



OPERATING AND MAINTENANCE MANUAL

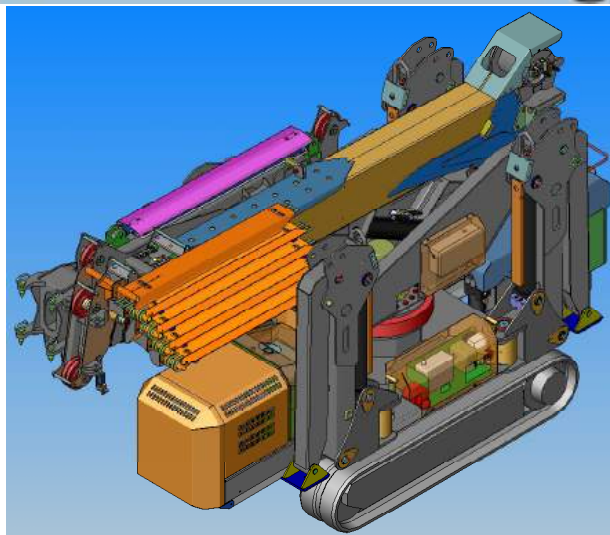
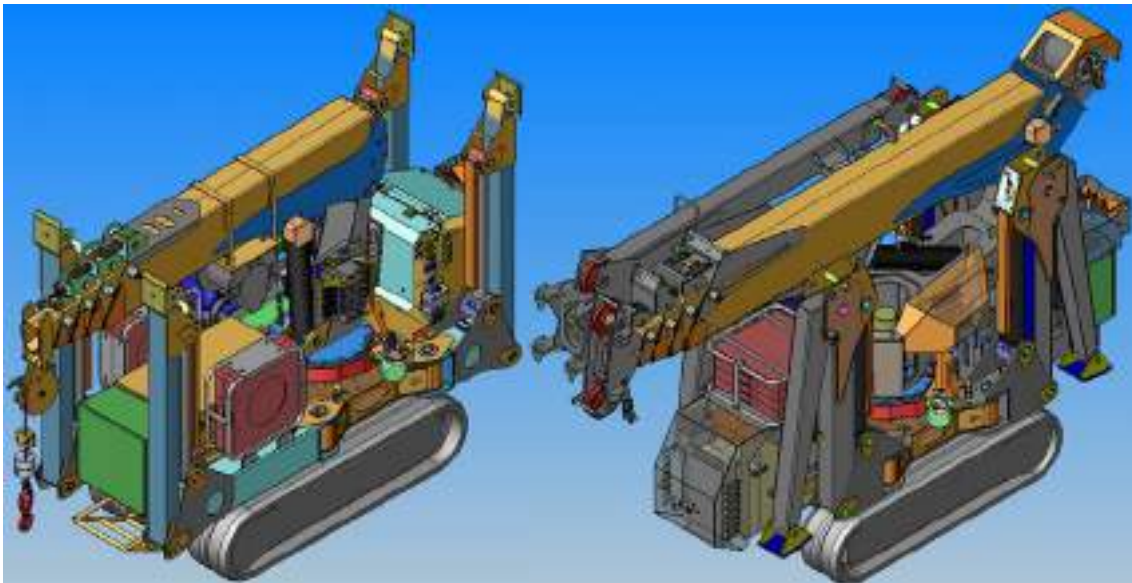
SPD265C+

SPD360C+

SPD360CD

SPD500CD

SERIAL NUMBER: _____



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MANUAL REVIEW		
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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 contains proprietary information. All rights are reserved.

No part of this manual may be reproduced or photocopied without prior written consent of IMAI S.r.l. Only customers to whom the manual has been supplied together with the machine are allowed to use it to carry out use and maintenance operations on the machine it refers to.

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. IMAI S.r.l. 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.

IMAI 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.

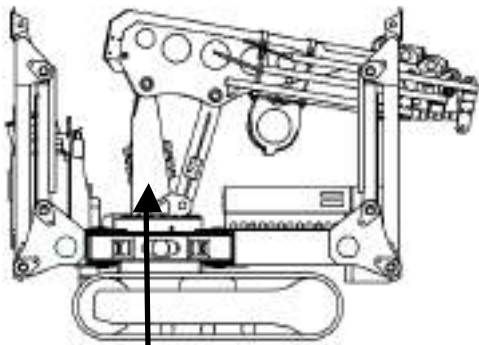
The CE marking approves the conformity by the machinery **guideline 98/37/EC**.

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.

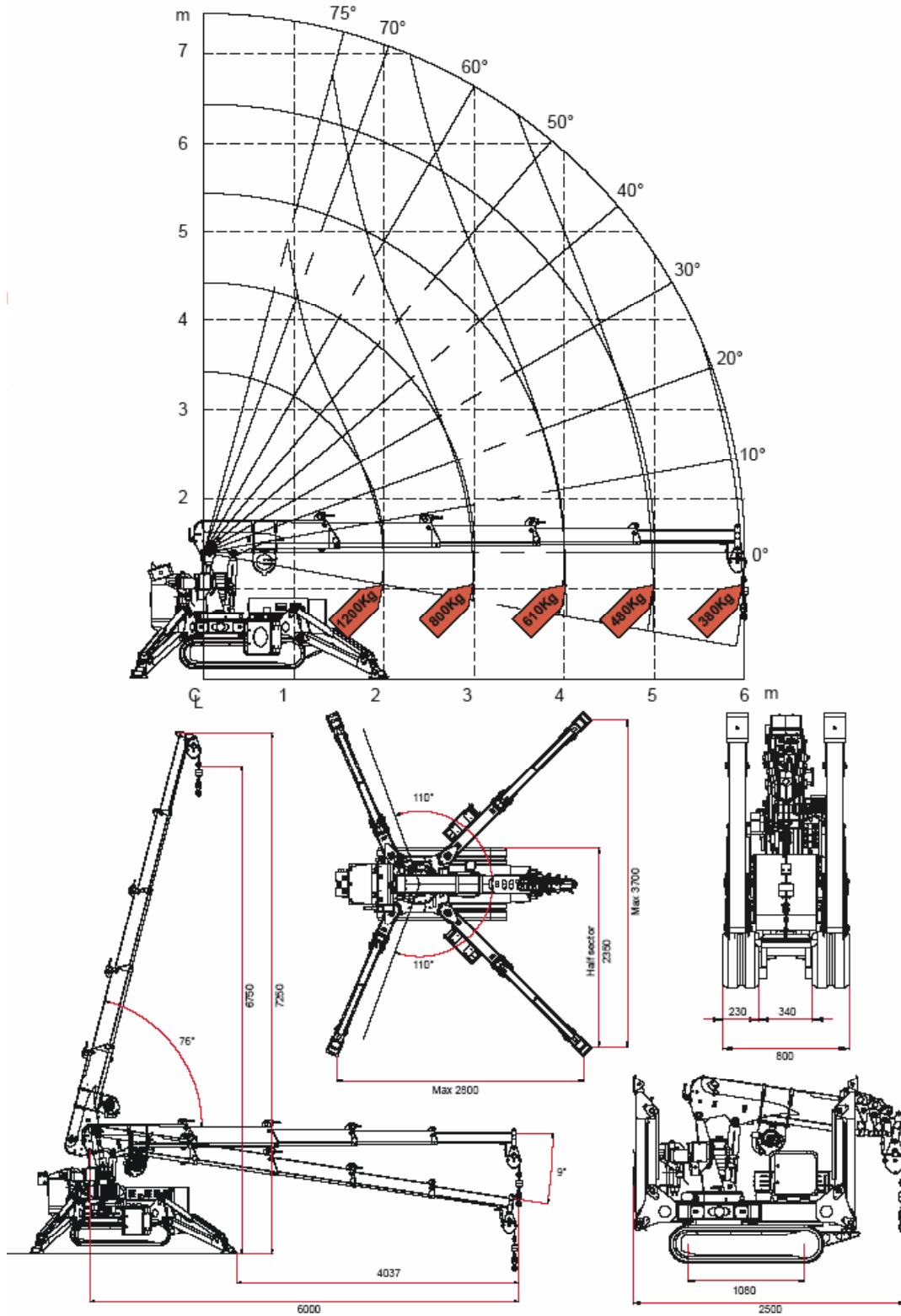
	IMAI	CE
Modello	<input type="text"/>	
Numero di produzione	<input type="text"/>	
Anno di produzione	<input type="text"/>	
Peso	<input type="text"/>	kg
IMAI s.r.l. Via Campardone, 7 - Zona Industriale Colle Umberto (TV)		

1.2 Technical Specifications

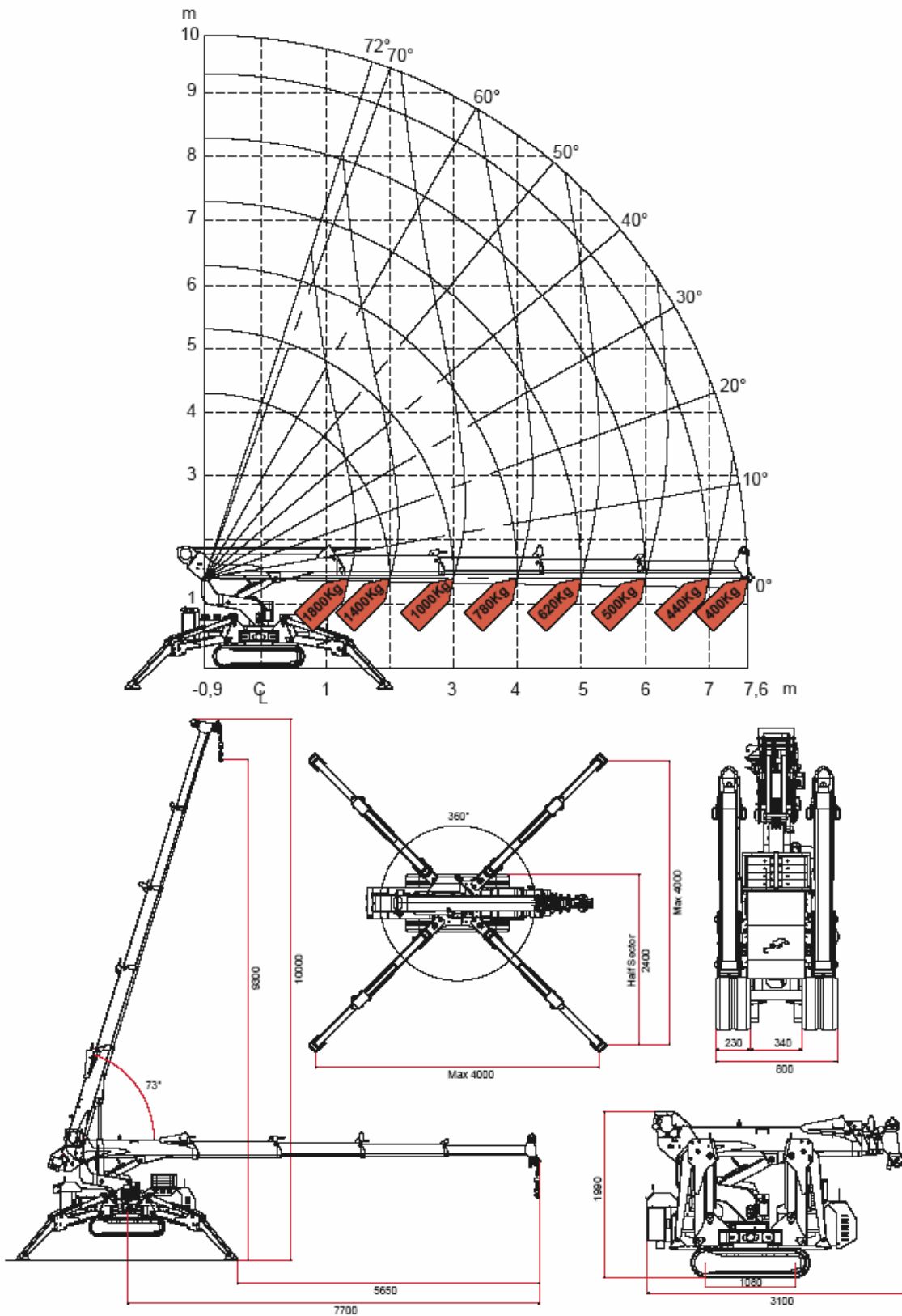
MODEL	SPD 265+	MODEL	SPD 360C+
Loading momentum	2600 Kgm	Loading momentum	4300 Kgm
Maximum working height	7 m	Maximum working height	9.7 m
Maximum SWL	1200 kg	Maximum SWL	1800 kg
Rotation	220°	Rotation	360°
Dimensions	2500x800x1750 mm	Dimensions	3100x800x1750 mm
Weight	1.700 Kg	Weight	2200 Kg
Max outriggers load	1400 Kg	Max outriggers load	1900 Kg
Track area Max track loadings	1080x230x2 mm 0.34 Kg/cm ²	Track area Max track loadings	1080x230x2 mm 0.44 Kg/cm ²
ENGINE	Electric 24V-DC 3kW (4 batteries 12V-120Ah)	ENGINE	Electric 24V-DC 3kW (4 batteries 12V-390Ah)
MODEL	SPD 360CD	MODEL	SPD 500CD
Loading momentum	4300 Kgm	Loading momentum	5100 Kgm
Maximum working height	9.7 m	Maximum working height	10.7 m
Maximum SWL	1800 kg	Maximum SWL	1750 kg
Rotation	360°	Rotation	360°
Dimensions	3100x800x1750 mm	Dimensions	2500x800x1750 mm
Weight	2200 Kg	Weight	2800 Kg
Max outriggers load	1900 Kg	Max outriggers load	2100 Kg
Track area Max track loadings	1080x230x2 mm 0.44 Kg/cm ²	Track area Max track loadings	1400x250x2 mm 0.40 Kg/cm ²
ENGINE	Diesel 7.4/10.1kW/hp 12V (tank 5 Liter)	ENGINE	CD- Diesel 14/19kW/CV 12V (tank 4 Liter)

DIMENSIONS AND LOADING DIAGRAM OF THE CRANE WITH HOOK

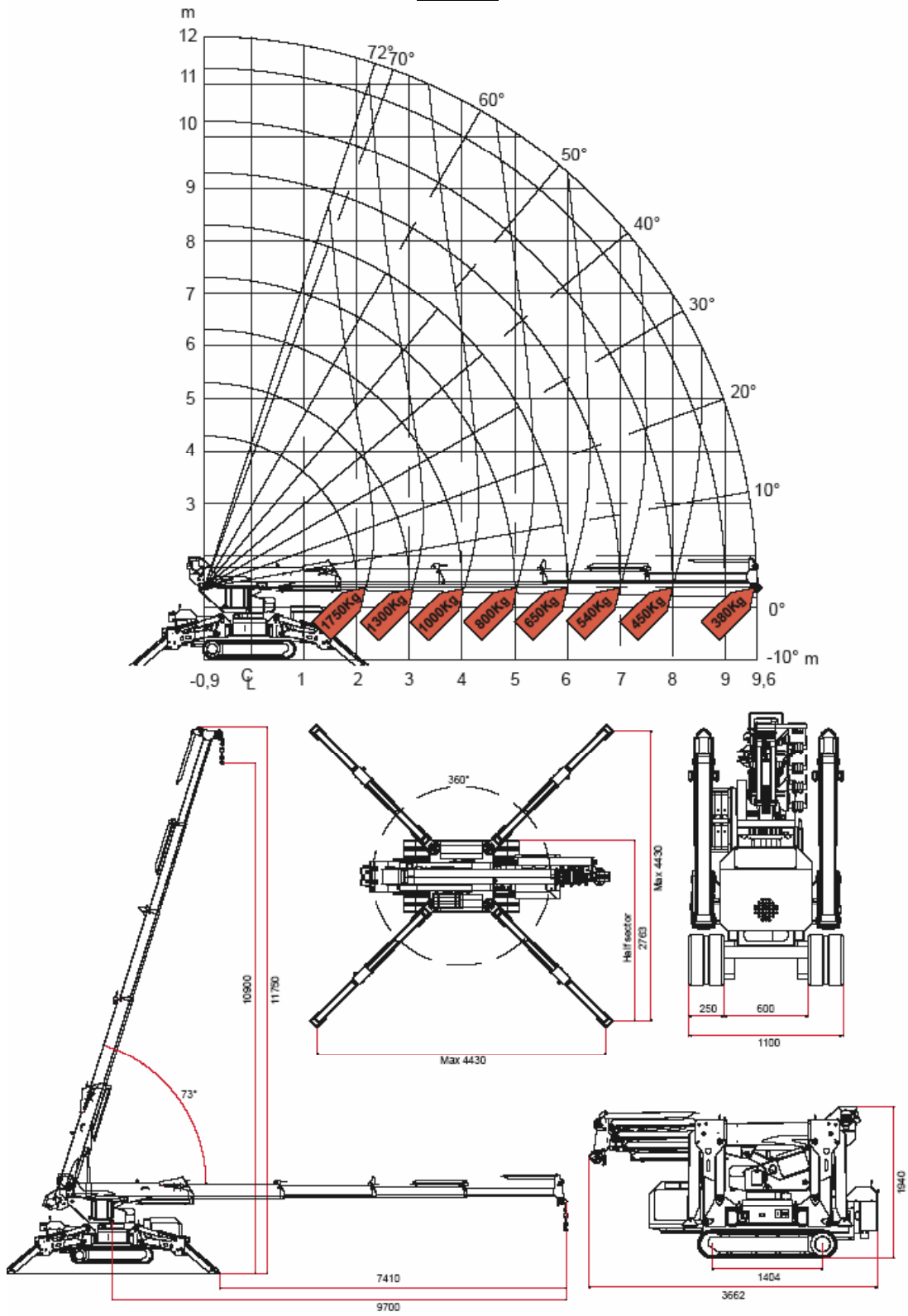
SPD265



SPD360



SPD500



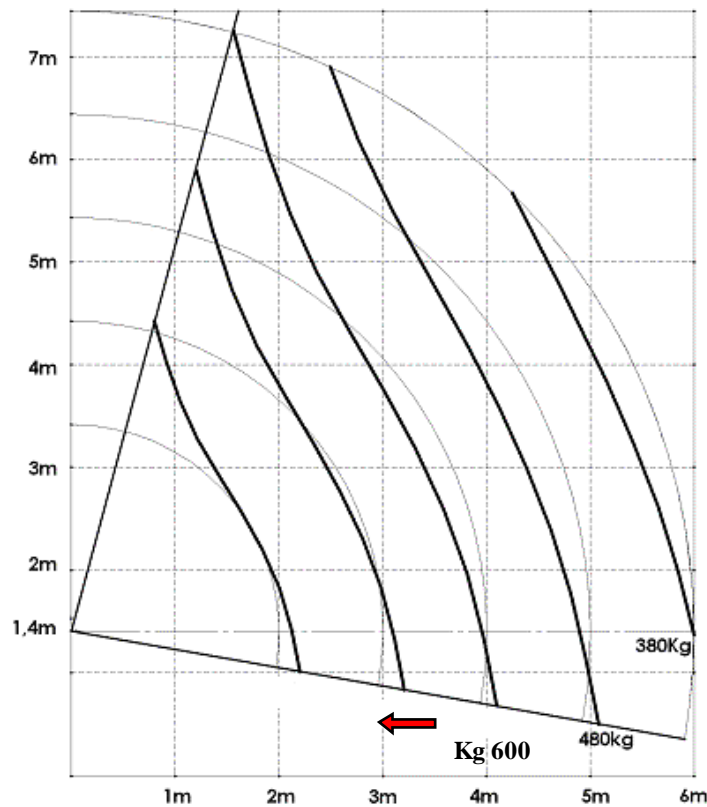
Apply the hook directly to the crane boom.



Check always the hook SWL capacity.



WINCH LOADING DIAGRAM (EX:spd265)



The winch capacity of model SPD265 is of 600 kg (see the machine CE plate).

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

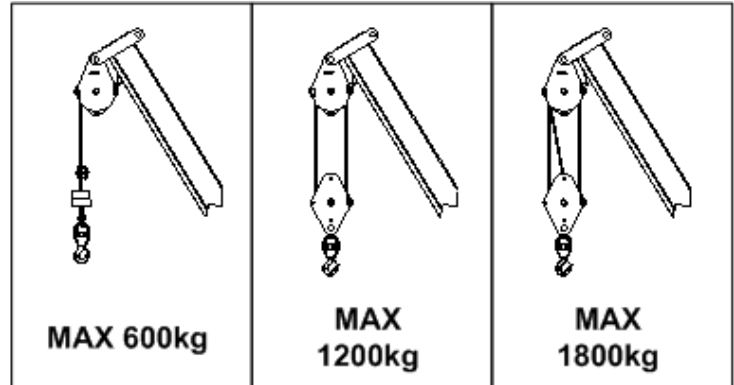


Within the 600-kg loading capacity, the boom can lift loads exceeding the winch capacity thus activating the load limiting device. In order to lift heavier loads it is necessary to modify the pulley configuration by using a single, double or triple line pull.



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

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. Every machine is equipped with a chart, as the one indicated in the picture, which indicates the winch lifting capacity depending on the configuration chosen.



Double line pull



Triple line pull

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. IMAI S.r.l. 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 IMAI S.r.l.

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!
Don't use the machine to lift people

ATTENTION

THE MACHINE DON'T HAVE BEEN PROJECTED TO LIFT PEOPLE, IT DON'T RESPECT THE SAFETY REQUIREMET OF THE U.E. NORMATIVE FOR THIS KIND OF LIFTING

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 IMAI S.r.l. 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 IMAI S.r.l.'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 IMAI S.r.l.'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. IMAI S.r.l. shall acknowledge any right to replacements under warranty by means of a credit note.

ART.7 Equipment not manufactured by IMAI S.r.l. and applied to IMAI S.r.l. products - such as engines, electrical components and others - are not covered by this guarantee but by their own manufacturer's guarantee. IMAI S.r.l. 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 IMAI S.r.l.

ART.9 The warranty claim will be effective only if it is returned with the delivery verbal to IMAI S.r.l. within 30 days from the date of delivery of the machine. All warranty claims will have to be submitted to IMAI S.r.l. 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 IMAI S.r.l.)
- Use of non authorized accessories or accessories not fit for IMAI'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 IMAI S.r.l. 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. L'accurata analisi dei rischi svolta dal fabbricante ha consentito di eliminare la maggior parte dei pericoli connessi alle condizioni d'uso della macchina, sia previste che ragionevolmente prevedibili.

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.

① 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.**

① 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:

Volt (V)	Min dist. Insulated electric wire	Min. dist. uninsulated electric wire	Place of wires
< 500	0.5 m	2 m	Buildings
500- 45.000	1.5	4 m	Tram, trains
>45.000	Not in use	6 m	High tension Power-lines

2.5 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

2.6 Daily check

Daily checks to be performed before starting the machine::

- Check hydraulic oil level
- Verify there is no visible oil leakage
- Check safety micro-switch. Remove possible mud, grease, etc. residues without using metal tools.
- Test safety systems
- Carpentry condition visual check
- Check outriggers efficiency
- Verify safety labels are present and readable
- Make sure the working area is ventilated as batteries produce explosive gases (C)
- Check greasing of the machine
- Check oil level and gasoline level of **diesel engine** (CD)

2.7 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 lay 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.



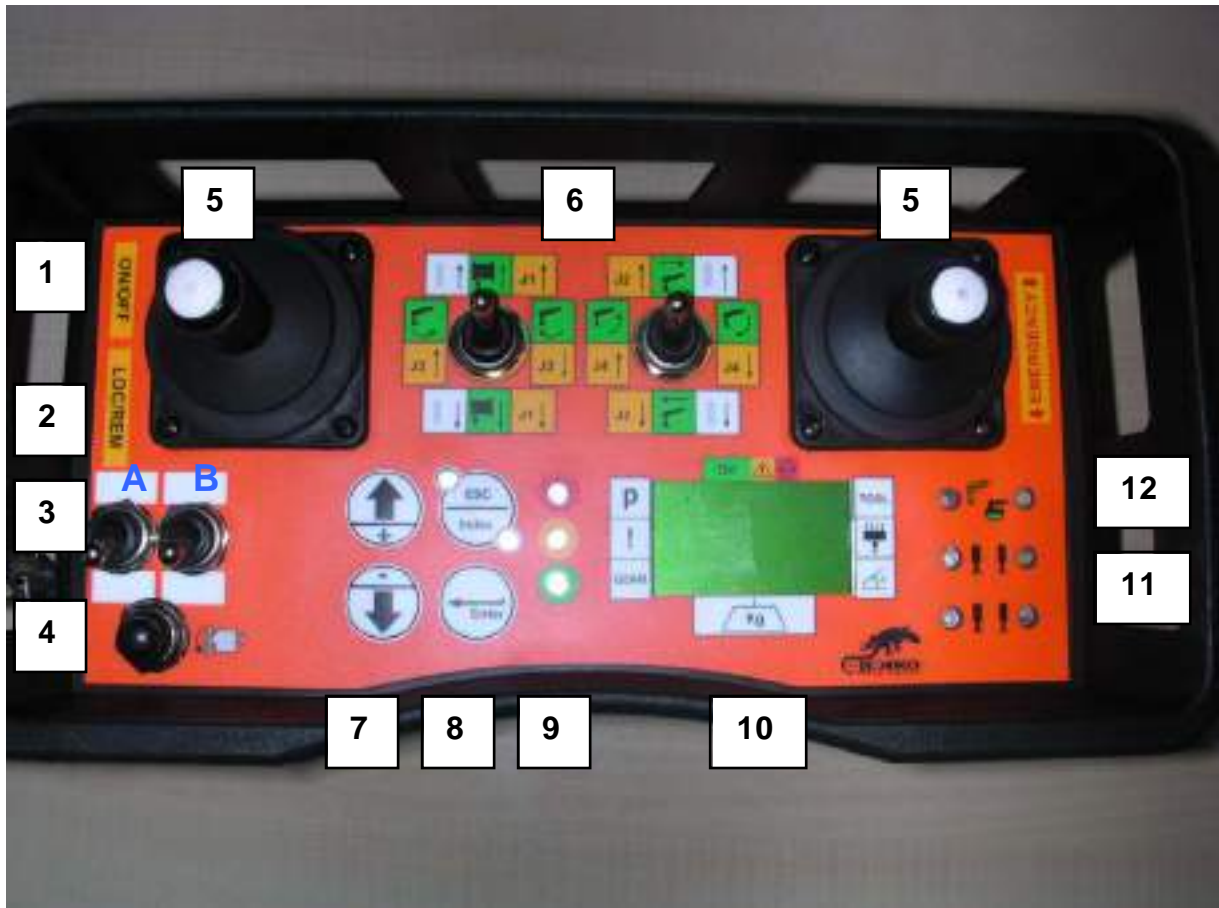
In case the machine has to work on upper floors, verify their maximum loading capacity according to what indicated in paragraph 'Technical Specifications'.

CAUTION!!!

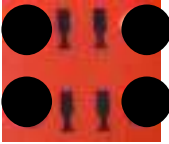
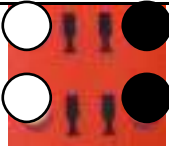
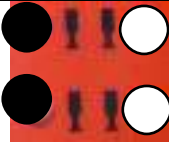
Don't work on floors without having verified their loading capacity. The manufacturer declines any responsibility arising from damage or collapse.

3 MACHINE SIGNALS AND CONTROLS

3.1 Main switchboard



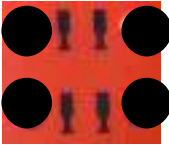
Ref.	Descrizione
1	Panel on/off key switch
2	Locale/remote key switch
3	A>Switch 24V-380V B > One joystick track movement front and back switch
4	Diesel engine ignition push button and machine start –up
5	Control joystick – activation by pressing on the push button
6	Move key switches for crane (switch UP) /Jib (switch DOWN)
7	Display scroll keys
8	Display ESC/ENTER keys
9	Flashing LEDs
10	Display
11	Signal LEDs for stabilizers
12	Signal LED for crane/truck activation

<p>● LIT LED</p> <p>○ FLASHING LED</p>	<p>OPERATING WORK SECTOR SPD265</p>
	<p>From rear left stabilizer to rear right stabilizer 220°</p>
	<p>From front left stabilizer to rear right stabilizer</p>
	<p>From front right stabilizer to rear left stabilizer</p>



CAUTION!!!

Whatever other combination not indicated in the table above won't allow the crane functioning. It will only be possible to move the truck and the stabilizers.

<p>● LIT LED</p>	<p>OPERATING WORK SECTOR SPD360-500</p>
	<p>360° continuous rotation On SPD500 the led flash if the outrigger isn't opened correctly</p>

Flashing led

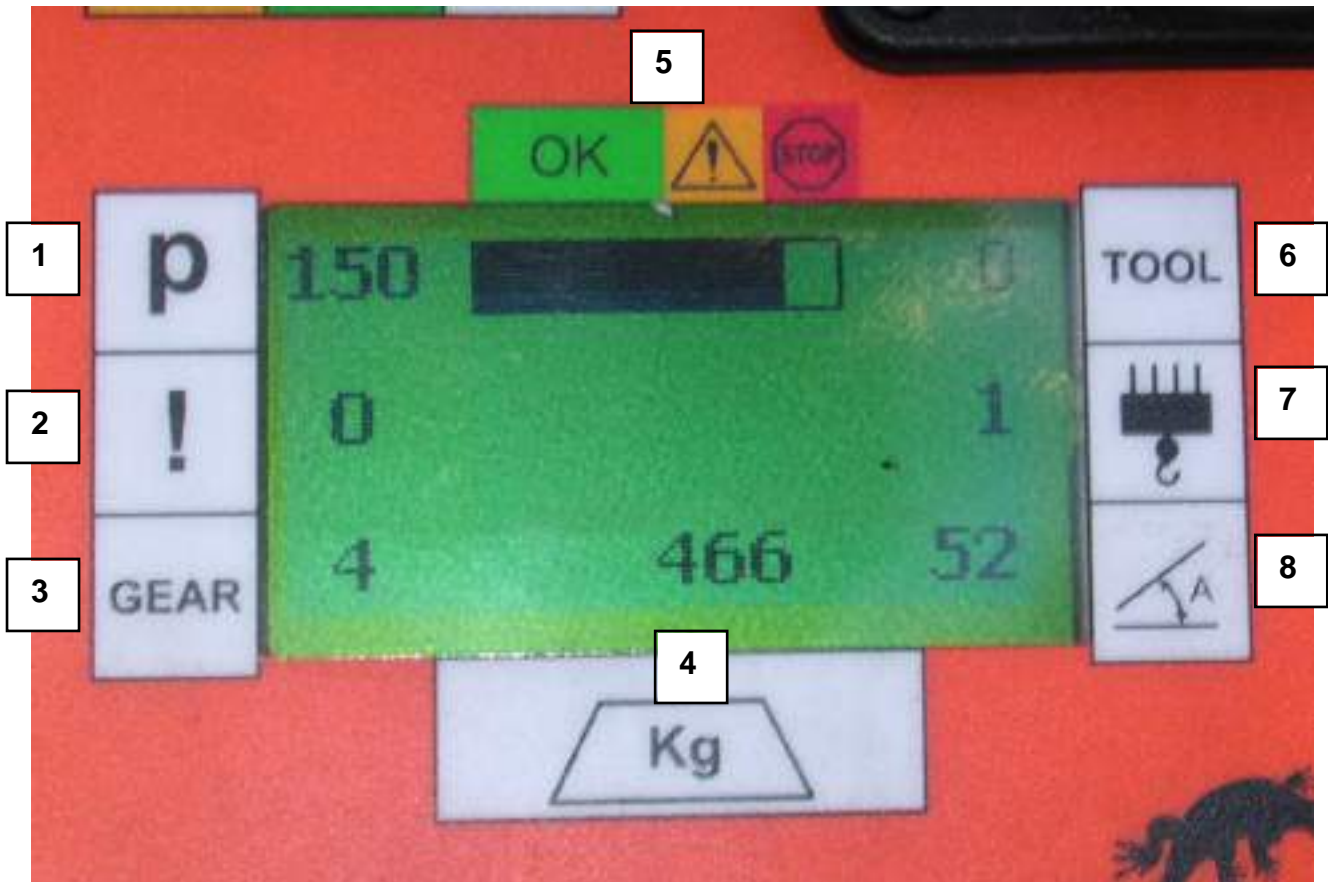
Red > flashing when warning or alarm are activated

Yellow > on when anticollision system is activated, off when anticollision system is deactivated

Green > on when maintenance is OK, flashing when maintenance is due

Red-yellow-green > flashing when by-pass is activated

Display functions



Ref.	Description
1	Pressure value on the lifting jack
2	Error code indicator
3	Gear engaged
4	Load lifted by the winch
5	Proportional indicator of maximum pressure attainment
6	Indicator of activated tool – 0 > Winch 1M > Manipulator 2JH > Jib 3JM > Mechanical Jib 4J > Hook
7	Indicator of line pull type present on the winch rope
8	Indicator of the boom angle in comparison with the horizontal position

Control and configuration pages:

Hold down ENTER to page to the MAIN MENU

Hold down ESC to exit the MAIN MENU

Press the up and down arrows to scroll the menu (press fast the button)

Press ENTER to select/page to; press ESC to deselect/exit a function

Press ENTER to set the values > an asterisk "*" will appear up the space on the left > change position of the asterisk "*" using ESC > modify the value by means of arrow + or - > press ENTER to exit (the asterisk has to be positioned on the last figure on the right and then it disappears)

- 1- INPUT > page indicating the list of inputs and their state
- 2- OUTPUT > page indicating the list of outputs and their state
- 3- ANALOGIC > page indicating the list of analogical inputs-outputs and their state
- 4- CALIBRATION
 - o Angle min: ___ > enter to set angle min
 - o Angle max: ___ > enter to set angle max
 - o Load min
 - o Load max
 - o Enter to set joy right down
 - o Enter to set joy right up
 - o Enter to set joy right zero
 - o Enter to set joy left down
 - o Enter to set joy left up
 - o Enter to set joy left zero
 - o Joy dead ZONE
 - o Enter to set reset time 1
 - o Enter to set reset time 2
- 5- MACHINE PAR.
 - o Max pression
 - o Min pression
 - o Max load
 - o Min load
- 6- MACHINE OPE.
 - o n°rope (1,2,3)
 - o n°tool (**0** > Winch **1M** > Manipulator **2JH** > Jib **3JM** > Mechanical Jib **4J** > Hook)
 - o anti-collision device
 - o Imperial Unit: **0** > E. U. / **1** > Imp. Unit
- 7- BY-PASS
 - o Crane (when activated by pressing ENTER, the corresponding led will flash and the ring turn on)
 - o Truck (when activated by pressing ENTER, the corresponding led will flash and the ring turn on)
- 8- TIMER
 - o H. MNT1
 - o H. MNT2
 - o H. TOT
- 9- SAVE

**CAUTION!!!**

Configuration pages 4 and 5 can be paged to only by entering a password supplied under the manufacturer's authorization.

After modifying the settings, page to the SAVE page and save by pressing ENTER.

Key alternate functions:


TEMPORARY BY-PASS: in case of overload, some moves of the crane might be deactivated for safety purposes. If it is necessary to carry out these moves in order to overcome the emergency condition, follow the procedure here below :


- Press the two arrows on the switchboard at the same time, the buzzer will stop in 5 seconds, the three-colour LEDs near the ENTER/ESC keys start flashing in order to indicate that the by-pass is activated. At this point, the operator is allowed 10 seconds to carry out the necessary moves. This procedure can be repeated three times provided a one-minute interval is left between one and the next. When the emergency condition is over, switch the switchboard off and then switch it on again.

FIXED BY-PASS: it is activated by paging from the main menu to page 7. The by-pass CRANE activates all the crane moves, the by-pass TRUCK activates all the truck moves. **CAUTION!!! USE THIS PROCEDURE VERY CAREFULLY SINCE IT CUTS OUT ALL THE MACHINE SAFETY SYSTEMS.**

**CAUTION!!!**

Stop and restart the machine after using the fixed by-pass in order to go back to the basic settings.

ANTICOLLISION SYSTEM: lift up the boom to the intended angle, press arrow  ; when the value is saved, the two LEDs of the ESC key will flash in turn.

Press arrow  to deactivate the system. (the yellow led turn on)

Alarms:

The alarm code disappears only when the problem is solved

The warning code appears as a consequence of the wrong move that generated it and disappears with a 2-second delay in order to suggest the move which is not allowed in that configuration. It could be present also to give an advertisement about machine functioning. For informations see the following table and the label present on the machine.



ALARMS	ACTION
1 alarm E2PROM HEAD	→ 1° Check fuses >2° Call service
2 pressure transducer disconnected	→ Check pressure transducer wiring
3 pressure transducer short-circuited	→ 1° Check fuses >2° Replace it
4 jib pressure transducer disconnected	→ Check jib pressure transducer wiring
5 jib pressure transducer short-circuited	→ 1° Check fuses >2° Replace it
6 w inch strain gauge disconnected	→ Check strain gauge wiring
7 w inch strain gauge short-circuited	→ 1° Check fuses >2° Replace it
8 angle sensor disconnected	→ Check wiring
9 angle sensor short-circuited	→ 1° Check fuses >2° Replace it
30-35 timeout (1-2-3-4-5-6) CANBUS ARM	→ 1° Check fuses >2° Call service
WARNINGS	ACTION
10 local emergency held down	→ Reset the machine emergency push button
11 remote emergency held down	→ Reset the radio remote control emergency push button
40 maintenance alarm 1	→ Carry out scheduled maintenance (500 hours)
41 maintenance alarm 2	→ Carry out scheduled maintenance (1000 hours)
51 block due to max pressure	→ Activate allowed function by the machine
52 block due to min pressure	→ Lift the boom
53 block due to max load	→ Lay the load to the ground or change n° of rope
54 block due to rope up	→ Unwind the rope or telescope in
55 block due to rope down	→ Wind the rope
56 block due to machine instability SPD360	→ Activate allowed function by the machine
57 clockwise slewing block SPD265	→ Turn the boom to the opposite sector
58 counterclockwise slewing block SPD265	→ Turn the boom to the opposite sector
59 block due to pressure transducer alarm	→ Check and/or replace for probable failure
60 block due to jib pressure transducer alarm	→ Check and/or replace for probable failure
61 block due to w inch strain gauge alarm	→ Check and/or replace for probable failure
62 block due to angle sensor alarm	→ Check and/or replace for probable failure
63 block due to anticollision	→ Lower the boom
64 block due to global safety system	→ 1° Check fuses >2° Call service
65 block due to max angle	→ Lower the boom
66 slowing down because of the anticollision	→ No action, safety system
67 slowing down because of the max angle	→ No action, safety system
70 block due to wrong tool selected	→ Select the right tool on the menu
71 slewing block	→ Activate allowed function by the machine
72 hook lifting tool	→ Winch is automatically locked
73 clockwise slewing block SPD360	→ Restore the correct stabilisation of the machine
74 counterclockwise slewing block SPD360	→ Restore the correct stabilisation of the machine
75 wrong stabilisation SPD360	→ Restore the correct stabilisation of the machine
76 wrong stabilisation SPD500	→ Restore the correct stabilisation of the machine
77 block for instability of SPD500	→ Activate allowed function by the machine
78 block for wrong stabilization	→ Restore the correct stabilisation of the machine
79 block of jib SPD500	→ Do the jib movement boom up
80 clockwise slewing block SPD500	→ Restore the correct stabilisation of the machine
81 counterclockwise slewing block SPD500	→ Restore the correct stabilisation of the machine
90 engine off	→ Turn on the engine
91 machine start-up	→ Push turn on engine button to start-up machine

Login with password to the machine settings

Switch on the switchboard and when the software name and the machine model are displayed press ENTER to page to the password login page. Press ESC to move the cursor (*) and the keys (+) and (-) to increase/decrease the figures in order to set every number of the password. Press ENTER to confirm the password (the asterisk has to be on the last figure on the right). Page to the MAIN MENU by pressing ENTER, and setting page No 4 CALIBRATION or No 5 MACHINE PARAMETER will appear depending on the password entered.



CAUTION!!!

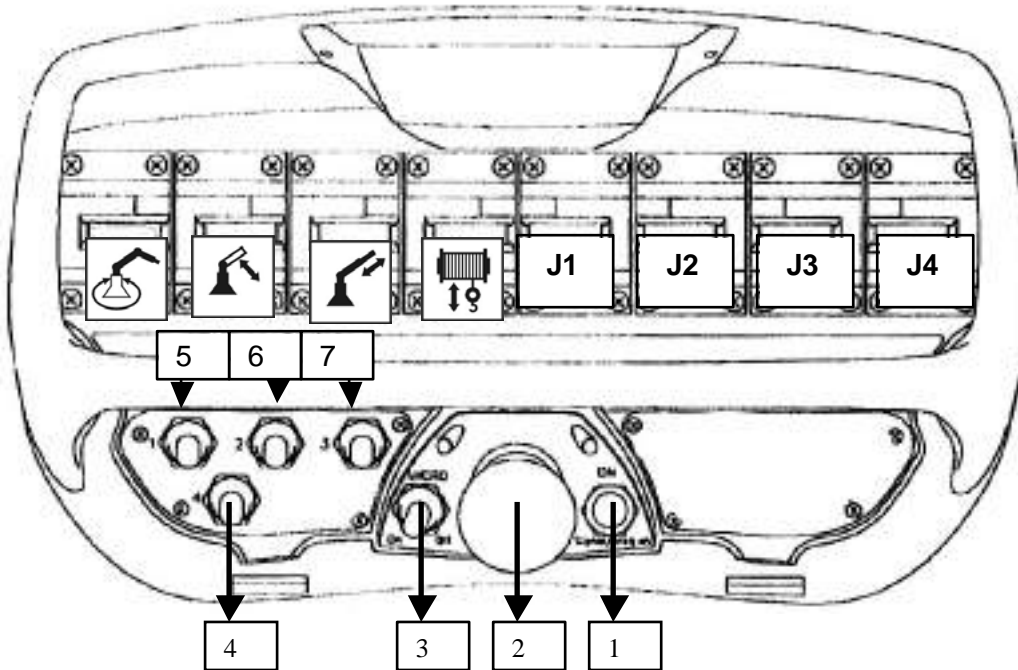
Login with password to the machine setting pages is only allowed to authorized personnel specialized in modifying the settings. For further information, see the manual of software setting supplied to the specialized technicians, only.

WINCH CALIBRATION

- 1- Enter page CALIBRATION (4) and select LOAD MIN
- 2- Press ENTER and set the numerical value at 0
NB: no load has to be on the winch.
- 3- Press ENTER to confirm the value (the asterisk has to be on the last figure on the right)
- 4- Select LOAD MAX and lift a load whose weight you know by means of the winch
- 5- Press ENTER and use the arrows to set the weight of the lifted load.
- 6- Press ENTER to confirm the value (the asterisk has to be on the last figure on the right)
- 7- Select SAVE and press ENTER, wait until the calibration setting are saved, stop and restart the machine and carry out a test to check whether the weight indicated on the display is correct otherwise repeat the procedure.

NB: There may be a slight difference (some Kg) between the weight indicated and the real one.
The load is only indicative and have a gap of 10%

3.2 Radio remote control



Ref.	Description
1	ON activation of the radio remote control and frequency change during operation
2	Emergency push button
3	Optional
4	Adjustment of the crane working speed SLOW/FAST
5	Adjustment of the engine rpm MIN/AUTOMATIC/MAX
6	Diesel engine start/stop
7	Crane By-pass

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!!!

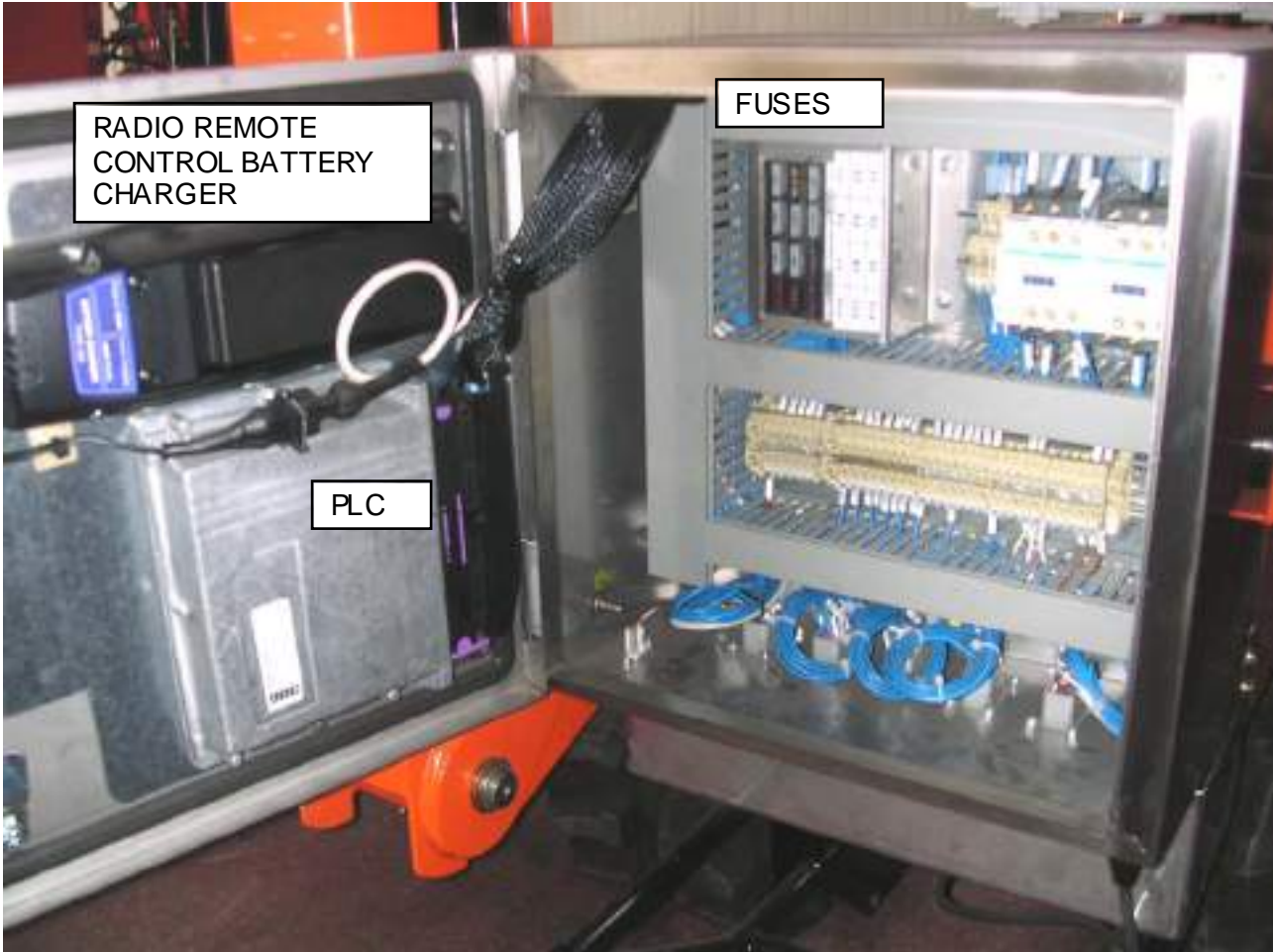
Access to the electrical cabinet is allowed to authorized personnel, only. Tampering with the electrical cabinet will nullify the warranty conditions.

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



CAUTION!!!

VERIFY THE ELECTRIC INSTALLATION EARTHING AT ALL TIMES. MAKE SURE THAT THERE IS A SUITABLY DIMENSIONED GROUND FAULT CIRCUIT.



4 USE OF THE MACHINE IN REGULAR WORKING CONDITIONS

4.1 Machine starting

Battery version (C):

- Turn the battery switch on the ON position
- Take the switchboard
- Start the machine by turning the key switch of the switchboard on the ON position and push turn on engine button to start-up the machine.

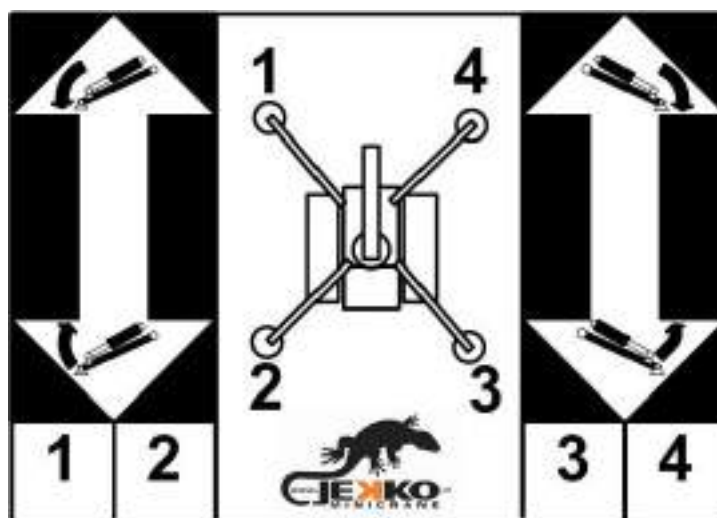
Engine version (CD):

- Turn the battery switch on the ON position
- Take the switchboard
- Start the machine by turning the key switch of the switchboard on the ON position and push turn on engine button to start-up the machine.
- Press the proper push button on the switchboard or turn the key switch on the RADIO position and start the engine by means of the proper switch on the radio remote control.

In case the engine doesn't start electrically, start it manually by means of the self-winding system following the procedure described in paragraph 4.7 (only 15LD440).

4.2 Handling and stabilization of the machine

- Start the machine (see 4.1)
- The machine is equipped with a 2-way solenoid valve automatically making the oil flow to the truck or crane system depending on what signal light is lit on the switchboard. In case the 2-way solenoid valve didn't work, deviate the oil manually as described in paragraph 4.8.
- Position the machine using the joysticks on the switchboard (press the push button on top of every joystick and in the meanwhile move it to operate the tracks). To move the machine front and back using only the right joystick, put down the switch 3B (see 3.1)
- 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 HORIZONTAL AS POSSIBLE.



- Check the correct working configuration looking at the LEDs on the switchboard – **when the machine is correctly stabilized the crane LED is on.**



CAUTION!!!

Do not operate the machine when the tracks are on the ground.



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.

4.3 Use of the crane

Once the machine is correctly stabilized (crane LED on), the 2-way solenoid valve automatically makes oil flow from the truck to the crane system.

Key switch on LOCAL position:

Use the joysticks to carry out the moves indicated

- When the central key switches are up, the crane can be operated (green moves)
- When the central key switches are down, the jib can be operated (yellow moves)

Key switch turned to REMOTE position:

When the key switch is in this position, the radio remote control is activated:

- Start the radio remote control
- Use the uniaxial analogical joysticks to operate the crane and the jib

4.4 From crane configuration to truck configuration

CAUTION: switching from crane to truck configuration is possible only if the crane boom is in a central horizontal position and carrying no load – the LED lit on the switchboard indicates that the corresponding configuration is activated.

4.5 Stop and laying-up of the machine

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

4.6 Settings of the tools installed

Access to page N°6 MACHINE OPERATOR on the MAIN MENU:

1- in underpage “n°tool” select the number corresponding to the tool installed

VALUE	SYMBOL ON DISPLAY	DESCRIPTION
0	O	Winch
1	M	Manipulator
2	JH	Hydraulic jib
3	JM	Mechanical jib
4	H	Hook

2- in underpage “n°rope” select the kind of line pull (single, double, triple) installed on the winch
Once the values are set, save them on page 9.

For the tool use, see the relative section or the manual supplied.

4.7 Diesel engine 15LD440 emergency start

- 1- Switch on the switchboard turning the key switch on the ON position
- 2- Move the fuel valve lever on the engine right side on the “pull start” position **1**
- 3- Pull the string gently all along and force the piston resistance – let the string wind up – start the machine by pulling the string energetically – once the engine is started, wait some minutes
- 4- Move the engine valve back on the “normal” position **2**



Once the engine started by means of the manual procedure, it is very important to move the fuel valve lever back on position 1 otherwise the engine won't stop even if pressing the emergency button.

4.8 Emergency procedure to change configuration

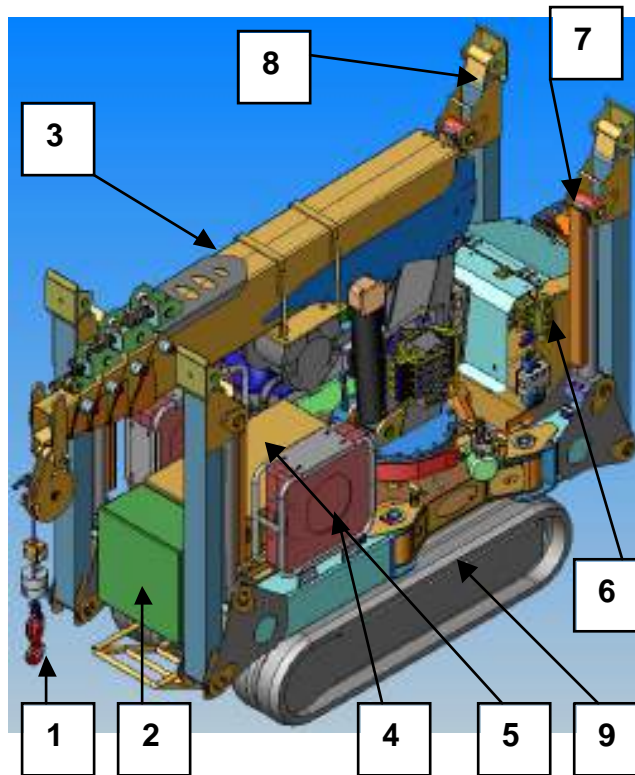
ATTENTION! CALL ASSISTANCE TO DO THIS EMERGENCY PROCEDURE.

Remove seals of solenoid valve Y1,Y2,Y3.

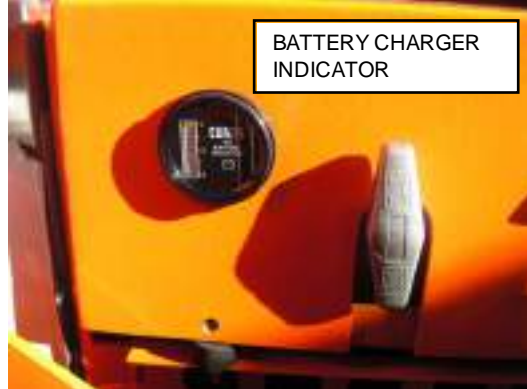
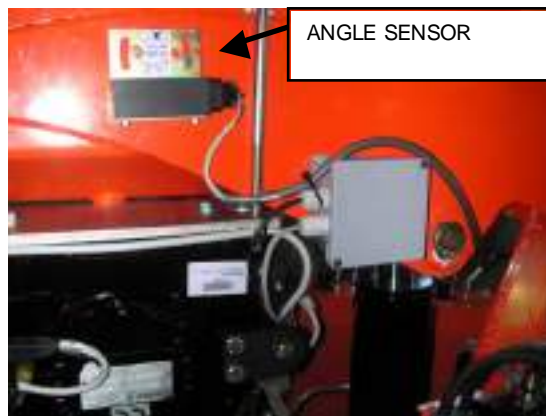
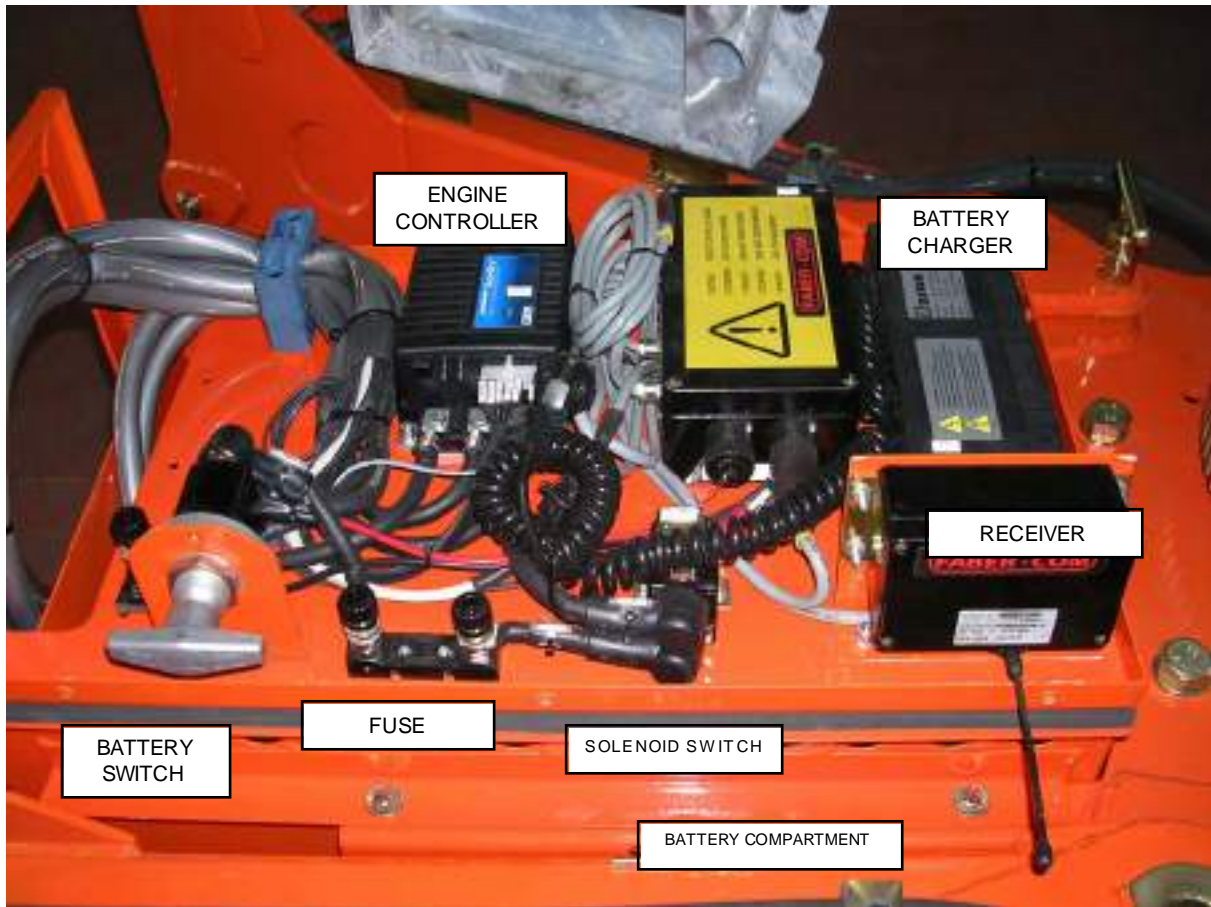
Turn the handle clockwise to deviate the oil flow to the crane system, counterclockwise to the truck. When the handle is in its standard position, the oil flow is delivered to the crane system.



5 MAIN PARTS OF MODEL SPD265C+

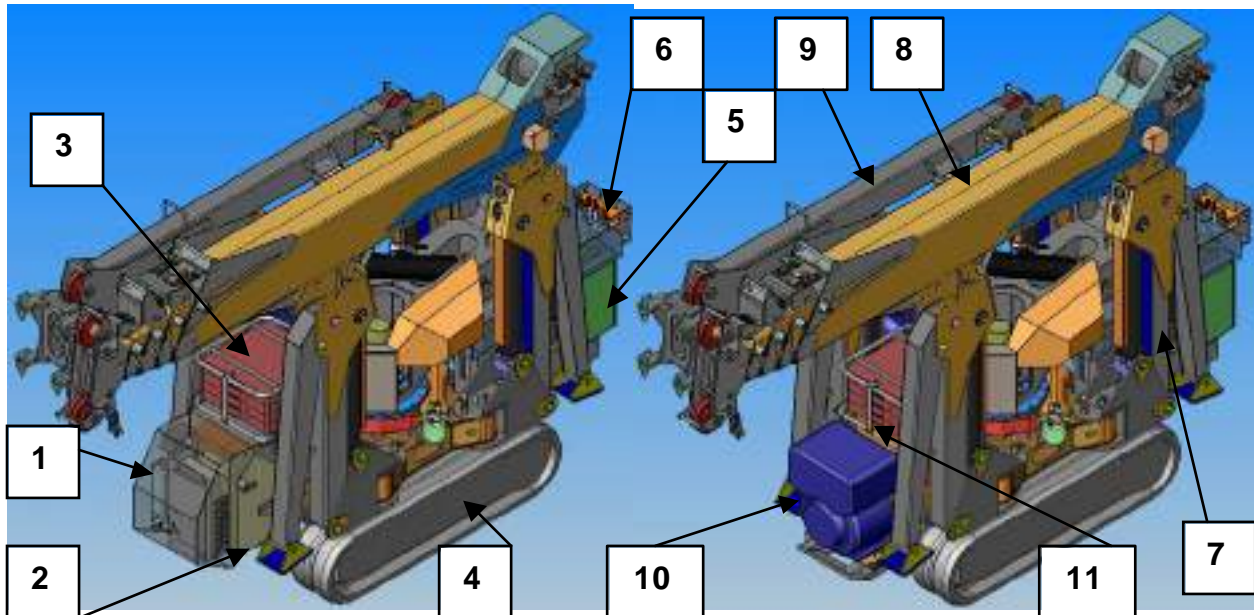


Ref.	Description
1	Winch
2	Main electrical cabinet
3	Crane
4	Pads
5	Battery compartment
6	Hydraulic distributor
7	Switchboard
8	Outrigger
9	Track





6 MAIN PARTS OF MODEL SPD360C+/CD

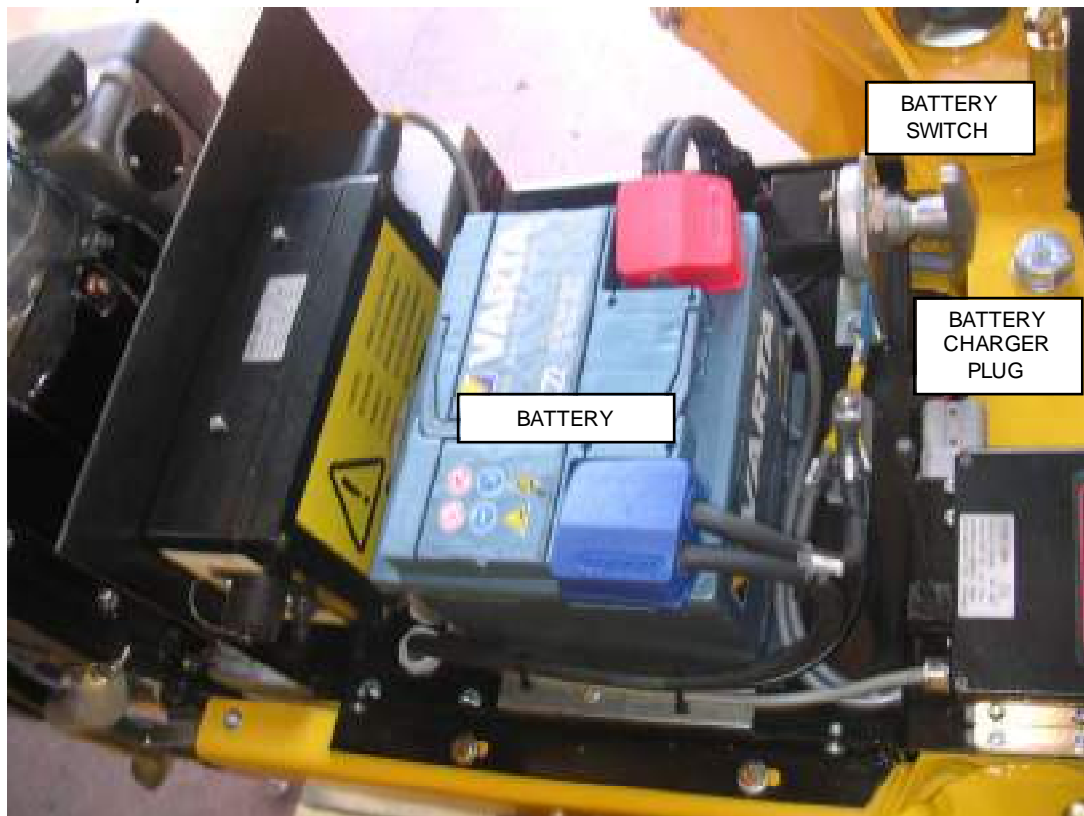


Ref.	Description
1	Electronic components
2	Battery compartment
3	Chocks
4	Truck
5	Main electrical cabinet
6	Switchboard
7	Stabilizer
8	Crane
9	Jib
10	Diesel engine
11	Diesel electronic components

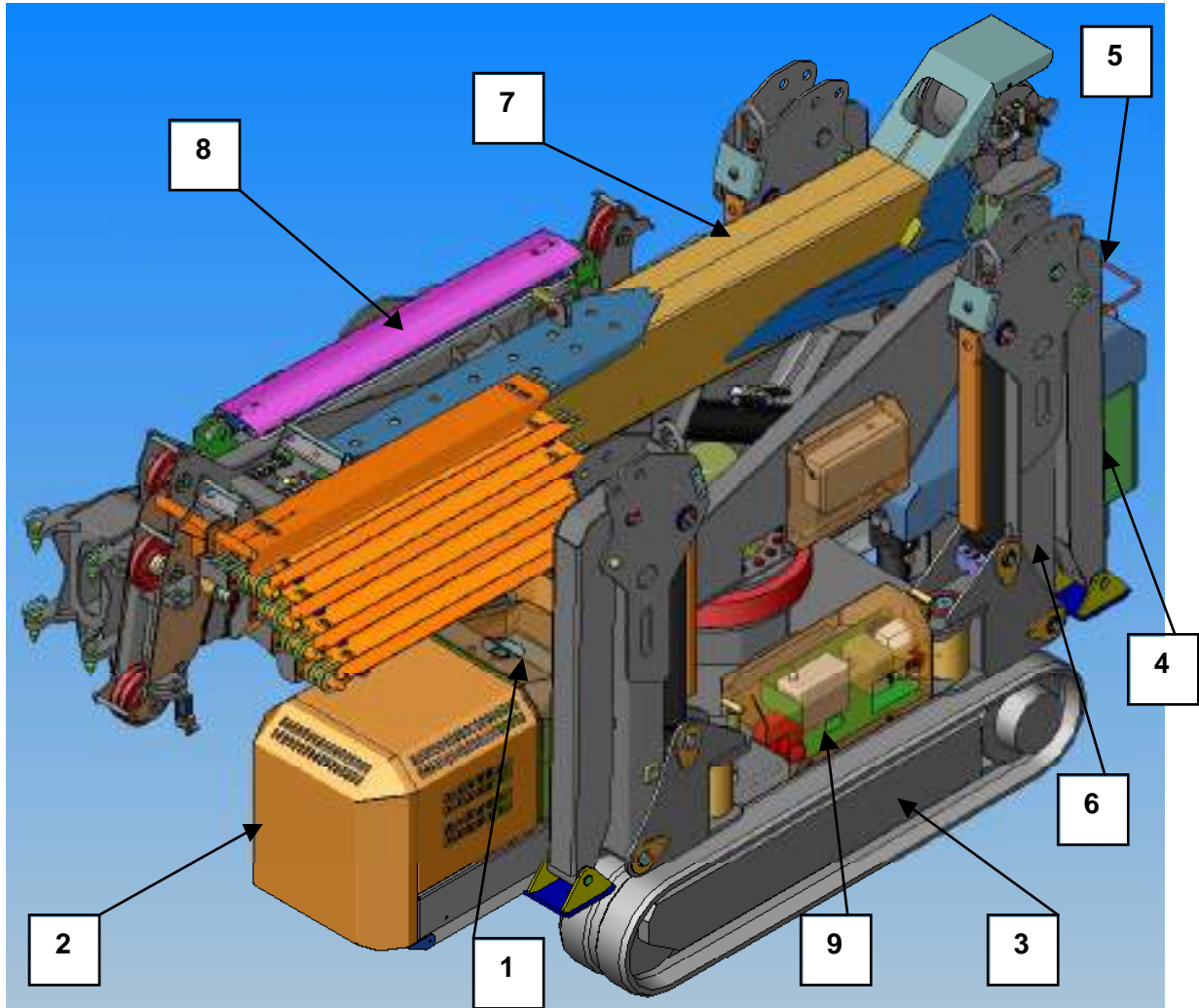
1- Electronic components C+



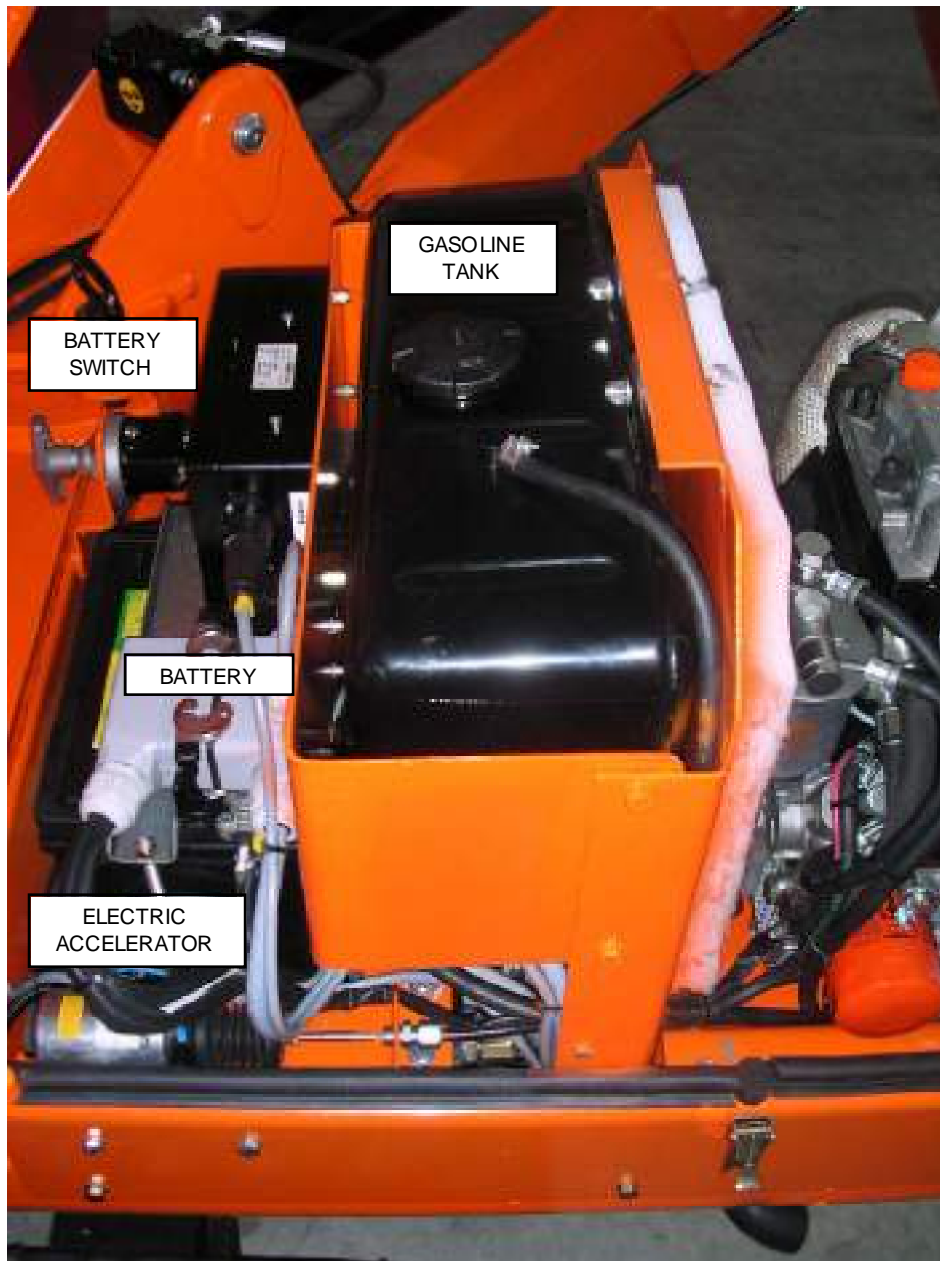
2- Electronic components CD



7 MAIN PARTS OF MODEL SPD500CD

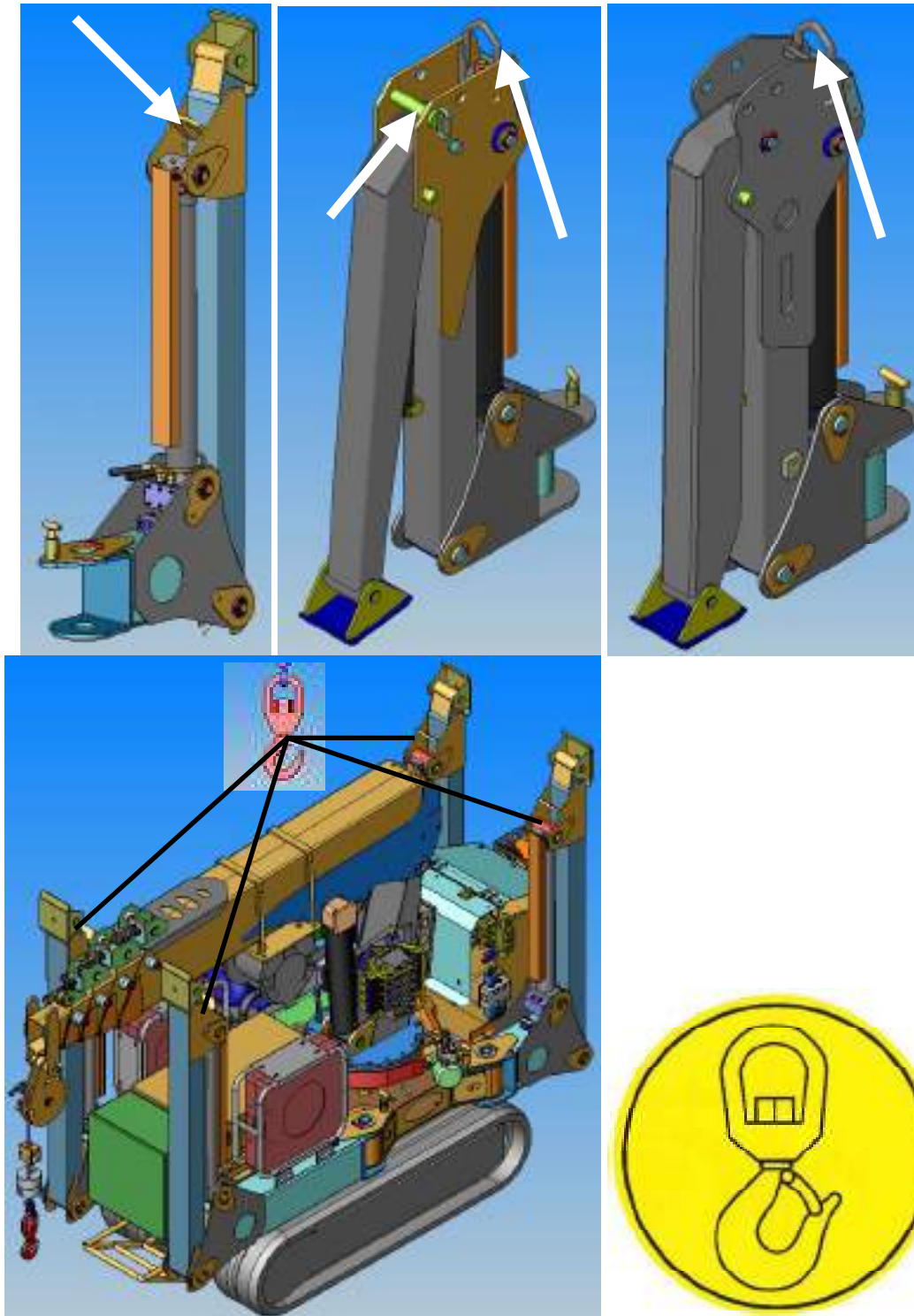


Ref.	Description
1	Diesel engine compartement
2	Battery compartement
3	Track
4	Main electrical cabinet
5	Switchboard
6	Stabilizer
7	Crane
8	Jib
9	380V power pack compartement



8 HANDLING AND TRANSPORT

Every machine has four anchor points located on each stabilizer in order to lift and position the machine by means of a yard crane. There is a label like below in the point of lifting.



Lifting and transport

9 TROUBLESHOOTING

9.1 Alarms of battery charger model BC1

IN CASE OF ALARM, THE BATTERY CHARGER STOPS DELIVERING CURRENT AND THE LED STARTS FLASHING

State	Alarm	Description (action)
Flashing GREEN	Timeout	Phase 1 exceeding the duration limits allowed – check the battery capacity
Flashing RED-YELLOW	Battery current	Loss of control of the output current – damage to the control logic
Flashing RED-GREEN	Battery voltage	Non-complying battery (check the nominal voltage) or loss of control of the output current (damage to the control logic)
Flashing RED-YELLOW-GREEN	Thermal alarm	Overheating of the semiconductors – check the fan operation
Flashing YELLOW-GREEN	Selection	An unused configuration has been selected – check the key switch position

9.2 Alarms of battery charger model NG1

IN CASE OF ALARM, THE BATTERY CHARGER STOPS DELIVERING CURRENT, THE LED STARTS FLASHING AND AN ACOUSTIC SIGNAL IS GIVEN

State	Alarm	Description (action)
Flashing RED	Presence of batteries	Non-complying or disconnected batteries
Flashing YELLOW	Thermal probe	Thermal probe disconnected or outside the operational range
Flashing GREEN	Timeout	Phase 1 and/or phase 2 exceeding the duration limits allowed – check the battery capacity
Flashing RED-YELLOW	Battery current	Damage to the control logic
Flashing RED-YELLOW	Battery voltage	Loss of control of the output current – battery disconnected or damage to the control logic
Flashing YELLOW-GREEN	Selection	An unused configuration has been selected – check the key switch position
Flashing RED-YELLOW-GREEN	Thermal alarm	Overheating of the semiconductors – check the fan operation

9.3 Alarms of battery charger model NG3

IN CASE OF ALARM, THE BATTERY CHARGER STOPS DELIVERING CURRENT, THE LED STARTS FLASHING AND AN ACOUSTIC SIGNAL IS GIVEN

State	Alarm	Description (action)
Flashing RED	Presence of batteries	Non-complying or disconnected batteries
Flashing YELLOW	Thermal probe	Thermal probe disconnected or outside the operational range
Flashing GREEN	Timeout	Phase 1 and/or phase 2 exceeding the duration limits allowed – check the battery capacity
Flashing RED-YELLOW	Battery current	Damage to the control logic
Flashing YELLOW-GREEN	Selection	An unused configuration has been selected – check the key switch position
Flashing RED-YELLOW-GREEN	Thermal alarm	Overheating of the semiconductors – check the fan operation

9.4 Machine alarms

ALARMS	ACTION
1 alarm E2PROM HEAD	→ 1° Check fuses >2° Call service
2 pressure transducer disconnected	→ Check pressure transducer wiring
3 pressure transducer short-circuited	→ 1° Check fuses >2° Replace it
4 jib pressure transducer disconnected	→ Check jib pressure transducer wiring
5 jib pressure transducer short-circuited	→ 1° Check fuses >2° Replace it
6 w inch strain gauge disconnected	→ Check strain gauge wiring
7 w inch strain gauge short-circuited	→ 1° Check fuses >2° Replace it
8 angle sensor disconnected	→ Check wiring
9 angle sensor short-circuited	→ 1° Check fuses >2° Replace it
30-35 timeout (1-2-3-4-5-6) CANBUS ARM	→ 1° Check fuses >2° Call service
WARNINGS	ACTION
10 local emergency held down	→ Reset the machine emergency push button
11 remote emergency held down	→ Reset the radio remote control emergency push button
40 maintenance alarm 1	→ Carry out scheduled maintenance (500 hours)
41 maintenance alarm 2	→ Carry out scheduled maintenance (1000 hours)
51 block due to max pressure	→ Activate allowed function by the machine
52 block due to min pressure	→ Lift the boom
53 block due to max load	→ Lay the load to the ground or change n° of rope
54 block due to rope up	→ Unwind the rope or telescope in
55 block due to rope down	→ Wind the rope
56 block due to machine instability SPD360	→ Activate allowed function by the machine
57 clockwise slewing block SPD265	→ Turn the boom to the opposite sector
58 counterclockwise slewing block SPD265	→ Turn the boom to the opposite sector
59 block due to pressure transducer alarm	→ Check and/or replace for probable failure
60 block due to jib pressure transducer alarm	→ Check and/or replace for probable failure
61 block due to w inch strain gauge alarm	→ Check and/or replace for probable failure
62 block due to angle sensor alarm	→ Check and/or replace for probable failure
63 block due to anticollision	→ Lower the boom
64 block due to global safety system	→ 1° Check fuses >2° Call service
65 block due to max angle	→ Lower the boom
66 slowing down because of the anticollision	→ No action, safety system
67 slowing down because of the max angle	→ No action, safety system
70 block due to wrong tool selected	→ Select the right tool on the menu
71 slewing block	→ Activate allowed function by the machine
72 hook lifting tool	→ Winch is automatically locked
73 clockwise slewing block SPD360	→ Restore the correct stabilisation of the machine
74 counterclockwise slewing block SPD360	→ Restore the correct stabilisation of the machine
75 wrong stabilisation SPD360	→ Restore the correct stabilisation of the machine
76 wrong stabilisation SPD500	→ Restore the correct stabilisation of the machine
77 block for instability of SPD500	→ Activate allowed function by the machine
78 block for wrong stabilization	→ Restore the correct stabilisation of the machine
79 block of jib SPD500	→ Do the jib movement boom up
80 clockwise slewing block SPD500	→ Restore the correct stabilisation of the machine
81 counterclockwise slewing block SPD500	→ Restore the correct stabilisation of the machine
90 engine off	→ Turn on the engine
91 start-up machine	→ Push turn on engine button to start-up machine

10 STANDAR 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 green LED starts 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



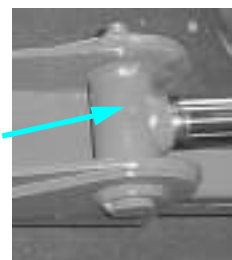
Lubrication is to be carried out only when the machine is at a standstill.

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:

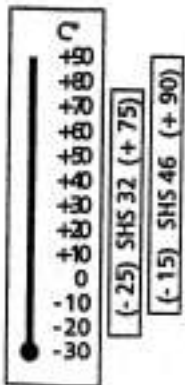
- Articulated joints on stabilizers
- Chains
- Pivots
- Winch
- Slewing gear
- Boom extensions



Hydraulic oil

Top up or replace only with the following recommended oil:

**OIL ROLOIL HLD 46 AI
or 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 an 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.

Battery charger (C)

- 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 **WARNING!!!: 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.

Battery (C)

- 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.

10.3 How to increase the battery lifetime

Charging

- 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.

Topping-up

- 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.

Cleaning

- Nothing has to fall inside the battery.
- Clean only with water, then dry.
- Protect cables with anti-rust products.

Storing

- 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 (CD)

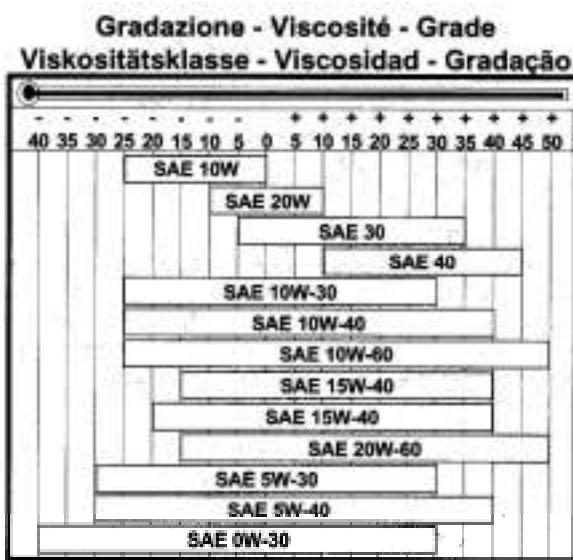
⇒ For further details, see the relative use and maintenance manual.

RECOMMENDED OILS:

-AGIP SUPER DIESEL MULTIGRADE 15W40 specification API CF-4/SG ACEA E2,B2 mil-I-46152 D/E

-ESSO SPECIAL PKW-UNIFLO DIESEL 15W40 specification API CF-4/SG ACEA E2,B2 mil-I-46152 D/E

-In countries where AGIP and ESSO products aren't available, it is recommended the API SJ/CF oil for diesel engines or whatever other oil complying with the specification MIL-L-46152 D/E



NB: For further details, see the engine manual.

10.4 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 place them so that they cannot fall in case hydraulic pressure should fall. Tutte le parti rimosse devono essere appoggiate su superfici solide e posizionate in modo che non cadano se la pressione idraulica decade
- ❖ 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.

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

11 SERVICING FORMS

11.1 Introduction

According to the European Directive 98/37/EC 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.

IMAI 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 have 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, IMAI S.r.l. 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 (every 6/12/18/24 months)
- 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.



12.2 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

.....

.....



State IN-OUT (Page 1)	DESCRIPTION	Higher than 0 > *	Equal to 0 > -
HEAD I-HO			
0	Front right cross piece		
1	Front left cross piece		
2	Back right cross piece		
3	Back left cross piece		
4	Front right stabilizer		
5	Front left stabilizer		
6	Back right stabilizer		
7	Back left stabilizer		
8	Engine thermal sensor		
9	Manual accelerator/stabilizer lever downward		
ARM I-AO			
0	Crane in rest position (closed)		
1	Crane left side		
2	Jib alarm		
3	Crane right side		
4	Rope in		
5	Jib activated		
6	Rope out		
SLIM I-SO			
0	Sb deadman right control		
1	Sb deadman left control		
2	Sa remote key (on main switchboard)		
3	Sa engine start		
4	Sa emergency mushroom push button		
5	SbSel1 right – three-phase engine off		
6	SbSel1 left – three-phase engine on		
7	SbSel2 right – aux off		
8	SbSel2 left – aux on		
9	SbSel3 right – selection of crane on the right		
SLIM I-S1			
0	SbSel3 left – selection of manipulator on the left		
1	SbSel4 right – selection of crane on the right		
2	SbSel4 right – selection of manipulator on the right		
3	SLIM up key		
4	SLIM down key		
5	SLIM index key		
6	SLIM enter key		
RADIO CONTROL I-RO			
0	Ra-p1 automatic acceleration		
1	Ra-p2 not used		
2	Ra-p3 not used		
3	Ra-p4 engine stop		
4	Ra-p5 engine start		
5	Ra-p6 acceleration		
6	Ra-p7 not used		



State IN-OUT (Page 2)	DESCRIPTION	Higher than 0 > *	Equal to 0 > -
7	Ra-p8 slow gears		
8	Ra-fungo emergency mushroom push button		
OUTPUT ON HEAD O-HO			
0	yv solenoid valve 1		
1	yv solenoid valve 2		
2	yv solenoid valve 3		
3	K engine start		
4	K automatic switch		
5	K speed 1		
6	K speed 2		
7	yv solenoid valve 4		
OUTPUT ON ARM O-AO			
0	K buzzer		
1	yv switch J2J3		
OUTPUT ON SLIM O-SO			
0	Front right LED		
1	Front left LED		
2	Back right LED		
3	Back left LED		
4	Crane LED		
5	Truck LED		
6	Index LED on SLIM		
7	Green LED on SLIM		
8	Yellow LED on SLIM		
9	Red LED on SLIM		
ANALOGIC			
0	Pressure transducer		
1	Jib pressure transducer		
2	Winch strain gauge		
3	Angle sensor		
4	right joystick x		
5	right joystick y		
6	left joystick x		
7	left joystick y		
8	PWM descent		
9	PWM ascent		
10	PWM slewing CCW		
11	PWM winch descent		
12	PWM J1 upward		
13	PWM J1 downward		
14	PWM J2 upward		
15	PWM J2 downward		
16	PWM winch descent		
17	PWM slewing CW		
18	PWM retraction		
19	PWM extension		

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 SPD265C+/360C+

THREE-PHASE FEEDING KIT PP380-4E



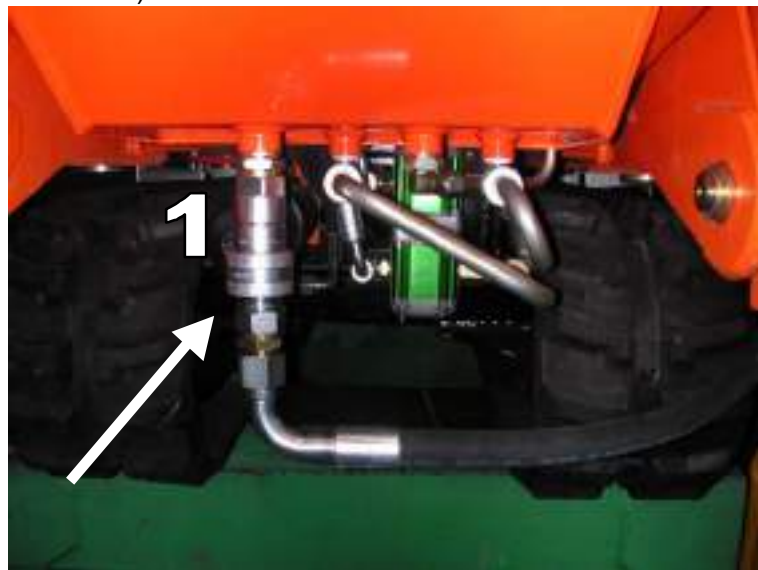
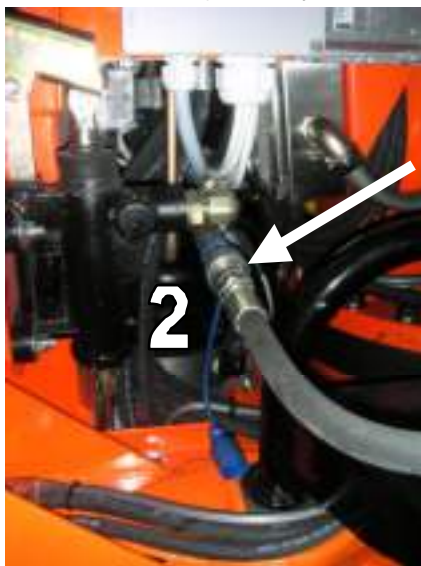
Introduction: the three-phase feeding kit PP380-4E is only used to operate the crane once the machine is stabilized. The transfer by truck is only fed by battery with electrical motor.

Installation:

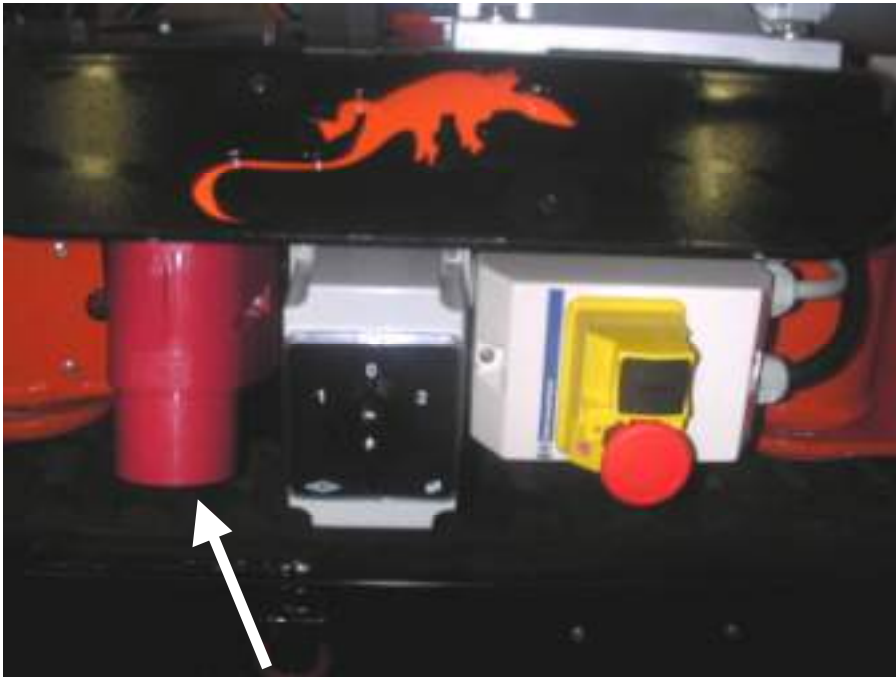
- Put the kit frame into the proper holes located on the machine bed right side



- Connect the quick coupling to the proper housings
 - > 1 (Return line under the tank)
 - > 2 (Delivery line beside the tank)



- Put the three-phase feeding plug (380V red) into the kit proper socket

**Use:**

- Make sure the machine is stabilized
- Turn the feeding key switch located on the switchboard on position 380V (3.1)
- Start the engine by means of the special black push button and turn the key 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). 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

- 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)



Transfer by truck can only be done by exploiting the battery or the diesel feeding



When disconnecting the kit hydraulic feeding in order to remove the kit from the machine, first disconnect line 2 and then line 1. A different procedure might generate dangers deriving from high-pressure fluid jets!!!

13.2 380V FEEDING KIT FOR SPD360CD

**THREE-PHASE FEEDING KIT
PP380-4D/F**



Introduction: the three-phase feeding kit PP380-4D/F is positioned on the front of the machine SPD360CD and give you the possibility to operate the crane once the machine is stabilized and to move the track.

Installation:

- Connect the quick coupling to the proper housings and the battery recharging cable of the machine by using the proper plug.



- Put the three-phase feeding plug (380V red) into the kit proper socket

Use:

- Turn the feeding key switch located on the switchboard on position 380V (3.1)
- Start the engine by means of the special black push button and turn the key 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). 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 counterclockwise as indicated by the arrow on the engine carter

- 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)

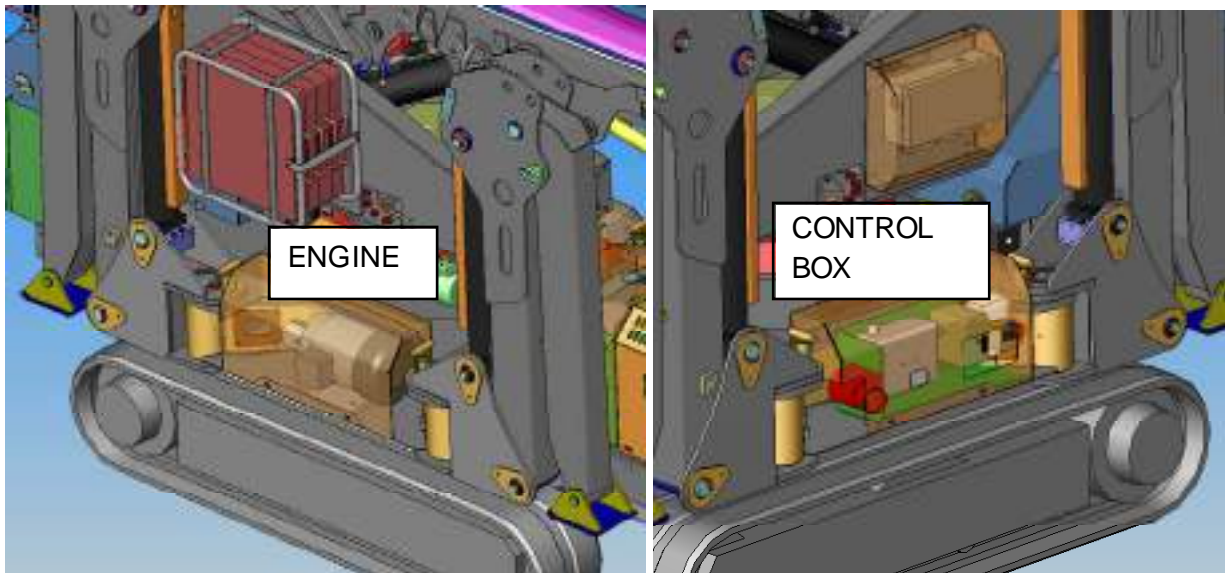
13.3 380V FEEDING KIT FOR SPD500CD

THREE-PHASE FEEDING KIT SPD500CD

Introduction: the three-phase feeding kit for SPD500 is positioned on the lateral parts of the machine and give you the possibility to operate the crane once the machine is stabilized.

Installation:

- The quick coupling to the proper housings and the battery recharging cable of the machine are already connected. Put the three-phase feeding plug (380V red) into the kit proper socket



Use:

- Turn the feeding key switch located in the main control panel on position 380V (3.1)
- Start the engine by means of the special black push button and turn the key 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). 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 counterclockwise as indicated by the arrow on the engine block

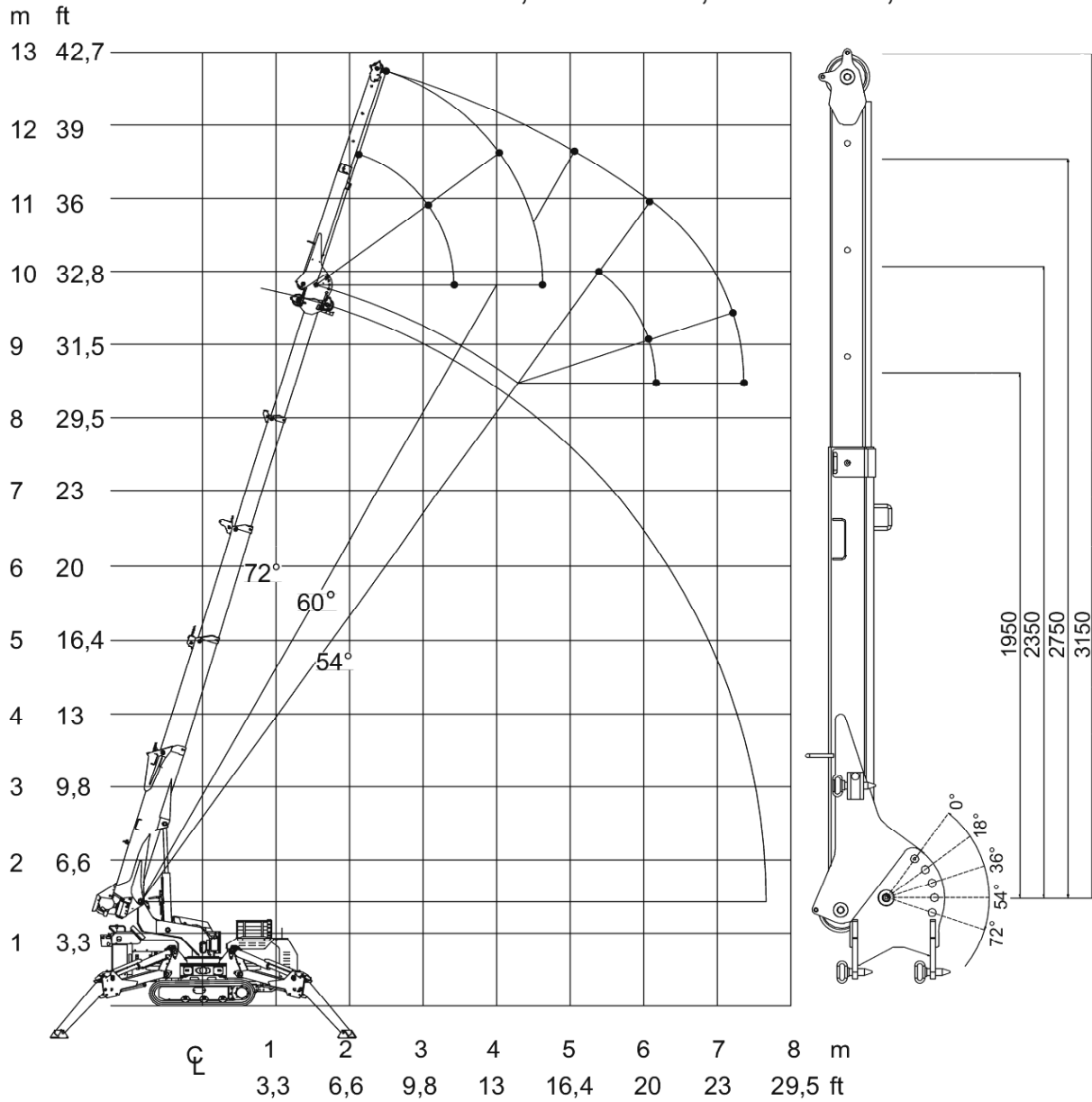
- To stop the engine, press the red emergency mushroom push button or turn the key switch on the 0 position

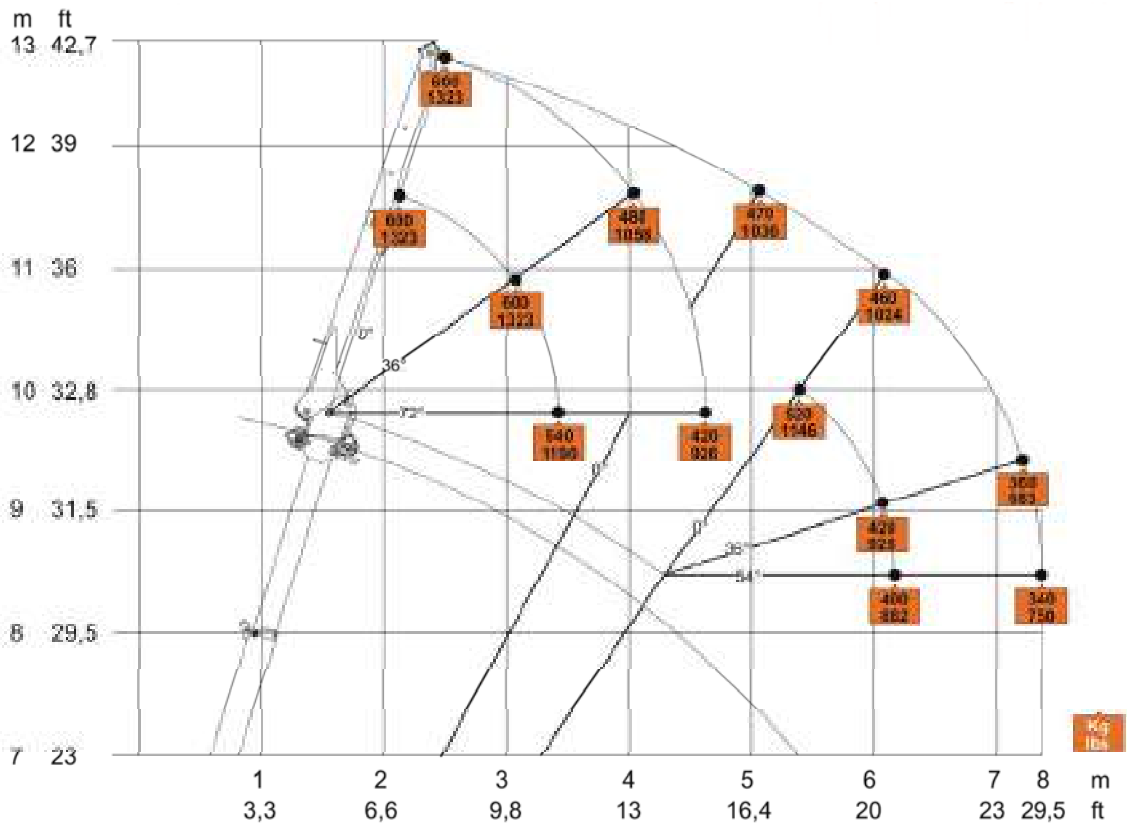


In case the engine doesn't start:

- check that the emergency push button is deactivated (to unlock it, turn the ring nut)

13.4 MECHANICAL JIB (JM) SPD360





		JIB TILTING ANGLE				
Kg	mm	72°	54°	36°	18°	0°
		lbs	ft			
72°	1950	540	550	600	600	600
	6.4	1190	1213	1323	1323	1323
	2350	490	510	550	600	600
	7.71	1080	1124	1213	1323	1323
60°	2750	490	470	510	600	600
	9	992	1036	1124	1323	1323
	3150	420	430	480	560	600
	10.33	926	948	1058	1236	1323
54°	1950	-	430	450	480	530
	6.4	-	948	992	1058	1168
	2350	-	400	420	450	510
	7.71	-	882	926	992	1124
54°	2750	-	380	400	430	490
	9	-	838	882	948	1080
	3150	-	360	370	410	470
	10.33	-	794	816	904	1036
54°	1950	-	400	420	460	520
	6.4	-	882	926	1014	1146
	2350	-	380	400	440	500
	7.71	-	838	882	970	1102
54°	2750	-	360	380	420	490
	9	-	794	838	926	1080
	3150	-	340	360	410	460
	10.33	-	750	794	904	1014

CAUTION: when the jib is lower than 50°, the winch capacity is restricted to about 50 kg.

13.4.1 Installation

1. On the switchboard, set the presence of the mechanical jib 3-JM (see paragraph 4.6)
2. Stabilize the machine
3. Take the rope block and the weights off the rope only leaving the cable with the metal eyelet (thimble)
4. Disconnect the rest lock on the jib tip and turn the jib slightly towards the boom in order to align the two right coupling holes with the ones on the crane boom extension
5. Use the boom extension to centre the hole and insert the two right pins (fig. 1)
6. Remove the pin fixing the jib to the crane, turn the jib and anchor it by means of the two remaining left pins
7. Slip the rope along the upper pulley of the crane fourth extension and the jib rear and front pulleys (fig. 2)
8. Put the rope block, 3 weights and limit micro switch back in their place according to the needs
9. Connect the limit micro switch feeding plugs: 4th extension-jib cable winder, jib cable winder-sensor on jib tip.
10. To adjust the jib inclination, clasp the hook as shown in fig. 3 and operate the winch gently to lever and lift or to lower the boom and move the pin on the hole according to the intended inclination

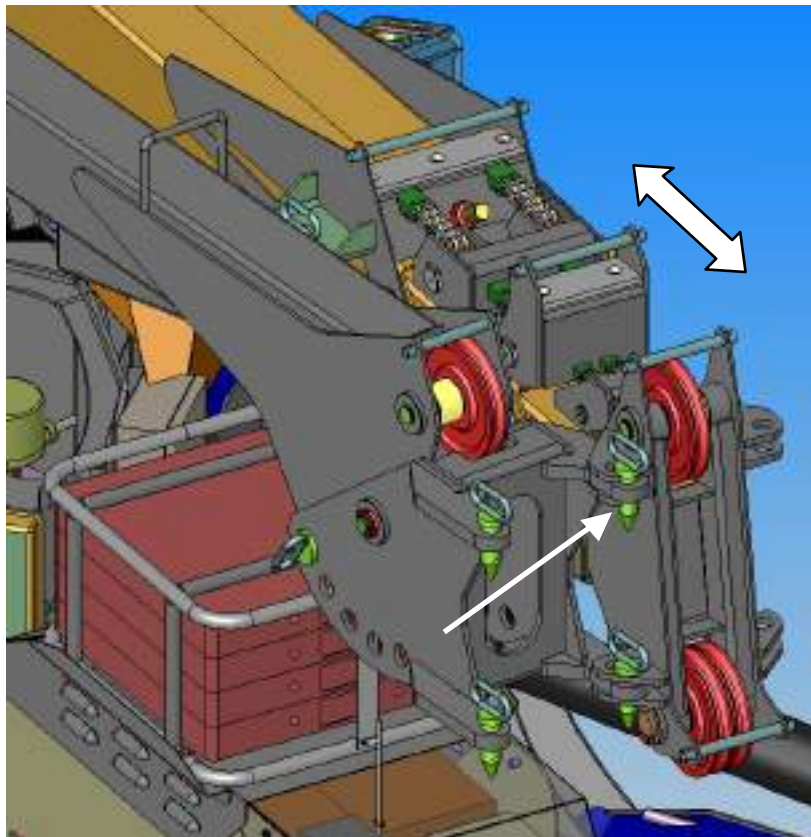


Fig. 1

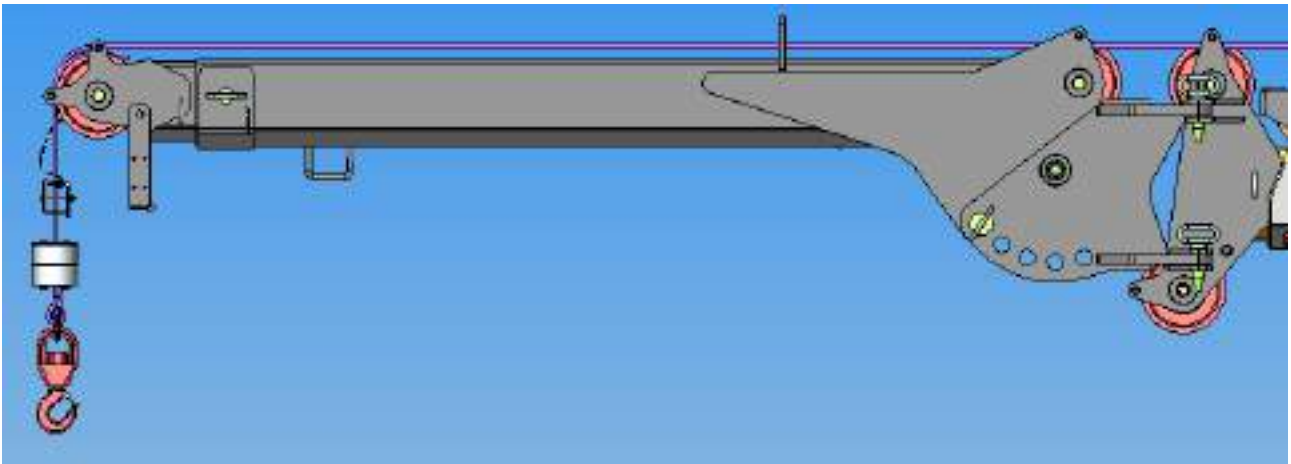


Fig. 2

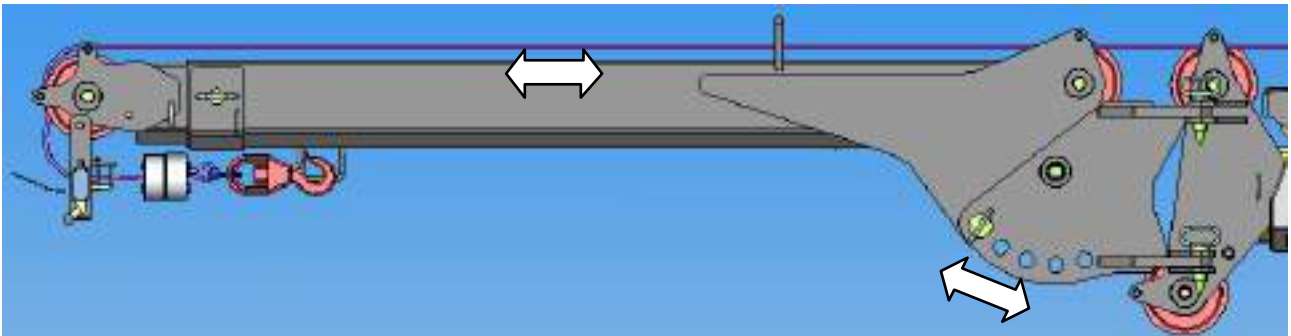
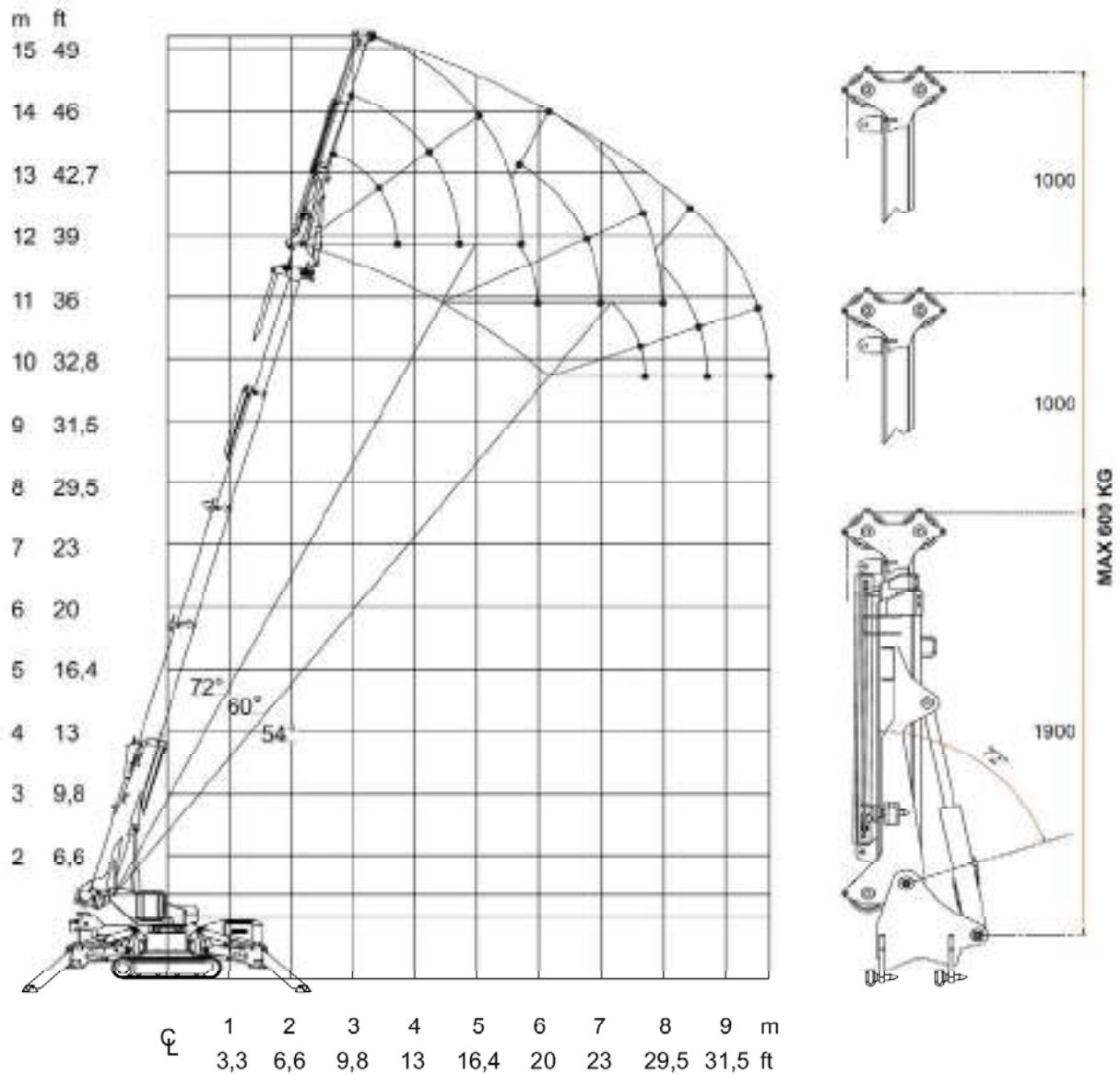
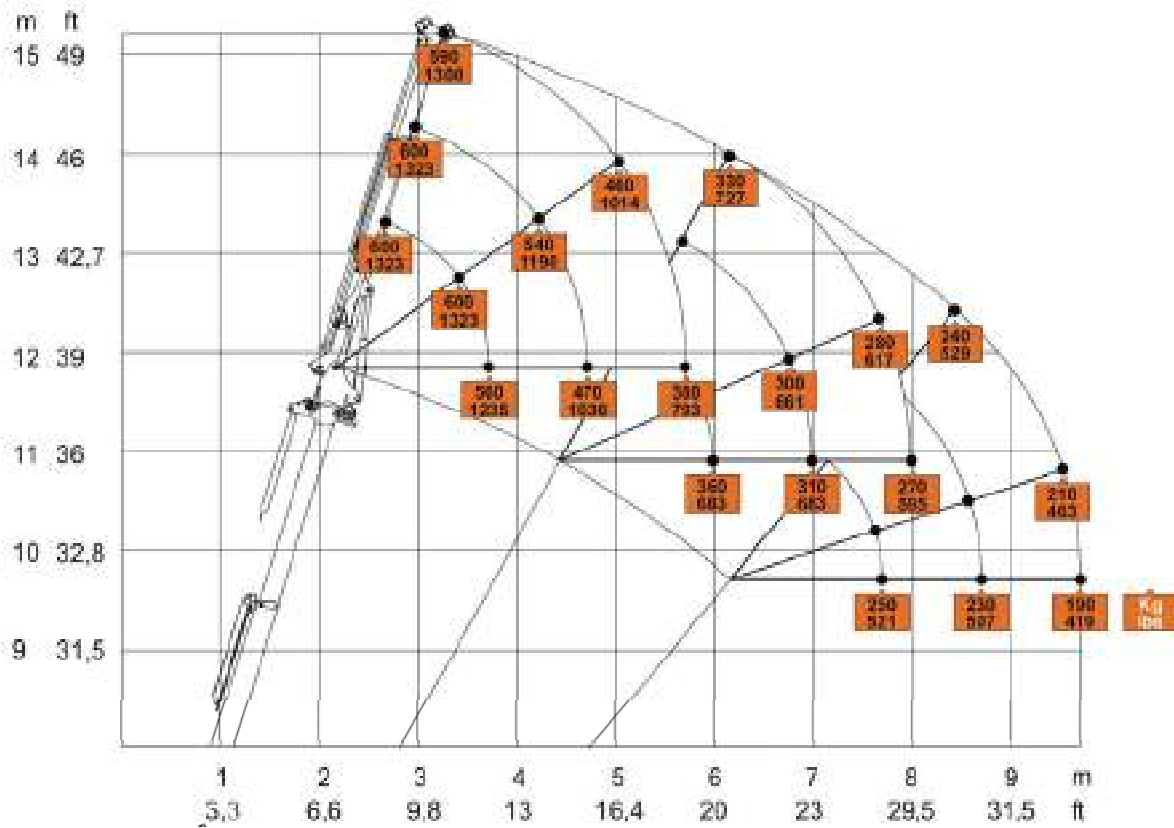


Fig. 3

13.5 HYDRAULIC JIB (JH) SPD500



**The hydraulic jib work only over the horizontal line.
If you are under the orizontal line all the movements will be
locked, you can only do the jib movement boom up.**



		JIB TILTING ANGLE				
		Kg	mm	72°	36°	0°
		lbs	ft			
MAIN BOOM TILTING ANGLE	72°	1900 6.2	560 1235	600 1323	600 1323	
		2850 9.3	470 1036	540 1190	600 1323	
		3800 12.5	380 837	460 1014	590 1300	
	60°	1900 6.2	360 793	350 771	400 881	
		2850 9.3	310 683	300 661	370 815	
		3800 12.5	270 595	280 617	330 727	
	54°	1900 6.2	250 551	270 595	360 793	
		2850 9.3	230 507	240 529	270 595	
		3800 12.5	190 419	210 463	240 529	

13.5.1 Installation

- A. Stabilize the machine
- B. Take the rope block and the weights off the rope only leaving the cable with the metal eyelet (thimble)
- C. Disconnect the rest lock on the jib tip and turn the jib slightly towards the boom in order to align the two right coupling holes with the ones on the crane boom extension
- D. Use the boom extension to centre the hole and insert the two right pins (fig. 1)
- E. Remove the pin fixing the jib to the crane, turn the jib and anchor it by means of the two remaining left pins
- F. Slip the rope along the upper pulley of the crane fourth extension and the jib rear and front pulleys (fig. 2)
- G. Put the rope block, 3 weights and limit micro switch back in their place according to the needs
- H. Connect the limit micro switch feeding plugs: 4th extension-jib cable winder, jib cable winder-sensor on jib tip and the and the quick coupling to the proper housings. CAUTION!! CHEK ALWAYS THE JIB MOVEMENTS AND THE COUPLING COLOR CONNECTION BEFORE USE THE JIB.
- I. On the switchboard, set the presence of the hydraulic jib 2-JH (see paragraph 4.6)

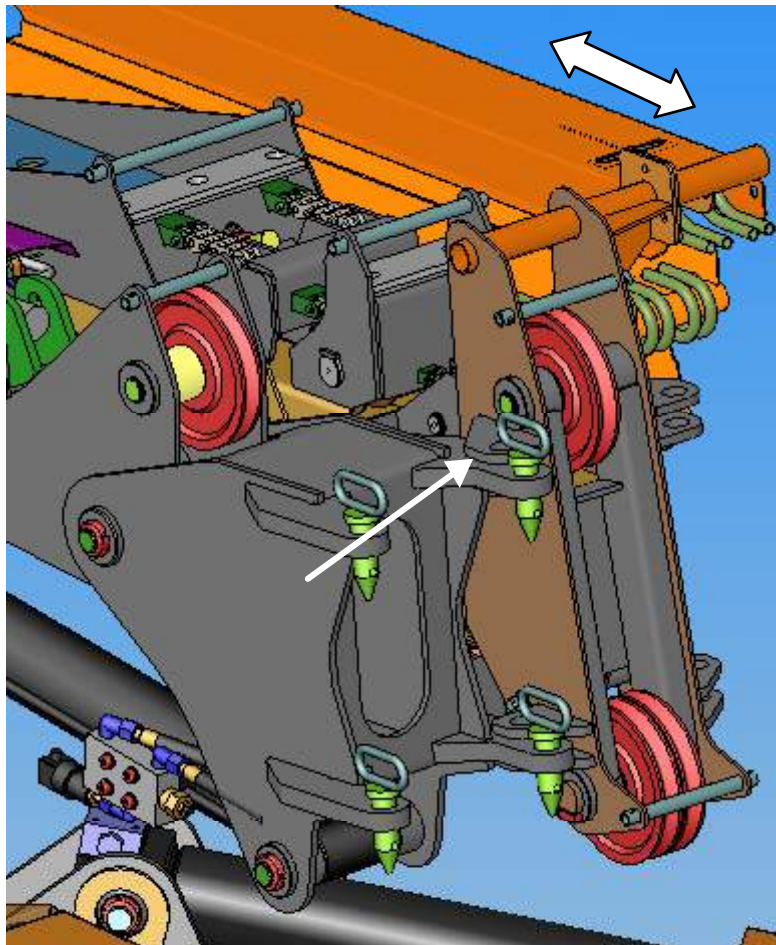


Fig. 1

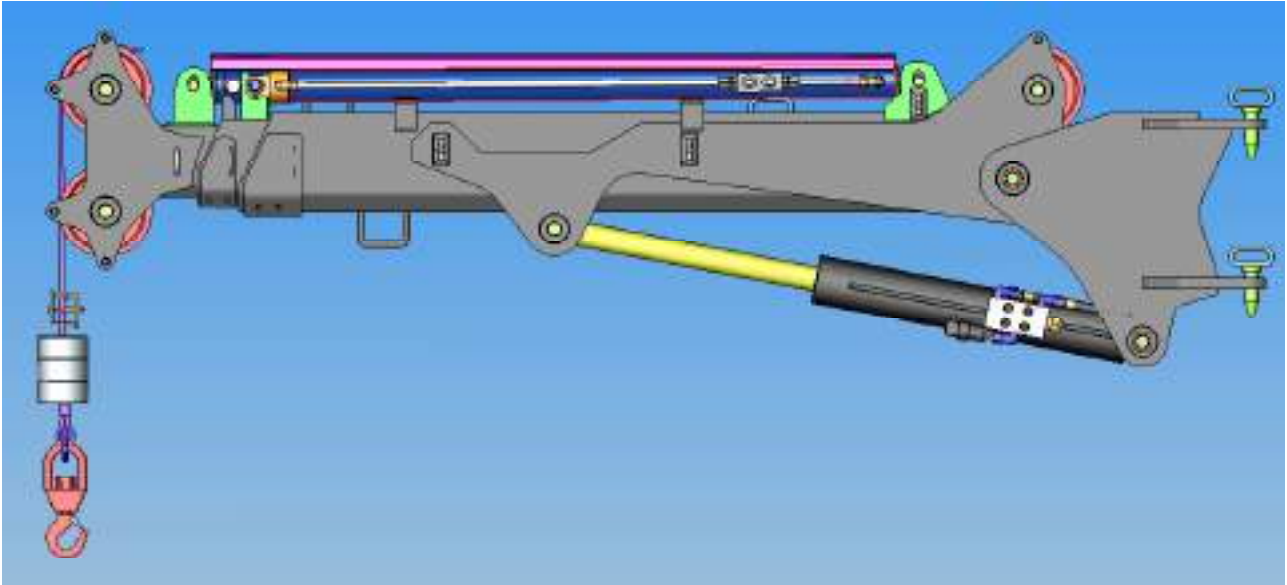


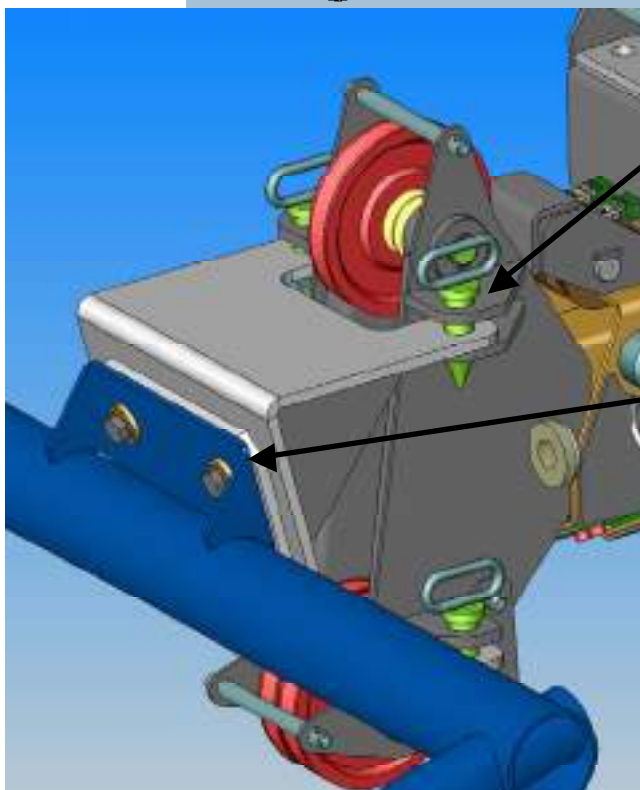
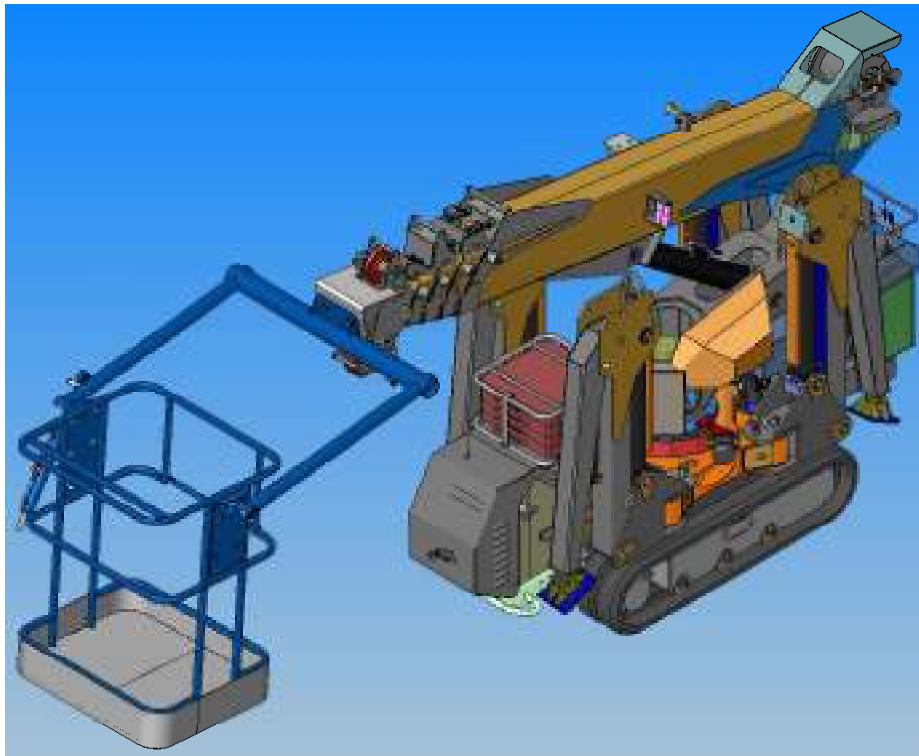
Fig. 2



Fig. 3

13.6 LEVEL BASKET CONNECTION (ONLY SPD360 EXTRA U.E.)

THIS APPLICATION DON'T SATISFY THE EN280 E.U. REQUIREMENT ABOUT PEOPLE LIFTING SO IT CAN BE USED ONLY ON EXTRA E.U. COUNTRY



1. Connect the basket using the 4 bolts to the mechanical support
2. Connect the mechanical support to the machine using the 4 pins (the same of the Jib)