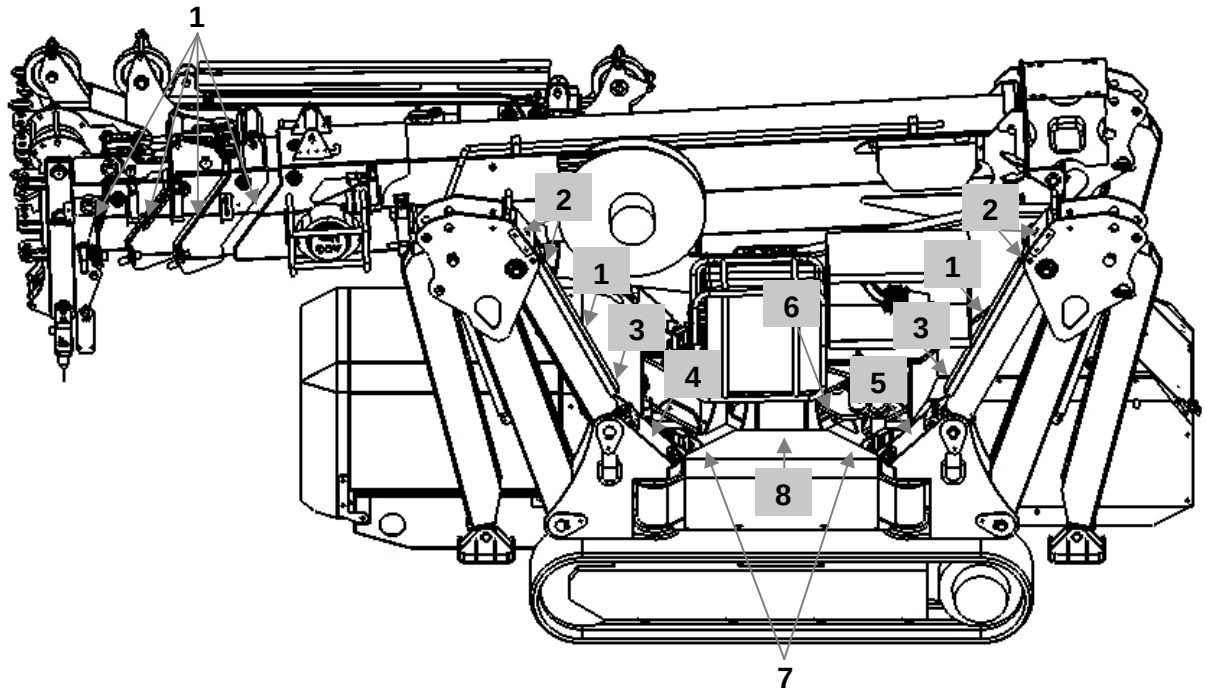
PICTURE	N°	DESCRIPTION
	51	"OVERLOAD" slower movements due to overload
	52	"MIN PRESS" warning of a pressure sensor
	53	"MAX LOAD" warning of a max load
	54	"MAX ROPE UP" cable has reached max. height. Controls for winch up and boom out are blocked. "
	55	"MIN ROPE DOWN" cable has reached min. height . Control winch down is blocked
	56	"NSTABI ROTA. 360" warning stop rotation 360°
	57	"ROTATION BLOCK RIGHT SIDE " blocks boom rotation due to dangerous area
	58	"ROTATION BLOCK LEFT SIDE" blocks boom rotation due to dangerous area
	60	"SLOW BOOM UP-DOWN" warning slow boom up-down
	61	"BLOCK MAX. HEIGHT " first slows down, then it blocks max. boom-lifting
	63	"NEGATIVE ANGLE AND LOW PRESSURE ON CYLINDER BASE" blocks machine movements, except boom in
	64	"RISERVA" empty fuel
	65	"ALLARME TRASDUTTORI" Alarm of a pressure sensor
	66	"MOTOR MAINTENANCE HOURS" warns about motor working hours. Message will appear only when machine turns on
	67	"MACHINE MAINTENANCE HOURS" warns about machine working hours. Message will appear only when machine turns on
	68	"EMERGENCY RADIO " emergency button is pressed down
	69	"EMERGENCY LOCAL" emergency button is pressed down
	70	"VIRTUAL WALL MAX. HEIGHT" slow down and block due to virtual wall
	71	"FRONT V.W. " slow down and block due to virtual wall
	72	"ANGLE V.W. " slow down and block due to virtual wall
	73	"V.W. LEFT SIDE" slow down and block due to virtual wall
	74	"V.W. LEFT SIDE" slow down and block due to virtual wall
	75	"OUTRIGGERS MOVEMENT LOCK" outriggers lock, engaged when relative load is higher than 10%
	76	"BLOCK ROPE OVERLOAD" winch block due to single rope overload
	77	"V.W. LEFT ANGLE" slow down and block due to virtual wall
	78	"V.W. RIGHT ANGLE" slow down and block due to virtual wall
	79	" BLOCK JIB" jib block
	80	"SLOW BOOM IN-OUT" warning slow boom in-out

21

XJAV

22





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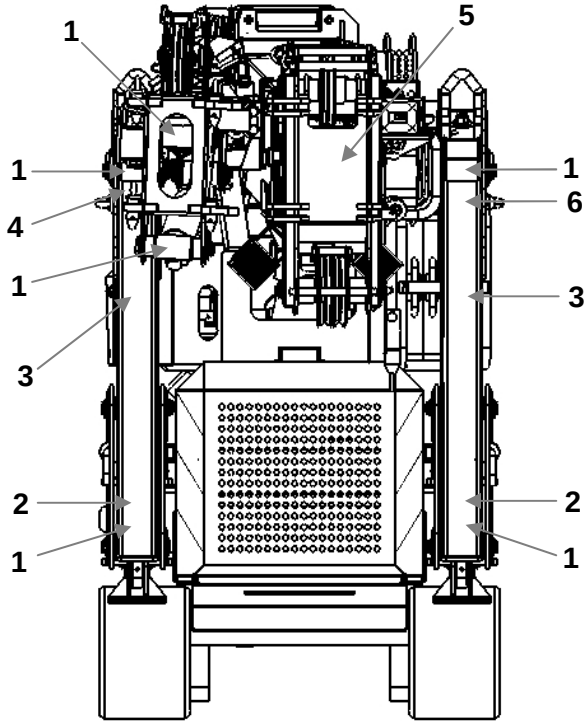
4	PRX2	5	PRX3	6	PRX10
7		8			



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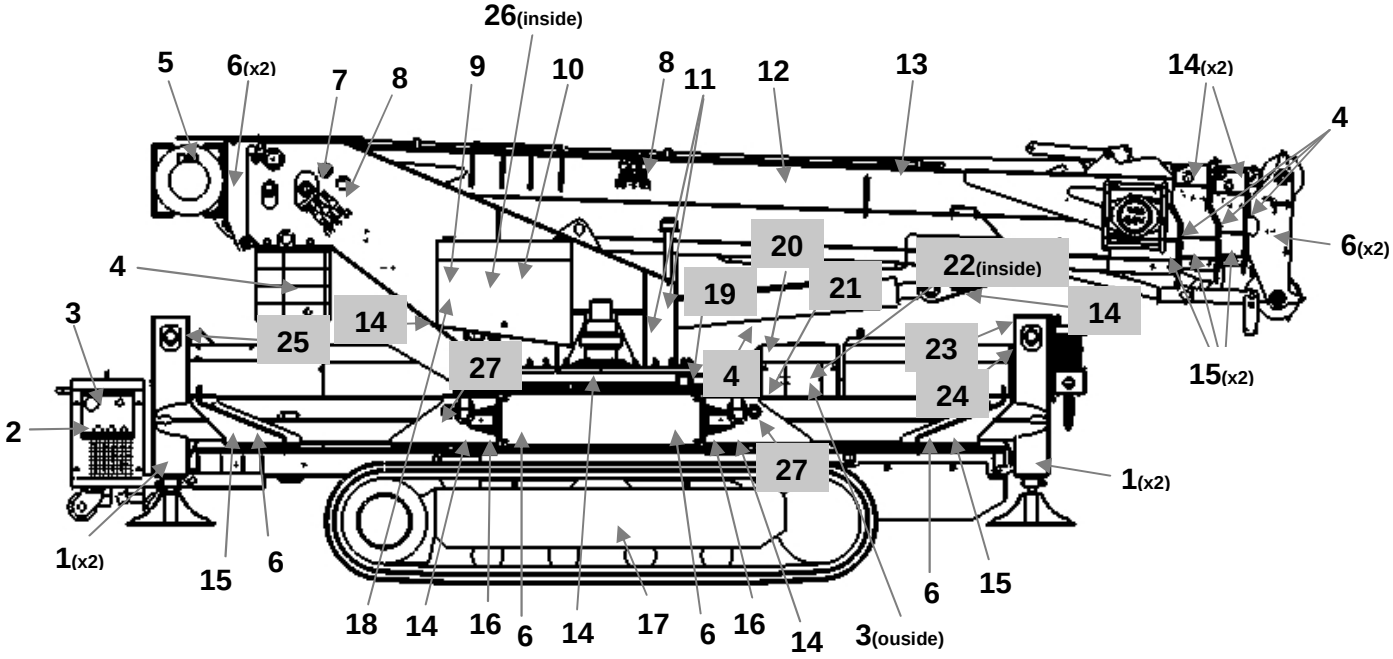
4		5		6	

2.8 Labels SPX1040-SPX1275



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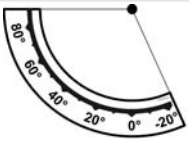
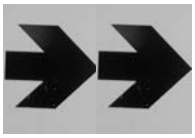
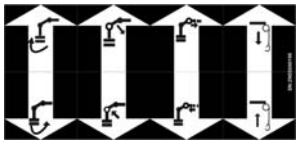
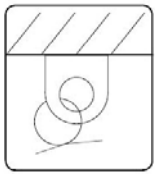
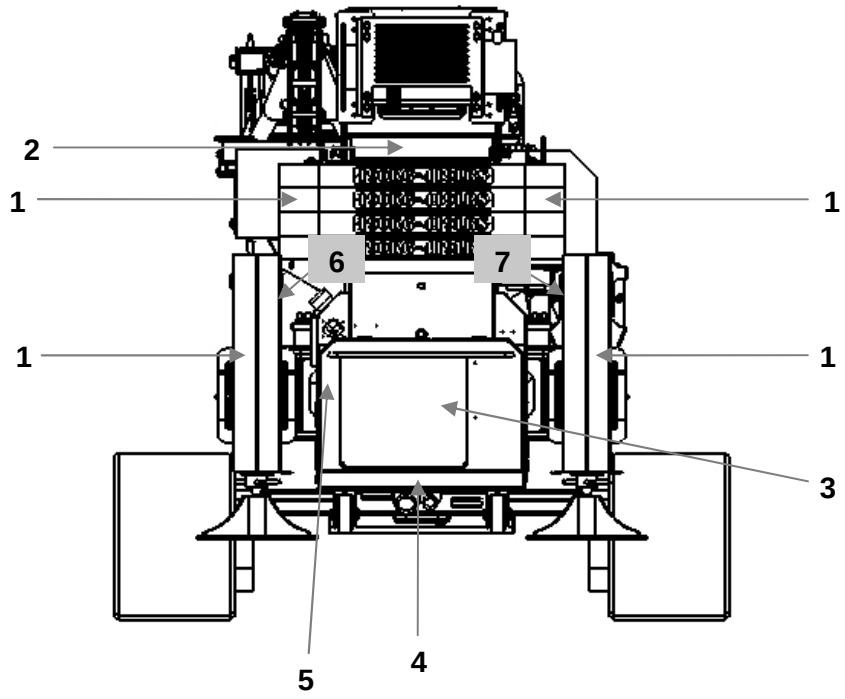
4		5	Y20	6	
7	PRX11	8	S3	9	
10		11		12	SPX 1040

13		14		15	
16		17		18	
19	PRX10A	20		21	
22	Inside FD1 FD2 FD3 	23	PRX7	24	
25	PRX5	26	Inside  Y18B / Y18A Y17B / Y17A Y16A / Y16B Y15B / Y15A Y14A / Y14B 	27	


2
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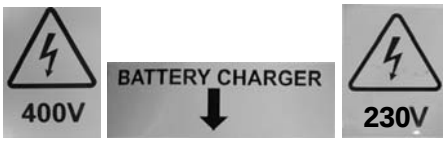
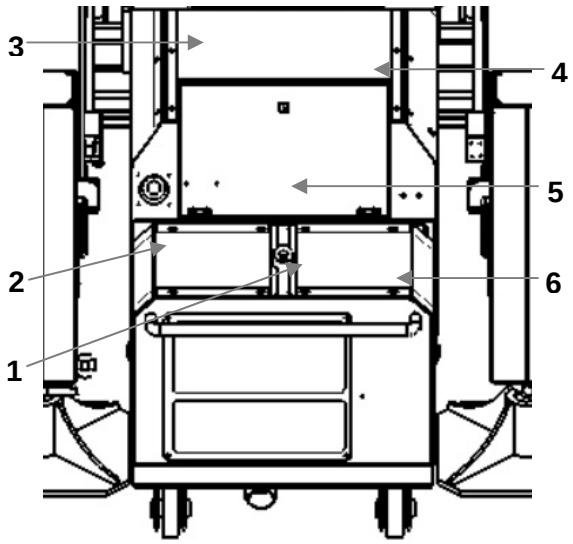
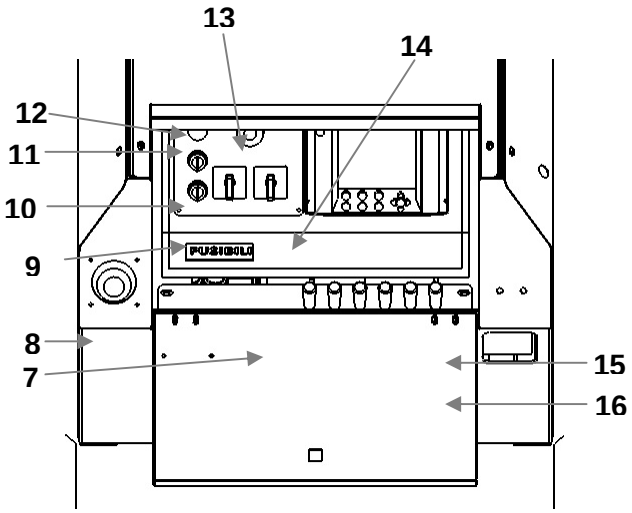
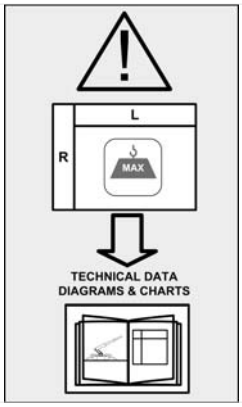
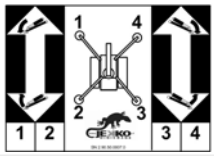
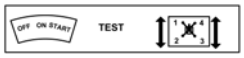
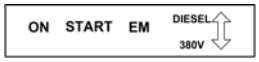
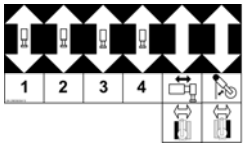
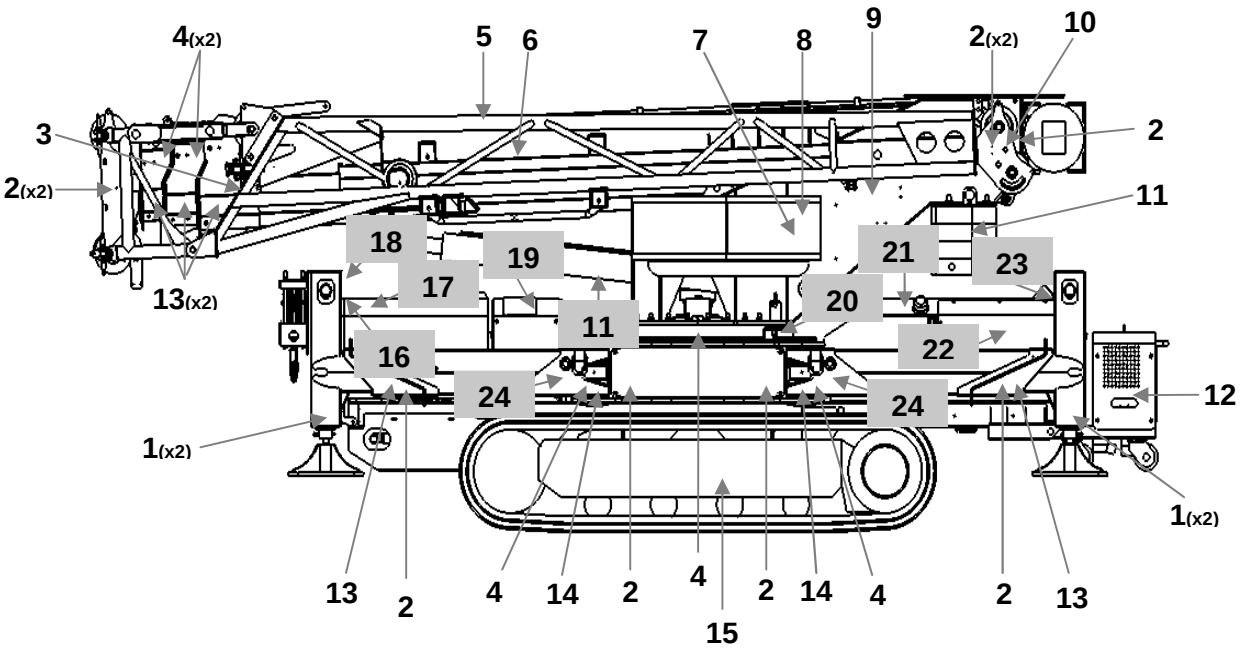
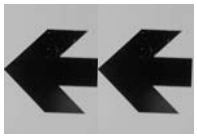
1		2		3	
4	 400V BATTERY CHARGER 230V	5	 ORMET CE MODELLO / MODEL MATR./ S.N. ANNO / YEAR PESO / WEIGHT KG	6	 2
7	 3				

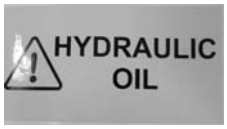
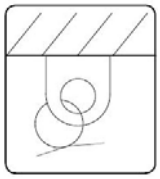


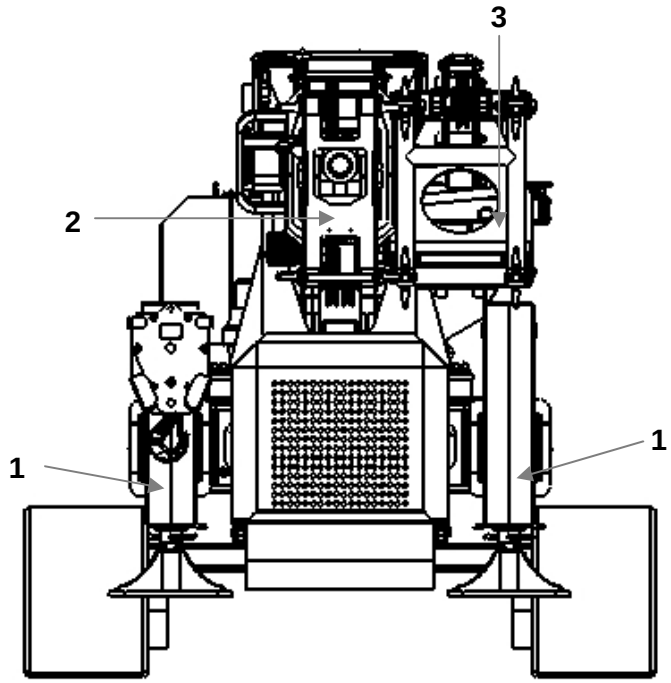


1		2		3	
4		5		6	
7		8		9	F1 F2 F3 F13 F14 F15 F4 F5 F6 F16 F17 F18 F7 F8 F9 F19 F20 F21 F10 F11 F12 F22 F23 F24
10		11	CAN BUS 2	12	
13	PRESS TO OPEN-CLOSE TRACK	14	HANDY PTHBO	15	
16	 				



1		2		3	
4		5		6	SPX 1040
7		8		9	
10	S2	11		12	
13		14		15	
16	1	17		18	PRX8

19		**20**	**PRX10**	**21**	
22	LMI — ALARMS ARE INDICATED IN THE ICONS FIRST COLUMN PICTURE | N° | DESCRIPTION 1 "Crc_Run1" Internal breakdown in the powerpack MC2. 2 "Crc_Tab1" Internal breakdown in the powerpack MC2. 3 "Crc_Prg1" Internal breakdown in the powerpack MC2. 4 "E2promAlarm" Internal breakdown in the powerpack MC2. 5 "Time Out Radio" failing communication between powerpack and remote control 6 "Time Out Arm1" failing communication with the first CPU of the ARM 7 "Time Out Arm2" failing communication with the second CPU of the ARM 10 " Time Out Acq1A" failing communication with the CPU of the Acq1A 11 "Angle LOW-HIG" internal problem of calibration 12 "Main boom extension LOW-HIGH" internal problem of calibration 16 "PREL LOW" disconnected cable on the bottom plate sensor 17 "PREL HIG" internal breakdown on the bottom plate sensor 18 "PREH LOW" disconnected cable on the cylinder 19 "PREH HIGH" internal breakdown of the cylinder sensor 20 MOTORE Diesel" General motor alarm 23 "PIN" the pin is in, but the boom is not in the correct position 24 "OVERLOAD" load limiting device if machine is overloaded 25 "KA2" security relay KA2 is broken 26 "KA3" security relay KA3 is broken 27 "BATTERIA" low battery 28 "MAX ANGLE" maximum boom inclination 30 "Angle LOW-HIGH" internal problem of hydraulic jib sensor calibration 31 "Angle LOW-HIGH" internal problem of hydraulic jib angle sensor calibration 32 "Jib extension LOW-HIGH" internal problem of hydraulic jib sensor calibration LMI — WARNINGS ARE INDICATED IN THE ICONS FIRST COLUMN PICTURE | N° | DESCRIPTION 51 "OVERLOAD" slower movements due to overload 52 "MIN PRESS" warning of a pressure sensor 53 "MAX LOAD" warning of a max load 54 "MAX ROPE UP" cable has reached max. height. Controls for winch up and boom out are blocked! " 55 "MIN ROPE DOWN" cable has reached min. height . Control winch down is blocked 56 "INSTABI ROTA 360" warning stop rotation 360° 57 "ROTATION BLOCK RIGHT SIDE " blocks boom rotation due to dangerous area 58 "ROTATION BLOCK LEFT SIDE" blocks boom rotation due to dangerous area 60 "SLOW BOOM UP-DOWN" warning slow boom up-down 61 "BLOCK MAX. HEIGHT " first slows down, then it blocks max. boom lifting 63 "NEGATIVE ANGLE AND LOW PRESSURE ON CYLINDER BASE" blocks machine movements, except boom in 64 "RISERVA" empty fuel 65 "ALLARME TRASDUTTORI" Alarm of a pressure sensor 66 "MOTOR MAINTENANCE HOURS" warns about motor working hours. Message will appear only when machine turns on 67 "MACHINE MAINTENANCE HOURS" warns about machine working hours. Message will appear only when machine turns on. 68 "EMERGENCY RADIO " emergency button is pressed down 69 "EMERGENCY LOCAL" emergency button is pressed down 70 "VIRTUAL WALL MAX. HEIGHT" slow down and block due to virtual wall 71 "FRONT V.W. " slow down and block due to virtual wall 72 "ANGLE V.W. " slow down and block due to virtual wall 73 "V.W. LEFT SIDE" slow down and block due to virtual wall 74 "V.W. LEFT SIDE" slow down and block due to virtual wall 75 "OUTRIGGERS MOVEMENT LOCK" outriggers lock, engaged when relative load is higher than 10% 76 "BLOCK ROPE OVERLOAD" winch block due to single rope overload 77 "V.W. LEFT ANGLE" slow down and block due to virtual wall 78 "V.W. RIGHT ANGLE" slow down and block due to virtual wall 79 " BLOCK JIB" jib block 80 "SLOW BOOM IN-OUT" warning slow boom in-out	**23**	**PRX6**	**24**	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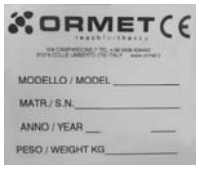
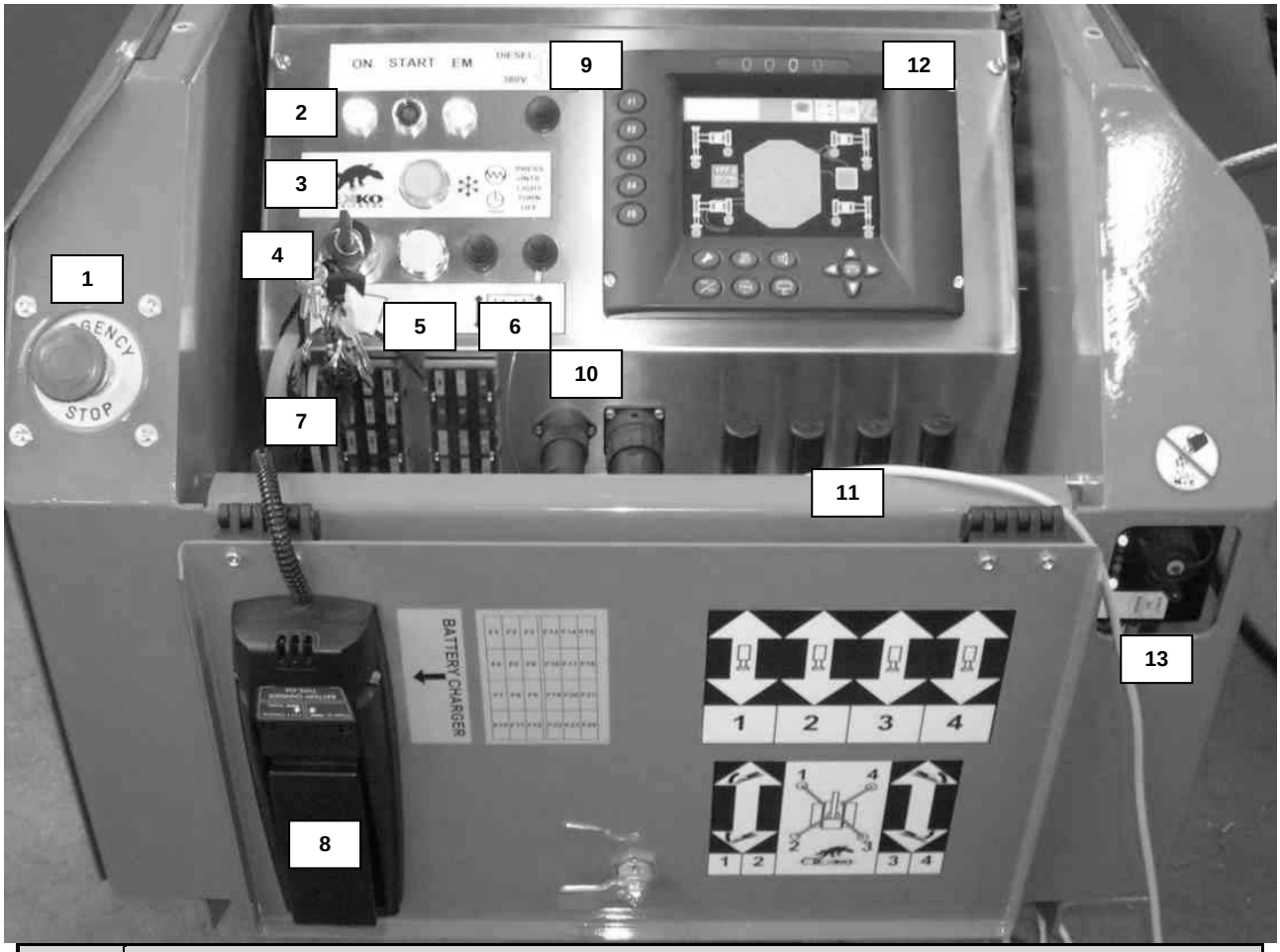
1		2		3	 ORMET CE MODELLO / MODEL MATR./ S.N. ANNO / YEAR PESO / WEIGHT KG

3 MACHINE SIGNALS AND CONTROLS

3.1 Main switchboard



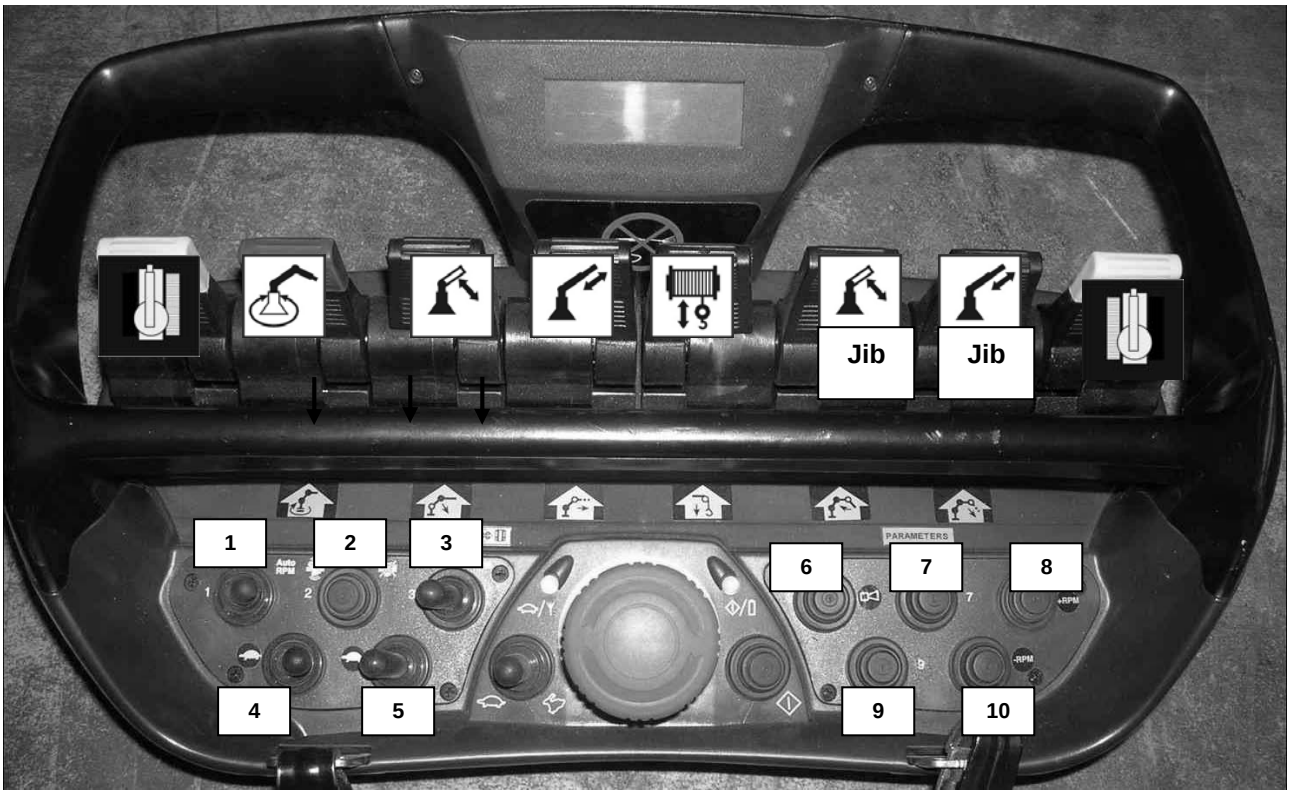
Ref.	Description
1	Emergency push button
2	Signals machine ON / machine START / emergency on EM
3	Diesel Engine ignition push button for first cool starting
4	Panel on/off key switch
5	Valve test push button
6	Outriggers switch selector (only SPX1040)
7	Fuse
8	Radio control battery charger
9	Switch diesel-3Fase/380V
10	Connection pc CAN-BUS and emergency joystick
11	Outrigger up-down valve bank (opening and extension only for SPX1040)
12	Display JEMMI JEKKO MAN-MACHINE INTERFACE
13	Radio remote control unit

Display functions

Ref.	Description
1	Push button for scroll pages
2	Push button for settings
3	Display

For the use of Jemmy see chapter 7.

3.2 Radio remote control



Ref.	Description
1	Adjustment of the engine rpm MAX/AUTOMATIC
2	Engine start
3	One joystick track movement front and back switch
4	Crane speed adjustment SLOW/FAST
5	Track speed adjustment SLOW/FAST
6	Engine stop
7	Parameters display scroll
8	Engine speed increase
9	Winch 2° speed (only SPX1040)
10	Engine speed decrease

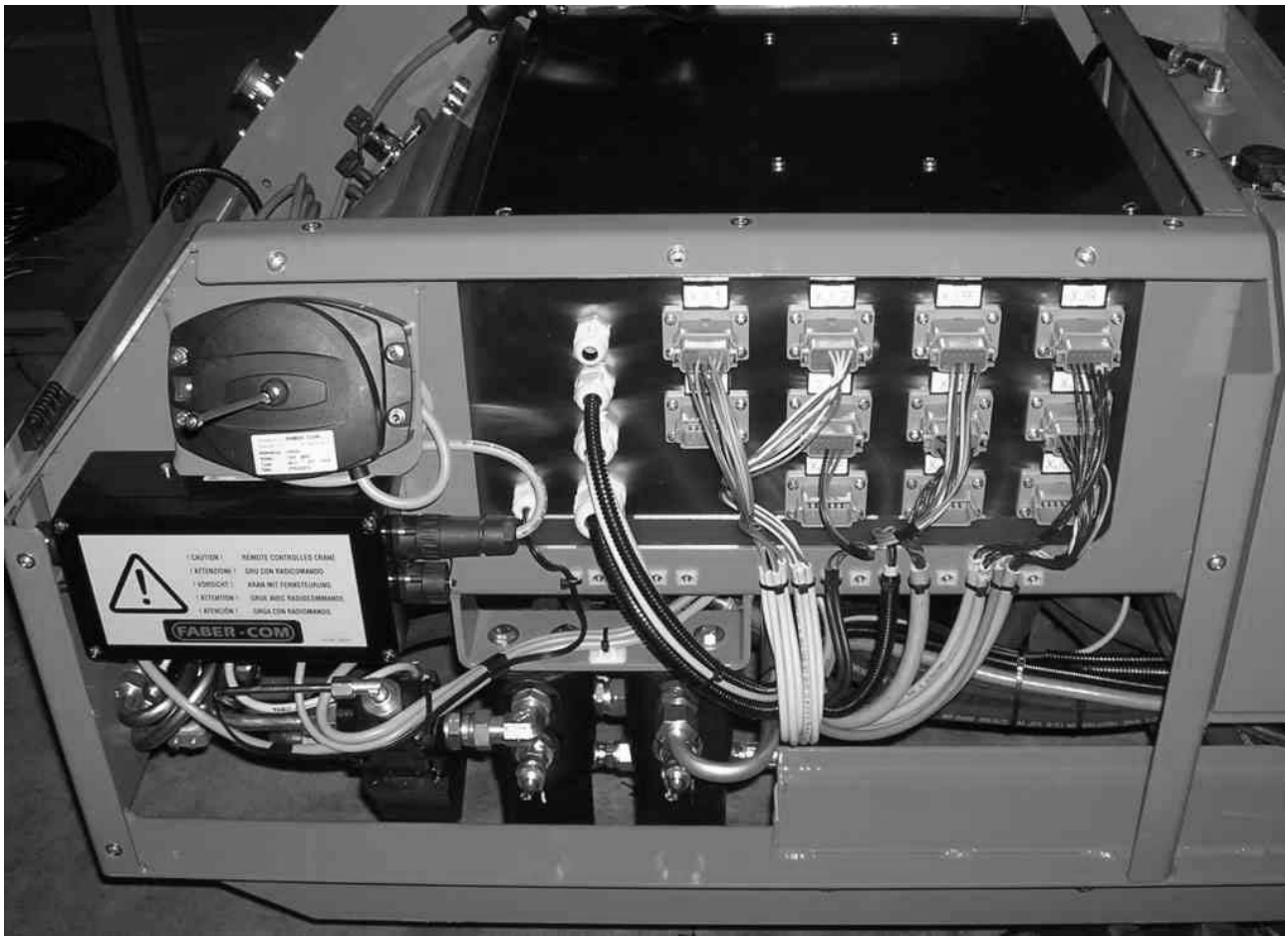
3.3 Main electrical cabinet

The electrical cabinet contains the components of the machine feeding system as well as a PLC system controlling the machine running.

CAUTION!!!

Access to the electrical cabinet is allowed to authorize personnel, only.
Tampering with the electrical cabinet will nullify the warranty conditions.

Note: Possible repairs have to be carried out by the manufacturer or under its authorization.

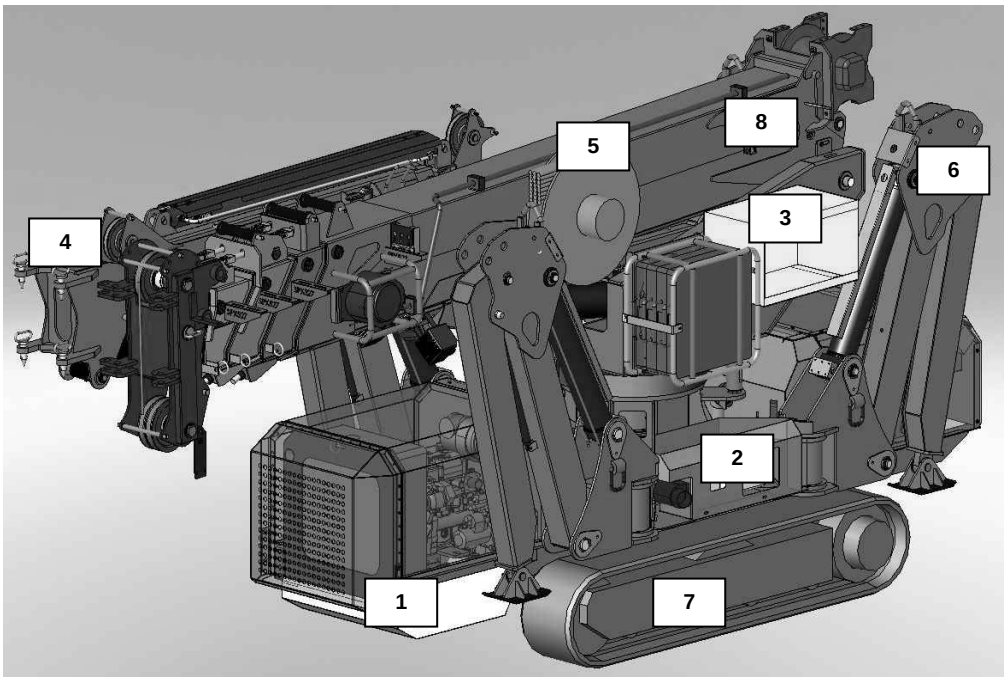


Main electrical cabinet

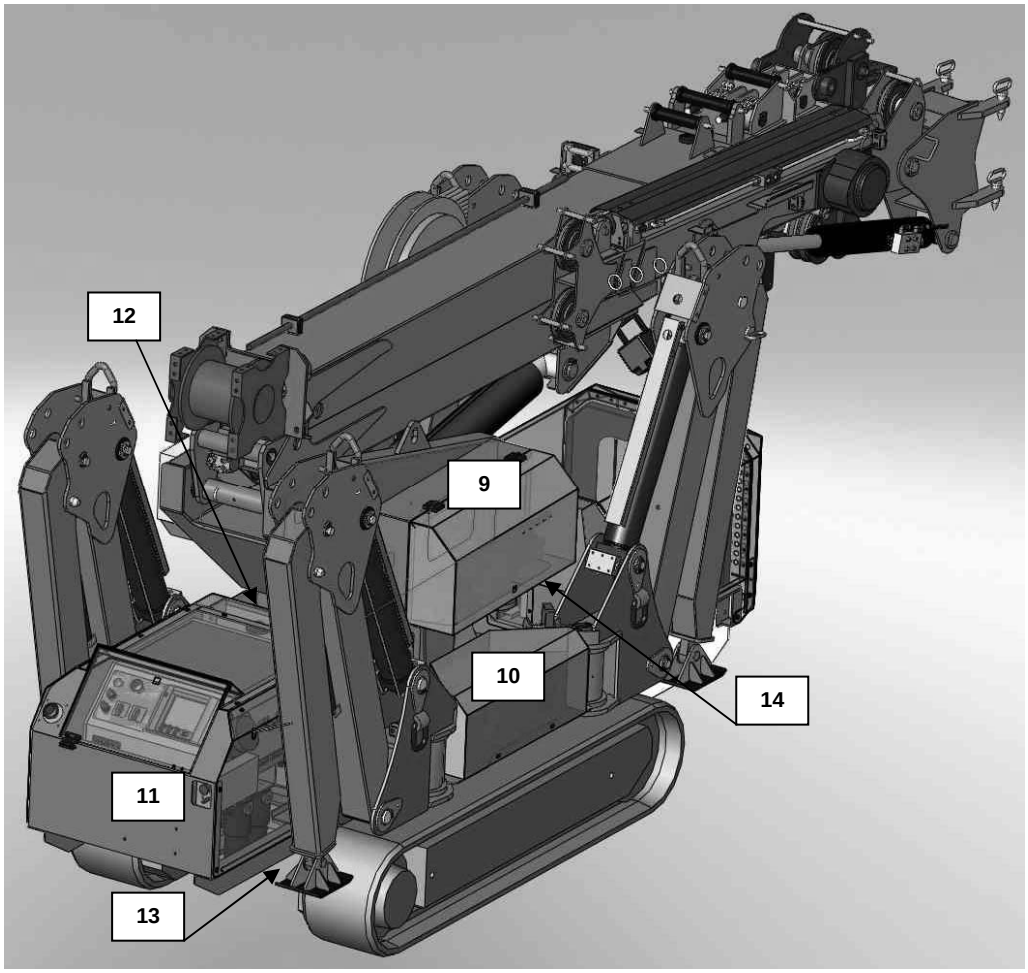
3.4 Diesel engine electric box

Ref.	Description
1	Engine start key switch
2	Alternator light
3	Fuse

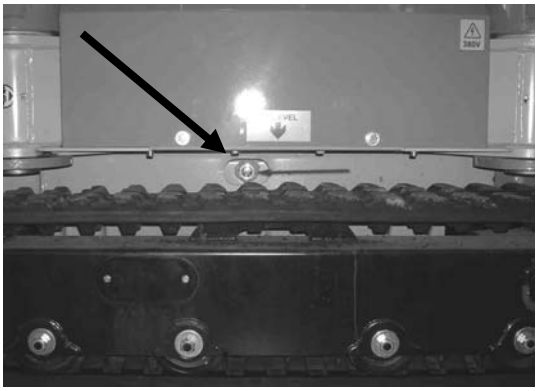
4 MAIN PART SPX527



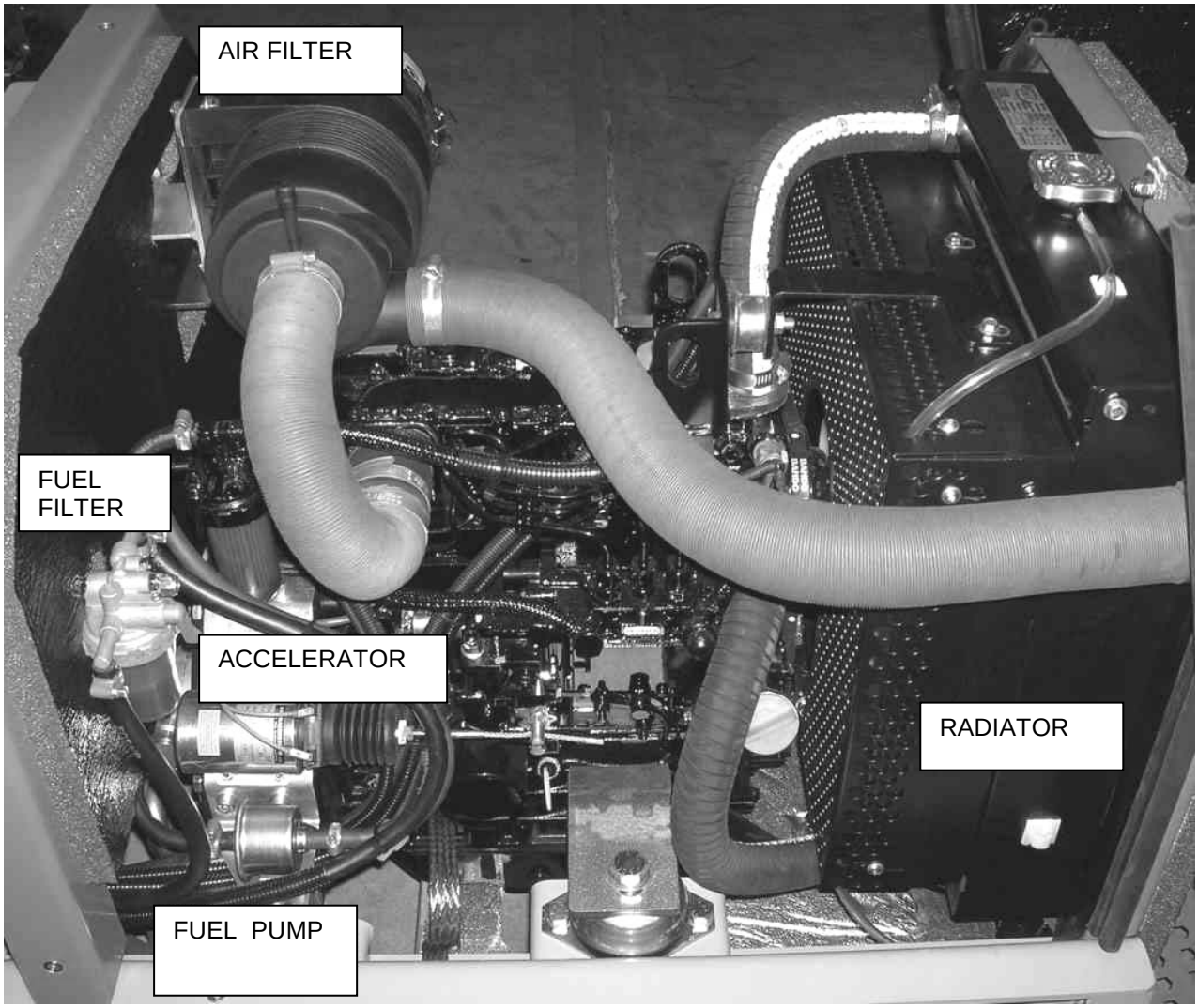
Ref.	Description
1	Diesel engine vain
2	Electric 380V box vain
3	Box for tools, documents, radio remote control
4	Hydraulic jib
5	Hydraulic pipes reel
6	Outrigger
7	Track
8	crane



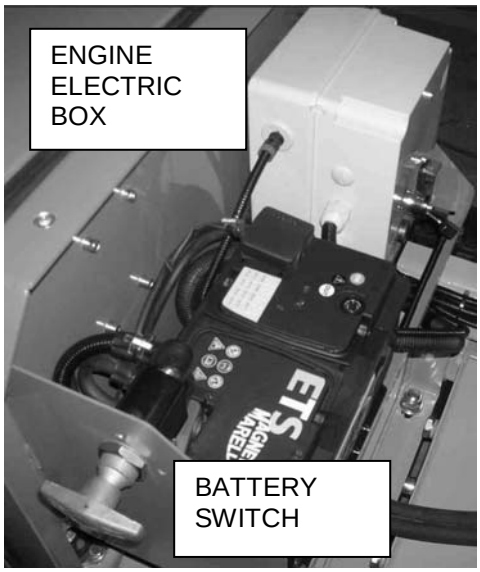
Ref.	Description
9	Crane valve bank vain
10	Electric motor 380V vain
11	Main switchboard electric and hydraulic
12	Fuel tank
13	Hydraulic oil tank (under the machine)
14	Battery and engine electric box vain



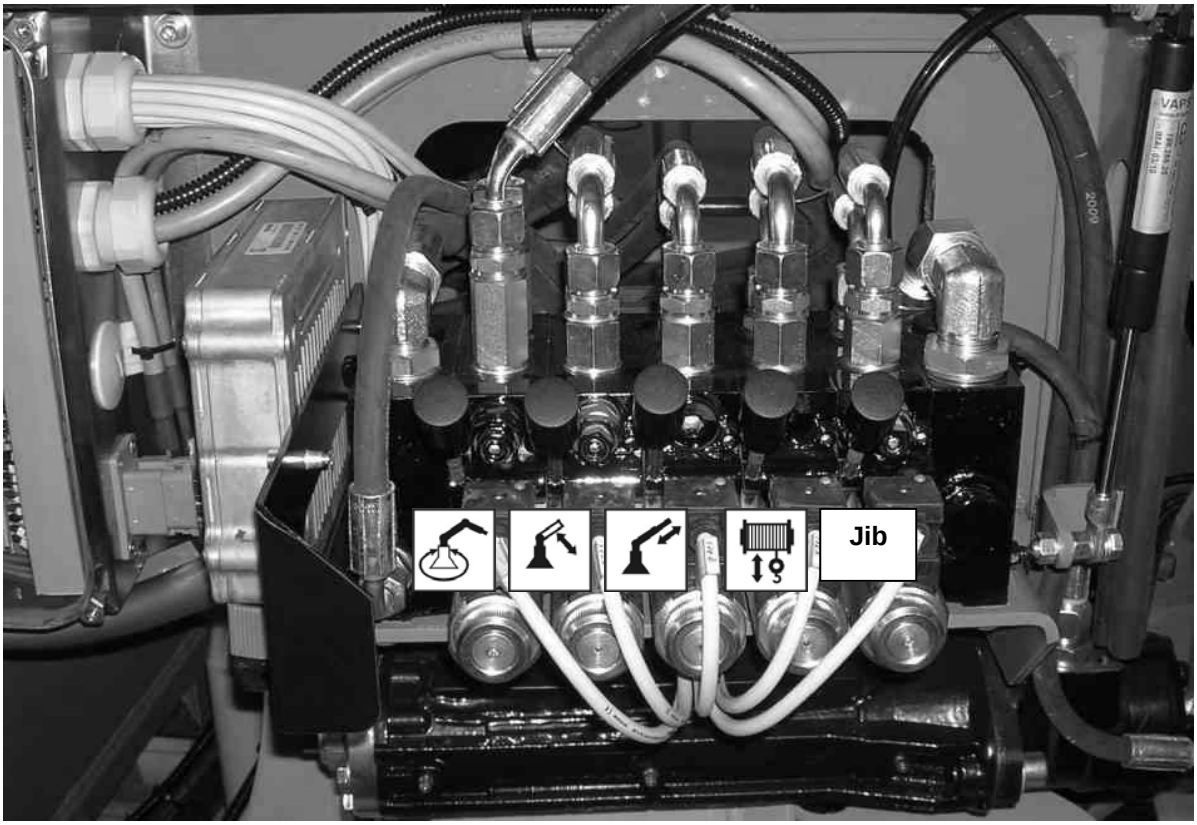
Hydraulic oil level



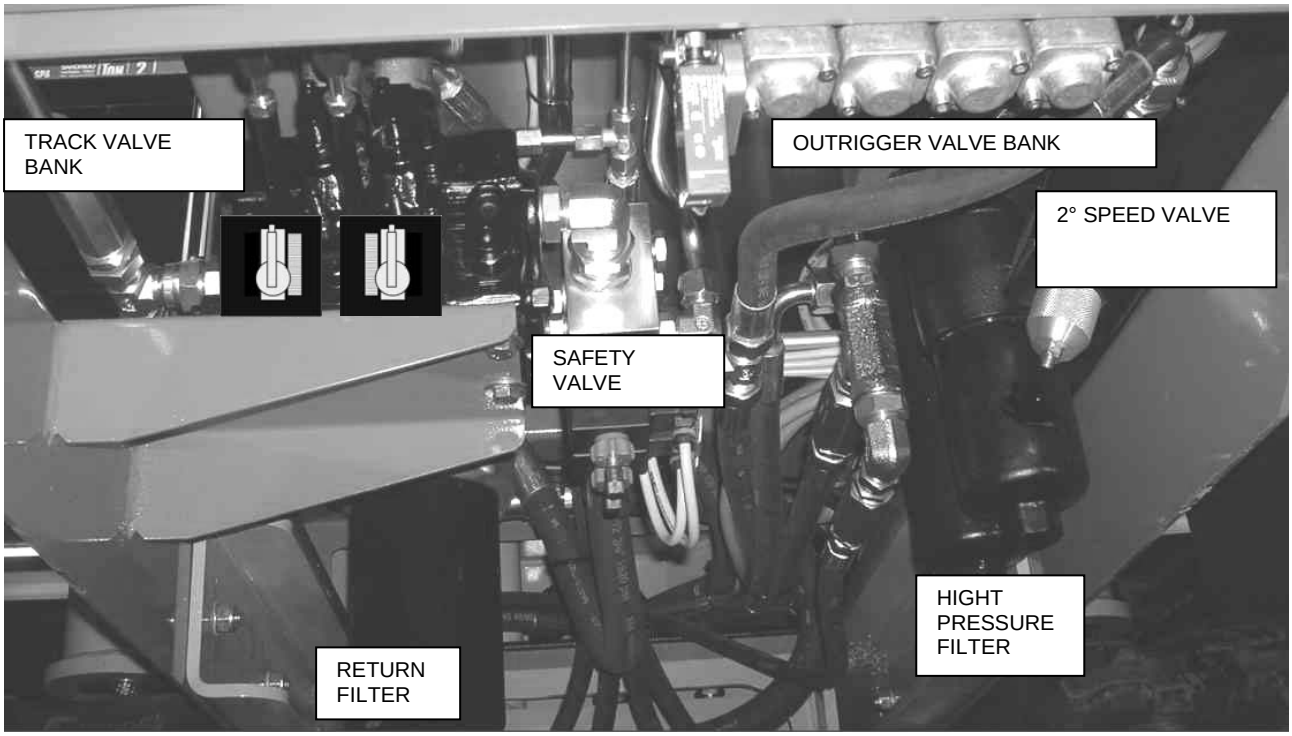
Engine vain spx527



Battery vain spx527

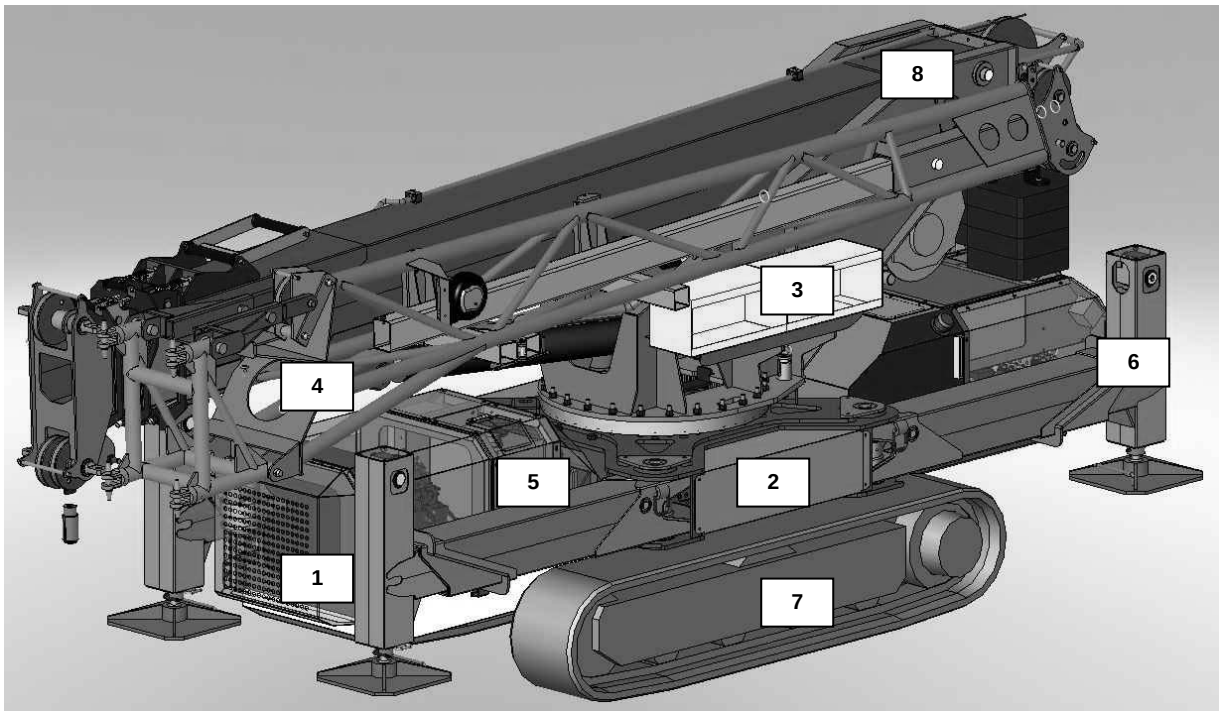


Crane valve bank spx527

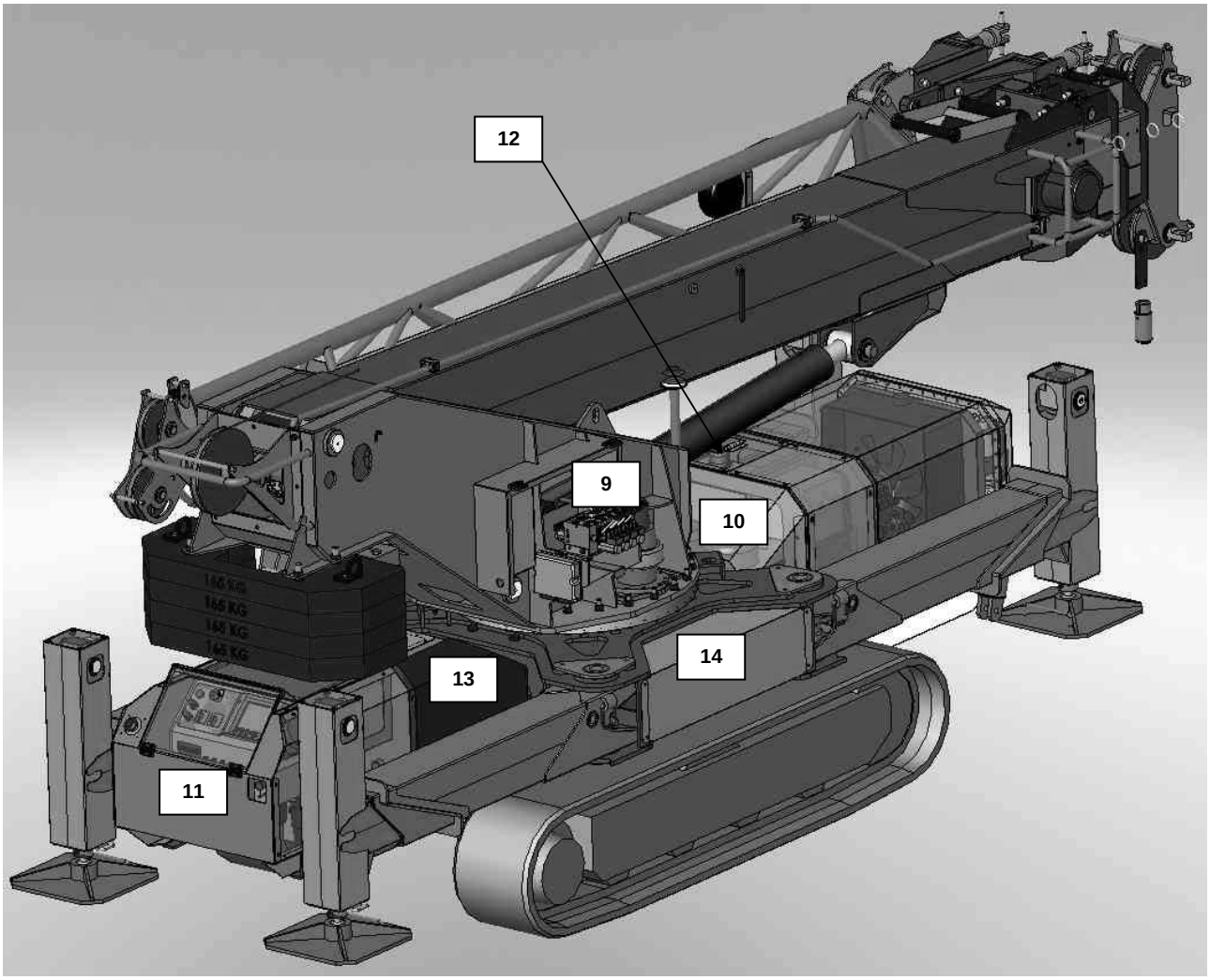


Hydraulic vain spx527

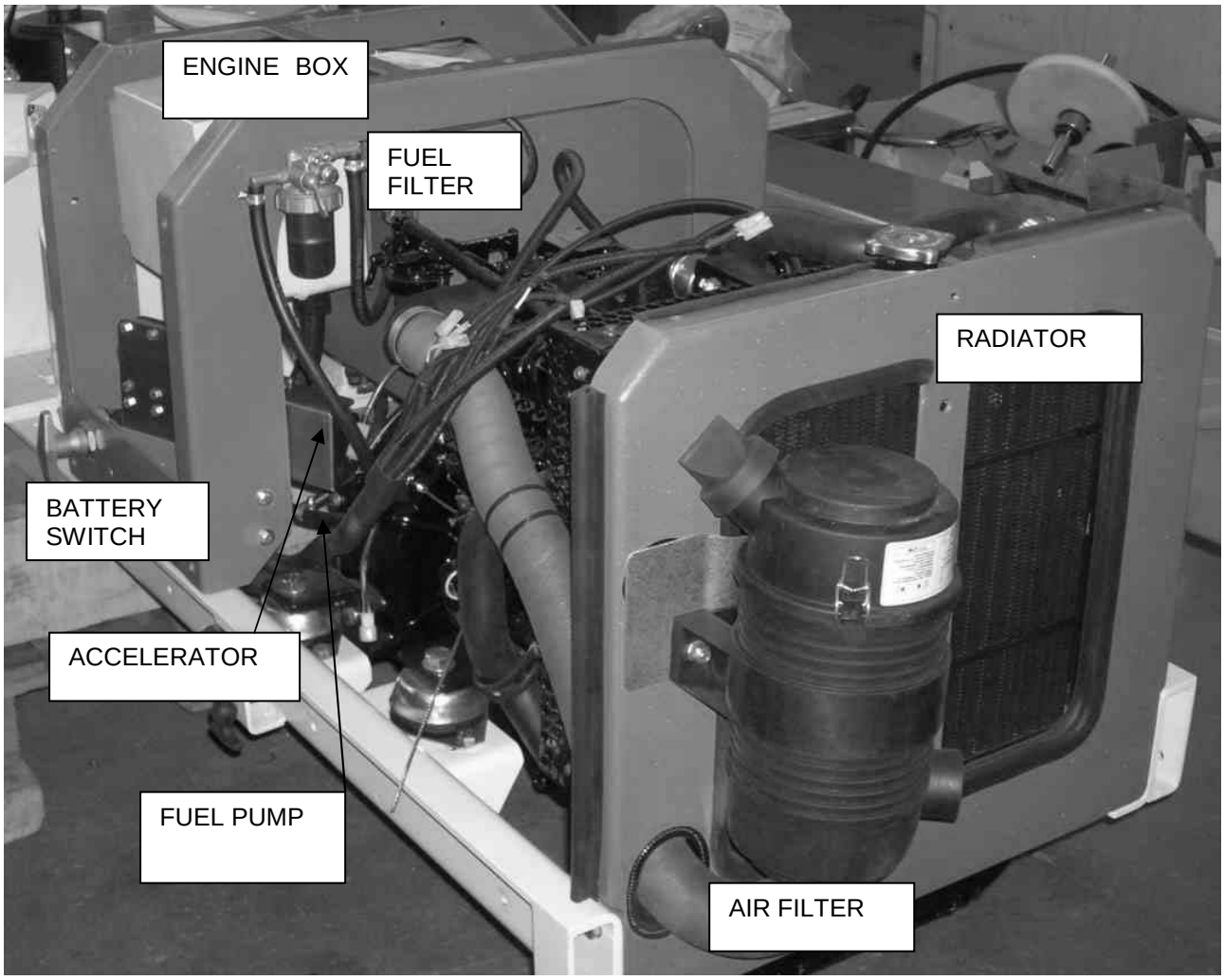
5 MAIN PART SPX1040-SPX1275



Ref.	Description
1	Diesel engine vain
2	Battery vain
3	Box for tools, documents, radio remote control
4	Mechanic jib
5	Electric 380V box vain (optional)
6	Outrigger
7	Track
8	crane

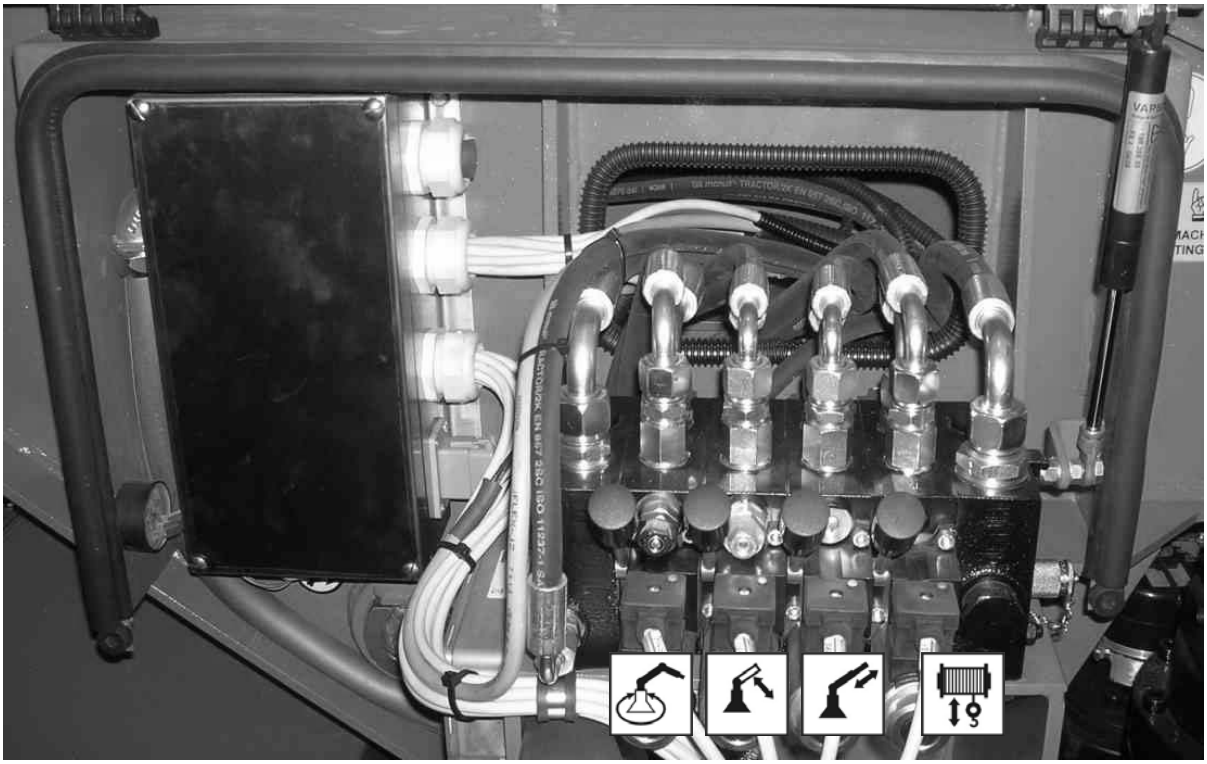


Ref.	Description
9	Crane valve bank vain
10	Electric motor 380V vain
11	Hydraulic and electric vain
12	Fuel tank
13	Hydraulic oil tank
14	380V vain

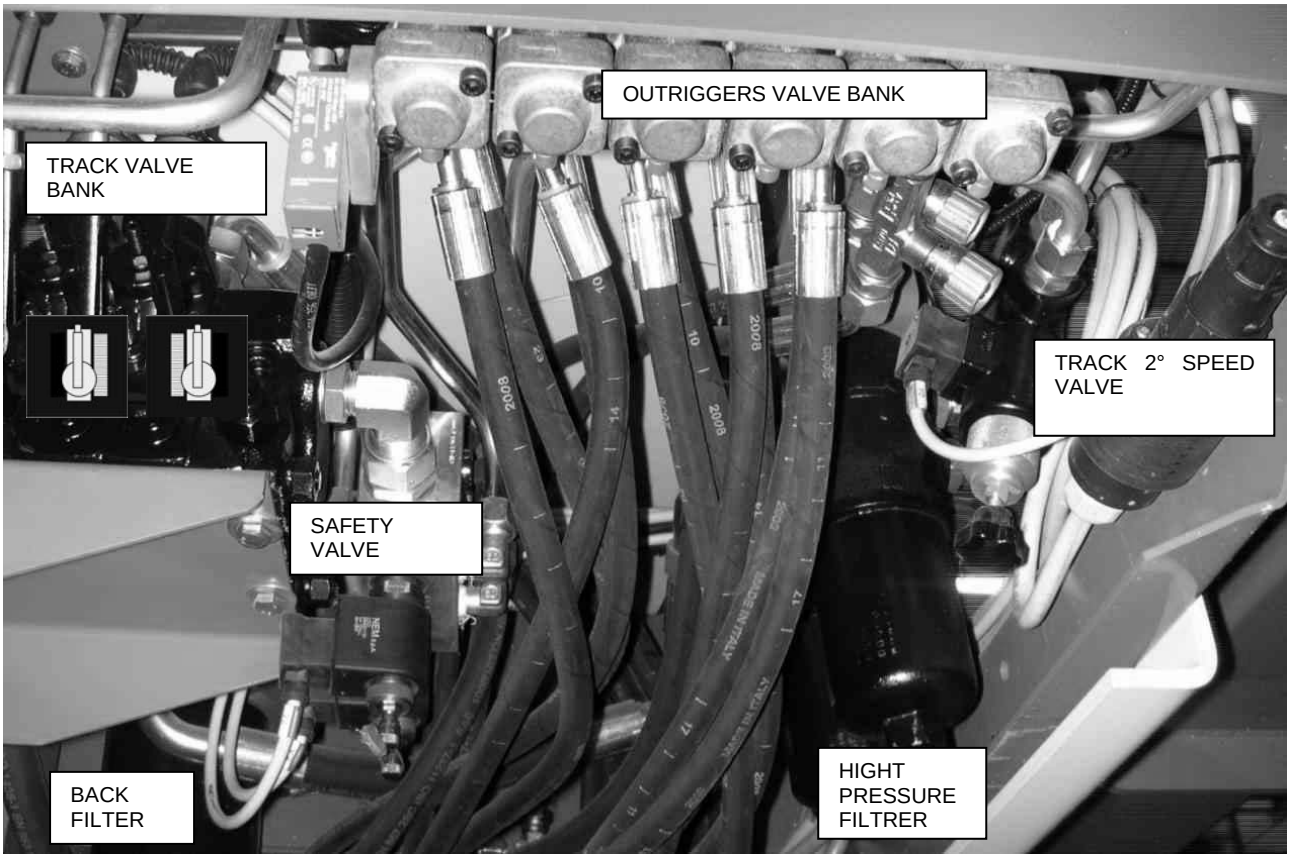


Engine vain spx1040.15

Battery vain spx1040.15



Crane valve bank spx1040.15



Hydraulic vain spx1040.15

6 USE OF THE MACHINE IN REGULAR WORKING CONDITIONS

6.1 Daily check

Daily checks to be performed before starting the machine:

- Check hydraulic oil level
- Verify there is no visible oil leakage
- Test safety systems
- Carpentry condition visual check
- Check greasing of the machine
- Check engine oil level

6.2 Machine starting

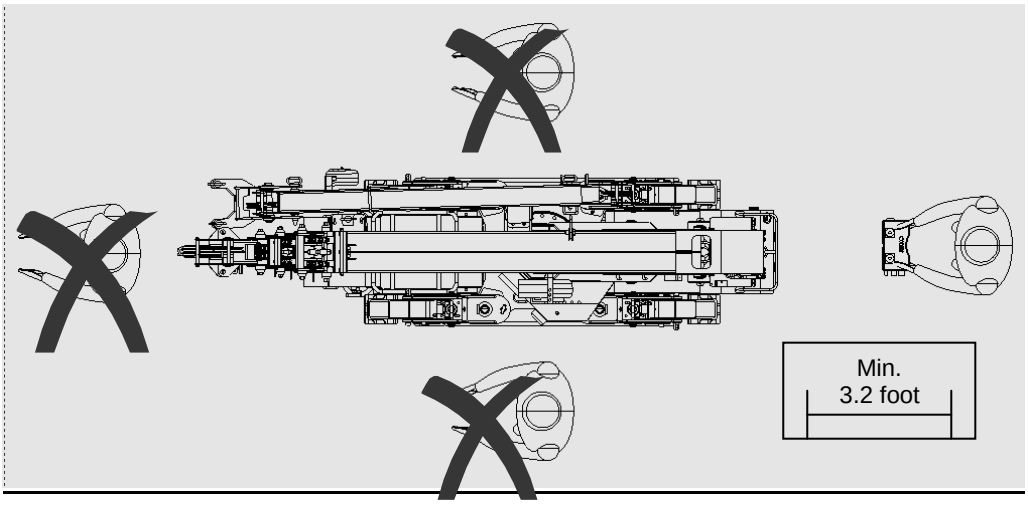
- Turn the battery switch on the ON position
- Start the machine by turning the key switch of the switchboard on the ON position (3.1)
- Turn on radio remote control (3.2)
- Set the working configuration (see cap.7)
- Enable machine turning to START
- Set the engine to use (diesel or 380V optional)
- Press button for cool starting (only if it's first machine start), when the light turn off, turn on the engine using radio control button. In case the engine doesn't start electrically, start it by the emergency key on the motor box (see 6.7)

6.3 Handling and stabilization of the machine

- Start the machine (see 6.2)
- Press F4 to see handling parameters on the display (see cap.7)
- Drive the machine using the joysticks on the radio control. To move the machine front and back using only one joystick, move the swich n°3 (see 3.2). **Don't turn quickly or sheer when you are driving on a slope, risk of tipping over!!**
- Use the switch on the radio control to modify track speed (see cap. 3.2), if engine tend to turn off leave the switch on FAST position

CAUTION!!!

Safety transition driving position is only behind the machine



TRUCK MODE CONFIGURATION

CAUTION!!!

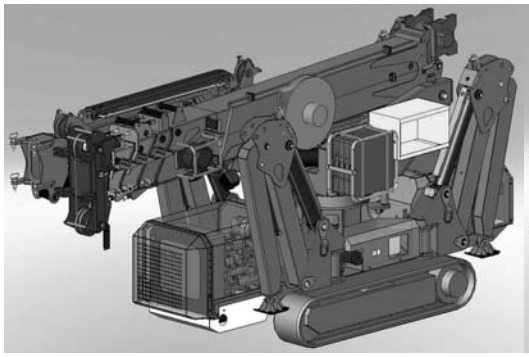
During the transition on truck mode you have to be sure that:

- **Boom must be on position central and horizontal; pin to lock crane rotation must be inserted to use Pick and Carry configuration**
- **Crane Jib must be closed and stowed**
- **Outriggers must be positioned closed, retracted and locked**

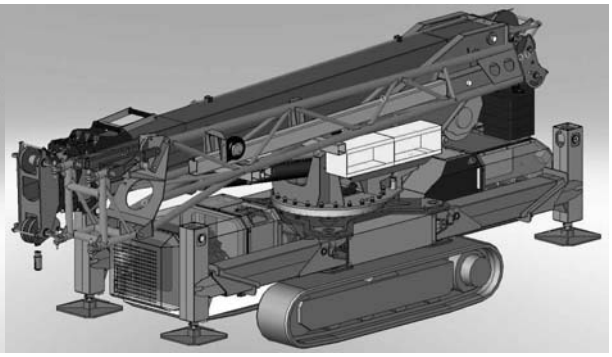
CAUTION!!!

Drive always along max slope direction.

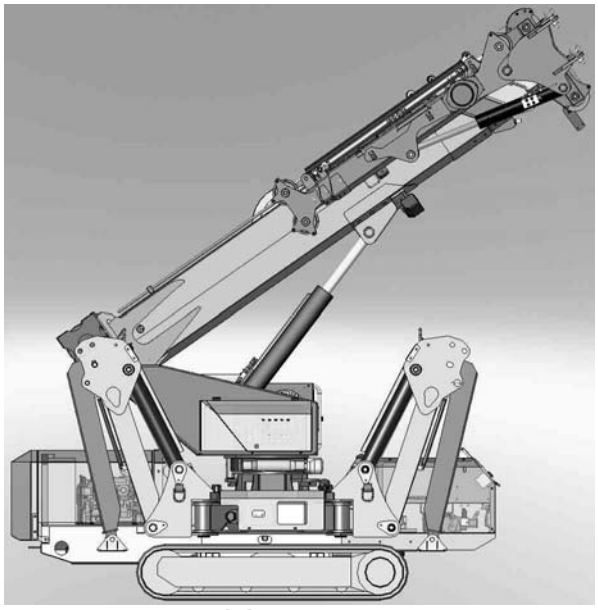
TRACK AND PICK&CARRY CONFIGURATION:



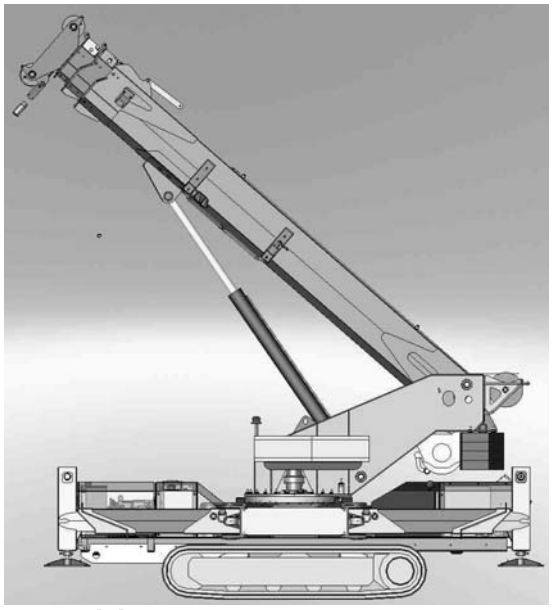
track spx527



track spx1040.15



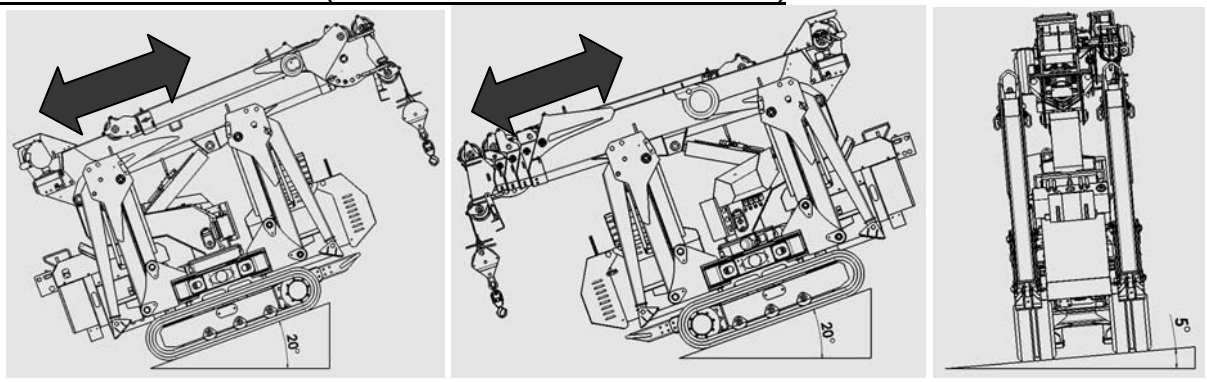
Pick&Carry spx527



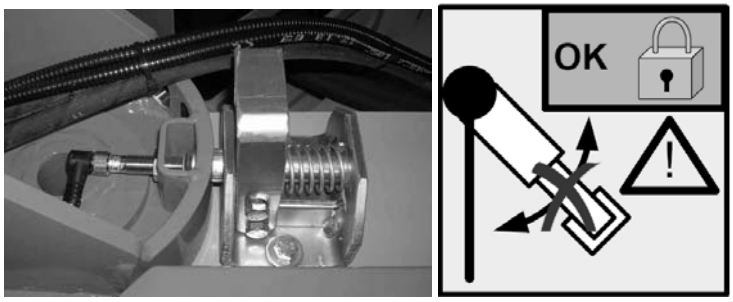
Pick&Carry spx1040.15

ATTENTION: PICK AND CARRY CONFIGURATION ON SPX527 IS ACTIVE ONLY IF PIN THAT LOCK CRANE ROTATION IS INSERTED AND THE BOOM IS ORIENTED TO HYDRAULIC VAIN (SEE PICTURE).

MAX SLOPE GRADIENT (ONLY TRACK CONFIGURATION):

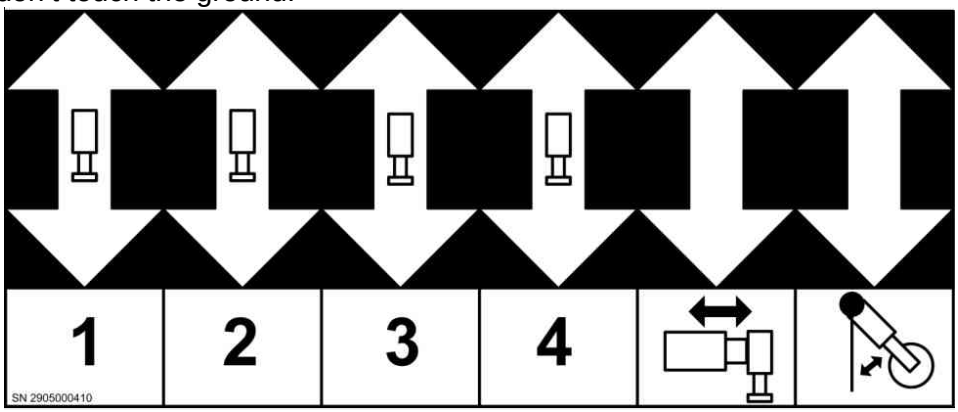


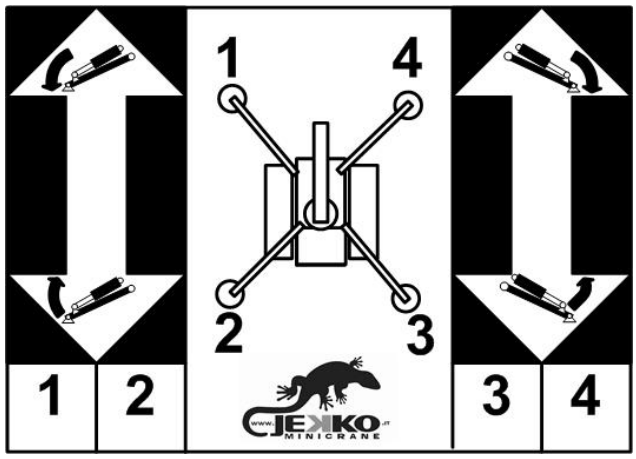
- SPX527 STABILIZATION: To see stability parameters press F2 on the display (see cap7). Extend the stabilizers depending on the configuration chosen and fix them with the appropriate locks. Position the chocks and lower the stabilizers using the hydraulic levers aboard the machine, lift the machine from the ground and make sure that the stabilizers rest on the centre of the pads and that the tracks don't touch the ground. PADS MUST BE POSITIONED AS HORRIZONTAL AS POSSIBLE .



Outrigger lock spx527

- STABILIZATION SPX1040.15: To see stability parameters press F2 on the display (see cap7). Open an extend the stabilizers depending on the configuration chosen using the hydraulic levers aboard the machine and the switch on the switchboard (see cap3.1). Lift the machine from the ground using valve bank levers n° 1-2-3-4 and make sure that the tracks don't touch the ground.





- Check on the display page F2 (see cap.7) that the working configuration is right

CAUTION!!!
Do not operate the machine when the tracks are on the ground.
MAXIMUM HEIGHT ABOVE GROUND TRACK 0.32ft.

CAUTION!!!
Do not tamper with the stabilizer position sensing system in order to alter the machine running. The manufacturer declines all deriving liability.

Do not work on floors whose structural characteristics are unknown. Use suitably dimensioned pads, only.

6.4 Use of the crane

Once the machine is correctly stabilized:
- Use the joysticks to carry out the moves indicated
- Use the switch on the radio control to change speed crane movement (see 3.2)
- To see machine condition press F1 and see on the display (see cap7)

6.5 Stop and laying-up of the machine

- Make sure that the crane boom is in a central horizontal position and carrying no load
- Retract the stabilizers and park the machine
- Turn the cut-out switch on the OFF position
- Turn the battery switch on the OFF position

6.6 Diesel engine emergency start

1- Turn on the machine and switch on to START
2- Press button to cool starting (if necessary) and then start the engine using key on motor box

6.7 Emergency use

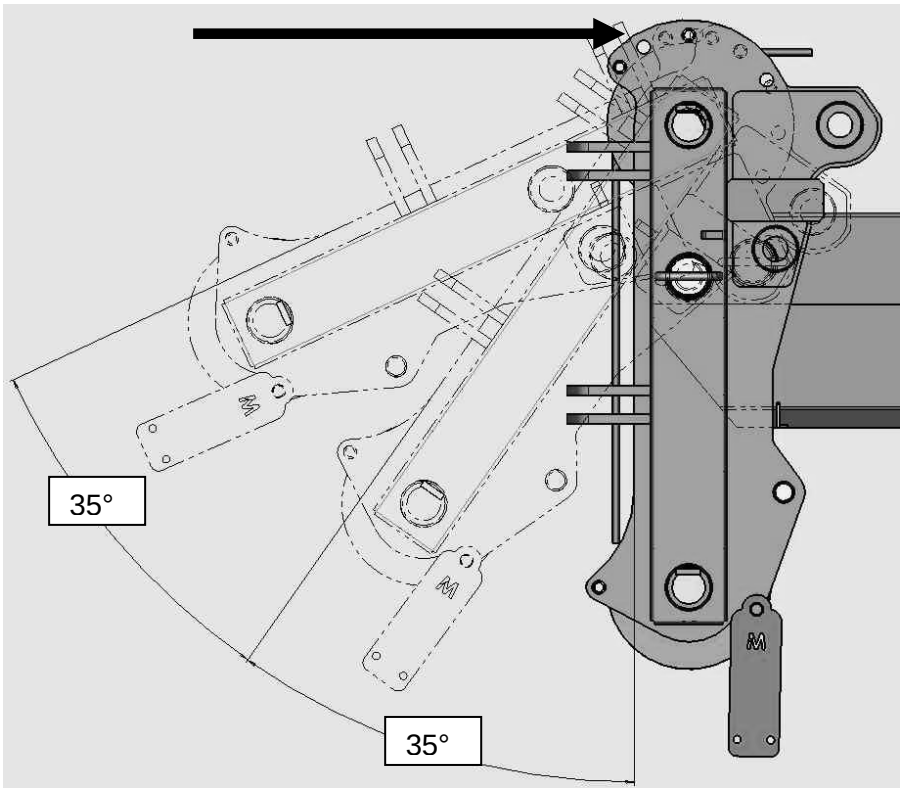
ATTENTION!! CALL ASSISTANCE TO DO THIS EMERGENCY PROCEDURE.
For emergency use is necessary remove seals of solenoid valves and use manually valve bank levers.

6.8 Use of the machine with emergency joystick manipulator

ATTENTION!!!
Use of the joystick only for emergency, see display instruction for use (see cap. 7).

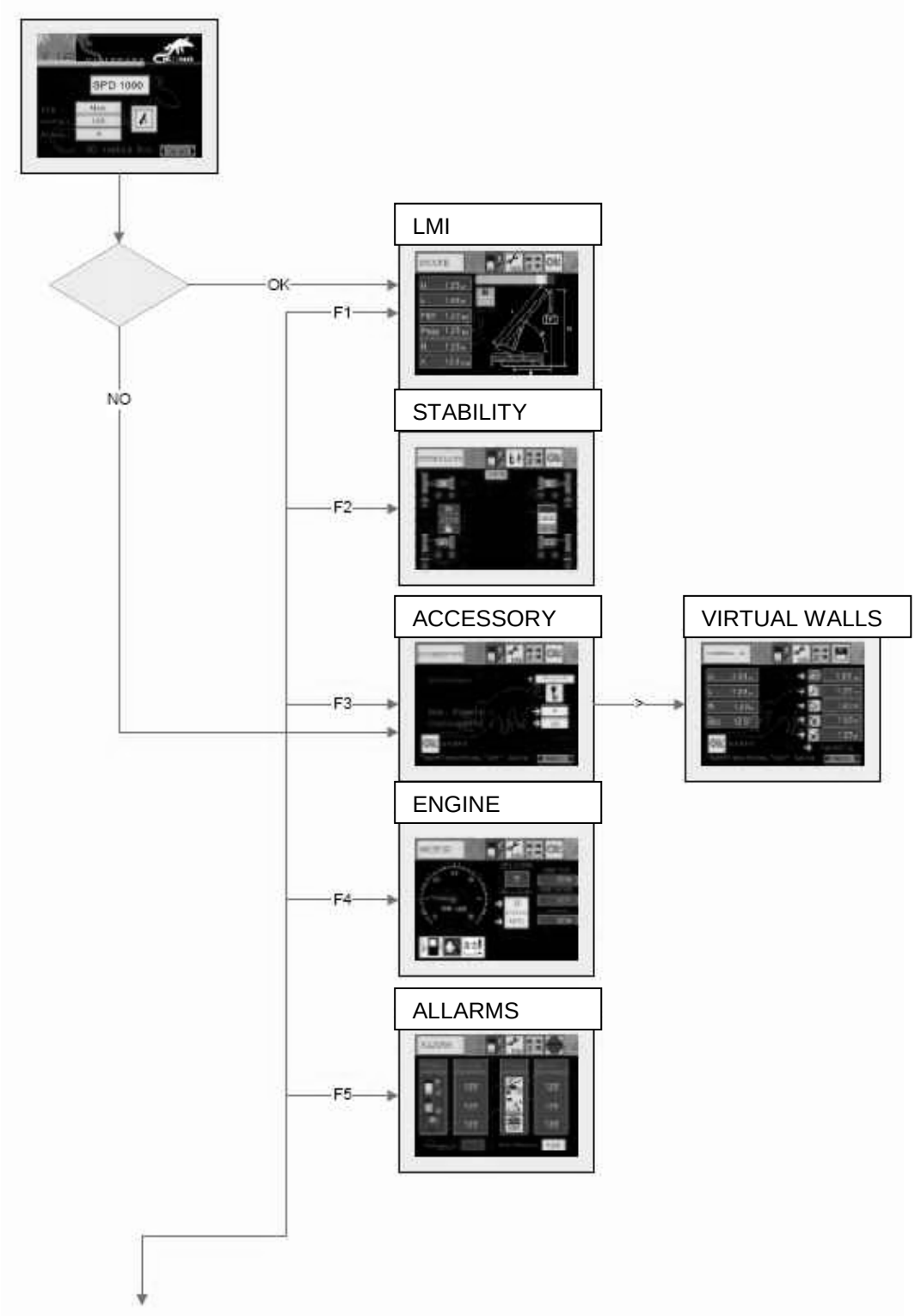
6.9 Pulley head angle spx527

You can set pulley head angle on three position; remove the pin, set the pulley head on desired position and lock it again with pin. ATTENTION TO SET PROTECTION ROPE PIPE ON THE RIGHT HOLE.

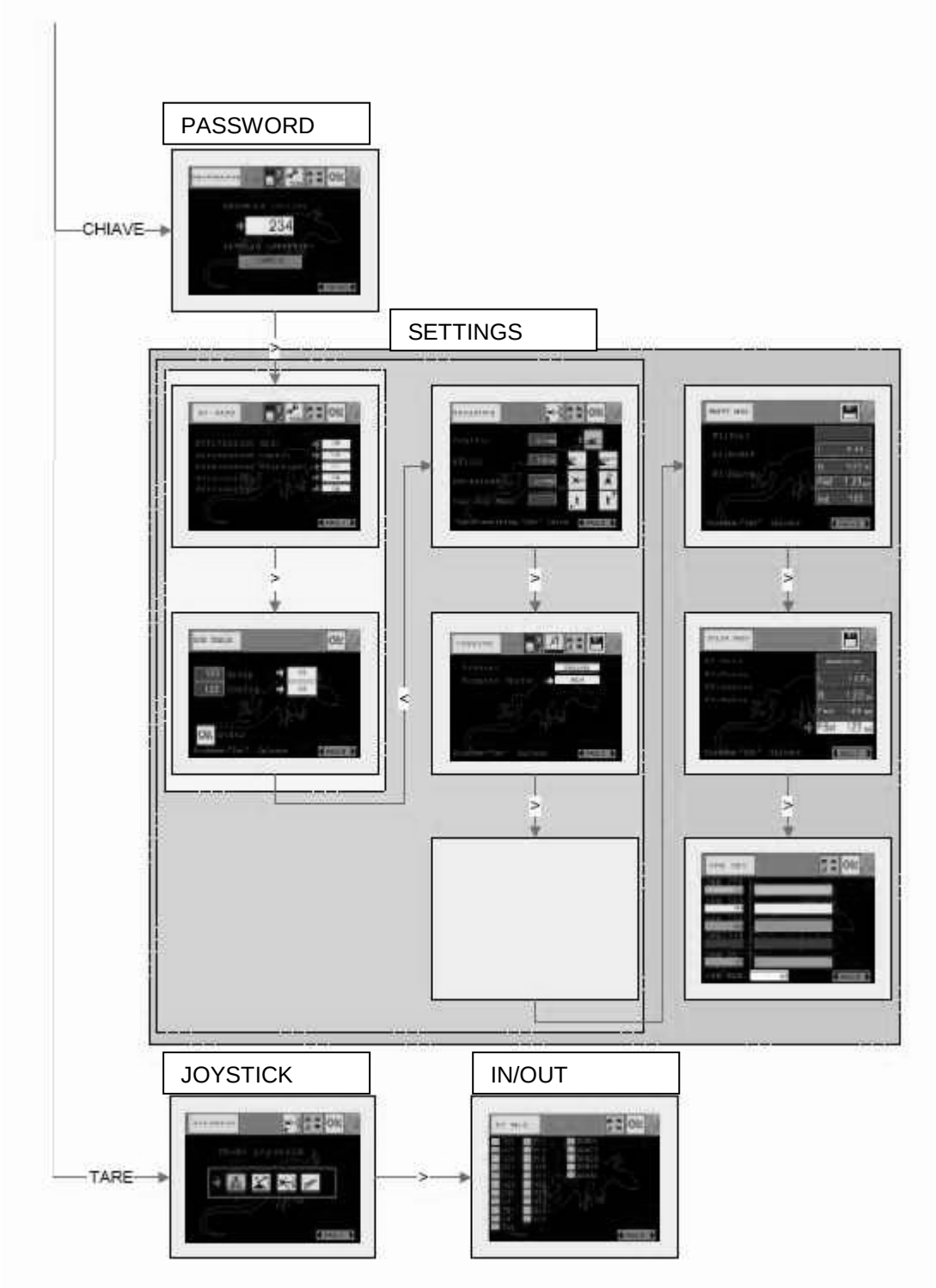


ATTENTION!!!
Remember to set pulley head configuration also on the display (see cap7)

7 USE OF DISPLAY JEMMI PAGES



Structure



structure

Page First

The first page appears only when the machine turns on. You can check condition and settings. To carry on navigation you must set the working configuration. Press  to confirm or after pressing the button  to go to page “accessory” and change settings.		
On the new version the first page appears only when the machine turns on. You can see machine settings.		
After few seconds will automatically appear setting page n°3, if it’s right one press “SET” to use machine.		

7.1 Page 1 LMI (recall with F1)

In this page you can check boom positions and machine position.
Bargraf:

indicates SWL status of the load limiter

lights reflect limiter:

-0-80% ok green

-90% of max load pre-alarm yellow

-100% overload red

Crane

Crane+Jib

 Indicates the colour of the load chart according to boom position (green-red-grey).

 Indicates pin position to block rotation (green free, red locked).

In this page you can check boom positions and machine position only if hydraulic jib is installed.

7.2 Page 2 STABILITY (recall with F2)

In this page you can check outriggers position and machine stability. The chart has different colours according to the position of outriggers sensors.

The three circles indicate the position of the three outriggers limit switch: rotation, extension and floor-resting.
-Rotation
-Extension (only SPX1040.15)
-Floor-resting

 Indicates boom rotation grades.

 Indicates pin position to block rotation (green free, red locked).

 Indicates the colour of the load chart according to boom position (green-red-grey).

7.3 Page 3 CONFIGURATION (recall with F3)

7.3.1 Page 3/1 Accessory

In this page you can select the kind of accessory. The accessories will change load limiter.

BOOM CONFIG: Select the type of accessory installed on the boom. (MAIN – JIB600H-)

PART NR: indicates the number of ropes (line single, double, triple, fourth), or use of 0 KOOK or 0 STINGER

COUNTERWEIGHT: indicate installed counterweight

PULLEY HEAD INCLINATION: indicated pulley head inclination 0°-35°-70°

Press Enter to enter inside (arrow get red) use arrows to modify, Enter again to confirm (arrow get yellow), use arrows to move

By pressing “SET” you can confirm and save settings. When pressing the button, the new chart for load limiter will be registered.

to confirm values

press to change to virtual walls page

Image	Initial	Description	Machine
	Main	Main boom without accessory. Work with winch	SPX527 –SPX1040.15
	Jib 0°	Main boom with horizontal jib. Work with winch	SPX1040.15
	Jib 25°	Main boom with 25° jib inclination. Work with winch	SPX1040.15
	Stinger 0°	Main boom with horizontal jib and extension. Work with winch	SPX1040.15
	Stinger 25°	Main boom with 25° jib inclination and extension. Work with winch	SPX1040.15
	Hook	Main boom work with hook	SPX527 –SPX1040.15
	Hydraulic Jib	Main boom with hydraulic jib. Work with winch	SPX527

7.3.2 Page 3/2 Virtual Walls

Here you can activate virtual walls To register and activate a virtual wall: Put the boom where you want create the wall Skim using buttons   through virtual walls and press  to select. The indicator  turns red to indicate the wall subject to a change Press the button  to record the current value of wall position Press the button  to cancel the value		If you press  SET you can activate the wall function. The box turns green  . The control  . cancels all the values at the same time.

7.4 Page 4 ENGINE (recall with F4)

In this page you can check diesel motor condition, 380V motor condition as well as working hours.  Empty fuel.  Engine oil pressure.  Battery alternator  Engine water temperature		MACHINE HOURS DIESEL ENGINE HOURS 380V ENGINE HOURS

7.5 Page 5 ALARMS (recall with F5)

In this page you can see alarm conditions. In the first 1° and 2° columns, you can see a symbol and a number		In the 3° and 4° columns, a symbol and a number indicate the type of warning

indicating the type of alarm If there are more than 3 alarms at the same time, the others can be viewed on the box “Roll Alarm”		If there are more than 3 warnings at the same time, the others can be viewed on the box “Roll Warning”

LMI		ALARMS ARE INDICATED IN THE ICONS FIRST COLUMN
PICTURE	N°	DESCRIPTION
	1	“Crc_Run1” Internal breakdown in the powerpack MC2.
	2	“Crc_Tab1” Internal breakdown in the powerpack MC2.
	3	“Crc_Prg1” Internal breakdown in the powerpack MC2.
	4	“E2promAlarm” Internal breakdown in the powerpack MC2.
	5	“Time Out Radio” failing communication between powerpack and remote control
	6	“Time Out Arm1” failing communication with the first CPU of the ARM
	7	“Time Out Arm2” failing communication with the second CPU of the ARM
	10	“ Time Out Acq1A” failing communication with the CPU of the Acq1A
	11	“Angle LOW-HIG” internal problem of calibration
	12	“Main boom extension LOW-HIGH” internal problem of calibration
	16	“PREL LOW” disconnected cable on the bottom plate sensor
	17	“PREL HIG” internal breakdown on the bottom plate sensor
	18	“PREH LOW” disconnected cable on the cylinder
	19	“PREH HIGH” internal breakdown of the cylinder sensor
	20	“MOTORE Diesel” General motor alarm
	23	“PIN” the pin is in, but the boom is not in the correct position
	24	“OVERLOAD” load limiting device if machine is overloaded
	25	“KA2” security relay KA2 is broken
	26	“KA3” security relay KA3 is broken
	27	“BATTERIA” low battery
	28	“MAX ANGLE” maximum boom inclination
	30	“Angle LOW-HIGH” internal problem of hydraulic jib sensor calibration
	31	“Angle LOW-HIGH” internal problem of hydraulic jib angle sensor calibration
	32	“Jib extension LOW-HIGH” internal problem of hydraulic jib sensor calibration

LMI		WARNINGS ARE INDICATED IN THE ICONS FIRST COLUMN
PICTURE	N°	DESCRIPTION
	51	"OVERLOAD" slower movements due to overload
ALRM	52	"MIN PRESS" warning of a pressure sensor
	53	"MAX LOAD" warning of a max load
	54	"MAX ROPE UP" cable has reached max. height. Controls for winch up and boom out are blocked. "
	55	"MIN ROPE DOWN" cable has reached min. height . Control winch down is blocked
	56	"NSTABI ROTA 360" warning stop rotation 360°
	57	"ROTATION BLOCK RIGHT SIDE " blocks boom rotation due to dangerous area
	58	"ROTATION BLOCK LEFT SIDE" blocks boom rotation due to dangerous area
	60	"SLOW BOOM UP-DOWN" warning slow boom up-down
	61	"BLOCK MAX. HEIGHT " first slows down, then it blocks max. boom lifting
	63	"NEGATIVE ANGLE AND LOW PRESSURE ON CYLINDER BASE" blocks machine movements, except boom in
	64	"RISERVA" empty fuel
ALRM	65	"ALLARME TRASDUTTORI" Alarm of a pressure sensor
Timer1	66	"MOTOR MAINTENANCE HOURS" warns about motor working hours. Message will appear only when machine turns on
Timer2	67	"MACHINE MAINTENANCE HOURS" warns about machine working hours. Message will appear only when machine turns on.
REMOTE	68	"EMERGENCY RADIO " emergency button is pressed down
LOCAL	69	"EMERGENCY LOCAL" emergency button is pressed down
	70	"VIRTUAL WALL MAX. HEIGHT" slow down and block due to virtual wall
	71	"FRONT V.W. " slow down and block due to virtual wall
	72	"ANGLE V.W. " slow down and block due to virtual wall
	73	"V.W. LEFT SIDE" slow down and block due to virtual wall
	74	"V.W. LEFT SIDE" slow down and block due to virtual wall
	75	"OUTRIGGERS MOVEMENT LOCK" outriggers lock, engaged when relative load is higher than 10%
	76	"BLOCK ROPE OVERLOAD" winch block due to single rope overload
	77	"V.W. LEFT ANGLE" slow down and block due to virtual wall
	78	"V.W. RIGHT ANGLE" slow down and block due to virtual wall
jib	79	" BLOCK JIB" jib block
	80	"SLOW BOOM IN-OUT" warning slow boom in-out

7.6 Page 6 SETTINGS (recall with button " Key")

In this page you can log in with a password to activate pages with advanced settings

There are 3 types of levels

1° L Client
2° L Dealer
3° L Constructor

Press Enter to enter inside (arrow get red) use arrows to modify, Enter again to confirm (arrow get yellow), use arrows to move

Page 6/1 (recall with button ">") Password level 1

In this page you can activate the bypass functions **A2B:** Winch micro switch rope up-down **Stability:** Outriggers **Overload:** Lifting boom **Diesel motor:** Oil and water temperature		Every by-pass has a time span of two minute When you activate the bypass, the following symbol appears on the screen 

7.6.1 Page 6/2 (recall with button ">") Password level 1

Page to bypass the load limits of the load chart (it is used to lock machine working configuration): Select the variable term and write in the relative values, see chart below Press  to set the loading chart. After a certain time, it will reset Press  to bypass chart limits. After a certain time, it will reset		 to confirm loading chart

Config	Description	Group	description
	SPX527		
0	MAIN pulley head 0°	0	On track Pick&Carry
1	MAIN pulley head 35°	1	SWL 0%
2	MAIN pulley head 70°	2	SWL 50%
3	Hydraulic Jib	3	SWL 100%
	SPX1040.15		
0	MAIN with counterweight	0	On track Pick&Carry
1	MAIN without counterweight	1	SWL 0%
2	JIB 0° without counterweight	2	SWL 50%
3	JIB 25° without counterweight and hydraulic Jib SPX527	3	SWL 100%
4	Stinger 0° without counterweight		
5	Stinger 25° without counterweight		

7.6.2 Page 6/3 (recall with button ">") Password level 2

Here you can calibrate the three main sectors in case of substitution **-Boom Angle** **-Boom Extension** **-Crane Rotation** **-Angle&Extension hydraulic Jib** Select the type of measurement, press  and position boom or machine angle in the same position indicated by the picture.		 By pressing SET, you confirm and save settings.

Config	Description	Group	description
	Boom horizontal tilting, 0° angle		Rotation angle 90°
	Boom completely in		Rotation angle 0° (make two complete rotation of the crane)
	Boom completely out		Hydraulic jib horizontal tilting, boom completely in and out

7.6.3 Page 6/4 (recall with button ">") Password level 2

In this page you can set language, unity of measurement, if you want, you can activate blocks for configuration on page 3, as well as stability block <u>Language:</u> every label will change according to selected language <u>Unit</u>: choose Metric or Imperial unit <u>Configuration block</u>: you can block configurations set on page 3 "Accessory"		 By pressing "SET" indicated settings will be saved. <u>The stability block:</u> allows you to use the machine only if under max. stability, anti-two blocks on page 2 are green. Otherwise stability works in the red chart. <u>Downgrade</u>: allows to downgrade on % machine SWL

7.6.4 Page 6/5 (recall with button ">") Password level 2

In this page you can reset maintenance alarms If, when starting the machine, the following alarms appear on the display for some minutes  warning 66  warning 67		You have to select the relative Reset and press  , then keep  pressed for at least 3 seconds. Warning signal will be cancelled.

Page 6/6 (recall with button ">") Password level 3

Page to calibrate vehicle load chart (only for specialized and authorized person). ON THIS PAGE DON'T CHANGE ANYTHINGS AND ESC IMMEDIATLY		

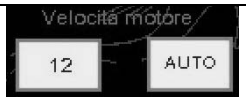
7.6.5 Page 6/7 (recall with button">") Password level 3

Page to calibrate vehicle load chart (only for specialized and authorized person). ON THIS PAGE DON'T CHANGE ANYTHINGS AND ESC IMMEDIATLY		

7.6.6 Page 6/8 (recall with button ">") Password level 3

In this page you can check machine working hours, divided by the effort done according to the load chart SWL		

Page 7/1 (recall with button "tare/esc")

To use machine without radio remote control. Remove the cap on the plug and connect the joystick. (see cap3.1) Activate the vehicle by turning the key to the right press  to start the vehicle Press  to select joystick mode. Press  to select those movements the joystick has to perform.		 Tramite le seguenti caselle cambio la velocità e il modo di utilizzo dei giri del motore diesel .

7.6.7 Page 7/2 (recall with button ">")

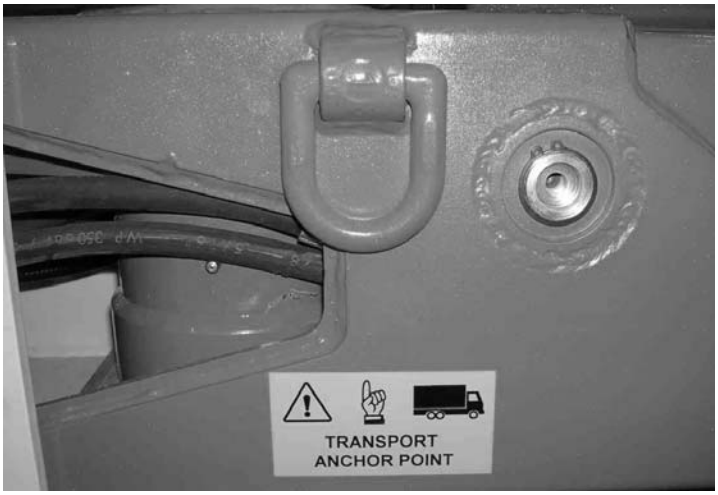
In this page you can check condition of inputs and outputs of the main unit Mc2 and of the slave "Arm"  You can check also the value of the 2 cylinder pressures.		

8 HANDLING AND TRANSPORT

8.1 Anchor for transport

Every machine has four anchor points located on each stabilizer in order to anchor it during transport .There is a label like below in the point of anchor:

SPX527



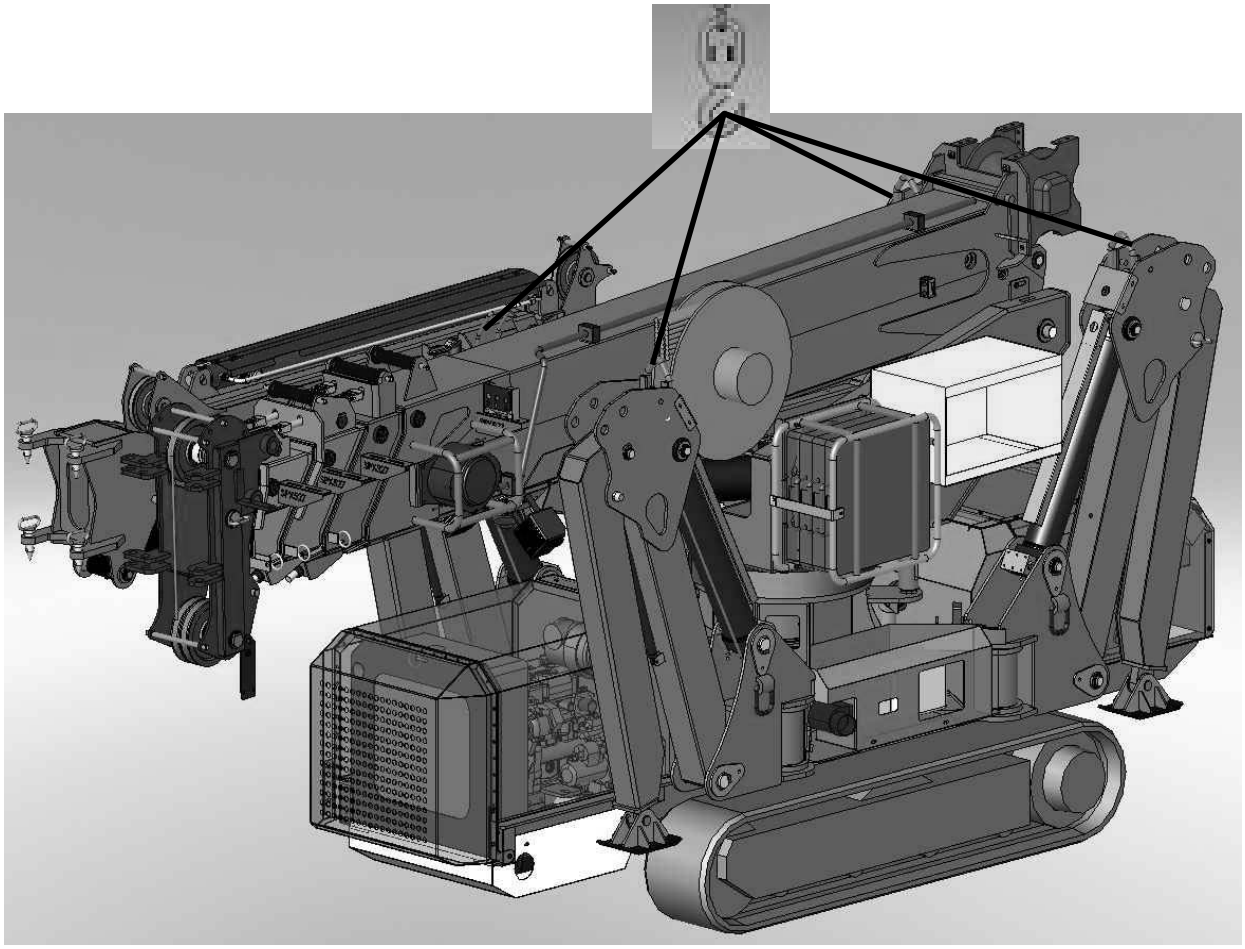
SPX1040-SPX1275

8.2 Lifting point

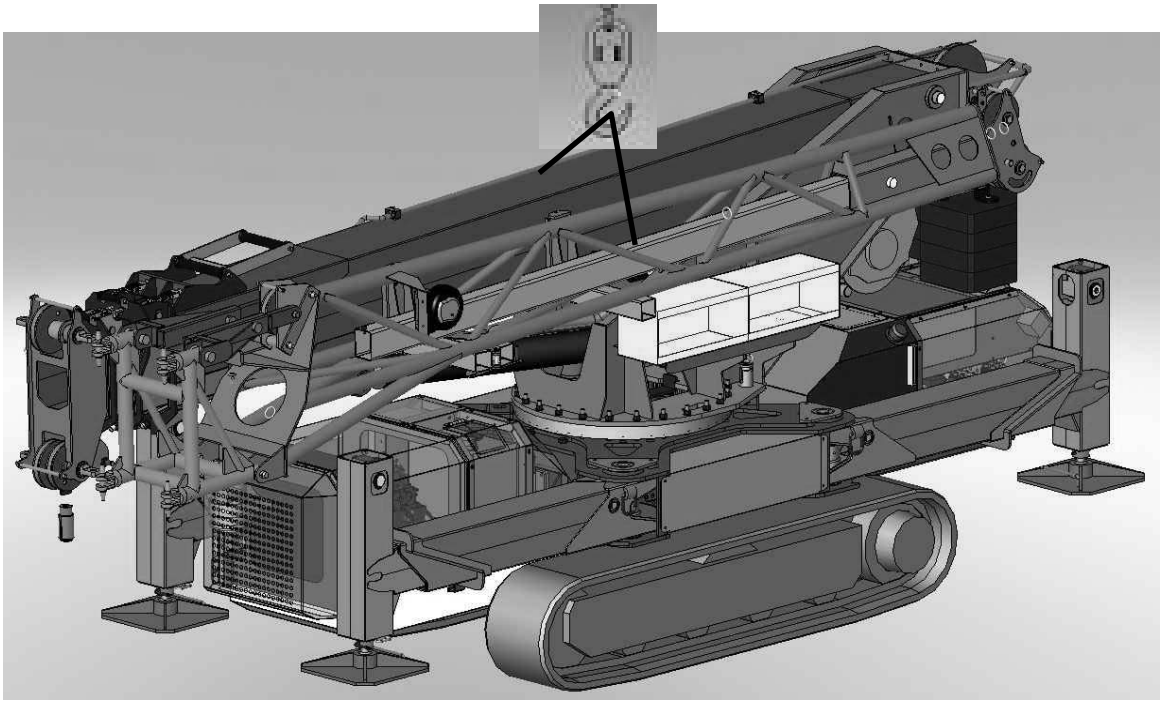
Every machine has lifting points indicated by labels on each stabilizer in order to lift and position the machine by means of a yard crane (4 point for SPX527 and 2 for SPX1040.15CD):

SPX527

SPX1040-SPX1275



SPX527 LIFTING POINT



SPX1040-SPX1275 LIFTING POINT

9 TROUBLESHOOTING

9.1 Alarms and warnings

On the following table there are alarms and warnings and possible solutions (press F5 to see on the LMI display).

LMI 		ALARMS ARE INDICATED IN THE ICONS FIRST COLUMN
PICTURE	N°	DESCRIPTION
	1	"Crc_Run1" Internal breakdown in the powerpack MC2.
	2	"Crc_Tab1" Internal breakdown in the powerpack MC2.
	3	"Crc_Prg1" Internal breakdown in the powerpack MC2.
	4	"E2promAlarm" Internal breakdown in the powerpack MC2.
	5	"Time Out Radio" failing communication between powerpack and remote control
	6	"Time Out Arm1" failing communication with the first CPU of the ARM
	7	"Time Out Arm2" failing communication with the second CPU of the ARM
	10	" Time Out Acq1A" failing communication with the CPU of the Acq1A
	11	"Angle LOW-HIG" internal problem of calibration
	12	"Main boom extension LOW-HIGH" internal problem of calibration
	16	"PREL LOW" disconnected cable on the bottom plate sensor
	17	"PREL HIG" internal breakdown on the bottom plate sensor
	18	"PREH LOW" disconnected cable on the cylinder
	19	"PREH HIGH" internal breakdown of the cylinder sensor
	20	 "MOTORE Diesel" General motor alarm
	23	"PIN" the pin is in, but the boom is not in the correct position
	24	"OVERLOAD" load limiting device if machine is overloaded
	25	"KA2" security relay KA2 is broken
	26	"KA3" security relay KA3 is broken
	27	"BATTERIA" low battery
	28	"MAX ANGLE" maximum boom inclination
	30	"Angle LOW-HIGH" internal problem of hydraulic jib sensor calibration
	31	"Angle LOW-HIGH" internal problem of hydraulic jib angle sensor calibration
	32	"Jib extension LOW-HIGH" internal problem of hydraulic jib sensor calibration

WARNINGS ARE INDICATED IN THE ICONS FIRST COLUMN

PICTURE	N°	DESCRIPTION
	51	"OVERLOAD" slower movements due to overload
	52	"MIN PRESS" warning of a pressure sensor
	53	"MAX LOAD" warning of a max load
	54	"MAX ROPE UP" cable has reached max. height. Controls for winch up and boom out are blocked. "
	55	"MIN ROPE DOWN" cable has reached min. height . Control winch down is blocked
	56	"NSTABI ROTA 360" warning stop rotation 360°
	57	"ROTATION BLOCK RIGHT SIDE " blocks boom rotation due to dangerous area
	58	"ROTATION BLOCK LEFT SIDE" blocks boom rotation due to dangerous area
	60	"SLOW BOOM UP-DOWN" warning slow boom up-down
	61	"BLOCK MAX. HEIGHT " first slows down, then it blocks max. boom lifting
	63	"NEGATIVE ANGLE AND LOW PRESSURE ON CYLINDER BASE" blocks machine movements, except boom in
	64	"RISERVA" empty fuel
	65	"ALLARME TRASDUTTORI" Alarm of a pressure sensor
	66	"MOTOR MAINTENANCE HOURS" warns about motor working hours. Message will appear only when machine turns on
	67	"MACHINE MAINTENANCE HOURS" warns about machine working hours. Message will appear only when machine turns on.
	68	"EMERGENCY RADIO " emergency button is pressed down
	69	"EMERGENCY LOCAL" emergency button is pressed down
	70	"VIRTUAL WALL MAX. HEIGHT" slow down and block due to virtual wall
	71	"FRONT V.W. " slow down and block due to virtual wall
	72	"ANGLE V.W. " slow down and block due to virtual wall
	73	"V.W. LEFT SIDE" slow down and block due to virtual wall
	74	"V.W. LEFT SIDE" slow down and block due to virtual wall
	75	"V.W. LEFT ANGLE" slow down and block due to virtual wall
	76	"V.W. RIGHT ANGLE" slow down and block due to virtual wall
	77	"OUTRIGGERS MOVEMENT LOCK" outriggers lock, engaged when relative load is higher than 10%
	78	"BLOCK ROPE OVERLOAD" winch block due to single rope overload
	79	" BLOCK JIB" jib block
	80	"SLOW BOOM IN-OUT" warning slow boom in-out

10 STANDARD OPERATOR MAINTENANCE

10.1 Ordinary Maintenance

Ordinary maintenance can be carried out independently by the machine operator. A regular a careful maintenance preserves the machine and extends its life cycle. Damages and malfunctions often require higher costs in terms of time and money than those faced for a correct maintenance. When a deadline of extraordinary maintenance is reached, the picture flashing until the warning alarm is reset after servicing the machine. The basic preset deadlines of extraordinary maintenance are at 500 and 1000 working hours.

Washing

- The equipment can be washed with detergents.
- Do not use degreasers and/or acid detergents.

DO NOT WASH THE MACHINE WITH A HIGH-PRESSURE WATER JET CLEANER

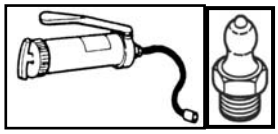
Lubrication

Lubrication is to be carried out only when the machine is at a standstill.

RECOMMENDED LUBRICANTS:

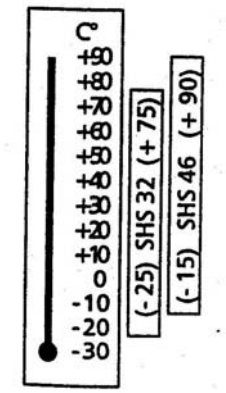
LITHIUM-BASED LUBRICANTS for temperatures ranging from -20°C to +50°C

The areas to be lubricated are equipped with a special lubricating nipple
and are indicated with a sticky label:



Hydraulic oil

Top up or replace only with the following recommended oil:



OIL ROLOIL HLD 46 AI
o equivalent, viscosity index 46 cst (ISO VG 46).

CAUTION!

If the machine works in a very cold climate where the temperature falls much below the freezing point, use oil with VG32 viscosity index.

Please dispose of the used engine oil in a manner that is compatible with the environment. We suggest you take it in a sealed container to your local service station for reclamation. Do not throw it in the trash; pour it on the ground or down a drain.

Welding

Welding must be carried out by authorized personnel, only, since some electrical devices have to be disconnected during these operations..

10.2 Battery recharging

- Connect the feeding cable by means of the suitable plug 220V blue 110V yellow
- For the batteries to recharge, it isn't necessary that the machine is started or that the battery switch is on the ON position. When the connection is done, the battery charger fan starts
- When recharging the batteries, place the machine in a well-aired place in order to avoid explosions due to the explosive gases generated by the batteries
- The battery charger starts and stops automatically

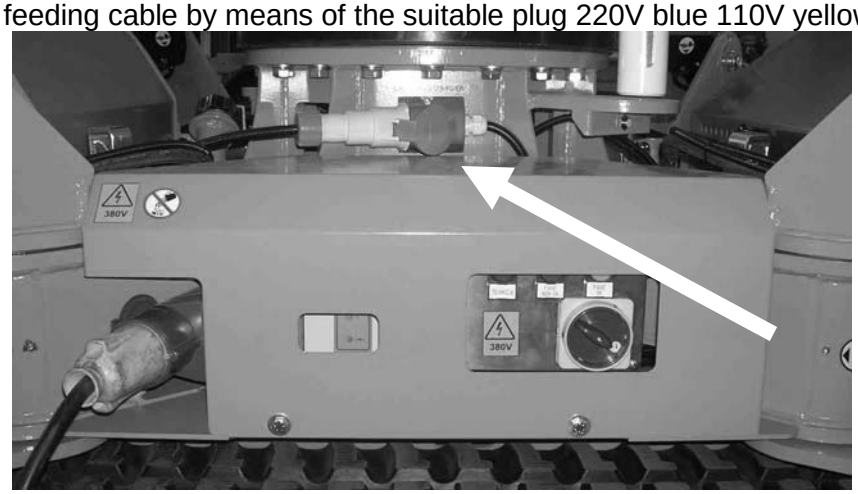
It is recommended to avoid run the batteries completely down otherwise the recharging time would remarkably extended thus implying the risk of damaging the batteries. Once the machine is stabilized, connect it to the power supply as soon as possible and operate under voltage.

At the end of the working day or when the machine will be laid up for long periods, remember to disconnect the battery switch in order to avoid run the batteries completely down.

10.3 Battery recharging

The battery is recharged by diesel motor engine, if necessary to recharge it open engine electrical vain an use a proper battery charger. The machine can have an automatic battery charger to use when diesel motor is off.

- Connect the feeding cable by means of the suitable plug 220V blue 110V yellow



- For the batteries to recharge, it isn't necessary that the machine is started or that the battery switch is on the ON position. When the connection is done, the battery charger fan starts

- The battery charger starts and stops automatically

It is recommended to avoid run the batteries completely down otherwise the recharging time would remarkably extended thus implying the risk of damaging the batteries. Once the machine is stabilized, connect it to the power supply as soon as possible and operate under voltage.

At the end of the working day or when the machine will be laid up for long periods, remember to disconnect the battery switch in order to avoid run the batteries completely down.

General warnings about battery charger and charging

- To avoid overheating, check that all the cooling clefts are not clogged.
- Protect the battery charger from possible water sprays.
- Make sure that the available power supply corresponds to that indicated on the battery charger identification plate.
- If an extension or a multiple jack are used, make sure they are suitable to the overall voltage required.
- Turn off the power supply before connecting or disconnecting plugs.
- In case of lead-acid storage battery charging WARNINGN!!!:EXPLOSIVE GASES > keep flames and sparks away. Battery must be located on a ventilated area.
- Do not use the battery charger to charge batteries of hot-air engine cars.
- Only rechargeable batteries can be charged.
- Check battery voltage is the same indicated on battery charger identification plate
- Don't try to repair the battery charger: the cover opening may cause danger of electrical shock
- If the battery charge does not work correctly, unplug it immediately from the main and from the battery and apply to the seller

- Always wear individual protective clothing such as safety glasses, gloves, etc. when performing battery maintenance.
- Never add acid to the battery.
- Do not expose to extreme heat or open flame.
- Make sure electrolyte covers are close
- Keep the battery clean and dry.

10.4 How to increase the battery lifetime

- Re-charge battery after each usage.
- Verify electrolyte level is over the plates.
- Tighten vent caps before charging;
- Do not interrupt charge cycle;
- Never charge a frozen battery.
- Perform re-charging in ventilated areas only.
- Add water only after have completely re-charged the battery;
- Never let the electrolyte level falls below the plates;
- Use distilled water or water with low mineral content.
- Nothing has to fall inside the battery.
- Clean only with water and then dry.
- Protect cables with anti-rust products.
- Completely charge the battery before storing.
- Store batteries in a cool, dry location.
- Avoid direct exposure to heat sources such as radiators or heaters
- While storing, charge batteries every six weeks.

Diesel engine

⇒ For further details, see the relative use and maintenance manual.

10.5 General warnings for maintenance activity

- ❖ The machine must be parked on a level surface.
- ❖ Perform maintenance when the machine is cold.
- ❖ Rest the machine on some blocks, it cannot be kept lifted.
- ❖ Rest all disassembled components on solid surfaces and places them so that they cannot fall in case hydraulic pressure should fall.
- ❖ All lifting devices must comply with the rules in force.
- ❖ If possible, do not climb on the machine but use suitable lifting platforms.
- ❖ Wear individual protective clothing (D.P.I.) such as gloves, glasses, etc.).
- ❖ Do not wear jewels or things that can be lost while working
- ❖ Pay attention not to damage hydraulic pipes or electrical cables during maintenance operation;
- ❖ Use suitable tools only.

10.6 Extraordinary maintenance

Extraordinary maintenance shall be carried out by authorized workshops only.

The following timetable shows the maintenance operation schedule. Extraordinary maintenance shall be carried out every 500 and 1000 working hours. The operator shall apply the machine servicing before time is elapsing, otherwise the warranty will become void.

COMPONENT PART	TYPE OF CHECK	WEEKLY	500 hours	**1000 hours**	**YEARLY**
1. FRAME & STRUCTURE					**COMPLETE CHECK OF THE MACHINE INCLUDED LOADING TESTS**
• ***Main frame***	***cricks and wear***	X	X	X	
• ***Crane pillar and extension***	***cricks and wear and greasing***	X	X	X	
• ***Outriggers***	***cricks and wear and greasing***	X	X	X	
• ***Extensions chains***	***cricks, wear, greasing and tightening***	X	X	X	
• ***Pin***	***cricks, wear, greasing and tightening***		X	X	
• ***Track***	***state of repair and wear***		X	X	
• ***Trucks Fixing Bolts***	***cricks, wear and tightening***		X	X	
• ***Crane Fixing Bolts***	***cricks, wear and tightening***		X	X	
• ***Frame Fixing Bolts***	***cricks, wear and tightening***		X	X	
2. LIFTING SYSTEM					
• ***Lifting hook***	***cricks and wear***	X			
• ***Winch rope***	***cricks and wear***	X			
3. HYDRAULIC SYSTEM					
• ***Pump***	***oil leakage, noise***		X	X	
• ***Oil tank***	***oil level, oil condition***		X	X	
• ***Hydraulic oil***	***changing***			X	
• ***Filter***	***changing***		X	X	
• ***Cylinders and valves***	***oil leakage***	X		X	
• ***Outriggers valve bank***	***oil leakage***	X		X	
• ***Trucks and crane valve bank***	***oil leakage***			X	
• ***Flexible pipes***	***oil leakage and wear***		X	X	
• ***Hydraulic pressure***	***check***		X	X	
4. ELECTRICAL PARTS					
• ***All panel***	***oxidation***		X	X	
• ***Power line***	***state of repair and wear***			X	
• ***Battery charge***	***state and functioning***		X	X	
• ***Batteries***	***electrolyte level***	X	X	X	
• ***Pressure detector***	***functioning***		X	X	
• ***Angle-extension sensor***	***functioning***		X	X	
• ***Proximity***	***functioning***		X	X	
5. SAFETY DEVICES					
• ***Emergency Push Button***	***functioning***	X	X	X	
• ***Signals on the switchboard***	***functioning***		X	X	
6. ACCESSORIES					
• ***Winch***	***greasing***		X	X	
• ***Kit 380V***	***functioning oil leakage***		X	X	
7. WARNING PLATES					
• ***"CE" mark, identification plate of the crane and of the accessories***	***presence and visibility***		X	X	
• ***Labels***	***presence and visibility***		X	X	
8. DIESEL ENGINE					
• ***Carter oil****	***Change***	X	X	X	
For more detail see the relative use and maintenance manual of engine. ATTENTION: FIRST OIL AND FILTER CHANGE AFTER 50 WORKING HOURS.					

11 SERVICING FORMS

11.1 Introduction

According to the European Directive 2006/42/CE the machine's operator has to create and regularly update a maintenance register to record:
- extraordinary and special maintenance operations,
- 500-working hour warrant-compulsory checks on structural component parts,
- 1000-working hour compulsory checks carried out by the controlling authority.

ORMET S.p.A. has prepared a model of this register for you. Ordinary maintenance will be done in careful accordance with the instructions provided in the maintenance manual. Extraordinary maintenance, e.g. the substitution of a component part or the repair of a safety device, are to be made by trained personnel or at an authorized workshop.
It is very important to take care of and update the register, in order to keep the machine always in perfect safety and performance conditions, and to prove its regular functioning in case of inspection by controlling authorities.
Instruction reported in this manual and in the register has been prepared under the regulations and standards in force at the time of first operating the machine. Further and new regulations could modify your obligations: in this case, ORMET S.p.A. will be at your disposal for further explanation.
In the register you can record:

- Quite important faults and the relevant repairs
- Periodical checks
- Change of structural, hydraulic and safety component parts
- Change of property

This register and the operating manual are an integral part of the machine and must always be kept with the machine, even in case of sale.

This register includes:

- Use and maintenance
- Compulsory periodical checks
- Forms to record periodical checks and maintenance operations
- Forms to record reports on maintenance and servicing, (with progressive record number and enclosures)
- Form for the conveyance of information in case of sale, transfer of property or change of operator

11.2 Events that relieve the manufacturer from its liability

THE MANUFACTURER SHALL BE RELIEVED FROM ANY RESPONSIBILITY OR LIABILITY IN CASE OF:

- Improper use of the machine
- *Tampering with the machine or with its component parts*
- *Machine used by not authorized personnel*
- *Serious maintenance shortage*
- *Partial or complete non-observance of instructions*
- *Non-topping up of lubrication system in the periodical checks and non-filling in of relevant reports*
- *Non-performance of periodical checks*
- *Use of non original spare parts (spare parts not recommended by the manufacturer)*
- *Non authorized modifications and repairs*
- *Exceptional events.*

11.3 Maintenance and servicing register

The following forms have been prepared in order to facilitate the operator to record and prove the maintenance and servicing carried out on the machine.

Filling in the forms regularly is strongly recommended.

12 ENCLOSURE

12.1 Summarizing list of maintenance and servicing interventions

DATE	*TIPE OF INTERVENTION*	*N° REPORT*	*OPERATOR SIGNATURE*

12.2 Detailed Forms On Servicing And Maintenance

Report on intervention N° _____ ***date:*** *_____/_____/____*

(reports must be enclosed to the relevant intervention form with their number)

Machinery/appliance type: .....Serial Number: .....

SERVICING WORKSHOP

Workshop: .....

Town: ..... postcode.:.....

address: ..... n° .....

DESCRIPTION

STAMP AND SIGNATURE

….....

Report on intervention N° _____ ***date:*** *_____/_____/____*

(reports must be enclosed to the relevant intervention form with their number)

Machinery/appliance type: .....Serial Number: .....

SERVICING WORKSHOP

Workshop: .....

Town: ..... postcode.:.....

address: ..... n° .....

DESCRIPTION

STAMP AND SIGNATURE

….....

.

12.3 Form For The Conveyance Of Information

CONVEYANCE OF INFORMATION CONTAINED IN THE MANUAL

Date:.....

The undersigned:.....

..... postcode.: .....

address: ..... n° .....

Telephone: .....

STATE:

☑ to have received and well understood the information on functioning of the machine
☑ to have received the operating and maintenance manual and to have well understood its content

From Mr:.....

..... postcode. .....

address: ..... n° .....

Telephone: .....

AND TAKES ON THE RESPONSIBILITY TO CONVEY THE SAME INFORMATION AND THE MACHINE MANUAL TO THE NEXT OPERATOR OR OWNER.

FAITHFULLY
Previous operator

……..……

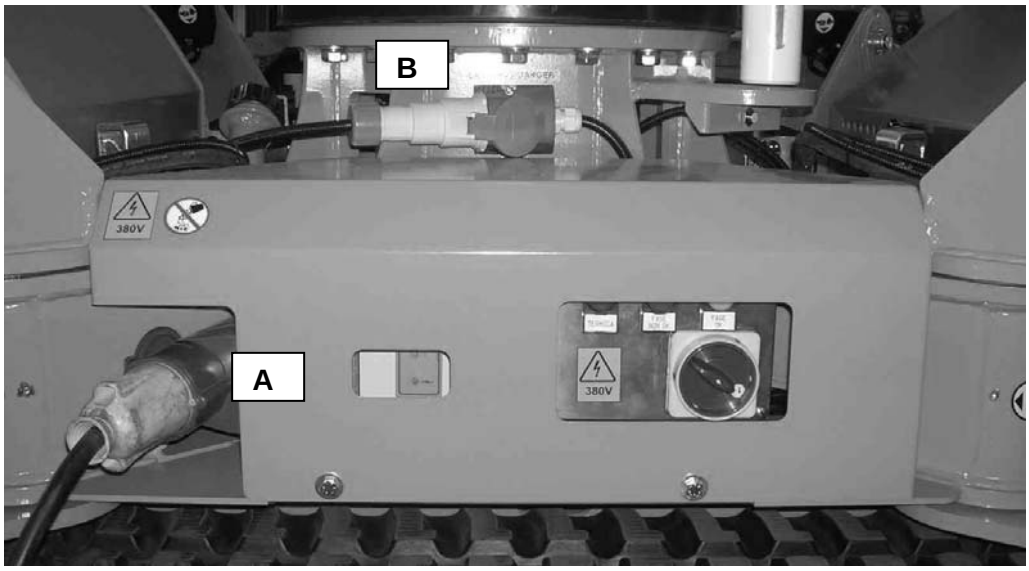
FAITHFULLY
Next operator

……..……

13 TOOLS

The tools supplied have to be installed exclusively on the jekko line machines they have been designed and manufactured for. The manufacturer declines all liability deriving from non-intended uses.

13.1 380V FEEDING KIT FOR SPX527



Introduction: the three-phase feeding kit is installed directly on the lateral vain of the machine and is used to operate the crane and the tracks by electrical feeding.

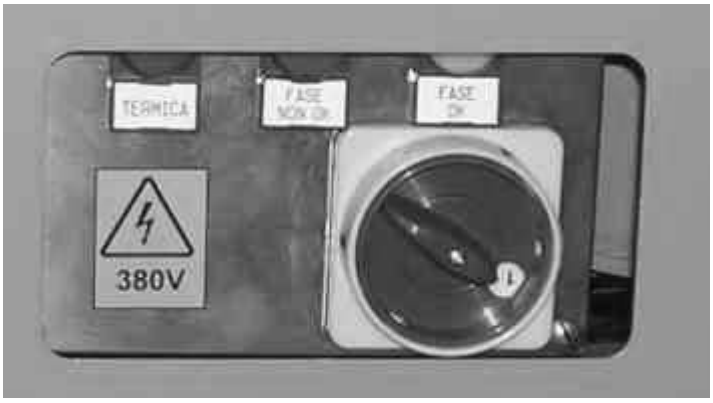
Installation:

- Connect 380V red socket A and 220V blue (110V yellow) socket to start the engine battery charger. If 380V socket don't have 5 poles you have to connect 220V or 100V socket to an external feeding point

Use:

- Turn the feeding key switch located on the switchboard on position 380V (3.1)

- Start the engine by means of the black push button on the radiocontrol and turn the switch on position 1 or 2 – leave the key switch in the position that implies the engine correct rotation (clockwise rotation as indicated by the arrow and green light on). In the diesel version, when the engine starts, the light ON on the panel located behind the kit lights up to indicate that the machine battery is recharging. The light marked with the lightning symbol indicates the presence of voltage.



Check at all times that the engine rotation is clockwise as indicated by the arrow on the engine block, green light on.

- To stop the engine, press the red emergency mushroom push button or turn the key switch on the 0 position

In case the engine doesn't start:
- check that the emergency push button is deactivated (to unlock it, turn the ring nut) or the rotation is ok

13.2 380V FEEDING KIT FOR SPX1040

Introduction: the three-phase feeding kit is installed directly on the lateral vain of the machine and is used to operate the crane and the tracks by electrical feeding.

Installation:

- Connect 380V red socket A and 220V blue (110V yellow) socket to start the engine battery charger. If 380V socket don't have 5 poles you have to connect 220V or 100V socket to an external feeding point

Use:

- Turn the feeding key switch located on the switchboard on position 380V (3.1)

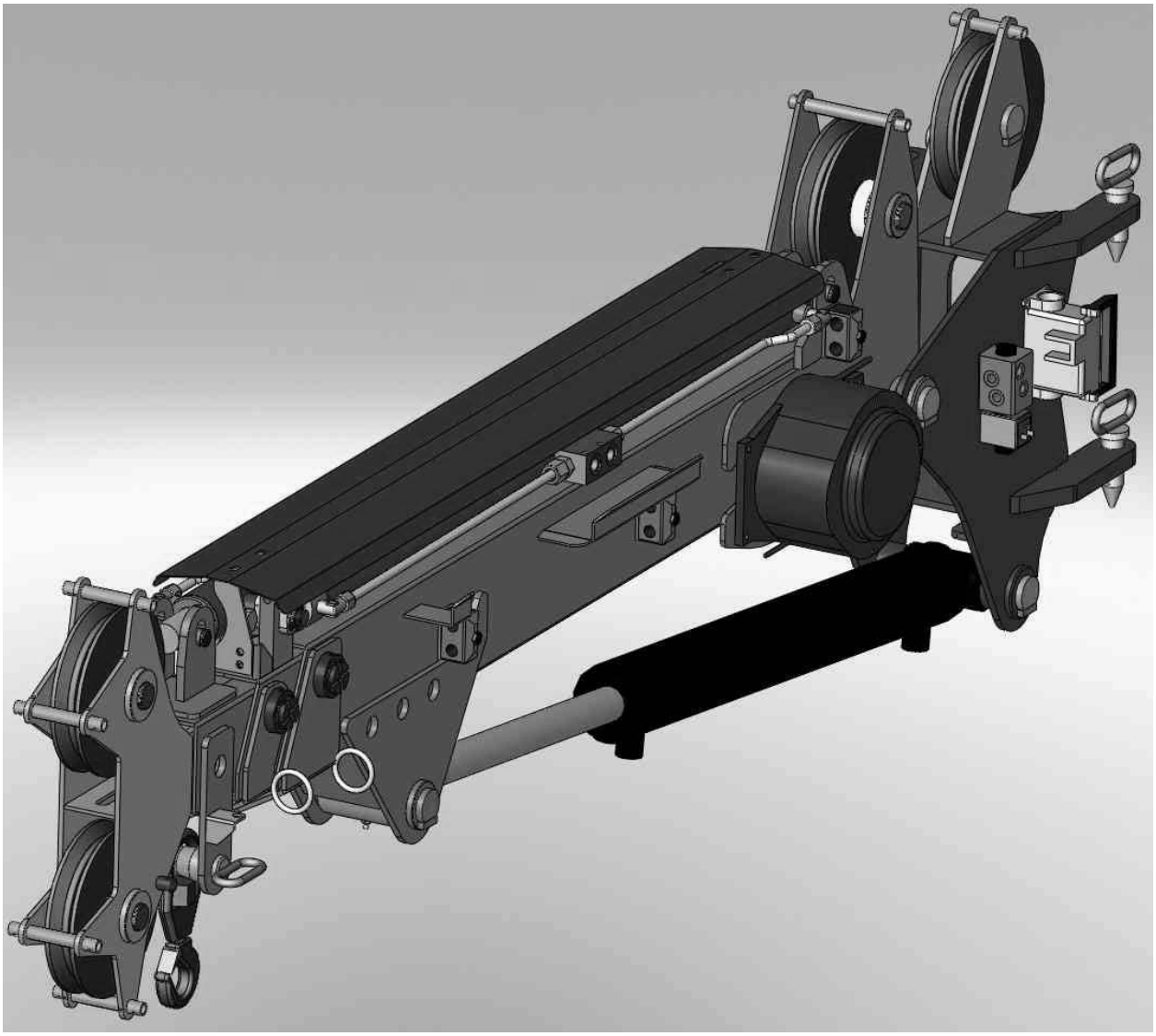
- Start the engine by means of the black push button on the radiocontrol and turn the switch on position 1 or 2 – leave the key switch in the position that implies the engine correct rotation (clockwise rotation as indicated by the arrow and green light on). In the diesel version, when the engine starts, the light ON on the panel located behind the kit lights up to indicate that the machine battery is recharging. The light marked with the lightning symbol indicates the presence of voltage. It's possible to choose number of engine to use **M1** 4Kw or **M2** 4Kw or to **0 M1+M2** 8Kw.

Check at all times that the engine rotation is clockwise as indicated by the arrow on the engine block, green light on.

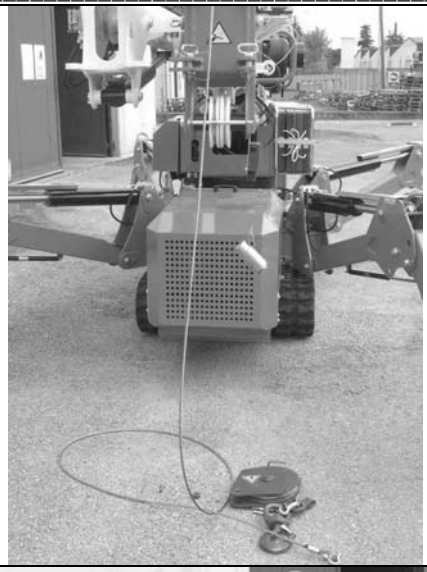
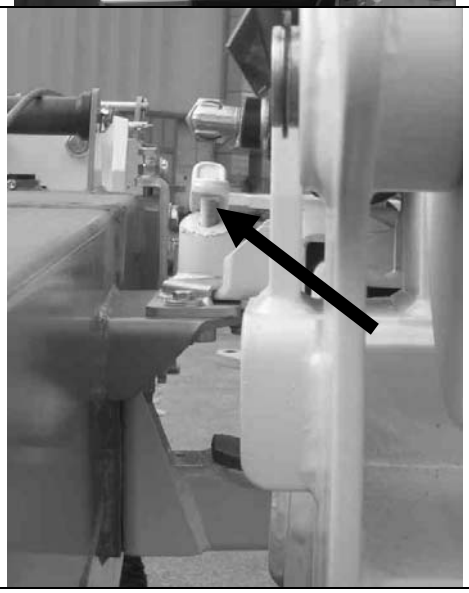
- To stop the engine, press the red emergency mushroom push button or turn the key switch on the 0 position

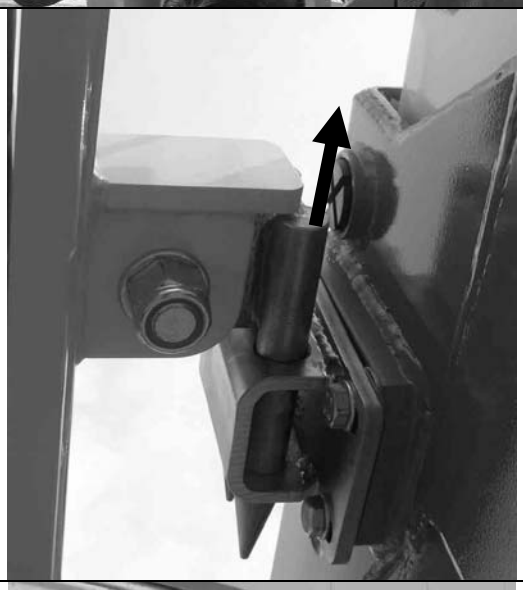
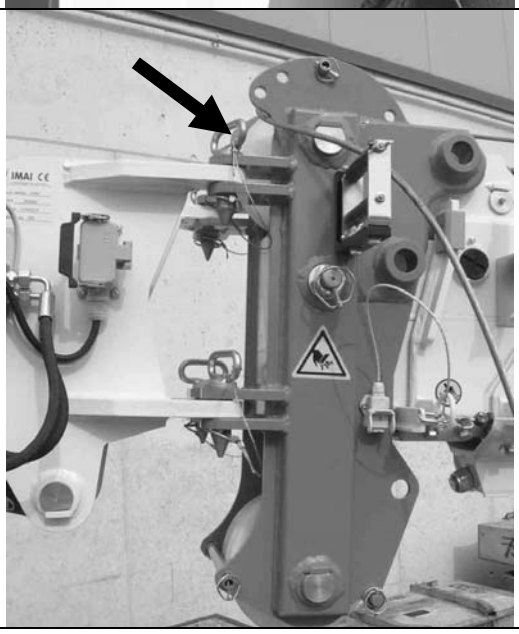
In case the engine doesn't start:
- check that the emergency push button is deactivated (to unlock it, turn the ring nut) or the rotation is ok

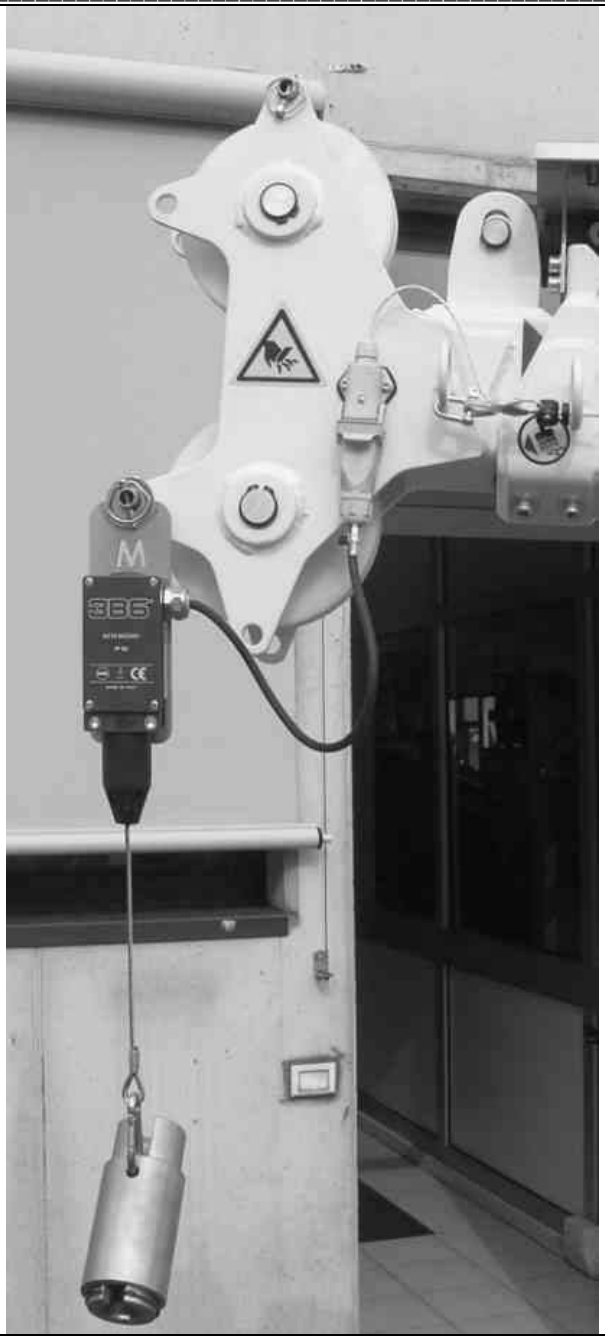
13.3 HYDRAULIC JIB JHN600

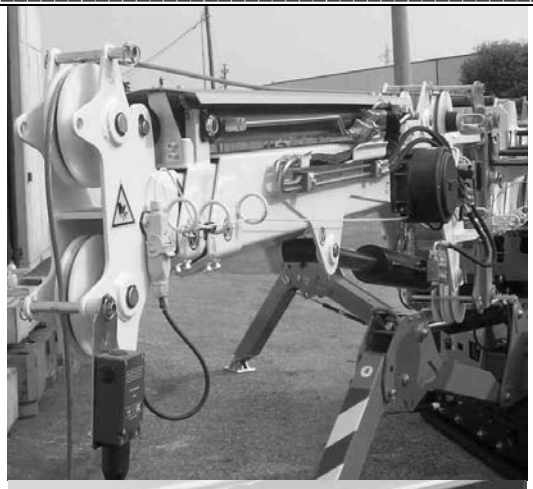
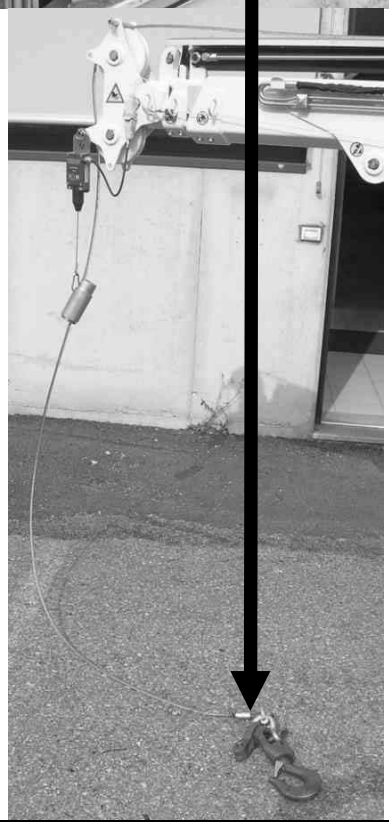


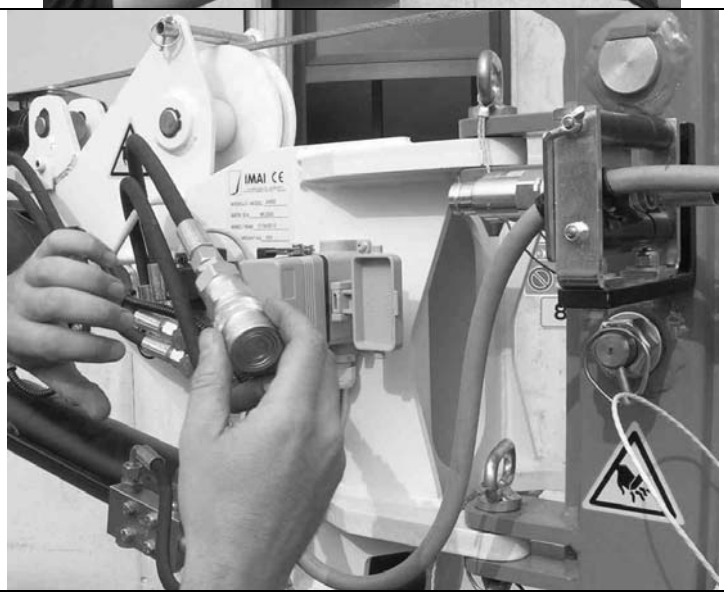
INSTALLATION		
FASE	**DESCRIPTION**	**IMMAGE**
1	Stabilize the machine	
2	Set the accessory hydraulic jib JH600-(see cap 7)	

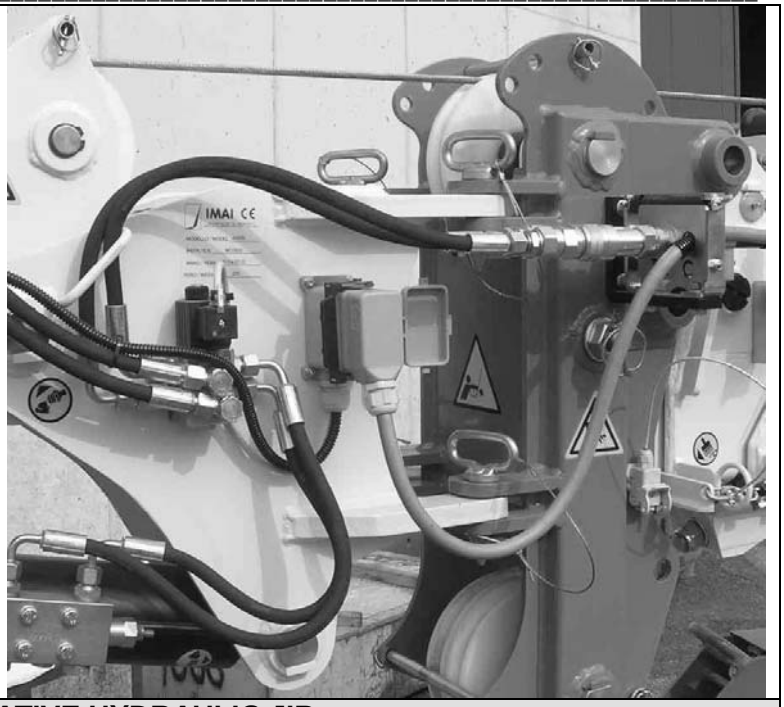
3	Remove the pulley	
4	Remove right pins	
5	Unlock jib blocking pin	

6	Turn jib and move boom out to set left pins	
7	Make boom out until jib is disengage	
8	Open completely jib and lock with all 4 pins	

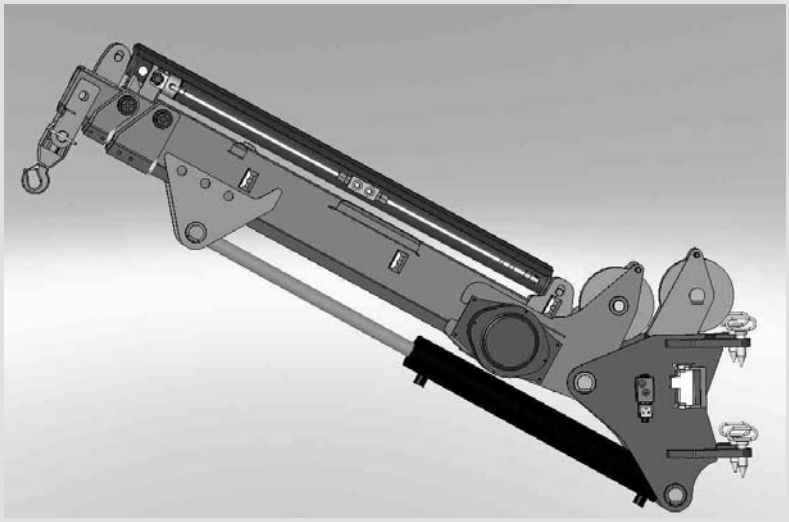
9	Disconnect rope micro switch and put it on jib head	

10	Set the rope inside the pulley and apply weight and hook	  

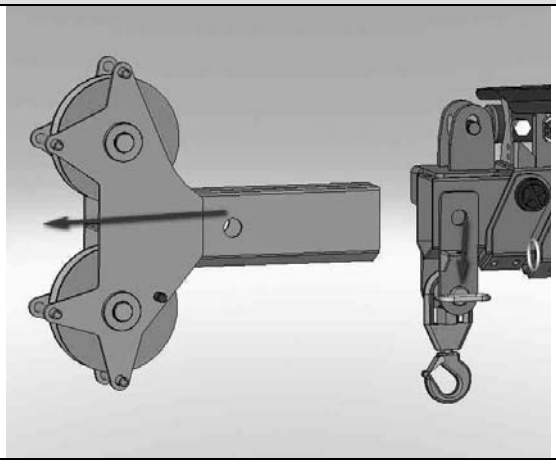
11	Remove the plate with hydraulic and electric pipe and set it in front of 4° boom	 
12	Make hydraulic and electric connection	

13	Correct connection	

NEGATIVE HYDRAULIC JIB

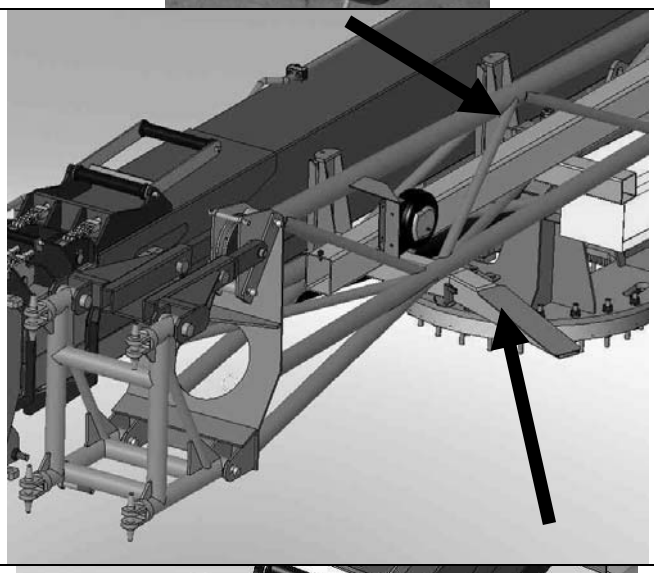
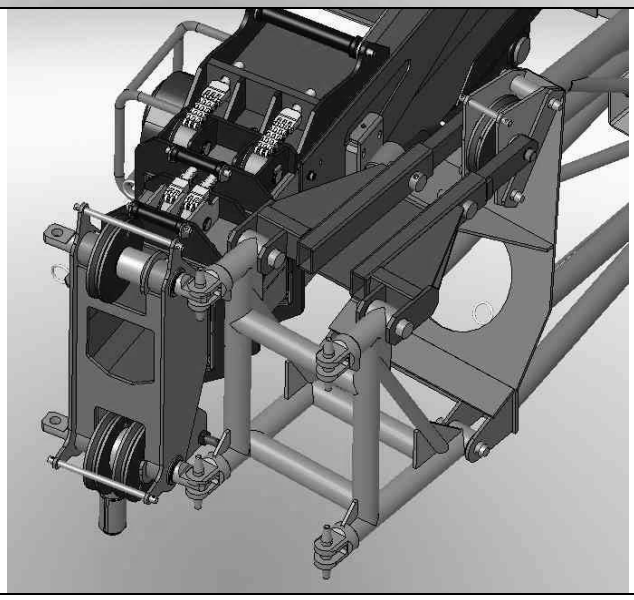


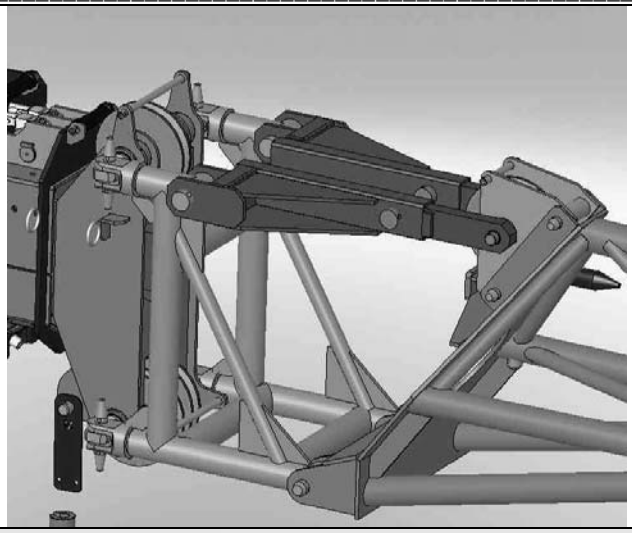
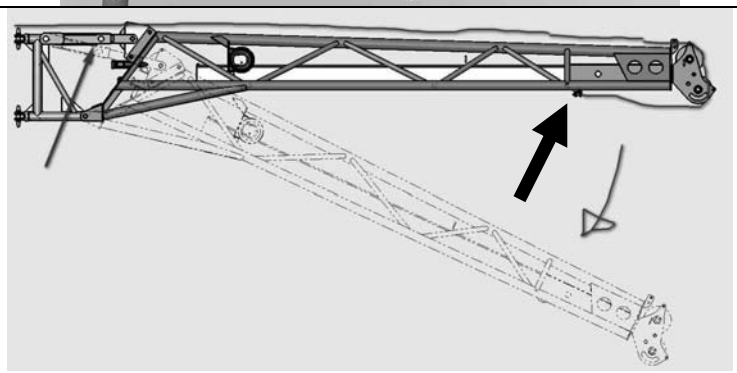
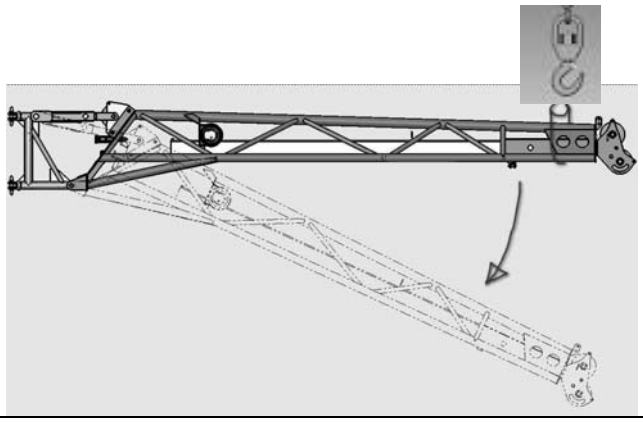
ATTENTION: THE +30° INCLINATION IS POSSIBLE ONLY IF YOU REMOVE THE ROPE LIKE IN THE PICTURE AND YOU USE ONLY HOOK

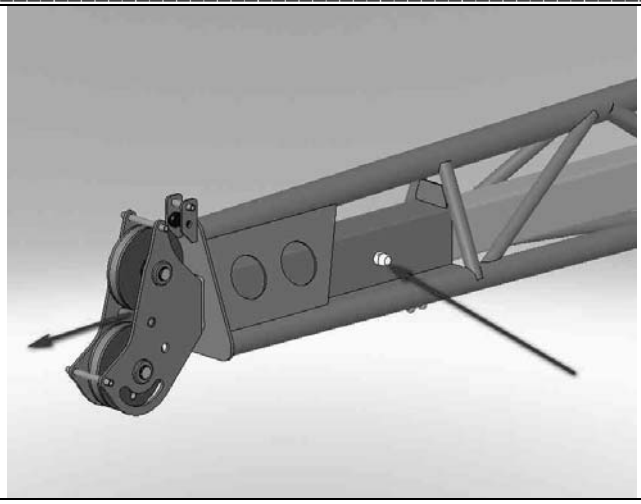
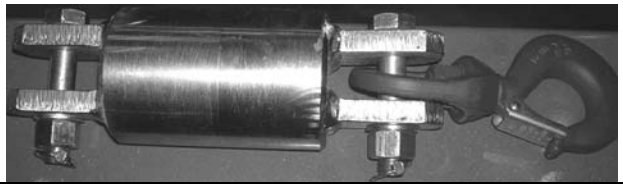
	To use: - Set accessory negative hydraulic jib - Remove rope - Remove rope micro switch - Remove pulley head - Set hook like in the picture	

13.4 MECANIC JIB SPX1040CH-SPX1275

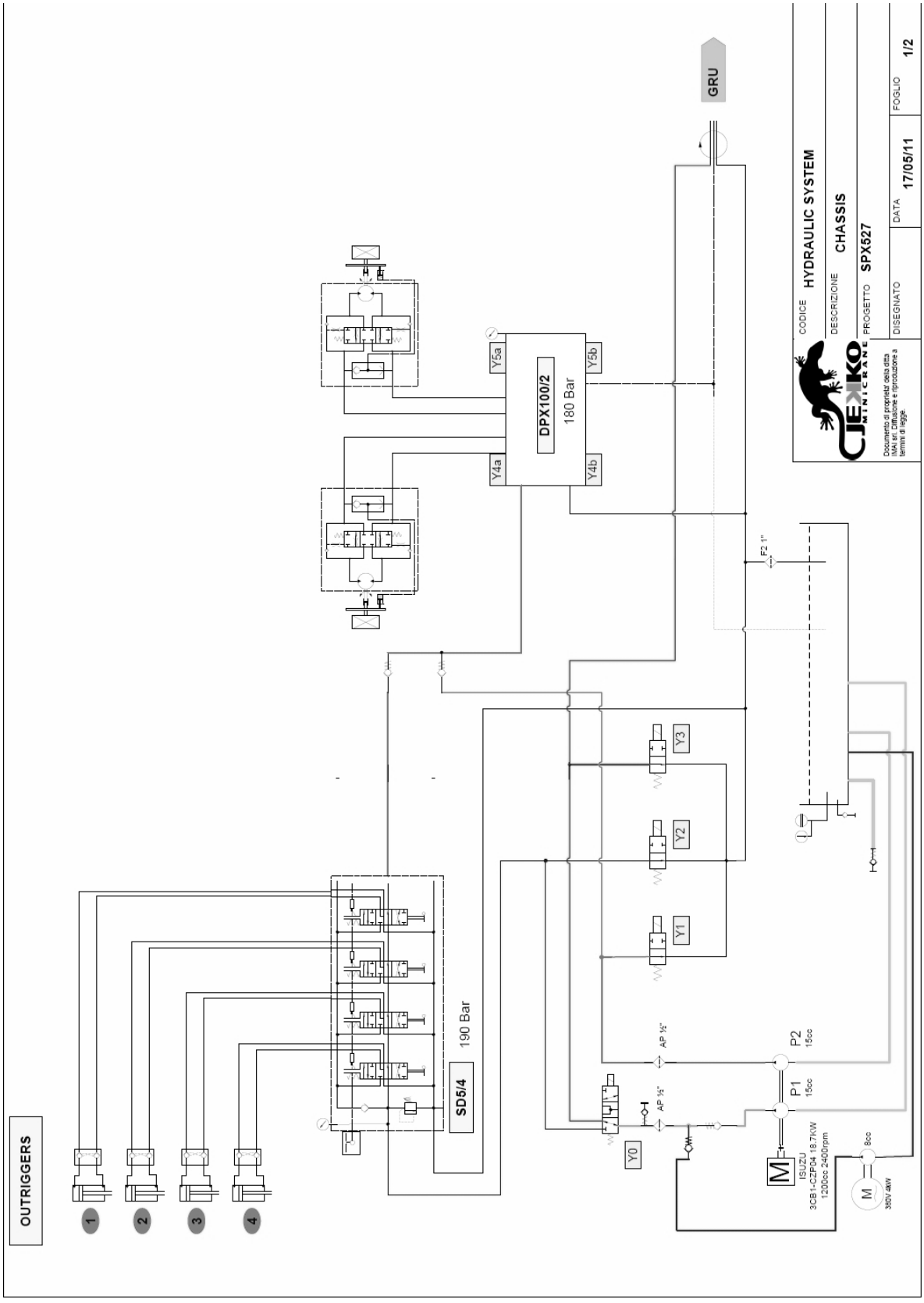
INSTALLATION		
FASE	**DESCRIPTION**	**IMMAGE**
1	Stabilize the machine	
2	Set the accessory hydraulic jib (see cap 7)	

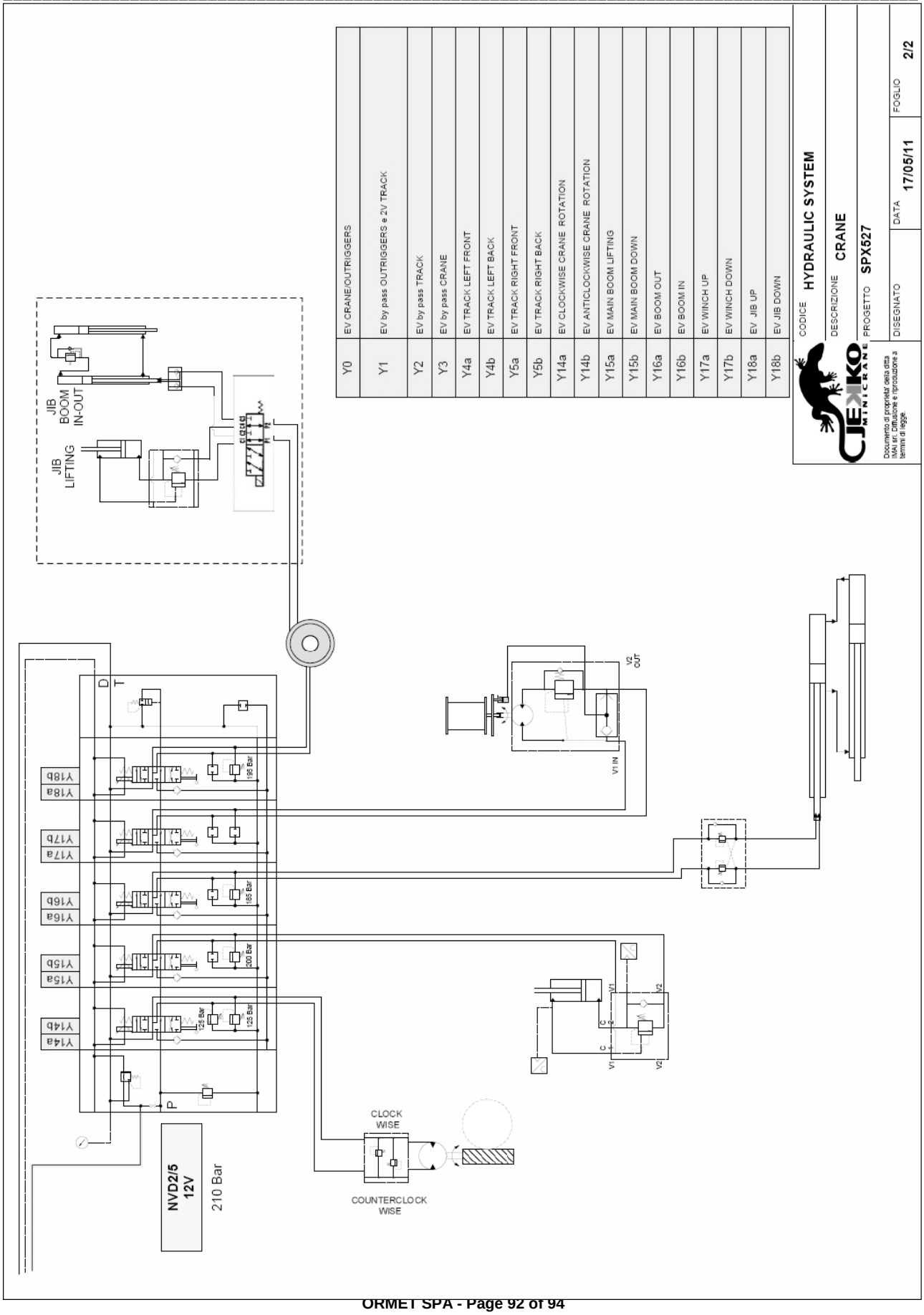
3	Remove pulley	
4	Remove locking pin and open the guide	
5	Turn jib and move boom out to set left pins. Make boom out until jib is disengaged.	

6	Open completely jib and lock with all 4 pins	
7	To set 0°-25° inclination : - Apply the rope like in the picture - Remove two pins - Use winch movements to set inclination - Lock again with two pins PAY ATTENTION TO ROPE, MAKE SLOWLY MOVEMENTS If you prefer lift jib with another lifting system to make the regulation	 

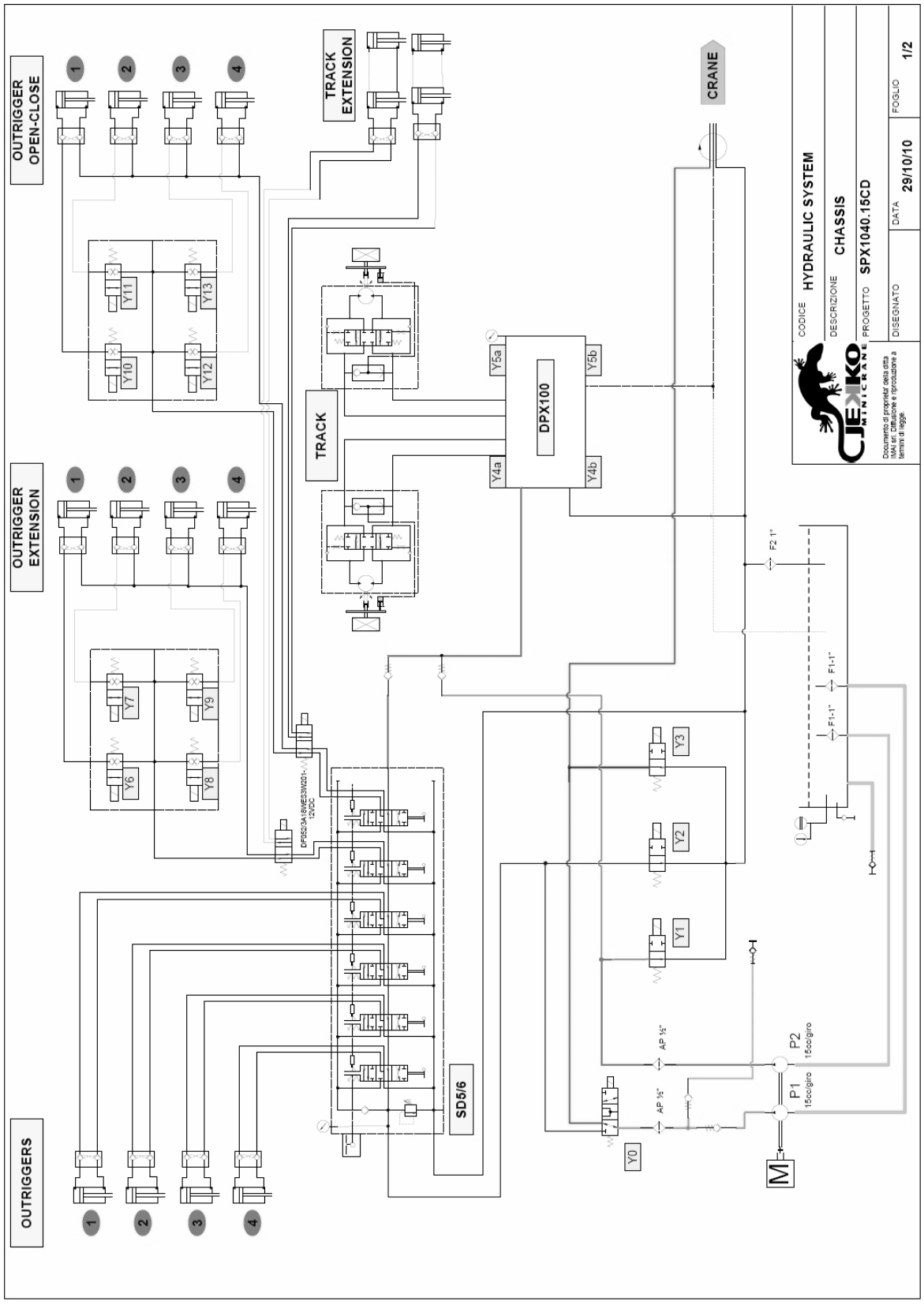
8	To set the extension remove pin, extract it and lock again with pin	
9	Disconnect rope micro switch and put it on jib head. Set the rope inside the pulley and apply weight and hook	

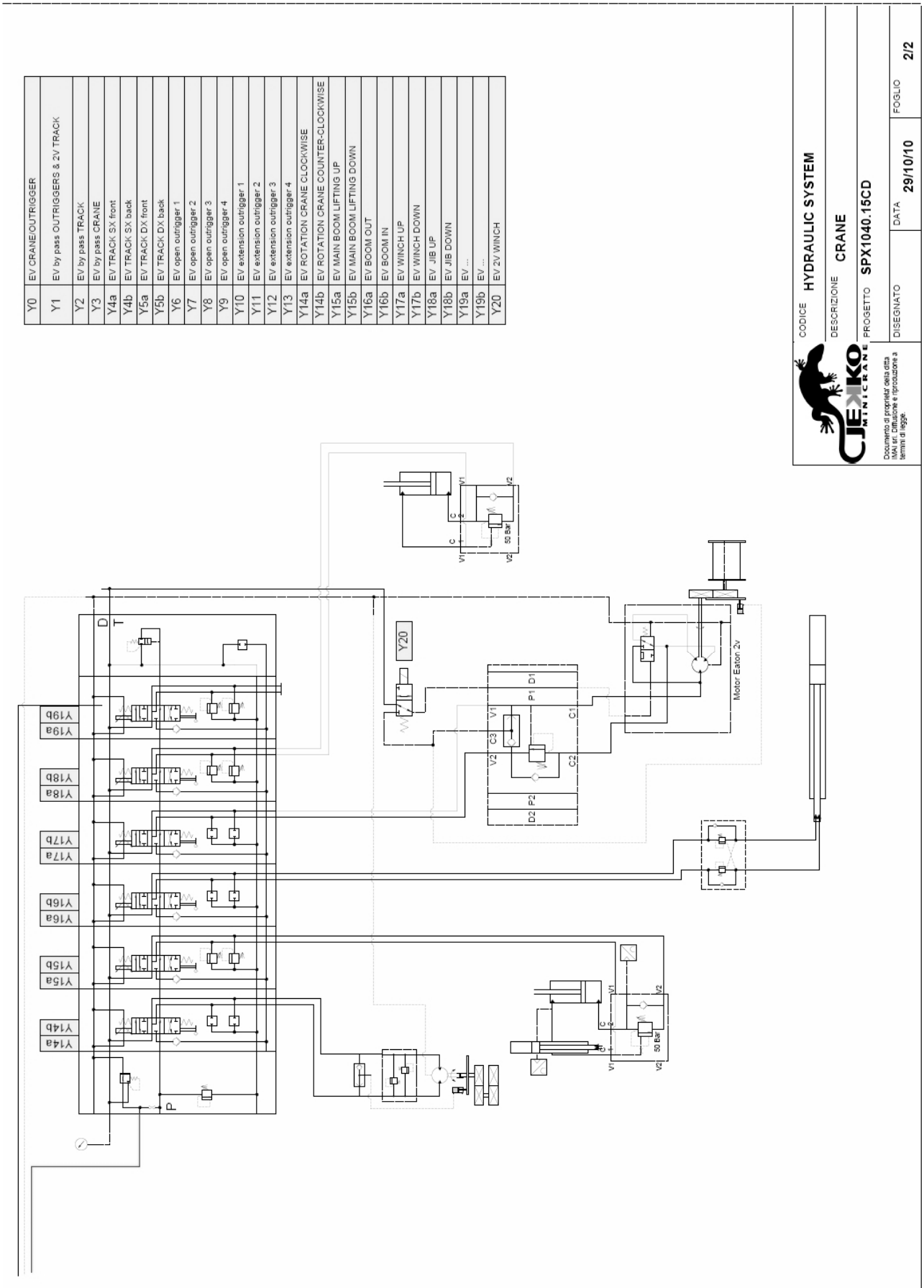
13.5 Hydraulic scheme SPX527




Y0 EV CRANE/OUTRIGGERS
Y1 EV by pass OUTRIGGERS e 2V TRACK
Y2 EV by pass TRACK
Y3 EV by pass CRANE
Y4a EV TRACK LEFT FRONT
Y4b EV TRACK LEFT BACK
Y5a EV TRACK RIGHT FRONT
Y5b EV TRACK RIGHT BACK
Y14a EV CLOCKWISE CRANE ROTATION
Y14b EV ANTICLOCKWISE CRANE ROTATION
Y15a EV MAIN BOOM LIFTING
Y15b EV MAIN BOOM DOWN
Y16a EV BOOM OUT
Y16b EV BOOM IN
Y17a EV WINCH UP
Y17b EV WINCH DOWN
Y18a EV JIB UP
Y18b EV JIB DOWN
CODICE HYDRAULIC SYSTEM
DESCRIZIONE CRANE
PROGETTO SPX527
DISEGNATO
DATA 17/05/11
FOGLIO 2/2
JIB BOOM IN-OUT
JIB LIFTING
V2 OUT
V1 IN
CLOCK WISE
COUNTERCLOCK WISE
NVD2/5 12V
210 Bar

13.6 Hydraulic scheme SPX1040-SPX1275




Y0 EV CRANE/OUTRIGGER
Y1 EV by pass OUTRIGGERS & 2V TRACK
Y2 EV by pass TRACK
Y3 EV by pass CRANE
Y4a EV TRACK SX front
Y4b EV TRACK SX back
Y5a EV TRACK DX front
Y5b EV TRACK DX back
Y6 EV open outrigger 1
Y7 EV open outrigger 2
Y8 EV open outrigger 3
Y9 EV open outrigger 4
Y10 EV extension outrigger 1
Y11 EV extension outrigger 2
Y12 EV extension outrigger 3
Y13 EV extension outrigger 4
Y14a EV ROTATION CRANE CLOCKWISE
Y14b EV ROTATION CRANE COUNTER-CLOCKWISE
Y15a EV MAIN BOOM LIFTING UP
Y15b EV MAIN BOOM LIFTING DOWN
Y16a EV BOOM OUT
Y16b EV BOOM IN
Y17a EV WINCH UP
Y17b EV WINCH DOWN
Y18a EV JIB UP
Y18b EV JIB DOWN
Y19a EV ...
Y19b EV ...
Y20 EV 2V WINCH
CODICE HYDRAULIC SYSTEM
DESCRIZIONE CRANE
PROGETTO SPX1040.15CD
DISEGNATO
DATA 29/10/10
FOGLIO 2/2
Documento di proprietà della ditta MAI srl. Diffusione e riproduzione a termini di legge.
Motor Eaton 2v
50 Bar