

# SPRING

## MACHINE CONTROL

ON BOARD ELECTRONIC SYSTEMS



SYSTEMS & SENSORS for OEM

## MACHINE CONTROL

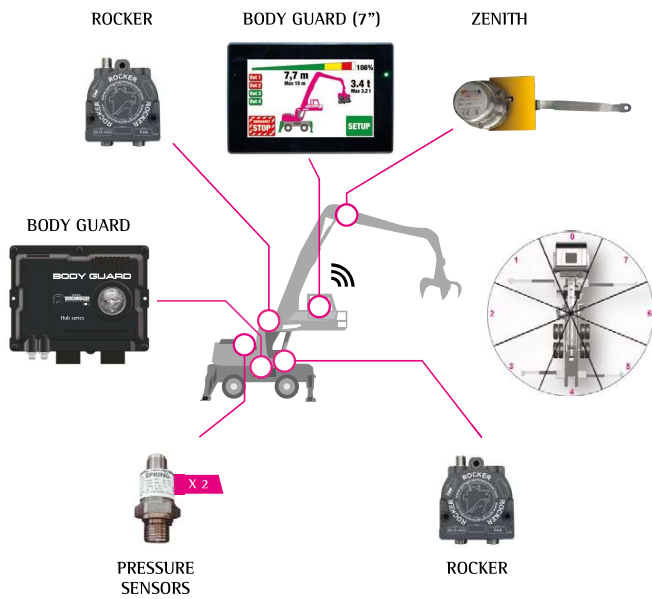
*for passion*

since 1995

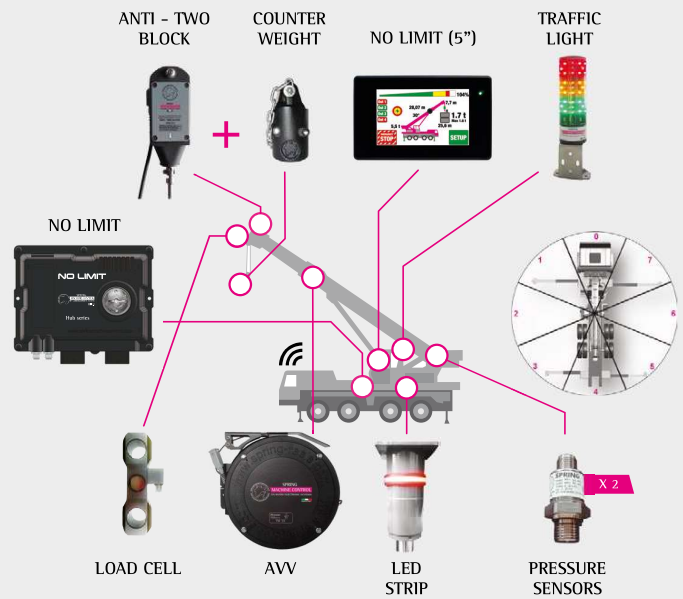


# LMI Load Limiters

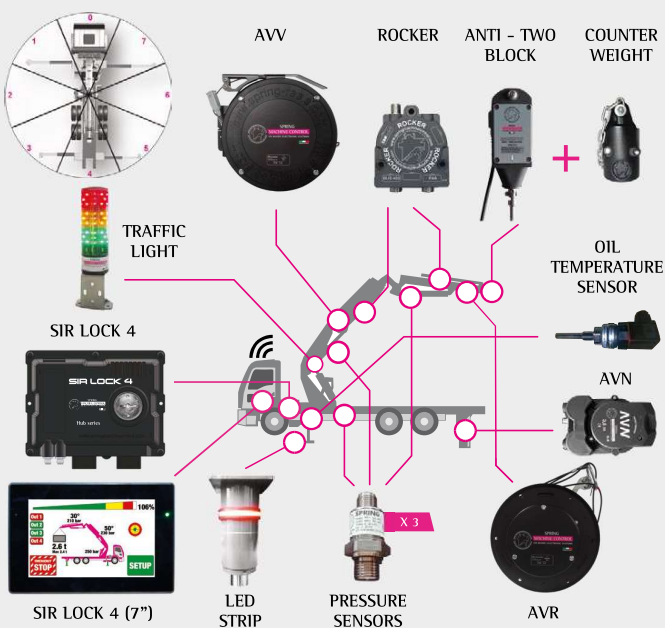
## BODY GUARD



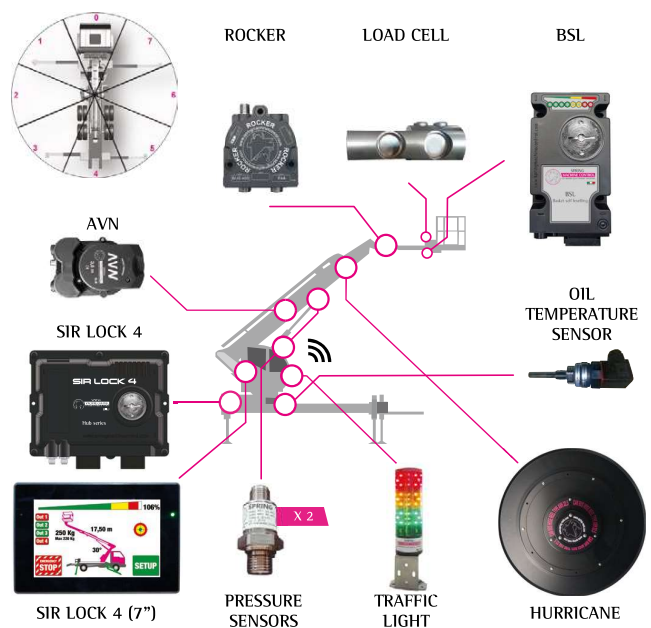
## NO LIMIT



## SIR LOCK 4 KNUCKLE-BOOM CRANES



## SIR LOCK 4 AERIAL PLATFORMS



“

# DAVIDE <sup>vs</sup> GOLIA <sup>PARJ</sup>



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## Special thanks:

Clients– above all those who took the project to heart

R&D Smc

UTEC Smc

Technicians Smc

Suppliers Smc – above all those who overcame the obstacles

Thanks of taking part to the project **DAVIDE <sup>vs</sup> GOLIA <sup>PARJ</sup>**

”

# BODY GUARD

## BODY GUARD: LOAD AND ARM MOVEMENT LIMITER AND DYNAMIC WEIGHING for industrial, railway loaders and excavators

The indicator is the supervisor, it must guarantee that all the goods handling can be carried out without any risk of tilting for the machine, limiting its capacity. This guarantees the safety of the operator and prevents machine, equipment and goods damaging.

The software is a powerful Load Limiter that can also manage the Movement Limiter, the Maintenance Program of the Machine and the weighing option.

The software license of the DYNAMIC WEIGHING, is particularly appreciated by the operators of the field. It is the result of more than 20 years of study in the weighing on board field; it is based on the principle of the oil pressure reading of the lifting cylinder. The results are extremely good both from the precision and reliability point of view.

### BODY GUARD ITS STRENGTH

- Load limiter
- Arm movement limiter
- Dynamic weighing
- Maintenance program
- Engine data management via CAN J1939



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This characteristics is **appreciated not only by the manufacturer but also by the dealer** that is able to set the parameters of the system during the final installation.



Software, hardware and sensors are manufactured with our trade mark.

**SPRING** machine control  
ELECTRONIC SYSTEMS

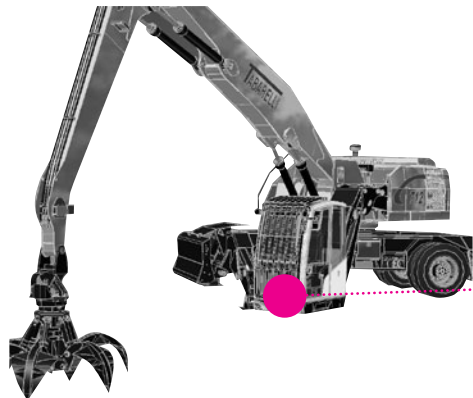
[www.springmachinecontrol.com](http://www.springmachinecontrol.com)



The **weight** of business



# BODY GUARD THE SYSTEM

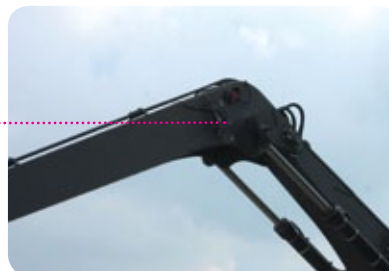
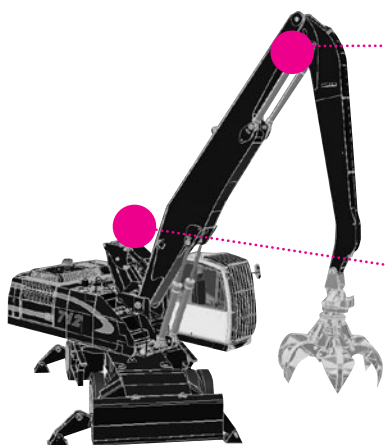


BODY GUARD indicator installed in the console



Engine data management  
via CAN J1939

Inclinometers on BOOM and STICK



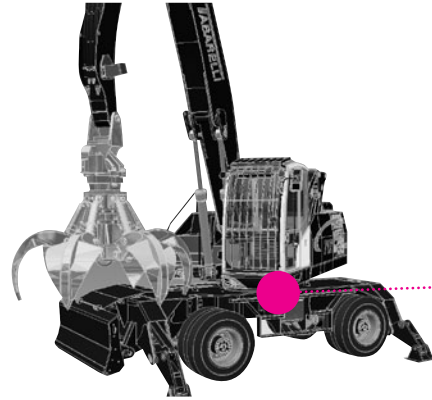
Option ZENITH sensor  
For a better precision of  
the arm movement limiter



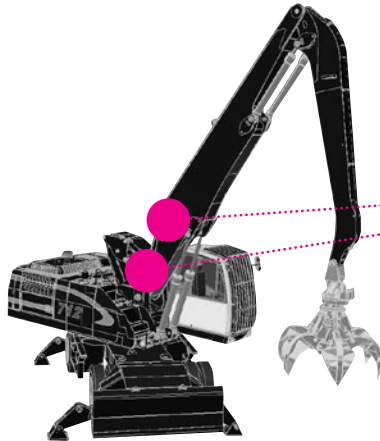
# BODY GUARD

## The system

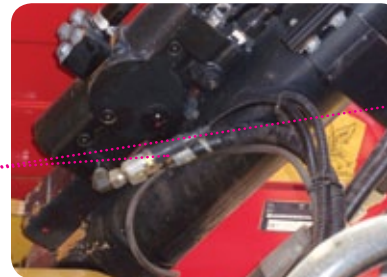
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ROCKER JOKER planar sensor for axes X, Y, Z

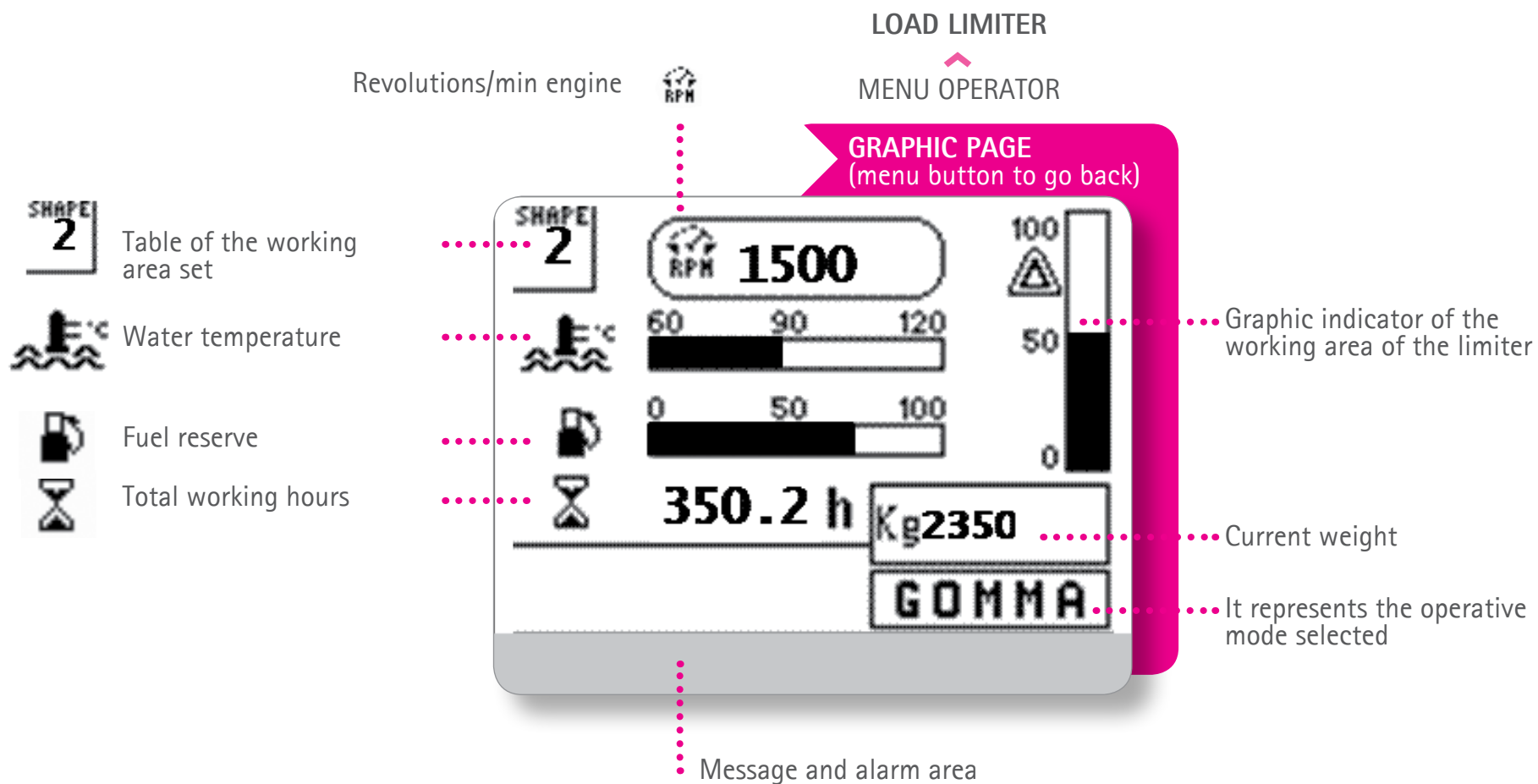


Pressure transducers on BOOM



# BODY GUARD

## Load limiter



# BODY GUARD

## Movement limiter

The horizontal cursor gives information about the position of Stick (PEN)

If the graduated bar limits are overtaken it means that the limit values of the horizontal movements have been overtaken too

The vertical cursor gives information about the BOOM (SOL).

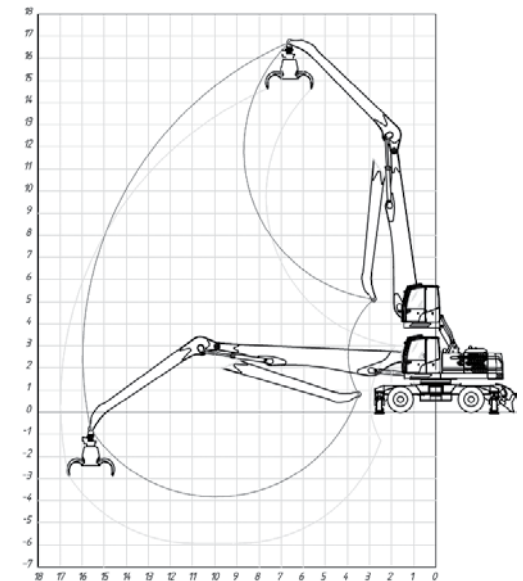
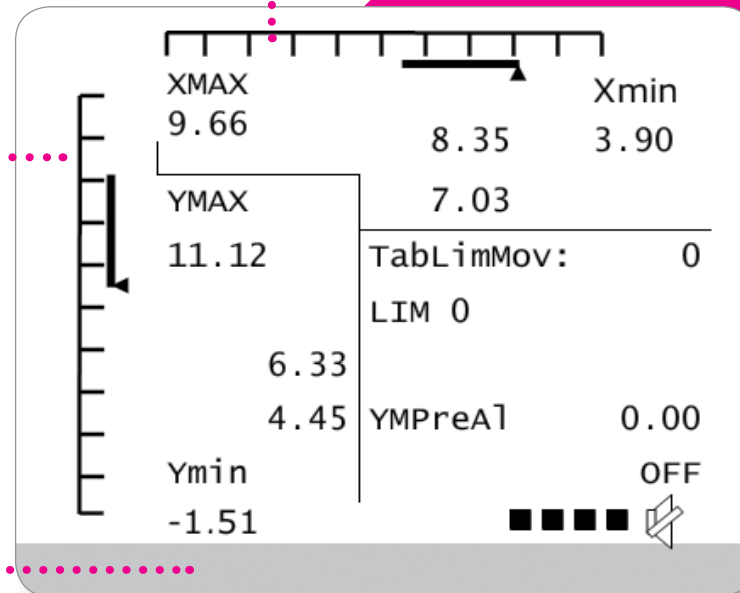
If the graduated bar limits are overtaken it means that the limit values of the vertical movements have been overtaken too.

Message and alarm area

### MOVEMENT LIMITER

MENU OPERATOR

GRAPHIC PAGE  
(menu button to go back)



In this condition it is possible to select a table among the ones memorized or memorize manually the limits making sure that the machine stops before reaching the limit itself (for example the roof).

The use of this Limiter does not exclude the work of the Load Limiter.

It is possible to select the table among the ones memorized (usually max area and Roof) in order to work always in safety conditions.



## BODY GUARD

### Maintenance limits

In the page of the maintenance limits, it is possible to see the hours left before the check-up.

#### HYDROSTATIC CHECK

MANUTENZIONE		ORE MOTORE FUN.
		468
INTERVENTO	STATO	ORE LIMITE
FILTRO OLIO MOTORE	OK	200
OLIO MOTORE	LIMIT	0
FILTRO ARIA MOTORE	OK	250
FILTRO OLIO LAVORO	OK	150
FILTRO OLIO TRAZIONE	OK	300
FILTRO CAMBIO VEL.	OK	250
OLIO CAMBIO VEL.	OK	250

Replace the object when the "STATUS" goes from "OK" to "LIMIT".

The status "LIMIT" (reverse flashing) means that the value of "LIMIT HOURS" of the part that needs the service is "0"

After the service the field "LIMIT HOURS" will be set with the new value of hours.

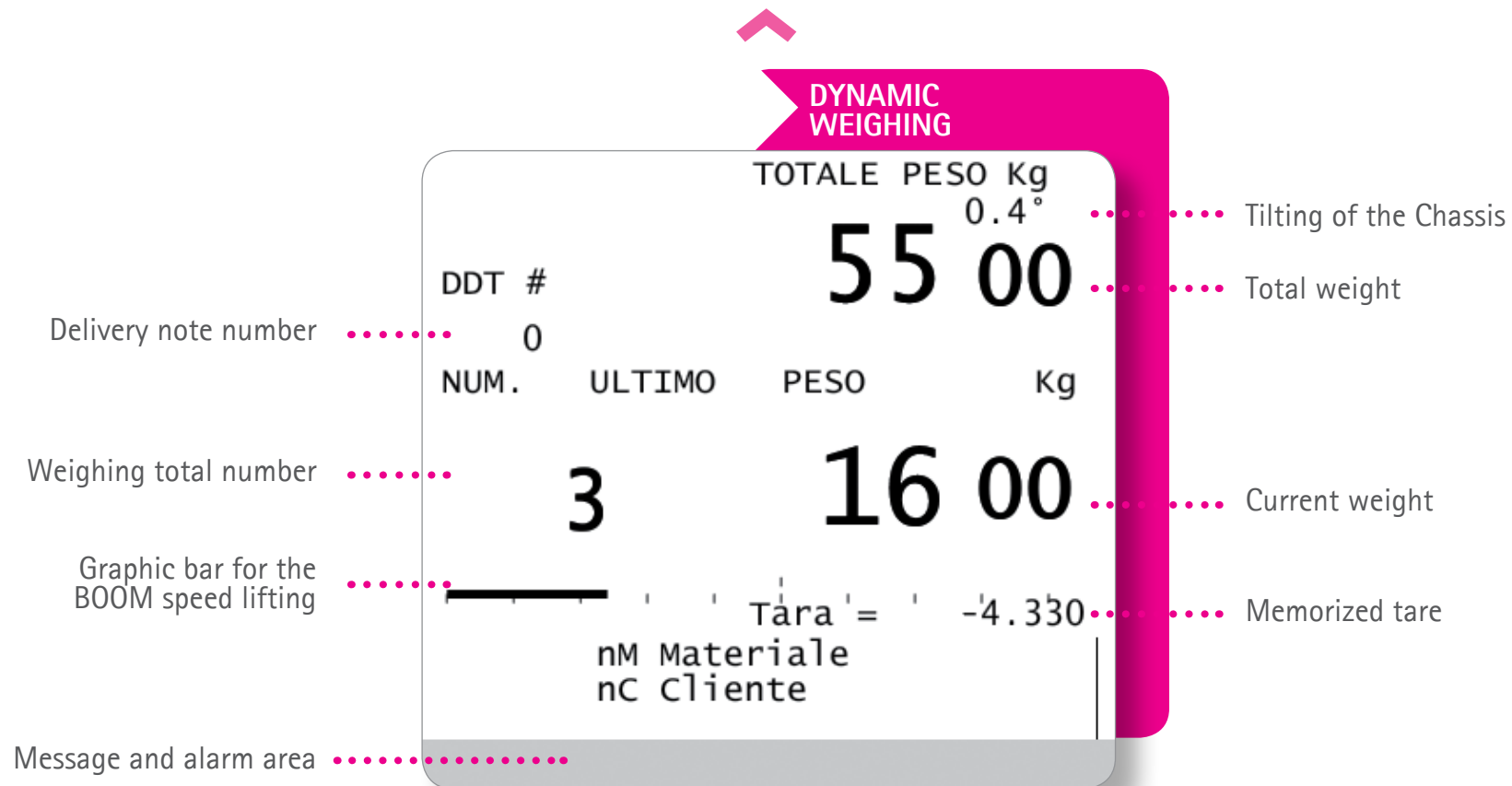
When the maintenance limit is reached the number will be negative; it indicates the hours after the LIMIT and in the column of the status there will be the writing LIMIT.

## BODY GUARD

### Dynamic weighing (optional)

The dynamic weighing is a very required option; BODY GUARD let the operator weigh without stopping the arm of the loader. The system is very precise (about +/- 1% a +/-3% on the total load) and very stout; it does not suffer from the strikes that the machine receives during the working day.

During the dynamic weighing both the Load and Movement Limiters work regularly.



There are 3 ways to start the weighing function: **AUTOMATIC**, **ON BOOKING**, **ON DEMAND**. Each one can be selected from the weighing menu.

With the **AUTOMATIC** weighing the system starts weighing each time the arm of the loader goes through the weighing point like going up.

**WEIGHING ON BOOKING:** the system starts the weighing each time the arm of the

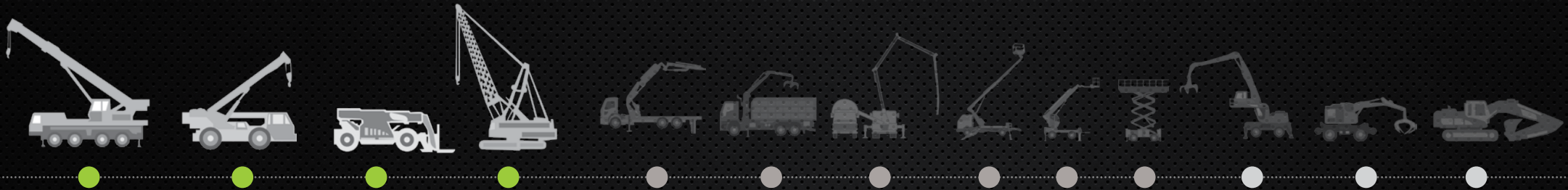
loader goes through (going up) the weighing point but only after the **BOOKING** using the button on the Joystick. Waiting for the booking the system is in "pause".

**WEIGHING ON DEMAND;** the system starts the weighing soon after the operator asks for it pressing the button on the Joystick.  
Do not forget to start weighing only when the arm is going up.

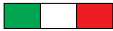




LOAD LIMITER



# NO LIMIT / SUPER SAFETY SYSTEM

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”

# NO LIMIT / SUPER SAFETY SYSTEM

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## LOAD LIMITER FOR TRUCK CRANE WITH HYDRAULIC AND LATTICE ARM

This system is a reliable supervisor; it limits the capacity of the truck crane to guarantee that the handling of the material can be carried out without running the risk of the tilting of the machine avoiding serious even fatal accidents and expensive damage to the equipment.

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This software is a powerful Load Limiter, an arm angle limiter, maintenance program; it is also available the system with the only weighing option with Load Cell.  
The software license about the WEIGHING is really very interesting for the operators.

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The system are made in the conformity with the requirement of the Machine Directive 2006/42/CE and the Reference Standard 13849-1 cat. C/D

### NO LIMIT / SUPER SAFETY SYSTEM ITS STRENGTH

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- Load limiter
- Limiter angle arm
- Maintenance program
- Management of the machine data via CAN J1939
- Weighing
- Auto test

“

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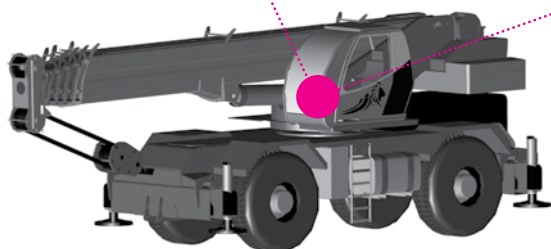
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NO LIMIT / SUPER SAFETY SYSTEM

# NO LIMIT Indicator and SUPER SAFETY SYSTEM

NO LIMIT



SUPER SAFETY SYSTEM

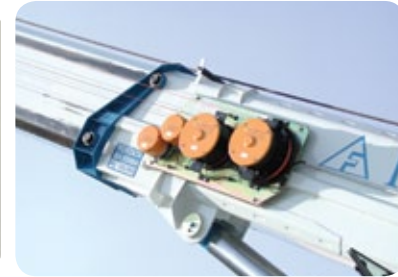
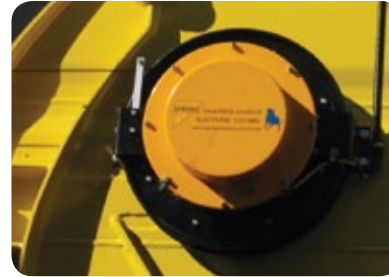


# NO LIMIT / SUPER SAFETY SYSTEM

## The system

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Cable reel angle and extension, available with single and multiple cable reel.



Reading of the load by pressure transducers or load cells

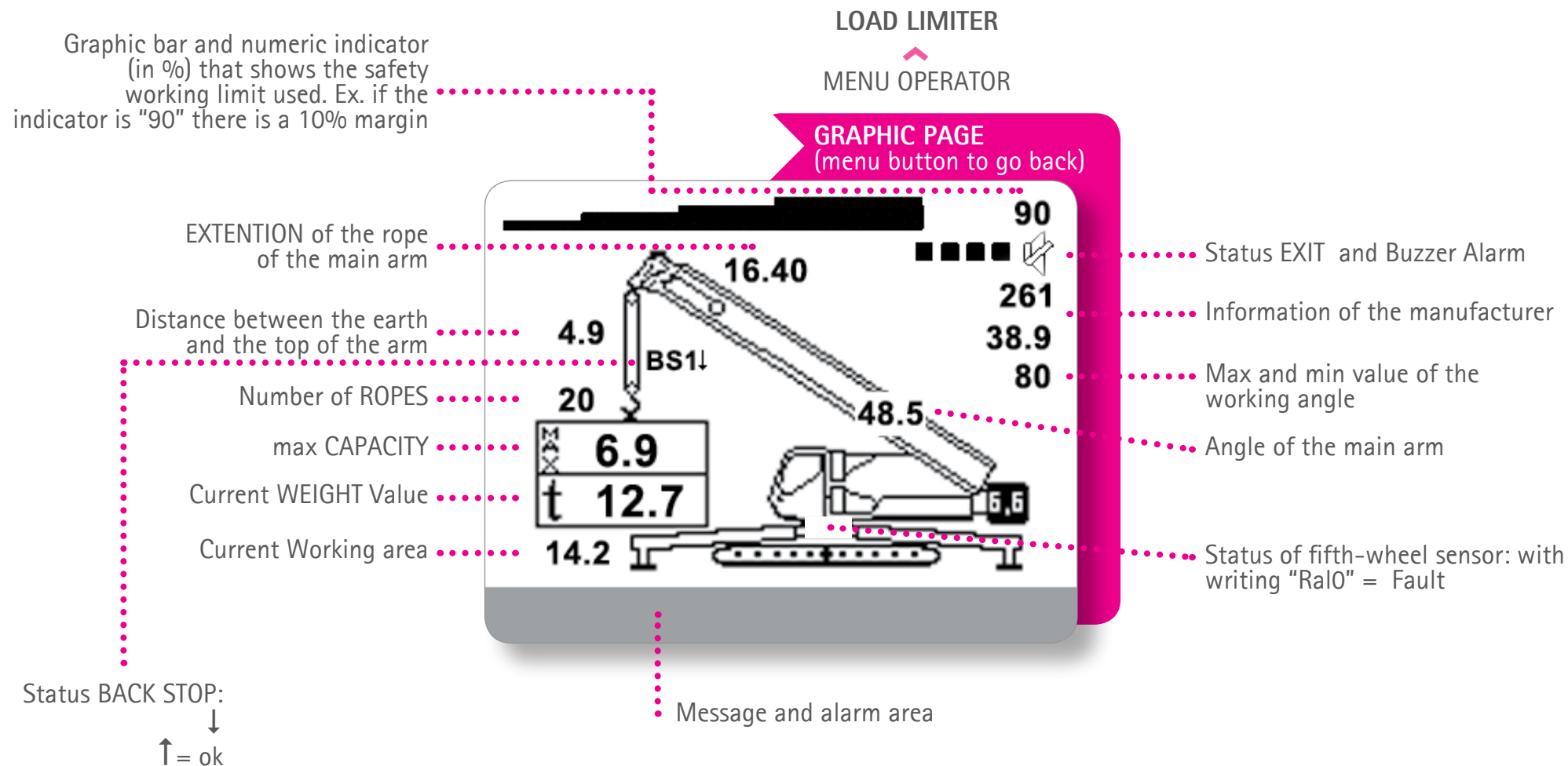


A2B





# NO LIMIT / SUPER SAFETY SYSTEM Load limiter



## NO LIMIT / SUPER SAFETY SYSTEM

### Maintenance limits

---

The MAINTENANCE page gives information about the regular maintenance according to the limit value set and the proper status of each control;



#### MAINTENANCE LIMITS

MANUTENZIONE		ORE MOTORE FUN. 468
INTERVENTO	STATO	ORE LIMITE
FILTRO OLIO MOTORE	OK	200
OLIO MOTORE	LIMIT	0
FILTRO ARIA MOTORE	OK	250
FILTRO OLIO LAVORO	OK	150
FILTRO OLIO TRAZIONE	OK	300
FILTRO CAMBIO VEL.	OK	250
OLIO CAMBIO VEL.	OK	250

Replace the object when the "STATUS" goes from "OK" to "LIMIT".

When the status is "LIMIT" (it blinks in reverse) and it means that the "ORE LIMITE"(Hour limit) value of the object that needs to be replaced is the same or bigger than the



In this condition it is possible to select one of the tables memorized or it is possible to memorize manually the limits making sure that the machine gets locked before reaching the max height (for ex. the roof ).

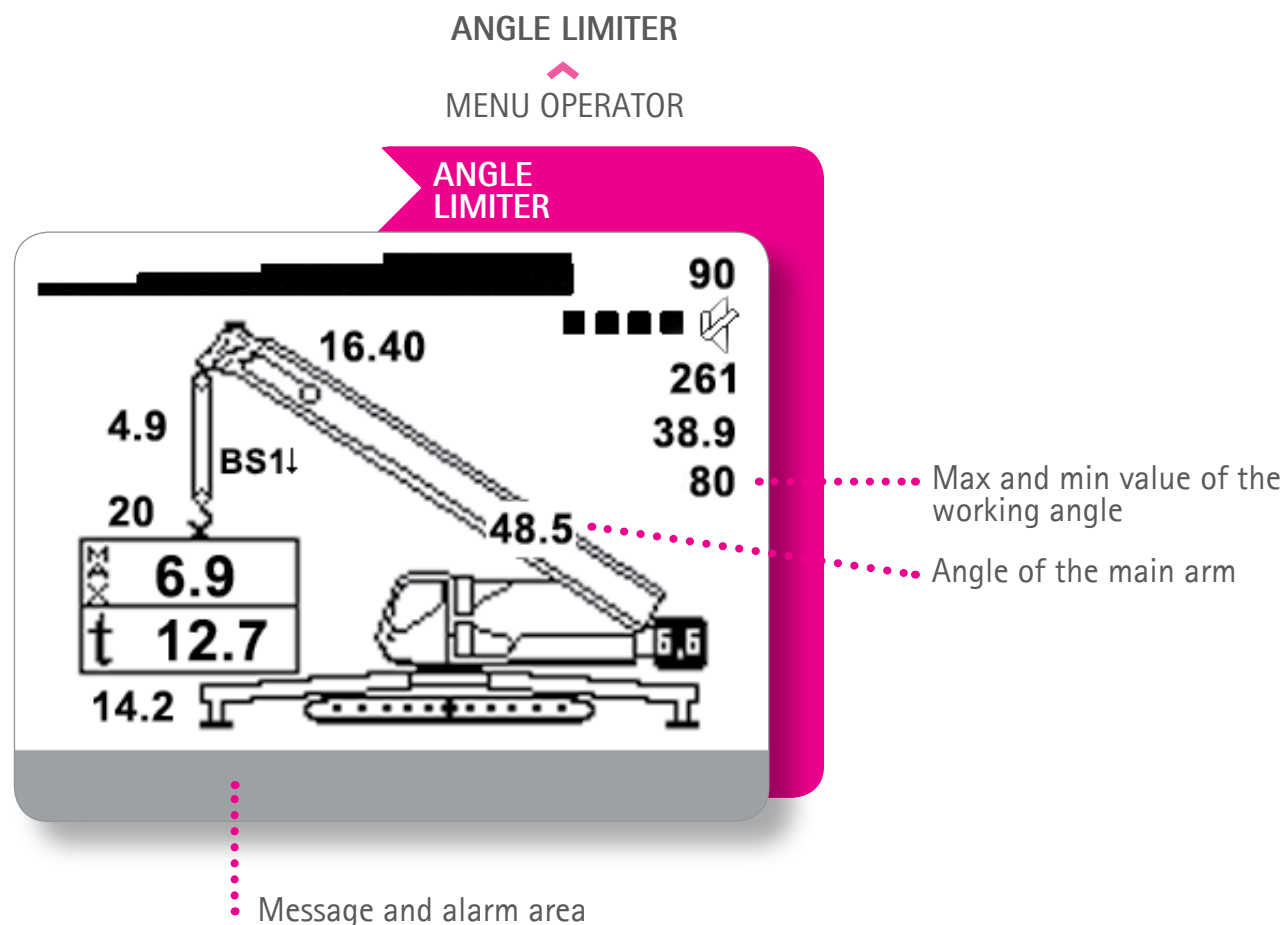
The use of this Limiter does not exclude the Load Limiter.

In the page dedicated to the limits of maintenance it is written the number of hours that remain before the required check up. After reaching the maintenance limit the system will show a negative number that represents the hours after the limit established and in the STATUS column will appear the writing LIMIT.

# NO LIMIT / SUPER SAFETY SYSTEM Angle limiter

## ANGLE LIMITER

If set by the manufacturer, it is possible to input the min and max angle; outside these limit the machine working is limited. Take the main arm to the desired position (the values will be taken automatically) and start the proper function.



# NO LIMIT / SUPER SAFETY SYSTEM





## Engine check

The "CONTROLLI MOTORE DIESEL" (DIESEL ENGINE CHECK) page gives information about the engine of the machine.

### ENGINE CHECK

MENU OPERATOR

### ENGINE CHECK

CONTROLLI MOTORE DIESEL		
	<b>10</b> bar	<b>FAULT</b>
	<b>120</b> °	<b>FAULT</b>
	<b>OFF</b>	<b>OK</b>
	<b>24.6</b> V	<b>OK</b>

Oil pressure check (bar)

Head temperature check (degrees)

Intake Air filter check (ON/OFF)

Battery charger alternator check (V)

Check status:

- OK => normal working;
- FAULT => faulty working;

in this condition the symbol "FAULT" blink in reverse:



### OPTION:

#### OIL PRESSURE

This control gives information about the oil pressure status: if the value is within the limits the status flag is "OK" if not, the status flag is "FAULT" and blinks;

#### HEAD TEMPERATURE

This control gives information about the head temperature: if the value is within the limits the status flag is "OK" if not, the status flag is "FAULT" and blinks;

#### INTAKE AIR FILTER

This control gives information about the air filter status: if the value is within the limits the status flag is "OK" if not, the status flag is "FAULT" and blinks;

#### BATTERY CHARGER ALTERNATOR

This control gives information about the battery charger status: if the value is within the limits the status flag is "OK" if not, the status flag is "FAULT" and blinks;



# NO LIMIT / SUPER SAFETY SYSTEM Hydrostatic check

The "CONTROLLI IDROSTATICHE" page gives information about hydrostatic aspects of the machine.

## HYDROSTATIC CHECK

MENU OPERATOR

HYDROSTATIC  
CHECK











Pump pressure check

Pump pressure check

Pump pressure check

Oil temperature check

Oil temperature check

CONTROLLI IDROSTATICHE		
		<b>0.0</b> bar
		<b>0.0</b> bar
		<b>0.0</b> bar
		<b>0.0</b> °C
		<b>0.0</b> °C

NO LIMIT / SUPER SAFETY SYSTEM  
WEIGHING (OPTION LICENSE ONLY FOR THE WEIGHING)

TOTAL PESO Kg

0.4°

55 00

DDT #

0

NUM. ULTIMO PESO Kg

3 16 00

Graphic bar for the BOOM speed lifting

Tara = -4.330

nM Materiale

nc Cliente

PESATURA DINAMICA

Tilting of the Chassis

Total weight

Current weight

Memorized tare

Delivery note number

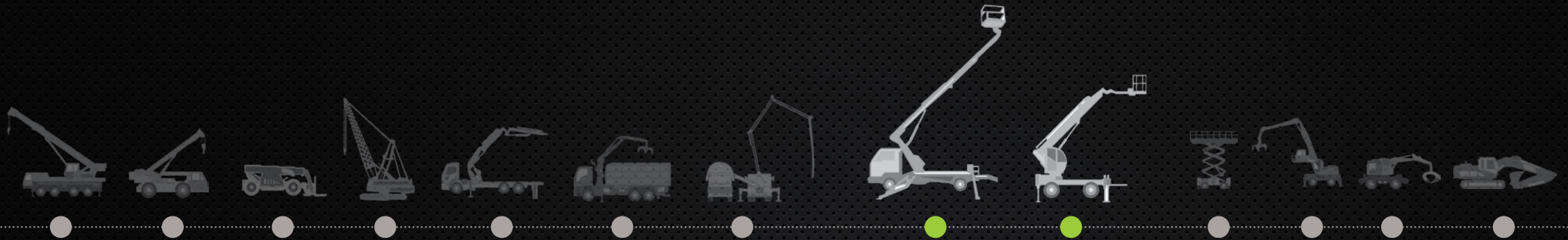
Weighing total number

Message and alarm area






BASKET SELF LEVELLING



# BASKET SELF LEVELLING

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”



# BASKET SELF LEVELLING

---

## BASKET SELF LEVELLING

---

The BSL module must keep the basket of an aerial platform in a perfect horizontal plane, it does not matter which are the positions of the arms that support the basket or of the chassis of the truck.

The module, working on a proportional valve or on a ON/OFF valve, works automatically to keep the plane horizontal

### APPLICATION FIELD

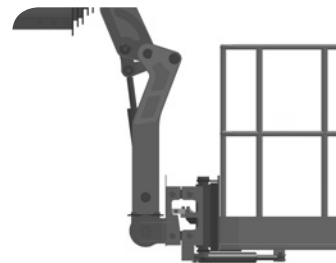
Aerial platform

## BASKET SELF LEVELLING ITS STRENGTH

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IP protection 68

Data upload thanks to a USB/PC



Software, hardware and sensors are manufactured with our trade mark.





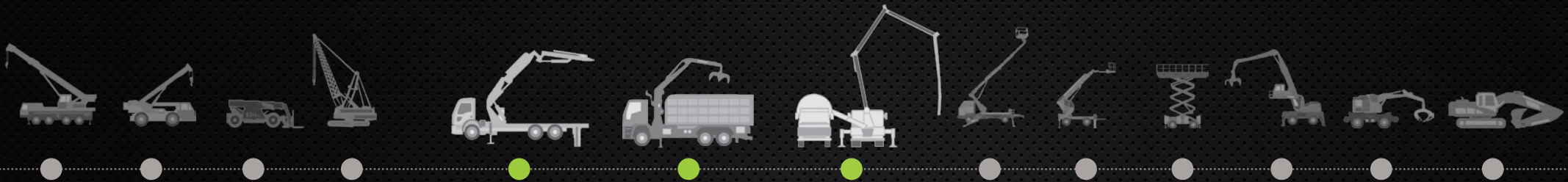
# BSL

## General Technical Specification

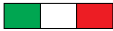
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- > Power Supply: 10 .. 30 Vdc
- > Solid State Tilt sensor, with Accelerometric MEMS Technology
- > 2 Solid State Power Output, for direct driving of double solenoid electro valve
  - Closed loop current control
  - Automatic offset drift correction
  - Max output current: 3 A for each channel
  - Safety relay for cut outputs, with redundant tilt sensor
  - Calibration parameter for:
    1. Dither frequency
    2. Min and Max output current
    3. Filtering
    4. PID control: Gain, Peak Rise and Fall slope answer, Increment and Decrement ramps
    5. Minimum Threshold for start regulation intervent
- > 2 ON/OFF input for output enable
- > RS485 interface, with Master and Slave capability
  1. Communication with Slave modules
  2. Reception commands from external Master (Enable/Disable outputs, Read/Write parameters)
- > RS232 connection for Setup, Load and Save calibration parameters
- > Optional external Tilt Sensor, connectable with RS485 serial bus
- > Range of use Counters, useful for giving an index of wear of the mechanical drive
- > 32 bit @80 MHZ RISC uController
  - 256 KByte Flash Memory
  - 16 KByte RAM
- > Non volatile memory:
  - 32 KByte FRAM
  - 32 KByte EEPROM
  - 8 byte for serial number string identify, write protected
- > Software loading throug RS232 or RS485, by Boot Loader
- > Diagnostic LED:
  - PWM output operation: show output current by low frequency blinks
  - Minimum Tilt threshold
  - Maximum Tilt threshold
  - Output alarm: overload, output disconnected

LOAD LIMITER



SIR LOCK

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# SIR LOCK

---

## SIR LOCK Moment limiter for knuckle boom

SIR LOCK system is the supervisor, it must guarantee that all the goods handling can be carried out without any risk for the machine, limiting its capacity. This guarantees the safety of the operator and prevents machine, equipment and goods damaging.

---

The software of the system is a powerful Moment Limiter with the management of the stabilization of the machine, the Safety on the Road, the maintenance program and the Black Box Events.

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SIR LOCK systems are prepared according to the technical features of the manufacturer. SIR LOCK is made in the conformity with the requirement of EN12999/A3:2011 about the crane for trucks.

### SIR LOCK ITS STRENGTH

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- Modular system
- Data upload thanks to a USB key
- Easy to install, only one cable connects the main parts of the system
- Modules – sensors – board IP66
- Safety on the road integrated

“

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# SIR LOCK THE INDICATOR

The layout of the indicator is simple and easy

## RESET button:

Pressed and released starts the booking of the temporary unlock called 5-30 i.e.:

- 5 seconds to make the movement not in safety conditions
- 30 seconds to wait until it is possible to repeat the movement

## INSIDE BUZZER:

in order to enable/disable it, keep the RESET button pressed for some seconds

## AB\_MODE button:

Keeping it pressed for some seconds it enables the control buttons

## MAN/RADIO key selector:

- MAN position => local operation
- RADIO position => radio control operation

EMERGENCY-STOP button to stop immediately and manually the movements independently of the control previously given to the system. The condition does not change until you unlock the button. The writing EMER2 indicates the emergency.



## LED BAR:

in operation mode it indicates the percentage(%) of the safety that remain

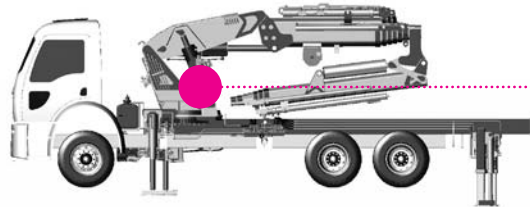
- GREEN LED area: ●●●●●●●●●●  
Safety area
- YELLOW LED: ●●●●  
Limit of the safety area
- RED LED: ●●  
NO safety area

## BUTTONS and DISPLAY

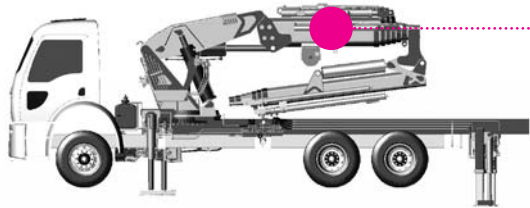


# SIR LOCK

## The system

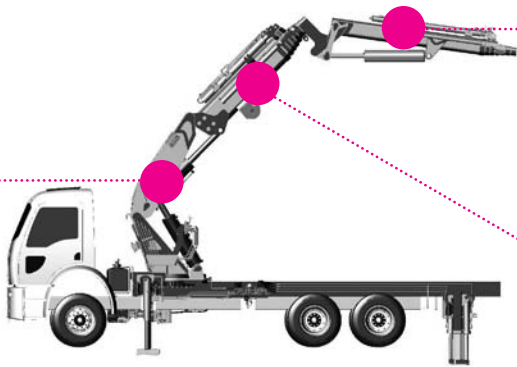


SIR LOCK indicator



Cable reel with angular sensor and A2B management  
Management Over Drum  
Management End Rope

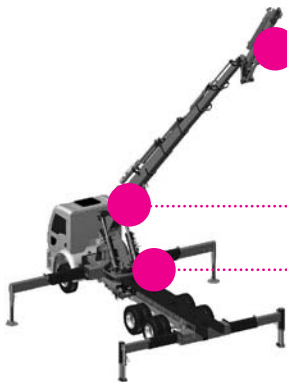
Angular sensor  
ARM1



Angular sensor  
ARM3



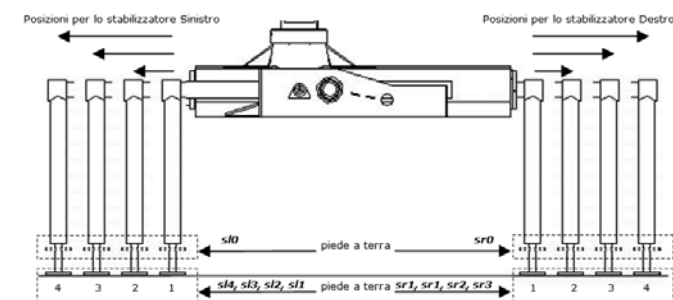
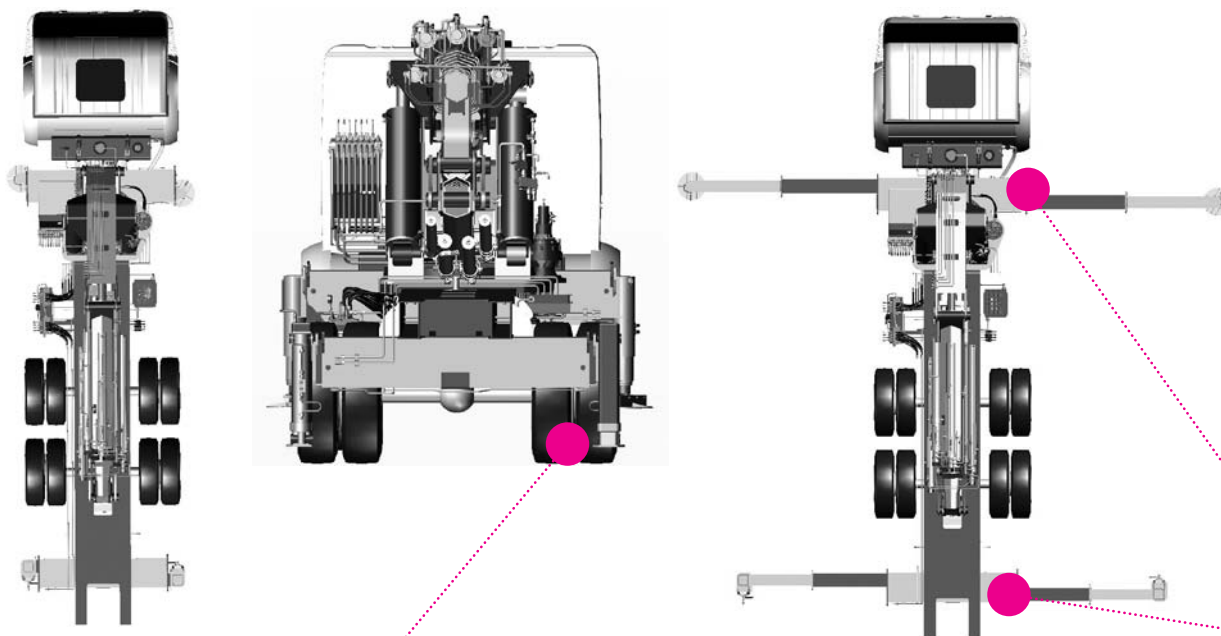
Angular sensor  
ARM2



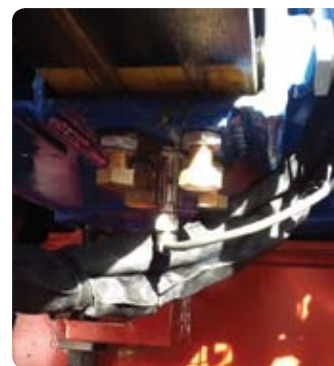
Pressure transducer ARM1, ARM2, ARM3

# SIR LOCK

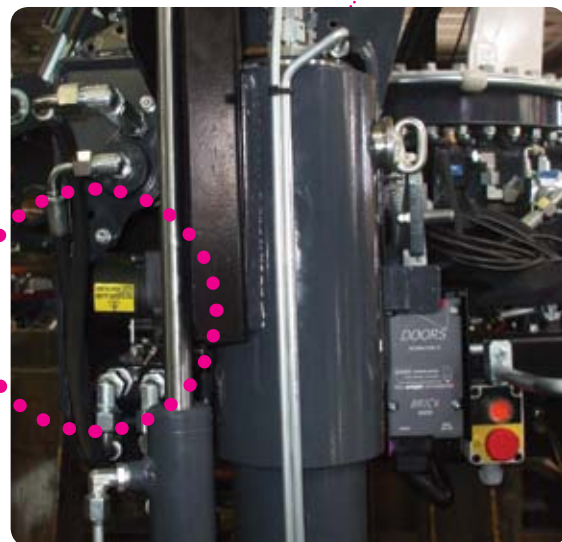
Management of the machine STABILIZATION: rotation – stabilizer out – feet on the ground



MANAGEMENT OF THE STABILIZER POSITION BY PROXIMITIES SENSORS



MANAGEMENT OF THE STABILIZER POSITION BY CABLE REEL SENSORS

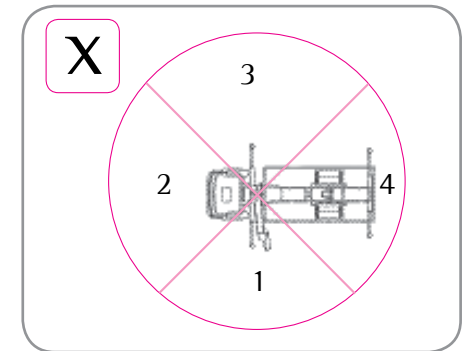
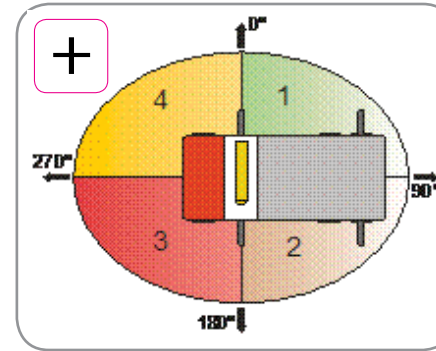
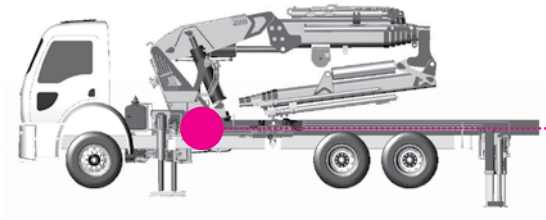


# SIR LOCK

## Management of the WORKING AREAS: 4 areas $+$ or $\times$

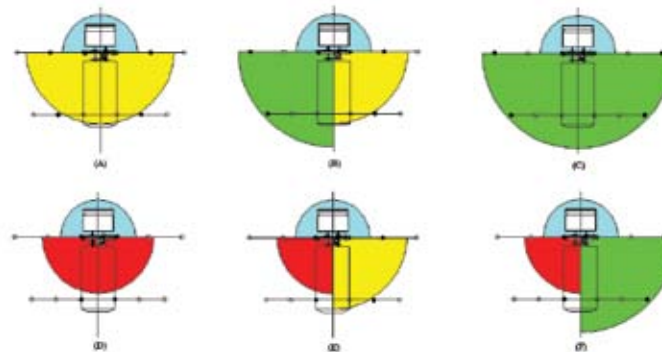
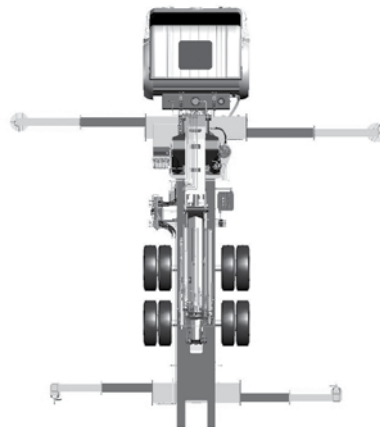
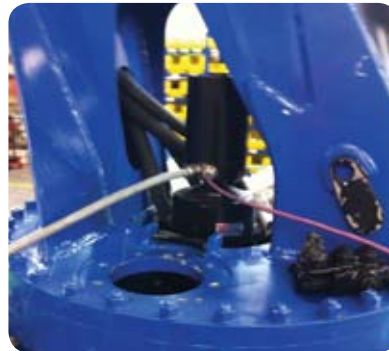
### PROXIMITIES SENSORS

Reading of the proximities sensors.



### ENCODER

Reading of the ENCODER in the rotary distributors.



### WORKING AREAS:

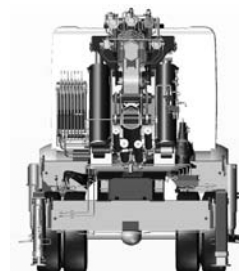
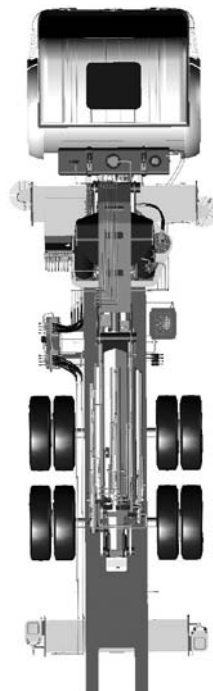
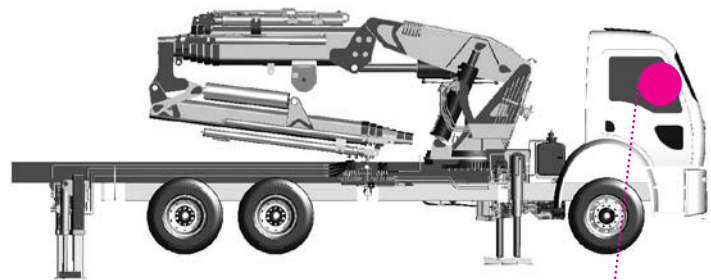
RED  
YELLOW  
GREEN

Reducing of the capacity according to the working area and the stabilizers out/in and feet on the ground.



# SIR LOCK

Management of the safety on the road: main arm in rest position – stabilizers in – feet up



Audio-visible signal installed in the console of the truck



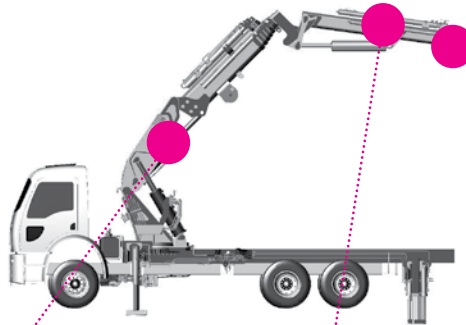
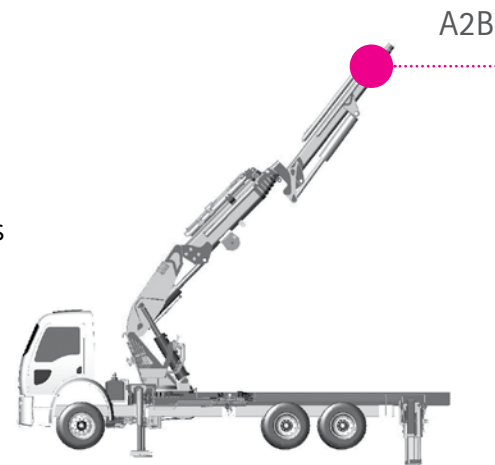
Green Led OK



Red Led with audio signal

# SIR LOCK Options

- LED lights ON
- Oil filter obstructed
- Reading of the weight on the hook
- Reading of pressure of the oil general delivery
- Reading of the temperature of the oil general delivery
- management of winch limit stop (A2B)
- management of the rotation according to the reading of the encoder which is inside the hydraulic coupling
- Reading of the stabilizer in 4 different positions both by the analogic sensor (Micro reel) and by digital sensors (Proximity/microswitch)
- Reading on the 3 axels of the carriage position
- PLE management



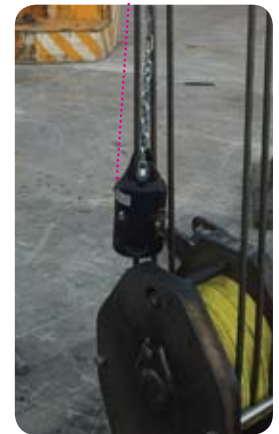
Led lights  
"ASK FOR THE OFFER" ←



Cable reel AVR 2 electrical contacts  
"ASK FOR THE OFFER" ←



Reading of the weight  
directly on the display





# SIR LOCK

## Technical and commercial features

SIR LOCK is a moment limiter and can manage the stabilizers of the crane; it has a new technology and it is a modular kit that can manage several configurations of the machine according to kind of equipment sold.

SIR LOCK can manage both the SINGLE and DOUBLE KNUCKLE BOOM.

### Management of the moment limiter:

Pressure transducer ARM1  
Angular sensor 360° on ARM1  
Pressure transducer ARM2  
Angular sensor 360° on ARM2  
Pressure transducer ARM3  
Angular sensor 360° on ARM3

### Management of the stabilization of the machine:

Proximity sensors for the management of the rotation L and R  
Management of the stabilizers with feet on the ground  
For the management of the stabilizer extension in 4 areas  
(option back stabilizers)

### Management of the hydraulic lever for the movements:

Management rotation R and L  
ARM1 UP and DW  
ARM1 IN and OUT  
ARM2 UP and DW  
ARM2 IN and OUT  
ARM3 UP and DW  
ARM3 IN and OUT  
WINCH2 UP e DW (NEW)  
WINCH3 UP e DW (NEW)

Management H2-B3

Management PLE

Management oil filter obstructed (NEW)

Management limit stop winch (NEW)

Management END ROPE (NEW)

RESET 5/30 by pass of the moment limiter

Management radio control

RADIO ENABLE, RADIO OK and RESET RADIO

Management output TRAFFIC LIGHTS

Management output DAMP VALVE

Management and supply of the sensor for axles X-Y-Z for the control of the chassis with programmable operating limit

Management and supply of the emergency button with RESET function and visualization of 90% and 100% of the max load.

Electric wiring

Visualization of the weight (NEW)

Management of SAFETY ON THE ROAD (NEW)

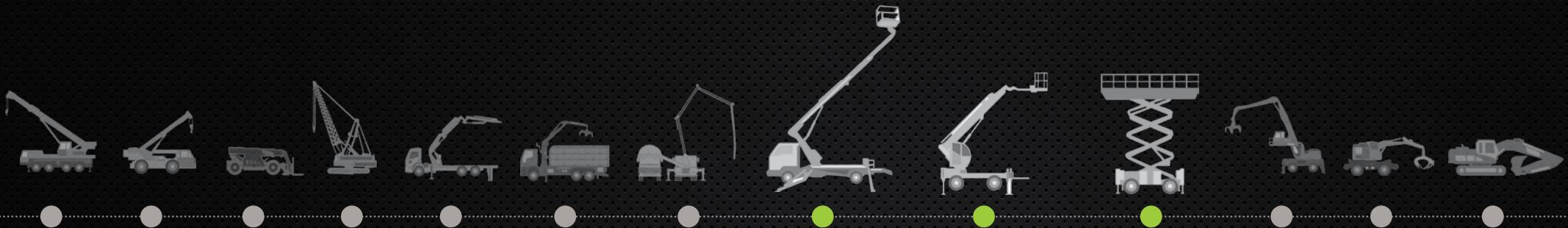




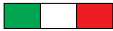




LOAD LIMITER



O'LAPA

**SPRING** *machine control*  
ELECTRONIC SYSTEMS  
[www.springmachinecontrol.com](http://www.springmachinecontrol.com)   
The **weight** of business

since 1995



“

# DAVIDE <sup>vs</sup> GOLIA <sup>PARJ</sup>



This family of products is the result of the work of a team that has been carrying out for more than 20 years.

We have been designing – manufacturing – selling – installing electronic systems for industrial vehicles for more than 20 years.

In a field where the manufacturers usually relay on the usual partners we have started a project called **DAVIDE <sup>vs</sup> GOLIA <sup>PARJ</sup>**

At SPRING machine control we are proud to be able to concentrate on an important goal even in such a difficult period of crisis.

**We are proud of our results, because we obtained them thanks to our own strength, ideas, capability, passion and above all thanks the faith that our clients put in our company.**

Our goal is not only to satisfy a technical request but also to offer a wide range of high performance products that can give profit from the management point of view.

**Your profit is an important part of our project.**

Please read carefully to better understand our **DAVIDE <sup>vs</sup> GOLIA <sup>PARJ</sup>**

## Special thanks:

Clients– above all those who took the project to heart

R&D Smc

UTEC Smc

Technicians Smc

Suppliers Smc – above all those who overcame the obstacles

Thanks of taking part to the project **DAVIDE <sup>vs</sup> GOLIA <sup>PARJ</sup>**

”

# O'LAPA

---

## O'LAPA Limiter aerial platform area

### O'LAPA ITS STRENGTH

---

- The philosophy of this system is the same we used for all our products, i.e. the possibility to satisfy all the technical features using modular systems without forgetting that it must be easy to use and to install.
- With a 20-year know-how in the design of industrial electronic systems, Spring machine control is the ideal partner that is able to offer complete systems and above all that is able to develop its own projects according to the market requirements

### O'LAPA PHILOSOPHY

---

- O'LAPA was born as area limiter for aerial platform
- It is a versatile system that means that it is able to satisfy the different requirements

“

SPRING machine control was the first company to introduce systems with the opportunity to **upload the software upgrade using a simple USB key.**

**This idea has changed the working habit;** during the test and the service, the technicians are no more obliged to have a PC

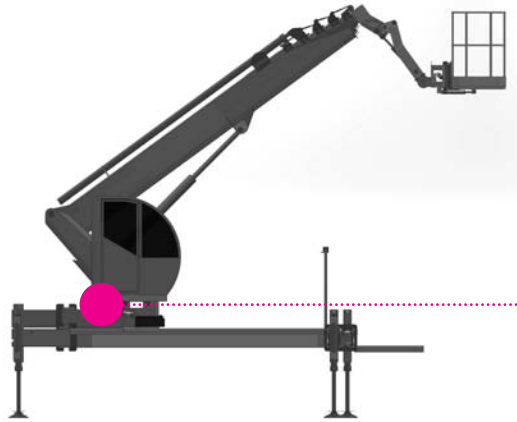
This characteristics is **appreciated not only by the manufacturer but also by the dealer** that is able to set the parameters of the system during the final installation.

”

Software, hardware and sensors are manufactured with our trade mark.



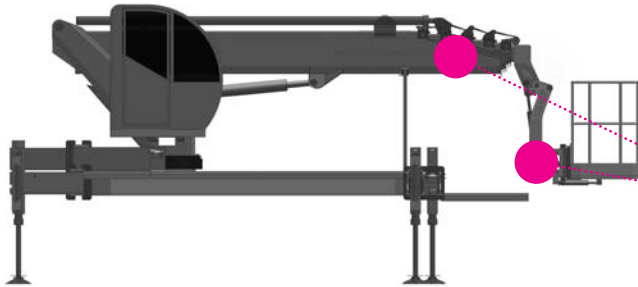
## O'LAPA SYSTEM



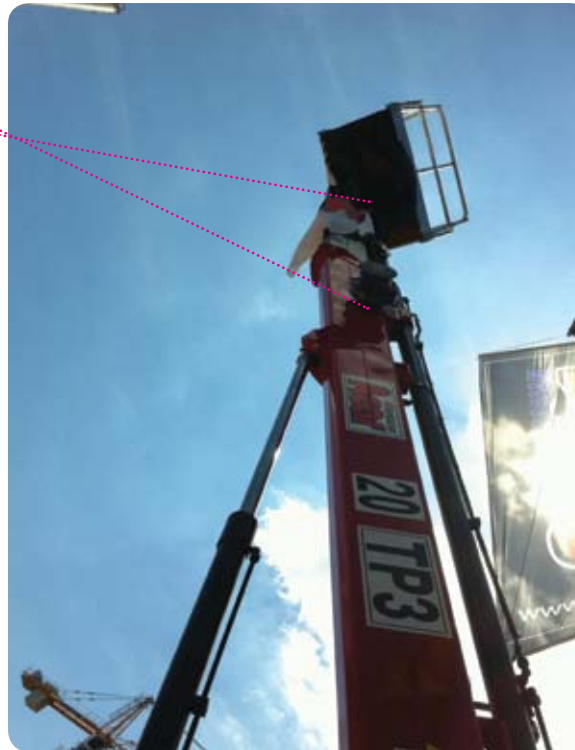
O'LAPA

Redounded reading of angle and extension of the ARM 1 and ARM2 (Fly JIB)

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O'LAPA can manage both ARM1 and ARM2 (Fly JIB)



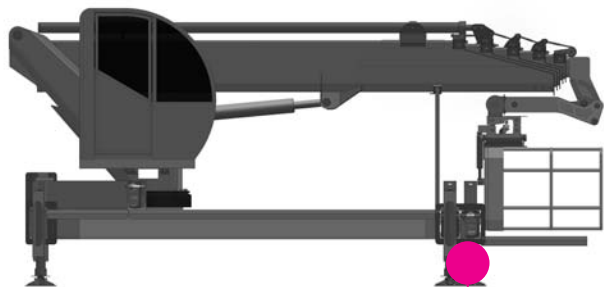
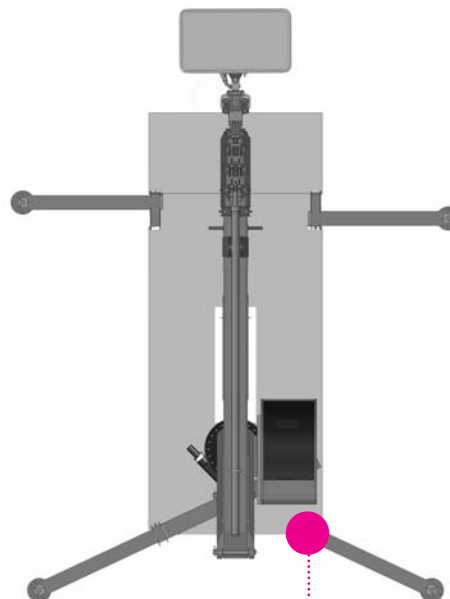
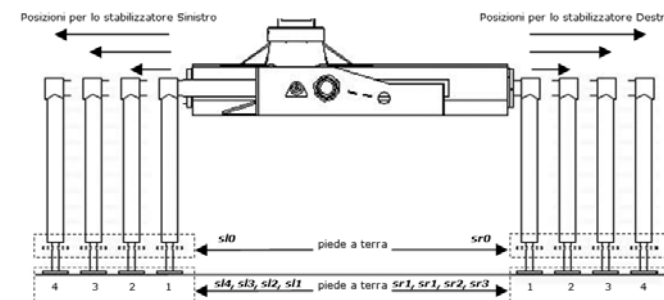
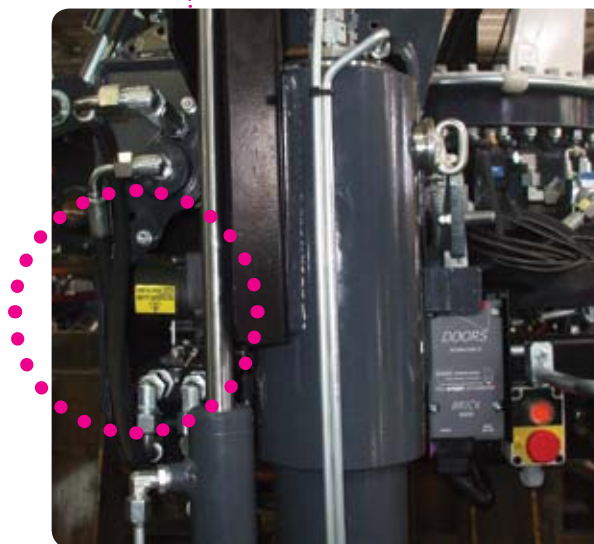
CABLE REEL

CABLE REEL with the redounded management of angle and extensions.



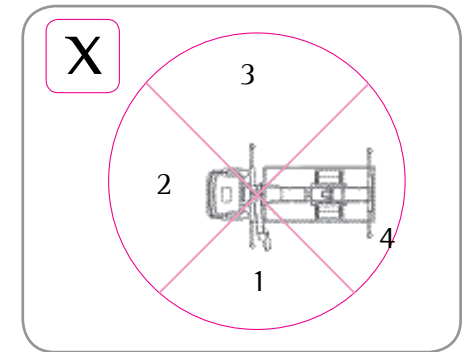
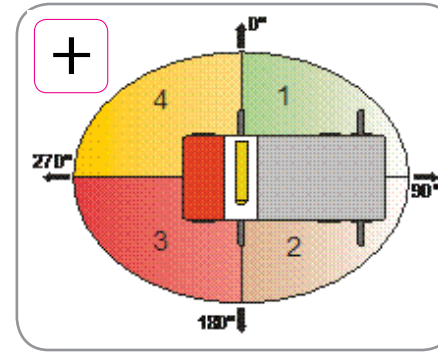
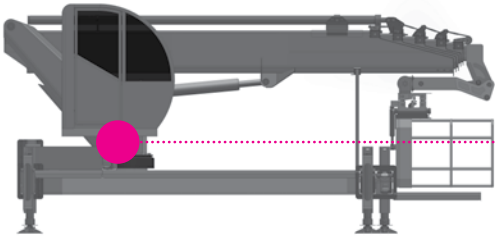
O'LAPA

Management of the STABILIZATION: rotation – stabilizer out – feet on the ground

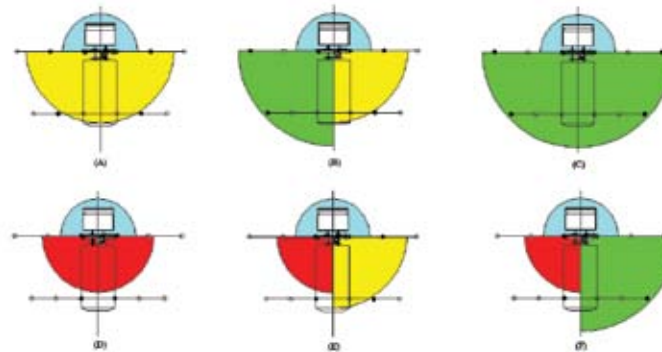
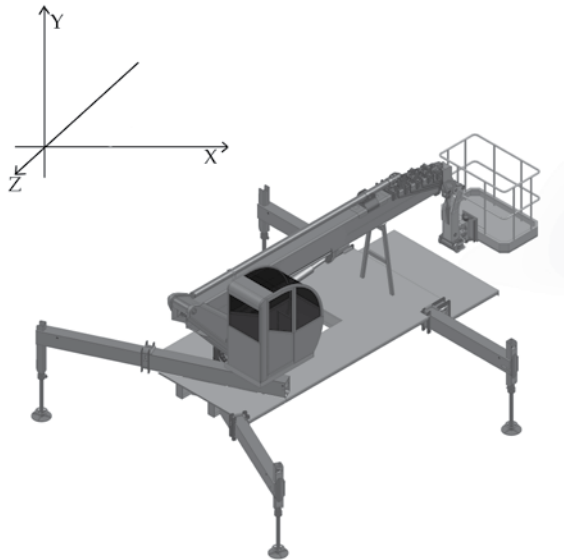

MANAGEMENT OF THE STABILIZER POSITION  
BY PROXIMITIES SENSORS

MANAGEMENT OF THE STABILIZER POSITION  
BY CABLE REEL SENSORS


O'LAPA

Management of the WORKING AREAS: 4 areas  $+$  or  $\times$



The system can manage the tilting of the chassis according to the axle X Y Z.



WORKING AREAS:

RED

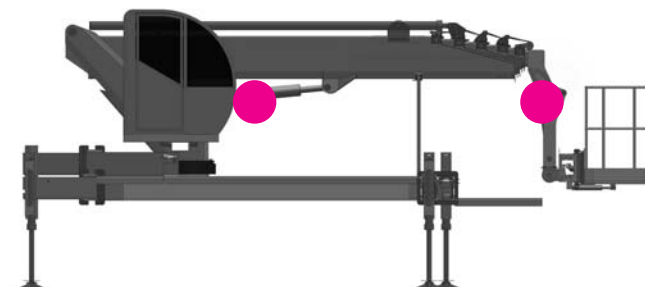
YELLOW

GREEN

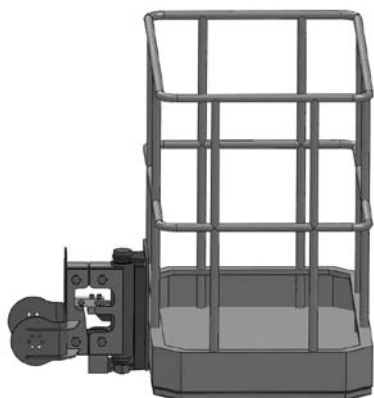
Reducing of the capacity according to the working area and the stabilizers out/in and feet on the ground.

## O'LAPA Moment limiter

O'LAPA is a versatile system; with the configuration THRIFTY LED it can manage the redounded working pressures of ARM1. It is also possible to manage the redounded working pressure of ARM2 (Fly JIB).



## Management of the weight in the basket and wind speed (redounded signals)



## WINDOW FUNCTION



Management of the closeness of  
The basket to an obstacle.

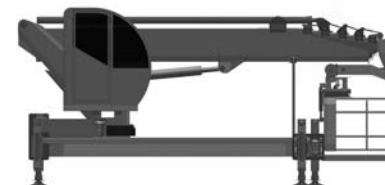
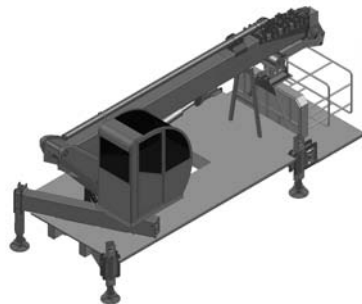
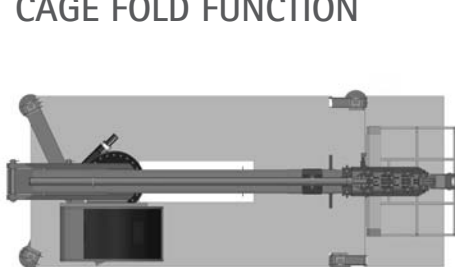
**4CED**: indicator for the data of the machine



Main technical features:

- Reading of angle and extension of ARM1 and ARM2 (Fly JIB)
- Reading of the real weight of the basket
- Reading of the wind speed
- Reading of the working area and of the chassis tilting (X,Y)
- Reading of the stabilizers and position of the stabilizers
- Auto Test
- Maintenance program

## CAGE FOLD FUNCTION



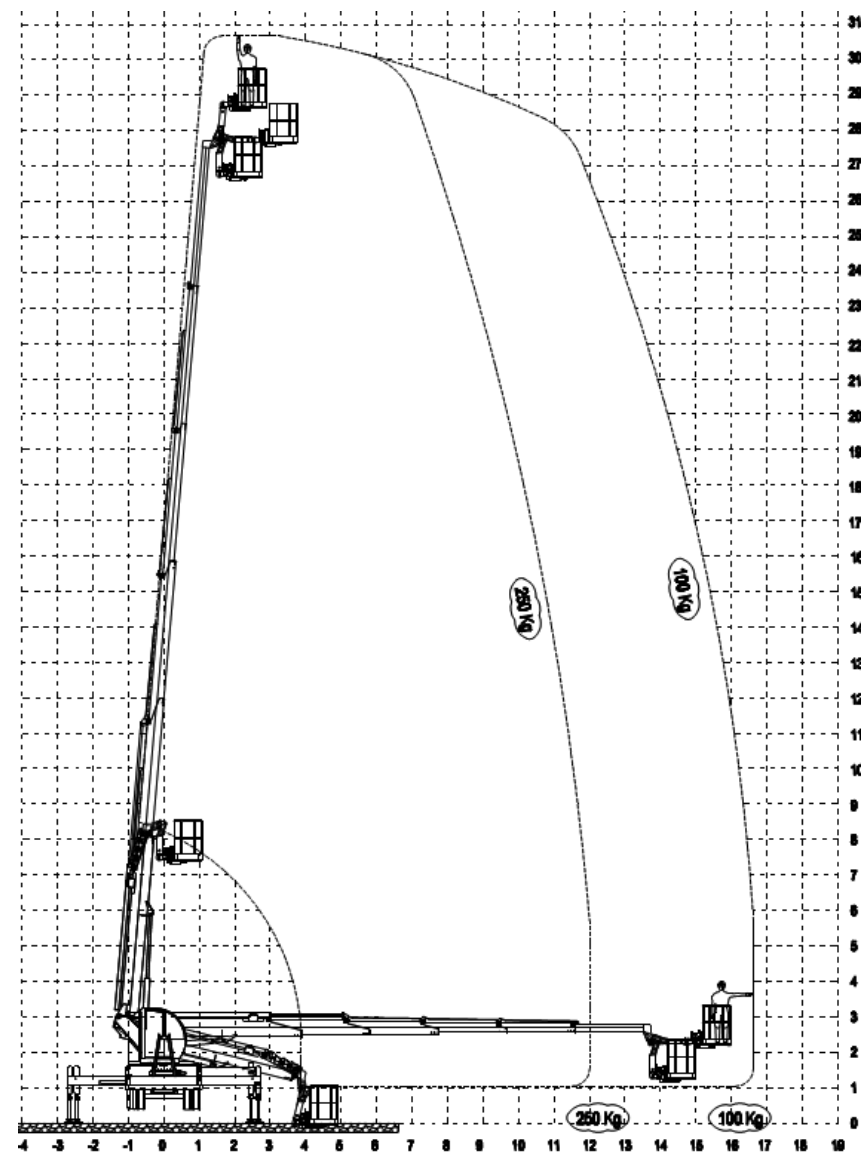
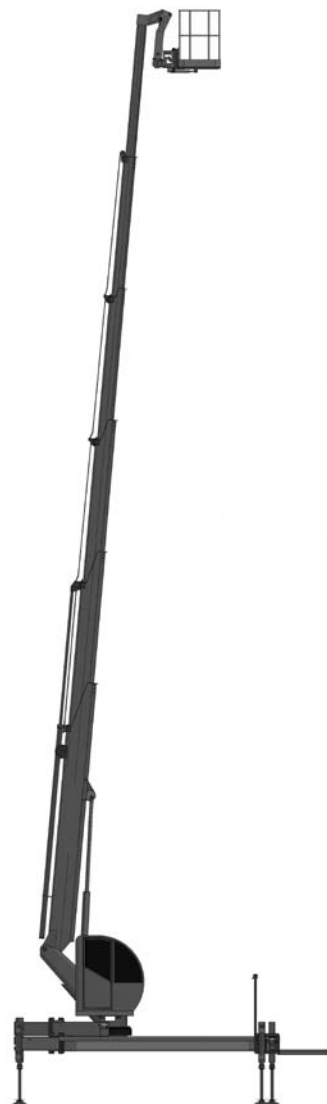
Management of the basket  
rest position



## O'LAPA Limiter aerial platform

O'LAPA is a working area limiter for aerial platform

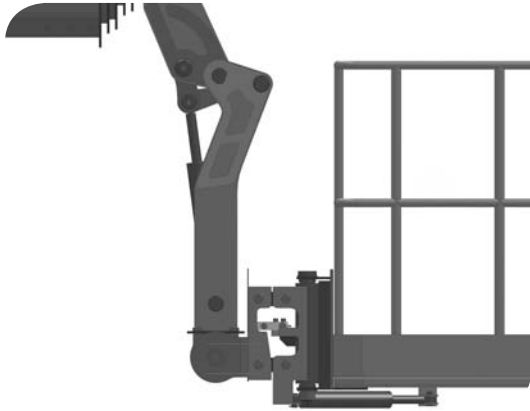
The system can manage the platform in a safe condition according to the work that the operator is carrying out, thanks to the help of the sensors installed on the machine and to the automatic management of the working table, reducing the working speed.



# O'LAPA

## BSL - Basket Self Levelling

---



It is an end product itself and not part of the O'LAPA system.

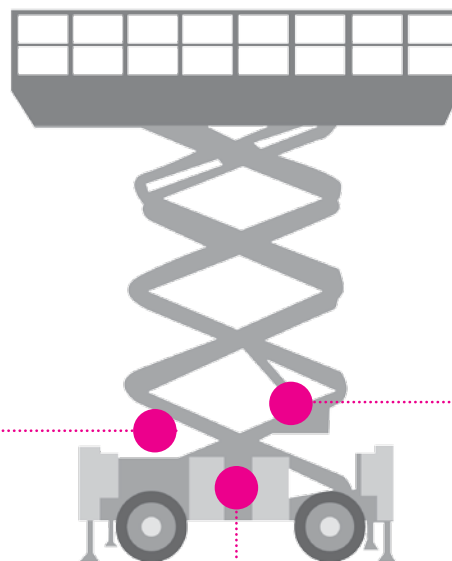
It must level automatically the basket; it is possible to unlock the basket manually to put it to the rest position.



# O'LAPA SCISSORS LIFT



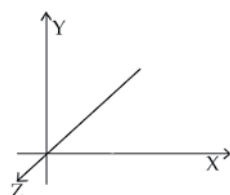
ROCKER MIR  
redounded angular sensor



PRESSURE SENSORS



O'LAPA

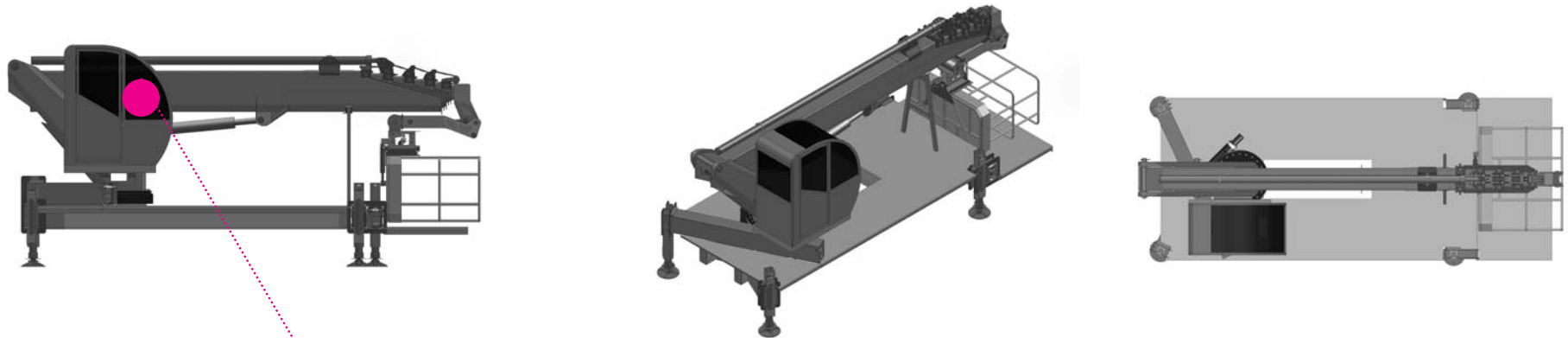


The system can manage the tilting of the chassis according to the axle X Y Z.

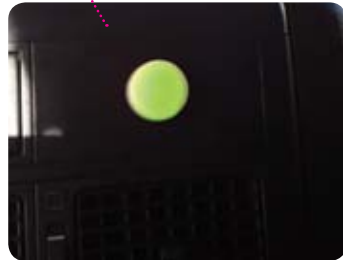
O'LAPA

Management of the safety on the road: main arm in rest position – stabilizers in – feet up

---



Audio-visible signal  
installed in the  
console of the truck



Green Led OK



Red Led with  
audio signal



**> Mechanical dimensions**

Width 31 mm  
Height 38 mm  
Depth 76 mm

A2L is a kit designed by SPRING machine control;  
it is a audio-visual signal for automotive application.  
This product can be used both inside and outside in  
remote control electrical panel .



## O'LAPA FUNCTIONS OF THE SYSTEM

---

- Tilting management of the chassis on the axles; the limit can be set as it is necessary; it hasn't got any restrictions
- Management of the rotation of the machine in areas (FRONT – BACK – RIGHT – LEFT)
- Management of the stabilizers in four different positions
- Management of the feet on the ground
- Management of the micro switch on the distributor levers ROTATION L/R; ARM1 UP DW; ARM2 IN OUT; ARM1 IN OUT; ARM2 UP DW
- Redounded management of the main working cylinder pressure and return of ARM1 and ARM2
- Redounded management and reading of the working angle of ARM1 and ARM2
- Redounded management and reading of the extension of ARM1 and ARM2
- Redounded management and reading of the weight of the basket
- Redounded management and reading of the wind speed
- WINDOW FUNCTION, management of the closeness of the basket to an obstacle.
- CAGE FOLD FUNCTION, management of basket rest
- 4CED INDICATOR with data of the machine; weight of the basket; wind speed; angles; extension; working pressure; test; maintenance program
- Management of SAFETY ON THE ROAD





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